

## Pressure Measurement



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- 1/454 - fixed connection and with capillary
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You can download all instructions, catalogs and certificates for SITRANS P free of charge at the following Internet address: [www.siemens.com/sitransp](http://www.siemens.com/sitransp)

### Overview

| Application  | Description   | Software for parameterization |
|--|---|-------------------------------|
| <b>SITRANS P Single-range transmitters for general applications</b>  |   |                               |
|   | <b>SITRANS P200</b><br>Two or three-wire transmitters for measuring gauge and absolute pressure <ul style="list-style-type: none"> <li>• Single-range transmitters for gauge and absolute pressure</li> <li>• Ceramic measuring cell</li> <li>• For general applications</li> </ul>   | 1/6 –                         |
|  | <b>SITRANS P210</b><br>Single-range transmitters for gauge pressure <ul style="list-style-type: none"> <li>• Stainless steel measuring cell</li> <li>• For low-pressure applications</li> </ul>   | 1/12 –                        |
|  | <b>SITRANS P220</b><br>Single-range transmitters for gauge pressure <ul style="list-style-type: none"> <li>• Stainless steel measuring cell, fully welded</li> <li>• For high-pressure applications and refrigeration technology</li> </ul>   | 1/17 –                        |
|   | <b>SITRANS LH100</b><br>Two-wire transmitter for measuring hydrostatic levels <ul style="list-style-type: none"> <li>• For measuring liquid levels in wells, tanks, channels, dams etc.</li> <li>• With ceramic diaphragm, Ø 23.4 mm</li> </ul>   | 1/23 –                        |
|    | <b>SITRANS LH300</b><br>Two-wire transmitter for measuring hydrostatic levels <ul style="list-style-type: none"> <li>• For measuring liquid levels in wells, tanks, channels, dams etc.</li> <li>• With ceramic diaphragm, Ø 30 mm</li> <li>• Suitable for small measuring ranges</li> </ul>  | 1/28 –                        |
| <br> | <b>SITRANS P Compact</b><br>Transmitters for gauge and absolute pressure for food, pharmaceuticals and biotechnology <ul style="list-style-type: none"> <li>• Single-range transmitters in two-wire system</li> <li>• Hygiene-based design with various aseptic connections according to EHEDG, FDA and GMP recommendations.</li> </ul>   | 1/34 –                        |
| <b>SITRANS P · Transmitters with WirelessHART communication</b>  |   |                               |
|   | <b>SITRANS P280</b><br>Wireless transmitter with Wireless HART for measuring gauge and absolute pressure <ul style="list-style-type: none"> <li>• Wireless communication with WirelessHART</li> <li>• Battery operation</li> <li>• Parameterization using 3 buttons and SIMATIC PDM with HART modem or wireless with WirelessHART</li> </ul>  | 1/43 SIMATIC PDM              |
| <b>SITRANS P · Transmitters for food, pharmaceuticals and biotechnology</b>  |   |                               |
| <br> | <b>SITRANS P300</b><br>Two-wire transmitters for measuring gauge and absolute pressure <ul style="list-style-type: none"> <li>• Hygiene-based design according to EHEDG, 3A, FDA and GMP</li> <li>• Parameterization using 3 buttons and communication over HART, PROFIBUS PA or FOUNDATION Fieldbus</li> <li>• Standard process connection G1/2", 1/2-NPT and front-flush process connections available</li> <li>• Range adjustment 100 : 1</li> </ul> | 1/48 SIMATIC PDM              |
|   | Factory-mounting of valve manifolds on SITRANS P300 transmitters <ul style="list-style-type: none"> <li>• Simplified assembly</li> <li>• With pressure test</li> <li>• Stainless steel valve manifolds</li> </ul>   | 1/71 –                        |

# Pressure Measurement

## Product overview

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| Application  | Description   | Software for parameterization |
|--|---|-------------------------------|
| <b>SITRANS P · Transmitters for gauge pressure for the paper industry</b>            |   |                               |
|     | Two-wire transmitters for measuring gauge pressure<br><b>SITRANS P300 and SITRANS P DS III with PMC connection for the paper industry</b> <ul style="list-style-type: none"><li>• Range adjustment 100 : 1</li><li>• Process connections for the paper industry</li><li>• Parameterization using 3 buttons and HART, PROFIBUS PA or FOUNDATION Fieldbus</li></ul>   | 1/73<br>SIMATIC PDM           |
| <b>SITRANS P Transmitters for applications with basic requirements (Basic)</b>       |   |                               |
|     | Two-wire transmitter for measuring: <ul style="list-style-type: none"><li>• Gauge pressure,</li><li>• Differential pressure and</li><li>• Flow</li></ul> <b>SITRANS P310</b> <ul style="list-style-type: none"><li>• Measuring accuracy up to 0.075 %</li><li>• Range adjustment: 100 : 1</li><li>• Parameterization using 3 buttons and HART</li></ul>   | 1/91<br>SIMATIC PDM           |
| <b>SITRANS P Transmitters for applications with advanced requirements (Advanced)</b> |   |                               |
|    | Two-wire transmitters for measuring: <ul style="list-style-type: none"><li>• Gauge pressure,</li><li>• Absolute pressure,</li><li>• Differential pressure and</li><li>• Flow or</li><li>• Level</li></ul> <b>SITRANS P320/P420 NEW</b> <ul style="list-style-type: none"><li>• Measuring accuracy:<ul style="list-style-type: none"><li>- SITRANS P320: 0.065 %</li><li>- SITRANS P420 0.04 %</li></ul></li><li>• Fast step response time of up to 105 ms</li><li>• Developed according to IEC 61508, SIL2/3 applications</li><li>• SIL validation remotely</li><li>• Diagnostics according to Namur NE107</li><li>• 4-key operation</li></ul>                      | 1/112<br>SIMATIC PDM          |
|   | Two-wire transmitters for measuring: <ul style="list-style-type: none"><li>• Gauge pressure,</li><li>• Absolute pressure,</li><li>• Differential pressure and</li><li>• Flow or</li><li>• Level</li></ul> <b>SITRANS P DS III</b> <ul style="list-style-type: none"><li>• Measuring accuracy up to 0.065 %</li><li>• Range adjustment: 100 : 1</li><li>• Parameterization using:<ul style="list-style-type: none"><li>- 3 buttons and HART for SITRANS P DS III HART</li><li>- 3 buttons and PROFIBUS PA for SITRANS P DS III PA series</li><li>- 3 buttons and FOUNDATION Fieldbus for SITRANS P DS III FF series</li></ul></li><li>• Available ex stock</li></ul> | 1/193<br>SIMATIC PDM          |
|   | Factory mounting of valve manifolds on gauge, absolute or differential pressure transmitters SITRANS P DS III <ul style="list-style-type: none"><li>• Simplified assembly</li><li>• With pressure test</li><li>• Stainless steel valve manifolds</li></ul>  | 1/280<br>–                    |
|   | Two-wire transmitters for measuring: <ul style="list-style-type: none"><li>• Gauge pressure,</li><li>• Differential pressure and</li><li>• Flow</li></ul> <b>SITRANS P410</b> <ul style="list-style-type: none"><li>• Measuring accuracy up to 0.04 %</li><li>• Range adjustment 100 : 1</li><li>• Parameterization using:<ul style="list-style-type: none"><li>- 3 buttons and HART for SITRANS P410 HART</li><li>- 3 buttons and PROFIBUS PA for SITRANS P410 PA</li><li>- 3 buttons and FOUNDATION Fieldbus for SITRANS P410 FF</li></ul></li></ul>  | 1/284<br>SIMATIC PDM          |
|   | Factory mounting of valve manifolds on gauge, absolute or differential pressure transmitters SITRANS P410 <ul style="list-style-type: none"><li>• Factory valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/280).</li></ul>  | –                             |



| Application   | Description  | Software for parameterization   |  |             |
|---|--|---|--|-------------|
| SITRANS P - Transmitters for applications with highest requirements (Premium)       |  |   |  |             |
|    | <p>Two-wire transmitters for measuring:</p> <ul style="list-style-type: none"><li>• Differential pressure</li><li>• Volume flow</li><li>• Mass flow</li><li>• Level</li><li>• Volume</li><li>• Mass</li></ul>  | <p><b>SITRANS P500</b></p> <ul style="list-style-type: none"><li>• Measuring accuracy up to 0.03 %</li><li>• Range adjustment: 200 :1</li><li>• High measuring accuracy</li><li>• Very fast response time</li><li>• Extremely good long-term stability</li><li>• Parameterization using 3 buttons or HART</li></ul>       | 1/324  | SIMATIC PDM |
|    | <p>Factory-mounting of manifolds on differential pressure transmitters SITRANS P500</p> <ul style="list-style-type: none"><li>• Simplified assembly</li><li>• With pressure test</li><li>• Stainless steel valve manifolds</li></ul>   |   | 1/349  | —           |
| Remote seals for transmitters and pressure gauges                                   |  |   |  |             |
|    | <p>Remote seals for measuring viscous, corrosive or fibrous media (as well as media at extreme temperatures)</p>   | <p>Remote seals for SITRANS P320/420 <b>NEW</b></p> <p>Remote seals for SITRANS P DSIII</p> <ul style="list-style-type: none"><li>• Remote seals in sandwich and flange designs</li><li>• Quick-release remote seals for the food industry</li><li>• Wide range of diaphragm materials and fill fluid available</li></ul> | 1/352<br>1/422   | —           |
| Fittings  |  |   |  |             |
|  | <p>Shutting off the lines for the medium and differential pressure</p> <p>Mounting of transmitter on valve manifold or shut-off fitting</p>  | <p>Shut-off fittings and valve manifolds available in steel, brass or stainless steel</p> <p>Valve manifolds available for the various process connections of the SITRANS P transmitters</p>  | 1/489  | —           |
|  | <p>As accessory for fittings are available:</p> <ul style="list-style-type: none"><li>• Oval flange</li><li>• Mounting collars</li><li>• Connection glands</li><li>• Connection parts G½</li><li>• Water traps</li><li>• Sealing rings to EN 837-1</li><li>• Pressure surge reducers</li><li>• Primary shut-off valves</li><li>• Compensation vessels</li><li>• Connection parts</li></ul> |   | 1/522<br>1/523<br>1/524<br>1/525<br>1/526<br>1/526<br>1/527<br>1/528<br>1/530<br>1/531 |             |

### Supplied product documentation on DVD and safety instructions



The scope of delivery of the Siemens products for process instrumentation includes a multilingual instruction sheet with **safety instructions** as well as a uniform **mini DVD – Process Instrumentation and Weighing Systems**. This DVD contains the most important manuals and certificates for the Siemens process instrumentation and weighing technology portfolio. The delivery may also contain product-specific or order-specific printed materials. For additional information, refer to the Annex on page 10/3.

## Pressure Measurement

Single-range transmitters for general applications

### SITRANS P200 for gauge and absolute pressure

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#### Overview



The SITRANS P200 pressure transmitter measures the gauge and absolute pressure of liquids, gases and vapors.

- Ceramic measuring cell
- Gauge and absolute measuring ranges 1 to 60 bar (15 to 1000 psi)
- For general applications

#### Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

#### Application

The SITRANS P200 pressure transmitter for gauge and absolute pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

#### Design

##### Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

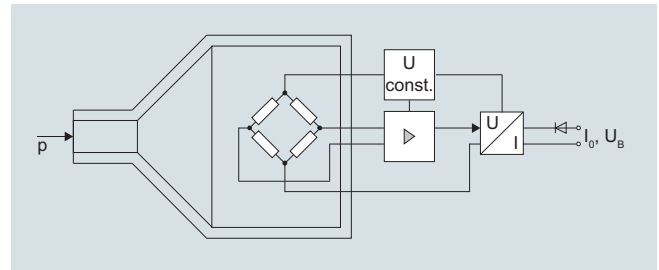
##### Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a M12 device plug (IP67) connected electrically. The output signal is between 4 and 20 mA.

#### Function

The pressure transmitter measures the gauge and absolute pressure of liquids and gases as well as the level of liquids.

##### Mode of operation



SITRANS P200 pressure transmitters (7MF1565-...), functional diagram

The ceramic measuring cell has a thin-film resistance bridge to which the operating pressure  $p$  is transmitted through a ceramic diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

# Pressure Measurement

## Single-range transmitters for general applications

### SITRANS P200 for gauge and absolute pressure

1

#### Technical specifications

|  |  |   |  |  |  |   |
|--|--|---|--|--|--|---|
| <b>Application</b><br>Gauge and absolute pressure measurement  |  | Liquids, gases and vapors   |  | Electromagnetic compatibility  |  | <ul style="list-style-type: none"> <li>• acc. IEC 61326-1/-2/-3</li> <li>• acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation <math>\leq 1\%</math></li> </ul>   |
| <b>Mode of operation</b><br>Measuring principle  |  | Piezo-resistive measuring cell (ceramic diaphragm)  |  | <b>Design</b><br>Weight  |  | Approx. 0.090 kg (0.198 lb)   |
| Measured variable  |  | Gauge and absolute pressure   |  | Process connections  |  | See dimension drawings  |
| <b>Inputs</b><br>Measuring range   |  | Gauge pressure<br>- Metric<br>- US measuring range  |  | Electrical connections   |  | <ul style="list-style-type: none"> <li>• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11</li> <li>• M12 device plug</li> <li>• 2 or 3-wire (0.5 mm<sup>2</sup>) cable (<math>\varnothing \pm 5.4</math> mm)</li> <li>• Quickon cable quick screw connection</li> </ul> |
| Absolute pressure<br>- Metric<br>- US measuring range  |  | 1 ... 60 bar (15 ... 870 psi)<br>15 ... 1000 psi  |  | Wetted parts materials   |  | Al <sub>2</sub> O <sub>3</sub> - 96 %<br>Stainless steel, mat. No. 1.4404 (SST 316 L)   |
| <b>Output</b><br>Current signal  |  | 4 ... 20 mA<br>(U <sub>B</sub> - 10 V)/0.02 A   |  | <ul style="list-style-type: none"> <li>• Measuring cell</li> <li>• Process connection</li> </ul>   |  | FPM (Standard)<br>Neoprene<br>Perbunan<br>EPDM  |
| <ul style="list-style-type: none"> <li>• Load</li> <li>• Auxiliary power U<sub>B</sub></li> </ul>                              |  | DC 7 ... 33 V (10 ... 30 V for Ex)  |  | <ul style="list-style-type: none"> <li>• Gasket</li> </ul>   |  | Stainless steel, mat. No. 1.4404 (SST 316 L)  |
| Voltage signal   |  | 0 ... 10 V DC   |  | Non-wetted parts materials   |  | Stainless steel, mat. No. 1.4404 (SST 316 L)  |
| <ul style="list-style-type: none"> <li>• Load</li> <li>• Auxiliary power U<sub>B</sub></li> <li>• Power consumption</li> </ul> |  | $\geq 10$ k $\Omega$<br>12 ... 33 V DC<br>$< 7$ mA at 10 k $\Omega$   |  | <ul style="list-style-type: none"> <li>• Enclosure</li> <li>• Rack</li> <li>• Cables</li> </ul>  |  | Plastic<br>PVC  |
| Ratiometric output   |  | 0 ... 90 %  |  | <b>Certificates and approvals</b>  |  | Classification according to pressure equipment directive (PED 2014/68/EU)   |
| <ul style="list-style-type: none"> <li>• Load</li> <li>• Auxiliary power U<sub>B</sub></li> <li>• Power consumption</li> </ul> |  | $\geq 10$ k $\Omega$<br>5 V DC $\pm 10\%$<br>$< 7$ mA at 10 k $\Omega$  |  | Lloyd's Register of Shipping (LR) <sup>1)</sup><br>Germanischer Lloyd (GL) <sup>1)</sup><br>American Bureau of Shipping (ABS) <sup>1)</sup><br>Bureau Veritas (BV) <sup>1)</sup><br>Det Norske Veritas (DNV) <sup>1)</sup><br>Drinking water approval (ACS) <sup>1)</sup><br>EAC <sup>1)</sup> |  | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)  |
| Characteristic curve   |  | Linear rising   |  | Underwriters Laboratories (UL) <sup>1)</sup>   |  | 12/20010<br>GL19740 11 HH00<br>ABS_11_HG 789392_PDA<br>BV 271007A0 BV<br>A 12553<br>ACS 15 ACC NY 360<br>№ TC RU C-DE.ГБ05.B.00732<br>OC НАННО «ЦБЭ»  |
| <b>Measuring accuracy</b><br>Error in measurement at limit setting incl. hysteresis and reproducibility                        |  | <ul style="list-style-type: none"> <li>• Typical: 0.25 % of measuring span</li> <li>• Maximum: 0.5 % of measuring span</li> </ul>   |  | UL 20110217 - E34453<br>IEC UL DK 21845  |  | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)  |
| Step response time T <sub>99</sub>   |  | $< 5$ ms  |  | <b>Explosion protection</b>  |  | Ex II 1/2 G Ex ia IIC T4 Ga/Gb<br>Ex II 1/2 D Ex ia IIIC T125 °C Da/Db  |
| Long-term stability  |  | 0.25 % of measuring span/year   |  | Intrinsic safety "i" (only with current output)  |  | SEV 10 ATEX 0146<br>U <sub>i</sub> $\leq 30$ V DC; I <sub>i</sub> $\leq 100$ mA; P <sub>i</sub> $\leq 0.75$ W   |
| <ul style="list-style-type: none"> <li>• Lower range value and measuring span</li> </ul>                                       |  | 0.25 % of measuring span/year   |  | EC type-examination certificate  |  | L <sub>i</sub> = 0 nH; C <sub>i</sub> = 0 nF  |
| Influence of ambient temperature   |  | 0.25 %/10 K of measuring span   |  | Connection to certified intrinsically-safe resistive circuits with maximum values:   |  |   |
| <ul style="list-style-type: none"> <li>• Lower range value and measuring span</li> <li>• Influence of power supply</li> </ul>  |  | 0.005 %/V   |  | Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12   |  |   |
| <b>Conditions of use</b><br>Process temperature with gasket made of:   |  | -15 ... +125 °C (+5 ... +257 °F)<br>-35 ... +100 °C (-31 ... +212 °F)<br>-20 ... +100 °C (-4 ... +212 °F)<br>-40 ... +125 °C (-40 ... +257 °F), usable for drinking water   |  |  |  |   |
| <ul style="list-style-type: none"> <li>• FPM (Standard)</li> <li>• Neoprene</li> <li>• Perbunan</li> <li>• EPDM</li> </ul>     |  | -25 ... +85 °C (-13 ... +185 °F)<br>-50 ... +100 °C (-58 ... +212 °F)   |  |  |  |   |
| Ambient temperature  |  |   |  |  |  |   |
| Storage temperature  |  |   |  |  |  |   |
| Degree of protection (to EN 60529)   |  | <ul style="list-style-type: none"> <li>• IP 65 with connector per EN 175301-803-A</li> <li>• IP 67 with M12 device plug</li> <li>• IP 67 with cable</li> <li>• IP 67 with cable quick screw connection</li> </ul> |  |  |  |   |

<sup>1)</sup> For variants with output signal 0 ... 5 V and ratiometric output available soon.

## Single-range transmitters for general applications

## Selection and ordering data

Order code

7MF1565 -

Non-wetted parts materials: stainless steel

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

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# Pressure Measurement

## Single-range transmitters for general applications

### SITRANS P200 for gauge and absolute pressure

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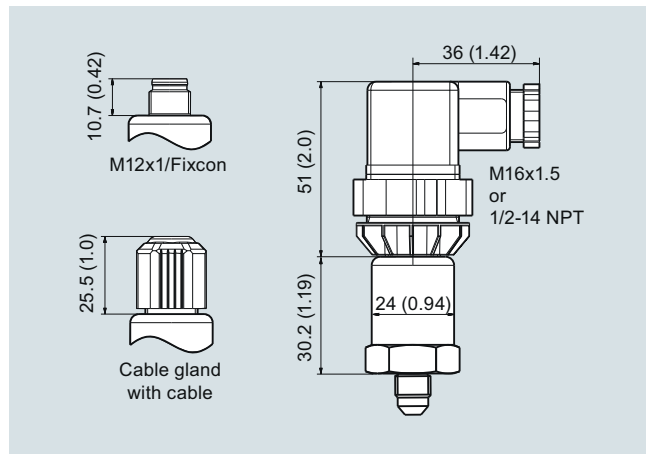
| Selection and ordering data   | Article No. | Order code   |
|---|-------------|--|
| <b>SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications</b><br>Accuracy typ. 0.25 %<br>Wetted parts materials: Ceramic and stainless steel + sealing material<br>Non-wetted parts materials: stainless steel   | 7MF1565-    |  |
| <b>Output signal</b><br>4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions)<br>0 ... 10 V; three-wire system; power supply 12 ... 33 V DC<br>0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC<br>Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 %   |             | 0<br>10<br>20<br>30  |
| <b>Explosion protection (only 4 ... 20 mA)</b><br>None<br>With explosion protection Ex ia IIC T4  |             | 0<br>1   |
| <b>Electrical connection</b><br>Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)<br>M12 device plug per IEC 61076-2-101<br>Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")<br>Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")<br>Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)<br>Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling)<br>Fixed mounted cable, length 5 m<br>Special version |             | 1<br>2<br>03<br>04<br>5<br>6<br>07<br>9<br>N1Y                       |
| <b>Process connection</b><br>G½" male per EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar)<br>G½" male thread and G1/8" female thread<br>G¼" male per EN 837-1 (¼" BSP male)<br>7/16"-20 UNF male<br>¼"-18 NPT male (standard for pressure ranges inH <sub>2</sub> O and psi)<br>¼"-18 NPT female<br>½"-14 NPT male<br>½"-14 NPT female<br>7/16"-20 UNF female<br>M20x1.5 male<br>G1/4" to DIN 3852 Form E<br>G1/2" to DIN 3852 Form E<br>Special version   |             | A<br>B<br>C<br>D<br>E<br>F<br>G<br>H<br>J<br>P<br>Q<br>R<br>Z<br>P1Y |
| <b>Sealing material between sensor and enclosure</b><br>Viton (FPM, standard)<br>Neoprene (CR)<br>Perbunan (NBR)<br>EPDM<br>Special version   |             | A<br>B<br>C<br>D<br>Z<br>Q1Y   |
| <b>Version</b><br>Standard version  |             | 1  |
| <b>Further designs</b><br>Supplement the Article No. with "-Z" and add Order code.<br>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<br>Oxygen version, free of oil and degreased, max. operating pressure 60 bar, max. process temperature +85 °C (only in conjunction with the sealing material Viton between sensor and enclosure and not with explosion protection version)  | C11<br>E10  |  |

## Pressure Measurement

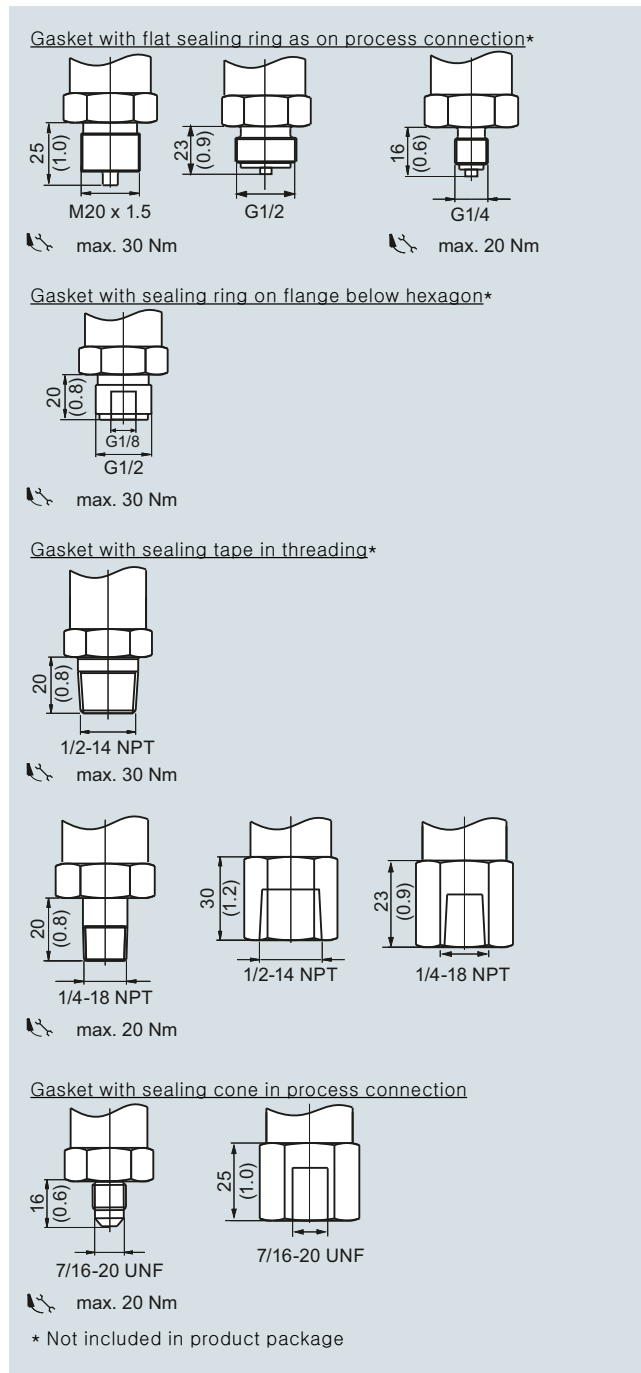
Single-range transmitters for general applications

### SITRANS P200 for gauge and absolute pressure

#### Dimensional drawings



SITRANS P200, electrical connections, dimensions in mm (inch)



SITRANS P200, process connections, dimensions in mm (inch)



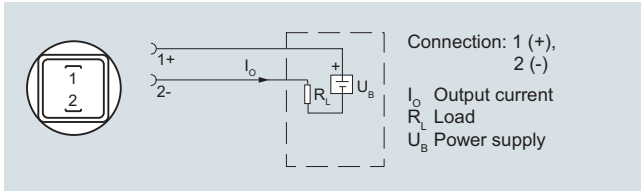
# Pressure Measurement

## Single-range transmitters for general applications

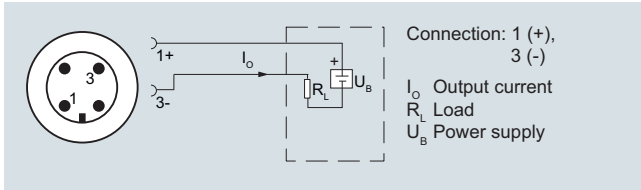
### SITRANS P200 for gauge and absolute pressure

1

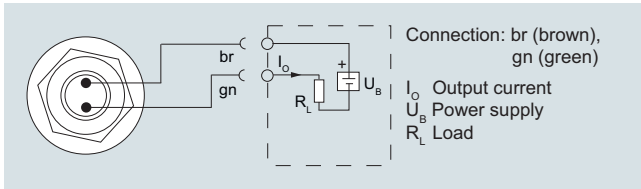
#### Schematics



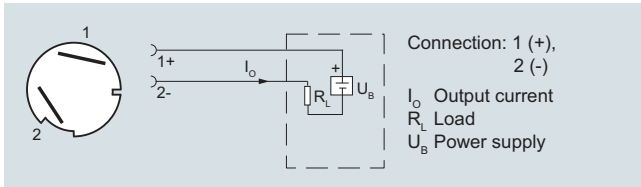
Connection with current output and connector per EN 175301



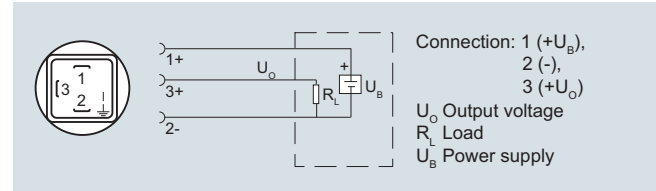
Connection with current output and M12x1 device plug



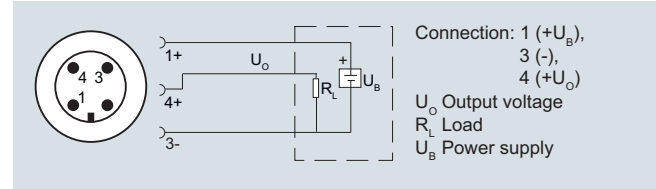
Connection with current output and cable



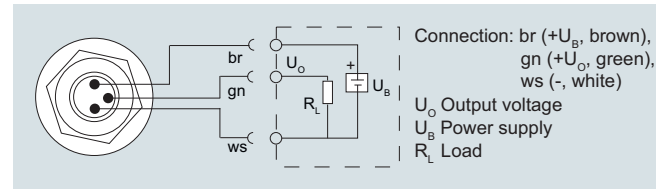
Connection with current output and Quickon cable quick screw connection



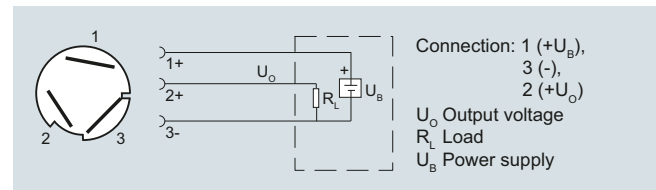
Connection with voltage output, ratiometric output and plug according to EN 175301



Connection with voltage output, ratiometric output and M12x1 device plug



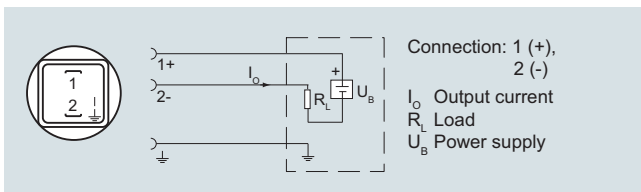
Connection with voltage output, ratiometric output and cable



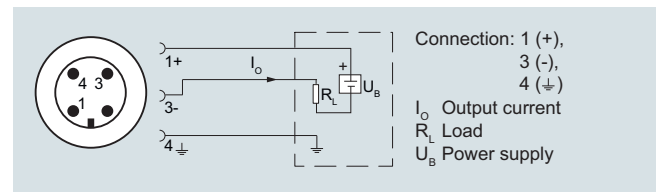
Connection with voltage output, ratiometric output and Quickon fast cable termination

#### Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure



Connection with current output and connector per EN 175301 (Ex)



Connection with current output and M12x1 device plug (Ex)

## Pressure Measurement

Single-range transmitters for general applications

### SITRANS P210 for gauge pressure

1

#### Overview



The pressure transmitter SITRANS P210 measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell
- Measuring ranges 100 to 600 mbar (1.45 to 8.7 psi) relative
- For low-pressure applications

#### Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

#### Application

The pressure transmitter SITRANS P210 for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

#### Design

##### *Device structure without explosion protection*

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

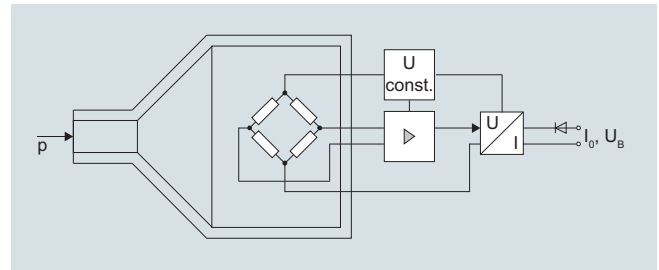
##### *Device structure with explosion protection*

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a M12 device plug (IP67) connected electrically. The output signal is between 4 and 20 mA.

#### Function

The pressure transmitter measures the gauge pressure of liquids and gases as well as the level of liquids.

##### *Mode of operation*



SITRANS P210 pressure transmitters (7MF1566-...), functional diagram

The stainless steel measuring cell has a thin-film resistance bridge to which the operating pressure  $p$  is transmitted through a stainless steel diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

# Pressure Measurement

## Single-range transmitters for general applications

### SITRANS P210 for gauge pressure

1

#### Technical specifications

|  |   |
|--|---|
| <b>Application</b>   | Liquids, gases and vapors   |
| <b>Mode of operation</b>   |   |
| Measuring principle  | Piezoresistive measuring cell (stainless steel diaphragm)   |
| Measured variable  | Gauge pressure  |
| <b>Inputs</b>  |   |
| Measuring range  |   |
| • Gauge pressure   | 100 ... 600 mbar (1.5 ... 8.7 psi)  |
| <b>Output</b>  |   |
| Current signal   | 4 ... 20 mA   |
| • Load   | ( $U_B - 10 \text{ V}$ )/0.02 A   |
| • Auxiliary power $U_B$  | DC 7 ... 33 V (10 ... 30 V for Ex)  |
| Voltage signal   | 0 ... 10 V DC   |
| • Load   | $\geq 10 \text{ k}\Omega$   |
| • Auxiliary power $U_B$  | 12 ... 33 V DC  |
| • Power consumption  | < 7 mA at 10 k $\Omega$   |
| Ratiometric output   | 0 ... 90 %  |
| • Load   | $\geq 10 \text{ k}\Omega$   |
| • Auxiliary power $U_B$  | 5 V DC $\pm 10 \%$  |
| • Power consumption  | < 7 mA at 10 k $\Omega$   |
| Characteristic curve   | Linear rising   |
| <b>Measuring accuracy</b>  |   |
| Error in measurement at limit setting incl. hysteresis and reproducibility | <ul style="list-style-type: none"> <li>Typical: 0.25 % of measuring span</li> <li>Maximum: 0.5 % of measuring span</li> </ul>   |
| Step response time $T_{99}$  | < 5 ms  |
| Long-term stability  |   |
| • Lower range value and measuring span                                     | 0.25 % of measuring span/year   |
| Influence of ambient temperature   |   |
| • Lower range value and measuring span                                     | <ul style="list-style-type: none"> <li>0.25 %/10 K of measuring span</li> <li>0.5 %/10 K of measuring span for a measuring range 100 ... 400 mbar</li> </ul>  |
| • Influence of power supply  | 0.005 %/V   |
| <b>Conditions of use</b>   |   |
| Process temperature with gasket made of:                                   |   |
| • FPM (Standard)   | -15 ... +125 °C (+5 ... +257 °F)  |
| • Neoprene   | -35 ... +100 °C (-31 ... +212 °F)   |
| • Perbunan   | -20 ... +100 °C (-4 ... +212 °F)  |
| • EPDM   | -40 ... +125 °C (-40 ... +257 °F), usable for drinking water  |
| Ambient temperature  | -25 ... +85 °C (-13 ... +185 °F)  |
| Storage temperature  | -50 ... +100 °C (-58 ... +212 °F)   |
| Degree of protection (to EN 60529)   | <ul style="list-style-type: none"> <li>IP 65 with connector per EN 175301-803-A</li> <li>IP 67 with M12 device plug</li> <li>IP 67 with cable</li> <li>IP 67 with cable quick screw connection</li> </ul> |
| Electromagnetic compatibility  | <ul style="list-style-type: none"> <li>acc. IEC 61326-1/-2/-3</li> <li>acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation <math>\leq 1 \%</math></li> </ul>                      |
| Mounting position  | upright   |

#### Design

|  |   |
|--|---|
| Weight   | Approx. 0.090 kg (0.198 lb)   |
| Process connections  | See dimension drawings  |
| Electrical connections   | <ul style="list-style-type: none"> <li>Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11</li> <li>M12 device plug</li> <li>2 or 3-wire (0.5 mm<sup>2</sup>) cable (<math>\varnothing \pm 5.4 \text{ mm}</math>)</li> <li>Quickon cable quick screw connection</li> </ul> |
| Wetted parts materials   |   |
| • Measuring cell   | Stainless steel, mat.-No. 1.4435  |
| • Process connection   | Stainless steel, mat. No. 1.4404 (SST 316 L)  |
| • Gasket   | <ul style="list-style-type: none"> <li>FPM (Standard)</li> <li>Neoprene</li> <li>Perbunan</li> <li>EPDM</li> </ul>  |
| Non-wetted parts materials   |   |
| • Enclosure  | Stainless steel, mat. No. 1.4404 (SST 316 L)  |
| • Rack   | Plastic   |
| • cables   | PVC   |
| <b>Certificates and approvals</b>  |   |
| Classification according to pressure equipment directive (PED 2014/68/EU)                      | For gases of fluid group 1 and liquids of fluid group 1; meets requirements as per article 4, paragraph 3 (good engineering practice)   |
| Lloyd's Register of Shipping (LR) <sup>1)</sup>  | 12/20010  |
| Germanischer Lloyd (GL) <sup>1)</sup>  | GL19740 11 HH00   |
| American Bureau of Shipping (ABS) <sup>1)</sup>  | ABS_11_HG 789392_PDA  |
| Bureau Veritas (BV) <sup>1)</sup>  | BV 271007A0 BV  |
| Det Norske Veritas (DNV) <sup>1)</sup>   | A 12553   |
| Drinking water approval (ACS) <sup>1)</sup>  | ACS 15 ACC NY 360   |
| EAC <sup>1)</sup>  | № TC RU C-DE.ГБ05.В.00732 OC НАННО «ЦБЭ»  |
| Underwriters Laboratories (UL) <sup>1)</sup>   |   |
| • for USA and Canada   | UL 20110217 - E34453  |
| • worldwide  | IEC UL DK 21845   |
| <b>Explosion protection</b>  |   |
| Intrinsic safety "i" (only with current output)  | Ex II 1/2 G Ex ia IIC T4 Ga/Gb<br>Ex II 1/2 D Ex ia IIIC T125 °C Da/Db  |
| EC type-examination certificate  | SEV 10 ATEX 0146  |
| Connection to certified intrinsically-safe resistive circuits with maximum values:             | $U_i \leq 30 \text{ V DC}$ ; $I_i \leq 100 \text{ mA}$ ; $P_i \leq 0.75 \text{ W}$  |
| Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12 | $L_i = 0 \text{ nH}$ ; $C_i = 0 \text{ nF}$   |

<sup>1)</sup> For variants with output signal 0 ... 5 V and ratiometric output available soon.

# Pressure Measurement

## Single-range transmitters for general applications

### SITRANS P210 for gauge pressure

1

#### Selection and ordering data

##### SITRANS P 210 pressure transmitters for gauge pressure for low pressure applications

Accuracy typ. 0.25 %

Wetted parts materials: Stainless steel + sealing material

Non-wetted parts materials: stainless steel

[Click on the Article No. for the online configuration in the PIA Life Cycle Portal.](#)

Article No.

Order code

7MF1566 - - - - -

#### Measuring range

#### Overload limit

min.

max.

#### Burst pressure

#### For gauge pressure

|                         |                        |                      |                  |
|-------------------------|------------------------|----------------------|------------------|
| 0...100 mbar (1.45 psi) | -400 mbar (-5.8 psi)   | 400 mbar (5.8 psi)   | 1 bar (14.5 psi) |
| 0...160 mbar (2.32 psi) | -400 mbar (-5.8 psi)   | 400 mbar (5.8 psi)   | 1 bar (14.5 psi) |
| 0...250 mbar (3.63 psi) | -800 mbar (-11.6 psi)  | 1000 mbar (14.5 psi) | 2 bar (29.0 psi) |
| 0...400 mbar (5.8 psi)  | -800 mbar (-11.6 psi)  | 1000 mbar (14.5 psi) | 2 bar (29.0 psi) |
| 0...600 mbar (8.7 psi)  | -1000 mbar (-14.5 psi) | 2000 mbar (29.0 psi) | 3 bar (43.5 psi) |

Other version, add Order code and plain text:

Measuring range: ... up to ... mbar (psi)

#### Output signal

4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions)

0 ... 10 V; three-wire system; power supply 12 ... 33 V DC

0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC

Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC  $\pm$  10 %

#### Explosion protection (only 4 ... 20 mA)

None

With explosion protection Ex ia IIC T4

#### Electrical connection

Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)

M12 device plug per IEC 61076-2-101

Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")

Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")

Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)

Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling)

Fixed mounted cable, length 5 m

Special version

#### Process connection

G1/2" male per EN 837-1 (1/2" BSP male) (standard for metric pressure ranges mbar, bar)

G1/2" male thread and G1/8" female thread

G1/4" male per EN 837-1 (1/4" BSP male)

7/16"-20 UNF male

1/4"-18 NPT male (standard for pressure ranges inH<sub>2</sub>O and psi)

1/4"-18 NPT female

1/2"-14 NPT male

1/2"-14 NPT female

7/16"-20 UNF female

M20x1.5 male

G1/4" to DIN 3852 Form E

G1/2" to DIN 3852 Form E

Special version

#### Sealing material between sensor and enclosure

Viton (FPM, standard)

Neoprene (CR)

Perbunan (NBR)

EPDM

Special version

#### Version

Standard version

#### Further designs

Supplement the Article No. with "-Z" and add Order code.

Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2

C11

3AA  
3AB  
3AC  
3AD  
3AG  
9AA

H1Y

0  
10  
20  
300  
11  
2  
03  
04  
5  
6  
07  
9

N1Y

A  
B  
C  
D  
E  
F  
G  
H  
J  
P  
Q  
R  
Z

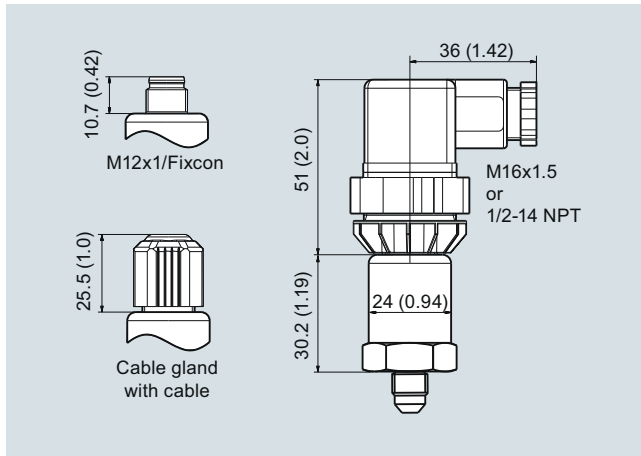
P1Y

A  
B  
C  
D  
Z

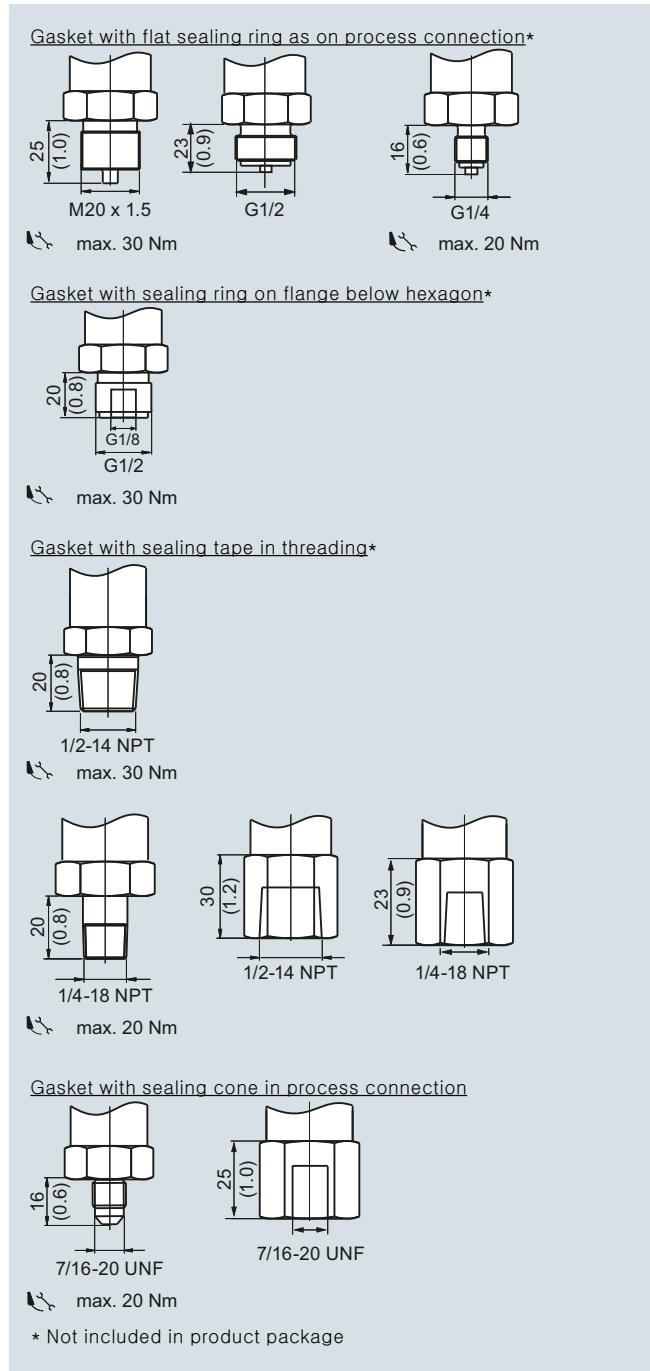
Q1Y

1

## Dimensional drawings



SITRANS P210, electrical connections, dimensions in mm (inch)



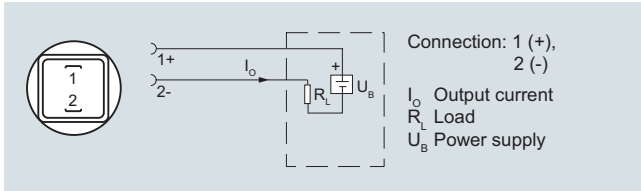
SITRANS P210, process connections, dimensions in mm (inch)

## Pressure Measurement

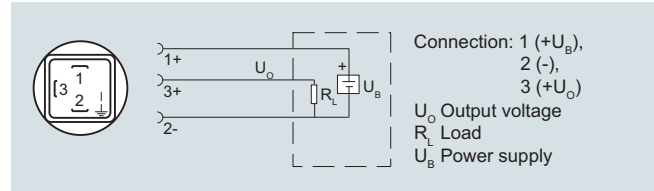
### Single-range transmitters for general applications

#### SITRANS P210 for gauge pressure

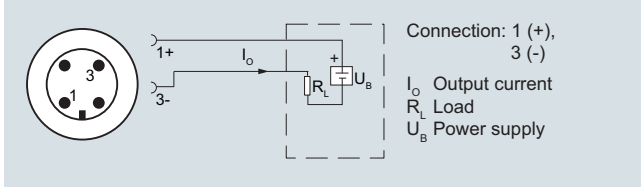
##### Schematics



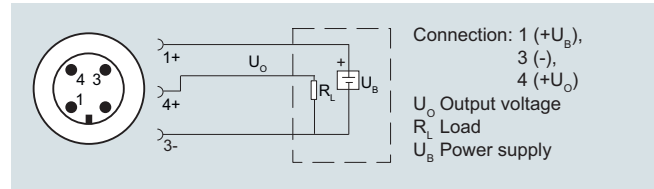
Connection with current output and connector per EN 175301



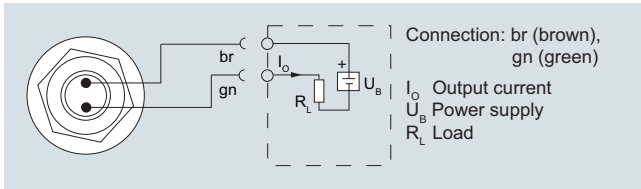
Connection with voltage output, ratiometric output and plug according to EN 175301



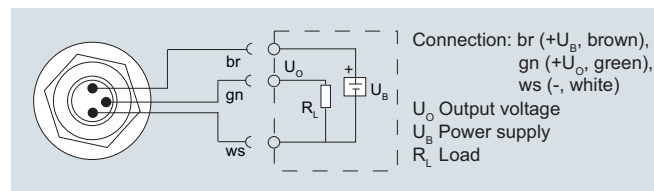
Connection with current output and M12x1 device plug



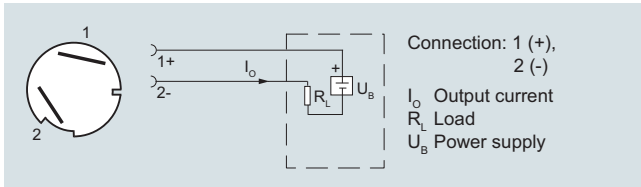
Connection with voltage output, ratiometric output and M12x1 device plug



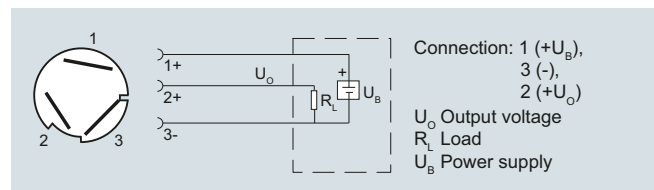
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



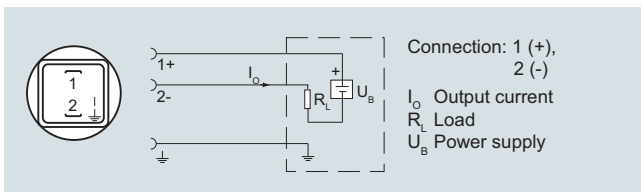
Connection with current output and Quickon cable quick screw connection



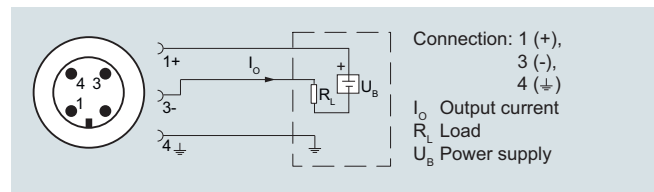
Connection with voltage output, ratiometric output and Quickon fast cable termination

#### Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure



Connection with current output and connector per EN 175301 (Ex)



Connection with current output and M12x1 device plug (Ex)



## Overview



The pressure transmitter SITRANS P220 measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell, fully welded
- Measuring ranges 2.5 to 1000 bar (36.3 to 14500 psi) relative
- For high-pressure applications and refrigeration technology division

## Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design
- Gasket-less

## Application

The pressure transmitter SITRANS P220 for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

## Design

### Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

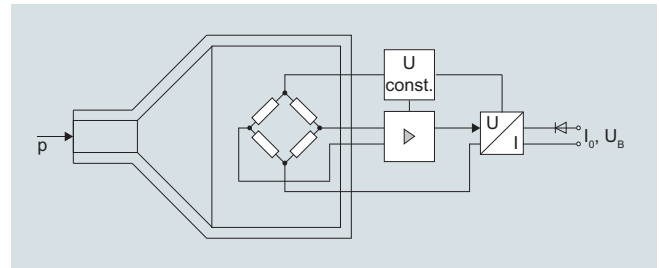
### Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a M12 device plug (IP67) connected electrically. The output signal is between 4 and 20 mA.

## Function

The pressure transmitter measures the gauge pressure of liquids and gases as well as the level of liquids.

### Mode of operation



SITRANS P220 pressure transmitters (7MF1567-...), functional diagram

The stainless steel measuring cell has a thick-film resistance bridge to which the operating pressure  $p$  is transmitted through a stainless steel diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

# Pressure Measurement

## Single-range transmitters for general applications

### SITRANS P220 for gauge pressure

1

#### Technical specifications

|   |   |  |  |
|---|---|--|--|
| <b>Application</b>  |   | <b>Design</b>  |  |
| Gauge pressure measurement  | Liquids, gases and vapors   | Weight   | Approx. 0.090 kg (0.198 lb)  |
| <b>Mode of operation</b>  |   | Process connections  | See dimension drawings   |
| Measuring principle   | Piezoresistive measuring cell (stainless steel diaphragm)   | Electrical connections   | <ul style="list-style-type: none"> <li>Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or ½-14 NPT or Pg 11</li> <li>M12 device plug</li> <li>2 or 3-wire (0.5 mm<sup>2</sup>) cable (Ø ± 5.4 mm)</li> <li>Quickon cable quick screw connection</li> </ul> |
| Measured variable   | Gauge pressure  | Wetted parts materials   |  |
| <b>Inputs</b>   |   | <ul style="list-style-type: none"> <li>Measuring cell</li> <li>Process connection</li> </ul>   | Stainless steel, mat.-No. 1.4016<br>Stainless steel, mat. No. 1.4404 (SST 316 L)   |
| Measuring range   |   | Non-wetted parts materials   |  |
| <ul style="list-style-type: none"> <li>Gauge pressure</li> <li>- Metric</li> <li>- US measuring range</li> </ul>  | 2.5 ... 1000 bar (36 ... 14500 psi)<br>30... 14500 psi  | <ul style="list-style-type: none"> <li>Enclosure</li> </ul>                                    | Stainless steel, mat. No. 1.4404 (SST 316 L)<br>Plastic<br>PVC   |
| <b>Output</b>   |   | <b>Certificates and approvals</b>  |  |
| Current signal  | 4 ... 20 mA   | Classification according to pressure equipment directive (PED 2014/68/EU)                      | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)   |
| <ul style="list-style-type: none"> <li>Load</li> <li>Auxiliary power U<sub>B</sub></li> </ul>   | (U <sub>B</sub> - 10 V)/0.02 A<br>DC 7 ... 33 V (10 ... 30 V for Ex)  | Lloyd's Register of Shipping (LR) <sup>1)</sup>  | 12/20010   |
| Voltage signal  | 0 ... 10 V DC   | Germanischer Lloyd (GL) <sup>1)</sup>  | GL19740 11 HH00  |
| <ul style="list-style-type: none"> <li>Load</li> <li>Auxiliary power U<sub>B</sub></li> <li>Power consumption</li> </ul>  | ≥ 10 kΩ<br>12 ... 33 V DC<br>< 7 mA at 10 kΩ  | American Bureau of Shipping (ABS) <sup>1)</sup>  | ABS_11_HG 789392_PDA   |
| Ratiometric output  | 0 ... 90 %  | Bureau Veritas (BV) <sup>1)</sup>  | BV 271007A0 BV   |
| <ul style="list-style-type: none"> <li>Load</li> <li>Auxiliary power U<sub>B</sub></li> <li>Power consumption</li> </ul>  | ≥ 10 kΩ<br>5 V DC ± 10 %<br>< 7 mA at 10 kΩ   | Det Norske Veritas (DNV) <sup>1)</sup>   | A 12553  |
| Characteristic curve  | Linear rising   | Drinking water approval (ACS) <sup>1)</sup>  | ACS 15 ACC NY 360  |
| <b>Measuring accuracy</b>   |   | EAC <sup>1)</sup>  | № TC RU C-DE.ГБ05.В.00732<br>ОС НАИИО «ЦСВЭ»   |
| Error in measurement at limit setting incl. hysteresis and reproducibility  | <ul style="list-style-type: none"> <li>Typical: 0.25 % of measuring span</li> <li>Maximum: 0.5 % of measuring span</li> </ul> | CRN <sup>2)</sup>  | 0F18659.5C   |
| Step response time T <sub>99</sub>  | < 5 ms  | Underwriters Laboratories (UL) <sup>1)</sup>   | UL 20110217 - E34453   |
| Long-term stability   |   | <ul style="list-style-type: none"> <li>for USA and Canada</li> <li>worldwide</li> </ul>        | IEC UL DK 21845  |
| <ul style="list-style-type: none"> <li>Lower range value and measuring span</li> </ul>  | 0.25 % of measuring span/year   | <b>Explosion protection</b>  |  |
| Influence of ambient temperature  |   | Intrinsic safety "i" (only with current output)  | Ex II 1/2 G Ex ia IIC T4 Ga/Gb<br>Ex II 1/2 D Ex ia IIIC T125 °C Da/Db   |
| <ul style="list-style-type: none"> <li>Lower range value and measuring span</li> <li>Influence of power supply</li> </ul>   | 0.25 %/10 K of measuring span<br>0.005 %/V  | EC type-examination certificate  | SEV 10 ATEX 0146   |
| <b>Conditions of use</b>  |   | Connection to certified intrinsically-safe resistive circuits with maximum values:             | U <sub>i</sub> ≤ 30 V DC; I <sub>i</sub> ≤ 100 mA; P <sub>i</sub> ≤ 0.75 W   |
| <ul style="list-style-type: none"> <li>Process temperature</li> <li>Ambient temperature</li> <li>Storage temperature</li> <li>Degree of protection (to EN 60529)</li> </ul> | -40 ... +120 °C (-40 ... +248 °F)<br>-25 ... +85 °C (-13 ... +185 °F)<br>-50 ... +100 °C (-58 ... +212 °F)                    | Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12 | L <sub>i</sub> = 0 nH; C <sub>i</sub> = 0 nF   |
|   |   | CSA <sup>2)</sup>  | 70006348   |
|   |   |  | Class I, Division I, Groups A, B, C and D;<br>Class II, Division 1, Groups E, F and G,<br>Class III  |
|   |   |  | Class I, Division 2, Groups A, B, C and D;<br>Class II, Division 2, Groups F and G,<br>Class III   |
|   |   |  | A/Ex ia IIC T4 Ga/Gb<br>A/Ex ia IIIC T125°C Da/Db  |
| <b>Electromagnetic compatibility</b>  |   |  |  |
|   |   |  |  |

<sup>1)</sup> For variants with output signal 0 ... 5 V and ratiometric output available soon.

<sup>2)</sup> See ordering data for available versions.

# Pressure Measurement

## Single-range transmitters for general applications

### SITRANS P220 for gauge pressure

1

#### Selection and ordering data

#### SITRANS P 220 pressure transmitters for gauge pressure, high-pressure and refrigeration applications, fully-welded version

Accuracy typ. 0.25 %

Wetted parts materials: stainless steel

Non-wetted parts materials: stainless steel

[Click on the Article No. for the online configuration in the PIA Life Cycle Portal.](#)

Article No.

Order code

#### Measuring range

#### Overload limit

Mini-  
mum

Max.

#### Burst pressure

#### For gauge pressure

|                |                   |                    |                      |                      |  |
|----------------|-------------------|--------------------|----------------------|----------------------|--|
| 0 ... 2.5 bar  | (0 ... 36.3 psi)  | -1 bar (-14.5 psi) | 6.25 bar (90.7 psi)  | 25 bar (363 psi)     |  |
| 0 ... 4 bar    | (0 ... 58 psi)    | -1 bar (-14.5 psi) | 10 bar (145 psi)     | 40 bar (870 psi)     |  |
| 0 ... 6 bar    | (0 ... 87 psi)    | -1 bar (-14.5 psi) | 15 bar (217 psi)     | 60 bar (522 psi)     |  |
| 0 ... 10 bar   | (0 ... 145 psi)   | -1 bar (-14.5 psi) | 25 bar (362 psi)     | 60 bar (870 psi)     |  |
| 0 ... 16 bar   | (0 ... 232 psi)   | -1 bar (-14.5 psi) | 40 bar (580 psi)     | 96 bar (1392 psi)    |  |
| 0 ... 25 bar   | (0 ... 363 psi)   | -1 bar (-14.5 psi) | 62.5 bar (906 psi)   | 150 bar (2176 psi)   |  |
| 0 ... 40 bar   | (0 ... 580 psi)   | -1 bar (-14.5 psi) | 100 bar (1450 psi)   | 240 bar (3481 psi)   |  |
| 0 ... 60 bar   | (0 ... 870 psi)   | -1 bar (-14.5 psi) | 150 bar (2175 psi)   | 360 bar (5221 psi)   |  |
| 0 ... 100 bar  | (0 ... 1450 psi)  | -1 bar (-14.5 psi) | 250 bar (3625 psi)   | 600 bar (8702 psi)   |  |
| 0 ... 160 bar  | (0 ... 2320 psi)  | -1 bar (-14.5 psi) | 400 bar (5801 psi)   | 960 bar (13924 psi)  |  |
| 0 ... 250 bar  | (0 ... 3625 psi)  | -1 bar (-14.5 psi) | 625 bar (9064 psi)   | 1500 bar (21756 psi) |  |
| 0 ... 400 bar  | (0 ... 5801 psi)  | -1 bar (-14.5 psi) | 1000 bar (14503 psi) | 2400 bar (34809 psi) |  |
| 0 ... 600 bar  | (0 ... 8702 psi)  | -1 bar (-14.5 psi) | 1500 bar (21755 psi) | 3600 bar (52200 psi) |  |
| 0 ... 1000 bar | (0 ... 14500 psi) | -1 bar (-14.5 psi) | 1500 bar (21755 psi) | 5000 bar (72520 psi) |  |

Other version, add Order code and plain text:

Measuring range: ... up to ... bar (psi)

#### Measuring ranges for gauge pressure

|                 |           |           |           |   |
|-----------------|-----------|-----------|-----------|---|
| 0 ... 30 psi    | -14.5 psi | 75 psi    | 360 psi   | * |
| 0 ... 60 psi    | -14.5 psi | 150 psi   | 580 psi   | * |
| 0 ... 100 psi   | -14.5 psi | 250 psi   | 580 psi   | * |
| 0 ... 150 psi   | -14.5 psi | 375 psi   | 870 psi   | * |
| 0 ... 200 psi   | -14.5 psi | 500 psi   | 1390 psi  | * |
| 0 ... 300 psi   | -14.5 psi | 750 psi   | 2170 psi  | * |
| 0 ... 500 psi   | -14.5 psi | 1250 psi  | 3480 psi  | * |
| 0 ... 750 psi   | -14.5 psi | 1875 psi  | 5220 psi  | * |
| 0 ... 1000 psi  | -14.5 psi | 2500 psi  | 5220 psi  | * |
| 0 ... 1500 psi  | -14.5 psi | 3750 psi  | 8700 psi  | * |
| 0 ... 2000 psi  | -14.5 psi | 5000 psi  | 13920 psi | * |
| 0 ... 3000 psi  | -14.5 psi | 7500 psi  | 21750 psi | * |
| 0 ... 5000 psi  | -14.5 psi | 12500 psi | 34800 psi | * |
| 0 ... 6000 psi  | -14.5 psi | 15000 psi | 34800 psi | * |
| 0 ... 8700 psi  | -14.5 psi | 21755 psi | 52200 psi | * |
| 0 ... 14500 psi | -14.5 psi | 21755 psi | 72520 psi | * |

Other version, add Order code and plain text: Measuring range: ... up to ... psi

#### Output signal

4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions)

0 ... 10 V; three-wire system; power supply 12 ... 33 V DC

0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC

Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 %

#### Explosion protection (only 4 ... 20 mA)

None

With explosion protection Ex ia IIC T4

#### Electrical connection

Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling) \*

M12 device plug per IEC 61076-2-101

Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")

Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")

Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling) \*

Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling) \*

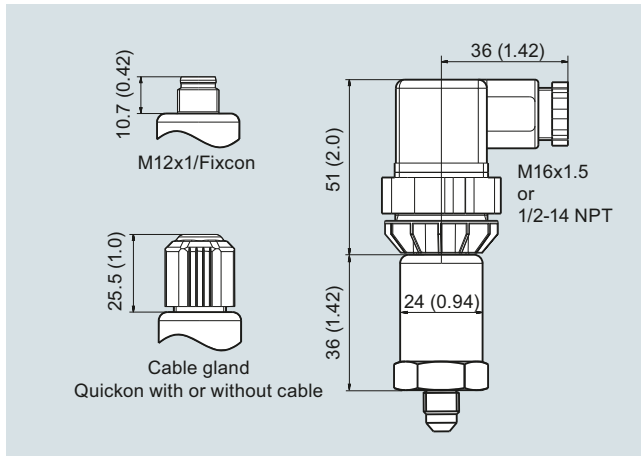
Fixed mounted cable, length 5 m

Special version

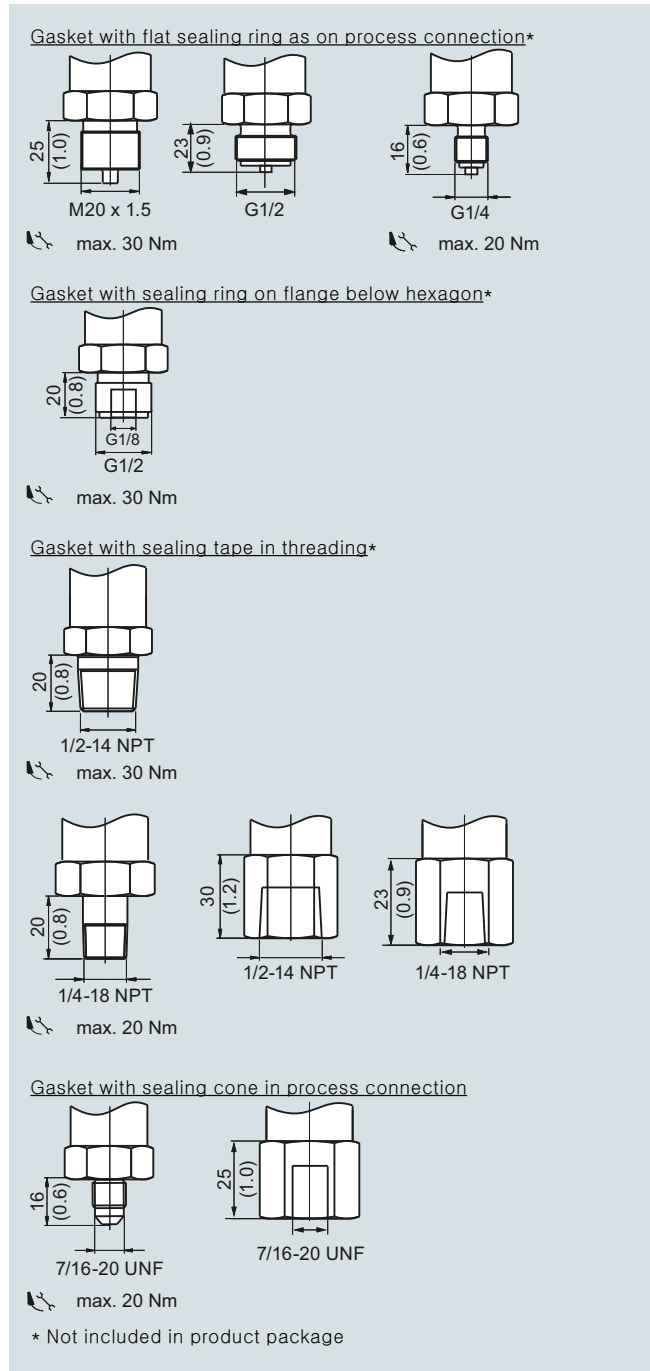
\* Order code E21 required for complete configuration with CRN and cCSA<sub>US</sub> Ex approval.



## Dimensional drawings



SITRANS P220, electrical connections, dimensions in mm (inch)



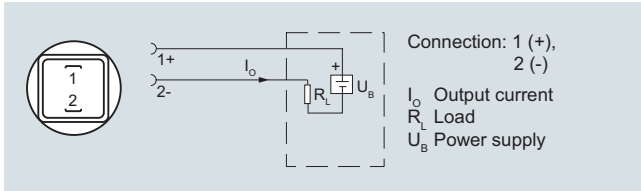
SITRANS P220, process connections, dimensions in mm (inch)

## Pressure Measurement

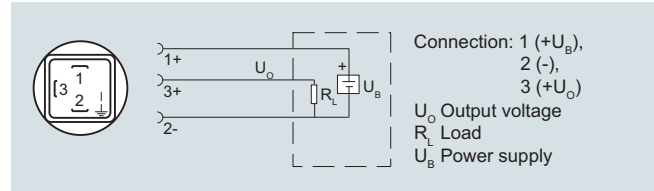
### Single-range transmitters for general applications

#### SITRANS P220 for gauge pressure

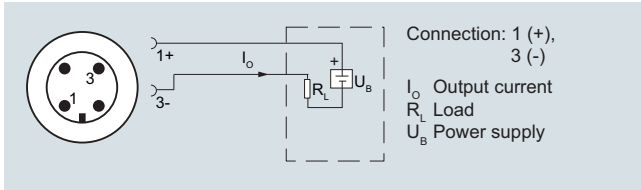
##### Schematics



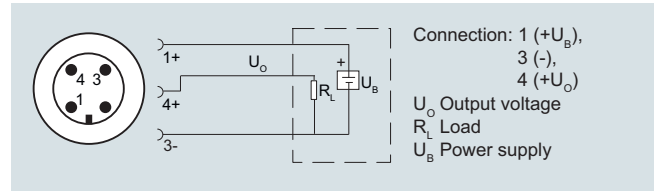
Connection with current output and connector per EN 175301



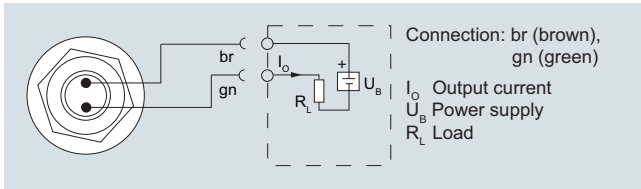
Connection with voltage output, ratiometric output and plug according to EN 175301



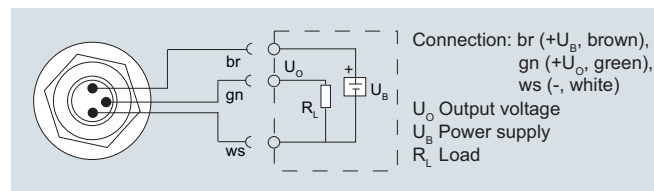
Connection with current output and M12x1 device plug



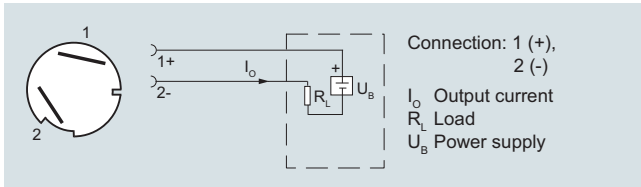
Connection with voltage output, ratiometric output and M12x1 device plug



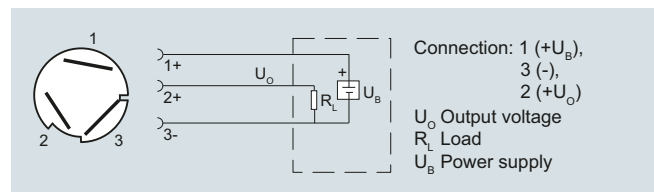
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



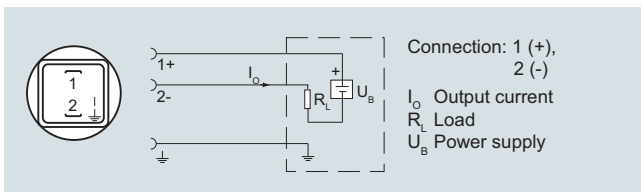
Connection with current output and cable quick screw connection Quick-on



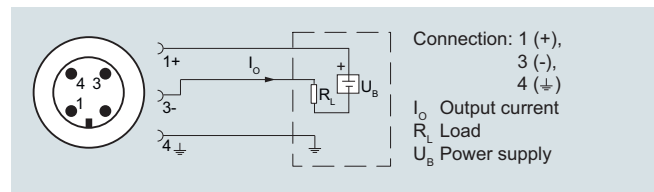
Connection with voltage output, ratiometric output and Quickon fast cable termination

#### Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure



Connection with current output and connector per EN 175301 (Ex)



Connection with current output and M12x1 device plug (Ex)



## Overview



The pressure transmitter SITRANS LH100 is a submersible sensor for hydrostatic level measurement.

The pressure transmitter measures the liquid levels in tanks, containers, channels and dams. The SITRANS LH100 pressure transmitters are available for various measuring ranges and with explosion protection as an option.

A junction box and a cable hanger are available as accessories for simple installation.

## Benefits

- Compact design
- Simple installation
- Small error in measurement (0.3 %)
- Degree of protection IP68

## Application

SITRANS LH100 pressure transmitters are used in the following branches, for example:

- Shipbuilding
- Water/waste water supply
- For use in unpressurized/open vessels and wells

## Design

The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

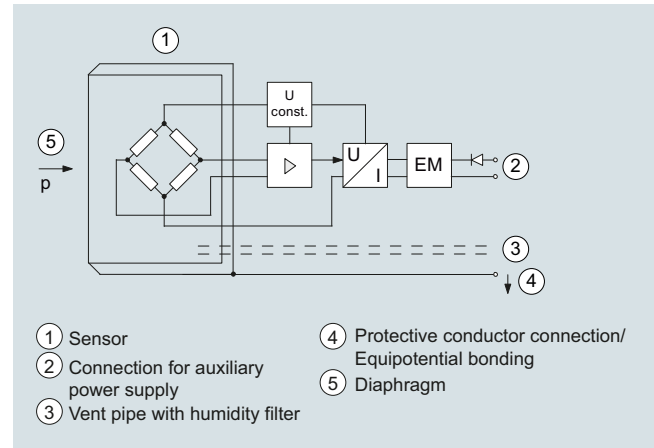
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel housing. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

The diaphragm is protected against external influences by a protective cap.

The sensor, the electronics and the connecting cable are housed in an enclosure with small dimensions.

The pressure transmitter is temperature-compensated for a wide temperature range.

## Function



SITRANS LH100 pressure transmitter, mode of operation and connection diagram

On one side of the sensor (1), the diaphragm (5) is exposed to the hydrostatic pressure which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe (3) in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condensation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to the Wheatstone resistance bridge in the sensor.

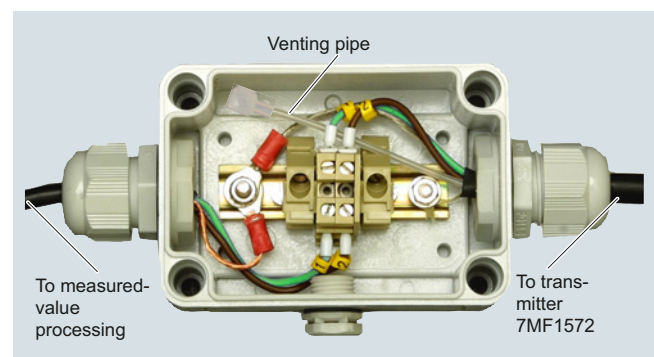
The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

The protective conductor connection/equipotential bonding (4) is connected to the enclosure.

## Integration

It is generally recommended that the connecting cable of the SITRANS LH100 transmitter is connected to the junction box, which can be ordered separately, and secured with the cable hanger, also available separately. The junction box has to be installed near the measuring point.

If the medium is anything other than water, it is also necessary to check compatibility with the specified materials of the transmitter.

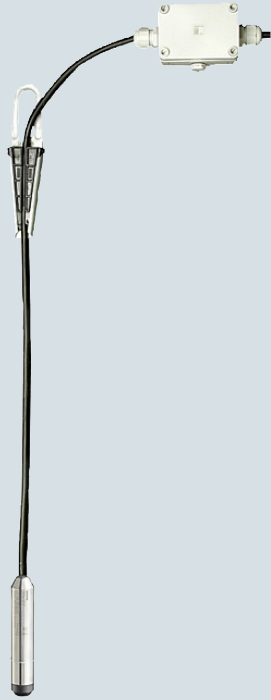


Junction box 7MF1572-8AA, open, schematic diagram

## Pressure Measurement

Single-range transmitters for general applications

### SITRANS LH100 Transmitter for hydrostatic level



Measuring point setup, generally with junction box 7MF1572-8AA and 7MF1572-8AB cable hanger

#### Technical specifications

##### Pressure transmitter SITRANS LH100 (submersible sensor)

###### Mode of operation

Measuring principle piezo-resistive

###### Input

Measured variable Hydrostatic level

Measuring range Max. permissible operating pressure

- |  |   |
|--|---|
| • 0 ... 3 mH <sub>2</sub> O (0 ... 9 ftH <sub>2</sub> O)   | • 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))  |
| • 0 ... 4 mH <sub>2</sub> O (0 ... 12 ftH <sub>2</sub> O)  | • 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))  |
| • 0 ... 5 mH <sub>2</sub> O (0 ... 15 ftH <sub>2</sub> O)  | • 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))  |
| • 0 ... 6 mH <sub>2</sub> O (0 ... 18 ftH <sub>2</sub> O)  | • 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))  |
| • 0 ... 10 mH <sub>2</sub> O (0 ... 30 ftH <sub>2</sub> O) | • 3.0 bar (43.5 psi) (corresponds to 30 mH <sub>2</sub> O (90 ftH <sub>2</sub> O))  |
| • 0 ... 20 mH <sub>2</sub> O (0 ... 60 ftH <sub>2</sub> O) | • 5.0 bar (72.5 psi) (corresponds to 50 mH <sub>2</sub> O (150 ftH <sub>2</sub> O)) |
| • 0 ... 0.3 bar  | • 1.5 bar   |
| • 0 ... 0.4 bar  | • 1.5 bar   |
| • 0 ... 0.5 bar  | • 1.5 bar   |
| • 0 ... 0.6 bar  | • 1.5 bar   |
| • 0 ... 1 bar  | • 3.0 bar   |
| • 0 ... 2 bar  | • 5.0 bar   |

###### Output

Output signal 4 ... 20 mA

###### Measuring accuracy

According to IEC 60770-1

Error in measurement at limit setting including hysteresis and reproducibility 0.3% of full-scale value (typical)

Measuring range

- |   |   |
|---|---|
| • 0 ... 3 mH <sub>2</sub> O (0 ... 9 ftH <sub>2</sub> O bzw. 0 ... 0.3 bar) | 0.5 % of full-scale value (typical)<br>1.0% of full-scale value (maximum) |
| • For all other measuring ranges  | 0.3 % of full-scale value (typical)<br>0.6% of full-scale value (maximum) |

###### Influence of ambient temperature

Measuring range

- |   |   |
|---|---|
| • 3 mH <sub>2</sub> O (9 ftH <sub>2</sub> O or 0.3 bar)                     | Zero and span<br>0.5 %/10 K of full-scale value |
| • 4 ... 6 mH <sub>2</sub> O (12 ... 18 ftH <sub>2</sub> O or 0.4...0.6 bar) | 0.45 %/10 K of full-scale value                 |
| • > 6 mH <sub>2</sub> O (> 18 ftH <sub>2</sub> O or > 0.6 bar)              | 0.3 %/10 K of full-scale value                  |

###### Long-term stability

Measuring range

- |   |   |
|---|---|
| • 3 mH <sub>2</sub> O (9 ftH <sub>2</sub> O or 0.3 bar)                     | Zero and span<br>0.4 % of full-scale value/year |
| • 4 ... 6 mH <sub>2</sub> O (12 ... 18 ftH <sub>2</sub> O or 0.4...0.6 bar) | 0.25% of full-scale value/year                  |
| • > 6 mH <sub>2</sub> O (> 18 ftH <sub>2</sub> O or > 0.6 bar)              | 0.2 % of full-scale value/year                  |

###### Rated conditions

Ambient conditions

- |                       |                                  |
|-----------------------|----------------------------------|
| • Process temperature | -10 ... +80 °C (14 ... 176 °F)   |
| • Storage temperature | -40 ... +80 °C (-40 ... +176 °F) |

Degree of protection according to IEC 60529 IP68

## Pressure Measurement

### Single-range transmitters for general applications

#### SITRANS LH100 Transmitter for hydrostatic level

1

##### Design

|  |   |
|--|---|
| Weight                                       | ≈ 0.2 kg ( ≈ 0.44 lb)   |
| • Pressure transmitter                       | 0.025 kg/m (≈ 0.015 lb/ft)  |
| • Cable; maximum cable length 100 m (330 ft) |   |
| Electrical connection                        | Cable with 3 conductors, vent pipe and integrated humidity filter           |
| Material                                     |   |
| • Seal diaphragm                             | Al <sub>2</sub> O <sub>3</sub> ceramic, 96%                                 |
| • Enclosure                                  | Stainless steel, mat. no. 1.4404/316L                                       |
| • Gasket                                     | FPM (standard)  |
|  | EPDM (optional)   |
| • Connecting cable                           | PE-HD (standard)  |
|  | PE-LD (in the case of versions with EPDM seal, suitable for drinking water) |

##### Auxiliary power

|  |   |
|--|---|
| Terminal voltage on pressure transmitter $U_B$ | 10 ... 33 V DC  |
|  | 10 ... 30 V DC for transmitter with intrinsic safety explosion protection |

##### Certificates and approvals

|   |  |
|---|--|
| Drinking water approval (ACS)   | Applied for                                  |
| Drinking water approval (WRAS)  | 1403525                                      |
| EAC   | № TC RU C-DE.ГБ05.B.00732<br>ОС НАИИО «ЦСВЭ» |
| Underwriters Laboratories (UL)  | 2014-11-17 - E344532                         |
| The transmitter is not subject to the pressure equipment directive (PED 2014/68/EU) |  |
| Explosion protection  |  |
| • Intrinsic safety "i"  | IECEx SEV 14.0003<br>SEV 14 ATEX 0109        |
| - Marking   | II 1 G Ex ia IIC T4 Ga                       |

##### Junction box

|   |                                      |
|---|--------------------------------------|
| Application                                 | for connecting the transmitter cable |
| Design                                      |                                      |
| Weight                                      | 0.2 kg (0.44 lb)                     |
| Electrical connection                       | 2 x 3-way (28 to 18 AWG)             |
| Cable entry                                 | 2 x Pg 9                             |
| Enclosure material                          | polycarbonate                        |
| Vent pipe for atmospheric pressure          |                                      |
| Rated conditions                            |                                      |
| Degree of protection according to IEC 60529 | IP65                                 |

##### Cable hanger

|             |                              |
|-------------|------------------------------|
| Application | for mounting the transmitter |
| Design      |                              |
| Weight      | 0.16 kg (0.35 lb)            |
| Material    | Galvanized steel, polyamide  |

# Pressure Measurement

## Single-range transmitters for general applications

### SITRANS LH100 Transmitter for hydrostatic level

1

#### Selection and ordering data

##### Pressure transmitter SITRANS LH100 (submersible sensor)

For measurement of the hydrostatic level through submersion, two-wire system, 4...20 mA, enclosure material mat. no. 1.4404 (316L), measuring cell Al<sub>2</sub>O<sub>3</sub> ceramic, with permanently mounted PE cable

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Measuring range Cable length

|  |       |
|--|-------|
| 0 ... 3 mH <sub>2</sub> O <sup>1)</sup>  | 10 m  |
| 0 ... 4 mH <sub>2</sub> O                | 10 m  |
| 0 ... 5 mH <sub>2</sub> O                | 10 m  |
| 0 ... 6 mH <sub>2</sub> O                | 10 m  |
| 0 ... 10 mH <sub>2</sub> O               | 20 m  |
| 0 ... 20 mH <sub>2</sub> O               | 30 m  |
| 0 ... 9 ftH <sub>2</sub> O <sup>1)</sup> | 33 ft |
| 0 ... 12 ftH <sub>2</sub> O              | 33 ft |
| 0 ... 15 ftH <sub>2</sub> O              | 33 ft |
| 0 ... 18 ftH <sub>2</sub> O              | 33 ft |
| 0 ... 30 ftH <sub>2</sub> O              | 66 ft |
| 0 ... 60 ftH <sub>2</sub> O              | 98 ft |
| 0 ... 0.3 bar <sup>1)</sup>              | 10 m  |
| 0 ... 0.4 bar                            | 10 m  |
| 0 ... 0.5 bar                            | 10 m  |
| 0 ... 0.6 bar                            | 10 m  |
| 0 ... 1 bar                              | 20 m  |
| 0 ... 2 bar                              | 30 m  |

#### Special versions:

Measuring ranges for special versions between

0 ... 3 mH<sub>2</sub>O and 0 ... 30 mH<sub>2</sub>O or

0 ... 9 ftH<sub>2</sub>O and 0 ... 100 ftH<sub>2</sub>O or

0 ... 0.3 bar and 0 ... 3 bar possible.

Special cable length/Special measuring range

Please add „-Z“ to Article No. and

specify Order code and plain text.

Note: Indication of measuring range

Y01 is always necessary.

For evaluation of the maximum possible cable length following data have to be regarded:

Transmitter:

C<sub>i</sub> = 0 µF, L<sub>i</sub> = 0 µH

Cable:

C<sub>k</sub> = 0.19 nF per meter cable

L<sub>k</sub> = 1.5 µH per meter cable

The maximum permitted data of the transmitter's power supply have to be considered!

3 m (10 ft)

5 m (16 ft)

7 m (23 ft)

10 m (33 ft)

15 m (49 ft)

20 m (66 ft)

25 m (82 ft)

30 m (98 ft)

40 m (131 ft)

50 m (164 ft)

60 m (198 ft)<sup>1)</sup>

70 m (231 ft)<sup>1)</sup>

80 m (264 ft)<sup>1)</sup>

90 m (297 ft)<sup>1)</sup>

100 m (330 ft)<sup>1)</sup>

#### Article No. Order code

7 MF 1 5 7 2 - A

1 C  
1 D  
1 E  
1 F  
1 H  
1 K  
2 C  
2 D  
2 E  
2 F  
2 H  
2 K  
3 C  
3 D  
3 E  
3 F  
3 H  
3 K

9 A H . .  
+  
Y 0 1

H 1 A  
H 1 B  
H 1 C  
H 1 D  
H 1 E  
H 1 F  
H 1 G  
H 1 H  
H 1 J  
H 1 K  
H 1 L  
H 1 M  
H 1 N  
H 1 P  
H 1 Q

#### Selection and ordering data

##### Pressure transmitter SITRANS LH100 (submersible sensor)

For measurement of the hydrostatic level through submersion, two-wire system, 4...20 mA, enclosure material mat. no. 1.4404 (316L), measuring cell Al<sub>2</sub>O<sub>3</sub> ceramic, with permanently mounted PE cable

#### Sealing material between sensor and enclosure

- FPM (Standard)
- EPDM (for drinking water applications)

#### Explosion protection

- without
- With ATEX II 1 G Ex ia IIC T4 Ga and IECEx Ex ia IIC T4 Ga

#### Additional versions

Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2, add "-Z" to article no. and add order code.

Indication of measuring range (only at special cable lengths) in "..." to ... mH<sub>2</sub>O" or "..." to ... ftH<sub>2</sub>O" or "..." to ... bar"

#### Accessories/spare parts

##### Junction box

for connecting the transmitter cable

##### Cable hanger

for securing the pressure transmitter

##### Protective caps as spare parts (10-pack)

##### Humidity filters as spare parts (10-pack)

<sup>1)</sup> Approvals pending.

#### Article No. Order code

7 MF 1 5 7 2 - A

1  
2

0  
1

#### Order code

C11

Y01

#### Article No.

7MF1572-8AA

7MF1572-8AB

7MF1572-8AD

7MF1572-8AE

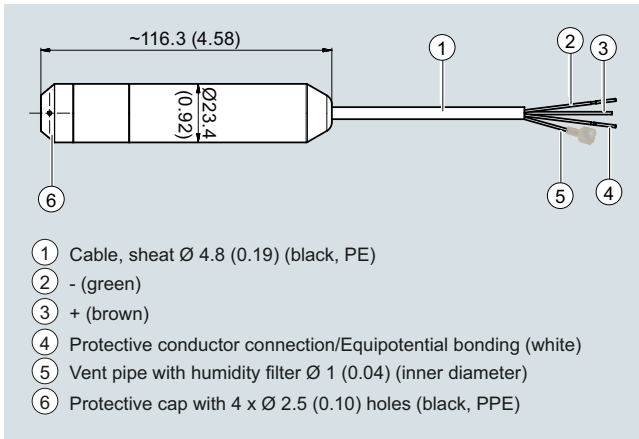
## Pressure Measurement

Single-range transmitters for general applications

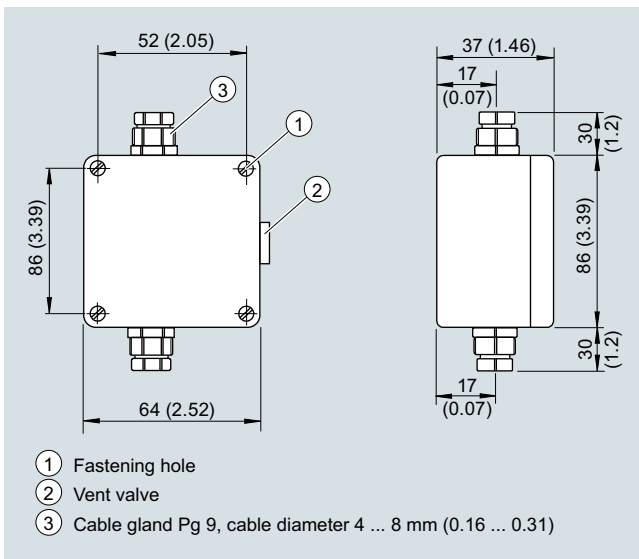
### SITRANS LH100 Transmitter for hydrostatic level

1

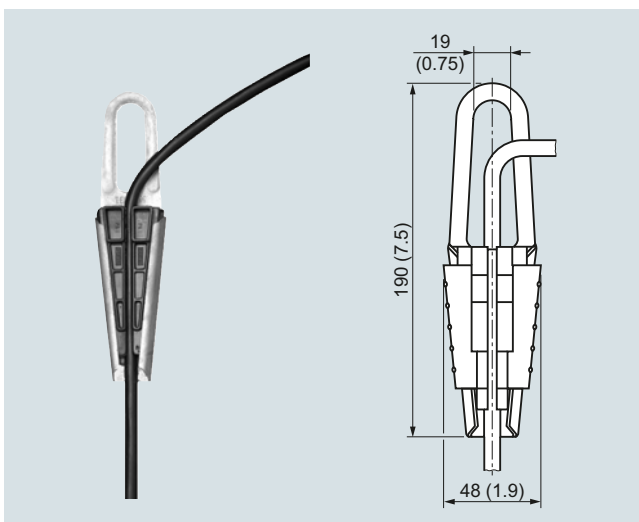
#### Dimensional drawings



SITRANS LH100 pressure transmitter, dimensions in mm (inch)



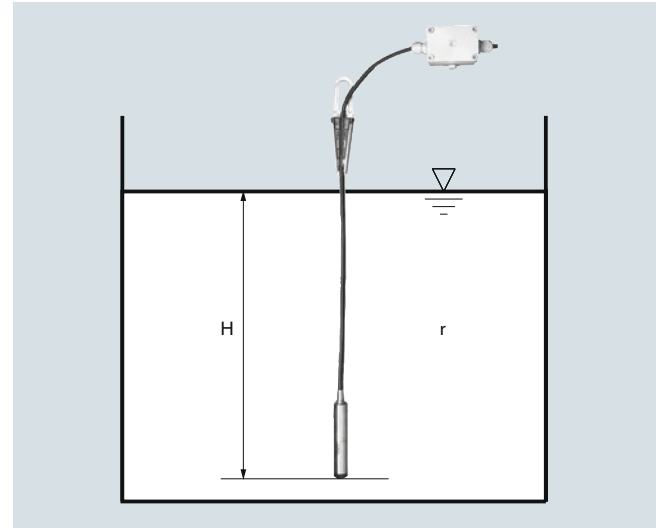
Junction box, dimensions in mm (inch)



Cable hanger, dimensions in mm (inch)

#### More information

##### Establishing the measuring range for water as process medium



Calculation of the measuring range:

$$p = \rho \times g \times H$$

with:

$\rho$  = density of medium

$g$  = local acceleration due to gravity

$H$  = maximum level

Example:

Medium: Water,  $\rho = 1\,000 \text{ kg/m}^3$

Acceleration due to gravity:  $9.81 \text{ m/s}^2$

Start-of-scale: 0 m

Maximum level: 6.0 m

Cable length: 10 m

Calculation:

$$p = 1\,000 \text{ kg/m}^3 \times 9.81 \text{ m/s}^2 \times 6.0 \text{ m}$$

$$p = 58\,860 \text{ N/m}^2$$

$$p = 589 \text{ mbar}$$

Transmitter to be ordered:

**7MF1572-1FA10**

Plus, if required, junction box 7MF1572-8AA and cable hanger 7MF1572-8AB

## Pressure Measurement

Single-range transmitters for general applications

### SITRANS LH300 Transmitter for hydrostatic level

1

#### Overview



The pressure transmitter SITRANS LH300 is a submersible sensor for hydrostatic level measurement with cap made of PPE (left), stainless steel (mid) and ETFE (right).

The pressure transmitter measures the liquid levels in tanks, containers, channels and dams. The SITRANS LH300 pressure transmitters are available for various measuring ranges and with explosion protection as an option.

A junction box and a cable hanger are available as accessories for simple installation.

#### Benefits

- Compact design
- Simple installation
- Small error in measurement (0.15 % typical)
- Degree of protection IP68

#### Application

SITRANS LH300 pressure transmitters are used in the following branches, for example:

- Shipbuilding
- Water/waste water supply
- Drinking water facilities
- For use in unpressurized/open vessels and wells
- Desalination plants

#### Design

The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

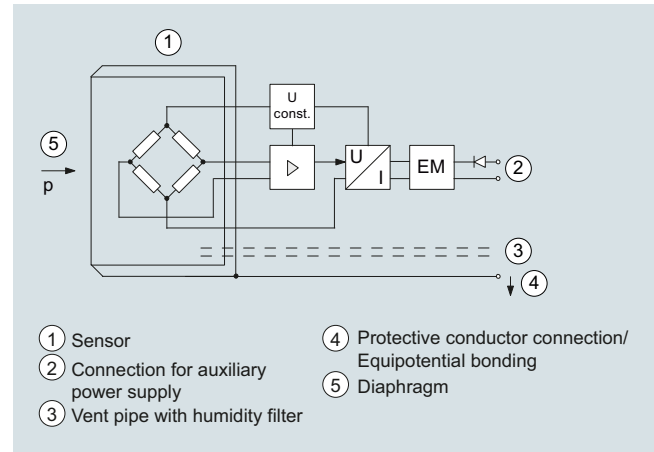
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel housing. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

The diaphragm is protected against external influences by a protective cap.

The sensor, the electronics and the connecting cable are housed in an enclosure with small dimensions.

The pressure transmitter is temperature-compensated for a wide temperature range.

#### Function



SITRANS LH300 pressure transmitter, mode of operation and connection diagram

On one side of the sensor (1), the diaphragm (5) is exposed to the hydrostatic pressure which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe (3) in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condensation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to the Wheatstone resistance bridge in the sensor.

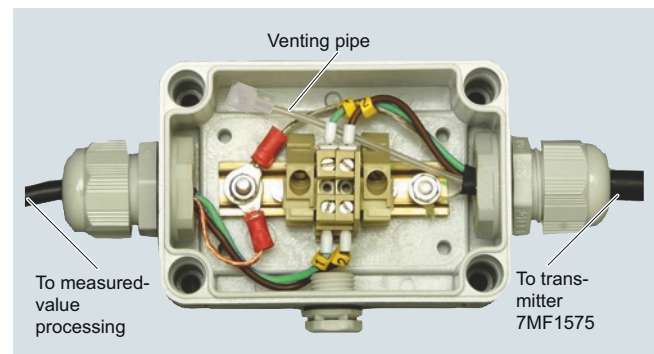
The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

The protective conductor connection/equipotential bonding (4) is connected to the enclosure.

#### Integration

It is generally recommended that the connecting cable of the SITRANS LH300 transmitter is connected to the junction box, which can be ordered separately, and secured with the cable hanger, also available separately. The junction box has to be installed near the measuring point, but outside the media.

If the medium is anything other than water, it is also necessary to check compatibility with the specified materials of the transmitter, cable and gasket.



Junction box 7MF1575-8AA, open, schematic diagram





Measuring point setup, generally with junction box 7MF1575-8AA and 7MF1575-8AB cable hanger

### Technical specifications

#### Pressure transmitter SITRANS LH300 (submersible sensor)

##### Mode of operation

|                     |                 |
|---------------------|-----------------|
| Measuring principle | Piezo-resistive |
|---------------------|-----------------|

##### Input

|   |  |
|---|--|
| Measured variable   | Hydrostatic level  |
| Measuring range   | Max. permissible operating pressure  |
| • 0 ... 1 mH <sub>2</sub> O (0 ... 3 ftH <sub>2</sub> O)    | • 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O)) |
| • 0 ... 2 mH <sub>2</sub> O (0 ... 6 ftH <sub>2</sub> O)    | • 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O)) |
| • 0 ... 3 mH <sub>2</sub> O (0 ... 9 ftH <sub>2</sub> O)    | • 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O)) |
| • 0 ... 4 mH <sub>2</sub> O (0 ... 12 ftH <sub>2</sub> O)   | • 2 bar (29 psi) (corresponds to 20 mH <sub>2</sub> O (60 ftH <sub>2</sub> O))     |
| • 0 ... 5 mH <sub>2</sub> O (0 ... 15 ftH <sub>2</sub> O)   | • 2 bar (29 psi) (corresponds to 20 mH <sub>2</sub> O (60 ftH <sub>2</sub> O))     |
| • 0 ... 6 mH <sub>2</sub> O (0 ... 18 ftH <sub>2</sub> O)   | • 2 bar (29 psi) (corresponds to 20 mH <sub>2</sub> O (60 ftH <sub>2</sub> O))     |
| • 0 ... 10 mH <sub>2</sub> O (0 ... 30 ftH <sub>2</sub> O)  | • 5 bar (72.5 psi) (corresponds to 50 mH <sub>2</sub> O (150 ftH <sub>2</sub> O))  |
| • 0 ... 20 mH <sub>2</sub> O (0 ... 60 ftH <sub>2</sub> O)  | • 10 bar (145 psi) (corresponds to 100 mH <sub>2</sub> O (300 ftH <sub>2</sub> O)) |
| • 0 ... 40 mH <sub>2</sub> O (0 ... 120 ftH <sub>2</sub> O) | • 20 bar (290 psi) (corresponds to 200 mH <sub>2</sub> O (600 ftH <sub>2</sub> O)) |
| Special measuring ranges                                    |  |
| • Up to 100 mH <sub>2</sub> O (300 ftH <sub>2</sub> O)      | • 20 bar (290 psi) (corresponds to 200 mH <sub>2</sub> O (600 ftH <sub>2</sub> O)) |
| • Up to 160 mH <sub>2</sub> O (480 ftH <sub>2</sub> O)      | • 24 bar (348 psi) (corresponds to 240 mH <sub>2</sub> O (720 ftH <sub>2</sub> O)) |

##### Measuring range

|                 |           |
|-----------------|-----------|
| • 0 ... 0.1 bar | • 1.5 bar |
| • 0 ... 0.2 bar | • 1.5 bar |
| • 0 ... 0.3 bar | • 1.5 bar |
| • 0 ... 0.4 bar | • 2 bar   |
| • 0 ... 0.5 bar | • 2 bar   |
| • 0 ... 0.6 bar | • 2 bar   |
| • 0 ... 1 bar   | • 5 bar   |
| • 0 ... 2 bar   | • 10 bar  |
| • 0 ... 4 bar   | • 20 bar  |

##### Special measuring range

|                |          |
|----------------|----------|
| • Up to 10 bar | • 20 bar |
| • Up to 16 bar | • 24 bar |

##### Output

|               |             |
|---------------|-------------|
| Output signal | 4 ... 20 mA |
|---------------|-------------|

##### Measuring accuracy

|  |   |
|--|---|
| According to IEC 60770-1   |   |
| Error in measurement at limit setting including hysteresis and reproducibility | ≤ 0.15 % of full-scale value (typical)<br>≤ 0.3 % of full-scale value (maximum) |
| Influence of ambient temperature   | ≤ 0.05 %/10 K of full-scale value (zero and span)                               |
| Long-term stability  | ≤ 0.15 % of full-scale value/year (zero and span)                               |

##### Rated conditions

|   |                                 |
|---|---------------------------------|
| Ambient conditions                          |                                 |
| • Process temperature                       | -10 ... +80 °C (14 ... 176 °F)  |
| • Storage temperature                       | -20 ... +80 °C (-4 ... +176 °F) |
| Degree of protection according to IEC 60529 | IP68                            |

## Pressure Measurement

### Single-range transmitters for general applications

#### SITRANS LH300 Transmitter for hydrostatic level

##### Design

|                                 |   |
|---------------------------------|---|
| Weight                          | ≈ 0.4 kg ( ≈ 0.88 lb)   |
| • Pressure transmitter          | 0.08 kg/m ( ≈ 0.059 lb/ft)  |
| • Cable                         |   |
| Maximal freely suspended length | 300 m (990 ft)  |
| Electrical connection           | Cable with 2 conductors, vent pipe and integrated humidity filters                          |
| Material                        |   |
| • Seal diaphragm                | Al <sub>2</sub> O <sub>3</sub> ceramic, 99.6 %  |
| • Enclosure                     | Stainless steel, mat. no. 1.4404/316L and 1.4539/904L (sea water applications) respectively |
|                                 | FPM (standard)  |
| • Gasket                        | EPDM (optional)   |
|                                 | PE (standard/drinking water applications)   |
| • Connecting cable              | FEP (for aggressive media)  |
|                                 | Stainless steel, PPE or ETFE  |
| • Cap                           |   |

##### Auxiliary power

|  |   |
|--|---|
| Terminal voltage on pressure transmitter $U_B$ | 10 ... 33 V DC for transmitter without explosion protection               |
|  | 10 ... 30 V DC for transmitter with intrinsic safety explosion protection |

##### Certificates and approvals

|   |   |
|---|---|
| Drinking water approval (ACS)           | 17 ACC NY 055   |
| Drinking water approval (WRAS)          | Pending   |
| Drinking water approval (DVGW/KTW W270) | Pending   |
| EAC                                     | TC N RU Д-DE.ГА02.B.05092   |
| Underwriters Laboratories (UL)          | ML File No. E344532, issued 2017-08-17  |
| Shipbuilding approval (LR)              | Pending   |
| Shipbuilding approval (DNV/GL)          | Pending   |
| Shipbuilding approval (BV)              | Pending   |
| Shipbuilding approval (ABS)             | Pending   |
| Pressure equipment directive            | The transmitter is not subject to the pressure equipment directive (PED 2014/68/EU) |
| Explosion protection                    |   |
| • ATEX                                  | SEV 16 ATEX 0121  |
| • IEC Ex                                | IEC Ex SEV 16.0003  |
| • EAC Ex                                | TC RU C-DE.AA87.B.00324   |
| • Intrinsic safety "i"                  |   |
| - Marking                               | II 1 G Ex ia IIC T4 Ga  |

##### Junction box

|   |                                      |
|---|--------------------------------------|
| <b>Application</b>                          | For connecting the transmitter cable |
| <b>Design</b>                               |                                      |
| Weight                                      | 0.2 kg (0.44 lb)                     |
| Electrical connection                       | 2 x 3-way (28 to 18 AWG)             |
| Cable entry                                 | 2 x PG 13.5                          |
| Enclosure material                          | Polycarbonate                        |
| Vent pipe for atmospheric pressure          |                                      |
| <b>Rated conditions</b>                     |                                      |
| Degree of protection according to IEC 60529 | IP65                                 |

##### Cable hanger

|                    |   |
|--------------------|---|
| <b>Application</b> | For mounting the transmitter                |
| <b>Design</b>      |   |
| Weight             | 0.16 kg (0.35 lb)                           |
| Material           | Galvanized steel, polyamide                 |
| Terminal area      | For cable with a diameter of 5.5 ... 9.5 mm |

## Pressure Measurement

## Single-range transmitters for general applications

## SITRANS LH300 Transmitter for hydrostatic level

1

| Selection and ordering data   |                 | Article No.     | Order code | Selection and ordering data   |  | Article No.     | Order code                               |
|---|-----------------|-----------------|------------|---|--|-----------------|--|
| <b>Pressure transmitter</b><br><b>SITRANS LH300 (submersible sensor)</b>  |                 | <b>7MF1575-</b> |            | <b>Pressure transmitter</b><br><b>SITRANS LH300 (submersible sensor)</b>  |  | <b>7MF1575-</b> |  |
| For hydrostatic level measurement, submersible transmitter, two-wire connection, 4 ... 20 mA, body material see Order option, measuring cell Al <sub>2</sub> O <sub>3</sub> ceramics (99.6 % purity), with fixed mounted cable, material of protective cap at PE cable: PPE (colour black)<br>material of protective cap at FEP cable: PPE (colour white)<br><br>Note: junction box and cable hanger have to be ordered separately. |                 |                 |            | <b>PE cable for general purpose and drinking water applications</b>   |  |                 |  |
| ➤ Click on the Article No. for the online configuration in the PLM Life Cycle Portal.   |                 |                 |            | Special cable length<br>Please add „Z“ to Article No. and specify<br>Order code and plain text:<br>Y01: Cable length .....        |  | <b>9 X</b>      | <b>H . .</b><br><b>+</b><br><b>Y 0 1</b> |
| <b>Measuring range</b>  |                 |                 |            | 3 m (≈ 10 ft)   |  |                 | <b>H 1 A</b>                             |
| <b>Cable length (PE cable)</b>  |                 |                 |            | 5 m (≈ 16 ft)   |  |                 | <b>H 1 B</b>                             |
| 0 ... 1 mH <sub>2</sub> O   | 5 m             | <b>1 A</b>      |            | 7 m (≈ 23 ft)   |  |                 | <b>H 1 C</b>                             |
| 0 ... 2 mH <sub>2</sub> O   | 5 m             | <b>1 B</b>      |            | 10 m (≈ 33 ft)  |  |                 | <b>H 1 D</b>                             |
| 0 ... 3 mH <sub>2</sub> O   | 10 m            | <b>1 C</b>      |            | 15 m (≈ 50 ft)  |  |                 | <b>H 1 E</b>                             |
| 0 ... 4 mH <sub>2</sub> O   | 10 m            | <b>1 D</b>      |            | 20 m (≈ 65 ft)  |  |                 | <b>H 1 F</b>                             |
| 0 ... 5 mH <sub>2</sub> O   | 10 m            | <b>1 E</b>      |            | 25 m (≈ 80 ft)  |  |                 | <b>H 1 G</b>                             |
| 0 ... 6 mH <sub>2</sub> O   | 10 m            | <b>1 F</b>      |            | 30 m (≈ 100 ft)   |  |                 | <b>H 1 H</b>                             |
| 0 ... 10 mH <sub>2</sub> O  | 20 m            | <b>1 H</b>      |            | 40 m (≈ 130 ft)   |  |                 | <b>H 1 J</b>                             |
| 0 ... 20 mH <sub>2</sub> O  | 30 m            | <b>1 K</b>      |            | 50 m (≈ 160 ft)   |  |                 | <b>H 1 K</b>                             |
| 0 ... 40 mH <sub>2</sub> O  | 50 m            | <b>1 L</b>      |            | 60 m (≈ 200 ft)   |  |                 | <b>H 1 L</b>                             |
| 0 ... 3 ftH <sub>2</sub> O  | 5 m (≈ 15 ft)   | <b>2 A</b>      |            | 70 m (≈ 230 ft)   |  |                 | <b>H 1 M</b>                             |
| 0 ... 6 ftH <sub>2</sub> O  | 5 m (≈ 15 ft)   | <b>2 B</b>      |            | 80 m (≈ 265 ft)   |  |                 | <b>H 1 N</b>                             |
| 0 ... 9 ftH <sub>2</sub> O  | 10 m (≈ 30 ft)  | <b>2 C</b>      |            | 90 m (≈ 295 ft)   |  |                 | <b>H 1 P</b>                             |
| 0 ... 12 ftH <sub>2</sub> O   | 10 m (≈ 30 ft)  | <b>2 D</b>      |            | 100 m (≈ 330 ft)  |  |                 | <b>H 1 Q</b>                             |
| 0 ... 15 ftH <sub>2</sub> O   | 10 m (≈ 30 ft)  | <b>2 E</b>      |            | 125 m (≈ 410 ft)  |  |                 | <b>H 1 R</b>                             |
| 0 ... 18 ftH <sub>2</sub> O   | 10 m (≈ 30 ft)  | <b>2 F</b>      |            | 150 m (≈ 495 ft)  |  |                 | <b>H 1 S</b>                             |
| 0 ... 30 ftH <sub>2</sub> O   | 20 m (≈ 60 ft)  | <b>2 H</b>      |            | 175 m (≈ 575 ft)  |  |                 | <b>H 1 T</b>                             |
| 0 ... 60 ftH <sub>2</sub> O   | 30 m (≈ 90 ft)  | <b>2 K</b>      |            | 200 m (≈ 650 ft)  |  |                 | <b>H 1 U</b>                             |
| 0 ... 120 ftH <sub>2</sub> O  | 50 m (≈ 150 ft) | <b>2 L</b>      |            | 225 m (≈ 740 ft)  |  |                 | <b>H 1 V</b>                             |
| 0 ... 0.1 bar   | 5 m             | <b>3 A</b>      |            | 250 m (≈ 820 ft)  |  |                 | <b>H 1 W</b>                             |
| 0 ... 0.2 bar   | 5 m             | <b>3 B</b>      |            | 275 m (≈ 900 ft)  |  |                 | <b>H 1 X</b>                             |
| 0 ... 0.3 bar   | 10 m            | <b>3 C</b>      |            | 300 m (≈ 990 ft)  |  |                 | <b>H 2 A</b>                             |
| 0 ... 0.4 bar   | 10 m            | <b>3 D</b>      |            | 350 m (≈ 1150 ft)   |  |                 | <b>H 2 B</b>                             |
| 0 ... 0.5 bar   | 10 m            | <b>3 E</b>      |            | 400 m (≈ 1320 ft)   |  |                 | <b>H 2 C</b>                             |
| 0 ... 0.6 bar   | 10 m            | <b>3 F</b>      |            | 450 m (≈ 1480 ft)   |  |                 | <b>H 2 D</b>                             |
| 0 ... 1 bar   | 20 m            | <b>3 H</b>      |            | 500 m (≈ 1650 ft)   |  |                 | <b>H 2 E</b>                             |
| 0 ... 2 bar   | 30 m            | <b>3 K</b>      |            | 550 m (≈ 1815 ft)   |  |                 | <b>H 2 F</b>                             |
| 0 ... 4 bar   | 50 m            | <b>3 L</b>      |            | 600 m (≈ 1980 ft)   |  |                 | <b>H 2 G</b>                             |
| Special versions:   |                 |                 |            | 650 m (≈ 2145 ft)   |  |                 | <b>H 2 H</b>                             |
| <u>Measuring ranges</u> for special versions between  |                 |                 |            | 700 m (≈ 2310 ft)   |  |                 | <b>H 2 J</b>                             |
| 0 ... 1 mH <sub>2</sub> O and 0 ... 160 mH <sub>2</sub> O or  |                 |                 |            | 750 m (≈ 2475 ft)   |  |                 | <b>H 2 K</b>                             |
| 0 ... 3 ftH <sub>2</sub> O and 0 ... 530 ftH <sub>2</sub> O or  |                 |                 |            | 800 m (≈ 2640 ft)   |  |                 | <b>H 2 L</b>                             |
| 0 ... 0.1 bar and 0 ... 16 bar possible.  |                 |                 |            | 850 m (≈ 2800 ft)   |  |                 | <b>H 2 M</b>                             |
|   |                 |                 |            | 900 m (≈ 2970 ft)   |  |                 | <b>H 2 N</b>                             |
|   |                 |                 |            | 950 m (≈ 3135 ft)   |  |                 | <b>H 2 P</b>                             |
|   |                 |                 |            | 1000 m (≈ 3300 ft)  |  |                 | <b>H 2 Q</b>                             |
|   |                 |                 |            | Other special cable length<br>Please add „Z“ to Article No. and specify<br>Order codes and plain text:<br>H1Y: Cable length ..... |  | <b>9 X</b>      | <b>H 1 Y</b><br><b>+</b><br><b>Y 0 1</b> |
|   |                 |                 |            | Y01: Measuring range .....  |  |                 |  |

# Pressure Measurement

Single-range transmitters for general applications

## SITRANS LH300 Transmitter for hydrostatic level

1

| Selection and ordering data  | Article No.           | Order code                     | Selection and ordering data   | Article No.  | Order code                      |
|--|-----------------------|--------------------------------|---|--|---------------------------------|
| <b>Pressure transmitter</b><br><b>SITRANS LH300 (submersible sensor)</b>   | <b>7 MF 1 5 7 5 -</b> |                                | <b>Pressure transmitter</b><br><b>SITRANS LH300 (submersible sensor)</b>  | <b>7 MF 1 5 7 5 -</b>  |                                 |
| <b>FEP cable for aggressive media</b>  |                       |                                | <b>Material of housing</b>  |  |                                 |
| Special cable length<br>Please add „-Z“ to Article No. and specify<br>Order code and plain text:<br>Y01: Cable length .....        | <b>9 X</b>            | <b>H . .</b><br><b>+ Y 0 1</b> | Stainless steel 316L<br>(1.4404)  | <b>Material of protective cap</b>                                    | <b>A</b>                        |
| 3 m (≈ 10 ft)  |                       | <b>H 5 A</b>                   | Stainless steel 316L<br>(1.4404)  | Protective capability<br>made of PPE (recom-<br>mended for PE cable) | <b>B</b>                        |
| 5 m (≈ 16 ft)  |                       | <b>H 5 B</b>                   | Stainless steel 316L<br>(1.4404)  | Protective cap made<br>of ETFE (standard with<br>FEP cable)          | <b>C</b>                        |
| 7 m (≈ 23 ft)  |                       | <b>H 5 C</b>                   | Stainless steel 316L<br>(1.4404)  | Stainless steel 316L<br>(1.4404)                                     | <b>D</b>                        |
| 10 m (≈ 33 ft)   |                       | <b>H 5 D</b>                   | Stainless steel 904L<br>(1.4539) for sea water<br>applications  | Protective cap PPE   | <b>E</b>                        |
| 15 m (≈ 50 ft)   |                       | <b>H 5 E</b>                   | Stainless steel 904L<br>(1.4539) for sea water<br>applications  | Protective cap ETFE  | <b>F</b>                        |
| 20 m (≈ 65 ft)   |                       | <b>H 5 F</b>                   | Stainless steel 904L<br>(1.4539) for seawater<br>applications   | Stainless steel 904L<br>(1.4539) for seawater<br>applications        |                                 |
| 25 m (≈ 80 ft)   |                       | <b>H 5 G</b>                   |   |  |                                 |
| 30 m (≈ 100 ft)  |                       | <b>H 5 H</b>                   |   |  |                                 |
| 40 m (≈ 130 ft)  |                       | <b>H 5 J</b>                   |   |  |                                 |
| 50 m (≈ 160 ft)  |                       | <b>H 5 K</b>                   |   |  |                                 |
| 60 m (≈ 200 ft)  |                       | <b>H 5 L</b>                   |   |  |                                 |
| 70 m (≈ 230 ft)  |                       | <b>H 5 M</b>                   |   |  |                                 |
| 80 m (≈ 265 ft)  |                       | <b>H 5 N</b>                   |   |  |                                 |
| 90 m (≈ 295 ft)  |                       | <b>H 5 P</b>                   |   |  |                                 |
| 100 m (≈ 330 ft)   |                       | <b>H 5 Q</b>                   |   |  |                                 |
| 125 m (≈ 410 ft)   |                       | <b>H 5 R</b>                   |   |  |                                 |
| 150 m (≈ 495 ft)   |                       | <b>H 5 S</b>                   |   |  |                                 |
| 175 m (≈ 575 ft)   |                       | <b>H 5 T</b>                   |   |  |                                 |
| 200 m (≈ 650 ft)   |                       | <b>H 5 U</b>                   |   |  |                                 |
| 225 m (≈ 740 ft)   |                       | <b>H 5 V</b>                   |   |  |                                 |
| 250 m (≈ 820 ft)   |                       | <b>H 5 W</b>                   |   |  |                                 |
| 275 m (≈ 900 ft)   |                       | <b>H 5 X</b>                   |   |  |                                 |
| 300 m (≈ 990 ft)   |                       | <b>H 6 A</b>                   |   |  |                                 |
| 350 m (≈ 1150 ft)  |                       | <b>H 6 B</b>                   |   |  |                                 |
| 400 m (≈ 1320 ft)  |                       | <b>H 6 C</b>                   |   |  |                                 |
| 450 m (≈ 1480 ft)  |                       | <b>H 6 D</b>                   |   |  |                                 |
| 500 m (≈ 1650 ft)  |                       | <b>H 6 E</b>                   |   |  |                                 |
| 550 m (≈ 1815 ft)  |                       | <b>H 6 F</b>                   |   |  |                                 |
| 600 m (≈ 1980 ft)  |                       | <b>H 6 G</b>                   |   |  |                                 |
| 650 m (≈ 2145 ft)  |                       | <b>H 6 H</b>                   |   |  |                                 |
| 700 m (≈ 2310 ft)  |                       | <b>H 6 J</b>                   |   |  |                                 |
| 750 m (≈ 2475 ft)  |                       | <b>H 6 K</b>                   |   |  |                                 |
| 800 m (≈ 2640 ft)  |                       | <b>H 6 L</b>                   |   |  |                                 |
| 850 m (≈ 2800 ft)  |                       | <b>H 6 M</b>                   |   |  |                                 |
| 900 m (≈ 2970 ft)  |                       | <b>H 6 N</b>                   |   |  |                                 |
| 950 m (≈ 3135 ft)  |                       | <b>H 6 P</b>                   |   |  |                                 |
| 1000 m (≈ 3300 ft)   |                       | <b>H 6 Q</b>                   |   |  |                                 |
| Other special cable length<br>Please add „-Z“ to Article No. and specify<br>Order codes and plain text:<br>H1Y: Cable length ..... | <b>9 X</b>            | <b>H 5 Y</b><br><b>+ Y 0 1</b> |   |  |                                 |
| Y01: Measuring range .....   |                       |                                |   |  |                                 |
|  |                       |                                | <b>Sealing material between sensor and housing</b>  |  |                                 |
|  |                       |                                | FPM (Standard)  | <b>1</b>   |                                 |
|  |                       |                                | EPDM (for drinking water)   | <b>2</b>   |                                 |
|  |                       |                                | <b>Explosion protection</b>   |  |                                 |
|  |                       |                                | without   | <b>0</b>   |                                 |
|  |                       |                                | With ATEX II1 G Ex ia IIC T4 Ga,<br>IECEx Ex ia IIC T4 Ga and EAC Ex (only pos-<br>sible for cable length ≤ 300 m (990 ft)) | <b>1</b>   |                                 |
|  |                       |                                | <b>Additional versions</b>  |  |                                 |
|  |                       |                                | Quality Inspection Certificate (factory calibra-<br>tion) to IEC 60770-2 (6 points upward)                                  |  | <b>Order code</b><br><b>C11</b> |
|  |                       |                                | <b>Accessories/spare parts</b>  |  | <b>Article No.</b>              |
|  |                       |                                | <b>Junction box</b>   |  | <b>7MF1575-8AA</b>              |
|  |                       |                                | <b>Cable hanger</b>   |  | <b>7MF1575-8AB</b>              |
|  |                       |                                | <b>Protective caps, PPE, as spare part (10-pack)</b>  |  | <b>7MF1575-8AD</b>              |
|  |                       |                                | <b>Protective caps, ETFE, as spare part (10-pack)</b>   |  | <b>7MF1575-8AE</b>              |
|  |                       |                                | <b>Humidity filters as spare part (10-pack)</b>   |  | <b>7MF1575-8AF</b>              |
|  |                       |                                | <b>Protective cap, stainless steel 316L (1.4404) for waste water applications</b>   |  | <b>7MF1575-8AG</b>              |
|  |                       |                                | <b>Protective cap, stainless steel 904L (1.4539) for sea water applications</b>   |  | <b>7MF1575-8AH</b>              |

## Pressure Measurement

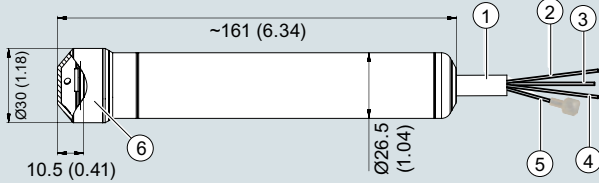
Single-range transmitters for general applications

### SITRANS LH300 Transmitter for hydrostatic level

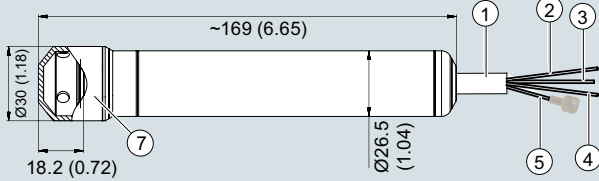
1

#### Dimensional drawings

##### Sensor with protective cap (PPE, ETFE)

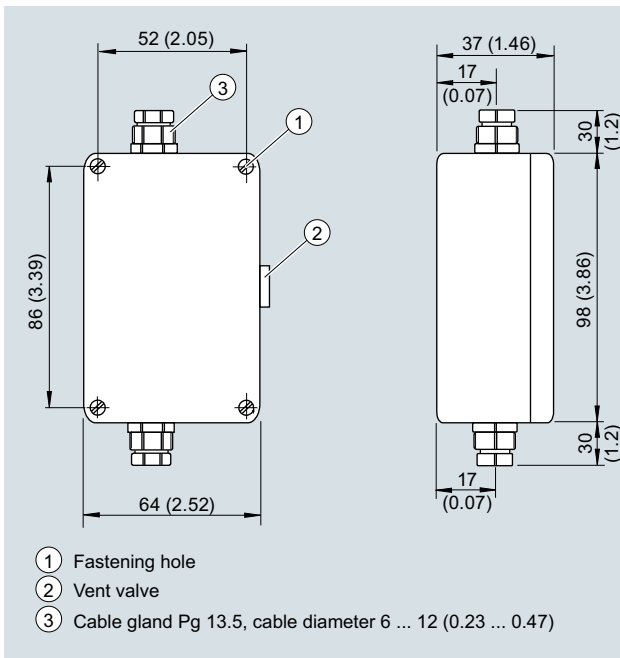


##### Sensor with protective cap (stainless steel)

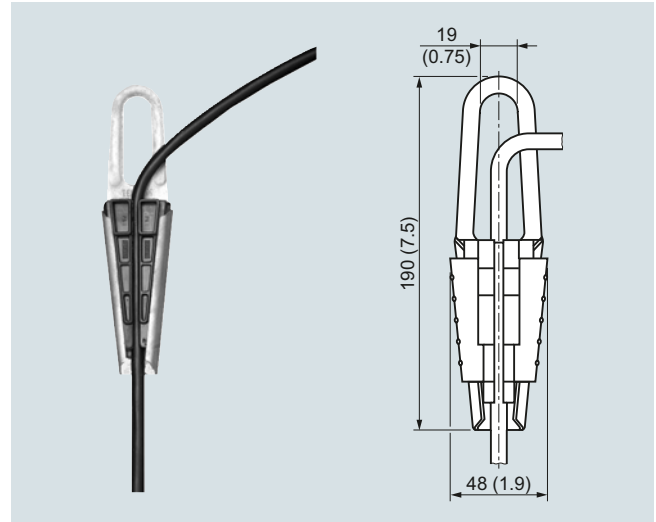


- ① Cable, sheath Ø 8.3 (0.33)
- ② - (blue)
- ③ + (brown)
- ④ Protective conductor connection/Equipotential bonding (black)
- ⑤ Vent pipe with humidity filter Ø 1 (0.04) (inner diameter)
- ⑥ Protective cap (PPE or PTFE) with 4 x Ø 2.5 (0.10) holes
- ⑦ Protective cap (stainless steel) with 4 x Ø 5 (0.20) holes

SITRANS LH300 pressure transmitter, dimensions in mm (inch)



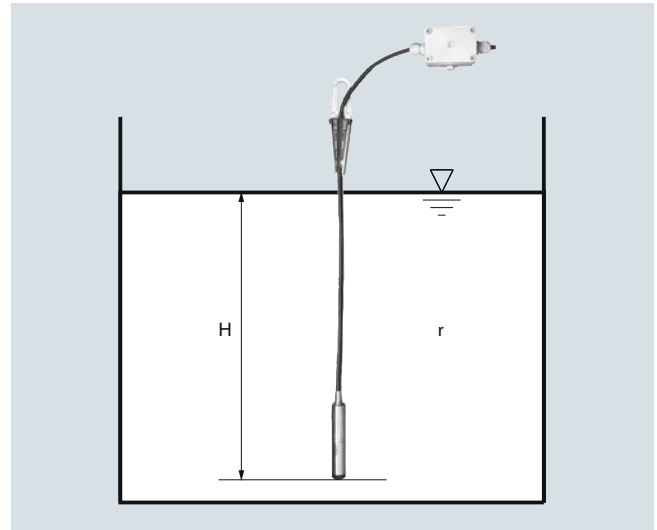
Junction box, dimensions in mm (inch)



Cable hanger, dimensions in mm (inch)

#### More information

##### Determination of the measuring range for medium water



Calculation of the measuring range:

$$p = \rho \times g \times H$$

with:

$\rho$  = density of medium

$g$  = local acceleration due to gravity

$H$  = maximum level

Example:

Medium: Water,  $\rho = 1\,000 \text{ kg/m}^3$

Acceleration due to gravity:  $9.81 \text{ m/s}^2$

Start-of-scale: 0 m

Maximum level: 6.0 m

Cable length: 10 m

Calculation:

$$p = 1\,000 \text{ kg/m}^3 \times 9.81 \text{ m/s}^2 \times 6.0 \text{ m}$$

$$p = 58\,860 \text{ N/m}^2$$

$$p = 589 \text{ mbar}$$

Transmitter to be ordered:

**7MF1575-1FA10**

Plus, if required, junction box 7MF1575-8AA and cable hanger 7MF1575-8AB

## Pressure Measurement

Single-range transmitters for general applications

### SITRANS P Compact for gauge and absolute pressure

1

#### Overview



The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology industries.

The use of high-grade materials guarantees compliance with hygiene regulations.

Particular value has been placed on a high surface quality. The system can be electropolished in addition.

A further important feature is the hygiene-based design of the process connection by means of various aseptic connections.

The completely welded stainless steel housing can be designed up to degree of protection IP67.

Using appropriate thermal decouplers, the SITRANS P Compact pressure transmitter can be used for process temperatures up to 200 °C (392 °F).

#### Benefits

- Measuring ranges from 0 to 160 mbar (0 to 2.32 psi) to 0 to 40 bar (0 to 580 psi)
- Linearity error including hysteresis < +0.2 % of full-scale value
- Piezo-resistive measurement system, vacuum-proof and overload-proof
- Hygiene-based design according to EHEDG, FDA and GMP recommendations
- Material and surface quality according to hygiene requirements
- Wetted parts made of stainless steel; completely welded
- Signal output 4 to 20 mA (0 to 20 mA as option)
- Stainless steel housing with degree of protection IP65 (IP67 as option)
- Process temperature up to 200 °C (392 °F)
- Explosion protection II 2G Ex [ib] IIC T6 to ATEX
- Easy and safe to clean

#### Application

The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology industries.

The use of high-grade materials guarantees compliance with hygiene regulations.

The SITRANS P Compact pressure transmitter is available in many versions. Exact adaptation of the pressure transmitter to conditions at the place of use is thus possible

#### Design

The electronics is potted to protect it against moisture, corrosive atmospheres and vibration.

#### Notes on operating the pressure transmitter

##### Compensation of internal atmospheric pressure

Compensation of the internal atmospheric pressure of the SITRANS P Compact pressure transmitters is performed as follows:

- in the plug versions by means of the screwed gland (IP65)
- in the field housings by means of an integral sintered filter (IP65) or a vented cable (IP67)
- in versions with cable outlet by means of a vented cable (IP67)

In the absolute pressure range there is no need for compensation with respect to atmospheric pressure.

**Note:** These degrees of protection are only achieved under the following conditions:

- if the pressure transmitter is installed correctly
- if the screwed glands are securely tightened
- if the cable diameters agree with the nominal diameters of the gaskets in the housing

**Note:** The integral EMC measures are only effective if the earth connection is made correctly.

##### CE marking

The CE marking of the pressure transmitter certifies compliance with the guidelines of the European Council (9/336/EC), the EMC law (13.11.1992), as well as the applicable generic standards.

Interference-free operation in systems and plants is achieved only if the specifications for shielding, earthing, cable routing and electrical isolation are observed during installation and assembly.

##### Hazardous areas

**Note:** Electrical equipment in hazardous areas must only be installed and operated by trained personnel.

Modifications to units and connections result in cancellation of the explosion protection and guarantee.

With intrinsically-safe circuits, make sure that equipotential bonding exists throughout the complete cabling inside and outside of the hazardous area. The limits specified in the ATEX approval must be observed.

**Function**

The process pressure acts on a piezo-resistive semiconductor measuring bridge through a remote seal and a transmission liquid. The pressure transmitter converts the pressure values into a load-independent current.

A compensation network makes the output signal largely independent of the ambient temperature. As a result of a specially adapted remote seal connection with minimized volume, the influence of the process temperature on the output signal is greatly reduced compared to a conventional screw connection.

The pressure transmitters can be powered with a non-regulated DC voltage of 10 to 30 V. Output signals common to measuring technology are available.

**Technical specifications****Pressure transmitters for food, pharmaceuticals and biotechnology****Mode of operation**

|                     |                 |
|---------------------|-----------------|
| Measuring principle | piezo-resistive |
|---------------------|-----------------|

**Input**

|                   |  |
|-------------------|--|
| Measured variable | gauge or absolute pressure   |
| Measuring range   | 0 ... 160 mbar (0 ... 2.32 psi)<br>...<br>0 ... 40 bar (0 ... 580 psi) |

**Output**

|                     |             |
|---------------------|-------------|
| Output signal       |             |
| • 2-wire system     | 4 ... 20 mA |
| • Three-wire system | 0 ... 20 mA |

**Measuring accuracy**

|  |                                      |
|--|--------------------------------------|
| Acc. to IEC 60770-1  |                                      |
| Error in measurement at limit setting incl. hysteresis and reproducibility | $\leq 0.2\%$ of full-scale value     |
| Adjustment accuracy  | $\leq \pm 0.2\%$ of full-scale value |
| Step response time   | < 20 ms                              |
| <u>Influence of ambient temperature</u>                                    |                                      |
| On the enclosure   |                                      |
| • Zero point   | < 0.2 %/10 K of full-scale value     |
| • Measuring span   | < 0.2 %/10 K of full-scale value     |
| On the process connection (remote seals)                                   | Zero error (depends on design)       |
| • Flange remote seal   |                                      |
| - DN 25 / 1"   | 4.8 mbar/10 K (0.069 psi/10 K)       |
| - DN 32 / 1¼"  | 2.3 mbar/10 K (0.033 psi/10 K)       |
| - DN 40 / 1½"  | 1.6 mbar/10 K (0.023 psi/10 K)       |
| - DN 50 / 2"   | 0.6 mbar/10 K (0.009 psi/10 K)       |
| • Clamp-on seal  |                                      |
| - DN 25 / 1"   | 9.5 mbar/10 K (0.14 psi/10 K)        |
| - DN 32 / 1¼"  | 4.1 mbar/10 K (0.06 psi/10 K)        |
| - DN 40 / 1½"  | 3.9 mbar/10 K (0.05 psi/10 K)        |
| - DN 50 / 2"   | 3.9 mbar/10 K (0.05 psi/10 K)        |

The zero error specified for the process connection should be considered as a guideline for a standard design. We will produce a detailed system calculation on request. Systems with reduced remote seal errors are available on request.

**Rated conditions**

Installation conditions

- Mounting position

Any, vertical as standard

Ambient conditions

- Ambient temperature
- Storage temperature
- Process temperature

-10 ... +70 °C (14 ... 158 °F)

-10 ... +90 °C (14 ... 194 °F)

Max. 200 °C (392 °F), depending on design

Vacuum-resistant

0 mbar (0 psi) absolute at max. 50 °C. Higher process temperatures on request.

- Degree of protection (to EN 60529)

IP65, optional IP67

- Electromagnetic Compatibility

- Emitted interference

To EN 50081 Part 1, issue 1993 (residential and industrial areas). The unit has no own emissions.

- Noise immunity to

EN 50082 Part 2, issue March 1995 (industrial areas)

**Design**

Weight (without remote seal)

- Field enclosure

≈ 460 G (≈ 1.01 (lb))

- Enclosure with plug

≈ 200 g (≈ 0.44 lb)

Enclosure

- Designs

- Field housing IP65 or IP67, with screwed gland
- Angled plug DIN 43650, IP65
- Cable connection, IP67
- M12 device plug, IP65

- Material

Stainless steel, mat. no. 1.4404/316L/1.4305

Material of union nut

Polyamide (with electrical connection using plug or cable)  
Electronics unit potted with silicone  
Internal ventilation for measuring ranges < 16 bar (< 232 psi), through housing thread or connection cable depending on design

Process connection

- Versions

See ordering data

- Material of coupling

Stainless steel, mat. no. 1.4404/316L

**Power supply**

Terminal voltage on transmitter

10 ... 30 V DC

Rated voltage

24 V DC

**Certificates and approvals**

Classification according to pressure equipment directive (PED 2014/68/EU)

- For 7MF8010-1... (with diaphragm seal)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

- For 7MF8010-2... (with clamp-on seal)

For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord

Explosion protection

- Intrinsic safety "i"
- Marking

TÜV 03 ATEX 2099 X  
Ex II 2G Ex ib IIC T6



## Pressure Measurement

Single-range transmitters for general applications

### SITRANS P Compact for gauge and absolute pressure

1

| Selection and Ordering data   | Article No.      | Ord. code |
|---|------------------|-----------|
| <b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front</b>         | <b>7MF8010 -</b> |           |
| 2-wire system<br>Process temperature up to 140 °C (284 °F)<br>Accuracy: 0.2 % of full-scale value<br>Output 4 ... 20 mA | 1                |           |
| Click on the Article No. for the online configuration in the PIA Life Cycle Portal.                                     |                  |           |
| <b>Diaphragm seal with quick-release clamp</b>  |                  |           |
| Milk pipe union to DIN 11851 with slotted union nut   |                  |           |
| • DN 25   | AD               |           |
| • DN 32   | AE               |           |
| • DN 40   | AF               |           |
| • DN 50   | AG               |           |
| • DN 65   | AH               |           |
| Milk pipe union to DIN 11851 with threaded socket   |                  |           |
| • DN 25   | BD               |           |
| • DN 32   | BE               |           |
| • DN 40   | BF               |           |
| • DN 50   | BG               |           |
| • DN 65   | BH               |           |
| Clamp connection to DIN 32676   |                  |           |
| • DN 25   | CD               |           |
| • DN 40   | CF               |           |
| • DN 50   | CG               |           |
| Clamp connection to ISO 2852  |                  |           |
| • 1 inch  | DM               |           |
| • 1½ inch   | DN               |           |
| • 2 inch  | DP               |           |
| • 2½ inch   | DQ               |           |
| IDF standard with slotted union nut   |                  |           |
| • 1 inch  | EM               |           |
| • 1½ inch   | EN               |           |
| • 2 inch  | EP               |           |
| IDF standard with threaded socket   |                  |           |
| • 1 inch  | FM               |           |
| • 1½ inch   | FN               |           |
| • 2 inch  | FP               |           |
| SMS standard with slotted union nut   |                  |           |
| • 1 inch  | GM               |           |
| • 1½ inch   | GN               |           |
| • 2 inch  | GP               |           |
| SMS standard with threaded socket   |                  |           |
| • 1 inch  | HM               |           |
| • 1½ inch   | HN               |           |
| • 2 inch  | HP               |           |
| DRD flange, without welding-type flange   |                  |           |
| • DN 50, PN 40  | JH               |           |
| Varivent connection (Tuchenhausen)  |                  |           |
| • D = 50, for Varivent housing DN 25 and 1 inch   | KF               |           |
| • D = 68, for Varivent housing DN 40 ... DN 125 and 1½ ... 6 inch   | KL               |           |
| Special version<br>(add Order code and plain text)  | ZA               | J 1 Y     |
| <b>Filling liquid</b>   |                  |           |
| Food oil, FDA-listed  | 3                |           |
| Special version<br>(add Order code and plain text)  | 9                | L 1 Y     |
| <b>Output signal</b>  |                  |           |
| 4 ... 20 mA   | 1                |           |
| Special version<br>(add Order code and plain text)  | 9                | M 1 Y     |

| Selection and Ordering data   | Article No.      | Ord. code |
|---|------------------|-----------|
| <b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front</b>         | <b>7MF8010 -</b> |           |
| 2-wire system<br>Process temperature up to 140 °C (284 °F)<br>Accuracy: 0.2 % of full-scale value<br>Output 4 ... 20 mA | 1                |           |
| <b>Diaphragm seal with aseptic connection</b>   |                  |           |
| Aseptic screwed gland to DIN 11864-1, form A, with slotted union nut  |                  |           |
| • 1 inch  | PM               |           |
| • 1½ inch   | PN               |           |
| • 2 inch  | PP               |           |
| • 2½ inch   | PQ               |           |
| Aseptic screwed gland to DIN 11864-1, form A with threaded socket   |                  |           |
| • 1 inch  | QM               |           |
| • 1½ inch   | QN               |           |
| • 2 inch  | QP               |           |
| • 2½ inch   | QQ               |           |
| Aseptic screwed NEUMO with slotted union nut <sup>1)</sup>  |                  |           |
| • DN 25   | RD               |           |
| • DN 32   | RE               |           |
| • DN 40   | RF               |           |
| • DN 50   | RG               |           |
| Aseptic screwed NEUMO with threaded socket <sup>1)</sup>  |                  |           |
| • DN 25   | SD               |           |
| • DN 32   | SE               |           |
| • DN 40   | SF               |           |
| • DN 50   | SG               |           |
| Aseptic screwed NEUMO with clamp connection, form R <sup>1)</sup>   |                  |           |
| • DN 25   | TD               |           |
| • DN 32   | TE               |           |
| • DN 40   | TF               |           |
| • DN 50   | TG               |           |
| Aseptic screwed NEUMO with clamp connection, form V <sup>1)</sup>   |                  |           |
| • DN 25   | UD               |           |
| • DN 32   | UE               |           |
| • DN 40   | UF               |           |
| • DN 50   | UG               |           |
| Male thread DIN 3852 Form A   |                  |           |
| • G½", min. meas. span 1.6 bar (23.2 psi)   | XA               |           |
| • G¾", min. meas. span 1 bar (14.5 psi)   | XB               |           |
| • G1", min. meas. span 0.4 bar (5.8 psi)  | XC               |           |
| • G1½", min. meas. span 0.25 bar (3.63 psi)   | XD               |           |
| • G2", min. meas. span 0.16 bar (2.32 psi)  | XE               |           |
| Special version<br>(add Order code and plain text)  | ZA               | J 1 Y     |
| <b>Filling liquid</b>   |                  |           |
| Food oil, FDA-listed  | 3                |           |
| Special version<br>(add Order code and plain text)  | 9                | L 1 Y     |
| <b>Output signal</b>  |                  |           |
| 4 ... 20 mA   | 1                |           |
| Special version<br>(add Order code and plain text)  | 9                | M 1 Y     |

<sup>1)</sup> Please specify as well:  
Connections for pipes: R01, R02 or R03, see table "Further designs" on next page

## Pressure Measurement

## Single-range transmitters for general applications

## SITRANS P Compact for gauge and absolute pressure

1

| Selection and Ordering data   |                      | Article No. | Ord. code | Selection and Ordering data  |                         | Article No. | Ord. code |
|---|----------------------|-------------|-----------|--|-------------------------|-------------|-----------|
| <b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front</b>         |                      | 7MF8010-    |           | <b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front</b>  |                         | 7MF8010-    |           |
| 2-wire system<br>Process temperature up to 140 °C (284 °F)<br>Accuracy: 0.2 % of full-scale value<br>Output 4 ... 20 mA |                      | 1           |           | 2-wire system<br>Process temperature up to 140 °C (284 °F)<br>Accuracy: 0.2 % of full-scale value<br>Output 4 ... 20 mA  |                         | 1           |           |
| <b>Housing design (stainless steel mat. No. 1.4404/316L) / electr. connection</b>                                       |                      |             |           | <b>Measured range</b>  |                         |             |           |
| Housing with angled plug to DIN 43650, IP65   |                      | 1           |           | <b>Overload pressure</b>   |                         |             |           |
| Housing with M12 device plug, IP65, union nut made of polyamide   |                      | 2           |           | (continued)  |                         |             |           |
| Housing with M12 device plug, IP65, union nut made of stainless steel   |                      | 3           |           | -1 ... +9 bar<br>(-14.5 ... +130.5 psi)  | 30 bar<br>(435 psi)     | GA          |           |
| Stainless steel field housing (small) with cable gland, IP65  |                      | 4           |           | -1 ... +15 bar<br>(-14.5 ... +217.6 psi)   | 50 bar<br>(725 psi)     | GB          |           |
| Stainless steel field housing (small) with cable gland, IP67  |                      | 5           |           | 0 ... 1 bar a<br>(0 ... 14.5 psi a)  | 10 bar a<br>(145 psi a) | HA          |           |
| Internal ventilation for measuring ranges < 16 bar (< 232 psi)  |                      |             |           | 0 ... 1.6 bar a<br>(0 ... 23.2 psi a)  | 10 bar a<br>(145 psi a) | HB          |           |
| <b>Measured range</b>   |                      |             |           | 0 ... 2.5 bar a<br>(0 ... 36.3 psi a)  | 16 bar a<br>(232 psi a) | HC          |           |
| 0 ... 160 mbar<br>(0 ... 2.32 psi)  | 2 bar<br>(29 psi)    | BB          |           | 0 ... 4 bar a<br>(0 ... 58 psi a)  | 16 bar a<br>(232 psi a) | HD          |           |
| 0 ... 250 mbar<br>(0 ... 3.63 psi)  | 2 bar<br>(29 psi)    | BC          |           | 0 ... 6 bar a<br>(0 ... 87 psi a)  | 30 bar a<br>(435 psi a) | HE          |           |
| 0 ... 400 mbar<br>(0 ... 5.8 psi)   | 6 bar<br>(87 psi)    | BD          |           | 0 ... 10 bar a<br>(0 ... 145 psi a)  | 30 bar a<br>(435 psi a) | JA          |           |
| 0 ... 600 mbar<br>(0 ... 8.7 psi)   | 6 bar<br>(87 psi)    | BE          |           | Special version<br>(add Order code and plain text)   |                         | ZA          | P 1 Y     |
| 0 ... 1 bar<br>(0 ... 14.5 psi)   | 10 bar<br>(145 psi)  | CA          |           | <b>Explosion protection</b>  |                         |             |           |
| 0 ... 1.6 bar<br>(0 ... 23.2 psi)   | 10 bar<br>(145 psi)  | CB          |           | without  |                         |             | 1         |
| 0 ... 2.5 bar<br>(0 ... 36.3 psi)   | 16 bar<br>(232 psi)  | CC          |           | with, to ATEX 100a, II 2 G, Ex ib IIC T6   |                         |             | 2         |
| 0 ... 4 bar<br>(0 ... 58 psi)   | 16 bar<br>(232 psi)  | CD          |           | <b>Further designs</b>   |                         | Order code  |           |
| 0 ... 6 bar<br>(0 ... 87 psi)   | 30 bar<br>(435 psi)  | CE          |           | Please add "-Z" to Article No. and specify Order code  |                         |             |           |
| 0 ... 10 bar<br>(0 ... 145 psi)   | 30 bar<br>(435 psi)  | DA          |           | <b>Hygiene version</b>   |                         | P01         |           |
| 0 ... 16 bar<br>(0 ... 232 psi)   | 50 bar<br>(725 psi)  | DB          |           | Roughness of process connection:<br>Foil $R_a < 0.8 \mu\text{m}$ ( $3.15 \cdot 10^{-8}$ inch);<br>Welded seams $R_a < 1.5 \mu\text{m}$ ( $5.9 \cdot 10^{-8}$ inch) |                         |             |           |
| 0 ... 25 bar<br>(0 ... 363 psi)   | 50 bar<br>(725 psi)  | DC          |           | <b>Integral cooling element</b>  |                         | K01         |           |
| 0 ... 40 bar<br>(0 ... 580 psi)   | 70 bar<br>(1015 psi) | DD          |           | Process temperature max. 200 °C<br>(392 °F) instead of 140 °C (284 °F)   |                         |             |           |
| -160 ... 0 mbar<br>(-2.32 ... 0 psi)  | 2 bar<br>(29 psi)    | EB          |           | <b>Connections for pipe</b>  |                         |             |           |
| -250 ... 0 bar<br>(-3.73 ... 0 psi)   | 2 bar<br>(29 psi)    | EC          |           | Pipes to DIN 11850   |                         | R01         |           |
| -400 ... 0 bar<br>(-5.8 ... 0 psi)  | 6 bar<br>(87 psi)    | ED          |           | ISO pipes to DIN 2463  |                         | R02         |           |
| -600 ... 0 bar<br>(-8.7 ... 0 psi)  | 6 bar<br>(87 psi)    | EE          |           | Pipes to O. D. Tubing "BS 4825 Part 1"   |                         | R03         |           |
| -1 ... 0 bar<br>(-14.5 ... 0 psi)   | 10 bar<br>(145 psi)  | FA          |           | <b>Certificates</b>  |                         |             |           |
| -1 ... 0.6 bar<br>(-14.5 ... 8.7 psi)   | 10 bar<br>(145 psi)  | FB          |           | Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2  |                         | C11         |           |
| -1 ... 1.5 bar<br>(-14.5 ... 21.8 psi)  | 16 bar<br>(232 psi)  | FC          |           | Inspection certificate to EN 10204-3.1   |                         | C12         |           |
| -1 ... 3 bar<br>(-14.5 ... 43.5 psi)  | 16 bar<br>(232 psi)  | FD          |           | Use of FDA-listed remote seal filling liquids certified by test report to EN 10204-2.2   |                         | C17         |           |
| -1 ... 5 bar<br>(-14.5 ... 72.5 psi)  | 30 bar<br>(435 psi)  | FE          |           | Roughness depth measurement $R_a$ certified by test report to EN 10204-3.1   |                         | C18         |           |
|   |                      |             |           | Certification to EHEDG for clamp-on seals with aseptic screwed gland to DIN 11864  |                         | C19         |           |

# Pressure Measurement

Single-range transmitters for general applications

## SITRANS P Compact for gauge and absolute pressure

1

| Selection and Ordering data   | Article No.      | Ord. code |
|---|------------------|-----------|
| <b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal</b>             | <b>7MF8010 -</b> |           |
| 2-wire system<br>Process temperature up to 140 °C (284 °F)<br>Accuracy: 0.2 % of full-scale value<br>Output 4 ... 20 mA | 2                |           |
| Click on the Article No. for the online configuration in the PIA Life Cycle Portal.                                     |                  |           |
| <b>Clamp-on remote seal (screwed gland at both ends) with quick-release clamps</b>                                      |                  |           |
| Milk pipe union to DIN 11851 with threaded socket   |                  |           |
| • DN 25   | AD               |           |
| • DN 32   | AE               |           |
| • DN 40   | AF               |           |
| • DN 50   | AG               |           |
| • DN 65   | AH               |           |
| Clamp connection to DIN 32676   |                  |           |
| • DN 25   | CD               |           |
| • DN 32   | CE               |           |
| • DN 40   | CF               |           |
| • DN 50   | CG               |           |
| • DN 65   | CH               |           |
| Clamp connection to ISO 2852 <sup>1)</sup>  |                  |           |
| • 1 inch  | DM               |           |
| • 1½ inch   | DN               |           |
| • 2 inch  | DP               |           |
| • 2½ inch   | DQ               |           |
| Special version (add Order code and plain text)   | ZA               | J 1 Y     |
| <b>Filling liquid</b>   |                  |           |
| Food oil, FDA-listed  | 3                |           |
| Special version (add Order code and plain text)   | 9                | L 1 Y     |
| <b>Output signal</b>  |                  |           |
| 4 ... 20 mA   | 1                |           |
| Special version (add Order code and plain text)   | 9                | M 1 Y     |

<sup>1)</sup> Please note the internal diameter of the pipe. Please specify pipe classes (see "Further designs")

| Selection and Ordering data   | Article No.      | Ord. code |
|---|------------------|-----------|
| <b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal</b>             | <b>7MF8010 -</b> |           |
| 2-wire system<br>Process temperature up to 140 °C (284 °F)<br>Accuracy: 0.2 % of full-scale value<br>Output 4 ... 20 mA | 2                |           |
| <b>Clamp-on seal with aseptic connection</b>  |                  |           |
| Aseptic screwed gland to DIN 11864-1, form A with threaded socket   |                  |           |
| • 1 inch  | QM               |           |
| • 1½ inch   | QN               |           |
| • 2 inch  | QP               |           |
| Aseptic screwed NEUMO with threaded socket <sup>1)</sup>  |                  |           |
| • DN 25   | SD               |           |
| • DN 32   | SE               |           |
| • DN 40   | SF               |           |
| • DN 50   | SG               |           |
| • DN 65   | SH               |           |
| Aseptic screwed NEUMO with clamp connection, form R <sup>1)</sup>   |                  |           |
| • DN 25   | TD               |           |
| • DN 32   | TE               |           |
| • DN 40   | TF               |           |
| • DN 50   | TG               |           |
| Aseptic screwed gland SÜDMO with threaded socket W 501 <sup>1)</sup>  |                  |           |
| • 1 inch  | VM               |           |
| • 1½ inch   | VN               |           |
| • 2 inch  | VP               |           |
| Aseptic screwed gland SÜDMO with clamp connection W 601 <sup>1)</sup>   |                  |           |
| • 1 inch  | WM               |           |
| • 1½ inch   | WN               |           |
| • 2 inch  | WP               |           |
| Special version (add Order code and plain text)   | ZA               | J 1 Y     |
| <b>Filling liquid</b>   |                  |           |
| Food oil, FDA-listed  | 3                |           |
| Medicinal white oil   | 2                |           |
| Special version (add Order code and plain text)   | 9                | L 1 Y     |
| <b>Output signal</b>  |                  |           |
| 4 ... 20 mA   | 1                |           |
| Special version (add Order code and plain text)   | 9                | M 1 Y     |

<sup>1)</sup> Please specify as well:  
Connections for pipes: R01, R02 or R03, see table "Further designs" on next page

## Pressure Measurement

## Single-range transmitters for general applications

## SITRANS P Compact for gauge and absolute pressure

1

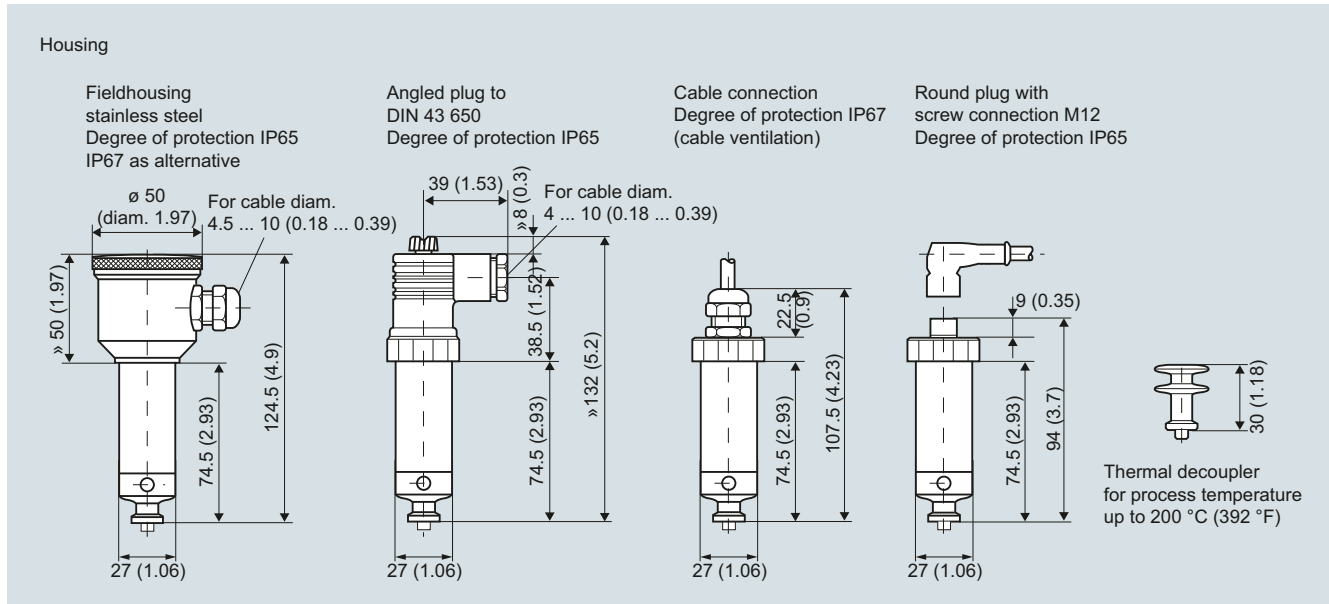
| Selection and Ordering data   |                      | Article No.    | Ord. code | Selection and Ordering data  |                         | Article No.    | Ord. code |
|---|----------------------|----------------|-----------|--|-------------------------|----------------|-----------|
| <b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal</b>             |                      | 7 MF 8 0 1 0 - |           | <b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal</b>  |                         | 7 MF 8 0 1 0 - |           |
| 2-wire system<br>Process temperature up to 140 °C (284 °F)<br>Accuracy: 0.2 % of full-scale value<br>Output 4 ... 20 mA |                      | 2              |           | 2-wire system<br>Process temperature up to 140 °C (284 °F)<br>Accuracy: 0.2 % of full-scale value<br>Output 4 ... 20 mA  |                         | 2              |           |
| <b>Housing design (stainless steel mat. No. 1.4404/316L) / electr. connection</b>                                       |                      |                |           | <b>Measured range    Overload pressure</b><br>(continued)  |                         |                |           |
| Housing with angled plug to DIN 43650, IP65, union nut made of polyamide  |                      | 1              |           | -1 ... 9 bar<br>(-14.5 ... 130.5 psi)  | 30 bar<br>(435 psi)     | GA             |           |
| Housing with M12 device plug, IP65, union nut made of polyamide   |                      | 2              |           | -1 ... 15 bar<br>(-14.5 ... 217.6 psi)   | 50 bar<br>(725 psi)     | GB             |           |
| Housing with M12 device plug, IP65, union nut made of stainless steel   |                      | 3              |           | 0 ... 1 bar a<br>(0 ... 14.5 psi a)  | 10 bar a<br>(145 psi a) | HA             |           |
| Stainless steel field housing (small) with cable gland, IP65  |                      | 4              |           | 0 ... 1.6 bar a<br>(0 ... 23.2 psi a)  | 10 bar a<br>(145 psi a) | HB             |           |
| Stainless steel field housing (small) with cable gland, IP67  |                      | 5              |           | 0 ... 2.5 bar a<br>(0 ... 36.3 psi a)  | 16 bar a<br>(232 psi a) | HC             |           |
| Internal ventilation for measuring ranges < 16 bar (< 232 psi)  |                      |                |           | 0 ... 4 bar a<br>(0 ... 58 psi a)  | 16 bar a<br>(232 psi a) | HD             |           |
| <b>Measured range    Overload pressure</b>  |                      |                |           | 0 ... 6 bar a<br>(0 ... 87 psi a)  | 30 bar a<br>(435 psi a) | HE             |           |
| 0 ... 160 mbar<br>(0 ... 2.32 psi)  | 2 bar<br>(29 psi)    | BB             |           | 0 ... 10 bar a<br>(0 ... 145 psi a)  | 30 bar a<br>(435 psi a) | JA             |           |
| 0 ... 250 mbar<br>(0 ... 3.63 psi)  | 2 bar<br>(29 psi)    | BC             |           | Special version<br>(add Order code and plain text)   |                         | ZA             | P1Y       |
| 0 ... 400 mbar<br>(0 ... 5.8 psi)   | 6 bar<br>(87 psi)    | BD             |           | <b>Explosion protection</b>  |                         |                |           |
| 0 ... 600 mbar<br>(0 ... 8.7 psi)   | 6 bar<br>(87 psi)    | BE             |           | without  |                         |                | 1         |
| 0 ... 1 bar<br>(0 ... 14.5 psi)   | 10 bar<br>(145 psi)  | CA             |           | with, to ATEX 100a, II 2 G, Ex ib IIC T6   |                         |                | 2         |
| 0 ... 1.6 bar<br>(0 ... 23.2 psi)   | 10 bar<br>(145 psi)  | CB             |           | <b>Further designs</b>   |                         | Order code     |           |
| 0 ... 2.5 bar<br>(0 ... 36.3 psi)   | 16 bar<br>(232 psi)  | CC             |           | Please add "-Z" to Article No. and specify Order code  |                         |                |           |
| 0 ... 4 bar<br>(0 ... 58 psi)   | 16 bar<br>(232 psi)  | CD             |           | <b>Hygiene version</b>   |                         | P01            |           |
| 0 ... 6 bar<br>(0 ... 87 psi)   | 30 bar<br>(435 psi)  | CE             |           | Roughness of process connection:<br>Foil $R_a < 0.8 \mu\text{m}$ ( $3.15 \cdot 10^{-8}$ inch);<br>Welded seams $R_a < 1.5 \mu\text{m}$ ( $5.9 \cdot 10^{-8}$ inch) |                         |                |           |
| 0 ... 10 bar<br>(0 ... 145 psi)   | 30 bar<br>(435 psi)  | DA             |           | <b>Integral cooling element</b>  |                         | K01            |           |
| 0 ... 16 bar<br>(0 ... 232 psi)   | 50 bar<br>(725 psi)  | DB             |           | Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)  |                         |                |           |
| 0 ... 25 bar<br>(0 ... 363 psi)   | 50 bar<br>(725 psi)  | DC             |           | <b>Connections for pipe</b>  |                         |                |           |
| 0 ... 40 bar<br>(0 ... 580 psi)   | 70 bar<br>(1015 psi) | DD             |           | Pipes to DIN 11850   |                         | R01            |           |
| -160 ... 0 mbar<br>(-2.32 ... 0 psi)  | 2 bar<br>(29 psi)    | EB             |           | ISO pipes to ISO 2463  |                         | R02            |           |
| -250 ... 0 bar<br>(-3.73 ... 0 psi)   | 2 bar<br>(29 psi)    | EC             |           | Pipes to O. D. Tubing "BS 4825 Part 1"   |                         | R03            |           |
| -400 ... 0 bar<br>(-5.8 ... 0 psi)  | 6 bar<br>(87 psi)    | ED             |           | <b>Certificates</b>  |                         |                |           |
| -600 ... 0 bar<br>(-8.7 ... 0 psi)  | 6 bar<br>(87 psi)    | EE             |           | Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2  |                         | C11            |           |
| -1 ... 0 bar<br>(-14.5 ... 0 psi)   | 10 bar<br>(145 psi)  | FA             |           | Inspection certificate to EN 10204-3.1   |                         | C12            |           |
| -1 ... 0.6 bar<br>(-14.5 ... 8.7 psi)   | 10 bar<br>(145 psi)  | FB             |           | Use of FDA-listed remote seal filling liquids certified by test report to EN 10204-2.2   |                         | C17            |           |
| -1 ... 1.5 bar<br>(-14.5 ... 21.8 psi)  | 16 bar<br>(232 psi)  | FC             |           | Roughness depth measurement $R_a$ certified by test report to EN 10204-3.1   |                         | C18            |           |
| -1 ... 3 bar<br>(-14.5 ... 43.5 psi)  | 16 bar<br>(232 psi)  | FD             |           | Certification to EHEDG for clamp-on seals with aseptic screwed gland to DIN 11864  |                         | C19            |           |
| -1 ... 5 bar<br>(-14.5 ... 72.5 psi)  | 30 bar<br>(435 psi)  | FE             |           |  |                         |                |           |

# Pressure Measurement

Single-range transmitters for general applications

## SITRANS P Compact for gauge and absolute pressure

### Dimensional drawings

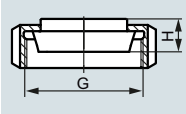


SITRANS P Compact, dimensions in mm (inch)

### Process connections

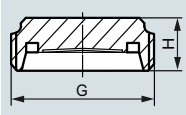
Diaphragm seal with quick-release clamp

#### Milk pipe union to DIN 11851 with slotted union nut



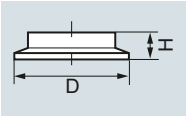
| DN | PN | H<br>mm (inch) | G             |
|----|----|----------------|---------------|
| 25 | 40 | 24 (0.95)      | Rd. 52 x 1/6" |
| 32 | 40 | 24 (0.95)      | Rd. 58 x 1/6" |
| 40 | 40 | 24 (0.95)      | Rd. 65 x 1/6" |
| 50 | 25 | 25.1 (0.99)    | Rd. 78 x 1/6" |
| 65 | 25 | 28.6 (1.13)    | Rd. 95 x 1/6" |

#### Milk pipe union to DIN 11851 with threaded socket



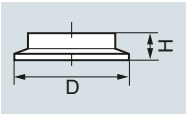
| DN | PN | H<br>mm (inch) | G             |
|----|----|----------------|---------------|
| 25 | 40 | -              | Rd. 52 x 1/6" |
| 32 | 40 | 20 (0.79)      | Rd. 58 x 1/6" |
| 40 | 40 | 20 (0.79)      | Rd. 65 x 1/6" |
| 50 | 25 | 20 (0.79)      | Rd. 78 x 1/6" |
| 65 | 25 | 22 (0.87)      | Rd. 95 x 1/6" |

#### Clamp connection to DIN 32676



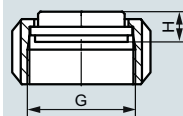
| DN | PN | H<br>mm (inch) | D<br>mm (inch) |
|----|----|----------------|----------------|
| 25 | 16 | 14 (0.55)      | 50.5 (2)       |
| 40 | 16 | 14 (0.55)      | 50.5 (2)       |
| 50 | 16 | 14 (0.55)      | 64 (2.52)      |

#### Clamp connection to ISO 2852



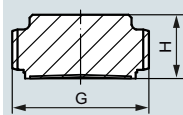
| DN  | PN | H<br>mm (inch) | D<br>mm (inch) |
|-----|----|----------------|----------------|
| 1"  | 16 | 14 (0.55)      | 50.5 (2)       |
| 1½" | 16 | 12 (0.47)      | 50.5 (2)       |
| 2"  | 16 | 14 (0.55)      | 64 (2.52)      |
| 2½" | 16 | 14 (0.55)      | 77.5 (3.05)    |

#### IDF standard with slotted union nut



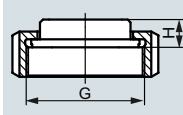
| DN  | PN | H<br>mm (inch) | G inch<br>(IDF thread) |
|-----|----|----------------|------------------------|
| 1"  | 40 | 21 (0.83)      | 1"                     |
| 1½" | 40 | 13.5 (0.53)    | 1½"                    |
| 2"  | 25 | 15 (0.59)      | 2"                     |

#### IDF standard with threaded socket



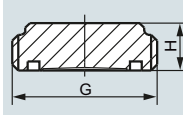
| DN  | PN | H<br>mm (inch) | G inch<br>(IDF thread) |
|-----|----|----------------|------------------------|
| 1"  | 40 | 21 (0.83)      | 1"                     |
| 1½" | 40 | 13.5 (0.53)    | 1½"                    |
| 2"  | 25 | 15 (0.59)      | 2"                     |

#### SMS standard with slotted union nut



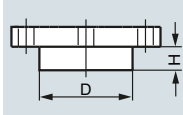
| DN  | PN | H<br>mm (inch) | G            |
|-----|----|----------------|--------------|
| 1"  | 40 | 16 (0.63)      | Rd 40 x 1.6" |
| 1½" | 40 | 16 (0.63)      | Rd 60 x 1.6" |
| 2"  | 25 | 16 (0.63)      | Rd 70 x 1.6" |

#### SMS standard with threaded socket



| DN  | PN | H<br>mm (inch) | G            |
|-----|----|----------------|--------------|
| 1"  | 40 | 16 (0.63)      | Rd 40 x 1.6" |
| 1½" | 40 | 20 (0.79)      | Rd 60 x 1.6" |
| 2"  | 25 | 20 (0.79)      | Rd 70 x 1.6" |

#### DRD flange, without welding-type flange



| DN | PN | H<br>mm (inch) | D<br>mm (inch) |
|----|----|----------------|----------------|
| 50 | 40 | 16.7 (0.66)    | 65.5 (2.58)    |

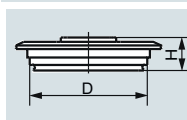
# Pressure Measurement

Single-range transmitters for general applications

## SITRANS P Compact for gauge and absolute pressure

1

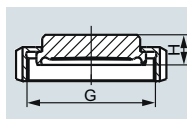
### Varivent connection



| DN            | PN    | H<br>mm (inch) | D<br>mm (inch) |
|---------------|-------|----------------|----------------|
| 25            | 25    | 19 (0.75)      | 50 (1.97)      |
| 40 ...<br>125 | 25/10 | 19 (0.75)      | 68 (2.68)      |

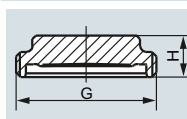
Diaphragm seal with aseptic connection

### Aseptic screwed gland to DIN 11864-1, form A, with slotted union nut



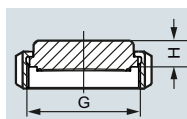
| DN  | PN | H<br>mm (inch) | G            |
|-----|----|----------------|--------------|
| 1"  | 40 | 20 (0.79)      | Rd 52 x 1/6" |
| 1½" | 40 | 20 (0.79)      | Rd 58 x 1/6" |
| 2"  | 25 | 20 (0.79)      | Rd 65 x 1/6" |
| 2½" | 25 | 20 (0.79)      | Rd 78 x 1/6" |

### Aseptic screwed gland to DIN 11864-1, form A, with threaded socket



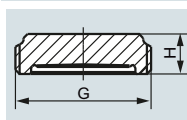
| DN  | PN | H<br>mm (inch) | G            |
|-----|----|----------------|--------------|
| 1"  | 40 | 15 (0.59)      | Rd 52 x 1/6" |
| 1½" | 40 | 15 (0.59)      | Rd 58 x 1/6" |
| 2"  | 25 | 15 (0.59)      | Rd 65 x 1/6" |
| 2½" | 25 | 15 (0.59)      | Rd 78 x 1/6" |

### Aseptic screwed NEUMO BioConnect with slotted union nut



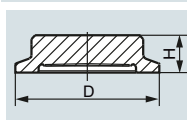
| DN | PN | H<br>mm (inch) | G        |
|----|----|----------------|----------|
| 25 | 16 | 15 (0.59)      | M 42 x 2 |
| 32 | 16 | 15 (0.59)      | M 52 x 2 |
| 40 | 16 | 15 (0.59)      | M 56 x 2 |
| 50 | 16 | 15 (0.59)      | M 68 x 2 |

### Aseptic screwed NEUMO BioConnect with threaded socket



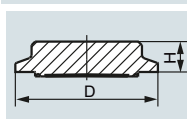
| DN | PN | H<br>mm (inch) | G        |
|----|----|----------------|----------|
| 25 | 16 | 20 (0.79)      | M 42 x 2 |
| 32 | 16 | 20 (0.79)      | M 52 x 2 |
| 40 | 16 | 20 (0.79)      | M 56 x 2 |
| 50 | 16 | 20 (0.79)      | M 68 x 2 |

### Aseptic screwed NEUMO BioConnect with clamp connection, form R



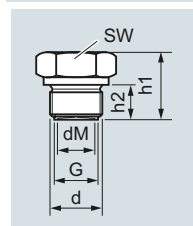
| DN | PN | H<br>mm (inch) | D<br>mm (inch) |
|----|----|----------------|----------------|
| 25 | 40 | 20 (0.79)      | 50.5 (2)       |
| 32 | 40 | 20 (0.79)      | 50.5 (2)       |
| 40 | 40 | 20 (0.79)      | 64 (2.52)      |
| 50 | 25 | 20 (0.79)      | 77.4 (3.05)    |

### Aseptic screwed NEUMO BioConnect with clamp connection, form V



| DN | PN | H<br>mm (inch) | D<br>mm (inch) |
|----|----|----------------|----------------|
| 25 | 40 | 15 (0.59)      | 50.5 (2)       |
| 32 | 40 | 15 (0.59)      | 50.5 (2)       |
| 40 | 40 | 15 (0.59)      | 64 (2.52)      |
| 50 | 25 | 15 (0.59)      | 77.4 (3.05)    |

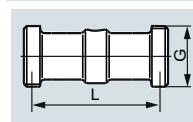
### Male thread DIN 3852, form A



| G    | d<br>mm (inch) | d <sub>M</sub><br>mm (inch) | h <sub>1</sub><br>mm (inch) | h <sub>2</sub><br>mm (inch) | SW<br>mm (inch) |
|------|----------------|-----------------------------|-----------------------------|-----------------------------|-----------------|
| G½A  | 26<br>(1.02)   | 17.5<br>(0.69)              | 27<br>(1.06)                | 14<br>(0.55)                | 27<br>(1.06)    |
| G¾A  | 32<br>(1.26)   | 22.6<br>(0.89)              | 31<br>(1.22)                | 16<br>(0.63)                | 32<br>(1.26)    |
| G1A  | 39<br>(1.54)   | 27<br>(1.06)                | 33<br>(1.30)                | 18<br>(0.71)                | 51<br>(2.01)    |
| G1½A | 55<br>(2.17)   | 40<br>(1.57)                | 40<br>(1.57)                | 22<br>(0.87)                | 55<br>(2.17)    |
| G2A  | 68<br>(2.68)   | 51<br>(2.00)                | 42<br>(1.65)                | 24<br>(0.94)                | 70<br>(2.76)    |

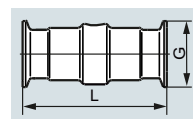
Clamp-on remote seal (screwed gland at both ends) with quick-release clamps

### Milk pipe union to DIN 11851 with threaded socket



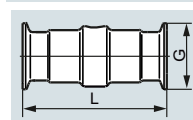
| DN | PN | L<br>mm (inch) | G            |
|----|----|----------------|--------------|
| 25 | 40 | 110 (4.33)     | Rd 52 x 1/6" |
| 32 | 40 | 110 (4.33)     | Rd 58 x 1/6" |
| 40 | 40 | 110 (4.33)     | Rd 65 x 1/6" |
| 50 | 25 | 110 (4.33)     | Rd 78 x 1/6" |
| 65 | 25 | 110 (4.33)     | Rd 95 x 1/6" |

### Clamp connection to DIN 32676



| DN | PN | L<br>mm (inch) | D<br>mm (inch) |
|----|----|----------------|----------------|
| 25 | 16 | 110 (4.33)     | 50.5 (2)       |
| 32 | 16 | 110 (4.33)     | 50.5 (2)       |
| 40 | 16 | 110 (4.33)     | 50.5 (2)       |
| 50 | 16 | 110 (4.33)     | 64 (2.52)      |
| 65 | 10 | 110 (4.33)     | 91 (3.58)      |

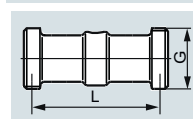
### Clamp connection to ISO 2852



| DN  | PN | L<br>mm (inch) | D<br>mm (inch) |
|-----|----|----------------|----------------|
| 1"  | 16 | 110 (4.33)     | 50.5 (2)       |
| 1½" | 16 | 110 (4.33)     | 50.5 (2)       |
| 2"  | 16 | 110 (4.33)     | 64 (2.52)      |
| 2½" | 16 | 110 (4.33)     | 91 (3.58)      |

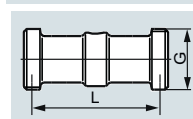
Clamp-on seal with aseptic connection

### Aseptic screwed gland to DIN 11864-1, form A, with threaded socket



| DN  | PN | L<br>mm (inch) | G            |
|-----|----|----------------|--------------|
| 1"  | 40 | 110 (4.33)     | Rd 52 x 1/6" |
| 1½" | 40 | 110 (4.33)     | Rd 65 x 1/6" |
| 2"  | 25 | 110 (4.33)     | Rd 78 x 1/6" |

### Aseptic screwed NEUMO BioConnect with threaded socket



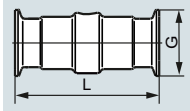
| DN | PN | L<br>mm (inch) | G        |
|----|----|----------------|----------|
| 25 | 16 | 110 (4.33)     | M 42 x 2 |
| 32 | 16 | 110 (4.33)     | M 52 x 2 |
| 40 | 16 | 110 (4.33)     | M 56 x 2 |
| 50 | 16 | 110 (4.33)     | M 68 x 2 |
| 65 | 16 | 110 (4.33)     | M 90 x 3 |

## Pressure Measurement

Single-range transmitters for general applications

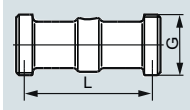
### SITRANS P Compact for gauge and absolute pressure

#### Aseptic screwed NEUMO BioConnect with clamp connection, form R



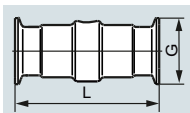
| DN | PN | L<br>mm (inch) | D<br>mm (inch) |
|----|----|----------------|----------------|
| 25 | 16 | 110 (4.33)     | 50.4 (2)       |
| 32 | 16 | 110 (4.33)     | 50.4 (2)       |
| 40 | 16 | 110 (4.33)     | 64 (2.52)      |
| 50 | 16 | 110 (4.33)     | 77.4 (3.05)    |

#### Aseptic screwed gland SÜDMO with threaded socket W 501



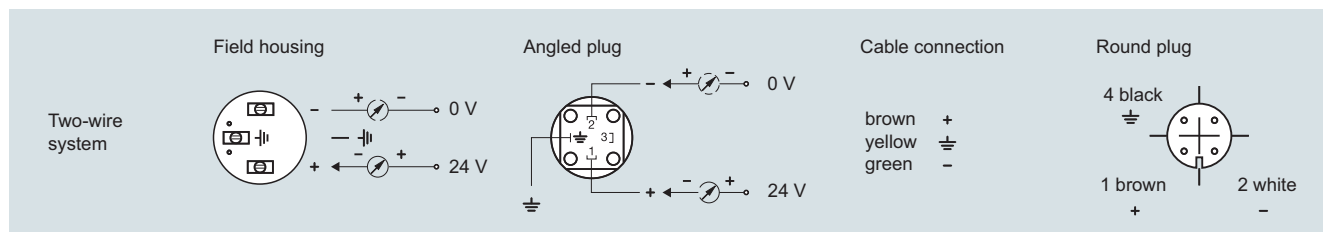
| DN  | PN | L<br>mm (inch) | G            |
|-----|----|----------------|--------------|
| 1"  | 25 | 110 (4.33)     | Rd 44 x 1/6" |
| 1½" | 25 | 110 (4.33)     | Rd 58 x 1/6" |
| 2"  | 20 | 110 (4.33)     | Rd 78 x 1/6" |

#### Aseptic screwed gland SÜDMO with threaded socket W 601



| DN  | PN | L<br>mm (inch) | D<br>mm (inch) |
|-----|----|----------------|----------------|
| 1"  | 16 | 110 (4.33)     | 50.5 (2)       |
| 1½" | 16 | 110 (4.33)     | 64 (2.52)      |
| 2"  | 16 | 110 (4.33)     | 77.5 (3.05)    |

### Schematics



SITRANS P Compact, connection diagram



### Overview



SITRANS P280 for flexible and cost-effective applications in pressure monitoring

- Supports the WirelessHART standard (HART V 7.1)
- Very high security level for wireless data transmission
- Built-in local user interface (LUI) with 3-button operation
- Optimum display and readability using graphical display (104 x 80 pixels) with integrated backlight
- Stand-by (deep sleep phase) can be activated and deactivated device with push of a button
- Battery power supply
- Battery service life up to 5 years
- Extend battery service life with HART modem interface which can be shut off
- Optimized power consumption through new design, and increase in battery service life.
- Simple configuration thanks to SIMATIC PDM
- Device meets IP65 degree of protection
- Can be used for absolute and gauge pressure measurements

### Benefits

The SITRANS P280 is a pressure transmitter that features Wireless HART as the standard communication interface.

Also available is a wired interface to connect a HART modem:

- Flexible pressure measurements
- Save costs on wiring for difficult installation conditions. Wireless technology offers cost advantages in cases where extensive wiring cost would normally apply.
- It enables additional hitherto unfeasible measuring points, particularly for monitoring purposes.
- Easy installation on moveable equipment
- Enables cost-effective temporary measurements, for example for process optimizations.
- Optimum solution in addition to wired communication and new possibilities for system solutions in process automation

### Application

The SITRANS P280 is a WirelessHART field device for measuring absolute and gauge pressure.

The measuring ranges for absolute and gauge pressure measurements are 0 to 1.6, 10, 50, 200 and 320 bar (0 to 23, 145, 725, 2900 and 4641 psi).

The sensor is integrated into the transmitter housing.

On the wireless communication side, the transmitter supports the WirelessHART standard. A HART modem can be connected to the transmitter particularly for initial commissioning, alternatively the device can be commissioned comfortably by means of the local pushbuttons w/o any additional handset devices.

It can be used in all industries and applications in non-explosive areas.

### Design

The SITRANS P280 has a robust aluminum enclosure and is suitable for outside use. It conforms with the IP65 safety class.

The operating temperature range is -40 to +80 °C (-40 to +176 °F). Power supply is provided through an integrated battery, which is available as an accessory. The device is only approved for operation with this battery.

The aerial features a rotatable joint which can be used for directional alignment. Wireless signals can thus be optimally received and transmitted.

A special highlight is the option for direct operation on the device. The operating strategy used in this case seamlessly integrates into the strategy of all new Siemens field devices.

Using the device's control buttons, it is easy to turn the HART modem interface of the device on and off. The device can be put to passive status and reactivated at any time. This helps to extend the service life of the battery.

The SITRANS P280 transmitter features a ceramic measuring cell for gauge and absolute pressure measurements.

### Function

The SITRANS P280 can join to a WirelessHART network. It can be parameterized and operated through this network. Measured process values are transported via the network to a WirelessHART gateway.

Field device data received by the WirelessHART-Gateway is transmitted to the connected systems, for example the process control system SIMATIC PCS 7. An introduction to the mode of operation of WirelessHART can be found in Catalog FI 01, section 8 or at <http://www.siemens.com/wirelesshart>.



# Pressure Measurement

## Transmitters with WirelessHART

### SITRANS P280 for gauge and absolute pressure

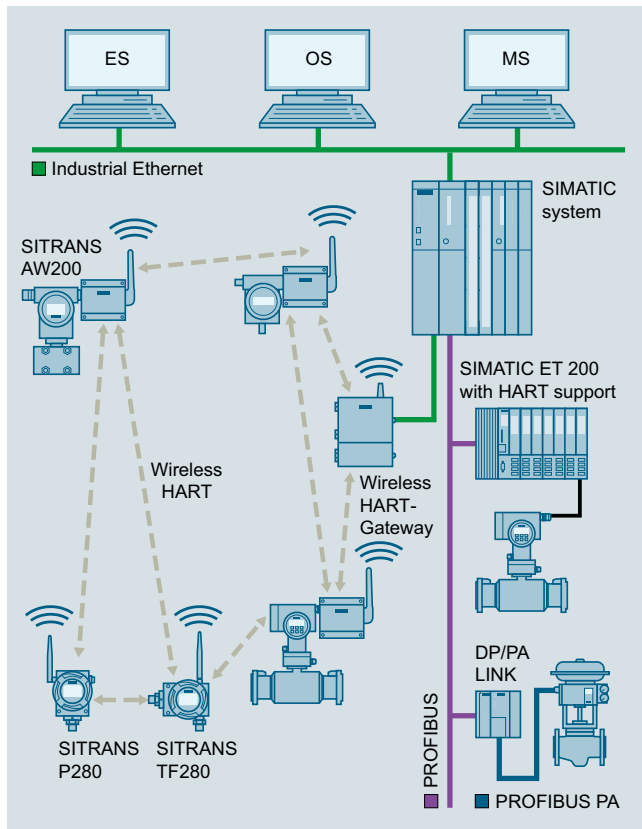
#### Integration

##### Connecting to SIMATIC PCS 7

The integration of field devices in SIMATIC PCS 7 and other process control systems can now be done seamlessly and cost-effectively with wireless technology, especially in situations where high wiring costs may be expected. Of particular interest are measuring points which are to be added and for which no MSR wiring is available.

Siemens WirelessHART devices are designed for optimum compatibility with products in the SCALANCE W range.

Where larger distances between the WirelessHART-Gateway and control systems need to be overcome, this connection can also be implemented on a wireless and cost-effective basis using the products of the SCALANCE W family.



Integration of a meshed network in SIMATIC PCS 7

#### Configuration

Configuration of the SITRANS P280 may be carried out as follows:

- Initial commissioning for the SITRANS P280 with SIMATIC PDM is generally carried out via a HART modem or the integrated local user interface, since the network ID and join key must be set up on the device before it can be accepted and integrated into the WirelessHART network.
- Once it is integrated into the network, the device can be conveniently operated with the WirelessHART network, the onsite HART modem or via the local user interface.
- Siemens WirelessHART devices operate with optimum coexistence to SCALANCE W family products.

#### Technical specifications

##### SITRANS P280 WirelessHART pressure transmitter

###### Mode of operation

|                     |                             |
|---------------------|-----------------------------|
| Measuring principle | piezo-resistive             |
| Measured variable   | Gauge and absolute pressure |

###### Gauge pressure input

|                                |                                  |
|--------------------------------|----------------------------------|
| Measuring range                | Overload limit/Bursting pressure |
| 0 ... 1.6 bar (0 ... 23 psi)   | 4 bar (58 psi)                   |
| 0 ... 10 bar (0 ... 145 psi)   | 20 bar (290 psi)                 |
| 0 ... 50 bar (0 ... 725 psi)   | 100 bar (1450 psi)               |
| 0 ... 200 bar (0 ... 2900 psi) | 400 bar (5801 psi)               |
| 0 ... 320 bar (0 ... 4641 psi) | 640 bar (9282 psi)               |

###### Units

mbar, bar, m4H<sub>2</sub>O, i4H<sub>2</sub>O, atm, Torr, gcm<sup>2</sup>, kgcm<sup>2</sup>, Pa, kPa, MPa, psi, mmHG, mmH<sub>2</sub>O, ftH<sub>2</sub>O, inHG, inH<sub>2</sub>O

###### Absolute pressure input

|                                    |                                  |
|------------------------------------|----------------------------------|
| Measuring range                    | Overload limit/Bursting pressure |
| 0 ... 1.6 bar a (0 ... 23 psi a)   | 4 bar a (58 psi a)               |
| 0 ... 10 bar a (0 ... 145 psi a)   | 20 bar a (290 psi a)             |
| 0 ... 50 bar a (0 ... 725 psi a)   | 100 bar a (1450 psi a)           |
| 0 ... 200 bar a (0 ... 2900 psi a) | 400 bar a (5801 psi a)           |
| 0 ... 320 bar a (0 ... 4641 psi a) | 640 bar a (9282 psi a)           |

###### Units

mbar, bar, m4H<sub>2</sub>O, i4H<sub>2</sub>O, atm, Torr, gcm<sup>2</sup>, kgcm<sup>2</sup>, Pa, kPa, MPa, psi, mmHG, mmH<sub>2</sub>O, ftH<sub>2</sub>O, inHG, inH<sub>2</sub>O

###### Output

|               |   |
|---------------|---|
| Output signal | 2.4 GHz Wireless signal with TSMP (Time Synchronized Mesh Protocol) |
|---------------|---|

###### Measuring accuracy

|  |  |
|--|--|
| Error in measurement at limit setting incl. hysteresis and reproducibility | typ. 0.17 % of sensor's span<br>max. 0.25 % of sensor's span |
| Long-term stability  | max. ± 0.25 % of sensor/year span                            |
| Influence of ambient temperature   | typ. 0.07 %/10K, max. 0.2 %/10 K of sensor's span            |

###### Rated conditions

|                             |  |
|-----------------------------|--|
| Ambient conditions          |  |
| • Ambient temperature       | -40 ... +80 °C (-40 ... +176 °F)<br>(in ambient temperatures below -20 °C (-4 °F) and above +70 °C (158 °F), readability of the display is limited.) |
| • Storage temperature       | -40 ... +85 °C (-40 ... +185 °F)   |
| • Relative humidity         | < 95 %   |
| Climatic class              | 4K4H in accordance with EN 60721-3-4 (stationary use at locations not protected against weather)   |
| Degree of protection        | IP65/NEMA 4  |
| Allowable media temperature | -40 ... +85 °C (-40 ... +185 °F)   |

# Pressure Measurement

## Transmitters with WirelessHART

### SITRANS P280 for gauge and absolute pressure

1

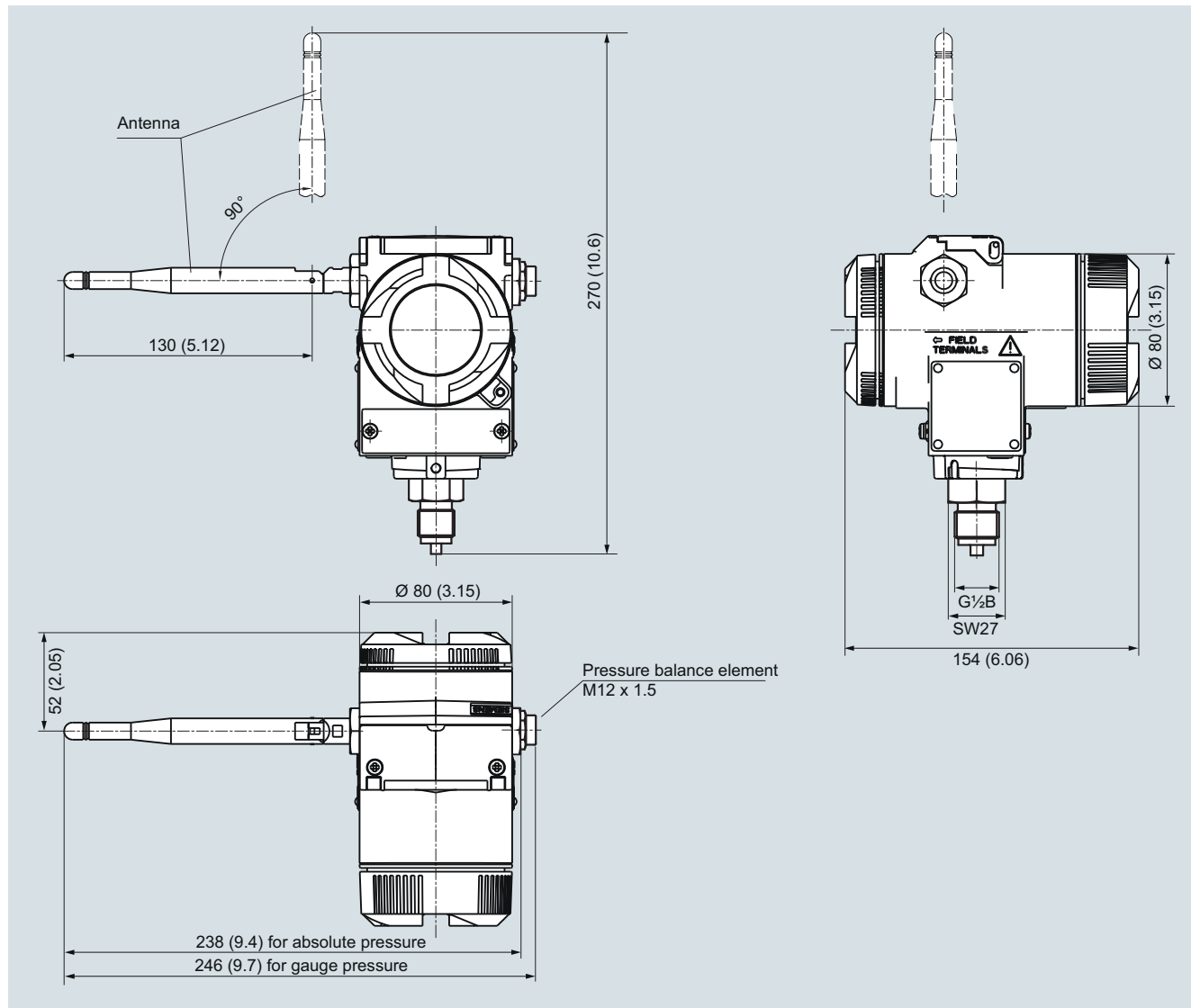
| Design  |   | Selection and Ordering data   | Article No.   |
|---|---|---|---|
| Enclosure material  | low-copper die-cast aluminum, AC-AlSi12(Fe)   | <b>SITRANS P280 WirelessHART pressure transmitter</b><br>(Required battery not included with delivery, see accessories)<br><a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  | <b>7MP1120-</b>   |
| Shock resistance  | in accordance with DIN EN 60068-2-29 / 03.95  |   | <b>0</b>  |
| Resistance to vibration   | in accordance with DIN EN 60068-2-6/ 12.07  |   |   |
| Weight  |   | <b>Measuring cell filling</b><br>Dry measuring cell   | <b>0</b>  |
| • without battery   | 1.5 kg (3.31 lb)  |   |   |
| • With battery  | 1.6 kg (3.53 lb)  | <b>Measuring span</b><br>Gauge pressure<br>0 ... 1.6 bar (0 ... 23 psi)<br>0 ... 10 bar (0 ... 145 psi)<br>0 ... 50 bar (0 ... 725 psi)<br>0 ... 200 bar (0 ... 2900 psi)<br>0 ... 320 bar (0 ... 4641 psi)<br><br>Absolute pressure<br>0 ... 1.6 bar a (0 ... 3 psi a)<br>0 ... 10 bar a (0 ... 145 psi a)<br>0 ... 50 bar a (0 ... 725 psi a)<br>0 ... 200 bar a (0 ... 2900 psi a)<br>0 ... 320 bar a (0 ... 4641 psi a) | <b>D<br/>E<br/>F<br/>G<br/>H<br/><br/>M<br/>N<br/>P<br/>Q<br/>R</b> |
| Dimensions (W x H x D)  | See Dimensional drawing   |   |   |
| Process connection  | <ul style="list-style-type: none"> <li>G½B male thread as per EN 837-1</li> <li>½-14 NPT</li> </ul>                               | <b>Wetted parts</b><br>Ceramic  | <b>K</b>  |
| Sensor break  | Is recognized   | <b>Display</b><br>Display, visible  | <b>1</b>  |
| <b>Displays and controls</b>  |   | <b>Enclosure</b><br>Die-cast aluminum   | <b>1</b>  |
| Display (with illumination)   | 104 x 80 pixels   | <b>Process connection</b><br>G½ as per EN 837-1<br>½-14 NPT   | <b>0<br/>1</b>  |
| • Size of display   | adjustable  | <b>Explosion protection</b><br>Without  | <b>A</b>  |
| • Number of digits  | adjustable  | <b>Antenna</b><br>Variable, attached to device  | <b>A</b>  |
| • Number of spaces after comma  |   |   |   |
| Setting options   | <ul style="list-style-type: none"> <li>on site with 3 buttons</li> <li>with SIMATIC PDM or HART-Communicator</li> </ul>           | <b>Further designs</b><br>Please add <b>"-Z"</b> to Article No. and specify Order code(s) and plain text.   | Order code  |
| <b>Power supply</b>   |   | <b>Stainless steel tag plate (measuring point description)</b><br>max. 16 digits entered in plain text<br>Y15: .....  | <b>Y15</b>  |
| Battery   | 3.6 V DC  | Measuring point message<br>max. 27 characters entered in plain text: Y16: .....   | <b>Y16</b>  |
| <b>Communication</b>  |   | <b>Accessories</b>  | Article No.   |
| Radio   | WirelessHART V7.1 conforming  | Lithium battery for SITRANS TF280/P280  | <b>7MP1990-0AA00</b>  |
| Transmission frequency band   | 2.4 GHz (ISM-Band)  | Mounting bracket, steel   | <b>7MF4997-1AC</b>  |
| Transmission range under reference conditions                             | Up to 250 m (line of sight) in outside areas<br>Up to 50 m (greatly dependent on obstacles) in inside areas                       | Mounting bracket, stainless steel   | <b>7MF4997-1AJ</b>  |
| Communication interfaces  | <ul style="list-style-type: none"> <li>HART communication with HART modem</li> <li>WirelessHART</li> </ul>                        | Cover, die-cast aluminum, without window  | <b>7MF4997-1BB</b>  |
| <b>Certificates and approvals</b>   |   | Cover, die-cast aluminum, with window   | <b>7MF4997-1BE</b>  |
| Wireless communication approvals  | R&TTE, FCC  | HART modem with USB interface   | <b>7MF4997-1DB</b>  |
| General Product Safety  | CSA US/C, CE, UL  | SIMATIC PDM   | <b>see Sec. 8</b>   |
| Classification according to pressure equipment directive (PED 2014/68/EU) | Gases: Fluid group 1<br>Liquids: Fluid group 1;<br>meets requirements as per Section 3, Subsection 3 (sound engineering practice) |   |   |

# Pressure Measurement

## Transmitters with WirelessHART

### SITRANS P280 for gauge and absolute pressure

#### Dimensional drawings



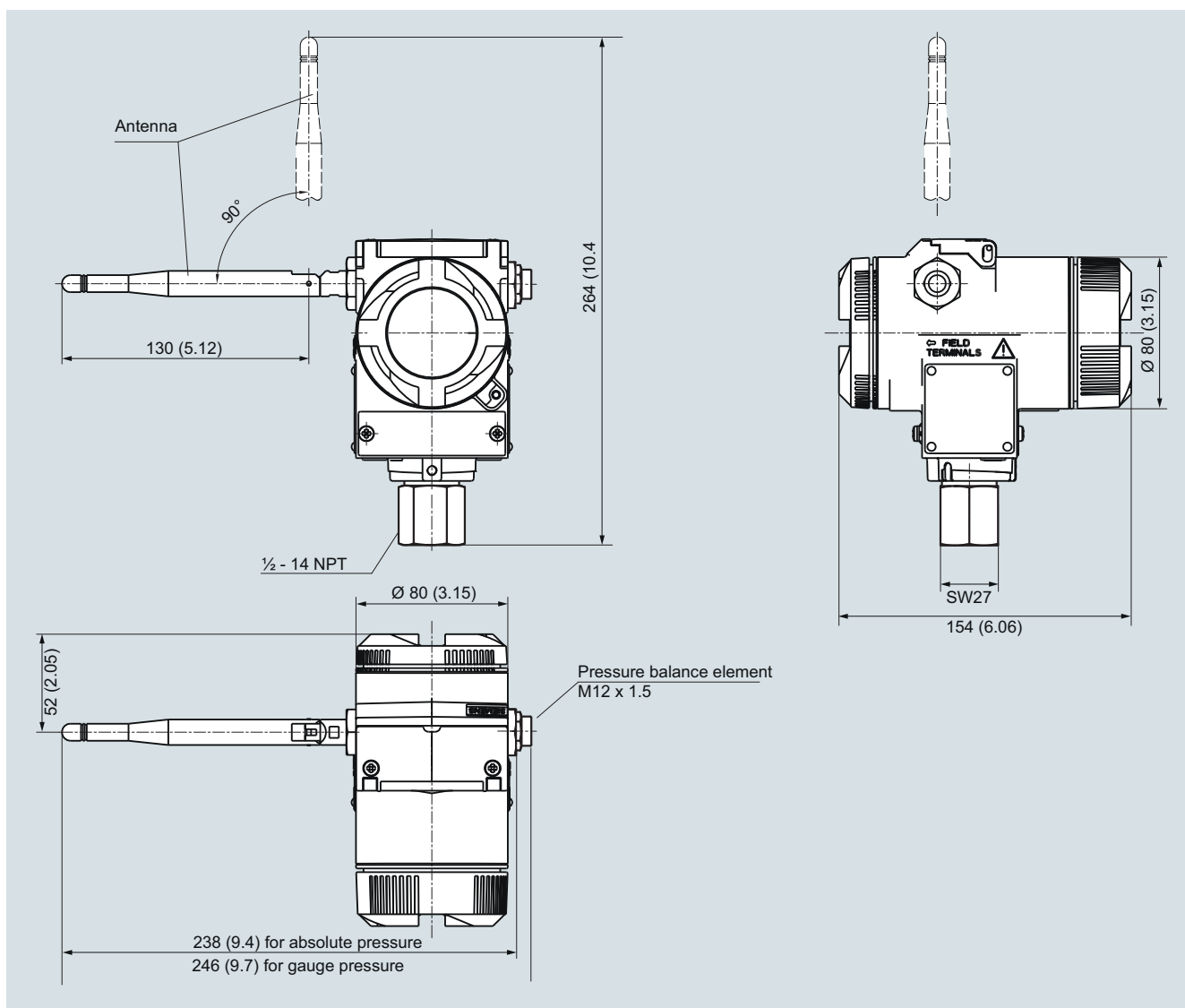
SITRANS P280 WirelessHART pressure transmitter, process connection G 1/2", dimensions in mm (inch)  
The dimensional drawing of the mounting bracket see on page 1/279.

## Pressure Measurement

### Transmitters with WirelessHART

#### SITRANS P280 for gauge and absolute pressure

1



SITRANS P280 WirelessHART pressure transmitter, process connection 1/2 - 14 NPT, dimensions in mm (inch)  
The dimensional drawing of the mounting bracket see on page 1/279.

## Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

#### Overview



The SITRANS P300 is a digital pressure transmitter for relative and absolute pressure. The conventional thread versions are available as process connections, as are flush-mounted versions. A large number of the flush-mounted versions are suitable for food and pharmaceutical applications, and satisfy the EHEDG and 3A hygiene requirements.

The output signal is a load-independent direct current from 4 to 20 mA or a PROFIBUS PA or FOUNDATION signal, which is linearly proportional to the input pressure. Communication is via HART protocol or PROFIBUS PA interface. Convenient buttons for easy local operation of the basic settings of the pressure transmitter.

The SITRANS P300 has a single-chamber stainless steel casing. The pressure transmitter is approved with "intrinsically safe" type of protection. It can be used in zone 1 or zone 0.

#### Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- Extensive diagnosis and simulation functions
- Minimum conformity error
- Small long-term drift
- Wetted parts made of high-grade materials (such as stainless steel, Hastelloy)
- Measuring range 0.008 bar to 400 bar (0.1 psi to 5802 psi)
- High measuring accuracy
- Parameterization over control keys and HART or PROFIBUS PA or FOUNDATION Fieldbus

#### Application

The pressure transmitter is available in versions for gauge pressure and for absolute pressure. The output signal is always a load-independent direct current from 4 to 20 mA or a PROFIBUS PA or FOUNDATION Fieldbus signal, which is linearly proportional to the input pressure. The pressure transmitter measures aggressive, non-aggressive and hazardous gases, as well as vapors and liquids.

It can be used for the following measurement types:

- Gauge pressure
- Absolute pressure

With appropriate parameter settings, it can also be used for the following additional measurement types:

- Level
- Volume
- Mass

The "intrinsically-safe" Ex version of the transmitter can be installed in hazardous areas (zone 1). The transmitters are provided with an EC type examination certificate and comply with the respective harmonized European standards of ATEX.

#### Gauge pressure

This variant measures aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest span is 0.01 bar (0.15 psi), the largest is 400 bar (5802 psi).

#### Level

With appropriate parameter settings, the gauge pressure variant measures the level of aggressive, non-aggressive and hazardous liquids.

For measuring the level in an open container you require one device; for measuring the level in a closed container, you require two devices and a process control system.

#### Absolute pressure

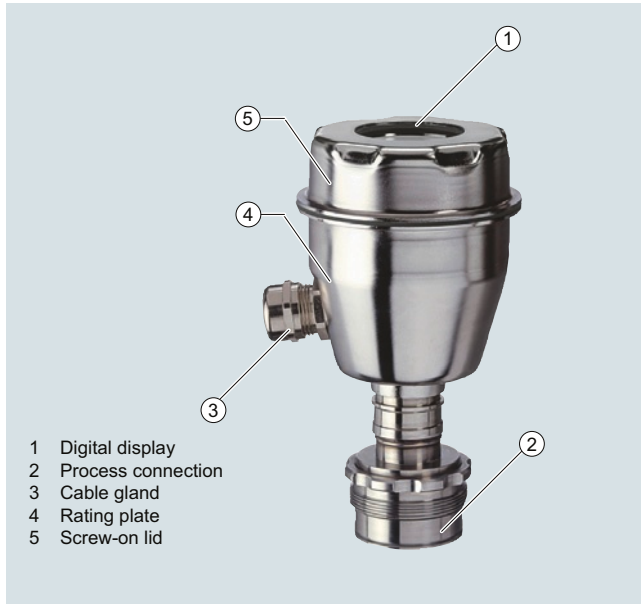
This variant measures the absolute pressure of aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest span is 0.008 bar a (0.12 psi a), the largest is 30 bar a (435 psi a).

## Design

The device comprises:

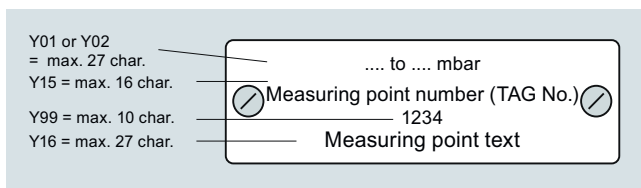
- Electronics
- Housing
- Measuring cell



Perspective view of SITRANS P300

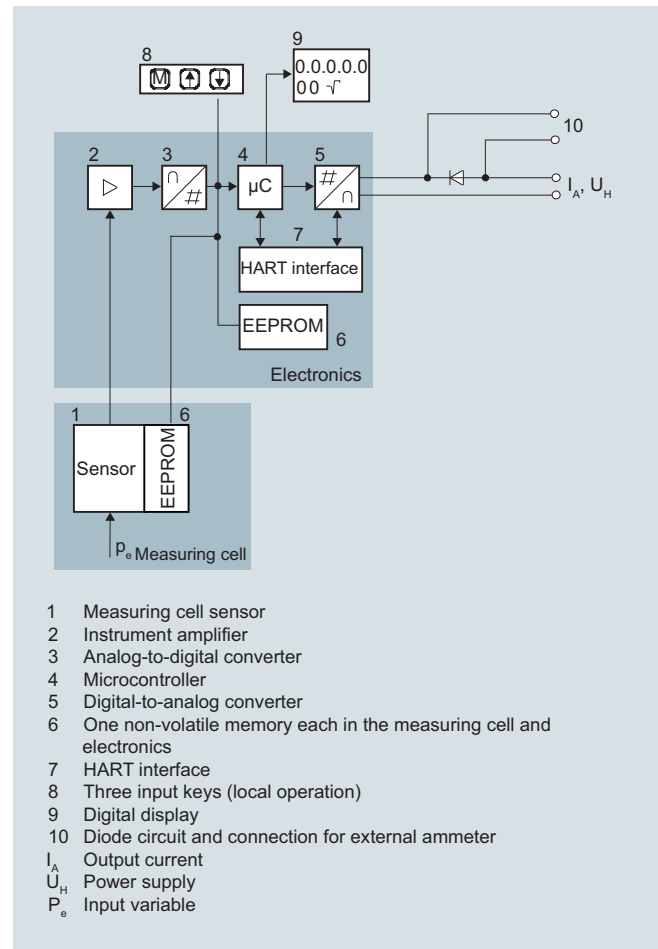
The housing has a screw-on lid (5) and, depending on the version, is with or without an inspection window. The electrical terminal housing, the buttons for operation of the device are located under this lid and, depending on the version, the display. The connections for the auxiliary power  $U_H$  and the shield are in the terminal housing. The cable gland is mounted on the side of the housing. The measuring cell with the process connection (2) is located on the bottom of the housing. The measuring cell with the process connection may differ from the one shown in the diagram, depending on the device version.

## Example of attached measuring points sign



## Function

### Operation of electronics with HART communication



Function diagram of electronics

The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the measuring amplifier (2) and digitalized in an analog-to-digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected according to linearity and thermal characteristics. In a digital-to-analog converter (5) it is then converted into the output current of 4 to 20 mA. A diode circuit provides reverse polarity protection. You can make an uninterrupted current measurement with a low-ohm ammeter at the connection (10). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first memory is linked to the measuring cell, the second to the electronics.

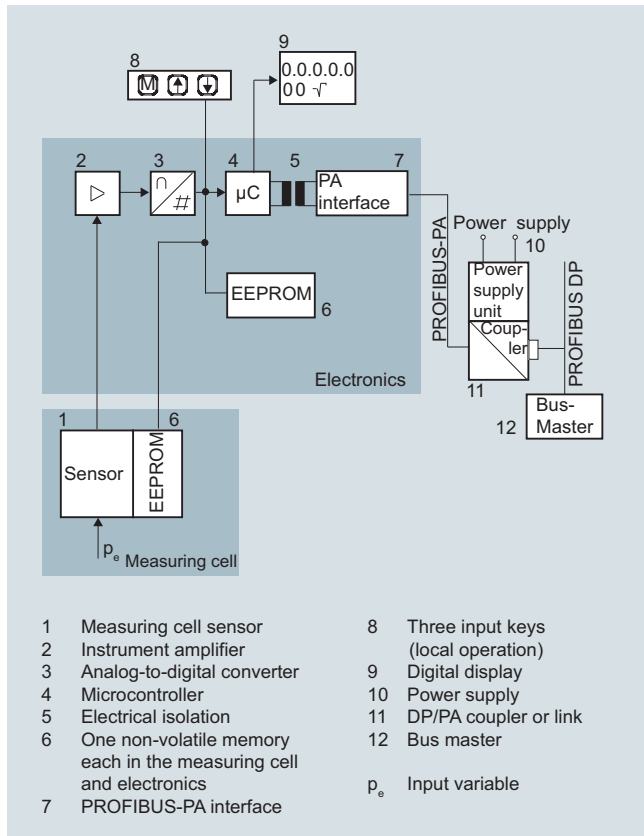
The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a display (9), you can use this to track mode settings and other messages. The basic mode settings can be changed with a computer via the HART modem (7).

## Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

#### Operation of electronics with PROFIBUS PA communication

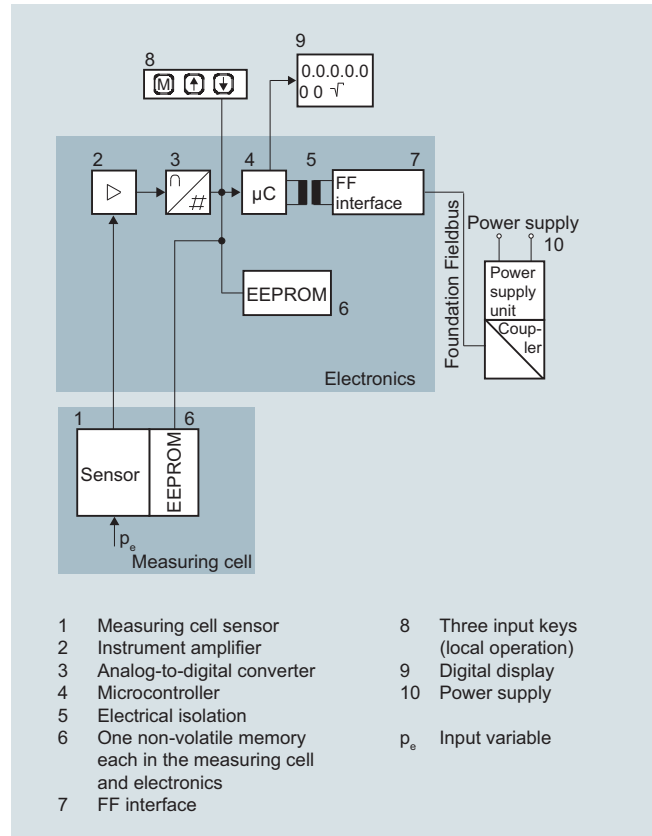


Function diagram of electronics

The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the measuring amplifier (2) and digitalized in an analog-to-digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected according to linearity and thermal characteristics. It is then made available at the PROFIBUS PA over an electrically isolated PROFIBUS PA interface (7). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first memory is linked to the measuring cell, the second to the electronics.

The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a display (9), you can use this to track mode settings and other messages. The basic mode settings (12) can be changed with a computer over the bus master.

#### Operation of electronics with FOUNDATION Fieldbus communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") amplified by the measuring amplifier (2) and digitalized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

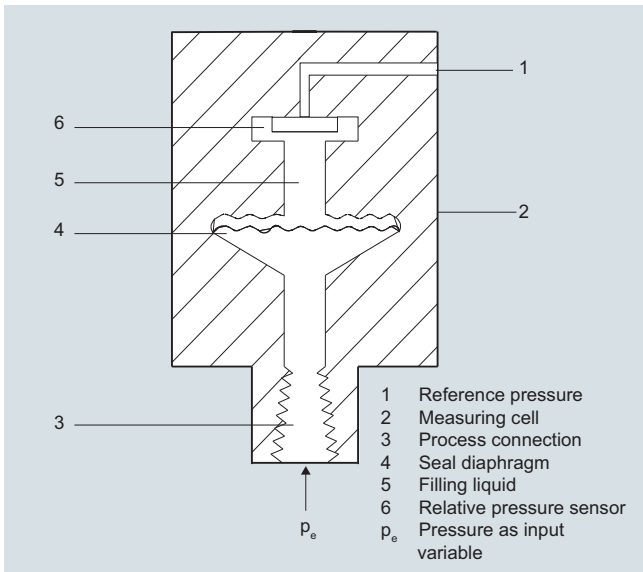
The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

#### Mode of operation of the measuring cells

The process connections available include the following:

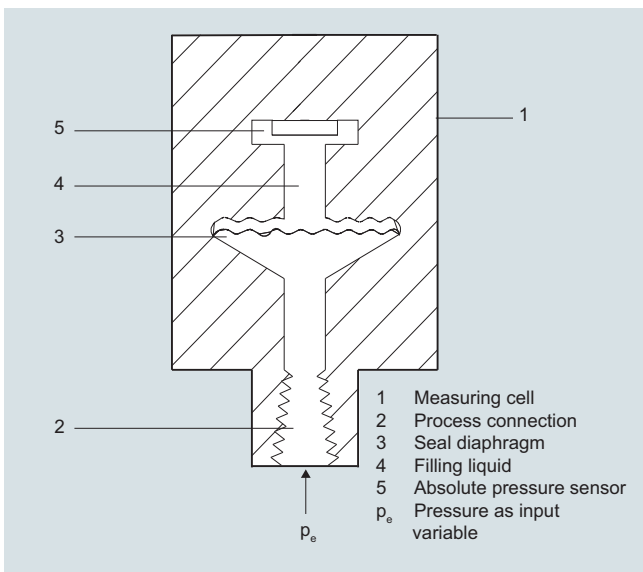
- G $\frac{1}{2}$
- $\frac{1}{2}$ -14 NPT
- Flush-mounted diaphragm:
  - Flanges to EN
  - Flanges to ASME
  - NuG and pharmaceutical connections



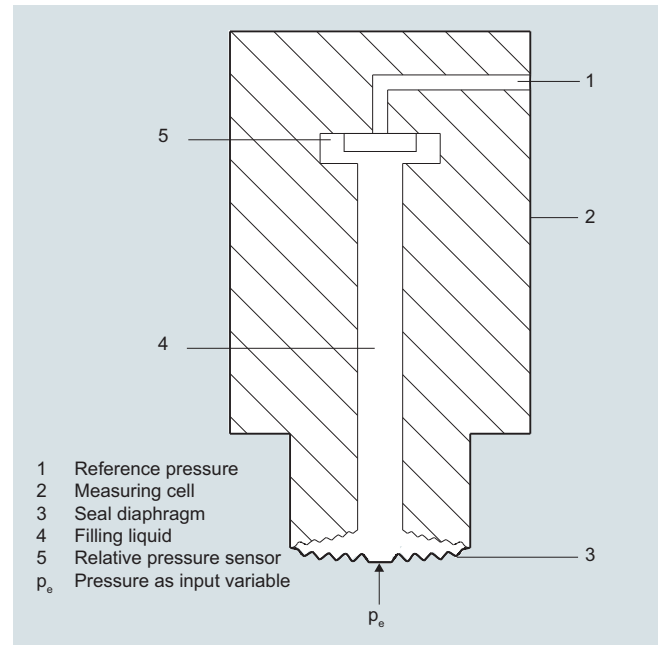
Measuring cell for gauge pressureMeasuring cell for gauge pressure, function diagram

The input pressure ( $p_e$ ) is transferred to the gauge pressure sensor (6) via the seal diaphragm (4) and the filling liquid (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Transmitters with spans  $\leq 63$  bar ( $\leq 926.1$  psi) measure the input pressure compared to atmospheric, transmitters with spans of  $\geq 160$  bar ( $\geq 2352$  psi) compared to a vacuum.

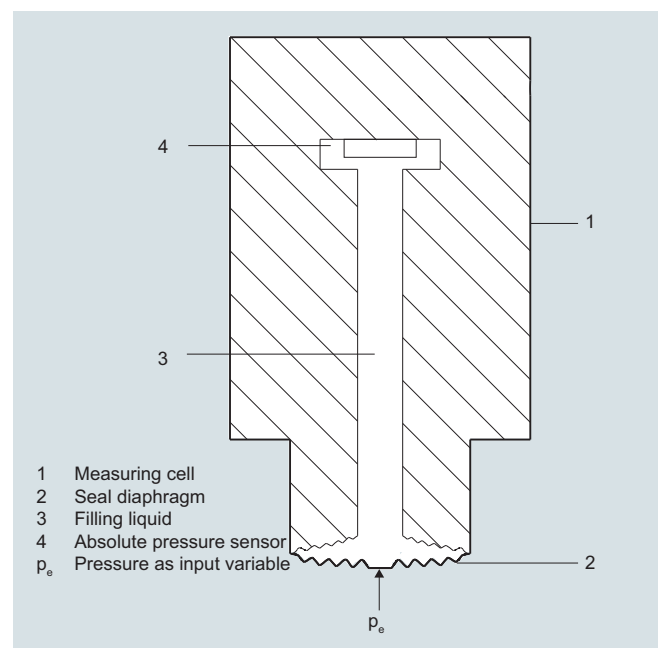
Measuring cell for absolute pressureMeasuring cell for absolute pressure, function diagram

The input pressure ( $p_e$ ) is transferred to the absolute pressure sensor (5) via the seal diaphragm (3) and the filling liquid (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Measuring cell for gauge pressure, front-flush diaphragmMeasuring cell for gauge pressure, front-flush diaphragm, function diagram

The input pressure ( $p_e$ ) is transferred to the gauge pressure sensor (6) via the seal diaphragm (4) and the filling liquid (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Transmitters with spans  $\leq 63$  bar ( $\leq 926.1$  psi) measure the input pressure compared to atmospheric, transmitters with spans of  $\geq 160$  bar ( $\geq 2352$  psi) compared to a vacuum.

Measuring cell for absolute pressure, front-flush diaphragmMeasuring cell for absolute pressure, front-flush diaphragm, function diagram



# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

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## SITRANS P300 for gauge and absolute pressure

The input pressure ( $p_e$ ) is transferred to the absolute pressure sensor (5) via the seal diaphragm (3) and the filling liquid (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

### Parameterization

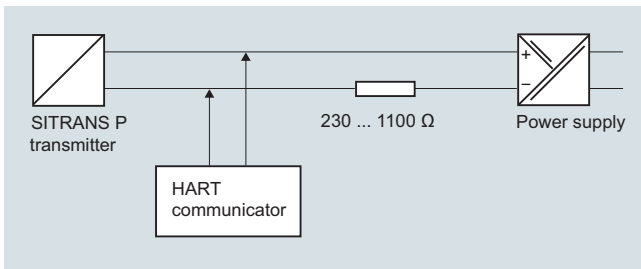
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

#### Parameterization using the input buttons (local operation)

With the input buttons you can easily set the most important parameters without any additional equipment.

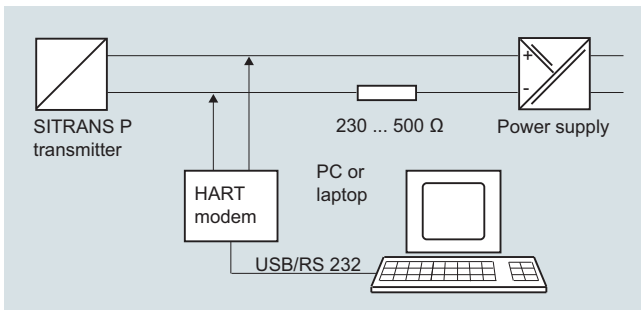
#### Parameterization using HART communication

Parameterization using HART communication is performed with a HART communicator or a PC.



Communication between a HART communicator and a pressure transmitter

When parameterizing with the HART communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

### Adjustable parameters on SITRANS P300 with HART communication

| Parameters   | Input keys | HART communication |
|--|------------|--------------------|
| Start of scale   | x          | x                  |
| Full-scale value   | x          | x                  |
| Electrical damping   | x          | x                  |
| Start-of-scale value without application of a pressure ("Blind setting") | x          | x                  |
| Full-scale value without application of a pressure ("Blind setting")     | x          | x                  |
| Zero adjustment  | x          | x                  |
| current transmitter  | x          | x                  |
| Fault current  | x          | x                  |
| Disabling of buttons, write protection                                   | x          | x <sup>1)</sup>    |
| Type of dimension and actual dimension                                   | x          | x                  |
| Input of characteristic  |            | x                  |
| Freely-programmable LCD  |            | x                  |
| Diagnostic functions   |            | x                  |

<sup>1)</sup> Cancel apart from write protection

### Diagnostic functions for SITRANS P300 with HART communication

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

### Available physical units of display for SITRANS P300 with HART communication

Table style: Technical specifications 2

| Physical variable                                  | Physical dimensions   |
|--|---|
| Pressure (setting can also be made in the factory) | Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O, ftH <sub>2</sub> O (20 °C), inHg, mmHg |
| Level (height data)                                | m, cm, mm, ft, in   |
| Volume   | m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid  |
| Mass   | g, kg, t, lb, Ston, Lton, oz  |
| Temperature  | K, °C, °F, °R   |
| Miscellaneous                                      | %, mA   |

Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. The PROFIBUS connects the SITRANS P300 PA to a process control system, e.g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the P300 is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

Adjustable parameters for SITRANS P300 with PROFIBUS PA and FOUNDATION Fieldbus

| Adjustable parameters                    | Input keys | PROFIBUS PA and FOUNDATION Fieldbus interface |
|--|------------|---|
| Electrical damping                       | x          | x   |
| Zero adjustment (correction of position) | x          | x   |
| Buttons and/or function disabling        | x          | x   |
| Source of measured-value display         | x          | x   |
| Physical dimension of display            | x          | x   |
| Position of decimal point                | x          | x   |
| Bus address                              | x          | x   |
| Adjustment of characteristic             | x          | x   |
| Input of characteristic                  |            | x   |
| Freely-programmable LCD                  |            | x   |
| Diagnostic functions                     |            | x   |

Diagnostic functions for SITRANS P300 with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

Physical dimensions available for the display

| Physical variable                                  | Physical dimensions  |
|--|--|
| Pressure (setting can also be made in the factory) | MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O, mmHg (4 °C), inH <sub>2</sub> O, inHg (4 °C), ftH <sub>2</sub> O (20 °C), mmHg, inHg   |
| Level (height data)                                | m, cm, mm, ft, in, yd  |
| Mass   | g, kg, t, lb, Ston, Lton, oz   |
| Volume   | m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid   |
| volume flow  | m <sup>3</sup> /s, m <sup>3</sup> /min, m <sup>3</sup> /h, m <sup>3</sup> /d, l/s, l/min, l/h, l/d, Ml/d, ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d |
| Mass flow  | g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d   |
| Total mass flow                                    | t, kg, g, lb, oz, LTon, STon   |
| Temperature  | K, °C, °F, °R  |
| Miscellaneous                                      | %  |

Hygiene version

In the case of the SITRANS P300 with 7MF812-... front-flush diaphragm, selected connections comply with the requirements of the EHEDG or 3A. You will find further details in the order form. Please note in particular that the seal materials used must comply with the requirements of 3A. Similarly, the filling liquids used must be FDA-compliant.

# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

### Technical specifications

#### SITRANS P300 for gauge and absolute pressure

##### Gauge pressure input

Measured variable

Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

(for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/process temperature)

| HART  | PROFIBUS PA/<br>FOUNDATION<br>Fieldbus |                                   |                                |
|---|--|-----------------------------------|--------------------------------|
| Span  | Nominal measuring range                | Max. operating pressure MAWP (PS) | Max. perm. test pressure       |
| 8.3 ... 250 mbar<br>0.83 ... 25 kPa<br>0.12 ... 3.6 psi | 250 mbar<br>25 kPa<br>3.6 psi          | 4 bar<br>400 kPa<br>58 psi        | 6 bar<br>600 kPa<br>87 psi     |
| 0.01 ... 1 bar<br>1 ... 100 kPa<br>0.15 ... 14.5 psi    | 1 bar<br>100 kPa<br>14.5 psi           | 4 bar<br>400 kPa<br>58 psi        | 6 bar<br>600 kPa<br>87 psi     |
| 0.04 ... 4 bar<br>4 ... 400 kPa<br>0.58 ... 58 psi      | 4 bar<br>400 kPa<br>58 psi             | 7 bar<br>0.7 MPa<br>102 psi       | 10 bar<br>1 MPa<br>145 psi     |
| 0.16 ... 16 bar<br>16 ... 1600 kPa<br>2.3 ... 232 psi   | 16 bar<br>1600 kPa<br>232 psi          | 21 bar<br>2.1 MPa<br>305 psi      | 32 bar<br>3.2 MPa<br>464 psi   |
| 0.63 ... 63 bar<br>63 ... 6300 kPa<br>9.1 ... 914 psi   | 63 bar<br>6300 kPa<br>914 psi          | 67 bar<br>6.7 MPa<br>972 psi      | 100 bar<br>10 MPa<br>1450 psi  |
| 1.6 ... 160 bar<br>0.16 ... 16 MPa<br>23 ... 2321 psi   | 160 bar<br>16 MPa<br>2321 psi          | 167 bar<br>16.7 MPa<br>2422 psi   | 250 bar<br>2.5 MPa<br>3626 psi |
| 4 ... 400 bar<br>0.4 ... 40 kPa<br>58 ... 5802 psi      | 400 bar<br>40 kPa<br>5802 psi          | 400 bar<br>40 MPa<br>5802 psi     | 600 bar<br>60 MPa<br>8700 psi  |

Lower measuring limit

(for 250mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.)

- Measuring cell with silicone oil
- Measuring cell with inert filling liquid

Upper measuring limit

30 mbar a/3 kPa a/0.44 psi a

30 mbar a/3 kPa a/0.44 psi a

100 % of max. span

(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 ° (140 °F) ambient temperature/process temperature)

##### Absolute pressure input

Measured variable

Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

Absolute pressure

| HART  | PROFIBUS PA/<br>FOUNDATION<br>Fieldbus             |                                      |                                     |
|---|--|--------------------------------------|-------------------------------------|
| Span  | Nominal measuring range                            | Max. operating pressure MAWP (PS)    | Max. perm. test pressure            |
| 8.34 ... 250 mbar a<br>0.83 ... 25 kPa a<br>3.35 ... 100 inH <sub>2</sub> O a<br>0.13 ... 3.63 psi a        | 250 mbar a<br>25 kPa a<br>100 inH <sub>2</sub> O a | 1.5 bar a<br>150 kPa a<br>21.8 psi a | 6 bar a<br>600 kPa a<br>87 psi a    |
| 43.34 ... 1300 mbar a<br>4.33 ... 130 kPa a<br>17.42 ... 522.4 inH <sub>2</sub> O a<br>0.63 ... 18.86 psi a | 1300 mbar a<br>130 kPa a<br>525 inH <sub>2</sub> O | 2.6 bar a<br>260 kPa a<br>37.7 psi a | 10 bar a<br>1 MPa a<br>145 psi a    |
| 0.17 ... 5 bar a<br>17 ... 500 kPa a<br>2.43 ... 72.5 psi a   | 5000 mbar a<br>500 kPa a<br>72.5 psi a             | 10 bar a<br>1 MPa a<br>145 psi a     | 30 bar a<br>3 MPa a<br>435 psi a    |
| 1 ... 30 bar a<br>0.1 ... 3 MPa a<br>14.6 ... 435 psi a   | 30 bar a<br>3 MPa a<br>435 psi a                   | 45 bar a<br>4.5 MPa a<br>653 psi a   | 100 bar a<br>10 MPa a<br>1450 psi a |

# Pressure Measurement

## Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

1

#### SITRANS P300 for gauge and absolute pressure

Lower measuring limit

- Measuring cell with silicone oil

0 mbar a/0 kPa a /0 psi a

- Measuring cell with inert filling liquid

- for process temperature  $-20\text{ °C} < \vartheta \leq +60\text{ °C}$   
( $-4\text{ °F} < \vartheta \leq +140\text{ °F}$ )

30 mbar a/3 kPa a/0.44 psi a

- for process temperature  
 $60\text{ °C} < \vartheta \leq +100\text{ °C}$  (max.  $85\text{ °C}$  for measuring cell 30 bar)  
( $140\text{ °F} < \vartheta \leq +212\text{ °F}$  (max.  $185\text{ °F}$  for meas. cell 435 psi))

30 mbar a + 20 mbar a · ( $\vartheta - 60\text{ °C}$ )/ $^{\circ}\text{C}$   
 3 kPa a + 2 kPa a · ( $\vartheta - 60\text{ °C}$ )/ $^{\circ}\text{C}$   
 0.44 psi a + 0.29 psi a · ( $\vartheta - 140\text{ °F}$ )/ $^{\circ}\text{F}$

Upper measuring limit

100 % of max. span  
 (for oxygen measurement max. 100 bar/10 MPa/1450 psi und  $60\text{ °C}$  ( $140\text{ °F}$ )  
 ambient temperature/process temperature)

Start of scale value

Between the measuring limits (fully adjustable)

#### Input of gauge pressure, with front-flush diaphragm

Measured variable

Gauge pressure, front-flush

Span (continuously adjustable) or measuring range, max. operating pressure and max. test pressure

| HART              | PROFIBUS PA/<br>FOUNDATION<br>Fieldbus |                                   |                          |
|-------------------|--|-----------------------------------|--------------------------|
| Span              | Nominal measuring range                | Max. operating pressure MAWP (PS) | Max. perm. test pressure |
| 0.01 ... 1 bar    | 1 bar                                  | 4 bar                             | 6 bar                    |
| 1 ... 100 kPa     | 100 kPa                                | 400 kPa                           | 600 kPa                  |
| 0.15 ... 14.5 psi | 14.5 psi                               | 58 psi                            | 87 psi)                  |
| 0.04 ... 4 bar    | 4 bar                                  | 7 bar                             | 10 bar                   |
| 4 ... 400 kPa     | 400 kPa                                | 0.7 MPa                           | 1 MPa                    |
| 0.58 ... 58 psi   | 58 psi                                 | 102 psi                           | 145 psi                  |
| 0.16 ... 16 bar   | 16 bar                                 | 21 bar                            | 32 bar                   |
| 16 ... 1600 kPa   | 1600 kPa                               | 2.1 MPa                           | 3.2 MPa                  |
| 2.3 ... 232 psi   | 232 psi                                | 305 psi                           | 464 psi                  |
| 0.63 ... 63 bar   | 63 bar                                 | 67 bar                            | 100 bar                  |
| 63 ... 6300 kPa   | 6300 kPa                               | 6.7 MPa                           | 10 MPa                   |
| 9.1 ... 914 psi   | 914 psi                                | 972 psi                           | 1450 psi                 |

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- Measuring cell with Neobee

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

Upper measuring limit

100% of max. span

#### Input of absolute pressure, with front-flush diaphragm

Measured variable

Absolute pressure, front-flush

Span (continuously adjustable) or measuring range, max. operating pressure and max. test pressure

| HART                            | PROFIBUS PA/<br>FOUNDATION<br>Fieldbus |                                   |                          |
|---------------------------------|--|-----------------------------------|--------------------------|
| Span                            | Nominal measuring range                | Max. operating pressure MAWP (PS) | Max. perm. test pressure |
| 43 ... 1300 mbar a              | 1300 mbar a                            | 2.6 bar a                         | 10 bar a                 |
| 4.3 ... 130 kPa a               | 130 kPa a                              | 260 kPa a                         | 1 MPa a                  |
| 17 ... 525 inH <sub>2</sub> O a | 525 inH <sub>2</sub> O a               | 37.7 psi a                        | 145 psi a                |
| 160 ... 5000 mbar a             | 5000 mbar a                            | 10 bar a                          | 30 bar a                 |
| 16 ... 500 kPa a                | 500 kPa a                              | 1 MPa a                           | 3 MPa a                  |
| 2.32 ... 72.5 psi a             | 72.5 psi a                             | 145 psi a                         | 435 psi a                |
| 1 ... 30 bar a                  | 30 bar a                               | 45 bar a                          | 100 bar a                |
| 0.1 ... 3 MPa a                 | 3 MPa a                                | 4.5 MPa a                         | 10 MPa a                 |
| 14.5 ... 435 psi a              | 435 psi a                              | 653 psi a                         | 1450 psi a               |

Depending on the process connection, the span may differ from these values

Lower measuring limit

0 mbar a/0 kPa a/0 psi a

Upper measuring limit

100 % of max. span

#### Output

Output signal

| HART        | PROFIBUS PA/ FOUNDATION Fieldbus                  |
|-------------|---|
| 4 ... 20 mA | Digital PROFIBUS PA or FOUNDATION Fieldbus signal |
| -           | IEC 61158-2                                       |

Physical bus

Protection against polarity reversal

Protected against short-circuit and polarity reversal.  
 Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

### SITRANS P300 for gauge and absolute pressure

#### Measuring accuracy for gauge pressure

Reference conditions

According to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Measuring cell with silicone oil
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span} / \text{set measuring span or nominal pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

$r \leq 1.25 :$   $\leq 0.075 \%$   
 $1.25 < r \leq 30 :$   $\leq (0.008 \cdot r + 0.065) \%$

- 1 bar/100 kPa/3.6 psi  
 4 bar/400 kPa/58 psi  
 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi

$r \leq 5 :$   $\leq 0.075 \%$   
 $5 < r \leq 100 :$   $\leq (0.005 \cdot r + 0.05) \%$

- 400 bar/40 MPa/5802 psi

$r \leq 3 :$   $\leq 0.075 \%$   
 $3 < r \leq 10 :$   $\leq (0.0029 \cdot r + 0.071) \%$   
 $10 < r \leq 100 :$   $\leq (0.005 \cdot r + 0.05) \%$

Influence of ambient temperature  
 (in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

$\leq (0.16 \cdot r + 0.1) \%$

- 1 bar/100 kPa/3.6 psi  
 4 bar/400 kPa/58 psi  
 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi  
 400 bar/40 MPa/5802 psi

$\leq (0.07 \cdot r + 0.08) \%$

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

- 250 mbar/25 kPa/3.6 psi

$\leq (0.25 \cdot r) \%$  per year

- 1 bar/100 kPa/3.6 psi  
 4 bar/400 kPa/58 psi

$\leq (0.25 \cdot r) \%$  in 5 years

- 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi  
 400 bar/40 MPa/5802 psi

$\leq (0.125 \cdot r) \%$  in 5 years

Effect of mounting position

$\leq 0.05$  mbar/0.005 kPa/0.000725 psi per 10° inclination  
 (zero point correction is possible with position error compensation)

Effect of auxiliary power supply  
 (in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and  
 FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of the rated measuring range

**SITRANS P300 for gauge and absolute pressure****Measuring accuracy for absolute pressure**

Reference conditions

According to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Measuring cell with silicone oil
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nominal pressure range}$ 

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

-  $r \leq 10$  $\leq 0.1 \%$ -  $10 < r \leq 30$  $\leq 0.2 \%$ Influence of ambient temperature  
(in percent per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a

 $\leq (0.15 \cdot r + 0.1) \%$ 

- 1300 mbar a/130 kPa a/18.8 psi a  
5 bar a/500 kPa a/72.5 psi a  
30 bar a/3000 kPa a/435 psi a

 $\leq (0.08 \cdot r + 0.16) \%$ Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F)) $\leq (0.25 \cdot r) \%$  in 5 years

Effect of mounting position (in pressure per change in angle)

 $\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi}$  per 10° inclination  
(zero point correction is possible with position error compensation)Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and  
FOUNDATION Fieldbus $3 \cdot 10^{-5}$  of the rated measuring range**Measuring accuracy for gauge and absolute pressure,  
with front-flush diaphragm**

According to IEC 60770-1

Reference conditions

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Measuring cell with silicone oil
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nom. pressure range}$ 

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

-  $r \leq 5$  $\leq 0.075 \%$ -  $5 < r \leq 100$  $\leq (0.005 \cdot r + 0.05) \%$ -  $r \leq 10$  $\leq 0.2 \%$ -  $10 < r \leq 30$  $\leq 0.4 \%$ Influence of ambient temperature  
(as percentage per 28 °C (50 °F)) $\leq (0.08 \cdot r + 0.16) \%$  $\leq (0.16 \cdot r + 0.24) \%$ Effect of process temperature  
(in pressure per temperature change)

- Temperature difference between process temperature and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F)) $(0.25 \cdot r) \%$  in 5 years

Effect of mounting position (in pressure per change in angle)

0.4 mbar/0.04 kPa/0.006 per 10° inclination  
(zero point correction is possible with position error compensation)Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and  
FOUNDATION Fieldbus $3 \cdot 10^{-5}$  of the rated measuring range

# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

### SITRANS P300 for gauge and absolute pressure

#### Rated conditions

##### Installation conditions

Ambient temperature

- Measuring cell with silicone oil
- Measuring cell with Neobee oil (FDA-compliant, with flush-mounted diaphragm)
- Measuring cell with inert liquid
- Display readable
- Storage temperature

Observe the temperature class in areas subject to explosion hazard.

-40 ... +85 °C (-40 ... +185 °F)

-10 ... +85 °C (14 ... +185 °F)

-40 ... +85 °C (-40 ... +185 °F)

-30 ... +85 °C (-22 ... +185 °F)

-50 ... +85 °C (-58 ... +185 °F)

(for Neobee: -20 ... +85 °C (-4 ... +185 °F))

(for temperature oil: -10 ... +85 °C (14 ... +165 °F))

Climatic class

Condensation

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

Degree of protection

- according to EN 60529
- according to NEMA 250

IP65, IP68

IP65, IP68, Type 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)

Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

##### Medium conditions

Temperature of medium

- Measuring cell with silicone oil
- Measuring cell with silicone oil (FDA-compliant, with flush-mounted diaphragm)
- Measuring cell with Neobee oil "Measuring cell with Neobee oil (FDA-compliant, with flush-mounted diaphragm)
- Measuring cell with silicone oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)
- Measuring cell with Neobee oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)
- Measuring cell with inert liquid
- Measuring cell with high-temperature oil (only for gauge pressure version with flush-mounted diaphragm)

-40 ... +100 °C (-40 ... +212 °F)

-40 ... +150 °C (-40 ... +302 °F)

-10 ... +150 °C (-14 ... +302 °F)

-40 ... +200 °C (-40 ... +392 °F)

-10 ... +200 °C (14 ... +392 °F)

-20 ... +100 °C (-4 ... +212 °F)

-10 ... +250 °C (14 ... 482 °F)

#### Design (standard version)

Weight (without options)

Approx. 800 g (1.8 lb)

Enclosure material

Stainless steel, mat. no. 1.4301/304

Material of parts in contact with the medium

- Connection shank
- Oval flange
- Seal diaphragm
- Measuring cell filling

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

Stainless steel, mat. no. 1.4404/316L

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

- Silicone oil
- Inert filling liquid

Process connection

- G½B to EN 837-1
- Female thread ½-14 NPT
- Oval flange PN 160 (MAWP 2320 psi) with fastening thread:
  - 7/16 -20 UNF to IEC 61518/DIN EN 61518
  - M10 as per DIN 19213

**SITRANS P300 for gauge and absolute pressure****Design (version with front-flush diaphragm)**

|  |   |
|--|---|
| Weight (without options)                     | approx. 1 ... 13 kg (2.2 ... 29 lb)   |
| Enclosure material                           | Stainless steel, mat. no. 1.4301/304  |
| Material of parts in contact with the medium |   |
| • Process connection                         | Stainless steel, mat. no. 1.4404/316L   |
| • Seal diaphragm                             | Stainless steel, mat. no. 1.4404/316L   |
| • Measuring cell filling                     | <ul style="list-style-type: none"> <li>• Silicone oil</li> <li>• Inert filling liquid</li> <li>• FDA compliant fill fluid (Neobee oil)</li> </ul>   |
| Process connection                           | <ul style="list-style-type: none"> <li>• Flanges as per EN and ASME</li> <li>• F&amp;B and pharmaceutical flanges</li> </ul>  |
| Surface quality touched-by-media             | $R_a$ -values $\leq 0.8 \mu\text{m}$ (32 $\mu$ -inch)/welds $R_{a1} \leq 1.6 \mu\text{m}$ (64 $\mu$ -inch)<br>(Process connections acc. to 3A; $R_a$ -values $\leq 0.8 \mu\text{m}$ (32 $\mu$ -inch)/welds $R_a \leq 0.8 \mu\text{m}$ (32 $\mu$ -inch)) |

**Power supply  $U_H$** 

|   | <b>HART</b>   | <b>PROFIBUS PA/FOUNDATION Fieldbus</b> |
|---|---|--|
| Terminal voltage on transmitter                 | 10.5 ... 42 V DC<br>for intrinsically safe operation:<br>10.5 ... 30 V DC |  |
| Power supply                                    | -   | Supplied through bus                   |
| Separate power supply                           | -   | Not necessary                          |
| Bus voltage                                     |   |  |
| • Without Ex                                    | -   | 9 ... 32 V                             |
| • With intrinsically-safe operation             | -   | 9 ... 24 V                             |
| Current consumption                             |   |  |
| • Max. basic current                            | -   | 12.5 mA                                |
| • Start-up current $\leq$ basic current         | -   | Yes                                    |
| • Max. fault current in the event of a fault    | -   | 15.5 mA                                |
| Fault disconnection electronics (FDE) available | -   | Yes                                    |



# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

| SITRANS P300 for gauge and absolute pressure  |  |  |
|---|--|--|
| Certificates and approvals  | HART   | PROFIBUS PA/ FOUNDATION Fieldbus   |
| Classification according to PED 2014/68/EU  | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 4, paragraph 3 (sound engineering practice)   |  |
| Water, waste water  | Pending  |  |
| <u>Explosion protection</u>   |  |  |
| Intrinsic safety "i"  | PTB 05 ATEX 2048   |  |
| <ul style="list-style-type: none"> <li>Marking</li> <li>Permissible ambient temperature               <ul style="list-style-type: none"> <li>Temperature class T4</li> <li>Temperature class T5</li> <li>Temperature class T6</li> </ul> </li> <li>Connection</li> </ul>  | II1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb   |  |
|   | -40 ... +85 °C (-40 ... +185 °F)   |  |
|   | -40 ... +70 °C (-40 ... +158 °F)   |  |
|   | -40 ... +60 °C (-40 ... +140 °F)   |  |
| <ul style="list-style-type: none"> <li>Effective inner capacitance:</li> <li>Effective internal inductance:</li> </ul>  | To certified intrinsically-safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ ,<br>$P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$   | To certified intrinsically-safe circuits with peak values:<br><u>FISCO supply unit:</u><br>$U_i = 17.5 \text{ V}$ , $I_i = 380 \text{ mA}$ , $P_i = 5.32 \text{ W}$<br><u>Linear barrier:</u><br>$U_i = 24 \text{ V}$ , $I_i = 250 \text{ mA}$ , $P_i = 1.2 \text{ W}$<br>$C_i = 1.1 \text{ nF}$<br>$L_i \leq 7 \mu\text{H}$ |
| Explosion protection to FM for USA <u>and</u> Canada (cFM <sub>US</sub> )   | $C_i = 6 \text{ nF}$<br>$L_i = 0.4 \text{ mH}$   |  |
| <ul style="list-style-type: none"> <li>Identification (DIP) or (IS); (NI)</li> </ul>  | Certificate of Compliance 3025099<br>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III<br>Certificate of Compliance 3025099C<br>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC 4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III |  |
| Dust explosion protection for zone 20/21/22   | PTB 05 ATEX 2048   |  |
| <ul style="list-style-type: none"> <li>Marking</li> <li>Permissible ambient temperature               <ul style="list-style-type: none"> <li>Temperature class T4</li> <li>Temperature class T5</li> <li>Temperature class T6</li> </ul> </li> <li>Connection</li> </ul>  | II 1 D Ex ia IIC T120 °C Da<br>II 1/2 D Ex ia IIC T120 °C Da/Db<br>II 2 D Ex ib IIC T120 °C Db   |  |
|   | -40 ... +85 °C (-40 ... +185 °F)<br>(in the case of mineral glass windows only -20 ... +85 °C (-4 ... +185 °F))  |  |
|   | -40 ... +70 °C (-40 ... +158 °F)<br>(in the case of mineral glass windows only -20 ... +70 °C (-4 ... +158 °F))  |  |
|   | -40 ... +60 °C (-40 ... +140 °F)<br>(in the case of mineral glass windows only -20 ... +60 °C (-4 ... +140 °F))  |  |
| <ul style="list-style-type: none"> <li>Effective inner capacitance:</li> <li>Effective internal inductance:</li> </ul>  | To certified intrinsically-safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$<br>$C_i = 6 \text{ nF}$<br>$L_i = 0.4 \mu\text{H}$  | To certified intrinsically-safe circuits with peak values:<br>$U_i = 24 \text{ V}$ , $I_i = 380 \text{ mA}$ , $P_i = 5.32 \text{ mW}$<br>$C_i = 5 \text{ nF}$<br>$L_i = 10 \mu\text{H}$  |
| Type of protection Ex nA/nL/ic (Zone 2)   | PTB 05 ATEX 2048   |  |
| <ul style="list-style-type: none"> <li>Marking</li> <li>Permissible ambient temperature               <ul style="list-style-type: none"> <li>Temperature class T4</li> <li>Temperature class T5</li> <li>Temperature class T6</li> </ul> </li> <li>Ex nA/nL connection</li> <li>Ex ic connection</li> <li>Effective inner capacitance:</li> <li>Effective internal inductance:</li> </ul> | II 2/3 G Ex ic IIC/IIB T4/T5/T6 Gb/Gc<br>II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc   |  |
|   | -40 ... +85 °C (-40 ... +185 °F)<br>(in the case of mineral glass windows only -20 ... +85 °C (-4 ... +185 °F))  |  |
|   | -40 ... +70 °C (-40 ... +158 °F)<br>(in the case of mineral glass windows only -20 ... +70 °C (-4 ... +158 °F))  |  |
|   | -40 ... +60 °C (-40 ... +140 °F)<br>(in the case of mineral glass windows only -20 ... +60 °C (-4 ... +140 °F))  |  |
|   | To certified intrinsically-safe circuits with peak values: $U_m = 45 \text{ V}$  | To certified intrinsically-safe circuits with peak values: $U_m = 32 \text{ V}$  |
|   | To certified intrinsically-safe circuits with peak values: $U_i = 45 \text{ V}$  | To certified intrinsically-safe circuits with peak values: $U_i = 32 \text{ V}$  |
|   | $C_i = 6 \text{ nF}$<br>$L_i = 0.4 \text{ mH}$   | $C_i = 5 \text{ nF}$<br>$L_i = 20 \mu\text{H}$   |

# Pressure Measurement

## Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

1

|  |  |  |   |
|--|--|--|---|
| <b>HART Communication</b>  |  | <b>FOUNDATION Fieldbus communication</b>   |   |
| HART communication   | 230 ... 1100 Ω   | Function blocks  | 3 function blocks analog input, 1 function block PID  |
| Protocol   | HART Version 5.x   |  |   |
| Software for computer  | SIMATIC PDM  |  |   |
| <b>PROFIBUS PA communication</b>   |  | • Analog input   | Yes, linearly rising or falling characteristic  |
| Simultaneous communication with master class 2 (max.)                    | 4  | - Adaptation to customer-specific process variables  | 0 ... 100 s   |
| The address can be set using   | Configuration tool or local operation (standard setting Address 126)                                   | - Electrical damping, adjustable   | Output/input (can be locked within the device with a bridge) parameterizable (last good value, substitute value, incorrect value) |
| Cyclic data usage  |  | - Simulation function  |   |
| • Output byte  | 5 (one measured value) or 10 (two measured values)   | - Failure mode   | Yes, one upper and lower warning limit and one alarm limit respectively   |
| • Input byte   | 0.1 or 2 (totalizer mode and reset function for dosing)  | - Limit monitoring   | Yes   |
| • Internal preprocessing   |  | - Square-rooted characteristic for flow measurement  |   |
| Device profile   | PROFIBUS PA Profile for Process Control Devices Version 3.0, class B                                   | • PID  | Standard FOUNDATION Fieldbus function block   |
| Function blocks  | 2  | • Physical block   | 1 resource block  |
| • Analog input   |  | Transducer blocks  | 1 transducer block Pressure with calibration, 1 transducer block LCD  |
| - Adaptation to customer-specific process variables                      | Yes, linearly rising or falling characteristic   | • Pressure transducer block  |   |
| - Electrical damping adjustable  | 0 ... 100 s  | - Can be calibrated by applying two pressures  | Yes   |
| - Simulation function  | Input /Output  | - Monitoring of sensor limits  | Yes   |
| - Failure function   | parameterizable (last good value, substitute value, incorrect value)                                   | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function  |
| - Limit monitoring   | Yes, one upper and lower warning limit and one alarm limit respectively                                |  |   |
| • Register (totalizer)   | Can be reset, preset, optional direction of counting, simulation function of register output           |  |   |
| - Failure mode   | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |  |   |
| - Limit monitoring   | One upper and lower warning limit and one alarm limit respectively                                     |  |   |
| • Physical block   | 1  |  |   |
| Transducer blocks  | 2  |  |   |
| • Pressure transducer block  |  |  |   |
| - Can be calibrated by applying two pressures                            | Yes  |  |   |
| - Monitoring of sensor limits  | Yes  |  |   |
| - Specification of a container characteristic with                       | Max. 30 nodes  |  |   |
| - Simulation function for measured pressure value and sensor temperature | Constant value or over parameterizable ramp function   |  |   |

# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

| Selection and Ordering data  |                                  | Article No.      |
|--|----------------------------------|------------------|
| <b>SITRANS P300 pressure transmitters for relative and absolute pressure</b> , single-chamber measuring housing, rating plate inscription in English |                                  |                  |
| <b>4 ... 20 mA/HART</b>  |                                  | <b>7MF8023 -</b> |
| <b>PROFIBUS PA</b>   |                                  | <b>7MF8024 -</b> |
| <b>FOUNDATION Fieldbus (FF)</b>  |                                  | <b>7MF8025 -</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |                                  |                  |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b>   |                  |
| Silicone oil   | normal                           | 1                |
| Inert liquid   | Cleanliness level 2 to DIN 25410 | 3                |
| <b>Measuring span (min. ... max.)</b>  |                                  |                  |
| 8.3 ... 250 mbar   | (0.12 ... 3.63 psi)              | A                |
| 0.01 ... 1 bar   | (0.145 ... 14.5 psi)             | B                |
| 0.04 ... 4 bar   | (0.58 ... 58 psi)                | C                |
| 0.16 ... 16 bar  | (2.32 ... 232 psi)               | D                |
| 0.63 ... 63 bar  | (9.14 ... 914 psi)               | E                |
| 1.6 ... 160 bar  | (23.2 ... 2320 psi)              | F                |
| 4 ... 400 bar  | (58 ... 5802 psi)                | G                |
| 8.34 ... 250 mbar a  | (0.13 ... 3.63 psi a)            | Q                |
| 43.34 ... 1300 mbar a  | (0.63 ... 18.86 psi a)           | S                |
| 0.17 ... 5 bar a   | (2.43 ... 72.5 psi a)            | T                |
| 1 ... 30 bar a   | (14.6 ... 435 psi a)             | U                |
| <b>Wetted parts materials</b>  |                                  |                  |
| Seal diaphragm   | Measuring cell                   |                  |
| Stainless steel  | Stainless steel                  | A                |
| Hastelloy  | Stainless steel                  | B                |
| Hastelloy  | Hastelloy                        | C                |
| Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" (recommended version) 1) 2) 3) 4) 5)                    |                                  | Y                |
| <b>Process connection</b>  |                                  |                  |
| • Connection shank G1/2B to EN 837-1   |                                  | 0                |
| • Female thread 1/2-14 NPT   |                                  | 1                |
| • Stainless steel oval flange with process connection (Oval flange has no female thread) 6)  |                                  |                  |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518  |                                  | 2                |
| - Mounting thread M10 to DIN 19213   |                                  | 3                |
| - Mounting thread M12 to DIN 19213   |                                  | 4                |
| • Male thread M20 x 1.5  |                                  | 5                |
| • Male thread 1/2 -14 NPT  |                                  | 6                |
| <b>Non-wetted parts materials</b>  |                                  |                  |
| • Stainless steel, deep-drawn and electrolytically polished  |                                  | 4                |
| <b>Version</b>   |                                  |                  |
| • Standard versions  |                                  | 1                |
| <b>Explosion protection</b>  |                                  |                  |
| • None   |                                  | A                |
| • With ATEX, Type of protection:   |                                  |                  |
| - "Intrinsic safety (Ex ia)"   |                                  | B                |
| • Zone 20/21/22 <sup>7)</sup>  |                                  | C                |
| • Ex nA/nL (Zone 2) <sup>8)</sup>  |                                  | E                |
| • with FM "intrinsic safety" (cFM <sub>US</sub> )  |                                  | M                |
| <b>Electrical connection / cable entry</b>   |                                  |                  |
| • Screwed gland M20x1.5 (polyamide) <sup>9)</sup>  |                                  | A                |
| • Screwed gland M20x1.5 (metal)  |                                  | B                |
| • Screwed gland M20x1.5 (stainless steel)  |                                  | C                |
| • M12 device plug (stainless steel), without cable socket  |                                  | G                |
| • Screwed gland 1/2-14 NPT metal thread <sup>10)</sup>   |                                  | H                |
| • Screwed gland 1/2-14 NPT stainless steel thread  |                                  | J                |

| Selection and Ordering data  |  | Article No.      |
|--|--|------------------|
| <b>SITRANS P300 pressure transmitters for relative and absolute pressure</b> , single-chamber measuring housing, rating plate inscription in English       |  |                  |
| <b>4 ... 20 mA/HART</b>  |  | <b>7MF8023 -</b> |
| <b>PROFIBUS PA</b>   |  | <b>7MF8024 -</b> |
| <b>FOUNDATION Fieldbus (FF)</b>  |  | <b>7MF8025 -</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |  |                  |
| <b>Display</b>   |  |                  |
| • Without display, with keys, closed lid   |  | 1                |
| • With display and keys, closed lid <sup>11)</sup>   |  | 2                |
| • With display and keys, lid with polycarbonate disc   |  | 4                |
| • (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) <sup>11)</sup>   |  |                  |
| • With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc <sup>11)</sup>                   |  | 5                |
| • With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS and FOUNDATION Fieldbus equipment: pressure units) <sup>11)</sup> |  | 6                |
| • With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane <sup>11)</sup>                           |  | 7                |

Power supply units see Chap. 7 "Supplementary Components".

A quick-start guide is included in the scope of delivery of the device.

- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF802-...Y...-... and 7MF4900-1...-B
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Remote seal for direct mounting only available in combination with process connection 1/2-14 NPT.
- M10 fastening thread: Max. span 160 bar (2320 psi) 7/16-20 UNF and M12 fastening thread: Max. span 400 bar (5802 psi)
- Only available together with electrical connection option A
- Only available together with electrical connection options B, C or G.
- Only together with HART electronics.
- Without cable gland.
- Display cannot be turned.

# Pressure Measurement

## Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

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| Selection and Ordering data   |                                       | Article No.                |
|---|---------------------------------------|----------------------------|
| <b>SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane</b> , single-chamber measuring housing, rating plate inscription in English  |                                       |                            |
| <b>4 ... 20 mA/HART</b>   |                                       | 7 MF 8 1 2 3 -             |
| <b>PROFIBUS PA</b>  |                                       | 7 MF 8 1 2 4 -             |
| <b>FOUNDATION Fieldbus (FF)</b>   |                                       | 7 MF 8 1 2 5 -             |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |                                       |                            |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b>        |                            |
| Silicone oil  | normal                                | 1                          |
| Inert liquid  |                                       | 3                          |
| FDA compliant fill fluid  |                                       |                            |
| • Neobee oil  | normal                                | 4                          |
| <b>Measuring span (min. ... max.)</b>   |                                       |                            |
| 0.01 ... 1 bar  | (0.15 ... 14.5 psi)                   | B                          |
| 0.04 ... 4 bar  | (0.58 ... 58 psi)                     | C                          |
| 0.16 ... 16 bar   | (2.32 ... 232 psi)                    | D                          |
| 0.63 ... 63 bar   | (9.14 ... 914 psi)                    | E                          |
| 43.34 ... 1300 mbar a <sup>1)</sup>   | (0.63 ... 18.86 psi a <sup>1)</sup> ) | S                          |
| 0.17 ... 5 bar a <sup>1)</sup>  | (2.43 ... 72.5 psi a <sup>1)</sup> )  | T                          |
| 1 ... 30 bar a <sup>1)</sup>  | (14.6 ... 435 psi a <sup>1)</sup> )   | U                          |
| <b>Wetted parts materials</b>   |                                       |                            |
| Seal diaphragm  | Measuring cell                        |                            |
| Stainless steel   | Stainless steel                       | A                          |
| Hastelloy <sup>2)</sup>   | Stainless steel                       | B                          |
| <b>Process connection</b>   |                                       |                            |
| <ul style="list-style-type: none"> <li>Flange version with Order code M., N., R. or Q.. (see "Further designs")</li> </ul>  |                                       | 7                          |
| <b>Non-wetted parts materials</b>   |                                       |                            |
| <ul style="list-style-type: none"> <li>Stainless steel, deep-drawn and electrolytically polished</li> </ul>   |                                       | 4                          |
| <b>Version</b>  |                                       |                            |
| <ul style="list-style-type: none"> <li>Standard versions</li> </ul>   |                                       | 1                          |
| <b>Explosion protection</b>   |                                       |                            |
| <ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> </ul> </li> <li>Zone 20/21/22<sup>3)</sup></li> <li>Ex nA/nL (Zone 2)<sup>4)</sup></li> <li>with FM "intrinsic safety" (cFM<sub>US</sub>)</li> </ul>   |                                       | A<br>B<br>C<br>E<br>M      |
| <b>Electrical connection / cable entry</b>  |                                       |                            |
| <ul style="list-style-type: none"> <li>Screwed gland M20x1.5 (polyamide)<sup>5)</sup></li> <li>Screwed gland M20x1.5 (metal)</li> <li>Screwed gland M20x1.5 (stainless steel)</li> <li>M12 device plug (stainless steel), without cable socket</li> <li>Screwed gland ½-14 NPT metal thread <sup>6)</sup></li> <li>Screwed gland ½-14 NPT stainless steel thread <sup>6)</sup></li> </ul> |                                       | A<br>B<br>C<br>G<br>H<br>J |

| Selection and Ordering data   |  | Article No.    |
|---|--|----------------|
| <b>SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane</b> , single-chamber measuring housing, rating plate inscription in English                                      |  |                |
| <b>4 ... 20 mA/HART</b>   |  | 7 MF 8 1 2 3 - |
| <b>PROFIBUS PA</b>  |  | 7 MF 8 1 2 4 - |
| <b>FOUNDATION Fieldbus (FF)</b>   |  | 7 MF 8 1 2 5 - |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |  |                |
| <b>Display</b>  |  |                |
| <ul style="list-style-type: none"> <li>Without display, with keys, closed lid</li> </ul>  |  | 1              |
| <ul style="list-style-type: none"> <li>With display and keys, closed lid<sup>7)</sup></li> </ul>  |  | 2              |
| <ul style="list-style-type: none"> <li>With display and keys, lid with polycarbonate disc (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units)<sup>7)</sup></li> </ul> |  | 4              |
| <ul style="list-style-type: none"> <li>With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc<sup>7)</sup></li> </ul>                              |  | 5              |
| <ul style="list-style-type: none"> <li>With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units)<sup>7)</sup></li> </ul>         |  | 6              |
| <ul style="list-style-type: none"> <li>With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane<sup>7)</sup></li> </ul>                                      |  | 7              |

Power supply units see Chap. 7 "Supplementary Components"

A quick-start guide is included in the scope of delivery of the device.

- 1) Not with temperature decoupler P00, not for process connections R01, R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.
- 2) Only available for flanges with options M., N. and Q..
- 3) Only together with electrical connection option A.
- 4) Only available together with electrical connection options B, C or G.
- 5) Only together with HART electronics.
- 6) Without cable gland.
- 7) Display cannot be turned.

# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

1

| Selection and Ordering data  | Order code   |  |  |  |
|--|--|--|--|--|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.  |  | HART   | PA   | FF   |
| <b>Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) made of:</b><br>made completely of stainless steel, for wall or pipe mounting  | A02  | ✓  | ✓  | ✓  |
| <b>Cable socket for M12 device plugs</b><br>• Stainless steel  | A51  | ✓  | ✓  | ✓  |
| <b>Rating plate inscription</b><br>(instead of English)  |  |  |  |  |
| • German   | B10  | ✓  | ✓  | ✓  |
| • French   | B12  | ✓  | ✓  | ✓  |
| • Spanish  | B13  | ✓  | ✓  | ✓  |
| • Italian  | B14  | ✓  | ✓  | ✓  |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi   | B21  | ✓  | ✓  | ✓  |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>1)</sup></b>  | C11  | ✓  | ✓  | ✓  |
| <b>Inspection certificate<sup>2)</sup></b><br>Acc. to EN 10204-3.1   | C12  | ✓  | ✓  | ✓  |
| <b>Factory certificate</b><br>Acc. to EN 10204-2.2   | C14  | ✓  | ✓  | ✓  |
| <b>Degree of protection IP65/IP68</b><br>(only for M20x1.5 and ½-14 NPT)   | D12  | ✓  | ✓  | ✓  |
| <b>Degree of protection IP6k9k</b><br>(only for M20x1.5)   | D46  | ✓  | ✓  | ✓  |
| <b>CRN approval Canada</b><br>(Canadian Registration Number)   | E22  | ✓  | ✓  | ✓  |
| <b>Export approval Korea</b>   | E11  | ✓  | ✓  | ✓  |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b>  | E80  | ✓  | ✓  | ✓  |
| <b>Ex Approval Ex ia/ib NEPSI</b>  | E55  | ✓  | ✓  | ✓  |
| <b>Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)</b>   |  |  |  |  |
| <b>Flange to EN 1092-1, Form B1</b><br>• DN 25, PN 40 <sup>3)</sup><br>• DN 40, PN 40<br>• DN 40, PN 100<br>• DN 50, PN 16<br>• DN 50, PN 40<br>• DN 80, PN 16<br>• DN 80, PN 40   | M11<br>M13<br>M23<br>M04<br>M14<br>M06<br>M16                      | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓                | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓                | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓                |
| <b>Flanges to ASME B16.5</b><br>• 1", class 150 <sup>4)</sup><br>• 1½", class 150<br>• 2", class 150<br>• 3", class 150<br>• 4", class 150<br>• 1", class 300 <sup>4)</sup><br>• 1½", class 300<br>• 2", class 300<br>• 3", class 300<br>• 4", class 300 | M40<br>M41<br>M42<br>M43<br>M44<br>M45<br>M46<br>M47<br>M48<br>M49 | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓ | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓ | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓ |
| <b>Threaded connector to DIN 3852-2, form A, thread to ISO 228</b><br>• G ¾"-A, front-flush <sup>4)</sup><br>• G 1"-A, front-flush <sup>4)</sup><br>• G 2"-A, front-flush  | R01<br>R02<br>R04  | ✓<br>✓<br>✓                                    | ✓<br>✓<br>✓                                    | ✓<br>✓<br>✓                                    |
| <b>Tank connection<sup>5)</sup></b><br>Sealing is included in delivery<br>• TG 52/50, PN 40<br>• TG 52/150, PN 40  | R10<br>R11   | ✓<br>✓   | ✓<br>✓   | ✓<br>✓   |

| Selection and Ordering data   | Order code   |                                      |                                      |                                      |
|---|--|--------------------------------------|--------------------------------------|--------------------------------------|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |  | HART                                 | PA                                   | FF                                   |
| <b>Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut)</b><br>• DN 50, PN 25<br>• DN 80, PN 25  | N04<br>N06   | ✓<br>✓                               | ✓<br>✓                               | ✓<br>✓                               |
| <b>Tri-Clamp connection according DIN 32676/ISO 2852</b><br>3A compliant <sup>6)</sup><br>• DN 50/2", PN 16<br>• DN 65/2.5", PN 10  | N14<br>N15   | ✓<br>✓                               | ✓<br>✓                               | ✓<br>✓                               |
| <b>Varivent connection</b><br>3A and EHEDG compliant <sup>6)</sup><br>• Type N = 68 for Varivent housing<br>DN 40 ... 125 and 1½" ... 6", PN 40   | N28  | ✓                                    | ✓                                    | ✓                                    |
| <b>Temperature decoupler up to 200 °C<sup>7)</sup></b><br>for front-flush diaphragm version   | P00  | ✓                                    | ✓                                    | ✓                                    |
| <b>Bio-Control sanitary process connection</b><br>• DN 50, PN 16<br>• DN 65, PN 16  | Q53<br>Q54   | ✓<br>✓                               | ✓<br>✓                               | ✓<br>✓                               |
| <b>Sanitary process connection to DRD</b><br>• DN 50, PN 40   | M32  | ✓                                    | ✓                                    | ✓                                    |
| <b>SMS socket with union nut</b><br>• 2"<br>• 2½"<br>• 3"   | M67<br>M68<br>M69                                    | ✓<br>✓<br>✓                          | ✓<br>✓<br>✓                          | ✓<br>✓<br>✓                          |
| <b>SMS threaded socket</b><br>• 2"<br>• 2½"<br>• 3"   | M73<br>M74<br>M75                                    | ✓<br>✓<br>✓                          | ✓<br>✓<br>✓                          | ✓<br>✓<br>✓                          |
| <b>IDF socket with union nut ISO 2853</b><br>• 2"<br>• 2½"<br>• 3"  | M82<br>M83<br>M84                                    | ✓<br>✓<br>✓                          | ✓<br>✓<br>✓                          | ✓<br>✓<br>✓                          |
| <b>IDF threaded socket ISO 2853</b><br>• 2"<br>• 2½"<br>• 3"  | M92<br>M93<br>M94                                    | ✓<br>✓<br>✓                          | ✓<br>✓<br>✓                          | ✓<br>✓<br>✓                          |
| <b>Sanitary process connection to NEUMO Bio-Connect screw connection</b><br>3A and EHEDG compliant <sup>6)</sup><br>• DN 50, PN 16<br>• DN 65, PN 16<br>• DN 80, PN 16<br>• DN 100, PN 16<br>• DN 2", PN 16<br>• DN 2½", PN 16<br>• DN 3", PN 16<br>• DN 4", PN 16  | Q05<br>Q06<br>Q07<br>Q08<br>Q13<br>Q14<br>Q15<br>Q16 | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓ | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓ | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓ |
| <b>Sanitary process connection to NEUMO Bio-Connect flange connection</b><br>3A and EHEDG compliant <sup>6)</sup><br>• DN 50, PN 16<br>• DN 65, PN 16<br>• DN 80, PN 16<br>• DN 100, PN 16<br>• DN 2", PN 16<br>• DN 2½", PN 16<br>• DN 3", PN 16<br>• DN 4", PN 16 | Q23<br>Q24<br>Q25<br>Q26<br>Q31<br>Q32<br>Q33<br>Q34 | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓ | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓ | ✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓<br>✓ |

# Pressure Measurement

## Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

1

| Selection and Ordering data  | Order code       |             |           |           |
|--|------------------|-------------|-----------|-----------|
| <b>Further designs</b>   |                  | <b>HART</b> | <b>PA</b> | <b>FF</b> |
| Add "-Z" to Article No. and specify Order code.  |                  |             |           |           |
| <b>Sanitary process connection to NEUMO Bio-Connect clamp connection</b><br>3A and EHEDG compliant <sup>6)</sup> |                  |             |           |           |
| • DN 50, PN 16   | <b>Q39</b>       | ✓           | ✓         | ✓         |
| • DN 65, PN 10   | <b>Q40</b>       | ✓           | ✓         | ✓         |
| • DN 80, PN 10   | <b>Q41</b>       | ✓           | ✓         | ✓         |
| • DN 100, PN 10  | <b>Q42</b>       | ✓           | ✓         | ✓         |
| • DN 2½", PN 16  | <b>Q48</b>       | ✓           | ✓         | ✓         |
| • DN 3", PN 10   | <b>Q49</b>       | ✓           | ✓         | ✓         |
| • DN 4", PN 10   | <b>Q50</b>       | ✓           | ✓         | ✓         |
| <b>Sanitary process connection to NEUMO Bio-Connect S flange connection</b>                                      |                  |             |           |           |
| • DN 2", PN 16   | <b>Q72</b>       | ✓           | ✓         | ✓         |
| <b>Aseptic threaded socket to DIN 11864-1 Form A</b><br>3A compliant <sup>6)</sup>                               |                  |             |           |           |
| • DN 50, PN 25   | <b>N33</b>       | ✓           | ✓         | ✓         |
| • DN 65, PN 25   | <b>N34</b>       | ✓           | ✓         | ✓         |
| • DN 80, PN 25   | <b>N35</b>       | ✓           | ✓         | ✓         |
| • DN 100, PN 25  | <b>N36</b>       | ✓           | ✓         | ✓         |
| <b>Aseptic flange with notch to DIN 11864-2 Form A</b><br>3A compliant <sup>6)</sup>                             |                  |             |           |           |
| • DN 50, PN 16   | <b>N43</b>       | ✓           | ✓         | ✓         |
| • DN 65, PN 16   | <b>N44</b>       | ✓           | ✓         | ✓         |
| • DN 80, PN 16   | <b>N45</b>       | ✓           | ✓         | ✓         |
| • DN 100, PN 16  | <b>N46</b>       | ✓           | ✓         | ✓         |
| <b>Aseptic flange with groove to DIN 11864-2 Form A</b><br>3A compliant <sup>6)</sup>                            |                  |             |           |           |
| • DN 50, PN 16   | <b>N43 + P11</b> | ✓           | ✓         | ✓         |
| • DN 65, PN 16   | <b>N44 + P11</b> | ✓           | ✓         | ✓         |
| • DN 80, PN 16   | <b>N45 + P11</b> | ✓           | ✓         | ✓         |
| • DN 100, PN 16  | <b>N46 + P11</b> | ✓           | ✓         | ✓         |
| <b>Aseptic clamp with groove to DIN 11864-3 Form A</b><br>3A compliant <sup>6)</sup>                             |                  |             |           |           |
| • DN 50, PN 25   | <b>N53</b>       | ✓           | ✓         | ✓         |
| • DN 65, PN 25   | <b>N54</b>       | ✓           | ✓         | ✓         |
| • DN 80, PN 16   | <b>N55</b>       | ✓           | ✓         | ✓         |
| • DN 100, PN 16  | <b>N56</b>       | ✓           | ✓         | ✓         |

| Selection and Ordering data   | Order code       |             |                 |           |
|---|------------------|-------------|-----------------|-----------|
| <b>Additional data</b>  |                  | <b>HART</b> | <b>PA</b>       | <b>FF</b> |
| Please add "-Z" to Article No. and specify Order code(s) and plain text.  |                  |             |                 |           |
| <b>Measuring range to be set</b><br>Specify in plain text (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi   | <b>Y01</b>       | ✓           | ✓ <sup>8)</sup> |           |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....   | <b>Y15</b>       | ✓           | ✓               | ✓         |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 characters, specify in plain text:<br>Y16: .....  | <b>Y16</b>       | ✓           | ✓               | ✓         |
| <b>Entry of HART TAG</b><br>Max. 8 characters, specify in plain text:<br>Y17: .....   | <b>Y17</b>       | ✓           |                 |           |
| <b>Setting of the display in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note: The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>3)</sup> , inH <sub>2</sub> O <sup>3)</sup> , ftH <sub>2</sub> O <sup>3)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>) ref. temperature 20 °C | <b>Y21</b>       | ✓           | ✓               | ✓         |
| <b>Setting of the display in non-pressure units<sup>9)</sup></b><br>Specify in plain text:<br>Y22: .... up to .... l, m <sup>3</sup> , m, USg, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)  | <b>Y22 + Y01</b> | ✓           |                 |           |
| <b>Preset bus address</b><br>(possible between 1 ... 126)<br>Specify in plain text:<br>Y25: .....   | <b>Y25</b>       |             | ✓               | ✓         |

Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22 and Y25 can be factory preset

✓ = available

#### Ordering example

Item line: 7MF8023-1DB24-1AB7-Z  
 B line: A02 + Y01 + Y21  
 C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)  
 C line: Y21: bar (psi)

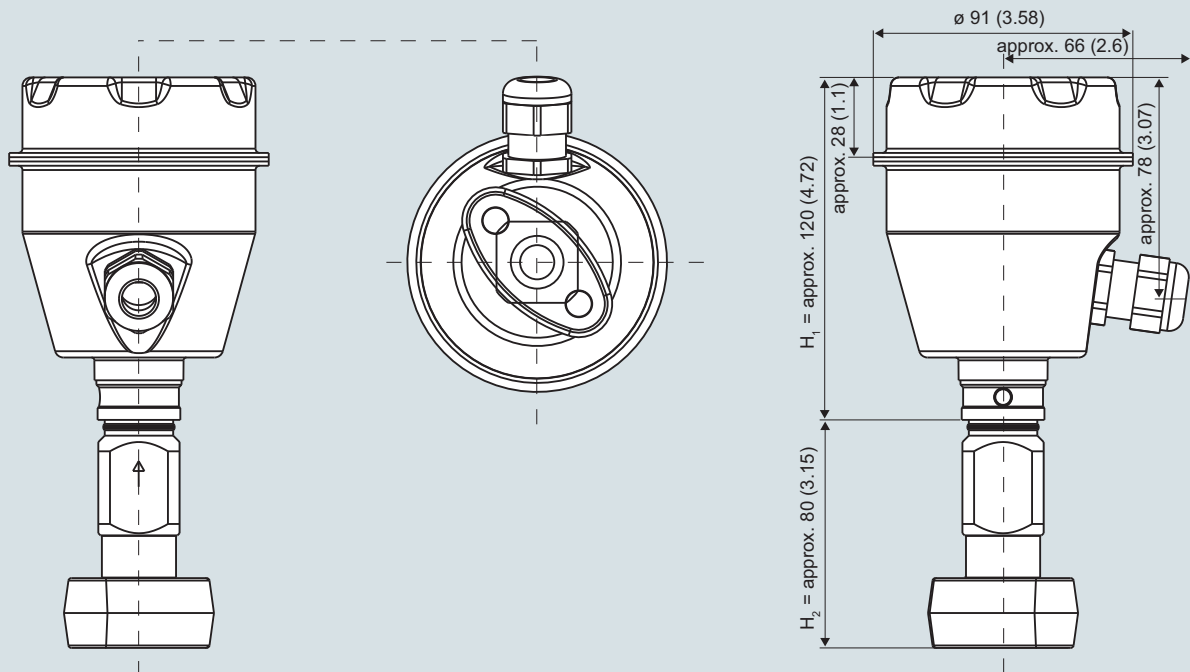
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- Special seal in Viton included in the scope of delivery (FKM; temperature range -20 ... +200 °C (-4 ... +392 °F))
- Cannot be combined with Order code P00. Can only be ordered with sili-cone oil measuring cell filling.
- The weldable socket can be ordered under accessories.
- 3A compliance ensured only when 3A compliant sealing rings are used.
- Conformity according to 3A and EHEDG. The maximum permissible temperatures of the medium depend on the respective cell fillings (see medium conditions).
- Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
- Preset values can only be changed over SIMATIC PDM.

## Pressure Measurement

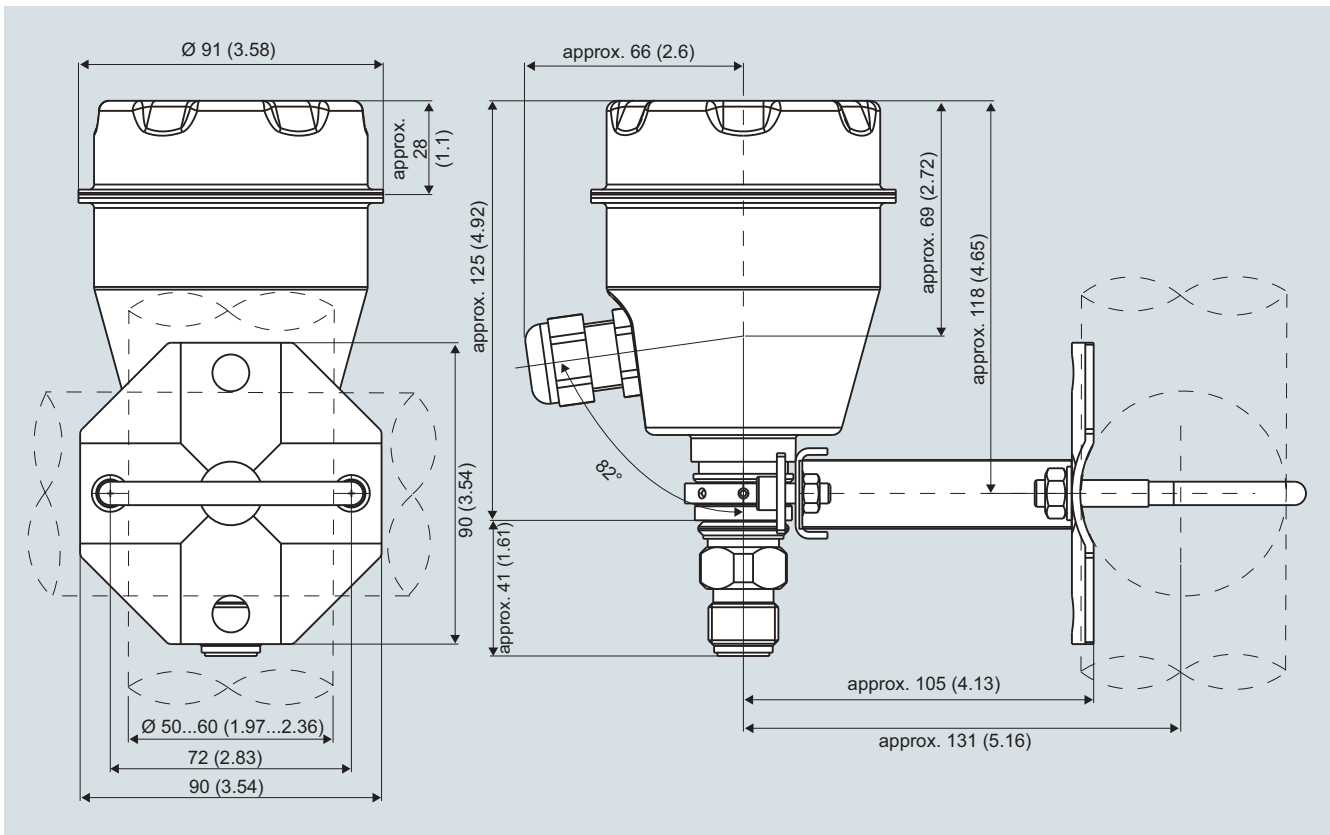
Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

#### Dimensional drawings

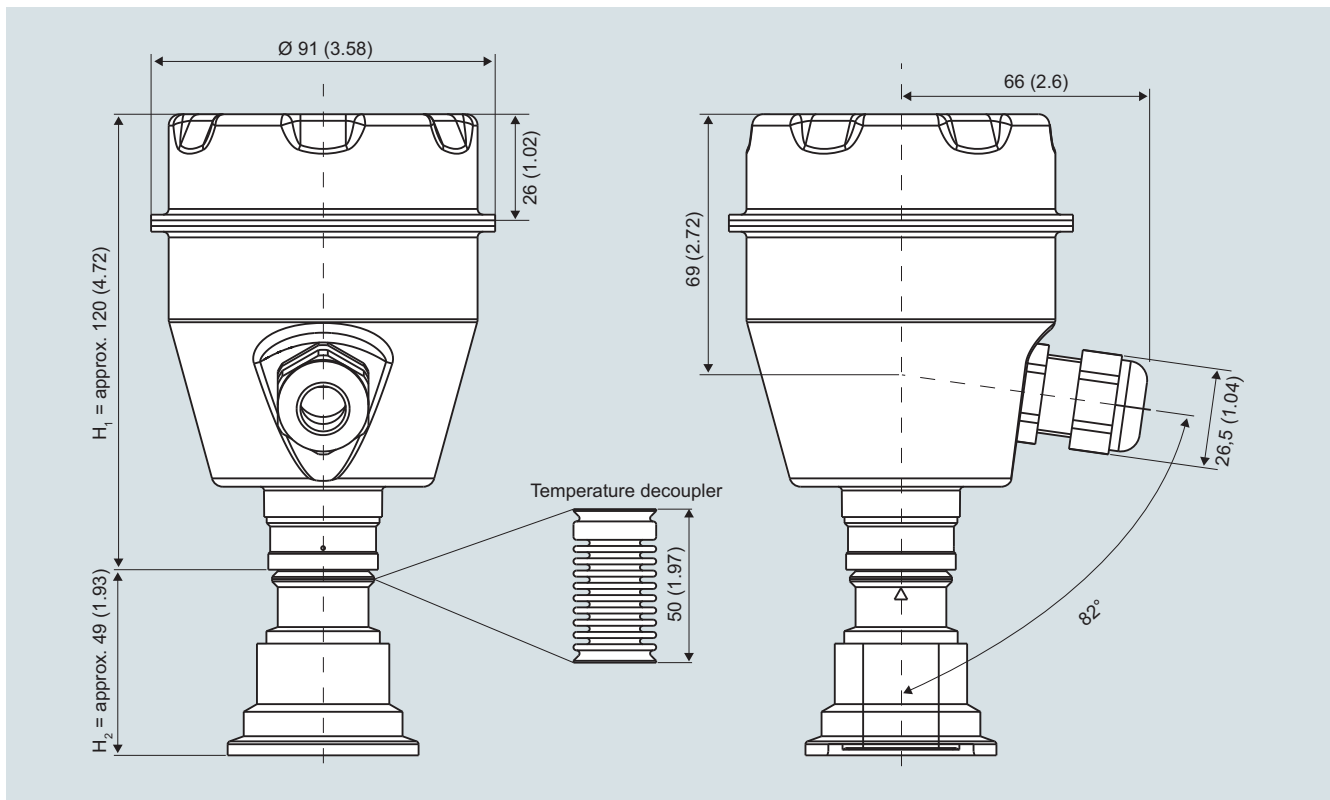


SITRANS P300, with oval flange, dimensions in mm (inch)



SITRANS P300, process connection M20 x 1.5, with mounted mounting bracket, dimensions in mm (inch)





SITRANS P300, front-flush, dimensions in mm (inch)

The diagram shows a SITRANS P300 with an example of a flange. In this drawing the height is subdivided into  $H_1$  and  $H_2$ .

$H_1$  = Height of the SITRANS P300 up to a defined cross-section

$H_2$  = Height of the flange up to this defined cross-section

Only the height  $H_2$  is indicated in the dimensions of the flanges.



# Pressure Measurement

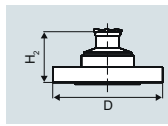
Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

### Flanges as per EN and ASME

#### Flange to EN

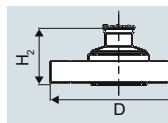
##### EN 1092-1



| Order code | DN | PN  | ØD            | H <sub>2</sub>        |
|------------|----|-----|---------------|-----------------------|
| <b>M11</b> | 25 | 40  | 115 mm (4.5") | Approx.<br>52 mm (2") |
| <b>M13</b> | 40 | 40  | 150 mm (5.9") |                       |
| <b>M23</b> | 40 | 100 | 170 mm (6.7") |                       |
| <b>M04</b> | 50 | 16  | 165 mm (6.5") |                       |
| <b>M14</b> | 50 | 40  | 165 mm (6.5") |                       |
| <b>M06</b> | 80 | 16  | 200 mm (7.9") |                       |
| <b>M16</b> | 80 | 40  | 200 mm (7.9") |                       |

#### Flanges to ASME

##### ASME B16.5

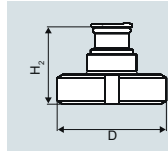


| Order code | DN  | PN  | ØD             | H <sub>2</sub>        |
|------------|-----|-----|----------------|-----------------------|
| <b>M40</b> | 1"  | 150 | 110 mm (4.3")  | Approx.<br>52 mm (2") |
| <b>M41</b> | 1½" | 150 | 130 mm (5.1")  |                       |
| <b>M42</b> | 2"  | 150 | 150 mm (5.9")  |                       |
| <b>M43</b> | 3"  | 150 | 190 mm (7.5")  |                       |
| <b>M44</b> | 4"  | 150 | 230 mm (9.1")  |                       |
| <b>M46</b> | 1½" | 300 | 155 mm (6.1")  |                       |
| <b>M47</b> | 2"  | 300 | 165 mm (6.5")  |                       |
| <b>M48</b> | 3"  | 300 | 210 mm (8.1")  |                       |
| <b>M49</b> | 4"  | 300 | 255 mm (10.0") |                       |

### NuG and pharmaceutical connections

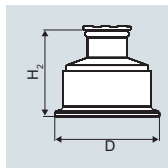
#### Connections to DIN

##### DIN 11851 (milk pipe union with slotted union nut)



| Order code | DN | PN | ØD            | H <sub>2</sub>        |
|------------|----|----|---------------|-----------------------|
| <b>N04</b> | 50 | 25 | 92 mm (3.6")  | Approx.<br>52 mm (2") |
| <b>N06</b> | 80 | 25 | 127 mm (5.0") |                       |

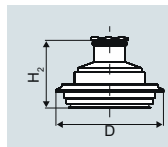
##### Tri-Clamp nach DIN 32676



| Order code | DN | PN | ØD           | H <sub>2</sub>        |
|------------|----|----|--------------|-----------------------|
| <b>N14</b> | 50 | 16 | 64 mm (2.5") | Approx.<br>52 mm (2") |
| <b>N15</b> | 65 | 10 | 91 mm (3.6") |                       |

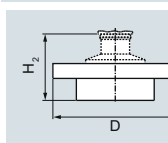
#### Other connections

##### Varivent connection



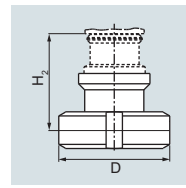
| Order code | DN         | PN | ØD           | H <sub>2</sub>        |
|------------|------------|----|--------------|-----------------------|
| <b>N28</b> | 40 ... 125 | 40 | 84 mm (3.3") | Approx.<br>52 mm (2") |

##### Sanitary process connection to DRD



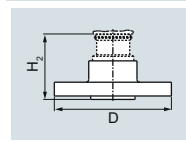
| Order code | DN | PN | ØD            | H <sub>2</sub>        |
|------------|----|----|---------------|-----------------------|
| <b>M32</b> | 50 | 40 | 105 mm (4.1") | Approx.<br>52 mm (2") |

#### Sanitary process screw connection to NEUMO Bio-Connect



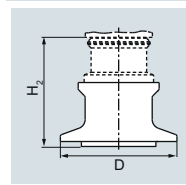
| Order code | DN  | PN | ØD            | H <sub>2</sub>        |
|------------|-----|----|---------------|-----------------------|
| <b>Q05</b> | 50  | 16 | 82 mm (3.2")  | Approx.<br>52 mm (2") |
| <b>Q06</b> | 65  | 16 | 105 mm (4.1") |                       |
| <b>Q07</b> | 80  | 16 | 115 mm (4.5") |                       |
| <b>Q08</b> | 100 | 16 | 145 mm (5.7") |                       |
| <b>Q13</b> | 2"  | 16 | 82 mm (3.2")  |                       |
| <b>Q14</b> | 2½" | 16 | 105 mm (4.1") |                       |
| <b>Q15</b> | 3"  | 16 | 105 mm (4.1") |                       |
| <b>Q16</b> | 4"  | 16 | 145 mm (5.7") |                       |

#### Sanitary process connection to NEUMO Bio-Connect flange connection



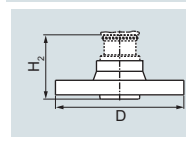
| Order code | DN  | PN | ØD            | H <sub>2</sub>        |
|------------|-----|----|---------------|-----------------------|
| <b>Q23</b> | 50  | 16 | 110 mm (4.3") | Approx.<br>52 mm (2") |
| <b>Q24</b> | 65  | 16 | 140 mm (5.5") |                       |
| <b>Q25</b> | 80  | 16 | 150 mm (5.9") |                       |
| <b>Q26</b> | 100 | 16 | 175 mm (6.9") |                       |
| <b>Q31</b> | 2"  | 16 | 100 mm (3.9") |                       |
| <b>Q32</b> | 2½" | 16 | 110 mm (4.3") |                       |
| <b>Q33</b> | 3"  | 16 | 140 mm (5.5") |                       |
| <b>Q34</b> | 4"  | 16 | 175 mm (6.9") |                       |

#### Sanitary process connection to NEUMO Bio-Connect clamp connection



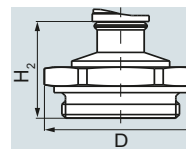
| Order code | DN  | PN | ØD             | H <sub>2</sub>        |
|------------|-----|----|----------------|-----------------------|
| <b>Q39</b> | 50  | 16 | 77.4 mm (3.0") | Approx.<br>52 mm (2") |
| <b>Q40</b> | 65  | 10 | 90.9 mm (3.6") |                       |
| <b>Q41</b> | 80  | 10 | 106 mm (4.2")  |                       |
| <b>Q42</b> | 100 | 10 | 119 mm (4.7")  |                       |
| <b>Q48</b> | 2½" | 16 | 90.9 mm (3.6") |                       |
| <b>Q49</b> | 3"  | 10 | 106 mm (4.2")  |                       |
| <b>Q50</b> | 4"  | 10 | 119 mm (4.7")  |                       |

#### Sanitary process connection to NEUMO Bio-Connect S flange connection



| Order code | DN | PN | ØD            | H <sub>2</sub>        |
|------------|----|----|---------------|-----------------------|
| <b>Q72</b> | 2" | 16 | 125 mm (4.9") | Approx.<br>52 mm (2") |

#### Threaded connection G¾", G1" and G2" acc. to DIN 3852



| Order code | DN | PN | ØD           | H <sub>2</sub>          |
|------------|----|----|--------------|-------------------------|
| <b>R01</b> | ¾" | 60 | 37 mm (1.5") | Approx.<br>45 mm (1.8") |
| <b>R02</b> | 1" | 60 | 48 mm (1.9") | Approx.<br>47 mm (1.9") |
| <b>R04</b> | 2" | 60 | 78 mm (3.1") | Approx.<br>52 mm (2")   |

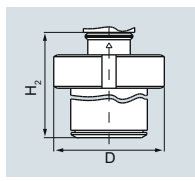
## Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

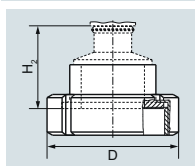
## SITRANS P300 for gauge and absolute pressure

1

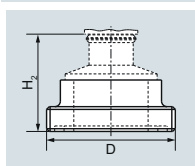
## Tank connection TG 52/50 and TG52/150

|  | Order code | DN | PN | ØD           | H <sub>2</sub>        |
|---|------------|----|----|--------------|-----------------------|
|   | <b>R10</b> | 25 | 40 | 63 mm (2.5") | Approx. 63 mm (2.5")  |
|   | <b>R11</b> | 25 | 40 | 63 mm (2.5") | Approx. 170 mm (6.7") |

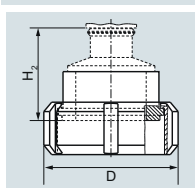
## SMS socket with union nut

|  | Order code | DN  | PN | ØD            | H <sub>2</sub>     |
|---|------------|-----|----|---------------|--------------------|
|   | <b>M67</b> | 2"  | 25 | 84 mm (3.3")  | Approx. 52 mm (2") |
|   | <b>M68</b> | 2½" | 25 | 100 mm (3.9") |                    |
|   | <b>M69</b> | 3"  | 25 | 114 mm (4.5") |                    |

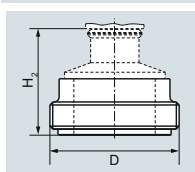
## SMS threaded socket

|  | Order code | DN  | PN | ØD          | H <sub>2</sub>     |
|---|------------|-----|----|-------------|--------------------|
|   | <b>M73</b> | 2"  | 25 | 70 x 1/6 mm | Approx. 52 mm (2") |
|   | <b>M74</b> | 2½" | 25 | 85 x 1/6 mm |                    |
|   | <b>M75</b> | 3"  | 25 | 98 x 1/6 mm |                    |

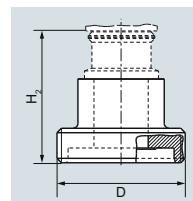
## IDF socket with union nut

|  | Order code | DN  | PN | ØD            | H <sub>2</sub>     |
|--|------------|-----|----|---------------|--------------------|
|  | <b>M82</b> | 2"  | 25 | 77 mm (3")    | Approx. 52 mm (2") |
|  | <b>M83</b> | 2½" | 25 | 91 mm (3.6")  |                    |
|  | <b>M84</b> | 3"  | 25 | 106 mm (4.2") |                    |

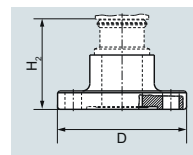
## IDF threaded socket

|  | Order code | DN  | PN | ØD             | H <sub>2</sub>     |
|---|------------|-----|----|----------------|--------------------|
|   | <b>M92</b> | 2"  | 25 | 64 mm (2.5")   | Approx. 52 mm (2") |
|   | <b>M93</b> | 2½" | 25 | 77.5 mm (3.1") |                    |
|   | <b>M94</b> | 3"  | 25 | 91 mm (3.6")   |                    |

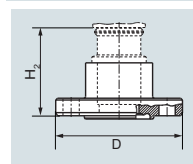
## Aseptic threaded socket to DIN 11864-1 Form A

|  | Order code | DN  | PN | ØD         | H <sub>2</sub>     |
|--|------------|-----|----|------------|--------------------|
|  | <b>N33</b> | 50  | 25 | 78 x 1/6"  | Approx. 52 mm (2") |
|  | <b>N34</b> | 65  | 25 | 95 x 1/6"  |                    |
|  | <b>N35</b> | 80  | 25 | 110 x 1/4" |                    |
|  | <b>N36</b> | 100 | 25 | 130 x 1/4" |                    |

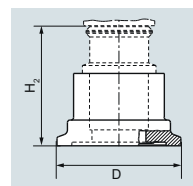
## Aseptic flange with notch to DIN 11864-2 Form A

|  | Order code | DN  | PN | ØD  | H <sub>2</sub>     |
|--|------------|-----|----|-----|--------------------|
|  | <b>N43</b> | 50  | 16 | 94  | Approx. 52 mm (2") |
|  | <b>N44</b> | 65  | 16 | 113 |                    |
|  | <b>N45</b> | 80  | 16 | 133 |                    |
|  | <b>N46</b> | 100 | 16 | 159 |                    |

## Aseptic flange with groove to DIN 11864-2 Form A

|  | Order code       | DN  | PN | ØD  | H <sub>2</sub>     |
|--|------------------|-----|----|-----|--------------------|
|  | <b>N43 + P11</b> | 50  | 16 | 94  | Approx. 52 mm (2") |
|  | <b>N44 + P11</b> | 65  | 16 | 113 |                    |
|  | <b>N45 + P11</b> | 80  | 16 | 133 |                    |
|  | <b>N46 + P11</b> | 100 | 16 | 159 |                    |

## Aseptic clamp with groove to DIN 11864-3 Form A

|  | Order code | DN  | PN | ØD   | H <sub>2</sub>     |
|--|------------|-----|----|------|--------------------|
|  | <b>N53</b> | 50  | 25 | 77.5 | Approx. 52 mm (2") |
|  | <b>N54</b> | 65  | 25 | 91   |                    |
|  | <b>N55</b> | 80  | 16 | 106  |                    |
|  | <b>N56</b> | 100 | 16 | 130  |                    |

# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 Accessories/Spare parts

### Selection and Ordering data

### Article No.

#### Spare parts / Accessories

#### Mounting bracket and fastening parts kit

made of stainless steel

7MF8997-1AA

#### Lid without window

gasket not included

7MF8997-1BA

#### Lid with glass window

gasket not included

7MF8997-1BD

#### NBR enclosure sealing

7MF8997-1BG

#### Measuring point label

unlabeled

7MF8997-1CA

#### Cable gland

- metal
- plastic (blue)

7MF8997-1EA

7MF8997-1EB

#### Weldable sockets for PMC connection

- PMC Style Standard: Thread 1½"
- PMC Style Minibolt: front-flush 1"

7MF4997-2HA

7MF4997-2HB

#### Gaskets for PMC connection

(packing unit = 5 units)

- PTFE seal for PMC Style Standard: Thread 1½"
- Gasket made of Viton for PMC Style Minibolt: front-flush 1"

7MF4997-2HC

7MF4997-2HD

#### Weldable socket for TG 52/50 and TG 52/150 connection

- TG 52/50 connection
- TG5 2/150 connection

7MF4997-2HE

7MF4997-2HF

#### Seals for TG 52/50 and TG 52/150 made of silicone

7MF4997-2HG

#### Seals for flange connection with front-flush diaphragm

Material FKM (Viton); temperature range: -20 ... +200 °C (-4 ... +392 °F), 10 units

- DN 25, PN 40 (M11)
- 1", class 150 (M40)

7MF4997-2HH

7MF4997-2HK

### Selection and Ordering data

### Article No.

#### Documentation

The entire documentation is available for download free-of-charge in various languages at: <http://www.siemens.com/processinstrumentation/documentation>

Compact operating instructions

- English, German, Spanish, French, Italian, Dutch

A5E03434657

#### Certificates (order only via SAP)

instead of Internet download

- hard copy (to order)
- on DVD (to order)

A5E03252406

A5E03252407

#### HART modem

with USB interface

7MF4997-1DB

Power supply units see Chap. 7 "Supplementary Components".

## Overview

The SITRANS P300 transmitter for gauge and absolute pressure can be delivered factory-fitted with the following valve manifolds:

- 7MF9011-4EA and 7MF9011-4FA valve manifolds for gauge pressure and absolute pressure transmitters

## Design

The 7MF9011-4EA valve manifolds are sealed with gaskets made of PTFE between transmitter and the valve manifold as standard. Soft iron, stainless steel and copper gaskets are also available for sealing purposes if preferred.

The 7MF9011-4FA valve manifolds are sealed with PTFE sealing tape between the transmitter and the valve manifold.

Once installed, the complete unit is checked under pressure for leaks (compressed air 6 bar (87 psi)) and is certified leak-proof with a test report to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the respective mounting brackets. The transmitters are mounted on the valve manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of valve manifolds", you will receive a mounting bracket for the valve manifold instead of a bracket for mounting the transmitter.

If you order an acceptance test certificate 3.1 to EN 10204 when choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitters and the valve manifolds respectively.

## Selection and Ordering data

### 7MF9011-4FA valve manifold on gauge and absolute pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P300  
7MF802-...1.-...

With process connection  
female thread 1/2-14 NPT  
in-sealed with PTFE sealing tape

Delivery incl. high-pressure test certified  
by test report to EN 10204-2.2

**T03**

#### Further designs:

Delivery includes mounting brackets and  
mounting clips made of stainless steel  
(instead of the mounting bracket supplied  
with the transmitter)

**A02**

Supplied acceptance test certificate to  
EN 10204- 3.1 for transmitters and  
mounted valve manifold

**C12**

### 7MF9011-4EA valve manifold on gauge and absolute pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P300  
7MF802-...0.-...

with process connection  
collar G1/2 A to EN 837-1  
with gasket made of PTFE between valve  
manifold and transmitter

**T02**

#### Alternative sealing material:

- Soft iron
- Stainless steel, Mat. No. 14571
- copper

**A70**

**A71**

**A72**

Delivery incl. high-pressure test certified  
by test report to EN 10204-2.2

#### Further designs:

Delivery includes mounting brackets and  
mounting clips made of stainless steel  
(instead of the mounting bracket supplied  
with the transmitter)

**A02**

Supplied acceptance test certificate to  
EN 10204- 3.1 for transmitters and  
mounted valve manifold

**C12**

## Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

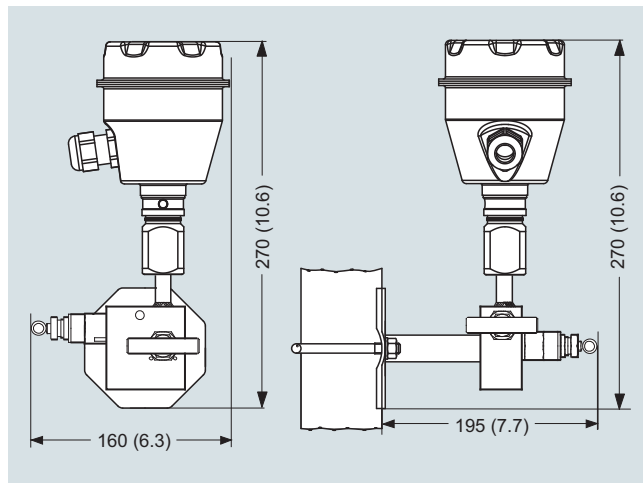
### SITRANS P300 - Factory-mounting of valve manifolds on transmitters

#### Dimensional drawings

##### Valve manifolds mounted on SITRANS P300



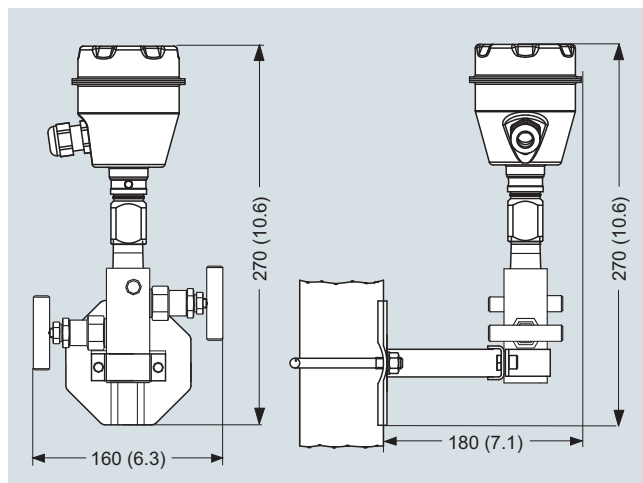
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)

## Overview



The SITRANS P300 and DS III pressure transmitters have been fitted with special process connections for the paper industry. With the two process connection threads 1½" and 1" flush at the front, the SITRANS P300 and DS III transmitters can be used for all processes in the paper industry.

SITRANS P300 and SITRANS PDS III series pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys via HART, PROFIBUS-PA or FOUNDATION Fieldbus interface.

Extensive functionality enables the pressure transmitter to be precisely adapted to the plant's requirements. Operation is very simple in spite of the numerous setting options.

Transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Various versions of the pressure transmitters are available for measuring:

- Gauge pressure
- Level
- Mass level
- Volume level

## Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads, e.g. abrasion.
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Minimum conformity error
- Small long-term drift
- Wetted parts made of Hastelloy
- Infinitely adjustable span from 0.03 bar to 16 bar (0.43 psi to 232 psi) for DS III with HART interface
- Nominal measuring range from 1 bar to 16 bar (14.5 psi to 232 psi) for DS III with PROFIBUS PA and FOUNDATION Fieldbus interface
- Infinitely adjustable span from 0.03 bar to 16 bar (0.43 psi to 232 psi) for SITRANS P300 with HART interface
- Nominal measuring range from 1 bar to 16 bar (14.5 psi to 232 psi) for SITRANS P300 with PROFIBUS PA interface
- High measuring accuracy
- Parameterization over control keys and HART Communication, or over PROFIBUS PA or FOUNDATION Fieldbus interface (DS III only).

## Application

The pressure transmitters of the DS III series, can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes the DS III pressure transmitters suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 3 control keys or programmed externally over HART or over PROFIBUS-PA or FOUNDATION Fieldbus interface (only DS III).

### SITRANS P, DS III series

Measured variable: Gauge pressure of aggressive and non-aggressive gases, vapors and liquids.

#### Span (infinitely adjustable)

For DS III with HART: 0.03 ... 16 bar (0.433 ... 232 psi)

#### Nominal measuring range

For DS III with PROFIBUS PA or FOUNDATION Fieldbus: 1 ... 16 bar (14.5 ... 232 psi)

### SITRANS P300

#### Span (infinitely adjustable)

For DS III with HART: 0.03 ... 16 bar (0.433 ... 232 psi)

#### Nominal measuring range

For DS III with PROFIBUS PA or FOUNDATION Fieldbus: 1 ... 16 bar (14.5 ... 232 psi)

## Pressure Measurement

Transmitters for gauge pressure for the paper industry

### SITRANS P DS III and P300 with PMC connection - Technical description

#### Design

##### SITRANS P DS III



Device front view, SITRANS P DS III

The transmitter consists of various components depending on the order. The possible versions are listed in the ordering information. The components described below are the same for all transmitters.

The rating plate (7, Figure "Device front view") with the Article No. is located on the side of the housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

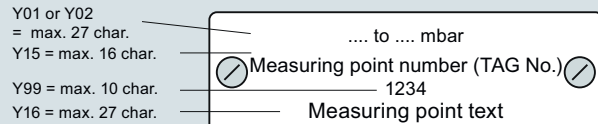
The approval label is located on the opposite side.

The housing is made of die-cast aluminium or stainless steel precision casting. A round cover is screwed on at the front and rear of the housing. The front cover (2) can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the housing.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

At the top of the housing is a plastic cover (1), which hides the input keys.

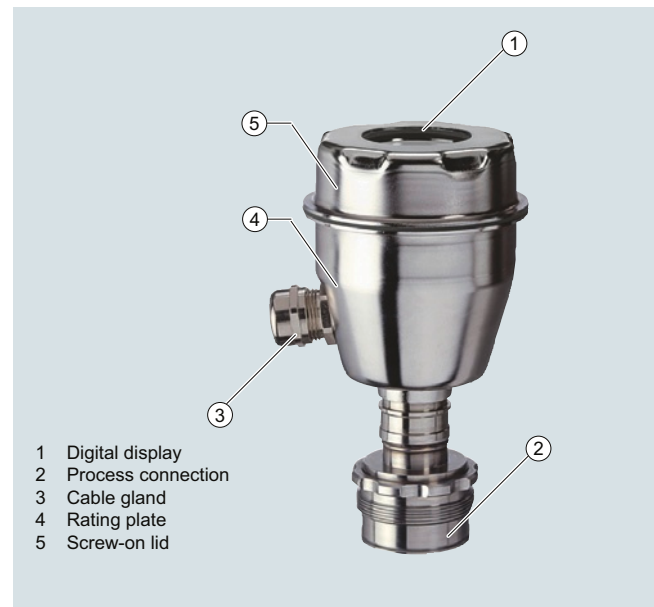
#### Example for an attached measuring point label



##### SITRANS P300

The device comprises:

- Electronics
- Housing
- Measuring cell



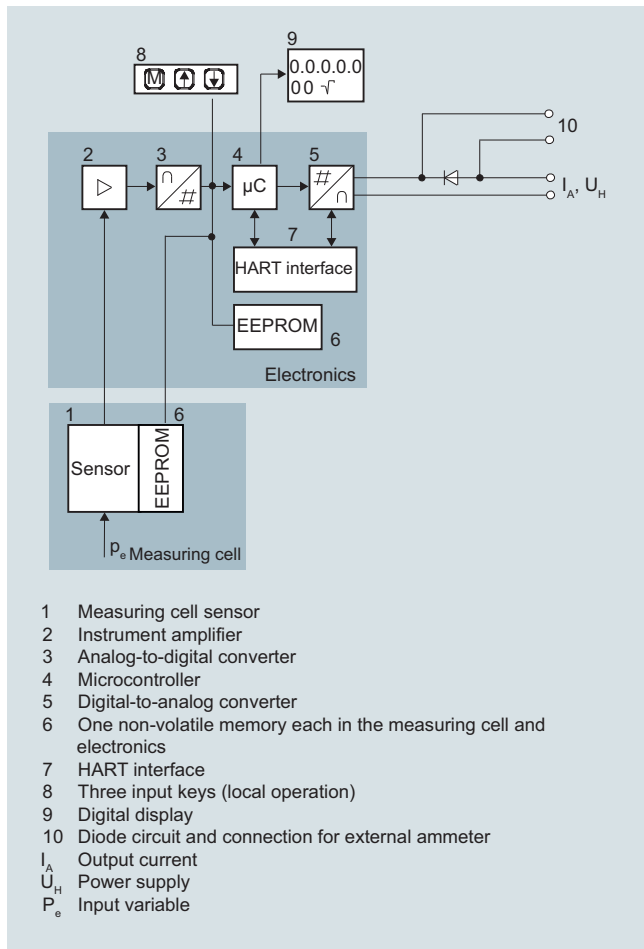
Perspective view of the SITRANS P300

The housing has a screw-on lid (5) and, depending on the version, is with or without an inspection window. The electrical terminal housing, the buttons for operation of the device are located under this lid and, depending on the version, the display. The connections for the auxiliary power UH and the shield are in the terminal housing. The cable gland is on the side of the housing. The measuring cell with the process connection (2) is located on the bottom of the housing. The measuring cell with the process connection may differ from the one shown in the diagram, depending on the device version.



## Function

## Operation of electronics with HART communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

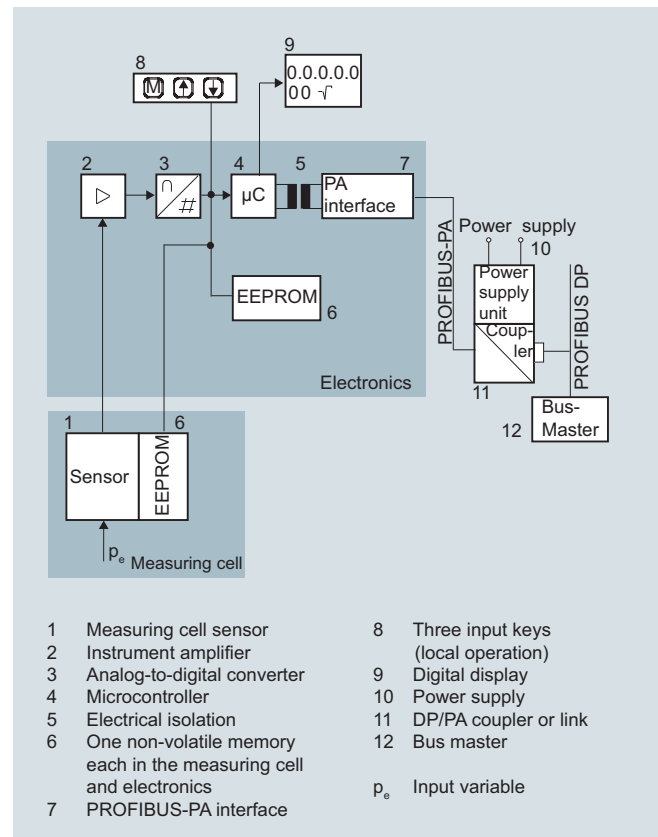
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with spans  $\leq 63$  bar (914 psi) measure the input pressure compared to atmosphere, the transmitters with spans 160 bar (2320 psi) measure compared to vacuum.

## Operation of electronics with PROFIBUS PA communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the PROFIBUS PA through an electrically isolated PA interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The first memory is linked with the measuring cell, the second with the electronics. This modular design means that the electronics and the measuring cell can be replaced separately from one another.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

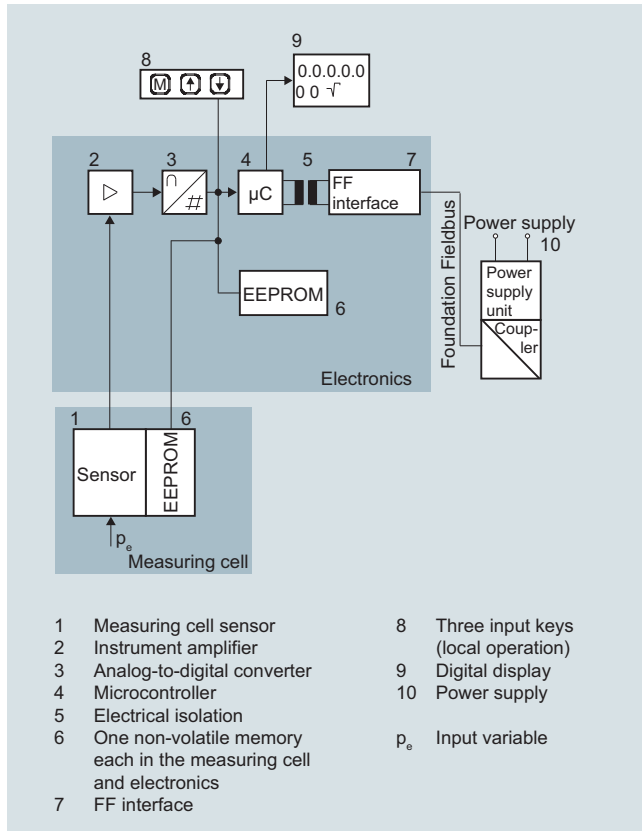
The results with status values and diagnostic values are transferred by cyclic data transmission on the PROFIBUS PA. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as SIMATIC PDM is required for this.

# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P DS III and P300 with PMC connection - Technical description

### Operation of electronics with FOUNDATION Fieldbus communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus interface (7).

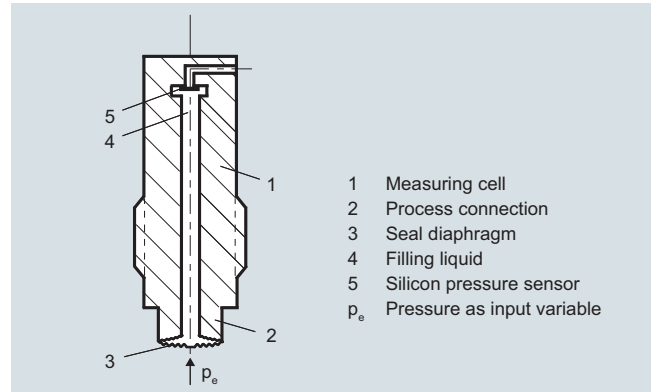
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

### Mode of operation of the measuring cell

Measuring cell for gauge pressure with front-flush diaphragm



Measuring cell for gauge pressure, with front-flush diaphragm for paper industry, function diagram

The pressure  $p_e$  is applied through the process connection (2, Figure "Measuring cell for gauge pressure, with front-flush diaphragm for paper industry, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

### Parameterization

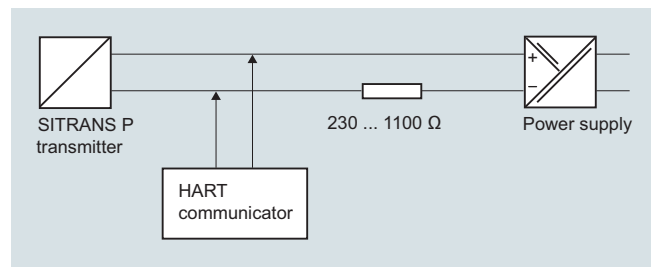
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

#### Parameterization using the input buttons (local operation)

With the input buttons you can easily set the most important parameters without any additional equipment.

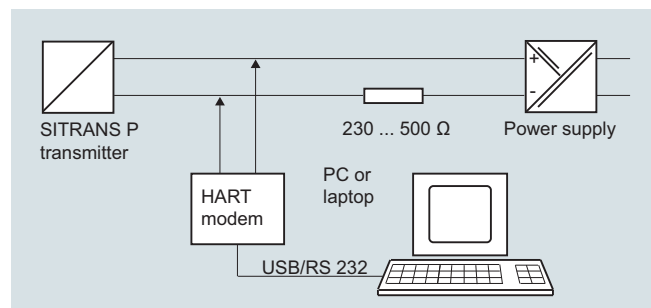
#### Parameterization using HART

Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

## SITRANS P DS III and P300 with PMC connection - Technical description

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

## Adjustable parameter DS III with HART and P300 with HART

| Parameters   | Input keys | HART communication |
|--|------------|--------------------|
| Start of scale   | x          | x                  |
| Full-scale value   | x          | x                  |
| Electrical damping   | x          | x                  |
| Start-of-scale value without application of a pressure ("Blind setting") | x          | x                  |
| Full-scale value without application of a pressure ("Blind setting")     | x          | x                  |
| Zero adjustment  | x          | x                  |
| current transmitter  | x          | x                  |
| Fault current  | x          | x                  |
| Disabling of buttons, write protection                                   | x          | x <sup>1)</sup>    |
| Type of dimension and actual dimension                                   | x          | x                  |
| Characteristic (linear)  | x          | x                  |
| Input of characteristic  |            | x                  |
| Freely-programmable LCD  |            | x                  |
| Diagnostic functions   |            | x                  |

<sup>1)</sup> Cancel apart from write protection

## Diagnostic functions for DS III with HART and P300 with HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

## Available physical units of display for DS III with HART and P300 with HART

| Physical variable                                  | Physical dimensions   |
|--|---|
| Pressure (setting can also be made in the factory) | Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O, ftH <sub>2</sub> O (20 °C), inHg, mmHg |
| Level (height data)                                | m, cm, mm, ft, in   |
| Volume   | m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, imp. gallon, bushel, barrel, barrel liquid  |
| Mass   | g, kg, t, lb, Ston, Lton, oz  |
| Temperature  | K, °C, °F, °R   |
| Miscellaneous                                      | %, mA   |

## Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. The PROFIBUS connects the DS III PA to a process control system, e.g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

## Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III with FOUNDATION Fieldbus is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

## Adjustable parameters for DS III with PROFIBUS PA and FOUNDATION Fieldbus, and P300 with PROFIBUS PA and FOUNDATION Fieldbus

| Adjustable parameters                    | Input keys | PROFIBUS PA and FOUNDATION Fieldbus interface |
|--|------------|---|
| Electrical damping                       | x          | x   |
| Zero adjustment (correction of position) | x          | x   |
| Buttons and/or function disabling        | x          | x   |
| Source of measured-value display         | x          | x   |
| Physical dimension of display            | x          | x   |
| Position of decimal point                | x          | x   |
| Bus address                              | x          | x   |
| Adjustment of characteristic             | x          | x   |
| Input of characteristic                  |            | x   |
| Freely-programmable LCD                  |            | x   |
| Diagnostic functions                     |            | x   |

## Diagnostic functions for DS III with PROFIBUS PA and FOUNDATION Fieldbus, and P300 with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

## Physical dimensions available for the display

| Physical variable                                  | Physical dimensions   |
|--|---|
| Pressure (setting can also be made in the factory) | MPa, hPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O, mmHg, inHg |
| Level (height data)                                | m, cm, mm, ft, in, yd   |
| Mass   | g, kg, t, lb, Ston, Lton, oz  |
| Volume   | m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, imp. gallon, bushel, barrel, barrel liquid  |
| Temperature  | K, °C, °F, °R   |
| Miscellaneous                                      | %   |

# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P DS III with PMC connection

1

### Technical specifications

#### SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry

| Input  | Gauge pressure  |   |  |                             |
|--|---|---|--|-----------------------------|
| Measured variable<br><br>Span (fully adjustable) or measuring range,<br>max. operating pressure and max. test pressure | HART  | PROFIBUS PA/<br>FOUNDATION<br>Fieldbus                |  |                             |
|  | Span  | Nominal measuring range                               | Max. operating pres-<br>sure MAWP (PS) | Max. perm.<br>test pressure |
|  | 0.01 ... 1 bar  | 1 bar   | 4 bar                                  | 6 bar                       |
|  | 1 ... 100 kPa   | 100 kPa   | 400 kPa                                | 600 kPa                     |
|  | 0.15 ... 14.5 psi   | 14.5 psi  | 58 psi                                 | 87 psi                      |
|  | 0.04 ... 4 bar  | 4 bar   | 7 bar                                  | 10 bar                      |
|  | 4 ... 400 kPa   | 400 kPa   | 0.7 MPa                                | 1 MPa                       |
|  | 0.58 ... 58 psi   | 58 psi  | 102 psi                                | 145 psi                     |
|  | 0.16 ... 16 bar   | 16 bar  | 21 bar                                 | 32 bar                      |
|  | 16 ... 1600 kPa   | 1600 kPa  | 2.1 MPa                                | 3.2 MPa                     |
| 2.3 ... 232 psi  | 232 psi   | 305 psi   | 464 psi                                |                             |
| Lower measuring limit<br>(For PMC-Style Minibolt no span < 500 mbar adjustable)  | 100 mbar a/10 kPa a/1.45 psi a  |   |  |                             |
| Upper measuring limit  | 100% of max. span   |   |  |                             |
| Output   | HART  | PROFIBUS PA/ FOUNDATION Fieldbus                      |  |                             |
| Output signal  | 4 ... 20 mA   | Digital PROFIBUS PA and<br>FOUNDATION Fieldbus signal |  |                             |
| • Lower limit (infinitely adjustable)  | 3.55 mA, factory preset to 3.84 mA  | -   |  |                             |
| • Upper limit (infinitely adjustable)  | 23 mA, factory preset to 20.5 mA or<br>optionally set to 22.0 mA  | -   |  |                             |
| Load   |   |   |  |                             |
| • Without HART communication   | $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$<br>$U_H$ : Power supply in V   | -   |  |                             |
| • With HART communication  | $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or<br>$R_B = 230 \dots 1100 \Omega$ (HART-Communicator)  | -   |  |                             |
| Physical bus   | -   | IEC 61158-2   |  |                             |
| Protection against polarity reversal   | Protected against short-circuit and polarity reversal. Each connection against the<br>other with max. supply voltage.   |   |  |                             |
| Electrical damping (step width 0.1 s)  | Set to 2 s (0 ... 100 s)  |   |  |                             |
| Measuring accuracy   | Acc. to IEC 60770-1   |   |  |                             |
| Reference conditions<br>(All error data refer always refer to the set span)  | • Increasing characteristic<br>• Start-of-scale value 0 bar/kPa/psi<br>• Stainless steel seal diaphragm<br>• Silicone oil filling<br>• Room temperature 25 °C (77 °F) |   |  |                             |
| Measuring span ratio r (spread, Turn-Down)   | r = max. measuring span/set measuring span or nom. pressure range   |   |  |                             |
| Error in measurement at limit setting incl.<br>hysteresis and reproducibility  |   |   |  |                             |
| • Linear characteristic  |   |   |  |                             |
| - r ≤ 5  | ≤ 0.075 %   |   |  |                             |
| - 5 < r ≤ 100  | ≤ (0.005 · r + 0.05) %  |   |  |                             |
| Influence of ambient temperature (in percent per 28 °C (50 °F))  | ≤ (0.08 · r + 0.16) %   |   |  |                             |
| Long-term stability (temperature change ± 30 °C (± 54 °F))   | ≤ (0.25 · r) % in 5 years   |   |  |                             |
| Effect of mounting position  | ≤ 0.1 mbar/0.01 kPa/0.00145 psi per 10° inclination<br>(zero point correction is possible with position error compensation)   |   |  |                             |
| Effect of auxiliary power supply<br>(in percent per change in voltage)   | 0.005 % per 1 V   |   |  |                             |
| Measuring value resolution for PROFIBUS PA and<br>FOUNDATION Fieldbus  | 3 · 10 <sup>-5</sup> of nominal measuring range   |   |  |                             |

| SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry |  |                                     |
|--|--|-------------------------------------|
|  | HART   | PROFIBUS PA and FOUNDATION Fieldbus |
| <b>Rated conditions</b>  |  |                                     |
| Degree of protection   | IP66 (optional IP66/IP68)  |                                     |
| • according to EN 60529  | Type 4X  |                                     |
| • according to NEMA 250  | -40 ... +100 °C (-40 ... +212 °F)  |                                     |
| Temperature of medium  |  |                                     |
| Ambient conditions   |  |                                     |
| • Ambient temperature  | -20 ... +85 °C (-4 ... +185 °F)  |                                     |
| - Transmitter  | -40 ... +85 °C (-40 ... +185 °F)   |                                     |
| • Storage temperature  | -50 ... +85 °C (-58 ... +185 °F)   |                                     |
| • Climatic class   |  |                                     |
| - Condensation   | Relative humidity 0 ... 100 %<br>Condensation permissible, suitable for use in the tropics   |                                     |
| • Electromagnetic Compatibility  |  |                                     |
| - Emitted interference and interference immunity                                       | Acc. to IEC 61326 and NAMUR NE 21  |                                     |
| <b>Design</b>  |  |                                     |
| Weight (without options)   | ≈ 1.5 kg (≈ 3.3 lb)  |                                     |
| Enclosure material   | Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408  |                                     |
| Wetted parts materials   |  |                                     |
| • Gasket (standard)  | PTFE flat gasket   |                                     |
| • O-ring (minibolt)  | FPM (Viton) or optionally: FFPM or NBR   |                                     |
| Measuring cell filling   | Silicone oil or inert filling liquid   |                                     |
| Process connection (standard)  | Flush-mounted, 1½", PMC Standard design  |                                     |
| Process connection (minibolt)  | Flush-mounted, 1", minibolt design   |                                     |
| <b>Power supply <math>U_H</math></b>   |  |                                     |
| Terminal voltage on transmitter  | 10.5 ... 45 V DC<br>10.5 ... 30 V DC in intrinsically-safe mode  | -                                   |
| Power supply   | -  | Supplied through bus                |
| Separate 24 V power supply   | -  | Not necessary                       |
| Bus voltage  |  |                                     |
| • Not Ex   | -  | 9 ... 32 V                          |
| • With intrinsically-safe operation  | -  | 9 ... 24 V                          |
| Current consumption  |  |                                     |
| • Basic current (max.)   | -  | 12.5 mA                             |
| • Start-up current ≤ basic current   | -  | Yes                                 |
| • Max. current in event of fault   | -  | 15.5 mA                             |
| Fault disconnection electronics (FDE) available  | -  | Yes                                 |
| <b>Certificates and approvals</b>  |  |                                     |
| Classification according to PED 2014/68/EU   | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) |                                     |

# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P DS III with PMC connection

1

### HART communication

|                       |                  |
|-----------------------|------------------|
| HART communication    | 230 ... 1100 Ω   |
| Protocol              | HART Version 5.x |
| Software for computer | SIMATIC PDM      |

### PROFIBUS PA communication

|   |  |
|---|--|
| Simultaneous communication with master class 2 (max.)                           | 4  |
| The address can be set using  | Configuration tool or local operation (standard setting address 126)                                   |
| Cyclic data usage   |  |
| • Output byte   | 5 (one measured value) or 10 (two measured values)   |
| • Input byte  | 0, 1, or 2 (register operating mode and reset function for metering)                                   |
| Internal preprocessing  |  |
| Device profile  | PROFIBUS PA Profile for Process Control Devices Version 3.0, class B                                   |
| Function blocks   | 2  |
| • Analog input  |  |
| - Adaptation to customer-specific process variables                             | Yes, linearly rising or falling characteristic   |
| - Electrical damping, adjustable  | 0 ... 100 s  |
| - Simulation function   | Input /Output  |
| - Failure mode  | parameterizable (last good value, substitute value, incorrect value)                                   |
| - Limit monitoring  | Yes, one upper and lower warning limit and one alarm limit respectively                                |
| • Register (totalizer)  | Can be reset, preset, optional direction of counting, simulation function of register output           |
| - Failure mode  | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |
| - Limit monitoring  | One upper and lower warning limit and one alarm limit respectively                                     |
| • Physical block  | 1  |
| Transducer blocks   | 2  |
| • Pressure transducer block   |  |
| - Can be calibrated by applying two pressures                                   | Yes  |
| - Monitoring of sensor limits   | Yes  |
| - Specification of a container characteristic with                              | Max. 30 nodes  |
| - Square-rooted characteristic for flow measurement                             | Yes  |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable  |
| - Simulation function for measured pressure value and sensor temperature        | Constant value or over parameterizable ramp function   |

### FOUNDATION Fieldbus communication

|  |   |
|--|---|
| Function blocks  | 3 function blocks analog input, 1 function block PID                    |
| • Analog input   |   |
| - Adaptation to customer-specific process variables  | Yes, linearly rising or falling characteristic                          |
| - Electrical damping, adjustable   | 0 ... 100 s   |
| - Simulation function  | Output/input (can be locked within the device with a bridge)            |
| - Failure mode   | parameterizable (last good value, substitute value, incorrect value)    |
| - Limit monitoring   | Yes, one upper and lower warning limit and one alarm limit respectively |
| - Square-rooted characteristic for flow measurement  | Yes   |
| • PID  | Standard FOUNDATION Fieldbus function block                             |
| • Physical block   | 1 resource block  |
| Transducer blocks  | 1 transducer block Pressure with calibration, 1 transducer block LCD    |
| • Pressure transducer block  |   |
| - Can be calibrated by applying two pressures  | Yes   |
| - Monitoring of sensor limits  | Yes   |
| - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function                    |

# Pressure Measurement

## Transmitters for gauge pressure for the paper industry

### SITRANS P DS III with PMC connection

1

| Selection and Ordering data   |                                    | Article No.                 |
|---|------------------------------------|-----------------------------|
| <b>SITRANS P pressure transmitters for gauge pressure, with PMC connection series DS III with HART</b>  |                                    | <b>7MF4133 -</b>            |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |                                    |                             |
| <b>Measuring cell filling</b>   | <b>Measuring cell-cleaning</b>     |                             |
| Silicone oil  | normal                             | 1                           |
| Inert liquid  | grease-free to cleanliness level 2 | 3                           |
| <b>Measuring span (min. ... max.)</b>   |                                    |                             |
| 0.01 ... 1 bar <sup>1)</sup>  | (0.15 ... 14.5 psi) <sup>1)</sup>  | B                           |
| 0.04 ... 4 bar  | (0.58 ... 58 psi)                  | C                           |
| 0.16 ... 16 bar   | (2.32 ... 232 psi)                 | D                           |
| <b>Wetted parts materials</b>   |                                    |                             |
| Seal diaphragm  | Connection shank                   |                             |
| Hastelloy   | Stainless steel                    | B                           |
| <b>Process connection</b>   |                                    |                             |
| <ul style="list-style-type: none"> <li>PMC Style Standard: Thread 1½"</li> <li>PMC Style Minibolt: front-flush 1" (not with minimum span: 500 mbar (7.25 psi) - version "B")</li> </ul>   |                                    | 2<br>3                      |
| <b>Non-wetted parts materials</b>   |                                    |                             |
| <ul style="list-style-type: none"> <li>Housing made of die-cast aluminium</li> <li>Housing stainless steel precision casting</li> </ul>   |                                    | 0<br>3                      |
| <b>Version</b>  |                                    |                             |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>   |                                    | 1<br>2<br>3                 |
| All versions include DVD with compact operating instructions in various EU languages.   |                                    |                             |
| <b>Explosion protection</b>   |                                    |                             |
| <ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>2)</sup></li> <li>„Ex nA/ic (Zone 2)"<sup>3)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>4)</sup></li> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>3)4)</sup></li> </ul> </li> </ul> |                                    | A<br>B<br>D<br>E<br>F<br>NC |
| <b>Electrical connection / cable entry</b>  |                                    |                             |
| <ul style="list-style-type: none"> <li>Female thread M20 x 1.5</li> <li>Female thread ½-14 NPT</li> <li>M12 device plugs (stainless steel)<sup>5) 6)</sup></li> </ul>   |                                    | B<br>C<br>F                 |
| <b>Display</b>  |                                    |                             |
| <ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: mA)</li> <li>With visible display (setting: mA)</li> <li>With customer-specific display (setting as specified, Order code "Y21" required)</li> </ul>   |                                    | 0<br>1<br>6<br>7            |

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Quick-start guide
- Sealing ring

<sup>1)</sup> Only with "PMC Style Standard" process connection

<sup>2)</sup> Without cable gland, with blanking plug

<sup>3)</sup> Configurations with M12 device plugs are only available in Ex ic.

<sup>4)</sup> Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.

<sup>5)</sup> Only in connection with Ex approval A, B, E or F.

<sup>6)</sup> M12 delivered without cable socket

| Selection and Ordering data   |                                    | Article No.                 |
|---|------------------------------------|-----------------------------|
| <b>SITRANS P pressure transmitter for gauge pressure, with PMC connection DS III with PROFIBUS PA (PA)</b>  |                                    | <b>7MF4134 -</b>            |
| <b>DS III with FOUNDATION Fieldbus (FF)</b>   |                                    | <b>7MF4135 -</b>            |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |                                    |                             |
| <b>Measuring cell filling</b>   | <b>Meas. cell cleaning</b>         |                             |
| Silicone oil  | normal                             | 1                           |
| Inert liquid  | grease-free to cleanliness level 2 | 3                           |
| <b>Nominal measuring range</b>  |                                    |                             |
| 1 bar <sup>1)</sup>   | (14.5 psi) <sup>1)</sup>           | B                           |
| 4 bar   | (58 psi)                           | C                           |
| 16 bar  | (232 psi)                          | D                           |
| <b>Wetted parts materials</b>   |                                    |                             |
| Seal diaphragm  | Connection shank                   |                             |
| Hastelloy   | Stainless steel                    | B                           |
| <b>Process connection<sup>2)</sup></b>  |                                    |                             |
| <ul style="list-style-type: none"> <li>PMC Style Standard: Thread 1½"</li> <li>PMC Style Minibolt: front-flush 1" (minimum span: 500 mbar (7.25 psi), not available with 1-bar-measuring cell (Option B))</li> </ul>  |                                    | 2<br>3                      |
| <b>Non-wetted parts materials</b>   |                                    |                             |
| <ul style="list-style-type: none"> <li>Housing made of die-cast aluminium</li> <li>Housing stainless steel precision casting</li> </ul>   |                                    | 0<br>3                      |
| <b>Version</b>  |                                    |                             |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>   |                                    | 1<br>2<br>3                 |
| All versions include DVD with compact operating instructions in various EU languages.   |                                    |                             |
| <b>Explosion protection</b>   |                                    |                             |
| <ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>3)</sup></li> <li>„Ex nA/ic (Zone 2)"<sup>4)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>5)</sup></li> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>3)5)</sup></li> </ul> </li> </ul> |                                    | A<br>B<br>D<br>E<br>F<br>NC |
| <b>Electrical connection / cable entry</b>  |                                    |                             |
| <ul style="list-style-type: none"> <li>Female thread M20 x 1.5</li> <li>Female thread ½-14 NPT</li> <li>M12 device plugs (stainless steel)<sup>6) 7)</sup></li> </ul>   |                                    | B<br>C<br>F                 |
| <b>Display</b>  |                                    |                             |
| <ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: bar)</li> <li>With visible display (setting: bar)</li> <li>With customer-specific display (setting as specified, Order code "Y21" required)</li> </ul>   |                                    | 0<br>1<br>6<br>7            |

Included in delivery of the device:

- Quick-start guide
- Sealing ring

<sup>1)</sup> Only with "PMC Style Standard" process connection

<sup>2)</sup> Sealing is included in delivery.

<sup>3)</sup> Without cable gland, with blanking plug

<sup>4)</sup> Configurations with M12 device plugs are only available in Ex ic.

<sup>5)</sup> Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505

<sup>6)</sup> Only in connection with Ex approval A, B, E or F.

<sup>7)</sup> M12 delivered without cable socket



# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P DS III with PMC connection

1

| Selection and Ordering data  | Order code        |      |    |    |
|--|-------------------|------|----|----|
| <b>Further designs</b>   |                   | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code.  |                   |      |    |    |
| <b>Device plugs</b>  |                   |      |    |    |
| • Angled   | A32               | ✓    |    |    |
| • Han 8D (metal, gray)   | A33               | ✓    |    |    |
| <b>M12 cable sockets (metal (CuZn))</b>  | A50               | ✓    | ✓  | ✓  |
| <b>Rating plate inscription</b><br>(instead of German)   |                   |      |    |    |
| • English  | B11               | ✓    | ✓  | ✓  |
| • French   | B12               | ✓    | ✓  | ✓  |
| • Spanish  | B13               | ✓    | ✓  | ✓  |
| • Italian  | B14               | ✓    | ✓  | ✓  |
| • Cyrillic (russian)   | B16               | ✓    | ✓  | ✓  |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi                               | B21               | ✓    | ✓  | ✓  |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>           | C11               | ✓    | ✓  | ✓  |
| <b>Inspection certificate</b><br>Acc. to EN 10204-3.1  | C12               | ✓    | ✓  | ✓  |
| <b>Factory certificate</b><br>Acc. to EN 10204-2.2   | C14               | ✓    | ✓  | ✓  |
| <b>"Functional safety (SIL2)" certificate acc. to IEC 61508</b>  | C20               | ✓    |    |    |
| <b>"Functional safety (SIL2/3)" certificate acc. to IEC 61508</b>  | C23               | ✓    |    |    |
| <b>PED for Russia with initial calibration mark</b>  | C99               | ✓    | ✓  | ✓  |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>                                 | D05               | ✓    | ✓  | ✓  |
| <b>Degree of protection IP66/IP68</b><br>(only for M20 x 1.5 and ½-14 NPT)                                   | D12               | ✓    | ✓  | ✓  |
| <b>Export approval Korea</b>   | E11               | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF4...-...-B..)         | E55 <sup>1)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF4...-...-D..)     | E56 <sup>1)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-...-E..)                     | E57 <sup>1)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection „Ex ia“, „Ex d" and „Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-...-R..) | E58 <sup>1)</sup> | ✓    | ✓  | ✓  |
| <b>Mounting</b>  |                   |      |    |    |
| • Weldable sockets for standard 1½" threaded connection  | P01               | ✓    | ✓  | ✓  |
| • Weldable socket for minibolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)                         | P02               | ✓    | ✓  | ✓  |

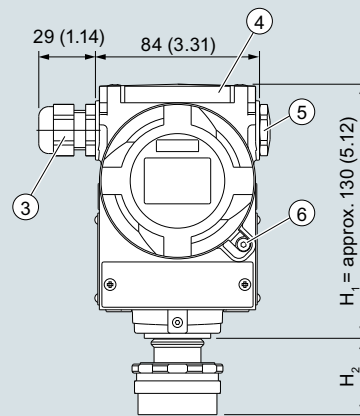
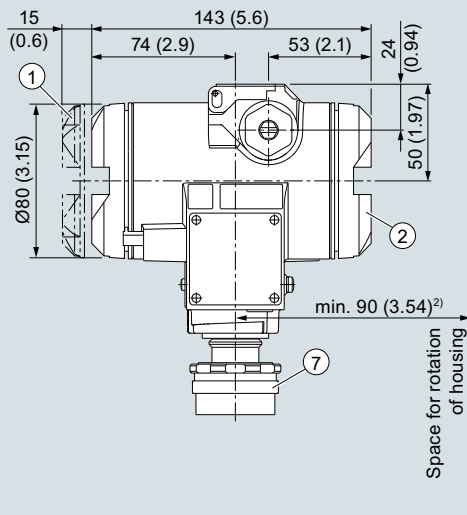
<sup>1)</sup> When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

| Selection and Ordering data  | Order code |      |                 |    |
|--|------------|------|-----------------|----|
| <b>Additional data</b>   |            | HART | PA              | FF |
| Please add "-Z" to Article No. and specify Order code(s) and plain text.   |            |      |                 |    |
| <b>Measuring range to be set</b><br>Specify in plain text (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi  | Y01        | ✓    | ✓ <sup>1)</sup> |    |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....  | Y15        | ✓    | ✓               | ✓  |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 characters, specify in plain text:<br>Y16: .....   | Y16        | ✓    | ✓               | ✓  |
| <b>Entry of HART address (TAG)</b><br>Max. 8 characters, specify in plain text:<br>Y17: .....  | Y17        | ✓    |                 |    |
| <b>Setting of pressure indication in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>+</sup> , inH <sub>2</sub> O <sup>+</sup> , ftH <sub>2</sub> O <sup>+</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>*) ref. temperature 20 °C | Y21        | ✓    | ✓               | ✓  |
| <b>Setting of pressure indication in non-pressure units<sup>2)</sup></b><br>Specify in plain text:<br>Y22: .... up to .... l, m <sup>3</sup> , m, USg, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)   | Y22 + Y01  | ✓    |                 |    |
| <b>Preset bus address</b><br>possible between 1 and 126<br>Max. 8 characters, specify in plain text:<br>Y25: .....   | Y25        |      | ✓               | ✓  |
| Only "Y01" and "Y21" can be factory preset<br>✓ = available  |            |      |                 |    |
| <b>ordering example</b><br>Item line: 7MF4133-1DB20-1AB7-Z<br>B line: C11 + Y01 + Y21<br>C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)<br>C line: Y21: bar (psi)  |            |      |                 |    |

<sup>1)</sup> Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.

## Dimensional drawings



① Electronic side, digital display  
(longer overall length for cover with window)<sup>1)</sup>

② Terminal side<sup>1)</sup>

③ Electrical connection:  
Screwed gland M20 x 1,5 or screwed gland ½-14 NPT or  
M12 device plug

④ Protective cover over keys

⑤ Blanking plug

⑥ Screw cover - safety bracket (only for type of protection  
"Explosion-proof enclosure", not shown in the drawing)

⑦ Process connection: PMC standard

<sup>1)</sup> Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing

<sup>2)</sup> 92 mm (3.6 inch) for minimum distance to permit rotation with indicator

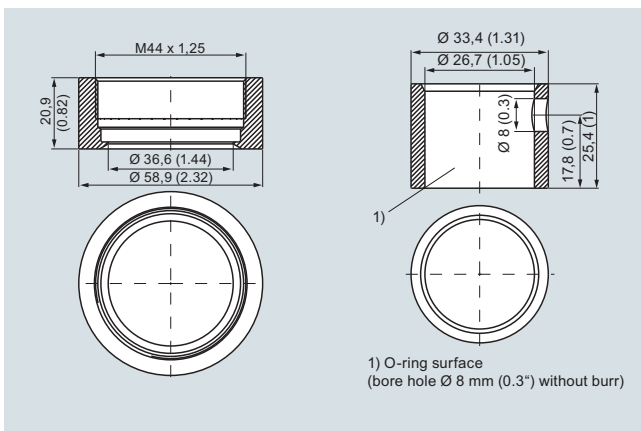
SITRANS P DS III pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

The diagram shows a SITRANS P DS III with an example of a flange. In this drawing the height is subdivided into  $H_1$  and  $H_2$ .

$H_1$  = Height of the SITRANS P DS III up to a defined cross-section

$H_2$  = Height of the flange up to this defined cross-section

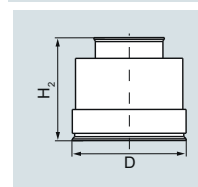
Only the height  $H_2$  is indicated in the dimensions of the flanges.



PMC Style Standard (left) and PMC Style Minibolt (right) weldable sockets, dimensions in mm (inch)

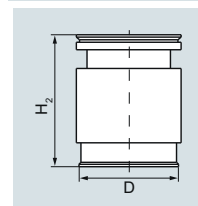
Material: Stainless steel, Mat. No. 1.4404/316L

## PMC Style standard



| DN | PN | ØD             | H <sub>2</sub>               |
|----|----|----------------|------------------------------|
|    |    | 40.9 mm (1.6") | approx.<br>36.8 mm<br>(1.4") |

## PMC Style minibolt



| DN | PN | ØD             | H <sub>2</sub>               |
|----|----|----------------|------------------------------|
|    |    | 26.3 mm (1.0") | approx.<br>33.1 mm<br>(1.3") |

# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P300 with PMC connection

### Technical specifications

#### SITRANS P300 for gauge pressure with PMC connection for the paper industry

| Input  |  | Gauge pressure (front-flush)  |   |
|--|--|---|---|
| Measured variable  |  | <b>HART</b>   | <b>PROFIBUS PA/ FOUNDATION Fieldbus</b>                         |
| Span (fully adjustable) or measuring range, max. operating pressure and max. test pressure |  | Span  | Nominal measuring range   |
|  |  | 0.01 ... 1 bar<br>1 ... 100 kPa<br>0.15 ... 14.5 psi  | Max. operating pressure MAWP (PS)<br>4 bar<br>400 kPa<br>58 psi |
|  |  | 0.04 ... 4 bar<br>4 ... 400 kPa<br>0.58 ... 58 psi  | Max. perm. test pressure<br>6 bar<br>600 kPa<br>87 psi          |
|  |  | 0.16 ... 16 bar<br>16 ... 1600 kPa<br>2.3 ... 232 psi   | 10 bar<br>1 MPa<br>145 psi                                      |
| Lower measuring limit<br>(For PMC-Style Minibolt no span < 500 mbar adjustable)            |  | 100 mbar a/10 kPa a/1.45 psi a  | 21 bar<br>2.1 MPa<br>305 psi                                    |
| Upper measuring limit  |  | 100 % of max. span  | 32 bar<br>3.2 MPa<br>464 psi                                    |
| Output   |  | <b>HART</b>   | <b>PROFIBUS PA/ FOUNDATION Fieldbus</b>                         |
| Output signal  |  | 4 ... 20 mA   | Digital PROFIBUS PA and FOUNDATION Fieldbus signal              |
| • Lower limit (infinitely adjustable)  |  | 3.55 mA, factory preset to 3.84 mA  | -   |
| • Upper limit (infinitely adjustable)  |  | 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA   | -   |
| Load   |  |   |   |
| • Without HART communication   |  | $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in $\Omega$<br>$U_H$ : Power supply in V  | -   |
| • With HART communication  |  | $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or<br>$R_B = 230 \dots 1100 \Omega$ (HART Communicator)  | -   |
| Physical bus   |  | -   | IEC 61158-2   |
| Protection against polarity reversal   |  | Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.  |   |
| Electrical damping (step width 0.1 s)  |  | Set to 2 s (0 ... 100 s)  |   |
| Measuring accuracy   |  | Acc. to IEC 60770-1   |   |
| Reference conditions   |  | <ul style="list-style-type: none"> <li>Increasing characteristic</li> <li>Start-of-scale value 0 bar/kPa/psi</li> <li>Stainless steel seal diaphragm</li> <li>Measuring cell with silicone oil</li> <li>Room temperature 25 °C (77 °F)</li> </ul> |   |
| Measuring span ratio r (spread, Turn-Down)   |  | $r = \text{max. measuring span/set measuring span or nom. pressure range}$  |   |
| Error in measurement at limit setting incl. hysteresis and reproducibility                 |  |   |   |
| Linear characteristic  |  |   |   |
| - $r \leq 5$   |  | $\leq 0.075 \%$   |   |
| - $5 < r \leq 100$   |  | $\leq (0.005 \cdot r + 0.05) \%$  |   |
| Influence of ambient temperature<br>(in percent per 28 °C (50 °F))                         |  | $\leq (0.08 \cdot r + 0.16) \%$   |   |
| Long-term stability (temperature change $\pm 30 \text{ °C}$ ( $\pm 54 \text{ °F}$ ))       |  | $\leq (0.25 \cdot r) \%$ in 5 years   |   |
| Effect of mounting position  |  | $\leq 0.1 \text{ mbar}/0.01 \text{ kPa}/0.00145 \text{ psi}$ per 10° inclination<br>(zero point correction is possible with position error compensation)  |   |
| Effect of auxiliary power supply<br>(in percent per change in voltage)                     |  | 0.005 % per 1 V   |   |
| Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus                         |  | $3 \cdot 10^{-5}$ of nominal measuring range  |   |

**SITRANS P300 for gauge pressure with PMC connection for the paper industry****Rated conditions**Installation conditions

Ambient temperature

Observe the temperature class in areas subject to explosion hazard.

- Measuring cell with silicone oil

-40 ... +85 °C (-40 ... +185 °F)

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

Climatic class

Condensation

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

Degree of protection

- according to EN 60529

IP65, IP68

- according to NEMA 250

Type 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)

Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

Medium conditions

Temperature of medium

- Measuring cell with silicone oil

-40 ... +100 °C (-40 ... +212 °F)

**Design**

Weight (without options)

Approx. 1 kg (2.2 lb)

Enclosure material

Stainless steel, mat. no. 1.4301/304

Material of parts in contact with the medium

- Seal diaphragm

Hastelloy C276, mat. no. 2.4819

- Measuring cell filling

Silicone oil

Surface quality touched-by-media

Ra-values ≤ 0.8 µm (32 µ inch)/welds Ra ≤ 1.6 µm (64 µ inch)

**Power supply U<sub>H</sub>**

Terminal voltage on transmitter

**HART**10.5 ... 42 V DC  
for intrinsically safe operation:  
10.5 ... 30 V DC**PROFIBUS PA/ FOUNDATION Fieldbus**

Power supply

Supplied through bus

Separate power supply

-

Not necessary

Bus voltage

- Without Ex

-

9 ... 32 V

- With intrinsically-safe operation

-

9 ... 24 V

Current consumption

- Max. basic current

-

12.5 mA

- Start-up current ≤ basic current

-

Yes

- Max. fault current in the event of a fault

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P300 with PMC connection

### SITRANS P300 for gauge pressure with PMC connection for the paper industry

#### Certificates and approvals

Classification according to PED 2014/68/EU

Explosion protection

Intrinsic safety "i"

Marking

Permissible ambient temperature

- Temperature class T4

- Temperature class T5

- Temperature class T6

Connection

Effective inner capacitance:

Effective internal inductance:

Explosion protection to FM for USA and Canada (cFM<sub>US</sub>)

- Identification (DIP) or (IS); (NI)

- Identification (DIP) or (IS)

#### HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 4, paragraph 3 (sound engineering practice)

PTB 05 ATEX 2048

II 1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F)

-40 ... +70 °C (-40 ... +158 °F)

-40 ... +60 °C (-40 ... +140 °F)

To certified intrinsically-safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

$C_i = 6 \text{ nF}$

$L_i = 0.4 \text{ mH}$

#### PROFIBUS PA/ FOUNDATION Fieldbus

To certified intrinsically-safe circuits with peak values:

FISCO supply unit:  
 $U_i = 17.5 \text{ V}$ ,  $I_i = 380 \text{ mA}$ ,  
 $P_i = 5.32 \text{ W}$

Linear barrier:  
 $U_i = 24 \text{ V}$ ,  $I_i = 250 \text{ mA}$ ,  $P_i = 1.2 \text{ W}$

$C_i = 1.1 \text{ nF}$

$L_i \leq 7 \mu\text{H}$

Certificate of Compliance 3025099

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Certificate of Compliance 3025099C

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC 4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

# Pressure Measurement

## Transmitters for gauge pressure for the paper industry

### SITRANS P300 with PMC connection

1

|   |   |  |   |
|---|---|--|---|
| <b>HART communication</b>                             |   | <b>FOUNDATION Fieldbus communication</b>   |   |
| HART  | 230 ... 1100 Ω  | Function blocks  | 3 function blocks analog input, 1 function block PID                    |
| Protocol  | HART Version 5.x  |  |   |
| Software for computer                                 | SIMATIC PDM   |  |   |
| <b>PROFIBUS PA communication</b>                      |   | • Analog input   | Yes, linearly rising or falling characteristic                          |
| Simultaneous communication with master class 2 (max.) | 4   | - Adaptation to customer-specific process variables  | 0 ... 100 s   |
| The address can be set using                          | Configuration tool<br>Local operation<br>(standard setting Address 126)                                 | - Electrical damping, adjustable   | Output/input (can be locked within the device with a bridge)            |
| Cyclic data usage                                     |   | - Simulation function  | parameterizable (last good value, substitute value, incorrect value)    |
| • Output byte   | One measured value: 5 bytes<br>Two measured values: 10 bytes  | - Failure mode   | Yes, one upper and lower warning limit and one alarm limit respectively |
| • Input byte  | Register operating mode:<br>1 bytes<br>Reset function due to metering:<br>1 bytes                       | - Limit monitoring   | Yes   |
| Device profile  | PROFIBUS PA Profile for Process Control Devices<br>Version 3.0, class B                                 | - Square-rooted characteristic for flow measurement  |   |
| Function blocks                                       | 2   | • PID  | Standard FOUNDATION Fieldbus function block                             |
| • Analog input  |   | • Physical block   | 1 resource block  |
| - Adaptation to customer-specific process variables   | Linearly rising or falling characteristic   | Transducer blocks  | 1 transducer block Pressure with calibration, 1 transducer block LCD    |
| - Electrical damping                                  | 0 ... 100 s adjustable  | • Pressure transducer block  |   |
| - Simulation function                                 | Input /Output   | - Can be calibrated by applying two pressures  | Yes   |
| - Limit monitoring                                    | One upper and lower warning limit and one alarm limit respectively                                      | - Monitoring of sensor limits  | Yes   |
| • Register (totalizer)                                | Can be reset and preset<br>Optional direction of counting<br>Simulation function of the register output | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function                    |
| - Limit monitoring                                    | One upper and lower warning limit and one alarm limit respectively                                      |  |   |
| • Physical block                                      | 1   |  |   |
| Transducer blocks                                     | 2   |  |   |
| • Pressure transducer block                           |   |  |   |
| - Monitoring of sensor limits                         | Yes   |  |   |
| - Specification of a container characteristic with    | Max. 31 nodes   |  |   |
| - Characteristic curve                                | Linear  |  |   |
| - Simulation function                                 | Available   |  |   |
| • Transducer block "Electronic temperature"           |   |  |   |
| Simulation function                                   | Available   |  |   |

# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P300 with PMC connection

1

### Selection and Ordering data

Article No.

**SITRANS P300 pressure transmitters with PMC connection**, single-chamber measuring housing, rating plate inscription in English

**with 4 ... 20 mA / HART**

7 MF 8 1 2 3 -

**with PROFIBUS PA**

7 MF 8 1 2 4 -

**with FOUNDATION Fieldbus (FF)**

7 MF 8 1 2 5 -

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

| Measuring cell filling | Measuring cell cleaning          |
|------------------------|----------------------------------|
| Silicone oil           | normal                           |
| Inert liquid           | Cleanliness level 2 to DIN 25410 |

### Measuring span

|                     |            |
|---------------------|------------|
| 1 bar <sup>1)</sup> | (14.5 psi) |
| 4 bar               | (58 psi)   |
| 16 bar              | (232 psi)  |

### Wetted parts materials

|                |                 |
|----------------|-----------------|
| Seal diaphragm | Measuring cell  |
| Hastelloy      | Stainless steel |

### Process connection

- PMC Style Standard: Thread 1½"
- PMC Style Minibolt: front-flush 1" (minimum span: 500 mbar (7.25 psi), not available with 1-bar-measuring cell (Option B))

### Non-wetted parts materials

- Stainless steel, deep-drawn and electrolytically polished

### Version

- Standard versions

### Explosion protection

- None
- With ATEX, Type of protection:
  - "Intrinsic safety (Ex ia)"
- Zone 20/21/22<sup>2)</sup>
- Ex nA/nL (Zone 2)<sup>3)</sup>
- With FM + CSA, Type of protection:
  - "Intrinsic Safe (is)" (planned)<sup>4)</sup>

### Electrical connection/cable entry

- Screwed gland M20 x .5 (polyamide)<sup>5)</sup>
- Screwed gland M20 x 1.5 (metal)
- Screwed gland M20 x 1.5 (stainless steel)
- M12 device plug (stainless steel), without cable socket)
- ½-14 NPT metal thread<sup>6)</sup>
- ½-14 NPT stainless steel thread<sup>6)</sup>

1

3

B

C

D

B

2

3

4

1

A

B

C

E

M

A

B

C

G

H

J

### Selection and Ordering data

Article No.

**SITRANS P300 pressure transmitters with PMC connection**, single-chamber measuring housing, rating plate inscription in English

**with 4 ... 20 mA / HART**

7 MF 8 1 2 3 -

**with PROFIBUS PA**

7 MF 8 1 2 4 -

**with FOUNDATION Fieldbus (FF)**

7 MF 8 1 2 5 -

### Display

- Without display, with keys, closed lid
- With display and keys, closed lid <sup>7)</sup>
- With display and keys, lid with polycarbonate disc (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units)<sup>7)</sup>
- With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc <sup>7)</sup>
- With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure unit)<sup>7)</sup>
- With display (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane<sup>7)</sup>

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Quick-start guide
- Sealing ring

- 1) Only with "Standard" process connection
- 2) Not in conjunction with electrical connection option A.
- 3) Only available together with electrical connection options B, C or G.
- 4) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 5) Only together with HART electronics.
- 6) Without cable gland.
- 7) Display cannot be turned.



# Pressure Measurement

## Transmitters for gauge pressure for the paper industry

### SITRANS P300 with PMC connection

1

| Selection and Ordering data  | Order code |             |           |           |
|--|------------|-------------|-----------|-----------|
| <b>Further designs</b>   |            | <b>HART</b> | <b>PA</b> | <b>FF</b> |
| Add "-Z" to Article No. and specify Order code.  |            |             |           |           |
| <b>Cable socket for M12 device plugs</b>   |            |             |           |           |
| • Stainless steel  | <b>A51</b> | ✓           | ✓         | ✓         |
| <b>Rating plate inscription</b><br>(instead of English)  |            |             |           |           |
| • German   | <b>B10</b> | ✓           | ✓         | ✓         |
| • French   | <b>B12</b> | ✓           | ✓         | ✓         |
| • Spanish  | <b>B13</b> | ✓           | ✓         | ✓         |
| • Italian  | <b>B14</b> | ✓           | ✓         | ✓         |
| <b>English rating plate</b>  | <b>B21</b> | ✓           | ✓         | ✓         |
| Pressure units in inH <sub>2</sub> O and/or psi  |            |             |           |           |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b> | <b>C11</b> | ✓           | ✓         | ✓         |
| <b>Inspection certificate</b><br>Acc. to EN 10204-3.1  | <b>C12</b> | ✓           | ✓         | ✓         |
| <b>Factory certificate</b><br>Acc. to EN 10204-2.2   | <b>C14</b> | ✓           | ✓         | ✓         |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>                       | <b>D05</b> | ✓           | ✓         | ✓         |
| <b>Degree of protection IP65/IP68</b><br>(only for M20x1.5 and ½-14 NPT)                           | <b>D12</b> | ✓           | ✓         | ✓         |
| <b>Mounting</b>  |            |             |           |           |
| • Weldable sockets for standard 1½" threaded connection  | <b>P01</b> | ✓           | ✓         | ✓         |
| • Weldable socket for minibolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)               | <b>P02</b> | ✓           | ✓         | ✓         |

| Selection and Ordering data   | Order code       |             |                 |           |
|---|------------------|-------------|-----------------|-----------|
| <b>Additional data</b>  |                  | <b>HART</b> | <b>PA</b>       | <b>FF</b> |
| Please add "-Z" to Article No. and specify Order code(s) and plain text.  |                  |             |                 |           |
| <b>Measuring range to be set</b><br>Specify in plain text (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi   | <b>Y01</b>       | ✓           | ✓ <sup>1)</sup> |           |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....   | <b>Y15</b>       | ✓           | ✓               | ✓         |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 char., specify in plain text: Y16: .....  | <b>Y16</b>       | ✓           | ✓               | ✓         |
| <b>Entry of HART address (TAG)</b><br>Max. 8 char., specify in plain text: Y17: .....   | <b>Y17</b>       | ✓           |                 |           |
| <b>Setting of pressure indication in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note: The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>*) ref. temperature 20 °C | <b>Y21</b>       | ✓           | ✓               | ✓         |
| <b>Setting of pressure indication in non-pressure units<sup>2)</sup></b><br>Specify in plain text:<br>Y22: ..... up to ..... l, m <sup>3</sup> , m, USg, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)  | <b>Y22 + Y01</b> | ✓           |                 |           |
| <b>Preset bus address</b><br>possible between 1 and 126<br>Specify in plain text: Y25: .....  | <b>Y25</b>       |             | ✓               | ✓         |

Only "Y01" and "Y21" can be factory preset

✓ = available

<sup>1)</sup> Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

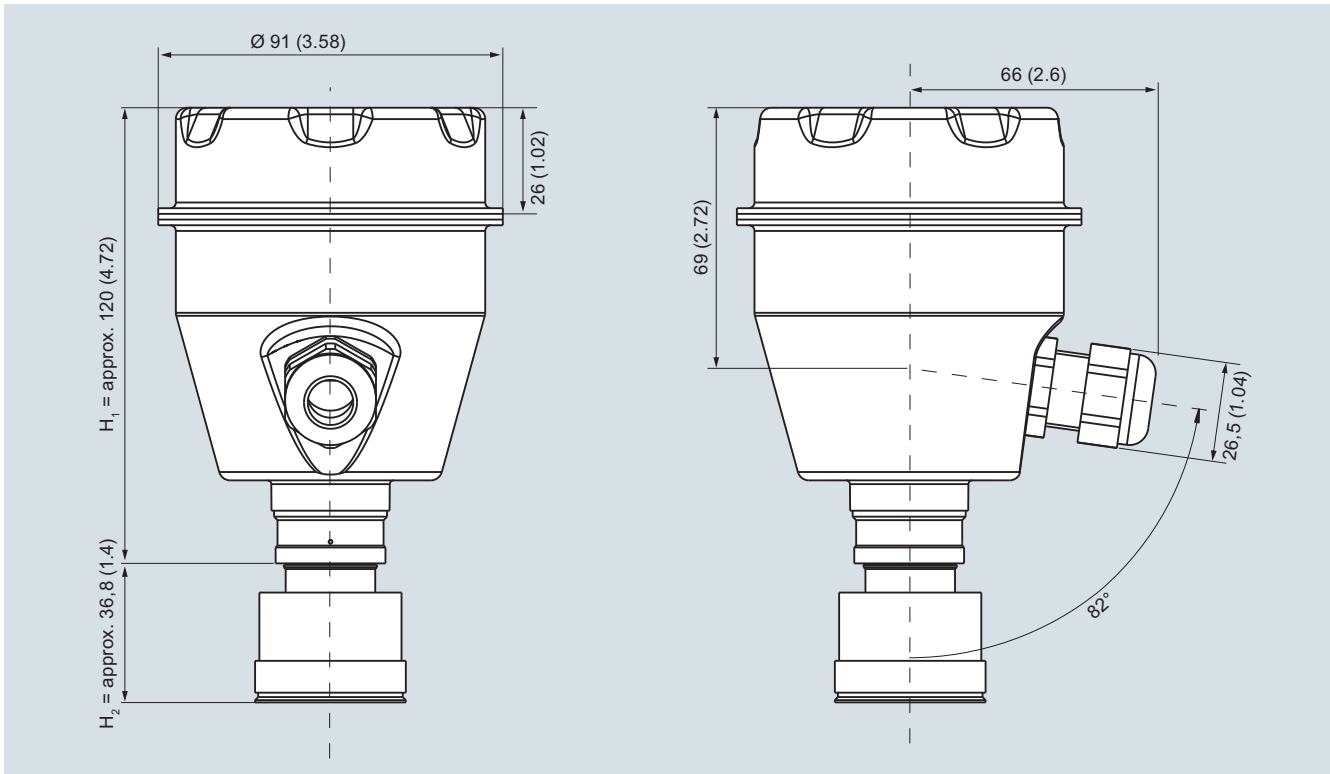
<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.

# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P300 with PMC connection

### Dimensional drawings



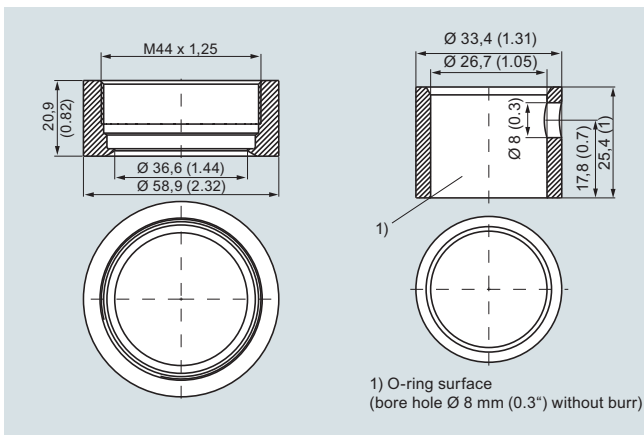
SITRANS P300 pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

The diagram shows a SITRANS P300 with an example of a flange. In this drawing the height is subdivided into  $H_1$  and  $H_2$ .

$H_1$  = Height of the SITRANS P300 up to a defined cross-section

$H_2$  = Height of the flange up to this defined cross-section

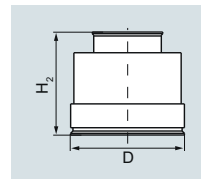
Only the height  $H_2$  is indicated in the dimensions of the flanges.



PMC Style Standard (left) and PMC Style Minibolt (right) weldable sockets, dimensions in mm (inch)

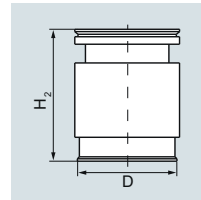
Material: Stainless steel, mat. No. 1.4404 / 316L

#### PMC Style Standard



| DN | PN | ØD             | H <sub>2</sub>               |
|----|----|----------------|------------------------------|
|    |    | 40.4 mm (1.6") | Approx.<br>36.8 mm<br>(1.4") |

#### PMC Style Mini bolt



| DN | PN | ØD             | H <sub>2</sub>               |
|----|----|----------------|------------------------------|
|    |    | 26.3 mm (1.0") | Approx.<br>33.1 mm<br>(1.3") |

**Overview**

SITRANS P310 pressure transmitters are digital pressure transmitters with a high level of operating convenience. With a measurement accuracy of 0.075 %, they complement the SITRANS P DS III and round off the portfolio. The parameterization is performed using input buttons or the HART interface.

Extensive functionality enables the pressure transmitter to be precisely adapted to the plant's requirements. Operation is very simple in spite of the numerous setting options.

Transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

SITRANS P310 pressure transmitters are available in various versions for measuring:

- Gauge pressure
- Differential pressure
- Volume flow
- Mass flow

**Benefits**

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Good long-term stability
- Wetted parts made of high-grade materials (stainless steel, Hastelloy)
- Infinitely adjustable spans from 0.01 bar to 700 bar (0.15 psi to 10153 psi)
- Measuring accuracy 0.075 %
- Parameterization over input buttons and HART interface

**Application**

SITRANS P310 pressure transmitters are particularly suited for use in the industrial areas of Energy, Oil & Gas as well as Water/Wastewater. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes them suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 3 input buttons or programmed externally over HART interface.

**Pressure transmitter for gauge pressure**

Measured variable: Gauge pressure of aggressive and non-aggressive gases, vapors and liquids.

Span (infinitely adjustable):  
0.01 bar to 700 bar (0.15 psi to 10153 psi)

**Pressure transmitters for differential pressure and flow**

Measured variables:

- Differential pressure
- Small positive or negative pressure
- Flow  $q \sim \sqrt{\Delta p}$  (together with a primary differential pressure device (see Chapter "Flow Meters"))

Span (infinitely adjustable):  
1 mbar ... 30 bar (0.0145 ... 435 psi)

## Pressure Measurement

Transmitters for applications with basic requirements (Basic)

SITRANS P310

### Technical description

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#### Design



Front view

The transmitter consists of various components depending on the order. The possible versions are listed in the ordering information. The components described below are the same for all transmitters.

The rating plate (7, Figure "Front view") with the Article No. is located on the side of the housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

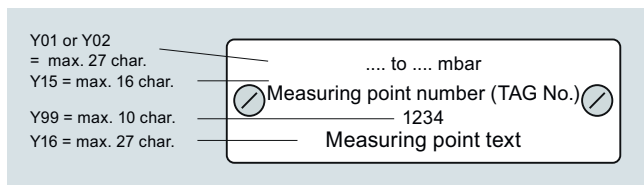
The approval label is located on the opposite side.

The housing is made of die-cast aluminium or stainless steel precision casting. A round cover (6) is screwed on at the front and rear of the housing. The front cover can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the housing.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

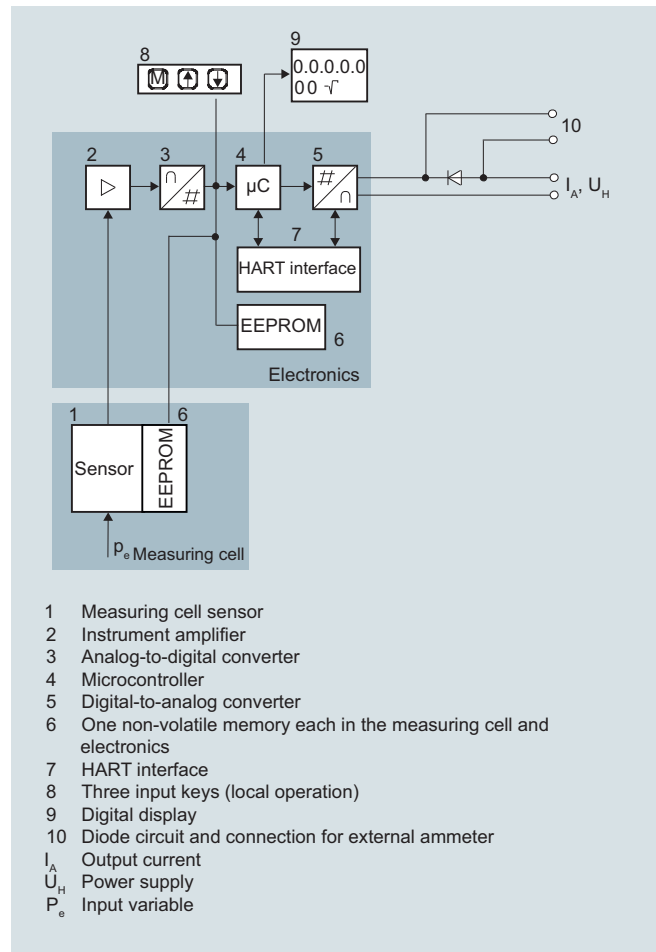
At the top of the housing is a plastic cover (1), which hides the input keys.

#### Example for an attached measuring point label



#### Function

##### Operation of electronics with HART communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with spans  $\leq 63$  bar measure the input pressure compared to atmosphere, transmitters with spans  $\geq 160$  bar compared to vacuum.

# Pressure Measurement

## Transmitters for applications with basic requirements (Basic)

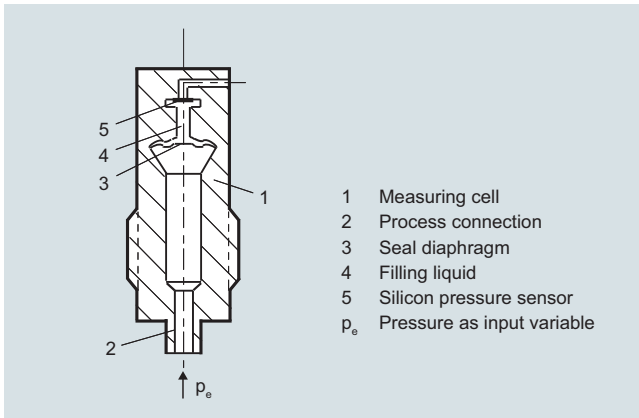
### SITRANS P310

#### Technical description

1

#### Mode of operation of the measuring cells

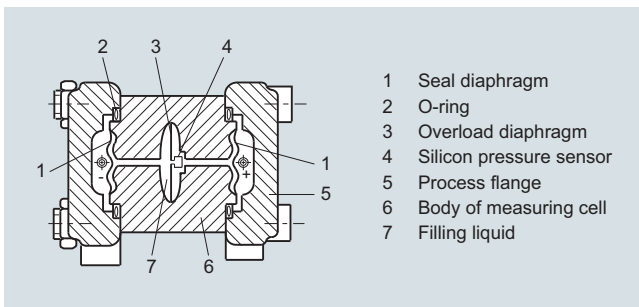
##### Measuring cell for gauge pressure



Measuring cell for gauge pressure, function diagram

The pressure  $p_e$  is applied through the process connection (2, Figure "Measuring cell for gauge pressure, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

##### Measuring cell for differential pressure and flow



Measuring cell for differential pressure and flow, function diagram

The differential pressure is transmitted through the seal diaphragms (1, Figure "Measuring cell for differential pressure and flow, function diagram") and the filling liquid (7) to the silicon pressure sensor (4).

The measuring diaphragm is flexed by the applied differential pressure. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the differential pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (3) is flexed until the seal diaphragm rests on the body of the measuring cell (6), thus protecting the silicon pressure sensor from overloads.

#### Parameterization SITRANS P310

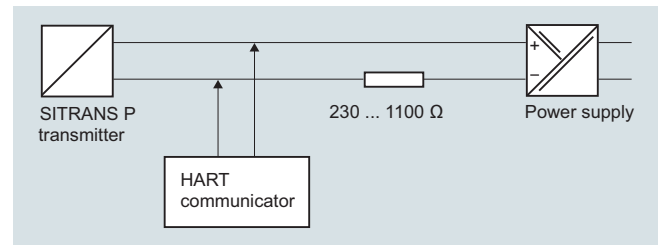
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

##### Parameterization using the input buttons (local operation)

With the input buttons you can easily set the most important parameters without any additional equipment.

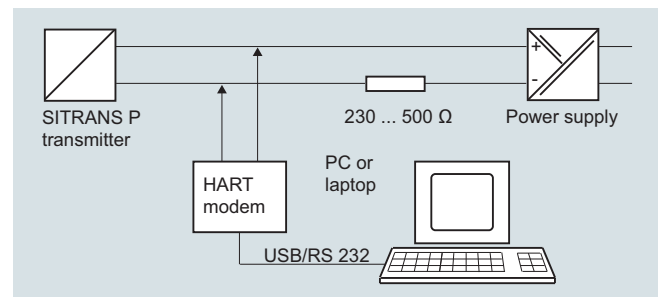
##### Parameterization using HART

Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

##### Adjustable parameters, DS III with HART

| Parameters   | Input keys (DS III HART) | HART communication |
|--|--------------------------|--------------------|
| Start of scale   | x                        | x                  |
| Full-scale value   | x                        | x                  |
| Electrical damping   | x                        | x                  |
| Start-of-scale value without application of a pressure ("Blind setting") | x                        | x                  |
| Full-scale value without application of a pressure ("Blind setting")     | x                        | x                  |
| Zero adjustment  | x                        | x                  |
| current transmitter  | x                        | x                  |
| Fault current  | x                        | x                  |
| Disabling of buttons, write protection                                   | x                        | x <sup>1)</sup>    |
| Type of dimension and actual dimension                                   | x                        | x                  |
| Characteristic (linear / square-rooted)                                  | x <sup>2)</sup>          | x <sup>2)</sup>    |
| Input of characteristic  |                          | x                  |
| Freely-programmable LCD  |                          | x                  |
| Diagnostic functions   |                          | x                  |

<sup>1)</sup> Cancel apart from write protection

<sup>2)</sup> Only differential pressure

## Pressure Measurement

Transmitters for applications with basic requirements (Basic)

SITRANS P310

1

### Technical description

Available physical units of display for SITRANS P310 with HART

| Physical variable                                  | Physical dimensions   |
|--|---|
| Pressure (setting can also be made in the factory) | Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O, ftH <sub>2</sub> O (20 °C), inHg, mmHg |
| Level (height data)                                | m, cm, mm, ft, in   |
| Volume   | m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid  |
| Mass   | g, kg, t, lb, Ston, Lton, oz  |
| volume flow  | m <sup>3</sup> /d, m <sup>3</sup> /h, m <sup>3</sup> /s, l/min, l/s, ft <sup>3</sup> /d, ft <sup>3</sup> /min, ft <sup>3</sup> /s, US gallon/min, US gallon/s                               |
| Mass flow  | t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min   |
| Temperature  | K, °C, °F, °R   |
| Miscellaneous                                      | %, mA   |

## Technical specifications

## SITRANS P310 for gauge pressure

## Input

Measured variable

Gauge pressure

Span (fully adjustable), max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

Span

Max. operating pressure MAWP (PS)

Max. perm. test pressure

0.01 ... 1 bar  
1 ... 100 kPa  
0.15 ... 14.5 psi4 bar  
400 kPa  
58 psi6 bar  
600 kPa  
87 psi0.04 ... 4 bar  
4 ... 400 kPa  
0.58 ... 58 psi7 bar  
0.7 MPa  
102 psi10 bar  
1 MPa  
145 psi0.16 ... 16 bar  
16 ... 1600 kPa  
2.3 ... 232 psi21 bar  
2.1 MPa  
305 psi32 bar  
3.2 MPa  
464 psi0.63 ... 63 bar  
63 ... 6300 kPa  
9.1 ... 914 psi67 bar  
6.7 MPa  
972 psi100 bar  
10 MPa  
1450 psi1.6 ... 1 bar  
0.16 ... 16 MPa  
23 ... 2321 psi167 bar  
16.7 MPa  
2422 psi250 bar  
25 MPa  
3626 psi4 ... 400 bar  
0.4 ... 40 MPa  
58 ... 5802 psi400 bar  
40 MPa  
5802 psi600 bar  
60 MPa  
8700 psi7 ... 700 bar  
0.7 ... 70 MPa  
102 ... 10153 psi800 bar  
80 MPa  
11603 psi800 bar  
80 MPa  
11603 psi

Lower measuring limit

- Measuring cell with silicone oil filling

30 mbar a/3 kPa a/0.44 psi a

Upper measuring limit

100 % of max. span

Start of scale value

Between the measuring limits continuously adjustable

## Output

Output signal

4 ... 20 mA

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

Load

- Without HART

$$R_B \leq (U_H - 10.5 \text{ V}) / 0.023 \text{ A in } \Omega$$

$$U_H: \text{Power supply in V}$$

- With HART

$$R_B = 230 \dots 500 \Omega \text{ (SIMATIC PDM) or}$$

$$R_B = 230 \dots 1100 \Omega \text{ (HART Communicator)}$$

Protection against polarity reversal

Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)



# Pressure Measurement

Transmitters for applications with basic requirements (Basic)

SITRANS P310

for gauge pressure

1

## SITRANS P310 for gauge pressure

### Measuring accuracy

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 1 bar/100 kPa/3.6 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi
- 400 bar/40 MPa/5802 psi
- 700 bar/70 MPa/10152 psi

$r \leq 5 :$   $\leq 0.075 \%$   
 $5 < r \leq 100 :$   $\leq (0.005 \cdot r + 0.07) \%$

$r \leq 3 :$   $\leq 0.075 \%$   
 $3 < r \leq 100 :$   $\leq (0.005 \cdot r + 0.07) \%$

Influence of ambient temperature (in percent per 28 °C (50 °F))

- at -40 ... +85 °C (-40 ... 185 °F)

$\leq (0.15 \cdot r + 0.25) \%$

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

$\leq (0.25 \cdot r) \%$  in 5 years

Effect of mounting position

$\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi}$  per 10° inclination  
 (zero point correction is possible with position error compensation)

Effect of auxiliary power supply  
 (in percent per change in voltage)

0.005 % per 1 V

### Rated conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %  
 Condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

### Design

Weight (without options)

Die-cast aluminum:  $\approx 2.0 \text{ kg}$  ( $\approx 4.4 \text{ lb}$ )  
 Stainless steel precision casting:  $\approx 4.6 \text{ kg}$  ( $\approx 10.1 \text{ lb}$ )

Enclosure material

Low-copper die-cast aluminum, GD-AISI 12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Connection shank

Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602

- Seal diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

Measuring cell filling

Silicone oil

Process connection

Connection shank G $\frac{1}{2}$ B to DIN EN 837-1, female thread  $\frac{1}{2}$ -14 NPT or male thread M20 x 1.5

Material of mounting bracket

- Steel

Sheet-steel, Mat. No. 1.0330, chrome-plated

- Stainless steel 304

Sheet stainless steel, mat. no. 1.4301 (SS 304)

- Stainless steel 316L

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

### Power supply $U_H$

Terminal voltage on transmitter

10.5 ... 45 V DC  
 10.5 ... 30 V DC in intrinsically-safe mode

# Pressure Measurement

## Transmitters for applications with basic requirements (Basic)

### SITRANS P310

for gauge pressure

1

**SITRANS P, DS III series for gauge pressure****Certificates and approvals**

Classification according to PED 2014/68/EU

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Explosion protection

## • Intrinsic safety "i"

PTB 13 ATEX 2007 X

- Marking

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

- Permissible ambient temperature

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

- Connection

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ;  $R_i = 300 \Omega$

- Effective internal inductance/capacitance

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

## • Explosion-proof "d"

PTB 99 ATEX 1160

- Marking

Ex II 1/2 G Ex d IIC T4/T6 Gb

- Permissible ambient temperature

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

- Connection

To circuits with values:  $U_H = 10.5 \dots 45 \text{ V DC}$ 

## • Dust explosion protection for zone 20 (pending)

PTB 01 ATEX 2055

- Marking

Ex II 1 D Ex ta IIIC T120 °C Da  
 Ex II 1/2 D Ex ta/tb IIIC T120 °C Da/Db

- Permissible ambient temperature

-40 ... +85 °C (-40 ... +185 °F)

- Max. surface temperature

120 °C (248 °F)

- Connection

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

- Effective internal inductance/capacitance

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

## • Dust explosion protection for zone 21/22 (pending)

PTB 01 ATEX 2055

- Marking

Ex II 2 D Ex tb IIIC T120 °C Db

- Connection

To circuits with values:  
 $U_H = 10.5 \dots 45 \text{ V DC}$ ;  $P_{\max} = 1.2 \text{ W}$

## • Type of protection "n" (zone 2)

PTB 13 ATEX 2007 X

- Marking

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc  
 Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

- Connection (Ex nA)

 $U_m = 45 \text{ V}$ 

- Connections (Ex ic)

To circuits with values:  
 $U_i = 45 \text{ V}$

- Effective internal inductance/capacitance

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

## • Explosion protection acc. to FM (pending)

Certificate of Compliance 3008490

- Identification (XP/DIP) or (IS); (NI)

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

## • Explosion protection to CSA (pending)

Certificate of Compliance 1153651

- Identification (XP/DIP) or (IS)

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

**HART communication**

HART

230 ... 1100  $\Omega$ 

Protocol

HART Version 5.x

Software for computer

SIMATIC PDM


# Pressure Measurement

Transmitters for applications with basic requirements (Basic)

SITRANS P310

for gauge pressure

1

| Selection and Ordering data   |                                | Article No.      |
|---|--------------------------------|------------------|
| <b>Pressure transmitter for gauge pressure, SITRANS P310 with HART</b>  |                                | <b>7MF2033 -</b> |
|  Click on the Article No. for the online configuration in the PIA Life Cycle Portal. |                                |                  |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b> |                  |
| Silicone oil  | normal                         | 1                |
| <b>Measuring span (min. ... max.)</b>   |                                |                  |
| 0.01 ... 1 bar  | (0.15 ... 14.5 psi)            | B                |
| 0.04 ... 4 bar  | (0.58 ... 58 psi)              | C                |
| 0.16 ... 16 bar   | (2.32 ... 232 psi)             | D                |
| 0.63 ... 63 bar   | (9.14 ... 914 psi)             | E                |
| 1.6 ... 160 bar   | (23.2 ... 2320 psi)            | F                |
| 4.0 ... 400 bar   | (58.0 ... 5802 psi)            | G                |
| 7.0 ... 700 bar   | (102.0 ... 10153 psi)          | J                |
| <b>Wetted parts materials</b>   |                                |                  |
| Seal diaphragm  | Process connection             |                  |
| Stainless steel   | Stainless steel                | A                |
| Hastelloy   | Stainless steel                | B                |
| Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" (recommended version) <sup>1) 2) 3) 4)</sup>                             |                                | Y 1              |
| Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" <sup>1) 2) 3) 4)</sup>   |                                | Y 0              |
| <b>Process connection</b>   |                                |                  |
| • Connection shank G1/2B to EN 837-1  |                                | 0                |
| • Female thread 1/2-14 NPT  |                                | 1                |
| • Male thread M20 x 1.5   |                                | 5                |
| <b>Non-wetted parts materials</b>   |                                |                  |
| • Housing made of die-cast aluminium  |                                | 0                |
| • Housing stainless steel precision casting <sup>5)</sup>   |                                | 3                |
| <b>Version</b>  |                                |                  |
| • Standard version, German plate inscription, setting for pressure unit: bar  |                                | 1                |
| • International version, English plate inscription, setting for pressure unit: bar  |                                | 2                |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal   |                                | 3                |
| All versions include DVD with compact operating instructions in various EU languages.   |                                |                  |
| <b>Explosion protection</b>   |                                |                  |
| • None  |                                | A                |
| • With ATEX, Type of protection:  |                                |                  |
| - "Intrinsic safety (Ex ia)"  |                                | B                |
| - "Explosion-proof (Ex d)" <sup>6)</sup>  |                                | D                |
| - "Ex nA/ic (Zone 2)" <sup>7)</sup>   |                                | E                |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>8) 9)</sup> (pending)                                  |                                | R                |
| • FM + CSA intrinsic safe (is) (pending) <sup>10)</sup>   |                                | F                |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>8) 9) 10)</sup> (pending)  |                                | S                |
| • With FM + CSA, Type of protection:  |                                |                  |
| - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>6) 10)</sup> (pending)  |                                | NC               |
| <b>Electrical connection / cable entry</b>  |                                |                  |
| • Screwed gland M20 x1 .5   |                                | B                |
| • Screwed gland 1/2-14 NPT  |                                | C                |
| • Han 7D device plug (plastic housing) incl. mating connector <sup>11)</sup>  |                                | D                |

| Selection and Ordering data   |  | Article No.      |
|---|--|------------------|
| <b>Pressure transmitter for gauge pressure, SITRANS P310 with HART</b>  |  | <b>7MF2033 -</b> |
| <b>Display</b>  |  |                  |
| • without display   |  | 0                |
| • without visible display (display concealed, setting: mA)  |  | 1                |
| • with visible display (setting: mA)  |  | 6                |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)   |  | 7                |
| Power supply units see Chap. 7 "Supplementary Components".  |  |                  |
| A quick-start guide is included in the scope of delivery of the device.   |  |                  |
| 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here. |  |                  |
| 2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.   |  |                  |
| 3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y... and 7MF4900-1...-B   |  |                  |
| 4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.   |  |                  |
| 5) Not in conjunction with Electrical connection "Han 7D device plug".  |  |                  |
| 6) Without cable gland, with blanking plug  |  |                  |
| 7) Configurations with Han and M12 device plugs are only available in Ex ic.  |  |                  |
| 8) With enclosed cable gland Ex ia and blanking plug.   |  |                  |
| 9) Only in connection with IP66.  |  |                  |
| 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.   |  |                  |
| 11) Only in connection with Ex approval A, B or E.  |  |                  |

# Pressure Measurement

## Transmitters for applications with basic requirements (Basic)

### SITRANS P310

for gauge pressure

1

| Selection and Ordering data   | Order code        |
|---|-------------------|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |                   |
| <b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>       |                   |
| • Steel   | A01               |
| • Stainless steel 304   | A02               |
| • Stainless steel 316L  | A03               |
| <b>Device plugs<sup>1)</sup></b>  |                   |
| • Han 7D (metal)  | A30               |
| • Han 8D (instead of Han 7D)  | A31               |
| • Angled  | A32               |
| • Han 8D (metal)  | A33               |
| <b>Rating plate inscription</b><br>(instead of German)  |                   |
| • French  | B12               |
| • Spanish   | B13               |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi  | B21               |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>2)</sup></b>                                 | C11               |
| <b>Inspection certificate<sup>3)</sup></b><br>Acc. to EN 10204-3.1  | C12               |
| <b>Factory certificate</b><br>Acc. to EN 10204-2.2  | C14               |
| <b>Acceptance certificate (EN 10204-3.1)</b><br>PMI test of parts in contact with medium  | C15               |
| <b>Functional safety (SIL2) (pending)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | C20               |
| <b>Functional safety (SIL2/3)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration         | C23               |
| <b>PED for Russia with initial calibration mark</b>   | C99               |
| <b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>  | D07               |
| <b>Degree of protection IP66/IP68</b><br>(only for M20x1.5 and ½-14 NPT)  | D12               |
| <b>Cable gland and sealing plug made of metal</b>   | D32               |
| <b>TAG plate empty (no inscription)</b>   | D61               |
| <b>Export approval Korea</b>  | E11               |
| <b>CRN approval Canada</b><br>(Canadian Registration Number)  | E22               |
| <b>Dual seal</b>  | E24               |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF2033-.....-B..)  | E55 <sup>4)</sup> |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF2033-.....-D..)                                      | E56 <sup>4)</sup> |
| <b>Ex protection "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF2033-.....-E..)  | E57 <sup>4)</sup> |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b><br>(only for transmitter 7MF2.....-B..)   | E80               |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b><br>(only for transmitter 7MF2.....-D..)  | E81               |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b><br>(only for transmitter 7MF2.....-E..)                                     | E82               |

| Selection and Ordering data  | Order code |
|--|------------|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.  |            |
| <b>Transient protector 6 kV (lightning protection)</b>   | J01        |
| <b>Marine approvals</b>  |            |
| • Det Norske Veritas Germanischer Lloyd (DNV-GL)   | S10        |
| • Lloyds Register (LR)   | S11        |
| • French marine classification society Bureau Veritas (BV)   | S12        |
| • American Bureau of Shipping (ABS)  | S14        |
| • Russian Maritime Register (RMR)  | S16        |
| • Korean Register of Shipping (KR)   | S17        |
| 1) Han device plug IP65  |            |
| 2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. |            |
| 3) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.  |            |
| 4) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.   |            |

| Selection and Ordering data  | Order code |
|--|------------|
| <b>Additional data</b><br>Please add "-Z" to Article No. and specify Order code(s) and plain text.   |            |
| <b>Measuring range to be set</b><br>Specify in plain text (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi  | Y01        |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....  | Y15        |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 characters, specify in plain text:<br>Y16: .....   | Y16        |
| <b>Entry of HART address (TAG)</b><br>Max. 8 characters, specify in plain text:<br>Y17: .....  | Y17        |
| <b>Setting of pressure indication in pressure units</b><br>Specify in plain text (standard setting: bar): Y21:<br>mbar, bar, kPa, MPa, psi, ...<br>Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br><sup>*</sup> ) ref. temperature 20 °C | Y21        |
| <b>Setting of pressure indication in non-pressure units<sup>1)</sup></b><br>Specify in plain text:<br>Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)   | Y22 + Y01  |
| <b>Ordering example</b><br>Item line: 7MF2033-1EA00-1AA7-Z<br>B line: A01 + Y01 + Y21<br>C line: Y01: 10 ... 20 bar (145 ... 290 psi)<br>C line: Y21: bar (psi)  |            |

1) Preset values can only be changed over SIMATIC PDM.

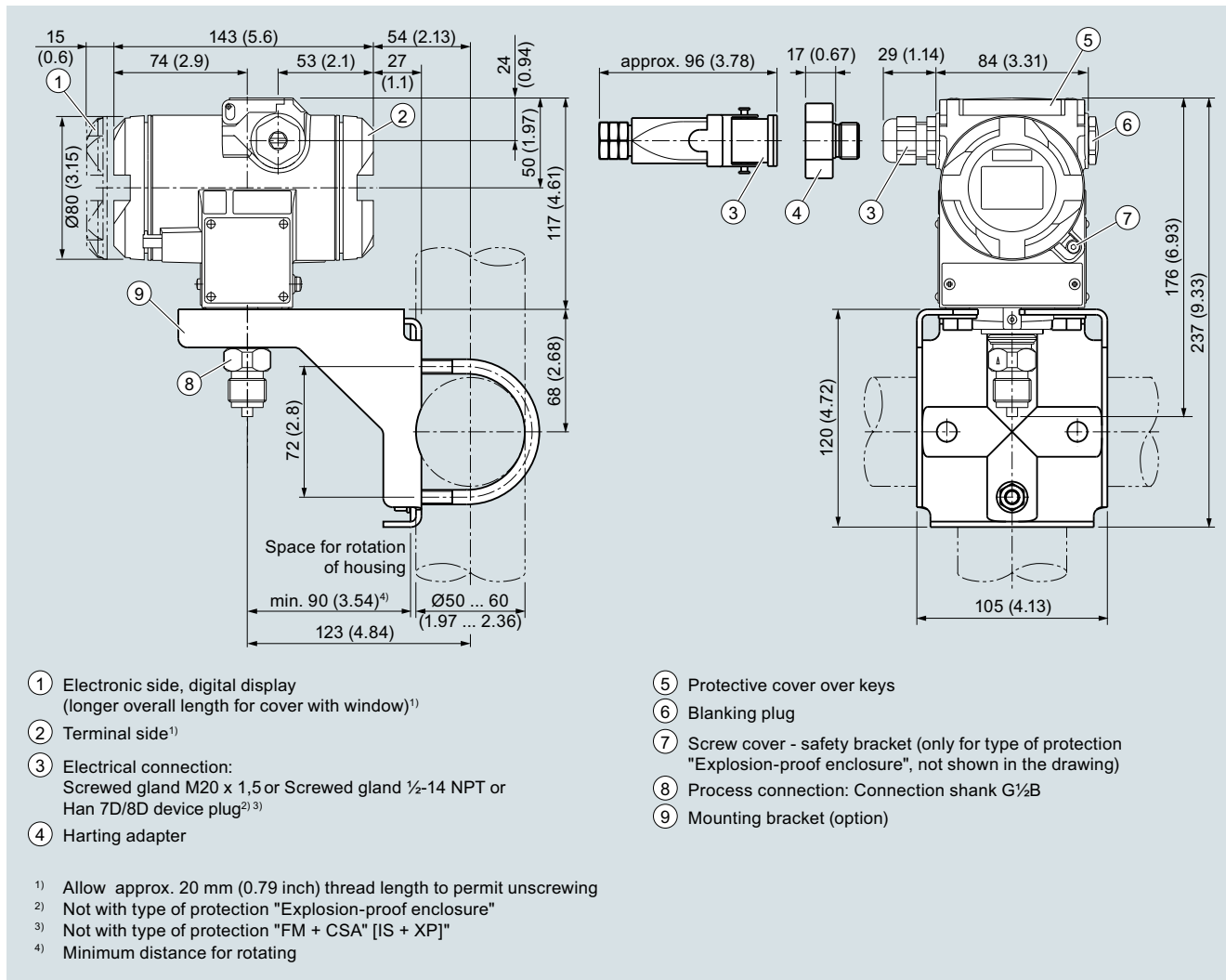
## Pressure Measurement

Transmitters for applications with basic requirements (Basic)

SITRANS P310

for gauge pressure

### Dimensional drawings



SITRANS P310 pressure transmitters for gauge pressure, dimensions in mm (inch)

## Technical specifications

## SITRANS P310 for differential pressure and flow

## Input

Measured variable

Differential pressure and flow

Span (fully adjustable), max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive)

Span

Max. operating pressure MAWP (PS)

1 ... 60 mbar  
0.1 ... 6 kPa  
0.4 ... 24 inH<sub>2</sub>O160 bar  
16 MPa  
2320 psi2.5 ... 250 mbar  
0.2 ... 25 kPa  
1 ... 100 inH<sub>2</sub>O6 ... 600 mbar  
0.6 ... 60 kPa  
2.4 ... 240 inH<sub>2</sub>O16 ... 1600 mbar  
1.6 ... 160 kPa  
6.4 ... 642 inH<sub>2</sub>O50 ... 5000 mbar  
5 ... 500 kPa  
20 ... 2000 inH<sub>2</sub>O0.3 ... 30 bar  
0.03 ... 3 MPa  
4.35 ... 435 psi

Lower measuring limit

- Measuring cell with silicone oil filling

-100 % of max. measuring range (-33 % for 30 bar/3 MPa/435 psi cell) or  
30 mbar a/3 kPa a/0.44 psi a

Upper measuring limit

100 % of max. span

Start of scale value

Between the measuring limits continuously adjustable

## Output

Output signal

4 ... 20 mA

- Lower limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

- Upper limit (infinitely adjustable)

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

Load

- Without HART

$$R_B \leq (U_H - 10.5 \text{ V}) / 0.023 \text{ A in } \Omega$$

$$U_H: \text{Power supply in V}$$

- With HART

$$R_B = 230 \dots 500 \Omega \text{ (SIMATIC PDM) or}$$

$$R_B = 230 \dots 1100 \Omega \text{ (HART Communicator)}$$

Protection against polarity reversal

Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

# Pressure Measurement

Transmitters for applications with basic requirements (Basic)

SITRANS P310

## for differential pressure and flow

### SITRANS P310 for differential pressure and flow

#### Measuring accuracy

Reference conditions

(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

#### • Linear characteristic

- 60 mbar/6 kPa/0.87 psi

$r \leq 5$  :  $\leq 0.075 \%$   
 $5 < r \leq 60$ :  $\leq (0.005 \cdot r + 0.07) \%$

- 250 mbar/25 kPa/3.6 psi  
 600 mbar/60 kPa/8.7 psi  
 1600 mbar/160 kPa/23.2 psi  
 5000 mbar/500 kPa/72.5 psi  
 30 bar/3000 kPa/435 psi

$r \leq 5$  :  $\leq 0.075 \%$   
 $5 < r \leq 100$ :  $\leq (0.005 \cdot r + 0.07) \%$

#### • Square-rooted characteristic (flow > 50 %)

- 60 mbar/6 kPa/0.87 psi

$r \leq 5$  :  $\leq 0.075 \%$   
 $5 < r \leq 60$ :  $\leq (0.005 \cdot r + 0.07) \%$

- 250 mbar/25 kPa/3.6 psi  
 600 mbar/60 kPa/8.7 psi  
 1600 mbar/160 kPa/23.2 psi  
 5000 mbar/500 kPa/72.5 psi  
 30 bar/3000 kPa/435 psi

$r \leq 5$  :  $\leq 0.075 \%$   
 $5 < r \leq 100$ :  $\leq (0.005 \cdot r + 0.07) \%$

#### • Square-rooted characteristic (flow > 25 ... 50 %)

- 60 mbar/6 kPa/0.87 psi

$r \leq 5$  :  $\leq 0.15 \%$   
 $5 < r \leq 60$ :  $\leq (0.01 \cdot r + 0.14) \%$

- 250 mbar/25 kPa/3.6 psi  
 600 mbar/60 kPa/8.7 psi  
 1600 mbar/160 kPa/23.2 psi  
 5000 mbar/500 kPa/72.5 psi  
 30 bar/3000 kPa/435 psi

$r \leq 5$  :  $\leq 0.15 \%$   
 $5 < r \leq 100$ :  $\leq (0.01 \cdot r + 0.14) \%$

Influence of ambient temperature (in percent per 28 °C (50 °F))

#### • at -40 ... +85 °C (-40 ... +185 °F)

$\leq (0.15 \cdot r + 0.25) \%$

Influence of static pressure

#### • on the zero point

- 60 mbar/6 kPa/0.87 psi  
 250 mbar/25 kPa/3.63 psi  
 600 mbar/60 kPa/8.7 psi  
 1600 mbar/160 kPa/23.21 psi

$\leq (0.15 \cdot r) \%$  per 70 bar  
 (zero point correction is possible with position error compensation)

- 5 bar/500 kPa/72.5 psi  
 30 bar/3 MPa/435 psi

$\leq (0.2 \cdot r) \%$  per 70 bar  
 (zero point correction is possible with position error compensation)

#### • on the span

$\leq 0.14 \%$  per 70 bar/7 MPa/1015 psi

Long-term stability

(temperature change  $\pm 30$  °C ( $\pm 54$  °F))

$\leq (0.25 \cdot r) \%$  in 5 years  
 static pressure max. 70 bar/7 MPa/1015 psi

Effect of mounting position (in pressure per change in angle)

$\leq 0.7$  mbar/0.07 kPa/0.001015 psi per 10° inclination  
 (zero point correction is possible with position error compensation)

Effect of auxiliary power supply (in percent per change in voltage)

0.005 % per 1 V



**SITRANS P310 for differential pressure and flow****Rated conditions**

Degree of protection

- according to EN 60529
- according to NEMA 250

Temperature of medium

- Measuring cell with silicone oil filling

- In conjunction with dust explosion protection

Ambient conditions

- Ambient temperature

- Transmitter
- Display readable

- Storage temperature

- Climatic class

- Condensation

- Electromagnetic Compatibility

- Emitted interference and interference immunity

IP66 (optional IP66/IP68)

Type 4X

-40 ... +100 °C (-40 ... +212 °F);  
-20 ... +100 °C (-4 ... +212 °F) with 30 bar measuring cell

-20 ... +60 °C (-4 ... +140 °F)

-40 ... +85 °C (-40 ... +185 °F)

-30 ... +85 °C (-22 ... +185 °F)

-50 ... +85 °C (-58 ... +185 °F)

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

Acc. to IEC 61326 and NAMUR NE 21

**Design**

Weight (without options)

Die-cast aluminum: ≈ 4.5 kg (≈ 9.9 lb)

Stainless steel precision casting: ≈ 7.1 kg (≈ 15.6 lb)

Enclosure material

Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Seal diaphragm
- Process flanges and sealing screw
- O-Ring

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602

FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR

Measuring cell filling

Silicone oil

Process connection

Female thread 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518

Material of mounting bracket

- Steel
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

**Power supply  $U_H$** 

Terminal voltage on transmitter

10.5 ... 45 V DC

10.5 ... 30 V DC in intrinsically-safe mode

# Pressure Measurement

Transmitters for applications with basic requirements (Basic)

SITRANS P310

## for differential pressure and flow

1

### SITRANS P310 for differential pressure and flow

#### Certificates and approvals

Classification according to PED 2014/68/EU

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature
- Connection
- Effective internal inductance/capacitance

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
-40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

- Explosion-proof "d"

- Marking
- Permissible ambient temperature

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:  $U_H = 10.5 \dots 45 \text{ V DC}$

- Dust explosion protection for zone 20 (pending)

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection
- Effective internal inductance/capacitance

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120 °C Da

Ex II 1/2 D Ex ta/tb IIIC T120 °C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

$L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

- Dust explosion protection for zone 21/22 (pending)

- Marking
- Connection

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120 °C Db

To circuits with values:  $U_H = 10.5 \dots 45 \text{ V DC}$ ;  $P_{\max} = 1.2 \text{ W}$

- Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)
- Effective internal inductance/capacitance

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

$U_m = 45 \text{ V}$

To circuits with values:

$U_i = 45 \text{ V}$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

- Explosion protection acc. to FM (pending)

- Identification (XP/DIP) or (IS); (NI)

Certificate of Compliance 3008490

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

- Explosion protection to CSA (pending)

- Identification (XP/DIP) or (IS)

Certificate of Compliance 1153651

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

#### HART communication

HART

230 ... 1100  $\Omega$

Protocol

HART Version 5.x

Software for PC

SIMATIC PDM

# Pressure Measurement

## Transmitters for applications with basic requirements (Basic)

### SITRANS P310

for differential pressure and flow

1

| Selection and Ordering data  |   | Article No.                                | Selection and Ordering data   |  | Article No.           |
|--|---|--|---|--|-----------------------|
| <b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)</b>  |   | <b>7 MF 2 4 3 3 -</b>                      | <b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)</b>   |  | <b>7 MF 2 4 3 3 -</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |   |  | <b>Electrical connection/cable entry</b>  |  |                       |
| <b>Measuring cell filling</b>  |   |  | <ul style="list-style-type: none"> <li>Screwed gland M20 x 1.5</li> <li>Screwed gland ½-14 NPT</li> <li>Han 7D device plug (plastic housing) incl. mating connector<sup>12/13)</sup></li> </ul>   |  | B<br>C<br>D           |
| <b>Measuring cell cleaning</b>   |   |  | <b>Display</b>  |  |                       |
| Silicone oil   | normal  | 1  | <ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: mA)</li> <li>With visible display (setting: mA)</li> <li>with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)</li> </ul>  |  | 0<br>1<br>6<br>7      |
| <b>Measuring span (min. ... max.)</b>  |   |  | <b>Power supply units</b> see Chap. 7 "Supplementary Components".   |  |                       |
| PN 160 (MAWP 2320 psi)   |   |  | Included in delivery of the device:   |  |                       |
| 1 ... 60 mbar (0.4015 ... 24.09 inH <sub>2</sub> O)  |   | C  | <ul style="list-style-type: none"> <li>Quick-start guide</li> <li>Sealing plug(s) or sealing screw(s) for the process flanges(s)</li> </ul>   |  |                       |
| 2.5 ... 250 mbar (1.004 ... 100.4 inH <sub>2</sub> O)  |   | D  | <ol style="list-style-type: none"> <li>When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.</li> <li>If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.</li> <li>The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-...Y... and 7MF4900-1...-B</li> <li>The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.</li> <li>Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).</li> <li>Not in conjunction with Electrical connection "Han 7D device plug".</li> <li>Without cable gland, with blanking plug</li> <li>With enclosed cable gland Ex ia and blanking plug</li> <li>Configurations with Han and M12 device plugs are only available in Ex ic.</li> <li>Only in connection with IP66.</li> <li>Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.</li> <li>Only in connection with Ex approval A, B or E.</li> <li>Permissible only for crimp-contact of conductor cross-section 1 mm<sup>2</sup></li> </ol> |  |                       |
| 6 ... 600 mbar (2.409 ... 240.9 inH <sub>2</sub> O)  |   | E  |   |  |                       |
| 16 ... 1600 mbar (6.424 ... 642.4 inH <sub>2</sub> O)  |   | F  |   |  |                       |
| 50 ... 5000 mbar (20.08 ... 2008 inH <sub>2</sub> O)   |   | G  |   |  |                       |
| 0.3 ... 30 bar (4.35 ... 435 psi)  |   | H  |   |  |                       |
| <b>Wetted parts materials</b>  |   |  |   |  |                       |
| (stainless steel process flanges)  |   |  |   |  |                       |
| Seal diaphragm   | Parts of measuring cell                         |  |   |  |                       |
| Stainless steel  | Stainless steel                                 | A  |   |  |                       |
| Hastelloy  | Stainless steel                                 | B  |   |  |                       |
| Version for diaphragm seal <sup>1) 2) 3) 4)</sup>  |   | Y  |   |  |                       |
| <b>Process connection</b>  |   |  |   |  |                       |
| Female thread ¼-18 NPT with flange connection  |   |  |   |  |                       |
| <ul style="list-style-type: none"> <li>Sealing screw opposite process connection</li> <li>- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>- Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul>  |   | 2<br>0                                     |   |  |                       |
| <ul style="list-style-type: none"> <li>Vent on side of process flange<sup>5)</sup></li> <li>- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>- Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul>  |   | 6<br>4                                     |   |  |                       |
| <b>Non-wetted parts materials</b>  |   |  |   |  |                       |
| process flange screws Electronics housing  |   |  |   |  |                       |
| Stainless steel  | Die-cast aluminum                               | 2  |   |  |                       |
| Stainless steel  | Stainless steel precision casting <sup>6)</sup> | 3  |   |  |                       |
| <b>Version</b>   |   |  |   |  |                       |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>  |   | 1<br>2<br>3                                |   |  |                       |
| All versions include DVD with compact operating instructions in various EU languages.  |   |  |   |  |                       |
| <b>Explosion protection</b>  |   |  |   |  |                       |
| <ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"<sup>7)</sup></li> <li>"Explosion-proof (Ex d)"<sup>7)</sup></li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>8)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>9)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"<sup>8)10)</sup> (pending)</li> </ul> </li> <li>FM + CSA intrinsic safe (is) (pending)<sup>11)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>8)10)11)</sup> (pending)</li> <li>With FM + CSA, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>7)11)</sup> (pending)</li> </ul> </li> </ul> |   | A<br>B<br>D<br>P<br>E<br>R<br>F<br>S<br>NC |   |  |                       |

## Pressure Measurement

Transmitters for applications with basic requirements (Basic)

SITRANS P310

for differential pressure and flow

1

| Selection and Ordering data   | Order code |
|---|------------|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |            |
| <b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>                   |            |
| • Steel   | A01        |
| • Stainless steel 304   | A02        |
| • Stainless steel 316L  | A03        |
| <b>O-rings for process flanges</b><br>(instead of FPM (Viton))  |            |
| • PTFE (Teflon)   | A20        |
| • FEP (with silicone core, approved for food)   | A21        |
| • FFP (Kalrez, compound 4079),<br>for measured medium temperatures<br>-15 ... 100 °C (5 ... 212 °F)   | A22        |
| • NBR (Buna N)  | A23        |
| <b>Device plugs<sup>1)</sup></b>  |            |
| • Han 7D (metal)  | A30        |
| • Han 8D (instead of Han 7D)  | A31        |
| • Angled  | A32        |
| • Han 8D (metal)  | A33        |
| <b>Sealing screws (2 units)</b><br>¼-18 NPT, with valve in mat. of process flanges  | A40        |
| <b>Rating plate inscription</b><br>(instead of German)  |            |
| • French  | B12        |
| • Spanish   | B13        |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi  | B21        |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>2)</sup></b>   | C11        |
| <b>Inspection certificate<sup>3)</sup></b> to EN 10204-3.1  | C12        |
| <b>Factory certificate</b> to EN 10204-2.2  | C14        |
| <b>Acceptance certificate (EN 10204-3.1)</b><br>PMI test of parts in contact with medium  | C15        |
| <b>Functional safety (SIL2) (pending)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration             | C20        |
| <b>Functional safety (SIL2/3)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration                     | C23        |
| <b>PED for Russia with initial calibration mark</b>   | C99        |
| <b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b><br>(only together with seal diaphragm made of Hastelloy and stainless steel) | D07        |
| <b>Degree of protection IP66/IP68</b><br>(only for M20 x 1.5 and ½-14 NPT)  | D12        |
| <b>Cable gland and sealing plug made of metal</b>   | D32        |
| <b>Supplied with oval flange set</b><br>(2 items), PTFE packings and screws in thread of process flanges  | D37        |
| <b>TAG plate empty (no inscription)</b>   | D61        |

| Selection and Ordering data   | Order code        |
|---|-------------------|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.                                       |                   |
| <b>Export approval Korea</b>  | E11               |
| <b>Dual seal</b>  | E24               |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-B..)          | E55 <sup>4)</sup> |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-D..)      | E56 <sup>4)</sup> |
| <b>Explosion-proof "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-E..)                    | E57 <sup>4)</sup> |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b><br>(only for transmitter 7MF2...-.....-B..)             | E80               |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b><br>(only for transmitter 7MF2...-.....-D..)              | E81               |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b><br>(only for transmitter 7MF2...-.....-E..) | E82               |
| <b>Vent on side for gas measurements</b>  | H02               |
| <b>Stainless steel process flanges for vertical differential pressure lines</b>                                 | H03               |
| <b>Transient protector 6 kV (lightning protection)</b>  | J01               |
| <b>Marine approvals</b>   |                   |
| • Det Norske Veritas Germanischer Lloyd (DNV-GL)  | S10               |
| • Lloyds Register (LR)  | S11               |
| • French marine classification society Bureau Veritas (BV)  | S12               |
| • American Bureau of Shipping (ABS)   | S14               |
| • Russian Maritime Register (RMR)   | S16               |
| • Korean Register of Shipping (KR)  | S17               |

<sup>1)</sup> Han device plug IP65

<sup>2)</sup> When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

<sup>3)</sup> If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

<sup>4)</sup> When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

| Selection and Ordering data   | Order code                  |
|---|-----------------------------|
| <b>Additional data</b>  |                             |
| Please add <b>"-Z"</b> to Article No. and specify Order code(s) and plain text.   |                             |
| <b>Measuring range to be set</b>  |                             |
| Specify in plain text:  |                             |
| • in the case of linear characteristic curve (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi  | <b>Y01</b>                  |
| • in the case of square rooted characteristic (max. 5 characters):<br>Y02: ... up to ... mbar, bar, kPa, MPa, psi   | <b>Y02</b>                  |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b>   | <b>Y15</b>                  |
| Max. 16 characters, specify in plain text:<br>Y15: .....  |                             |
| <b>Measuring point text (entry in device variable)</b>  | <b>Y16</b>                  |
| Max. 27 char., specify in plain text: Y16: .....  |                             |
| <b>Entry of HART address (TAG)</b>  | <b>Y17</b>                  |
| Max. 8 char., specify in plain text: Y17: .....   |                             |
| <b>Setting of pressure indication in pressure units</b>   | <b>Y21</b>                  |
| Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...  |                             |
| Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>*) ref. temperature 20 °C |                             |
| <b>Setting of pressure indication in non-pressure units<sup>1)</sup></b>  | <b>Y22 +<br/>Y01 or Y02</b> |
| Specify in plain text:<br>Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units<br>"Y01" or "Y02" is essential, unit with<br>max. 5 characters)   |                             |

Only Y01, Y15, Y16, Y17, Y21 and Y22 can be factory preset.

<sup>1)</sup> Preset values can only be changed over SIMATIC PDM.

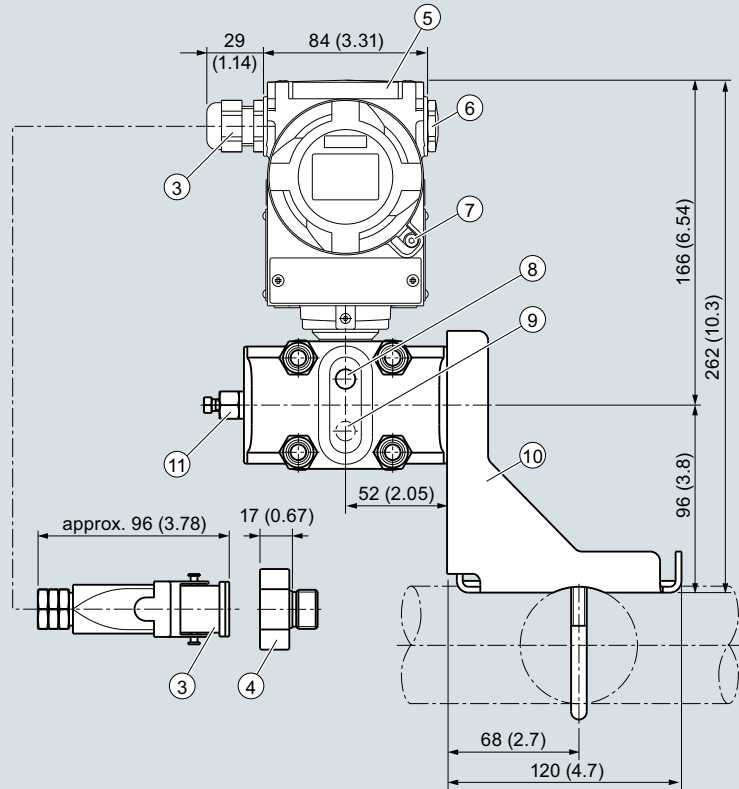
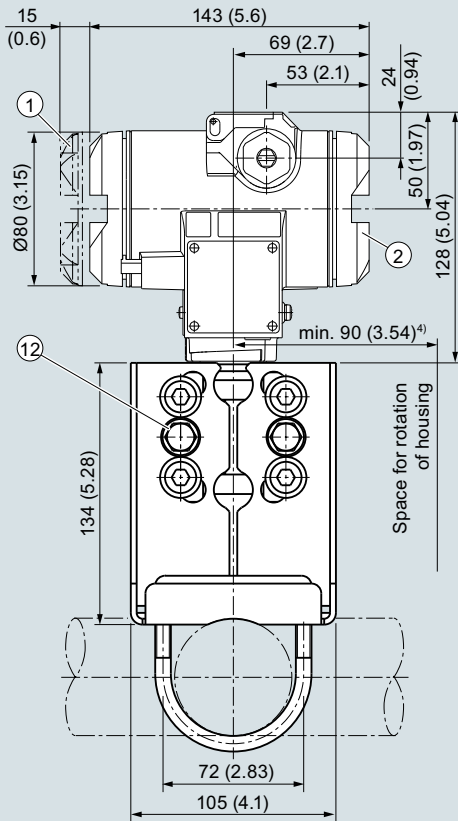
# Pressure Measurement

Transmitters for applications with basic requirements (Basic)

SITRANS P310

for differential pressure and flow

## Dimensional drawings



- ① Electronic side, digital display (longer overall length for cover with window)<sup>1)</sup>
- ② Terminal side<sup>1)</sup>
- ③ Electrical connection: Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/8D device plug<sup>2) 3)</sup>
- ④ Harting adapter
- ⑤ Protective cover over keys

- ⑥ Blanking plug
- ⑦ Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- ⑧ Lateral venting for liquid measurement (Standard)
- ⑨ Lateral venting for gas measurement (suffix H02)
- ⑩ Mounting bracket (option)
- ⑪ Sealing screw with valve (option)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

<sup>1)</sup> Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [IS + XP]"

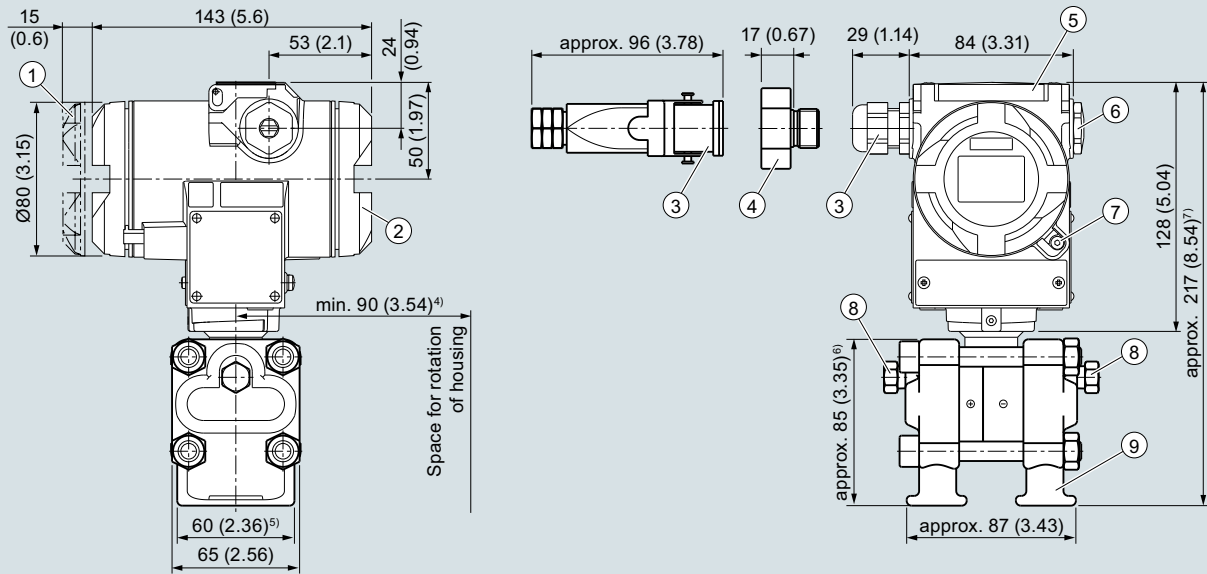
<sup>4)</sup> 92 mm (3.62 inch) for minimum distance to permit rotation with indicator

SITRANS P310 pressure transmitters for differential pressure and flow, dimensions in mm (inch)

**Pressure Measurement**Transmitters for applications with basic requirements (Basic)  
SITRANS P310

for differential pressure and flow

1



① Electronic side, digital display  
(longer overall length for cover with window)<sup>1)</sup>

② Terminal side<sup>1)</sup>

③ Electrical connection:  
Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or  
Han 7D/8D device plug<sup>2)</sup> 3)

④ Harting adapter

⑤ Protective cover over keys

⑥ Blanking plug

⑦ Screw cover - safety bracket (only for type of protection  
"Explosion-proof enclosure", not shown in the drawing)

⑧ Sealing screw with valve (option)

⑨ Process connection: ¼-18 NPT (IEC 61518)

1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing

2) Not with type of protection "Explosion-proof enclosure"

3) Not with type of protection "FM + CSA" [IS + XP]"

4) 92 mm (3.6 inch) for minimum distance to permit rotation with indicator

5) 74 mm (2.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

6) 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

7) 219 mm (8.62 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

SITRANS P310 pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines, optional "H03", dimensional drawing, dimensions in mm (inch)



SITRANS P310 pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines



# Pressure Measurement

Transmitters for applications with basic requirements (Basic)

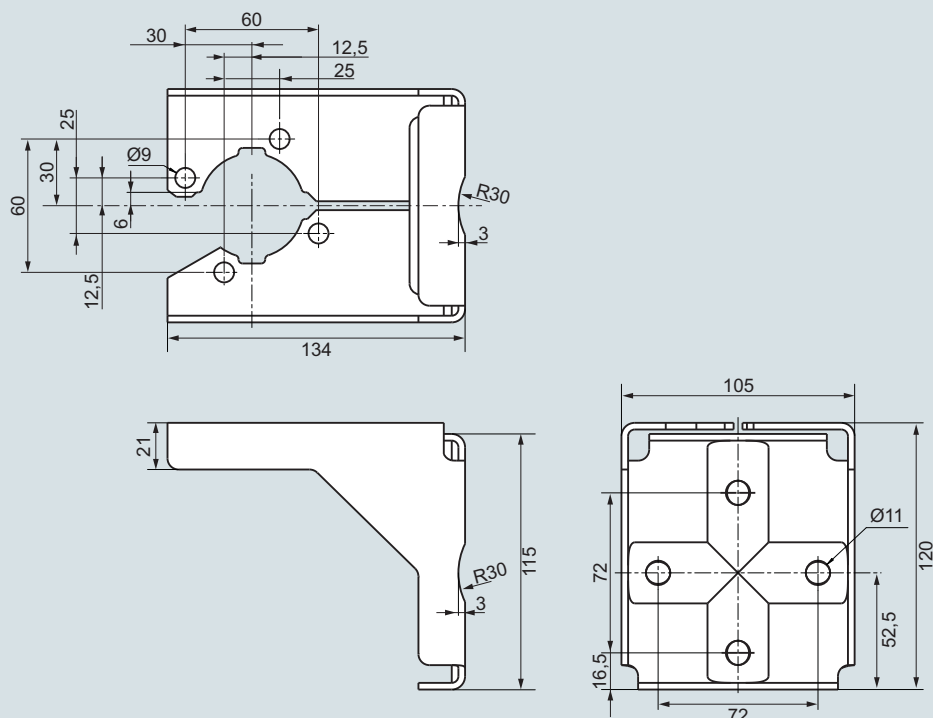
SITRANS P310

## Accessories/Spare Parts

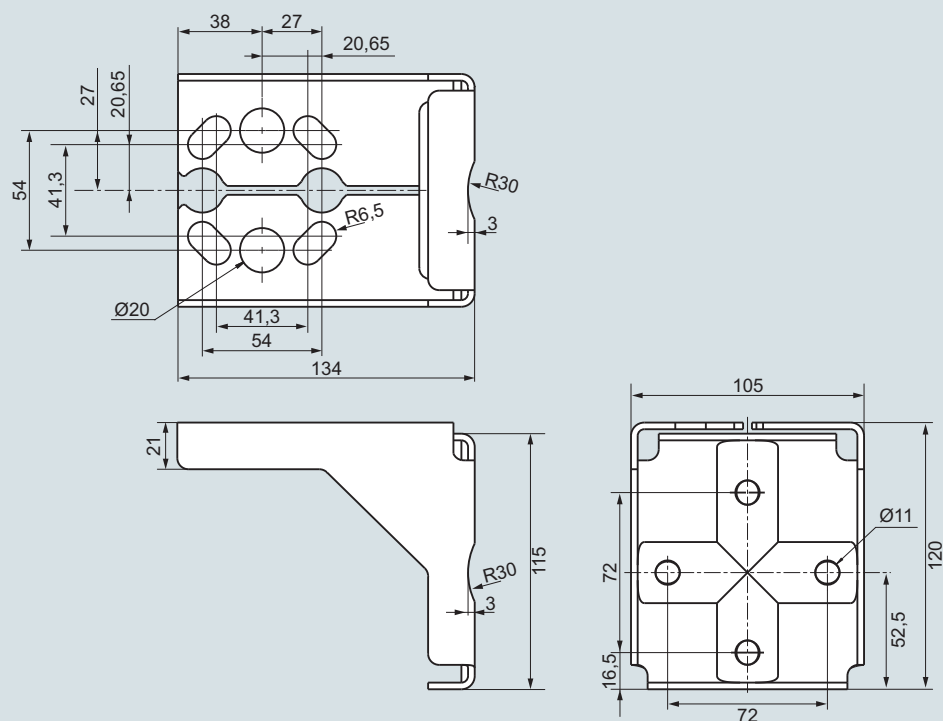
| Selection and Ordering data   | Article No.  |
|---|--|
| <b><i>Spare parts/Accessories</i></b>   |  |
| <b>Mounting bracket and fastening parts</b><br>for pressure transmitters<br>SITRANS P310 (7MF2033-.....-..C.)<br>• made of steel<br>• made of stainless steel 304/1.4301<br>• made of stainless steel 316L/1.4404                                     | <b>7MF4997-1AB</b><br><b>7MF4997-1AH</b><br><b>7MF4997-1AP</b>   |
| <b>Mounting bracket and fastening parts</b><br>for pressure transmitters<br>SITRANS P310<br>(7MF2033-.....-..A., ..B., ..D. and ..F.)<br>• made of steel<br>• made of stainless steel 304/1.4301<br>• made of stainless steel 316L/1.4404             | <b>7MF4997-1AC</b><br><b>7MF4997-1AJ</b><br><b>7MF4997-1AQ</b>   |
| <b>Mounting and fastening brackets</b><br>For differential pressure transmitters with<br>flange thread M10<br>SITRANS P310 (7MF2433-...)<br>• made of steel<br>• made of stainless steel 304/1.4301<br>• made of stainless steel 316L/1.4404          | <b>7MF4997-1AD</b><br><b>7MF4997-1AK</b><br><b>7MF4997-1AR</b>   |
| <b>Mounting and fastening brackets</b><br>For differential pressure transmitters with<br>flange thread 7/16 -20 UNF<br>SITRANS P310 (7MF2533-...)<br>• made of steel<br>• made of stainless steel 304/1.4301<br>• made of stainless steel 316L/1.4404 | <b>7MF4997-1AF</b><br><b>7MF4997-1AM</b><br><b>7MF4997-1AT</b>   |
| <b>Cover</b><br>Made of die-cast aluminum, including gasket.<br>Compatible for Ex and non-Ex transmitters<br>• without window<br>• with window  | <b>7MF4997-1BB</b><br><b>7MF4997-1BE</b>   |
| <b>Cover</b><br>Made of stainless steel, including gasket.<br>Compatible for Ex and non-Ex transmitters<br>• without window<br>• with window  | <b>7MF4997-1BC</b><br><b>7MF4997-1BF</b>   |
| <b>Digital indicator</b><br>Including mounting material   | <b>7MF4997-1BR</b>   |
| <b>Measuring point label</b><br>• without inscription (5 units)<br>• Printed (1 unit)<br>Data according to Y01 or Y02, Y15, Y16 and<br>Y99 (see "Pressure transmitters")  | <b>7MF4997-1CA</b><br><b>7MF4997-1CB-Z</b><br><b>Y...: .....</b>   |
| <b>Mounting screws</b><br>For measuring point label, grounding and con-<br>nection terminals or for display<br>(50 units)   | <b>7MF4997-1CD</b>   |
| <b>Sealing screws</b><br>(1 set = 2 units) for process flange<br>• made of stainless steel<br>• made of Hastelloy   | <b>7MF4997-1CG</b><br><b>7MF4997-1CH</b>   |
| <b>Sealing screws with vent valve</b><br>Complete (1 set = 2 units)<br>• made of stainless steel<br>• made of Hastelloy   | <b>7MF4997-1CP</b><br><b>7MF4997-1CQ</b>   |
| <b>O-rings for process flanges made of:</b><br>• FPM (Viton)<br>• PTFE (Teflon)<br>• FEP (with silicone core, approved for food)<br>• FFPM (Kalrez, compound 4079)<br>• NBR (Buna N)  | <b>7MF4997-2DA</b><br><b>7MF4997-2DB</b><br><b>7MF4997-2DC</b><br><b>7MF4997-2DD</b><br><b>7MF4997-2DE</b> |
| <b>Sealing ring</b> for process connection  | <b>see "Fittings"</b>  |

| Selection and Ordering data   | Article No.                              |
|---|--|
| <b>Documentation</b><br>The entire documentation is available for<br>download free-of-charge in various languages<br>at: <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/<br/>processinstrumentation/documentation</a> | <b>A5E35603949</b>                       |
| <b>Certificates (order only via SAP)</b><br>instead of Internet download<br>• hard copy (to order)<br>• on DVD (to order)   | <b>A5E03252406</b><br><b>A5E03252407</b> |
| <b>HART modem</b><br>with USB interface   | <b>7MF4997-1DB</b>                       |
| Power supply units see Chap. 7 "Supplementary Components".  |  |

## Dimensional drawings



Mounting bracket for SITRANS P310 gauge and absolute pressure-transmitters, dimensions in mm  
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



Mounting bracket for SITRANS P310 differential pressure transmitter, dimensions in mm  
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

### Technical description

1

#### Overview



SITRANS P320/P420 pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameter assignment is performed using input buttons or the HART interface.

The comprehensive functionality makes for precise adjustment of the pressure transmitter to the requirements of the plant. Operation is very user-friendly in spite of the numerous setting options.

Due to their advanced diagnostic functionalities according to NAMUR NE107, the SITRANS P320/P420 pressure transmitters are very suitable for use in chemical plants. Thanks to the advanced diagnostic functions and the process value storage, the SITRANS P420 is "Ready for Digitalization".

The "Remote Safety Handling" function saves customers significant amounts of time and money, because the SIL function can be switched on and validated remotely via SIMATIC PDM. This eliminates travel times and on-site operation via the local display or keyboard.

Parameter assignment using the HART protocol is very easy and quick thanks to the innovative EDD with integrated Quick Start wizard.

The transmitters can be equipped with various types of remote seals for special applications such as the measurement of highly viscous substances.

SITRANS P320/P420 pressure transmitters are available in various versions for measuring:

- Gauge pressure
- Absolute pressure
- Differential pressure
- Level
- Volume flow
- Mass flow

#### Benefits

- Diagnostic functions in accordance with NAMUR recommendation NE107
- SIL devices developed according to IEC 61508
- SIL validation on the device or remotely with SIMATIC PDM
- Reduction of internal inductance for Ex applications to LI = 0
- Step response time for pressure type T63 = 105 ms and for differential pressure type 135 ms.
- Minimal conformity error
- Very low temperature influence
- Very good long-term stability
- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- For corrosive and non-corrosive gases, vapors and liquids
- Extensive diagnostics and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Wetted parts made of high-grade materials (e.g., stainless steel, alloy, gold, Monel, tantalum)
- Infinitely adjustable spans from 0.01 bar to 700 bar (0.15 psi to 10153 psi)
- Convenient parameterization over 4 input buttons and HART interface

#### Application

SITRANS P320/P420 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads.

The pressure transmitters can be used in zone 1 or zone 0 with the corresponding Ex approval.

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 4 input buttons or programmed externally over HART interface.

#### **Pressure transmitter for gauge pressure**

Measured variable:

- Gauge pressure of corrosive and non-corrosive gases, vapors and liquids.

Span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 0.01 bar to 700 bar (0.15 psi to 10153 psi)

There are two series:

- Gauge pressure series
- Differential pressure series

#### **Pressure transmitters for absolute pressure**

Measured variable:

- Absolute pressure of corrosive and non-corrosive gases, vapors and liquids.

Span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 8.3 mbar a to 100 bar a (0.12 to 1450 psi a)

There are two series:

- Gauge pressure series
- Differential pressure series

**Pressure transmitters for differential pressure and flow**

Measured variables:

- Differential pressure
- Small positive or negative overpressure
- Flow  $q \sim \sqrt{\Delta p}$  (together with a primary differential pressure transducer (see section "Flow meters"))

Span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 1 mbar to 30 bar (0.0145 to 435 psi)

**Pressure transmitters for level**

Measured variable:

- Level of corrosive and non-corrosive liquids in open and closed vessels.

Span (infinitely adjustable)

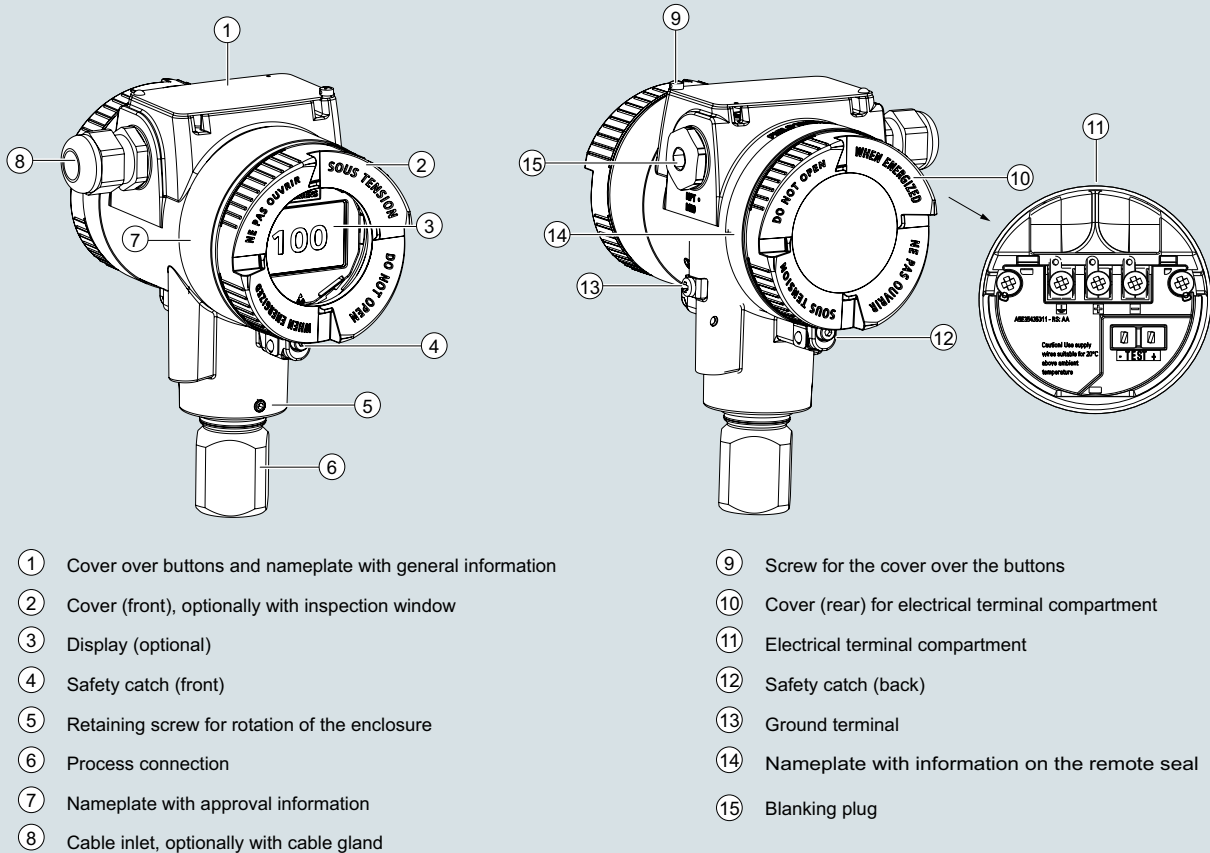
- For SITRANS P320/P420 with HART: 25 mbar to 5 bar (0.363 to 72.5 psi)

Type of the mounting flange:

- EN 1092-1 flanges
- ASME B16.5 flanges
- J.I.S. flanges
- Diverse range of sealing surface forms available

**Design**

Depending on the customer-specific order, the device comprises different parts.

**Device front view**

- The electronics enclosure is made of die cast aluminum or precision cast stainless steel.
- The housing has a removable circular cover at the front and the back.
- Depending on the device version, the front cover (2) may be designed as an inspection window.
- The cable inlet (8) to the electrical terminal compartment is at the side; either the left or right-hand one can be used. The unused opening is closed with a blanking plug (15).
- The ground terminal (13) is located on the side.

- The electrical terminal compartment (11) for the auxiliary power and shield is accessible when you remove the back cover (10).
- The measuring cell with process connection (6) is located in the bottom part of the enclosure. The measuring cell is prevented from rotating by a locking screw (5).
- Thanks to the modular design of the pressure transmitter, the measuring cell and application electronics or terminal compartment can be replaced if required.
- The cover over buttons (1), under which there are 4 buttons, is located on the upper face of the enclosure. The nameplate with general information is located on the cover over the buttons.

## Pressure Measurement

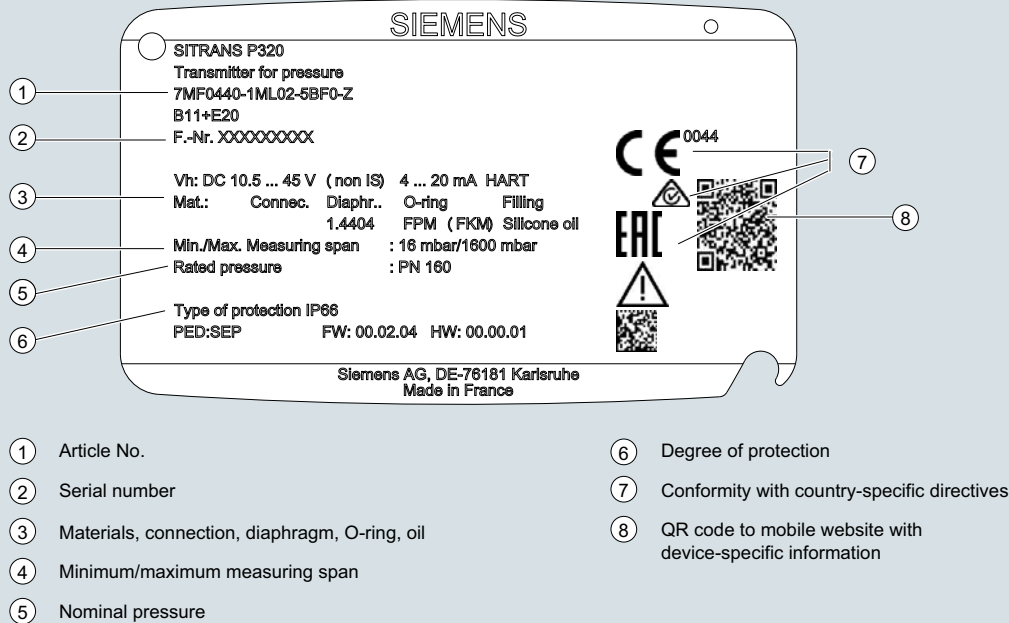
Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

### Technical description

#### Nameplates

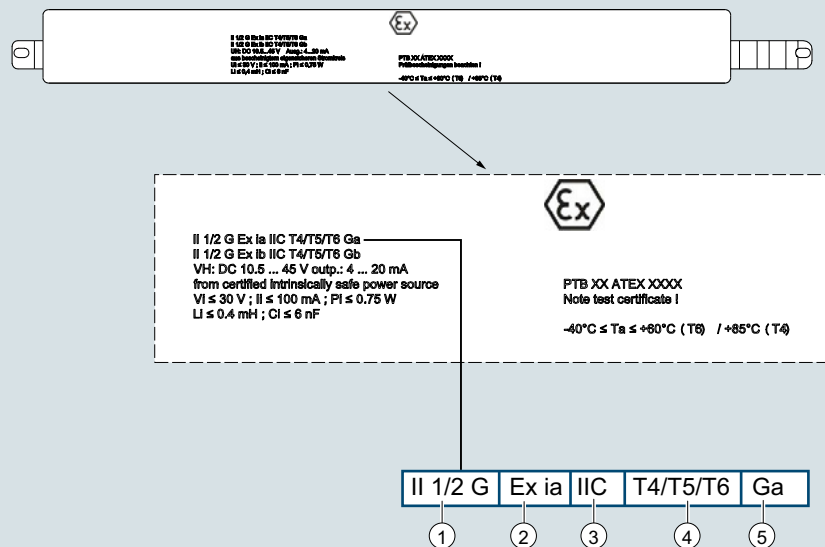
##### Nameplate

The nameplate with the article no. and other important information, such as design details and technical data, is located on the cover over the buttons.



##### Nameplate with approval information

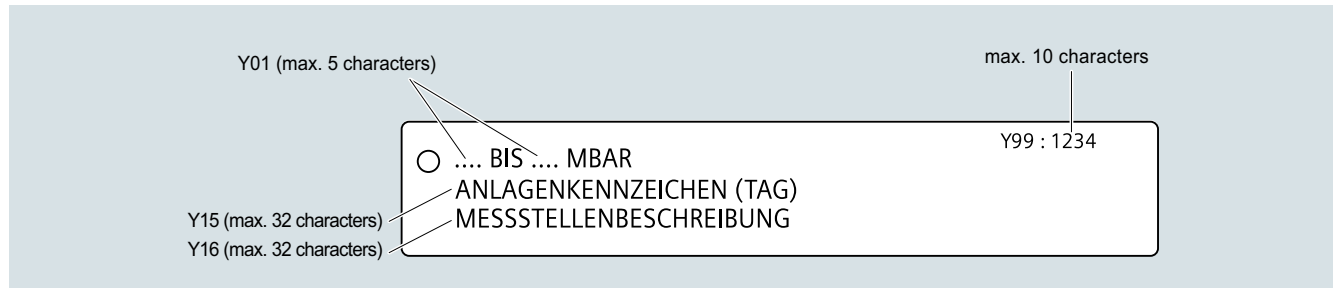
The nameplate with approval information is located on the front of the enclosure.



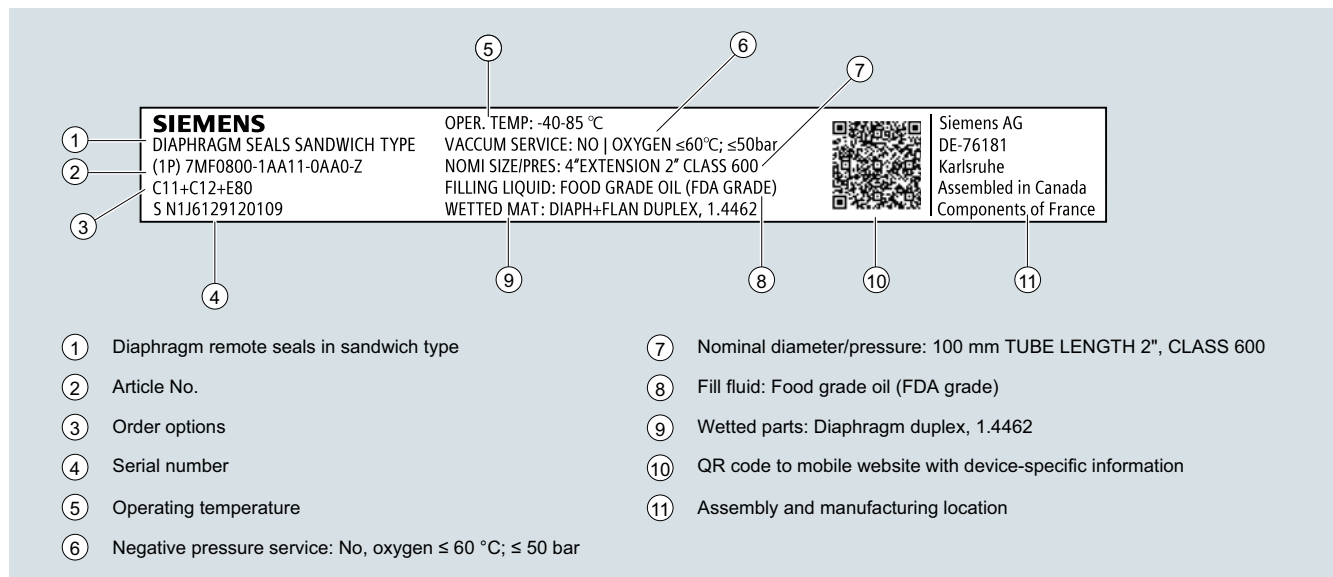
- 1** Characteristics of the hazardous area
- 2** Type of protection
- 3** Group (gas, dust)
- 4** Maximum surface temperature (temperature class)
- 5** Device protection level

Measuring point label

The measuring point label is located under the front cover.

Nameplate with information on the remote seals

The nameplate with information on the remote seals is located on the back of the enclosure.



# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

## Technical description

### Function

#### Adjustable parameters and diagnostics

SITRANS P320/P420 with HART communication

| Parameters                                      | Input buttons | SITRANS P320 | SITRANS P420            |
|---|---------------|--------------|-------------------------|
| Application, measurement type                   | x             | x            | x                       |
| Adjusting start of scale value/full scale value | x             | x            | x                       |
| Setting start of scale value/full scale value   | x             | x            | x                       |
| Electrical damping                              | x             | x            | x                       |
| Zero adjustment                                 | x             | x            | x                       |
| Fault current                                   | x             | x            | x                       |
| Saturation limits                               | x             | x            | x                       |
| Scaling of the display                          | x             | x            | x                       |
| Characteristic selection                        | x             | x            | x                       |
| Temperature unit                                | x             | x            | x                       |
| Key lock  | x             | x            | x                       |
| Change user pin                                 | x             | x            | x                       |
| Functional safety                               | x             | x            | x                       |
| Loop test                                       | x             | x            | x                       |
| Start view                                      | x             | x            | x                       |
| Pressure reference                              | x             | x            | x                       |
| Reset   | x             | x            | x                       |
| <b>Diagnostics and trend log</b>                |               |              |                         |
| Min/Max pointer                                 |               | x            | x                       |
| Limit monitoring                                |               |              | 2                       |
| Event counter (overflow/underflow)              |               |              | 2                       |
| Trend log                                       |               |              | 2, max.<br>1 500 values |

Available physical units of display for SITRANS P320/P420

| Physical variable                                  | Physical dimensions  |
|--|--|
| Pressure (setting can also be made in the factory) | Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), mH <sub>2</sub> O (4 °C), mmHg, inHg, atm, torr  |
| Level (height data)                                | m, cm, mm, ft, in  |
| Volumes (fill level)                               | m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI  |
| Volume (flow)                                      | m <sup>3</sup> /sec, m <sup>3</sup> /h, m <sup>3</sup> /d, l/sec, l/min, l/h, Ml/d, ft <sup>3</sup> /sec, ft <sup>3</sup> /h, ft <sup>3</sup> /d, SCF/min, SCF/h, NI/h, Nm <sup>3</sup> /hgal/sec, gal/min, gal/h, gal/d, Mgal/d, gal (UK)/sec, gal (UK)/min, gal (UK)/h, gal (UK)/d, bbl/sec, bbl/min, bbl/h, bbl/d |
| Mass (flow)  | Kg/sec, kg/min, kg/h, kg/d, g/sec, g/min, g/h, t/min, t/h, t/d, lb/sec, lb/min, lb/h, lb/d, ton/min, ton/h, ton/d, ton (UK)/h, ton (UK)/d  |
| Temperature  | °C, °F   |
| Miscellaneous                                      | %, mA, free text max. 12 characters  |

For more device information and technical specifications, refer to the individual device versions.



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (pressure series)

1

#### Technical specifications

##### SITRANS P320 / SITRANS P420 for gauge pressure (pressure series)

###### Input

|   |  |   |                                   |
|---|--|---|-----------------------------------|
| Measured variable   | Gauge pressure   |   |                                   |
| Span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086) (for oxygen measurement, max. 100 bar/ 10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/process temperature) | Span   | Max. permissible operating pressure MAWP (PS) | Maximum permissible test pressure |
|   | 8.3 ... 250 mbar   | 4 bar   | 6 bar                             |
|   | 0.83 ... 25 kPa  | 0.4 MPa                                       | 0.6 MPa                           |
|   | 0.12 ... 3.6 psi   | 58 psi  | 87 psi                            |
|   | 0.01 ... 1 bar   | 6 bar   | 9 bar                             |
|   | 1 ... 100 kPa  | 0.6 MPa                                       | 0.9 MPa                           |
|   | 0.15 ... 14.5 psi  | 87 psi  | 130 psi                           |
|   | 0.04 ... 4 bar   | 20 bar  | 30 bar                            |
|   | 4 ... 400 kPa  | 2 MPa   | 3 MPa                             |
|   | 0.58 ... 58 psi  | 290 psi                                       | 435 psi                           |
|   | 0.16 ... 16 bar  | 45 bar  | 70 bar                            |
|   | 0.016 ... 1.6 MPa  | 4.5 MPa                                       | 7 MPa                             |
|   | 2.3 ... 232 psi  | 652 psi                                       | 1015 psi                          |
|   | 0.63 ... 63 bar  | 80 bar  | 120 bar                           |
|   | 0.063 ... 6.3 MPa  | 8 MPa   | 12 MPa                            |
|   | 9.1 ... 914 psi  | 1160 psi                                      | 1740 psi                          |
|   | 1.6 ... 160 bar  | 240 bar                                       | 380 bar                           |
|   | 0.16 ... 16 MPa  | 24 MPa  | 38 MPa                            |
|   | 23 ... 2321 psi  | 3480 psi                                      | 5511 psi                          |
|   | 4 ... 400 bar  | 400 bar                                       | 600 bar                           |
|   | 0.4 ... 40 MPa   | 40 MPa  | 60 MPa                            |
|   | 58 ... 5802 psi  | 5802 psi                                      | 8702 psi                          |
|   | 7 ... 700 bar  | 800 bar                                       | 800 bar                           |
|   | 0.7 ... 70 MPa   | 80 MPa  | 80 MPa                            |
|   | 102 ... 10153 psi  | 11603 psi                                     | 11603 psi                         |
| Measuring limits  | For 250 mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a. |   |                                   |
| • Low measuring limit   | 30 mbar a/3 kPa a/0.44 psi a   |   |                                   |
| - Measuring cell with silicone oil filling  | 30 mbar a/3 kPa a/0.44 psi a   |   |                                   |
| - Measuring cell with inert oil   | 100 mbar a/10 kPa a/1.45 psi a   |   |                                   |
| - Measuring cell with FDA-compliant oil   | 100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/process temperature)                                    |   |                                   |
| • Upper measuring limit   | Between the measuring limits (infinitely adjustable)   |   |                                   |
| • Start of scale  |  |   |                                   |

###### Output

|   |   |
|---|---|
| Output signal                                   | 4 ... 20 mA   |
| • Low saturation limit (infinitely adjustable)  | 3.55 mA, factory preset to 3.8 mA   |
| • High saturation limit (infinitely adjustable) | 22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA   |
| • Ripple (without HART communication)           | $I_{pp} \leq 0.5\%$ of max. output current  |
| Adjustable damping                              | 0 ... 100 s, continuously adjustable over remote operation  |
|   | 0 ... 100 s, in increments of 0.1 s, adjustable over display  |
| • Current transmitter                           | 3.55 ... 22.8 mA  |
| • Failure signal                                | 3.55 ... 22.8 mA  |
| Load  | Resistor R [ $\Omega$ ]   |
| • Without HART communication                    | $R = (U_H - 10.5 \text{ V}) / 22.8 \text{ mA}$ ,<br>$U_H$ : Power supply in V   |
| • With HART communication                       | $R = 230 \dots 1100 \Omega$ (HART communicator (handheld))<br>$R = 230 \dots 500 \Omega$ (SIMATIC PDM)  |
| Characteristic curve                            | <ul style="list-style-type: none"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul> |
| Physical bus                                    | -   |
| Polarity-independent                            | -   |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

1

## for gauge pressure (pressure series)

### SITRANS P320 / SITRANS P420 for gauge pressure (pressure series)

#### Measuring accuracy

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Start of scale value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

$r = \text{max. measuring span/set measuring span and nominal measuring range}$

$r \leq 1.25$ :  $\leq 0.075\%$  (SITRANS P320)

$\leq 0.065\%$  (SITRANS P420)

$1.25 < r \leq 30$ :  $\leq (0.008 \cdot r + 0.055)\%$

$r \leq 5$ :  $\leq 0.065\%$  (SITRANS P320)

$\leq 0.04\%$  (SITRANS P420)

$5 < r \leq 100$ :  $\leq (0.004 \cdot r + 0.045)\%$

$r \leq 3$ :  $\leq 0.075\%$  (SITRANS P320)

$3 < r \leq 100$ :  $\leq (0.005 \cdot r + 0.05)\%$  (SITRANS P420)

$r \leq 5$ :  $\leq 0.075\%$  (SITRANS P420)

$5 < r \leq 100$ :  $\leq (0.005 \cdot r + 0.05)\%$  (SITRANS P420)

Influence of ambient temperature  
in % per 28 °C (50 °F)

- 250 mbar/25 kPa/3.6 psi

$\leq (0.16 \cdot r + 0.1)\%$

- 1 bar/100 kPa/3.6 psi

$\leq (0.05 \cdot r + 0.1)\%$

- 4 bar/400 kPa/58 psi

$\leq (0.025 \cdot r + 0.125)\%$

16 bar/1.6 MPa/232 psi

63 bar/6.3 MPa/914 psi

160 bar/16 MPa/2321 psi

400 bar/40 MPa/5802 psi

- 700 bar/70 MPa/10152 psi

$\leq (0.08 \cdot r + 0.16)\%$

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- 250 mbar/25 kPa/3.6 psi

$\leq (0.25 \cdot r)\%$  per year

- 1 bar/100 kPa/3.6 psi

In 5 years  $\leq (0.25 \cdot r)\%$

In 10 years  $\leq (0.35 \cdot r)\%$

- 4 bar/400 kPa/58 psi

In 5 years  $\leq (0.125 \cdot r)\%$

16 bar/1.6 MPa/232 psi

In 10 years  $\leq (0.15 \cdot r)\%$

63 bar/6.3 MPa/914 psi

160 bar/16 MPa/2321 psi

400 bar/40 MPa/5802 psi

- 700 bar/70 MPa/10152 psi

In 5 years  $\leq (0.25 \cdot r)\%$

In 10 years  $\leq (0.35 \cdot r)\%$

Step response time  $T_{63}$  (without electrical damping)

Approx. 0.105 s

Effect of mounting position (in pressure per change of angle)

$\leq 0.05$  mbar/0.005 kPa/0.000725 psi per 10° incline  
(zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (pressure series)

1

**SITRANS P320 / SITRANS P420 for gauge pressure (pressure series)****Rated conditions**

Temperature of medium

- Measuring cell with silicone oil filling -40 ... +100 °C (-40 ... +212 °F)
- Measuring cell with inert oil
  - 1 bar/100 kPa/3.6 psi -40 ... +85 °C (-40 ... +185 °F)
  - 4 bar/400 kPa/58 psi
  - 16 bar/1.6 MPa/232 psi
  - 63 bar/6.3 MPa/914 psi
  - 160 bar/16 MPa/2321 psi -20 ... +100 °C (-4 ... +212 °F)
  - 400 bar/40 MPa/5802 psi
  - 700 bar/70 MPa/10152 psi
- Measuring cell with FDA-compliant oil -10 ... +100 °C (14 ... +212 °F)

Ambient conditions

- Ambient temperature/enclosure
 

Observe the temperature class in areas subject to explosion hazard.

  - Measuring cell with silicone oil filling -40 ... +85 °C (-40 ... +185 °F)
  - Measuring cell with inert oil for gauge pressure measuring cells: -40 ... +85 °C (-40 ... +185 °F)
  - 1 bar/100 kPa/3.6 psi
  - 4 bar/400 kPa/58 psi
  - 16 bar/1.6 MPa/232 psi
  - 63 bar/6.3 MPa/914 psi
  - Measuring cell with inert oil -20 ... +85 °C (-4 ... +185 °F)
  - Measuring cell with FDA-compliant oil -10 ... +85 °C (14 ... +185 °F)
  - Display -20 ... +80 °C (-4 ... +176 °F)
- Storage temperature -50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))
- Climatic class in accordance with IEC 60721-3-4 4K4H
- Degree of protection
  - According to IEC 60529 IP66, IP68
  - According to NEMA 250 Type 4X
- Electromagnetic compatibility
  - Emitted interference and interference immunity According to IEC 61326 and NAMUR NE 21

**Design**

Weight

Approx. 2.3 kg (5.07 lb) with aluminum enclosure  
 Approx. 4.2 kg (9.25 lb) for stainless steel enclosure

Material

- Wetted parts materials
  - Process connection Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602
  - Oval flange Stainless steel, mat. no. 1.4404/316L
  - Seal diaphragm Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
- Non-wetted parts materials
  - Electronics housing
    - Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
    - Standard: Powder coating with polyurethane
    - Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
    - Stainless steel type plate (1.4404/316L)
  - Mounting bracket Electroplated steel or stainless steel

Process connection

- Connection shank G1/2A according to DIN EN 837-1
- Female thread ½-14 NPT
- Male thread M20 x 1.5 and ½-14 NPT
- Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread:
- Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:
  - 7/16-20 UNF according to EN 61518
  - M10 according to DIN 19213
- Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:
  - 7/16-20 UNF according to EN 61518
  - M12 according to DIN 19213
- Male thread M20 x 1.5 and ½-14 NPT

Electrical connection

- Cable entry via the following screwed glands:
- M20 x 1.5
  - ½-14 NPT
  - Han 7D/Han 8D device plug<sup>1)</sup>
  - M12 device plug

**Displays and controls**

Keys

4 keys for operation directly on the device

Display

- With or without integrated display (optional)
- Cover with inspection window (optional)

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge pressure (pressure series)

## SITRANS P320 / SITRANS P420 for gauge pressure (pressure series)

### Auxiliary power $U_H$

|  |   |
|--|---|
| Terminal voltage on pressure transmitter | 10.5 ... 45 V DC<br>10.5 ... 30 V DC in intrinsically safe mode |
| Ripple                                   | $U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)                     |
| Noise                                    | $U_{eff} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz)                  |
| Auxiliary power                          | –   |
| Separate supply voltage                  | –   |

### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Drinking water

- WRAS (England)
- ACS (France)
- DVGW (Germany)
- NSF (USA)

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

BAM (Germany), oxygen expenditures

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb  
-40 ... +80 °C (-40 ... +176 °F) temperature class T4  
-40 ... +70 °C (-40 ... +158 °F) temperature class T6  
-40 ... +100 °C (-40 ... +212 °F) temperature class T4  
-40 ... +70 °C (-40 ... +158 °F) temperature class T6  
To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$   
 $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

- Effective internal inductance/capacitance

- Flameproof enclosure "d"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb  
-40 ... +80 °C (-40 ... +176 °F) temperature class T4  
-40 ... +70 °C (-40 ... +158 °F) temperature class T6  
-40 ... +100 °C (-40 ... +212 °F) temperature class T4  
-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

- Dust explosion protection for Zone 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Max. surface temperature
- Connection

Ex II 1D Ex tb IIIC T120 °C Da  
Ex II 2D Ex tb IIIC T120 °C Db  
Ex II 3D Ex tc IIIC T120 °C Dc  
-40 ... +80 °C (-40 ... +176 °F)  
-40 ... +100 °C (-40 ... +212 °F)  
120 °C (248 °F)

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

- Dust explosion protection for Zone 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

Ex II 1D Ex ia IIIC T120 °C Da  
Ex II 2D Ex ib IIIC T120 °C Db  
Ex II 3D Ex ic IIIC T120 °C Dc  
-40 ... +80 °C (-40 ... +176 °F)  
-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$   
 $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

- Effective internal inductance/capacitance

**SITRANS P320 / SITRANS P420 for gauge pressure (pressure series)**

|  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Type of protection for Zone 2           <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature "ec"</li> <li>- Permissible ambient temperature "ic"</li> <li>- Permissible temperature of measuring medium</li> <li>- "ec" connection</li> <li>- "ic" connection</li> </ul> </li> <li>• Explosion protection acc. to FM           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or IS; NI; S</li> </ul> </li> <li>• Explosion protection according to CSA           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or (IS)</li> </ul> </li> </ul> | <p>Ex II 3G Ex ec IIC T4/T6 Gc<br/>Ex II 3G Ex ic IIC T4/T6 Gc</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4<br/>-40 ... +40 °C (-40 ... +104 °F) temperature class T6<br/>-40 ... +80 °C (-40 ... +176 °F) temperature class T4<br/>-40 ... +80 °C (-40 ... +176 °F) temperature class T6<br/>-40 ... +100 °C (-40 ... +212 °F) temperature class T4<br/>-40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>To a circuit with the operating values:<br/><math>U_n = 10.5</math> to <math>30</math> V, <math>4</math> ... <math>20</math> mA<br/>To certified intrinsically safe circuits with the peak values:<br/><math>U_i = 30</math> V, <math>I_i = 101</math> mA, <math>P_i = 760</math> mW<br/><math>U_i = 29</math> V, <math>I_i = 110</math> mA, <math>P_i = 800</math> mW</p> <p>Effective internal inductance/capacitance:<br/><math>L_i = 0.24</math> µH/<math>C_i = 3.29</math> nF<br/>Available soon<br/>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III<br/>Available soon<br/>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p> |
|--|--|

<sup>1)</sup> Han 8D is identical to Han 8U.

**HART communication**

|                       |                |
|-----------------------|----------------|
| HART                  | 230 ... 1100 Ω |
| Protocol              | HART 7         |
| Software for computer | SIMATIC PDM    |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge pressure (pressure series)

## Selection and ordering data

|   | Article No.      |
|---|------------------|
| <b>Pressure transmitters for gauge pressure (pressure series)</b>                     |                  |
| <b>SITRANS P320</b>   | 7MF030 - - - - - |
| <b>SITRANS P420</b>   | 7MF040 - - - - - |
| ➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal. |                  |
| <b>Communication</b>  |                  |
| HART, 4 ... 20 mA   | 0                |
| <b>Measuring cell filling</b>   |                  |
| Silicone oil  | 1                |
| Inert liquid  | 3                |
| Neobee oil  | 4                |
| <b>Maximum measuring span</b>   |                  |
| 250 mbar (3.6 psi)  | F                |
| 1000 mbar (14.5 psi)  | J                |
| 4000 mbar (58 psi)  | N                |
| 16 bar (232 psi)  | Q                |
| 63 bar (914 psi)  | T                |
| 160 bar (2321 psi)  | V                |
| 400 bar (5802 psi)  | W                |
| 700 bar (10153 psi)   | X                |
| <b>Process connection</b>   |                  |
| Male thread M20 x 1.5   | B                |
| Male thread G½ (DIN EN 837-1)   | D                |
| Female thread ½-14 NPT  | E                |
| Male thread ½-14 NPT  | F                |
| Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)                                 | G                |
| Oval flange, mounting thread: M10 (DIN 19213)   | H                |
| Oval flange, mounting thread: M12 (DIN 19213)   | J                |
| Version for diaphragm seal pressure   | U                |
| <b>Wetted parts materials: Process connection, seal diaphragm</b>                     |                  |
| Stainless steel 316L/1.4404, stainless steel 316L/1.4404                              | 0                |
| Stainless steel 316L/1.4404, alloy C276/2.4819  | 1                |
| Alloy C22/2.4602, alloy C276/2.4819   | 2                |
| <b>Non-wetted parts materials</b>   |                  |
| Die-cast aluminum   | 1                |
| Stainless steel precision casting CF3M/1.4409 similar to 316L                         | 2                |
| <b>Enclosure</b>  |                  |
| Dual chamber device   | 5                |
| <b>Type of protection</b>   |                  |
| Without Ex  | A                |
| Intrinsic safety  | B                |
| Flameproof enclosure  | C                |
| Flameproof enclosure, intrinsic safety  | D                |
| Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2                | L                |
| Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2             | M                |
| Combination of options B, C and L (zone model)  | S                |
| Combination of options B, C and M (zone model, Class Division)                        | T                |
| <b>Electrical connections/cable entries</b>   |                  |
| Thread for cable gland  |                  |
| • 2 x M20 x 1.5   | F                |
| • 2 x ½-14 NPT  | M                |
| <b>Local operation/display</b>  |                  |
| Without display (cover closed)  | 0                |
| With display (cover closed)   | 1                |
| With display (cover with glass pane)  | 2                |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (pressure series)

1

**Selection and ordering data**

| Options   | Order code | Options   | Order code |
|---|------------|---|------------|
| Add "-Z" to article no. and specify order code.   |            | <b>Device options</b>   |            |
| <b>Cable glands included</b>  |            | PDF file with device settings   | <b>D10</b> |
| Plastic   | <b>A00</b> | Double layer coating (epoxy resin and polyurethane)<br>120 µm of enclosure and cover  | <b>D20</b> |
| Metal   | <b>A01</b> | FVMQ enclosure sealing  | <b>D21</b> |
| Stainless steel   | <b>A02</b> | IP66/IP68 degree of protection (not for M12 and Han device plugs)                     | <b>D30</b> |
| Stainless steel 316L/1.4404   | <b>A03</b> | TAG label empty   | <b>D40</b> |
| CMP, for XP devices   | <b>A10</b> | Without labeling of the measuring range on the TAG label                              | <b>D41</b> |
| CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm,<br>cable outer diameter 10 ... 16 mm            | <b>A11</b> | Stainless steel Ex plate 1.4404/316L  | <b>D42</b> |
| CAPRI ADE 4F, stainless steel, cable inner diameter<br>7 ... 12 mm, cable outer diameter 10 ... 16 mm | <b>A12</b> | Increase of pressure stage from PN 420 to PN 500                                      | <b>D50</b> |
| <b>Han device plug mounted left</b>   |            | Overvoltage protection up to 6 kV (external)  | <b>D71</b> |
| Han 7D device plug (plastic, straight)  | <b>A30</b> | Adhesive labels on transport packaging (supplied by customer)                         | <b>D90</b> |
| Han 7D device plug (plastic, angled)  | <b>A31</b> |   |            |
| Han 7D device plug (metal, straight)  | <b>A32</b> | <b>General approval without Ex approval</b>   |            |
| Han 7D device plug (metal, angled)  | <b>A33</b> | Worldwide (CE, RCM) except EAC, FM, CSA, KCC  | <b>E00</b> |
| Han 8D device plug (plastic, straight)  | <b>A34</b> | Worldwide (CE, RCM, EAC, FM, CSA, KCC)  | <b>E01</b> |
| Han 8D device plug (plastic, angled)  | <b>A35</b> | CSA   | <b>E06</b> |
| Han 8D device plug (metal, straight)  | <b>A36</b> | EAC   | <b>E07</b> |
| Han 8D device plug (metal, angled)  | <b>A37</b> | FM  | <b>E08</b> |
| <b>Cable socket included</b>  |            | KCC   | <b>E09</b> |
| Plastic, for Han 7D/8D device plugs   | <b>A40</b> | UL  | <b>E10</b> |
| Metal, for Han 7D/8D device plugs   | <b>A41</b> | <b>Explosion protection approvals</b>   |            |
| <b>M12 device plug mounted left</b>   |            | ATEX (Europe)   | <b>E20</b> |
| Stainless steel, without cable socket   | <b>A62</b> | CSA (USA and Canada)  | <b>E21</b> |
| Stainless steel, with cable socket  | <b>A63</b> | FM (USA and Canada)   | <b>E22</b> |
| <b>Cable entry/connector mounting</b>   |            | IECEX (Worldwide)   | <b>E23</b> |
| 2x sealing plugs M20 x 1.5, IP66/68 installed on both sides   | <b>A90</b> | EACEx (GOST-R, -K, -B)  | <b>E24</b> |
| 2x sealing plugs ½-14 NPT, IP66/68 installed on both sides  | <b>A91</b> | INMETRO (Brazil)  | <b>E25</b> |
| Cable gland/connector mounted left  | <b>A97</b> | KCs (Korea)   | <b>E26</b> |
| Cable gland/connector mounted on right  | <b>A99</b> | NEPSI (China)   | <b>E27</b> |
| <b>Nameplate labeling</b>   |            | PESO (India)  | <b>E28</b> |
| German (bar)  | <b>B11</b> | TIIS Hazardous (Japan)  | <b>E29</b> |
| French (bar)  | <b>B12</b> | UKR Sepro (Ukraine)   | <b>E30</b> |
| Spanish (bar)   | <b>B13</b> | ATEX (Europe) and IECEX (Worldwide)   | <b>E47</b> |
| Italian (bar)   | <b>B14</b> | CSA (Canada) and FM (USA)   | <b>E48</b> |
| Chinese (bar)   | <b>B15</b> | ATEX (Europe) and IECEX (Worldwide) + CSA (Canada) and FM (USA)                       | <b>E49</b> |
| Russian (bar)   | <b>B16</b> | <b>Marine approvals</b>   |            |
| English (psi)   | <b>B20</b> | DNV-GL (Det Norske Veritas/Germanischer Lloyd)  | <b>E50</b> |
| Chinese (Pa)  | <b>B35</b> | LR (Lloyds Register)  | <b>E51</b> |
| <b>Certificates</b>   |            | BV (Bureau Veritas)   | <b>E52</b> |
| Quality test certificate, 5-point factory calibration<br>(IEC 60770-2)                                | <b>C11</b> | ABS (American Bureau of Shipping)   | <b>E53</b> |
| Acceptance certificate (EN 10204-3.1) - Material of<br>pressurized and wetted parts                   | <b>C12</b> | KR (Korean Register of Shipping)  | <b>E56</b> |
| Test report - NACE (MR 0103-2012 and MR 0175-2009)  | <b>C13</b> | RINA (Registro Italiano Navale)   | <b>E57</b> |
| Test report (EN 10204-2.2) - Wetted parts   | <b>C14</b> | CCS (China Classification Society)  | <b>E58</b> |
| Acceptance certificate (EN 10204-3.1) - PMI test of<br>pressurized and wetted parts                   | <b>C15</b> | <b>Country-specific approvals</b>   |            |
| <b>Certificates for functional safety</b>   |            | CRN approval Canada (Canadian Registration Number)                                    | <b>E60</b> |
| Functional safety (IEC 61508) - SIL2/3  | <b>C20</b> | <b>Special approvals</b>  |            |
|   |            | Oxygen application (with inert liquid, max. 100 bar<br>(1 450 psi) at 60° C (140 °F)) | <b>E80</b> |
|   |            | Dual seal   | <b>E81</b> |
|   |            | WRC / WRAS (drinking water);<br>only with pressure cap O-rings made of EPDM           | <b>E83</b> |
|   |            | NSF61 (drinking water)  | <b>E84</b> |
|   |            | ACS (drinking water)  | <b>E85</b> |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

## for gauge pressure (pressure series)

| Options  | Order code |
|--|------------|
| <b>Mounting bracket</b>  |            |
| Steel, galvanized  | <b>H01</b> |
| Stainless steel 1.4301/304   | <b>H02</b> |
| Stainless steel 1.4404/316L  | <b>H03</b> |
| <b>Flange connections with flange EN 1092-1</b>  |            |
| With flange adapter G½ Form B1   |            |
| • DN 25 PN 40, stainless steel 1.4571/316Ti  | <b>J80</b> |
| • DN 50 PN 40, stainless steel 1.4571/316Ti  | <b>J81</b> |
| • DN 80 PN 40, stainless steel 1.4571/316Ti  | <b>J82</b> |
| With siphon G½ Form B1   |            |
| • DN 25 PN 40, stainless steel 1.4571/316Ti  | <b>J83</b> |
| • DN 50 PN 40, stainless steel 1.4571/316Ti  | <b>J84</b> |
| • DN 80 PN 40, stainless steel 1.4571/316Ti  | <b>J85</b> |
| • DN 25 PN 100, stainless steel 1.4571/316Ti   | <b>J86</b> |
| <b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>  |            |
| Seal (EN 837-1) material Fe (soft iron)  | <b>K60</b> |
| Seal (EN 837-1) material 1.4571  | <b>K61</b> |
| Seal (EN 837-1) material Cu  | <b>K62</b> |
| <b>Process connection</b>  |            |
| Process connection male thread G½, bore hole 11 mm   | <b>K80</b> |
| <b>Shut-off valves, pneumatic blocks</b>   |            |
| With mounted pneumatic block 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in test report (EN 10204-2.2)                                  | <b>T02</b> |
| With mounted pneumatic block 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in test report (EN 10204-2.2) | <b>T03</b> |
| With mounted pneumatic block 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in test report (EN 10204-2.2)             | <b>T05</b> |
| With mounted pneumatic block 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in test report (EN 10204-2.2)   | <b>T06</b> |

## Selection and ordering data

| Customer-specific device settings  | Order code |
|--|------------|
| Add "-Z" to article no., specify order code and plain text or drop-down list selection.  |            |
| <b>Measuring span</b><br><b>Start of scale value (max. 5 characters),</b><br><b>full scale value (max. 5 characters),</b><br><b>unit [mbar, bar, kPa, MPa, psi, ...],</b><br><b>example: -0.5 ... 10.5 psi</b> | <b>Y01</b> |
| Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).  |            |
| Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm², kg/cm², kgf/cm², inH₂O, inH₂O (4°C), ftH₂O, mmH₂O, mmH₂O (4°C), mH₂O (4°C), mmHg, inHg, atm, torr  |            |
| <b>TAG</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b>  | <b>Y15</b> |
| Input field: Free text, max. 32 characters   |            |
| <b>Measuring point description</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b>  | <b>Y16</b> |
| Input field: Free text, max. 32 characters   |            |
| <b>TAG short</b><br><b>(device parameters, max. 8 characters)</b>  | <b>Y17</b> |
| Input field: Free text, max. 8 characters  |            |
| <b>Local display</b><br><b>[Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge</b>  | <b>Y21</b> |
| Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge  |            |
| <b>Local display</b><br><b>Scaling with standard units</b><br><b>[m³/s, l/s, m, inch, ...], example 1 ... 5 m</b>  | <b>Y22</b> |
| Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).  |            |
| Drop-down list: m, cm, mm, in, ft, m³, l, hl, in³, yd³, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm³, NI.  |            |
| <b>Local display</b><br><b>Scaling with user-specific units (max. 12 characters),</b><br><b>example 1 ... 5 m</b>  | <b>Y23</b> |
| Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).  |            |
| Input field 3: Free text, max. 8 characters  |            |
| <b>Saturation limits instead of 3.8 ... 20.5 mA,</b><br><b>example: 3.8 ... 22.0 mA</b>  | <b>Y30</b> |
| Drop-down list 1: 3.9, 4   |            |
| Drop-down list 2: 20.8, 22   |            |
| <b>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</b>  | <b>Y31</b> |
| Drop-down list: 3.75; 21.75; 22.5; 22.6  |            |
| <b>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</b>   | <b>Y32</b> |
| Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.  |            |
| <b>ID number of special version</b>  | <b>Y99</b> |
| Input field: max. 4 characters and only natural numbers from 0 ... 9999  |            |



# Pressure Measurement

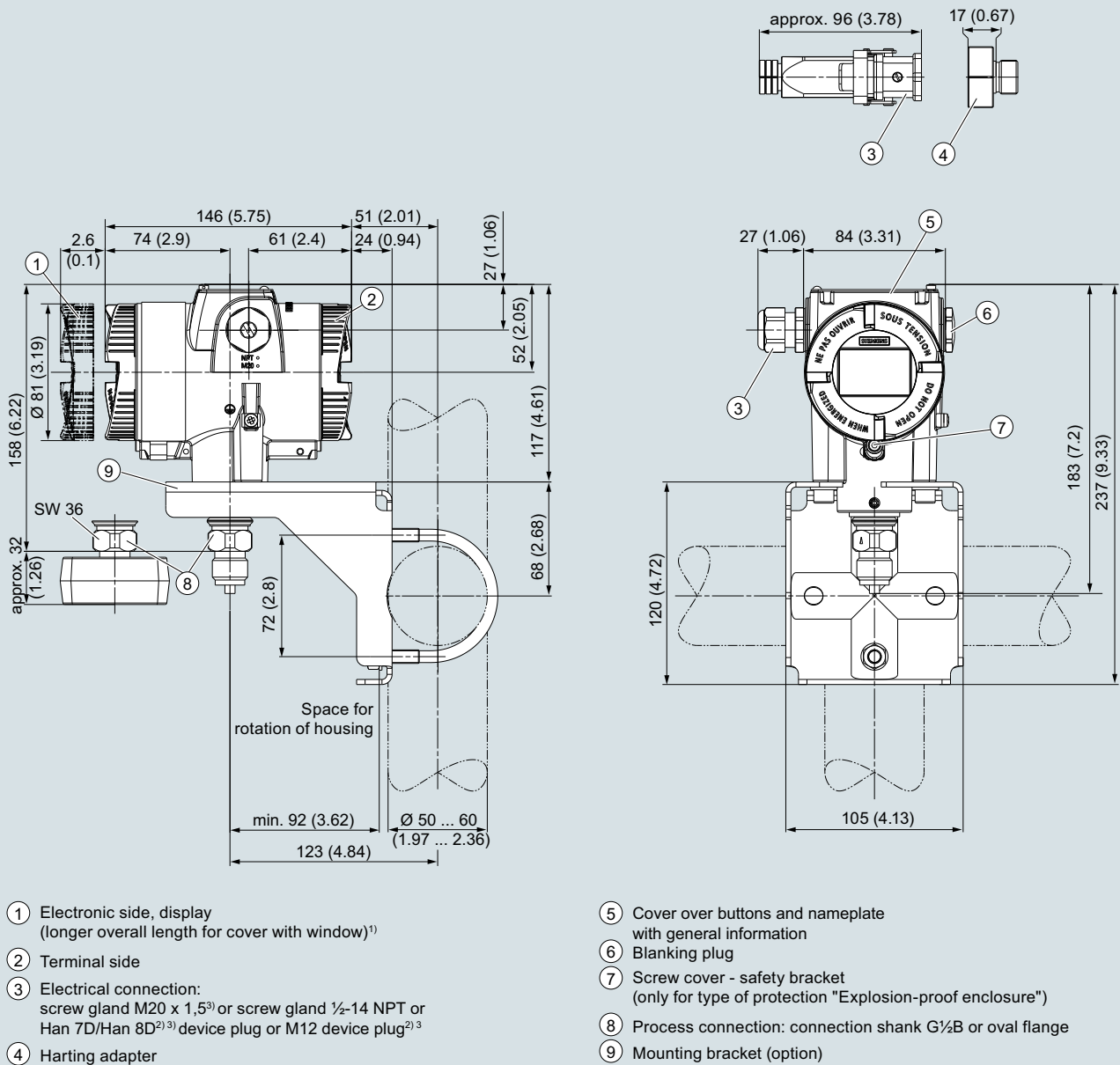
## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (pressure series)

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#### Dimensional drawings



SITRANS P320/P420 pressure transmitter for gauge pressure (pressure series), dimensions in mm (inch)

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge pressure (differential pressure series)

## Technical specifications

### SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)

| Input   |   |   |                                   |
|---|---|---|-----------------------------------|
| Measured variable   | Gauge pressure  |   |                                   |
| Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU) | Span  | Max. permissible operating pressure MAWP (PS) | Maximum permissible test pressure |
|   | 1 ... 20 mbar   | 160 bar                                       | 160 bar                           |
|   | 0.1 ... 2 kPa   | 16 MPa  | 16 MPa                            |
|   | 0.4019 ... 8.037 inH <sub>2</sub> O   | 2320 psi                                      | 2320 psi                          |
|   | 1 ... 60 mbar   | 160 bar                                       | 160 bar                           |
|   | 0.1 ... 6 kPa   | 16 MPa  | 16 MPa                            |
|   | 0.4019 ... 24.11 inH <sub>2</sub> O   | 2320 psi                                      | 2320 psi                          |
|   | 2.5 ... 250 mbar  | 160 bar                                       | 160 bar                           |
|   | 0.2 ... 25 kPa  | 16 MPa  | 16 MPa                            |
|   | 1.005 ... 100.5 inH <sub>2</sub> O  | 2320 psi                                      | 2320 psi                          |
|   | 6 ... 600 mbar  | 160 bar                                       | 160 bar                           |
|   | 0.6 ... 60 kPa  | 16 MPa  | 16 MPa                            |
|   | 2.41 ... 241.1 inH <sub>2</sub> O   | 2320 psi                                      | 2320 psi                          |
|   | 16 ... 1600 mbar  | 160 bar                                       | 160 bar                           |
|   | 1.6 ... 160 kPa   | 16 MPa  | 16 MPa                            |
|   | 6.43 ... 643 inH <sub>2</sub> O   | 2320 psi                                      | 2320 psi                          |
|   | 50 ... 5000 mbar  | 160 bar                                       | 160 bar                           |
|   | 5 ... 500 kPa   | 16 MPa  | 16 MPa                            |
|   | 20.09 ... 2009 inH <sub>2</sub> O   | 2320 psi                                      | 2320 psi                          |
|   | 0.3 ... 30 bar  | 160 bar                                       | 160 bar                           |
| 0.03 ... 3 MPa  | 16 MPa  | 16 MPa  |                                   |
| 4.35 ... 435 psi  | 2320 psi  | 2320 psi                                      |                                   |
| Measuring limits  |   |   |                                   |
| • Low measuring limit   |   |   |                                   |
| - Measuring cell with silicone oil filling  | 30 mbar a/3 kPa a/0.44 psi a  |   |                                   |
| - Measuring cell with inert oil   | 30 mbar a/3 kPa a/0.44 psi a  |   |                                   |
| - Measuring cell with FDA-compliant oil   | 100 mbar a/10 kPa a/1.45 psi a  |   |                                   |
| • Upper measuring limit   | 100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/process temperature)       |   |                                   |
| • Start of scale  | Between the measuring limits (infinitely adjustable)  |   |                                   |
| Output  | HART  |   |                                   |
| Output signal   | 4 ... 20 mA   |   |                                   |
| • Low saturation limit (infinitely adjustable)  | 3.55 mA, factory preset to 3.8 mA   |   |                                   |
| • High saturation limit (infinitely adjustable)   | 22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA   |   |                                   |
| • Ripple (without HART communication)   | I <sub>pp</sub> ≤ 0.5% of max. output current   |   |                                   |
| Adjustable damping  | 0 ... 100 s, continuously adjustable over remote operation  |   |                                   |
|   | 0 ... 100 s, in increments of 0.1 s, adjustable over display  |   |                                   |
| • Current transmitter   | 3.55 ... 22.8 mA  |   |                                   |
| • Failure signal  | 3.55 ... 22.8 mA  |   |                                   |
| Load  | Resistor R [Ω]  |   |                                   |
| • Without HART communication  | R = (U <sub>H</sub> - 10.5 V)/22.8 mA,<br>U <sub>H</sub> : Power supply in V  |   |                                   |
|   | R = 230 ... 1100 Ω (HART communicator (handheld))   |   |                                   |
| • With HART communication   | R = 230 ... 500 Ω (SIMATIC PDM)   |   |                                   |
| Characteristic curve  | • Linearly increasing or linearly decreasing<br>• Linear increase or decrease or according to the square root (only for differential pressure and flow) |   |                                   |
| Physical bus  | -   |   |                                   |
| Polarity-independent  | -   |   |                                   |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (differential pressure series)

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**SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)****Measuring accuracy**

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Start of scale value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

- Linear characteristic

- 20 mbar/2 kPa/8.031 inH<sub>2</sub>O
- 60 mbar/6 kPa/24.09 inH<sub>2</sub>O
- 250 mbar/25 kPa/3.6 psi
- 600 mbar/60 kPa/240.9 inH<sub>2</sub>O
- 1600 mbar/160 kPa/642.4 inH<sub>2</sub>O
- 5000 mbar/500 kPa/2008 inH<sub>2</sub>O
- 30 bar/3 MPa/435 psi

 $r = \text{max. measuring span/set measuring span and nominal measuring range}$ 

|                    |   |
|--------------------|---|
| $r \leq 5$ :       | $\leq 0.075\%$                                  |
| $5 < r \leq 20$ :  | $\leq (0.005 \cdot r + 0.05)\%$                 |
| $r \leq 5$ :       | $\leq 0.075\%$                                  |
| $5 < r \leq 60$ :  | $\leq (0.005 \cdot r + 0.05)\%$                 |
| $r \leq 5$ :       | $\leq 0.065\%$ (SITRANS P320)                   |
|                    | $\leq 0.04\%$ (SITRANS P420)                    |
| $5 < r \leq 100$ : | $\leq (0.005 \cdot r + 0.045)\%$ (SITRANS P320) |
|                    | $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P420) |

Influence of ambient temperature as % per 28 °C (50 °F)

- 20 mbar/2 kPa/8.031 inH<sub>2</sub>O
- 60 mbar/6 kPa/24.09 inH<sub>2</sub>O
- 250 mbar/25 kPa/3.6 psi
- 600 mbar/60 kPa/240.9 inH<sub>2</sub>O
- 1600 mbar/160 kPa/642.4 inH<sub>2</sub>O
- 5000 mbar/500 kPa/2008 inH<sub>2</sub>O
- 30 bar/3 MPa/435 psi
- 250 mbar/25 kPa/3.6 psi
- 5000 mbar/500 kPa/2008 inH<sub>2</sub>O
- 600 mbar/60 kPa/240.9 inH<sub>2</sub>O
- 1600 mbar/160 kPa/642.4 inH<sub>2</sub>O
- 30 bar/3 MPa/435 psi

$\leq (0.15 \cdot r + 0.1)\%$   
 $\leq (0.075 \cdot r + 0.1)\%$   
 $\leq (0.025 \cdot r + 0.125)\%$  (SITRANS P320)

 $\leq (0.025 \cdot r + 0.625)\%$  (SITRANS P420) $\leq (0.0125 \cdot r + 0.625)\%$  (SITRANS P420)Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- 20 mbar/2 kPa/8.031 inH<sub>2</sub>O
- 60 mbar/6 kPa/24.09 inH<sub>2</sub>O
- 250 mbar/25 kPa/3.6 psi
- 600 mbar/60 kPa/240.9 inH<sub>2</sub>O
- 1600 mbar/160 kPa/642.4 inH<sub>2</sub>O
- 5000 mbar/500 kPa/2008 inH<sub>2</sub>O

$\leq (0.2 \cdot r)\%$  per year  
 In 5 years  $\leq (0.25 \cdot r)\%$   
 In 5 years  $\leq (0.125 \cdot r)\%$   
 In 10 years  $\leq (0.15 \cdot r)\%$

- 30 bar/3 MPa/435 psi

In 5 years  $\leq (0.25 \cdot r)\%$   
 In 10 years  $\leq (0.35 \cdot r)\%$

Step response time  $T_{63}$  (without electrical damping)

Approx. 0.1 s

Effect of mounting position (in pressure per change of angle)

$\leq 0.07 \text{ mbar}/0.007 \text{ kPa}/0.01015266 \text{ psi}$  per 10° incline  
 (zero-point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

**Rated conditions**

Temperature of medium

- Measuring cell with silicone oil filling
  - Measuring cell 30 bar (435 psi), PN 420
- Measuring cell with inert oil
  - Measuring cell 30 bar (435 psi), PN 420
- Measuring cell with FDA-compliant oil
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)  
 -20 ... +85 °C (-4 ... +185 °F)  
 -20 ... +100 °C (-4 ... +212 °F)  
 -20 ... +85 °C (-4 ... +185 °F)  
 -10 ... +100 °C (14 ... +212 °F)  
 -40 ... +85 °C (-4 ... +185 °F)

Ambient conditions

- Ambient temperature/enclosure
  - Measuring cell with silicone oil filling
  - Measuring cell with silicone oil filling, measuring cell 30 bar (435 psi), PN 420
  - Measuring cell with inert oil
  - Measuring cell with FDA-compliant oil
  - Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
  - According to IEC 60529
  - According to NEMA 250
- Electromagnetic compatibility
  - Emitted interference and interference immunity

Observe the temperature class in areas subject to explosion hazard.

-40 ... +85 °C (-40 ... +185 °F)  
 -20 ... +85 °C (-4 ... +185 °F)  
 -20 ... +85 °C (-4 ... +185 °F)  
 -10 ... +85 °C (14 ... +185 °F)  
 -20 ... +80 °C (-4 ... +176 °F)  
 -50 ... +85 °C (-58 ... +185 °F); with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F)  
 4K4H

IP66, IP68  
 Type 4X

According to IEC 61326 and NAMUR NE 21

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

## for gauge pressure (differential pressure series)

### SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)

#### Design

|                                     |   |
|-------------------------------------|---|
| Weight                              | Approx. 3.9 kg (8.5 lb) with aluminum enclosure<br>Approx. 5.8 kg (12.7 lb) with stainless steel enclosure  |
| Material                            |   |
| • Wetted parts materials            |   |
| - Seal diaphragm                    | Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold  |
| - Process flanges and sealing plugs | Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360   |
| - O-ring                            | FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR  |
| • Non-wetted parts materials        |   |
| - Electronics housing               | <ul style="list-style-type: none"> <li>• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M</li> <li>• Standard: Powder coating with polyurethane<br/>Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane</li> <li>• Stainless steel type plate (1.4404/316L)</li> </ul> |
| - Pressure flange screws            | Stainless steel ISO 3506-1 A4-70  |
| - Mounting bracket                  | Steel, electrogalvanized steel, or stainless steel  |
| Process connection                  | ½-18 NPT female thread and flat connection with 7/16-20 UNF fastening screw thread in accordance with EN 61518 or M10 fastening screw thread in accordance with DIN 19213 (M12 for PN 420 (MWP 6092 psi))   |
| Electrical connection               | <p>Screw terminals</p> <p>Cable entry via the following screwed glands:</p> <ul style="list-style-type: none"> <li>• M20 x 1.5</li> <li>• ½-14 NPT</li> <li>• Han 7D/Han 8D device plug<sup>1)</sup></li> <li>• M12 device plug</li> </ul>  |

#### Displays and controls

|         |  |
|---------|--|
| Keys    | 4 keys for operation directly on the device  |
| Display | <ul style="list-style-type: none"> <li>• With or without integrated display (optional)</li> <li>• Cover with inspection window (optional)</li> </ul> |

#### Auxiliary power $U_H$

|  |   |
|--|---|
| Terminal voltage on pressure transmitter | 10.5 ... 45 V DC<br>10.5 ... 30 V DC in intrinsically safe mode |
| Ripple                                   | $U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)                     |
| Noise                                    | $U_{eff} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz)                  |
| Auxiliary power                          | –   |
| Separate supply voltage                  | –   |

#### Certificates and approvals

|   |   |
|---|---|
| Classification according to pressure equipment directive (PED 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)  |
| Drinking water  |   |
| • WRAS (England)  | Available soon  |
| • ACS (France)  | Available soon  |
| • DVGW (Germany)  | Available soon  |
| • NSF (USA)   | Available soon  |
| CRN (Canada)  | Available soon  |
| Explosion protection acc. to NEPSI (China)                                | Available soon  |
| Explosion protection acc. to INMETRO (Brazil)                             | Available soon  |
| BAM (Germany), oxygen expenditures  | Available soon  |
| Explosion protection  |   |
| • Intrinsic safety "i"  |   |
| - Marking   | II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb   |
| - Permissible ambient temperature   | -40 ... +80 °C (-40 ... +176 °F) temperature class T4<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T6  |
| - Permissible temperature of measuring medium                             | -40 ... +100 °C (-40 ... +212 °F) temperature class T4<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T6   |
| - Connection  | To certified intrinsically safe circuits with the peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$<br>$U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$<br>$L_i = 0.24 \text{ μH/C}_i = 3.29 \text{ nF}$ |
| - Effective internal inductance/capacitance                               |   |
| • Flameproof enclosure "d"  |   |
| - Marking   | Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb  |
| - Permissible ambient temperature   | -40 ... +80 °C (-40 ... +176 °F) temperature class T4<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T6  |
| - Permissible temperature of measuring medium                             | -40 ... +100 °C (-40 ... +212 °F) temperature class T4<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T6   |
| - Connection  | To a circuit with the operating values:<br>$U_n = 10.5 \text{ to } 45 \text{ V}$ , $I_n = 20 \text{ mA}$  |

**SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)**

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>Dust explosion protection for Zone 20, 21, 22           <ul style="list-style-type: none"> <li>Marking</li> <li>Permissible ambient temperature</li> <li>Permissible temperature of measuring medium</li> <li>Max. surface temperature</li> <li>Connection</li> </ul> </li> <li>Dust explosion protection for Zone 20, 21, 22           <ul style="list-style-type: none"> <li>Marking</li> <li>Permissible ambient temperature</li> <li>Permissible temperature of measuring medium</li> <li>Connection</li> </ul> </li> <li>Effective internal inductance/capacitance</li> <li>Type of protection for Zone 2           <ul style="list-style-type: none"> <li>Marking</li> <li>Permissible ambient temperature "ec"</li> <li>Permissible ambient temperature "ic"</li> <li>Permissible temperature of measuring medium</li> <li>"ec" connection</li> <li>"ic" connection</li> </ul> </li> <li>Explosion protection acc. to FM           <ul style="list-style-type: none"> <li>Marking (XP/DIP) or IS; NI; S</li> </ul> </li> <li>Explosion protection according to CSA           <ul style="list-style-type: none"> <li>Marking (XP/DIP) or (IS)</li> </ul> </li> </ul> | <p>Ex II 1D Ex tb IIIC T120 °C Da<br/>Ex II 2D Ex tb IIIC T120 °C Db<br/>Ex II 3D Ex tc IIIC T120 °C Dc</p> <p>-40 ... +80 °C (-40 ... +176 °F)<br/>-40 ... +100 °C (-40 ... +212 °F)<br/>120 °C (248 °F)</p> <p>To a circuit with the operating values:<br/><math>U_n = 10.5</math> to 45 V, 4 ... 20 mA</p> <p>Ex II 1D Ex ia IIIC T120 °C Da<br/>Ex II 2D Ex ib IIIC T120 °C Db<br/>Ex II 3D Ex ic IIIC T120 °C Dc</p> <p>-40 ... +80 °C (-40 ... +176 °F)<br/>-40 ... +100 °C (-40 ... +212 °F)</p> <p>To certified intrinsically safe circuits with the peak values:<br/><math>U_i = 30</math> V, <math>I_i = 101</math> mA, <math>P_i = 760</math> mW<br/><math>U_i = 29</math> V, <math>I_i = 110</math> mA, <math>P_i = 800</math> mW<br/><math>L_i = 0.24</math> μH/<math>C_i = 3.29</math> nF</p> <p>Ex II 3G Ex ec IIC T4/T6 Gc<br/>Ex II 3G Ex ic IIC T4/T6 Gc</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4<br/>-40 ... +40 °C (-40 ... +104 °F) temperature class T6<br/>-40 ... +80 °C (-40 ... +176 °F) temperature class T4<br/>-40 ... +80 °C (-40 ... +176 °F) temperature class T6</p> <p>-40 ... +100 °C (-40 ... +212 °F) temperature class T4<br/>-40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>To a circuit with the operating values:<br/><math>U_n = 10.5</math> to 30 V, 4 ... 20 mA</p> <p>To certified intrinsically safe circuits with the peak values:<br/><math>U_i = 30</math> V, <math>I_i = 101</math> mA, <math>P_i = 760</math> mW<br/><math>U_i = 29</math> V, <math>I_i = 110</math> mA, <math>P_i = 800</math> mW</p> <p>Effective internal inductance/capacitance:<br/><math>L_i = 0.24</math> μH/<math>C_i = 3.29</math> nF</p> <p>Available soon<br/>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p> <p>Available soon<br/>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p> |
|---|---|

<sup>1)</sup> Han 8D is identical to Han 8U.

**HART communication**

|                       |                |
|-----------------------|----------------|
| HART                  | 230 ... 1100 Ω |
| Protocol              | HART 7         |
| Software for computer | SIMATIC PDM    |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

for gauge pressure (differential pressure series)

## Selection and ordering data

Article No.

### Pressure transmitters for gauge pressure (differential pressure series)

SITRANS P320

7MF031 - - - - -

SITRANS P420

7MF041 - - - - -

➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.

### Communication

HART, 4 ... 20 mA

0

### Measuring cell filling

Silicone oil

1

Inert liquid

3

Neobee oil

4

### Maximum measuring span

20 mbar (8.037 inH<sub>2</sub>O)

B

60 mbar (24.11 inH<sub>2</sub>O)

D

250 mbar (1005 inH<sub>2</sub>O)

G

600 mbar (241.1 inH<sub>2</sub>O)

H

1 600 mbar (643 inH<sub>2</sub>O)

M

5000 mbar (2009 inH<sub>2</sub>O)

P

30 bar (435 psi)

R

### Process connection

Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518)

L

Oval flange, mounting thread: M10 (PN 160), (DIN 19213)

M

Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518) with lateral ventilation

N

Oval flange, mounting thread: M10 (PN 160) (DIN 19213) with lateral ventilation

P

### Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404

0

Stainless steel 316L/1.4404, alloy C276/2.4819

1

Alloy C22/2.4602, alloy C276/2.4819

2

Tantalum/tantalum (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

4

Monel 00/2.4360, Monel 400/2.4360 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

6

Stainless steel 316L/1.4404, gold-plated (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

8

### Non-wetted parts materials

Die-cast aluminum

1

Stainless steel precision casting CF3M/1.4409 similar to 316L

2

### Enclosure

Dual chamber device

5

### Type of protection

Without Ex

A

Intrinsic safety

B

Flameproof enclosure

C

Flameproof enclosure, intrinsic safety

D

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

L

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

M

Combination of options B, C and L (zone model)

S

Combination of options B, C and M (zone model, Class Division)

T

### Electrical connections/cable entries

Thread for cable gland

• 2 x M20 x 1.5

• 2 x 1/2-14 NPT

F  
M

Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge pressure (differential pressure series)

|   | Article No.         |
|---|---------------------|
| Pressure transmitters for gauge pressure (differential pressure series) |                     |
| SITRANS P320  | 7MF 0 3 1 - - - - - |
| SITRANS P420  | 7MF 0 4 1 - - - - - |
| Local operation/display   |                     |
| Without display (cover closed)  | 0                   |
| With display (cover closed)   | 1                   |
| With display (cover with glass pane)                                    | 2                   |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge pressure (differential pressure series)

1

## Selection and ordering data

| Options  | Order code | Options  | Order code |
|--|------------|--|------------|
| Add "-Z" to article no. and specify order code.  |            | <b>Device options</b>  |            |
| <b>Cable glands included</b>   |            | PDF file with device settings  | <b>D10</b> |
| Plastic  | <b>A00</b> | Double layer coating (epoxy resin and polyurethane)<br>120 µm of enclosure and cover | <b>D20</b> |
| Metal  | <b>A01</b> | FVMQ enclosure sealing   | <b>D21</b> |
| Stainless steel  | <b>A02</b> | IP66/IP68 degree of protection (not for M12 and Han device plugs)                    | <b>D30</b> |
| Stainless steel 316L/1.4404  | <b>A03</b> | TAG label empty  | <b>D40</b> |
| CMP, for XP devices  | <b>A10</b> | Without labeling of the measuring range on the TAG label                             | <b>D41</b> |
| CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm            | <b>A11</b> | Stainless steel Ex plate 1.4404/316L   | <b>D42</b> |
| CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm | <b>A12</b> | Increase of pressure stage from PN 420 to PN 500                                     | <b>D50</b> |
| <b>Han device plug mounted left</b>  |            | Overvoltage protection up to 6 kV (external)   | <b>D71</b> |
| Han 7D device plug (plastic, straight)   | <b>A30</b> | Adhesive labels on transport packaging (supplied by customer)                        | <b>D90</b> |
| Han 7D device plug (plastic, angled)   | <b>A31</b> |  |            |
| Han 7D device plug (metal, straight)   | <b>A32</b> | <b>General approval without Ex approval</b>  |            |
| Han 7D device plug (metal, angled)   | <b>A33</b> | Worldwide (CE, RCM) except EAC, FM, CSA, KCC   | <b>E00</b> |
| Han 8D device plug (plastic, straight)   | <b>A34</b> | Worldwide (CE, RCM, EAC, FM, CSA, KCC)   | <b>E01</b> |
| Han 8D device plug (plastic, angled)   | <b>A35</b> | CSA  | <b>E06</b> |
| Han 8D device plug (metal, straight)   | <b>A36</b> | EAC  | <b>E07</b> |
| Han 8D device plug (metal, angled)   | <b>A37</b> | FM   | <b>E08</b> |
| <b>Cable socket included</b>   |            | KCC  | <b>E09</b> |
| Plastic, for Han 7D/8D device plugs  | <b>A40</b> | UL   | <b>E10</b> |
| Metal, for Han 7D/8D device plugs  | <b>A41</b> | <b>Explosion protection approvals</b>  |            |
| <b>M12 device plug mounted left</b>  |            | ATEX (Europe)  | <b>E20</b> |
| Stainless steel, without cable socket  | <b>A62</b> | CSA (USA and Canada)   | <b>E21</b> |
| Stainless steel, with cable socket   | <b>A63</b> | FM (USA and Canada)  | <b>E22</b> |
| <b>Cable entry/connector mounting</b>  |            | IECEx (Worldwide)  | <b>E23</b> |
| 2x sealing plugs M20 x 1.5, IP66/68 installed on both sides  | <b>A90</b> | EACEx (GOST-R, -K, -B)   | <b>E24</b> |
| 2x sealing plugs ½-14 NPT, IP66/68 installed on both sides   | <b>A91</b> | INMETRO (Brazil)   | <b>E25</b> |
| Cable gland/connector mounted left   | <b>A97</b> | KCs (Korea)  | <b>E26</b> |
| Cable gland/connector mounted on right   | <b>A99</b> | NEPSI (China)  | <b>E27</b> |
| <b>Nameplate labeling</b>  |            | PESO (India)   | <b>E28</b> |
| German (bar)   | <b>B11</b> | TIIS Hazardous (Japan)   | <b>E29</b> |
| French (bar)   | <b>B12</b> | UKR Sepro (Ukraine)  | <b>E30</b> |
| Spanish (bar)  | <b>B13</b> | ATEX (Europe) and IECEx (Worldwide)  | <b>E47</b> |
| Italian (bar)  | <b>B14</b> | CSA (Canada) and FM (USA)  | <b>E48</b> |
| Chinese (bar)  | <b>B15</b> | ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)                      | <b>E49</b> |
| Russian (bar)  | <b>B16</b> | <b>Marine approvals</b>  |            |
| English (psi)  | <b>B20</b> | DNV-GL (Det Norske Veritas/Germanischer Lloyd)                                       | <b>E50</b> |
| Chinese (Pa)   | <b>B35</b> | LR (Lloyds Register)   | <b>E51</b> |
| <b>Certificates</b>  |            | BV (Bureau Veritas)  | <b>E52</b> |
| Quality test certificate, 5-point factory calibration (IEC 60770-2)                                | <b>C11</b> | ABS (American Bureau of Shipping)  | <b>E53</b> |
| Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts                   | <b>C12</b> | KR (Korean Register of Shipping)   | <b>E56</b> |
| Test report - NACE (MR 0103-2012 and MR 0175-2009)   | <b>C13</b> | RINA (Registro Italiano Navale)  | <b>E57</b> |
| Test report (EN 10204-2.2) - Wetted parts  | <b>C14</b> | CCS (China Classification Society)   | <b>E58</b> |
| Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts                   | <b>C15</b> | <b>Country-specific approvals</b>  |            |
| <b>Certificates for functional safety</b>  |            | CRN approval Canada (Canadian Registration Number)                                   | <b>E60</b> |
| Functional safety (IEC 61508) - SIL2/3   | <b>C20</b> |  |            |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (differential pressure series)

1

| Options  | Order code |
|--|------------|
| <b>Special approvals</b>   |            |
| Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))                             | <b>E80</b> |
| Dual seal  | <b>E81</b> |
| WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM                                       | <b>E83</b> |
| NSF61 (drinking water)   | <b>E84</b> |
| ACS (drinking water)   | <b>E85</b> |
| <b>Mounting bracket</b>  |            |
| Steel, galvanized  | <b>H01</b> |
| Stainless steel 1.4301/304   | <b>H02</b> |
| Stainless steel 1.4404/316L  | <b>H03</b> |
| <b>Process flanges; screw plug with vent valve</b>   |            |
| Welded in on right   | <b>J08</b> |
| Welded in on left  | <b>J09</b> |
| Glued in on right  | <b>J10</b> |
| Glued in on left   | <b>J11</b> |
| <b>Flange connections with flange EN 1092-1</b>  |            |
| Form B1  |            |
| • DN 25 PN 40, stainless steel 1.4571/316Ti  | <b>J70</b> |
| • DN 50 PN 40, stainless steel 1.4571/316Ti  | <b>J71</b> |
| • DN 80 PN 40, stainless steel 1.4571/316Ti  | <b>J72</b> |
| • DN 15 PN 40, stainless steel 1.4571/316Ti  | <b>J78</b> |
| Form C   |            |
| • DN 25 PN 40, stainless steel 1.4571/316Ti  | <b>J73</b> |
| • DN 50 PN 40, stainless steel 1.4571/316Ti  | <b>J74</b> |
| • DN 80 PN 40, stainless steel 1.4571/316Ti  | <b>J75</b> |
| <b>Flange connection options</b>   |            |
| Flange connection and temperature extension  | <b>J76</b> |
| Flange connection with epoxy resin coating   | <b>J77</b> |
| <b>Process flanges; special materials</b>  |            |
| Reserved for 7MF7: without process flanges, without screws, without gaskets                                    | <b>K00</b> |
| Process flange material alloy C4/2.4610  | <b>K01</b> |
| Process flange material Monel 400/2.4360   | <b>K02</b> |
| Process connection material PVDF, on the side ½-14 NPT   | <b>K05</b> |
| Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar | <b>K06</b> |
| Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar | <b>K07</b> |
| <b>Process flanges; process connection option</b>  |            |
| Process flange with process connection G½ welded on  | <b>K20</b> |
| Process connection (oval flange) NAM (ASTAVA)  | <b>K21</b> |
| <b>Process flanges chambered with gaskets</b>  |            |
| 1x chambered, graphite   | <b>K40</b> |
| 1x chambered, PTFE   | <b>K41</b> |
| 2x chambered, PTFE   | <b>K42</b> |
| <b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>  |            |
| O-ring, process flanges, PTFE  | <b>K50</b> |
| O-ring, process flanges, FEP (with silicone core, approved for food)   | <b>K51</b> |
| O-ring, process flanges, FFKM (FFPM)   | <b>K52</b> |
| O-ring, process flanges, NBR   | <b>K53</b> |
| O-ring, process flanges, EPDM  | <b>K54</b> |

| Options  | Order code |
|--|------------|
| <b>Process flange options</b>  |            |
| Process flanges for vertical differential pressure lines (half process flange)   | <b>K81</b> |
| Process flanges (+) - side front   | <b>K82</b> |
| Process flange screws, process flange nuts, material Monel 400/2.4360  | <b>K83</b> |
| Valve ¼-18 NPT, material same as process flanges   | <b>K84</b> |
| Valve mounted on the side, measured medium: Gas  | <b>K85</b> |
| Oval flange enclosed, gasket PTFE + mounting screws  | <b>K86</b> |
| <b>Pneumatic blocks</b>  |            |
| With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2) | <b>U01</b> |
| With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)     | <b>U02</b> |
| With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2) | <b>U03</b> |
| With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)     | <b>U04</b> |

# Pressure Measurement

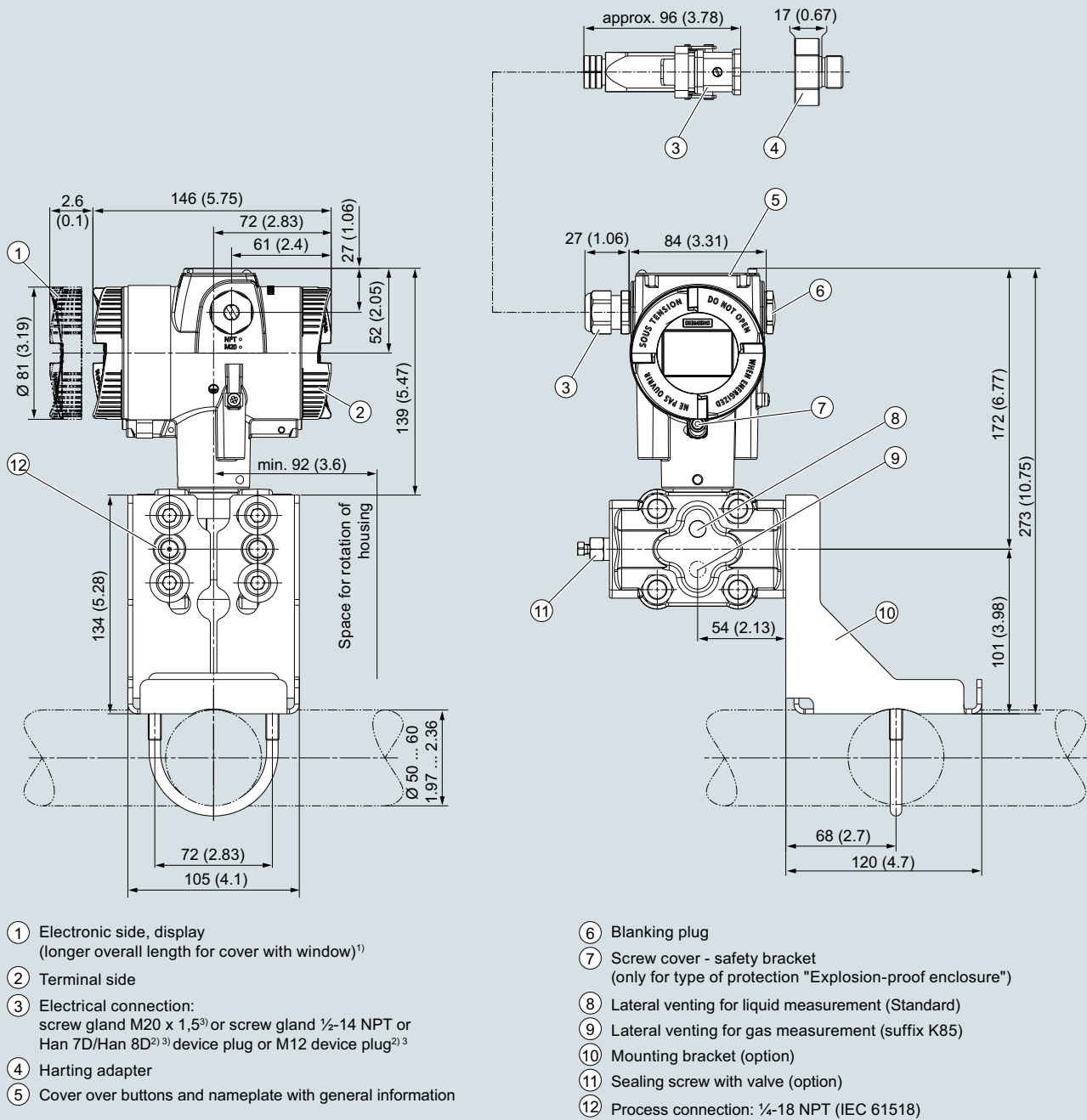
Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

for gauge pressure (differential pressure series)

## Selection and ordering data

| Customer-specific device settings   | Order code |
|---|------------|
| Add "-Z" to article no., specify order code and plain text or drop-down list selection.   |            |
| <b>Measuring span</b><br><b>Start of scale value (max. 5 characters),</b><br><b>full scale value (max. 5 characters),</b><br><b>unit [mbar, bar, kPa, MPa, psi, ...],</b><br><b>example: -0.5 ... 10.5 psi</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr | Y01        |
| <b>TAG</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b><br><br>Input field: Free text, max. 32 characters   | Y15        |
| <b>Measuring point description</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b><br><br>Input field: Free text, max. 32 characters   | Y16        |
| <b>TAG short</b><br><b>(device parameters, max. 8 characters)</b><br><br>Input field: Free text, max. 8 characters  | Y17        |
| <b>Local display</b><br><b>[Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge</b><br><br>Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge  | Y21        |
| <b>Local display</b><br><b>Scaling with standard units</b><br><b>[m<sup>3</sup>/s, l/s, m, inch, ...], example 1 ... 5 m</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.  | Y22        |
| <b>Local display</b><br><b>Scaling with user-specific units (max. 12 characters),</b><br><b>example 1 ... 5 m</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Input field 3: Free text, max. 8 characters   | Y23        |
| <b>Saturation limits instead of 3.8 ... 20.5 mA,</b><br><b>example: 3.8 ... 22.0 mA</b><br><br>Drop-down list 1: 3.9, 4<br>Drop-down list 2: 20.8, 22   | Y30        |
| <b>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</b><br><br>Drop-down list: 3.75; 21.75; 22.5; 22.6  | Y31        |
| <b>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</b><br><br>Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.   | Y32        |
| <b>ID number of special version</b><br><br>Input field: max. 4 characters and only natural numbers from 0 ... 9999  | Y99        |

## Dimensional drawings



SITRANS P320/P420 pressure transmitter for relative pressure (differential pressure series), dimensions in mm (inch)

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

## Technical specifications

### SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm

#### Input of gauge pressure, with flush-mounted diaphragm

Measured variable

Gauge pressure

Span (infinitely adjustable) or measuring range, max. operating pressure and max. test pressure

Span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

0.01 ... 1 bar  
1 ... 100 kPa  
0.15 ... 14.5 psi  
0.04 ... 4 bar  
4 ... 400 kPa  
0.58 ... 58 psi  
0.16 ... 16 bar  
0.016 ... 1.6 MPa  
2.3 ... 232 psi  
0.6 ... 63 bar  
0.063 ... 6.3 MPa  
9.1 ... 914 psi

Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange<sup>1)</sup>

Measuring limits

- Low measuring limit
  - Measuring cell with silicone oil filling
  - Measuring cell with inert oil
  - Measuring cell with FDA-compliant oil
- Upper measuring limit

100 mbar a/10 kPa a/1.45 psi a  
100 mbar a/10 kPa a/1.45 psi a  
100 mbar a/10 kPa a/1.45 psi a  
100% of max. span

#### Input of absolute pressure, with flush-mounted diaphragm

Measured variable

Absolute pressure

Span (infinitely adjustable) or measuring range, max. operating pressure and max. test pressure

Span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

43 ... 1300 mbar a  
4.3 ... 130 kPa a  
17 ... 525 inH<sub>2</sub>O a  
166 ... 5000 mbar a  
16.6 ... 500 kPa a  
2.41 ... 72.5 psi a  
1 ... 30 bar a  
0.1 ... 3 MPa a  
14.5 ... 435 psi a

Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange<sup>1)</sup>

Depending on the process connection, the span may differ from these values.

Measuring limits

- Low measuring limit
  - Measuring cell with silicone oil filling
- Upper measuring limit

0 bar a/0 kPa a/0 psi a  
100% of max. span

Start of scale

Between the measuring limits (infinitely adjustable)

#### Output

#### HART

Output signal

4 ... 20 mA  
3.55 mA, factory preset to 3.8 mA  
22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA  
 $I_{pp} \leq 0.5\%$  of max. output current  
0 ... 100 s, continuously adjustable over remote operation  
0 ... 100 s, in increments of 0.1 s, adjustable over display  
3.55 ... 22.8 mA  
3.55 ... 22.8 mA

- Current transmitter
- Failure signal

Load

- Without HART communication
- With HART communication

Resistor R [ $\Omega$ ]  
 $R = (U_H - 10.5 \text{ V}) / 22.8 \text{ mA}$ ,  
 $U_H$ : Power supply in V  
 $R = 230 \dots 1100 \Omega$  (HART communicator (handheld))  
 $R = 230 \dots 500 \Omega$  (SIMATIC PDM)

Characteristic curve

- Linearly increasing or linearly decreasing
- Linear increase or decrease or according to the square root (only for differential pressure and flow)

Physical bus

-

Polarity-independent

-

**SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm****Gauge pressure measuring accuracy, with flush-mounted diaphragm**

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Start of scale value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down) $r$  = maximum measuring span/set measuring span or nominal measuring range

- Linear characteristic

- 1 bar/100 kPa/3.6 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

 $r \leq 5$ :  $\leq 0.075\%$  $5 < r \leq 100$ :  $\leq (0.005 \cdot r + 0.05)\%$ 

Influence of ambient temperature in % per 28 °C (50 °F)

- 1 bar/100 kPa/3.6 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

 $\leq (0.08 \cdot r + 0.16)\%$ Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- 1 bar/100 kPa/3.6 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

In 5 years  $\leq (0.25 \cdot r)\%$ 

- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

In 5 years  $\leq (0.125 \cdot r)\%$ Step response time  $T_{63}$  (without electrical damping)

Approx. 0.1 s

Effect of mounting position (in pressure per change of angle)

0.4 mbar/0.04 kPa/0.006 per 10° incline  
(zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

**Absolute pressure measuring accuracy with flush diaphragm**

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Start of scale value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down) $r$  = maximum measuring span/set measuring span or nominal measuring range

- Linear characteristic

- All measuring cells

 $r \leq 10$ :  $\leq 0.2\%$  $10 < r \leq 30$ :  $\leq 0.4\%$ 

Influence of ambient temperature in % per 28 °C (50 °F)

- All measuring cells

 $\leq (0.16 \cdot r + 0.24)\%$ Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- All measuring cells

In 5 years  $\leq (0.25 \cdot r)\%$ Step response time  $T_{63}$  (without electrical damping)

Approx. 0.2 s

Effect of mounting position (in pressure per change of angle)

0.4 mbar/0.04 kPa/0.006 per 10° incline  
(zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

## for gauge and absolute pressure, flush-mounted diaphragm

### SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm

#### Rated conditions

Temperature of medium<sup>2)</sup>

- Measuring cell with silicone oil filling

-40 ... +150 °C (-40 ... +302 °F)  
-40 ... +200 °C (-40 ... +392 °F) with cooling extension  
-20 ... +100 °C (-4 ... +212 °F)  
-10 ... +150 °C (14 ... +302 °F)  
-10 ... +200 °C (14 ... +392 °F) with cooling extension

Ambient conditions

- Ambient temperature/enclosure
  - Measuring cell with silicone oil filling
  - Measuring cell with inert oil (different pressure classes)
- Measuring cell with FDA-compliant oil
- Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
  - According to IEC 60529
  - According to NEMA 250
- Electromagnetic compatibility
  - Emitted interference and interference immunity

Observe the temperature class in areas subject to explosion hazard.

-40 ... +85 °C (-40 ... +185 °F)

1 bar/100 kPa/3.6 psi

4 bar/400 kPa/58 psi

16 bar/1.6 MPa/232 psi

63 bar/6.3 MPa/914 ps

-40 ... +100 °C (-40 ... +212 °F)

160 bar/16 MPa/2321 psi

400 bar/40 MPa/5802 psi

700 bar/70 MPa/10152 ps

-20 ... +100 °C (-4 ... +212 °F)

-10 ... +85 °C (14 ... +185 °F)

-20 ... +80 °C (-4 ... +176 °F)

-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))

4K4H

IP66, IP68

Type 4X

According to IEC 61326 and NAMUR NE 21

#### Design

Weight (pressure transmitter without mounting flange)

Material

- Wetted parts materials
  - Process connection
  - Seal diaphragm
- Non-wetted parts materials
  - Electronics housing

Stainless steel, mat. no. 1.4404/316L

Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819

- Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M

- Standard: Powder coating with polyurethane

Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane

- Stainless steel type plate (1.4404/316L)

Steel, electrogalvanized steel, or stainless steel

- Mounting bracket

Process connection

- Flanges according to EN and ASME
- F&B and pharmaceutical flanges
- BioConnect/BioControl
- PMC style

Electrical connection

Cable entry via the following screwed glands:

- M20 x 1.5
- ½-14 NPT
- Han 7D/Han 8D device plug<sup>3)</sup>
- M12 device plug

#### Displays and controls

Keys

4 keys for operation directly on the device

Display

- With or without integrated display (optional)
- Cover with inspection window (optional)

#### Auxiliary power $U_H$

Terminal voltage on pressure transmitter

10.5 ... 45 V DC  
10.5 ... 30 V DC in intrinsically safe mode

Ripple

$U_{ss} \leq 0.2 \text{ V}$  (47 ... 125 Hz)

Noise

$U_{eff} \leq 1.2 \text{ mV}$  (0.5 ... 10 kHz)

Auxiliary power

–

Separate supply voltage

–

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

1

#### SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm

##### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)

Drinking water

- WRAS (England)
- ACS (France)
- DVGW (Germany)
- NSF (USA)

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

BAM (Germany), oxygen expenditures

Explosion protection

- Intrinsic safety "i"

- Marking

- Permissible ambient temperature

- Permissible temperature of measuring medium

- Connection

- Effective internal inductance/capacitance

- Flameproof enclosure "d"

- Marking

- Permissible ambient temperature

- Permissible temperature of measuring medium

- Connection

- Dust explosion protection for Zone 20, 21, 22

- Marking

- Permissible ambient temperature

- Permissible temperature of measuring medium

- Max. surface temperature

- Connection

- Dust explosion protection for Zone 20, 21, 22

- Marking

- Permissible ambient temperature

- Permissible temperature of measuring medium

- Connection

- Effective internal inductance/capacitance

- Type of protection for Zone 2

- Marking

- Permissible ambient temperature "ec"

- Permissible ambient temperature "ic"

- Permissible temperature of measuring medium

- "ec" connection

- "ic" connection

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

Ex II 1D Ex tb IIIC T120 °C Da

Ex II 2D Ex tb IIIC T120 °C Db

Ex II 3D Ex tc IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

120 °C (248 °F)

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

Ex II 1D Ex ia IIIC T120 °C Da

Ex II 2D Ex ib IIIC T120 °C Db

Ex II 3D Ex ic IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 3G Ex ec IIC T4/T6 Gc

Ex II 3G Ex ic IIC T4/T6 Gc

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +40 °C (-40 ... +104 °F) temperature class T6

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +80 °C (-40 ... +176 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 30 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

Effective internal inductance/capacitance:

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

### SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Explosion protection acc. to FM           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or IS; NI; S</li> </ul> </li> <li>• Explosion protection according to CSA           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or (IS)</li> </ul> </li> </ul> | <p>Available soon</p> <p>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p> <p>Available soon</p> <p>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p> |
|---|---|

- 1) The MAWP value of the pressure transmitter can be lower than the PN value of the mounting flange and vice versa.  
To determine the maximum permissible operating pressure and the maximum permissible test pressure, use the lowest value as reference.
- 2) Observe the temperature limits in the process connection standards (e.g. DIN 32676 and DIN 11851) for the maximum process temperature for flush-mounted process connections.
- 3) Han 8D is identical to Han 8U.

### HART communication

|                       |                |
|-----------------------|----------------|
| HART                  | 230 ... 1100 Ω |
| Protocol              | HART 7         |
| Software for computer | SIMATIC PDM    |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

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#### Selection and ordering data

|   | Article No.      |
|---|------------------|
| <b>Pressure transmitter for gauge and absolute pressure, with flush-mounted diaphragm</b> |                  |
| <b>SITRANS P320 for gauge pressure</b>  | 7MF030 - - - - - |
| <b>SITRANS P420 for gauge pressure</b>  | 7MF040 - - - - - |
| <b>SITRANS P320 for absolute pressure</b>   | 7MF032 - - - - - |
| <b>SITRANS P420 for absolute pressure</b>   | 7MF042 - - - - - |
| Click on the Article no. for the online configuration in the PIA Life Cycle Portal.       |                  |
| <b>Communication</b>  |                  |
| HART, 4 ... 20 mA   | 0                |
| <b>Measuring cell filling</b>   |                  |
| Silicone oil  | 1                |
| Inert liquid  | 3                |
| Neobee oil  | 4                |
| <b>Maximum measuring span</b>   |                  |
| 1000 mbar (14.5 psi)  | 0 J              |
| 4000 mbar (58 psi)  | 0 N              |
| 16 bar (232 psi)  | 0 Q              |
| 63 bar (914 psi)  | 0 T              |
| 1 300 mbar a (18.9 psi a)   | 2 L              |
| 5000 mbar a (72.5 psi a)  | 2 P              |
| 30 bar a (435 psi a)  | 2 R              |
| <b>Process connection</b>   |                  |
| Flush-mounted diaphragm   | K                |
| <b>Wetted parts materials: Process connection, seal diaphragm</b>                         |                  |
| Stainless steel 316L/1.4404, stainless steel 316L/1.4404                                  | 0                |
| Stainless steel 316L/1.4404, alloy C276/2.4819  | 1                |
| Alloy C22/2.4602, alloy C276/2.4819   | 2                |
| <b>Non-wetted parts materials</b>   |                  |
| Die-cast aluminum   | 1                |
| Stainless steel precision casting CF3M/1.4409 similar to 316L                             | 2                |
| <b>Enclosure</b>  |                  |
| Dual chamber device   | 5                |
| <b>Type of protection</b>   |                  |
| Without Ex  | A                |
| Intrinsic safety  | B                |
| Flameproof enclosure  | C                |
| Flameproof enclosure, intrinsic safety  | D                |
| Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2                    | L                |
| Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2                 | M                |
| Combination of options B, C and L (zone model)  | S                |
| Combination of options B, C and M (zone model, Class Division)                            | T                |
| <b>Electrical connections/cable entries</b>   |                  |
| Thread for cable gland  |                  |
| • 2 x M20 x 1.5   | F                |
| • 2 x ½-14 NPT  | M                |
| <b>Local operation/display</b>  |                  |
| Without display (cover closed)  | 0                |
| With display (cover closed)   | 1                |
| With display (cover with glass pane)  | 2                |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

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## Selection and ordering data

| Options  | Order code | Options  | Order code |
|--|------------|--|------------|
| Add "-Z" to article no. and specify order code.  |            | <b>Device options</b>  |            |
| <b>Cable glands included</b>   |            | PDF file with device settings  | <b>D10</b> |
| Plastic  | <b>A00</b> | Double layer coating (epoxy resin and polyurethane)<br>120 µm of enclosure and cover | <b>D20</b> |
| Metal  | <b>A01</b> | FVMQ enclosure sealing   | <b>D21</b> |
| Stainless steel  | <b>A02</b> | IP66/IP68 degree of protection (not for M12 and Han device plugs)                    | <b>D30</b> |
| Stainless steel 316L/1.4404  | <b>A03</b> | TAG label empty  | <b>D40</b> |
| CMP, for XP devices  | <b>A10</b> | Without labeling of the measuring range on the TAG label                             | <b>D41</b> |
| CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm            | <b>A11</b> | Stainless steel Ex plate 1.4404/316L   | <b>D42</b> |
| CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm | <b>A12</b> | Increase of pressure stage from PN 420 to PN 500                                     | <b>D50</b> |
| <b>Han device plug mounted left</b>  |            | Overvoltage protection up to 6 kV (external)   | <b>D71</b> |
| Han 7D device plug (plastic, straight)   | <b>A30</b> | Adhesive labels on transport packaging (supplied by customer)                        | <b>D90</b> |
| Han 7D device plug (plastic, angled)   | <b>A31</b> |  |            |
| Han 7D device plug (metal, straight)   | <b>A32</b> | <b>General approval without Ex approval</b>  |            |
| Han 7D device plug (metal, angled)   | <b>A33</b> | Worldwide (CE, RCM) except EAC, FM, CSA, KCC   | <b>E00</b> |
| Han 8D device plug (plastic, straight)   | <b>A34</b> | Worldwide (CE, RCM, EAC, FM, CSA, KCC)   | <b>E01</b> |
| Han 8D device plug (plastic, angled)   | <b>A35</b> | CSA  | <b>E06</b> |
| Han 8D device plug (metal, straight)   | <b>A36</b> | EAC  | <b>E07</b> |
| Han 8D device plug (metal, angled)   | <b>A37</b> | FM   | <b>E08</b> |
| <b>Cable socket included</b>   |            | KCC  | <b>E09</b> |
| Plastic, for Han 7D/8D device plugs  | <b>A40</b> | UL   | <b>E10</b> |
| Metal, for Han 7D/8D device plugs  | <b>A41</b> | <b>Explosion protection approvals</b>  |            |
| <b>M12 device plug mounted left</b>  |            | ATEX (Europe)  | <b>E20</b> |
| Stainless steel, without cable socket  | <b>A62</b> | CSA (USA and Canada)   | <b>E21</b> |
| Stainless steel, with cable socket   | <b>A63</b> | FM (USA and Canada)  | <b>E22</b> |
| <b>Cable entry/connector mounting</b>  |            | IECEX (Worldwide)  | <b>E23</b> |
| 2x sealing plugs M20 x 1.5, IP66/68 installed on both sides  | <b>A90</b> | EACEx (GOST-R, -K, -B)   | <b>E24</b> |
| 2x sealing plugs ½-14 NPT, IP66/68 installed on both sides   | <b>A91</b> | INMETRO (Brazil)   | <b>E25</b> |
| Cable gland/connector mounted left   | <b>A97</b> | KCs (Korea)  | <b>E26</b> |
| Cable gland/connector mounted on right   | <b>A99</b> | NEPSI (China)  | <b>E27</b> |
| <b>Nameplate labeling</b>  |            | PESO (India)   | <b>E28</b> |
| German (bar)   | <b>B11</b> | TIIS Hazardous (Japan)   | <b>E29</b> |
| French (bar)   | <b>B12</b> | UKR Sepro (Ukraine)  | <b>E30</b> |
| Spanish (bar)  | <b>B13</b> | ATEX (Europe) and IECEx (Worldwide)  | <b>E47</b> |
| Italian (bar)  | <b>B14</b> | CSA (Canada) and FM (USA)  | <b>E48</b> |
| Chinese (bar)  | <b>B15</b> | ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)                      | <b>E49</b> |
| Russian (bar)  | <b>B16</b> | <b>Marine approvals</b>  |            |
| English (psi)  | <b>B20</b> | DNV-GL (Det Norske Veritas/Germanischer Lloyd)                                       | <b>E50</b> |
| Chinese (Pa)   | <b>B35</b> | LR (Lloyds Register)   | <b>E51</b> |
| <b>Certificates</b>  |            | BV (Bureau Veritas)  | <b>E52</b> |
| Quality test certificate, 5-point factory calibration (IEC 60770-2)                                | <b>C11</b> | ABS (American Bureau of Shipping)  | <b>E53</b> |
| Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts                   | <b>C12</b> | KR (Korean Register of Shipping)   | <b>E56</b> |
| Test report - NACE (MR 0103-2012 and MR 0175-2009)   | <b>C13</b> | RINA (Registro Italiano Navale)  | <b>E57</b> |
| Test report (EN 10204-2.2) - Wetted parts  | <b>C14</b> | CCS (China Classification Society)   | <b>E58</b> |
| Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts                   | <b>C15</b> | <b>Country-specific approvals</b>  |            |
| <b>Certificates for functional safety</b>  |            | CRN approval Canada (Canadian Registration Number)                                   | <b>E60</b> |
| Functional safety (IEC 61508) - SIL2/3   | <b>C20</b> | <b>Special approvals</b>   |            |
|  |            | Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))   | <b>E80</b> |
|  |            | Dual seal  | <b>E81</b> |
|  |            | WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM             | <b>E83</b> |
|  |            | NSF61 (drinking water)   | <b>E84</b> |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

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| Options   | Order code |
|---|------------|
| ACS (drinking water)  | <b>E85</b> |
| 3A (hygiene)  | <b>E86</b> |
| EHEDG (hygiene)   | <b>E87</b> |
| <b>Process flanges, gaskets (instead of standard gas-gaskets FKM (FPM))</b> |            |
| Seal (EN 837-1) material Fe (soft iron)                                     | <b>K60</b> |
| Seal (EN 837-1) material 1.4571   | <b>K61</b> |
| Seal (EN 837-1) material Cu   | <b>K62</b> |
| <b>Process connection</b>   |            |
| Process connection male thread G $\frac{1}{2}$ , bore hole 11 mm            | <b>K80</b> |
| <b>Flanges according to DIN EN 1092-1 Form B1 and ASME standard B16.5</b>   |            |
| EN 1092-1 Form B1   |            |
| • DN 50 PN 16   | <b>M03</b> |
| • DN 80 PN 16   | <b>M05</b> |
| • DN 25 PN 40   | <b>M10</b> |
| • DN 40 PN 40   | <b>M12</b> |
| • DN 50 PN 40   | <b>M13</b> |
| • DN 80 PN 40   | <b>M15</b> |
| • DN 40 PN 100  | <b>M22</b> |
| ASME B16.5  |            |
| • 1" Class 150 RF   | <b>M30</b> |
| • 1 ½" Class 150 RF   | <b>M31</b> |
| • 2" Class 150 RF   | <b>M32</b> |
| • 3" Class 150 RF   | <b>M33</b> |
| • 4" Class 150 RF   | <b>M34</b> |
| • 1" Class 300 RF   | <b>M35</b> |
| • 1 ½" Class 300 RF   | <b>M36</b> |
| • 2" Class 300 RF   | <b>M37</b> |
| • 3" Class 300 RF   | <b>M38</b> |
| • 4" Class 300 RF   | <b>M39</b> |
| <b>Sanitary connections in accordance with the standard</b>                 |            |
| Sanitary flange DIN 11851   |            |
| • with slotted union nut DN 50 PN 25  | <b>N03</b> |
| • with slotted union nut DN 80 PN 25  | <b>N05</b> |
| Tri-Clamp   |            |
| • DIN 32676 DN 50 PN 16   | <b>N14</b> |
| • DIN 32676 DN 65 PN 10   | <b>N15</b> |
| • ISO 2852 2" PN 40   | <b>N22</b> |
| • ISO 2852 3" PN 40   | <b>N23</b> |
| Aseptic threaded socket   |            |
| • DIN 11864-1 Form A DN 50 PN 25  | <b>N33</b> |
| • DIN 11864-1 Form A DN 65 PN 25  | <b>N34</b> |
| • DIN 11864-1 Form A DN 80 PN 25  | <b>N35</b> |
| • DIN 11864-1 Form A DN100 PN 25  | <b>N36</b> |
| Aseptic flange with notch   |            |
| • DIN 11864-2 Form A DN 50 PN 16  | <b>N43</b> |
| • DIN 11864-2 Form A DN 65 PN 16  | <b>N44</b> |
| • DIN 11864-2 Form A DN 80 PN 16  | <b>N45</b> |
| • DIN 11864-2 Form A DN100 PN 16  | <b>N46</b> |
| Aseptic clamp with groove   |            |
| • DIN 11864-3 Form A DN 50 PN 25  | <b>N53</b> |
| • DIN 11864-3 Form A DN 65 PN 25  | <b>N54</b> |
| • DIN 11864-3 Form A DN 80 PN 16  | <b>N55</b> |
| • DIN 11864-3 Form A DN100 PN 16  | <b>N56</b> |

| Options  | Order code |
|--|------------|
| <b>Sanitary connections manufacturer-specific</b>      |            |
| Varivent type N for pipes DN 40 ... DN 125 PN 40       | <b>P06</b> |
| NEUMO BioConnect flange                                |            |
| • DN 50 PN 16  | <b>P14</b> |
| • DN 65 PN 16  | <b>P15</b> |
| • DN 80 PN 16  | <b>P16</b> |
| • DN100 PN 16  | <b>P17</b> |
| • 2" PN 16   | <b>P23</b> |
| • 2 ½" PN 16   | <b>P24</b> |
| • 3" PN 16   | <b>P25</b> |
| • 4" PN 16   | <b>P26</b> |
| NEUMO BioConnect clamp                                 |            |
| • DN 50 PN 16  | <b>P34</b> |
| • DN 65 PN 10  | <b>P35</b> |
| • DN 80 PN 10  | <b>P36</b> |
| • DN 100 PN 10   | <b>P37</b> |
| • 2 ½" PN 16   | <b>P43</b> |
| • 3" PN 10   | <b>P44</b> |
| • 4" PN 10   | <b>P45</b> |
| NEUMO BioControl flange                                |            |
| • DN 50 PN 16  | <b>P51</b> |
| • DN 65 PN 16  | <b>P52</b> |
| • DN 80 PN 16  | <b>P53</b> |
| <b>Sanitary connections special design</b>             |            |
| Tank connection  |            |
| • TG 52/50 PN 40 with seal                             | <b>Q00</b> |
| • TG 52/150 PN 40 with seal                            | <b>Q01</b> |
| DRD flange D = 65 mm DN 50 PN 40                       | <b>Q15</b> |
| SMS socket   |            |
| • with union nut 2" PN 25                              | <b>Q22</b> |
| • with union nut 2 ½" PN 25                            | <b>Q23</b> |
| • with union nut 3" PN 25                              | <b>Q24</b> |
| • with thread 2" PN 25                                 | <b>Q28</b> |
| • with thread 2 ½" PN 25                               | <b>Q29</b> |
| • with thread 3" PN 25                                 | <b>Q30</b> |
| IDF socket   |            |
| • with union nut ISO 2853 2" PN 25                     | <b>Q42</b> |
| • with union nut ISO 2853 2 ½" PN 25                   | <b>Q43</b> |
| • with union nut ISO 2853 3" PN 25                     | <b>Q44</b> |
| • with thread ISO 2853 2" PN 25                        | <b>Q48</b> |
| • with thread ISO 2853 2 ½" PN 25                      | <b>Q49</b> |
| • with thread ISO 2853 3" PN 25                        | <b>Q50</b> |
| <b>Weldable sockets for tank connection</b>            |            |
| Weldable piece for TG52/50                             | <b>Q90</b> |
| Weldable piece for TG52/150                            | <b>Q91</b> |
| <b>Connections for the paper industry</b>              |            |
| Process connection PMC Style Standard                  | <b>R00</b> |
| Process connection PMC Style Minibolt                  | <b>R01</b> |
| Weldable sockets for PMC Style Standard                | <b>R02</b> |
| Weldable sockets for PMC Style Minibolt                | <b>R03</b> |
| <b>Threaded connection</b>                             |            |
| Male thread G $\frac{3}{4}$ -A DIN 3852                | <b>R11</b> |
| Male thread G1-A DIN 3852                              | <b>R12</b> |
| Male thread G2-A DIN 3852                              | <b>R14</b> |
| <b>Special options front-flush</b>                     |            |
| Temperature decoupler (media temperature up to 200 °C) | <b>R85</b> |
| Mating connector including seal                        | <b>R90</b> |

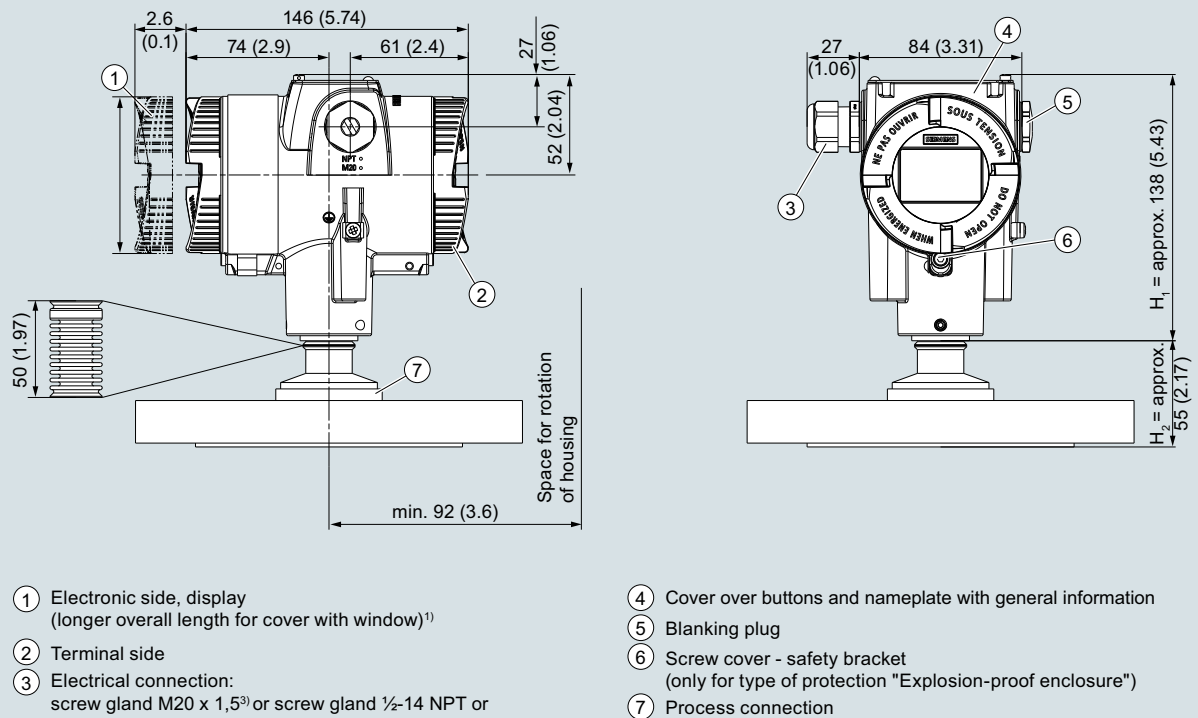
# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

## Selection and ordering data

| Customer-specific device settings   | Order code |
|---|------------|
| Add "-Z" to article no., specify order code and plain text or drop-down list selection.   |            |
| <b>Measuring span</b><br><b>Start of scale value (max. 5 characters),</b><br><b>full scale value (max. 5 characters),</b><br><b>unit [mbar, bar, kPa, MPa, psi, ...],</b><br><b>example: -0.5 ... 10.5 psi</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr | Y01        |
| <b>TAG</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b><br><br>Input field: Free text, max. 32 characters   | Y15        |
| <b>Measuring point description</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b><br><br>Input field: Free text, max. 32 characters   | Y16        |
| <b>TAG short</b><br><b>(device parameters, max. 8 characters)</b><br><br>Input field: Free text, max. 8 characters  | Y17        |
| <b>Local display</b><br><b>[Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge</b><br><br>Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge  | Y21        |
| <b>Local display</b><br><b>Scaling with standard units</b><br><b>[m<sup>3</sup>/s, l/s, m, inch, ...], example 1 ... 5 m</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.  | Y22        |
| <b>Local display</b><br><b>Scaling with user-specific units (max. 12 characters),</b><br><b>example 1 ... 5 m</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Input field 3: Free text, max. 8 characters   | Y23        |
| <b>Saturation limits instead of 3.8 ... 20.5 mA,</b><br><b>example: 3.8 ... 22.0 mA</b><br><br>Drop-down list 1: 3.9, 4<br>Drop-down list 2: 20.8, 22   | Y30        |
| <b>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</b><br><br>Drop-down list: 3.75; 21.75; 22.5; 22.6  | Y31        |
| <b>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</b><br><br>Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.   | Y32        |
| <b>ID number of special version</b><br><br>Input field: max. 4 characters and only natural numbers from 0 ... 9999  | Y99        |

**Dimensional drawings**

SITRANS P320/P420 pressure transmitter, with flush-mounted diaphragm, dimensions in mm (inch)

This figure consists of a SITRANS P320/P420 with an example flange.

In this figure, the height is divided into  $H_1$  and  $H_2$ .

$H_1$  = Height of the SITRANS P320/P420 up to a defined cross-section

$H_2$  = Height of the flange up to this defined cross-section

Only the height  $H_2$  is indicated in the dimensions of the flanges.

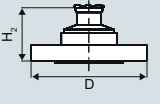
## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

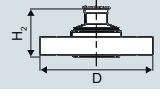
for gauge and absolute pressure, flush-mounted diaphragm

### Flanges according to EN and ASME

Flange according to EN

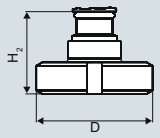
| EN 1092-1   |            |    |     |               |                       |
|---|------------|----|-----|---------------|-----------------------|
|  | Order code | DN | PN  | ØD            | H <sub>2</sub>        |
|   | M03        | 50 | 16  | 165 mm (6.5") | Approx.<br>52 mm (2") |
|   | M05        | 80 | 16  | 200 mm (7.9") |                       |
|   | M10        | 25 | 40  | 115 mm (4.5") |                       |
|   | M12        | 40 | 40  | 150 mm (5.9") |                       |
|   | M13        | 50 | 40  | 165 mm (6.5") |                       |
|   | M15        | 80 | 40  | 200 mm (7.9") |                       |
|   | M22        | 40 | 100 | 170 mm (6.7") |                       |

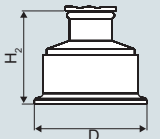
Flanges according to ASME

| ASME B16.5  |            |     |       |                |                       |
|---|------------|-----|-------|----------------|-----------------------|
|  | Order code | DN  | Class | ØD             | H <sub>2</sub>        |
|   | M30        | 1"  | 150   | 110 mm (4.3")  | Approx.<br>52 mm (2") |
|   | M31        | 1½" | 150   | 130 mm (5.1")  |                       |
|   | M32        | 2"  | 150   | 150 mm (5.9")  |                       |
|   | M33        | 3"  | 150   | 190 mm (7.5")  |                       |
|   | M34        | 4"  | 150   | 230 mm (9.1")  |                       |
|   | M35        | 1"  | 300   | 125 mm (4.9")  |                       |
|   | M36        | 1½" | 300   | 155 mm (6.1")  |                       |
|   | M37        | 2"  | 300   | 165 mm (6.5")  |                       |
|   | M38        | 3"  | 300   | 210 mm (8.1")  |                       |
|   | M39        | 4"  | 300   | 255 mm (10.0") |                       |

### NuG and pharmaceutical connections

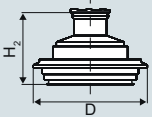
Connections to DIN

| DIN 11851 (milk pipe union with slotted union nut)                                  |            |    |    |               |                       |
|---|------------|----|----|---------------|-----------------------|
|  | Order code | DN | PN | ØD            | H <sub>2</sub>        |
|   | N03        | 50 | 25 | 92 mm (3.6")  | Approx.<br>52 mm (2") |
|   | N05        | 80 | 25 | 127 mm (5.0") |                       |

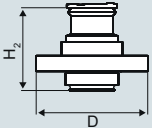
| TriClamp according to DIN 32676   |            |    |    |              |                       |
|---|------------|----|----|--------------|-----------------------|
|  | Order code | DN | PN | ØD           | H <sub>2</sub>        |
|   | N14        | 50 | 16 | 64 mm (2.5") | Approx.<br>52 mm (2") |
|   | N15        | 65 | 10 | 91 mm (3.6") |                       |
|   | N22        | 2" | 16 | 64 mm (2.5") | Approx.<br>52 mm (2") |
|   | N23        | 3" | 10 | 91 mm (3.6") |                       |

Other connections

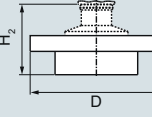
#### Varivent connection

|  | Order code | DN         | PN | ØD           | H <sub>2</sub>        |
|---|------------|------------|----|--------------|-----------------------|
|   | P06        | 40 ... 125 | 40 | 84 mm (3.3") | Approx.<br>52 mm (2") |

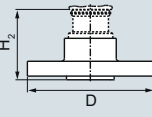
#### Bio-control connection

|  | Order code | DN | PN | ØD            | H <sub>2</sub>        |
|---|------------|----|----|---------------|-----------------------|
|   | P51        | 50 | 16 | 90 mm (3.5")  | Approx.<br>52 mm (2") |
|   | P52        | 65 | 16 | 120 mm (4.7") |                       |
|   | P53        | 80 | 16 | 150 mm (5.9") |                       |

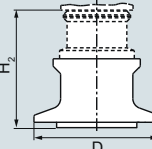
#### Sanitary process connection according to DRD

|  | Order code | DN | PN | ØD            | H <sub>2</sub>        |
|---|------------|----|----|---------------|-----------------------|
|   | Q15        | 65 | 40 | 105 mm (4.1") | Approx.<br>52 mm (2") |

#### Sanitary process connection according to NEUMO BioConnect flange connection

|  | Order code | DN  | PN | ØD            | H <sub>2</sub>        |
|---|------------|-----|----|---------------|-----------------------|
|   | P14        | 50  | 16 | 110 mm (4.3") | Approx.<br>52 mm (2") |
|   | P15        | 65  | 16 | 140 mm (5.5") |                       |
|   | P16        | 80  | 16 | 150 mm (5.9") |                       |
|   | P17        | 100 | 16 | 175 mm (6.9") |                       |
|   | P23        | 2"  | 16 | 100 mm (3.9") |                       |
|   | P24        | 2½" | 16 | 110 mm (4.3") |                       |
|   | P25        | 3"  | 16 | 140 mm (5.5") |                       |
|   | P26        | 4"  | 16 | 175 mm (6.9") |                       |

#### Sanitary process connection according to NEUMO BioConnect clamp connection

|  | Order code | DN  | PN | ØD             | H <sub>2</sub>        |
|---|------------|-----|----|----------------|-----------------------|
|   | P34        | 50  | 16 | 77.4 mm (3.0") | Approx.<br>52 mm (2") |
|   | P35        | 65  | 10 | 90.9 mm (3.6") |                       |
|   | P36        | 80  | 10 | 106 mm (4.2")  |                       |
|   | P37        | 100 | 10 | 119 mm (4.7")  |                       |
|   | P43        | 2½" | 16 | 77.4 mm (3.0") |                       |
|   | P44        | 3"  | 10 | 90.9 mm (3.6") |                       |
|   | P45        | 4"  | 10 | 119 mm (4.7")  |                       |

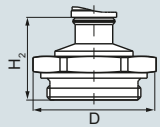
**Pressure Measurement**

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

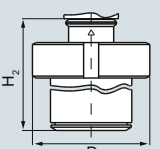
for gauge and absolute pressure, flush-mounted diaphragm

1

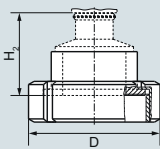
**Threaded connection G $\frac{3}{4}$ ", G1" and G2" acc. to DIN 3852**

|  | Order code | DN | PN | ØD           | H <sub>2</sub>       |
|---|------------|----|----|--------------|----------------------|
|   | <b>R11</b> | ¾" | 63 | 37 mm (1.5") | Approx. 45 mm (1.8") |
|   | <b>R12</b> | 1" | 63 | 48 mm (1.9") | Approx. 47 mm (1.9") |
|   | <b>R14</b> | 2" | 63 | 78 mm (3.1") | Approx. 52 mm (2")   |

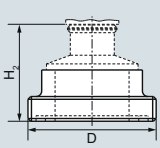
**Tank connection TG 52/50 and TG52/150**

|  | Order code | DN | PN | ØD           | H <sub>2</sub>        |
|---|------------|----|----|--------------|-----------------------|
|   | <b>Q00</b> | 25 | 40 | 63 mm (2.5") | Approx. 63 mm (2.5")  |
|   | <b>Q01</b> | 25 | 40 | 63 mm (2.5") | Approx. 170 mm (6.7") |

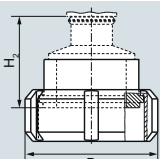
**SMS socket with union nut**

|  | Order code | DN  | PN | ØD            | H <sub>2</sub>       |
|---|------------|-----|----|---------------|----------------------|
|   | <b>Q22</b> | 2"  | 25 | 84 mm (3.3")  | Approx. 52 mm (2.1") |
|   | <b>Q23</b> | 2½" | 25 | 100 mm (3.9") |                      |
|   | <b>Q24</b> | 3"  | 25 | 114 mm (4.5") |                      |

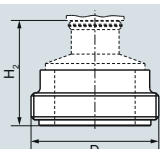
**SMS threaded socket**

|  | Order code | DN  | PN | ØD          | H <sub>2</sub>       |
|---|------------|-----|----|-------------|----------------------|
|   | <b>Q28</b> | 2"  | 25 | 70 x 1/6 mm | Approx. 52 mm (2.1") |
|   | <b>Q29</b> | 2½" | 25 | 85 x 1/6 mm |                      |
|   | <b>Q30</b> | 3"  | 25 | 98 x 1/6 mm |                      |

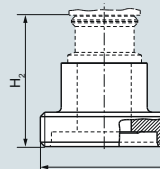
**IDF socket with union nut**

|  | Order code | DN  | PN | ØD            | H <sub>2</sub>       |
|---|------------|-----|----|---------------|----------------------|
|   | <b>Q28</b> | 2"  | 25 | 77 mm (3")    | Approx. 52 mm (2.1") |
|   | <b>Q29</b> | 2½" | 25 | 91 mm (3.6")  |                      |
|   | <b>Q30</b> | 3"  | 25 | 106 mm (4.2") |                      |

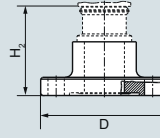
**IDF threaded socket**

|  | Order code | DN  | PN | ØD             | H <sub>2</sub>       |
|---|------------|-----|----|----------------|----------------------|
|   | <b>Q48</b> | 2"  | 25 | 64 mm (2.5")   | Approx. 52 mm (2.1") |
|   | <b>Q49</b> | 2½" | 25 | 77.5 mm (3.1") |                      |
|   | <b>Q50</b> | 3"  | 25 | 91 mm (3.6")   |                      |

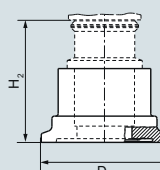
**Aseptic threaded socket according to DIN 11864-1 Form A**

|  | Order code | DN  | PN | ØD        | H <sub>2</sub>       |
|---|------------|-----|----|-----------|----------------------|
|   | <b>N33</b> | 50  | 25 | 78 x 1/6" | Approx. 52 mm (2.1") |
|   | <b>N34</b> | 65  | 25 | 95 x 1/6" |                      |
|   | <b>N35</b> | 80  | 25 | 110 x ¼"  |                      |
|   | <b>N36</b> | 100 | 25 | 130 x ¼"  |                      |

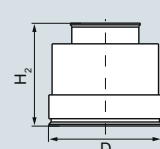
**Aseptic flange with notch to DIN 11864-2 Form A**

|  | Order code | DN  | PN | ØD         | H <sub>2</sub>       |
|---|------------|-----|----|------------|----------------------|
|   | <b>N43</b> | 50  | 16 | 94 (3.7")  | Approx. 52 mm (2.1") |
|   | <b>N44</b> | 65  | 16 | 113 (4.4") |                      |
|   | <b>N45</b> | 80  | 16 | 133 (5.2") |                      |
|   | <b>N46</b> | 100 | 16 | 159 (6.3") |                      |

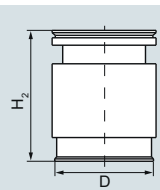
**Aseptic clamp with groove according to DIN 11864-3 Form A**

|  | Order code | DN  | PN | ØD          | H <sub>2</sub>       |
|---|------------|-----|----|-------------|----------------------|
|   | <b>N53</b> | 50  | 25 | 77.5 (3.1") | Approx. 52 mm (2.1") |
|   | <b>N54</b> | 65  | 25 | 91 (3.6")   |                      |
|   | <b>N55</b> | 80  | 16 | 106 (4.2")  |                      |
|   | <b>N56</b> | 100 | 16 | 130 (5.1")  |                      |

**Process connection PMC Style Standard**

|  | Order code | DN | PN | ØD             | H <sub>2</sub>         |
|---|------------|----|----|----------------|------------------------|
|   | <b>R00</b> | -  | -  | 40.9 mm (1.6") | Approx. 36.8 mm (1.4") |

**Process connection PMC Style Minibolt**

|  | Order code | DN | PN | ØD             | H <sub>2</sub>         |
|---|------------|----|----|----------------|------------------------|
|   | <b>R01</b> | -  | -  | 26.3 mm (1.0") | Approx. 33.1 mm (1.3") |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (pressure series)

## Technical specifications

### SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)

#### Input

|  |   |   |                                   |
|--|---|---|-----------------------------------|
| Measured variable  | Absolute pressure   |   |                                   |
| Span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086) | Span  | Max. permissible operating pressure MAWP (PS) | Maximum permissible test pressure |
|  | 8.3 ... 250 mbar a  | 4 bar a                                       | 6 bar a                           |
|  | 0.83 ... 25 kPa a   | 0.4 MPa a                                     | 0.6 MPa a                         |
|  | 3.3 ... 100.5 inH <sub>2</sub> O a  | 58 psi a                                      | 87 psi a                          |
|  | 43 ... 1300 mbar a  | 6.6 bar a                                     | 10 bar a                          |
|  | 4.3 ... 130 kPa a   | 0.66 MPa a                                    | 1 MPa a                           |
|  | 17.3 ... 522 inH <sub>2</sub> O a   | 95 psi a                                      | 145 psi a                         |
|  | 166 ... 5000 mbar a   | 20 bar a                                      | 30 bar a                          |
|  | 16.6 ... 500 kPa a  | 2 MPa a                                       | 3 MPa a                           |
|  | 2.41 ... 72.5 psi a   | 290 psi a                                     | 435 psi a                         |
|  | 1 ... 30 bar a  | 65 bar a                                      | 100 bar a                         |
|  | 0.1 ... 3 MPa a   | 6.5 MPa a                                     | 10 MPa a                          |
|  | 14.5 ... 435 psi a  | 942 psi a                                     | 1450 psi a                        |
|  | 5.3 ... 160 bar a   | 240 bar                                       | 380 bar a                         |
|  | 0.53 ... 16 MPa a   | 24 MPa  | 38 MPa a                          |
|  | 77 ... 2321 psi a   | 3480 psi                                      | 5511 psi a                        |
|  | 13.3 ... 400 bar a  | 400 bar a                                     | 600 bar a                         |
|  | 1.3 ... 40 MPa a  | 40 MPa a                                      | 60 MPa a                          |
|  | 192 ... 5802 psi a  | 5802 psi a                                    | 8702 psi a                        |
|  | 23.3 ... 700 bar a  | 800 bar a                                     | 800 bar a                         |
|  | 2.3 ... 70 MPa a  | 80 MPa a                                      | 80 MPa a                          |
|  | 337 ... 10153 psi a   | 11603 psi a                                   | 11603 psi a                       |
| Measuring limits   | 0 mbar a/kPa a/psi a  |   |                                   |
| • Low measuring limit  | For process temperature -20 °C < $\vartheta$ ≤ +60 °C (-4 °F < $\vartheta$ ≤ +140 °F)   |   |                                   |
| - Measuring cell with silicone oil filling   | For process temperature 60 °C < $\vartheta$ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < $\vartheta$ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))  |   |                                   |
| - Measuring cell with inert oil  | 30 mbar a/3 kPa a/0.44 psi a  |   |                                   |
|  | 30 mbar a + 20 mbar a · ( $\vartheta$ - 60 °C)/°C   |   |                                   |
|  | 3 kPa a + 2 kPa a · ( $\vartheta$ - 60 °C)/°C   |   |                                   |
|  | 0.44 psi a + 0.29 psi a · ( $\vartheta$ - 140 °F)/°F  |   |                                   |
| • Upper measuring limit  | 100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/process temperature)   |   |                                   |
| • Start of scale   | Between the measuring limits (infinitely adjustable)  |   |                                   |
| <b>Output</b>  | <b>HART</b>   |   |                                   |
| Output signal  | 4 ... 20 mA   |   |                                   |
| • Low saturation limit (infinitely adjustable)   | 3.55 mA, factory preset to 3.8 mA   |   |                                   |
| • High saturation limit (infinitely adjustable)  | 22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA   |   |                                   |
| • Ripple (without HART communication)  | $I_{pp} \leq 0.5\%$ of max. output current  |   |                                   |
| Adjustable damping   | 0 ... 100 s, continuously adjustable over remote operation  |   |                                   |
|  | 0 ... 100 s, in increments of 0.1 s, adjustable over display  |   |                                   |
| • Current transmitter  | 3.55 ... 22.8 mA  |   |                                   |
| • Failure signal   | 3.55 ... 22.8 mA  |   |                                   |
| Load   | Resistor R [Ω]  |   |                                   |
| • Without HART communication   | R = (U <sub>H</sub> - 10.5 V)/22.8 mA,<br>U <sub>H</sub> : Power supply in V  |   |                                   |
| • With HART communication  | R = 230 ... 1100 Ω (HART communicator (handheld))<br>R = 230 ... 500 Ω (SIMATIC PDM)  |   |                                   |
| Characteristic curve   | <ul style="list-style-type: none"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul> |   |                                   |
| Physical bus   | -   |   |                                   |
| Polarity-independent   | -   |   |                                   |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (pressure series)

1

**SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)****Measuring accuracy**

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Start of scale value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

- Linear characteristic (all measuring cells)

- $r \leq 10$
- $10 < r \leq 30$

 $r$  = maximum measuring span/set measuring span or nominal measuring range

- $\leq 0.1\%$
- $\leq 0.2\%$

Influence of ambient temperature  
(in % per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a
- 1300 mbar a/130 kPa a/18.8 psi a
- 5 bar a/500 kPa a/72.5 psi a
- 30 bar a/3000 kPa a/435 psi a
- 100 bar a/10 MPa a/1450 psi a
- 160 bar a/16 MPa a/2321 psi a
- 400 bar a/40 MPa a/5802 psi a
- 700 bar a/70 MPa a/10153 psi a

- $\leq (0.15 \cdot r + 0.1)\%$
- $\leq (0.08 \cdot r + 0.16)\%$

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)In 5 years  $\leq (0.25 \cdot r)\%$ Step response time  $T_{63}$  (without electrical damping)

Approx. 0.2 s

Effect of mounting position (in pressure per change of angle)

 $\leq 0.05$  mbar/0.005 kPa/0.000725 psi per 10° incline  
(zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

**Rated conditions**

Temperature of medium

- Measuring cell with silicone oil filling
- Measuring cell with inert oil

-40 ... +100 °C (-40 ... +212 °F)

- 1 bar/100 kPa/3.6 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

-40 ... +85 °C (-40 ... +185 °F)

- 160 bar/16 MPa/2321 psi
- 400 bar/40 MPa/5802 psi
- 700 bar/70 MPa/10153 psi

-20 ... +100 °C (-4 ... +212 °F)

- Measuring cell with FDA-compliant oil

-10 ... +100 °C (14 ... +212 °F)

Ambient conditions

- Ambient temperature/enclosure

Observe the temperature class in areas subject to explosion hazard.

- Measuring cell with silicone oil filling
- Measuring cell with inert oil for gauge pressure measuring cells:

-40 ... +85 °C (-40 ... +185 °F)

-40 ... +85 °C (-40 ... +185 °F)

- 1 bar/100 kPa/3.6 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

- Measuring cell with inert oil

-20 ... +85 °C (-4 ... +185 °F)

- Measuring cell with FDA-compliant oil

-10 ... +85 °C (14 ... +185 °F)

- Display

-20 ... +80 °C (-4 ... +176 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))

- Climatic class in accordance with IEC 60721-3-4

4K4H

- Degree of protection

- According to IEC 60529
- According to NEMA 250

IP66, IP68  
Type 4X

- Electromagnetic compatibility

- Emitted interference and interference immunity

According to IEC 61326 and NAMUR NE 21

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

### for absolute pressure (pressure series)

#### SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)

##### Design

Weight

Approx. 2.3 kg (5.07 lb) with aluminum enclosure  
Approx. 4.2 kg (9.25 lb) for stainless steel enclosure

Material

- Wetted parts materials
  - Process connection
  - Oval flange
  - Seal diaphragm
- Non-wetted parts materials
  - Electronics housing
  - Mounting bracket

Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602  
Stainless steel, mat. no. 1.4404/316L  
Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819

- Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
- Standard: Powder coating with polyurethane
  - Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
- Stainless steel type plate (1.4404/316L)
- Electroplated steel or stainless steel

Process connection

- Connection shank G1/2A according to DIN EN 837-1
- Female thread 1/2-14 NPT
- Male thread M20 x 1.5 and 1/2-14 NPT
- Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread:
- Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:
  - 7/16-20 UNF according to EN 61518
  - M10 according to DIN 19213
- Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:
  - 7/16-20 UNF according to EN 61518
  - M12 according to DIN 19213
- Male thread M20 x 1.5 and 1/2-14 NPT

Electrical connection

Cable entry via the following screwed glands:

- M20 x 1.5
- 1/2-14 NPT
- Han 7D/Han 8D device plug<sup>1)</sup>
- M12 device plug

##### Displays and controls

Keys

4 keys for operation directly on the device

Display

- With or without integrated display (optional)
- Cover with inspection window (optional)

##### Auxiliary power $U_H$

Terminal voltage on pressure transmitter

10.5 ... 45 V DC  
10.5 ... 30 V DC in intrinsically safe mode

Ripple

$U_{SS} \leq 0.2 \text{ V}$  (47 ... 125 Hz)

Noise

$U_{eff} \leq 1.2 \text{ mV}$  (0.5 ... 10 kHz)

Auxiliary power

–

Separate supply voltage

–

##### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Drinking water

- WRAS (England)
- ACS (France)
- DVGW (Germany)
- NSF (USA)

Available soon

Available soon

Available soon

Available soon

CRN (Canada)

Available soon

Explosion protection acc. to NEPSI (China)

Available soon

Explosion protection acc. to INMETRO (Brazil)

Available soon

BAM (Germany), oxygen expenditures

Available soon

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (pressure series)

1

**SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)****Explosion protection**

## • Intrinsic safety "i"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb  
 -40 ... +80 °C (-40 ... +176 °F) temperature class T4  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6  
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6  
 To certified intrinsically safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$   
 $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

## • Flameproof enclosure "d"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb  
 -40 ... +80 °C (-40 ... +176 °F) temperature class T4  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6  
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6  
 To a circuit with the operating values:  
 $U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

## • Dust explosion protection for Zone 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Max. surface temperature
- Connection

Ex II 1D Ex tb IIIC T120 °C Da  
 Ex II 2D Ex tb IIIC T120 °C Db  
 Ex II 3D Ex tc IIIC T120 °C Dc  
 -40 ... +80 °C (-40 ... +176 °F)  
 -40 ... +100 °C (-40 ... +212 °F)  
 120 °C (248 °F)  
 To a circuit with the operating values:  
 $U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

## • Dust explosion protection for Zone 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

Ex II 1D Ex ia IIIC T120 °C Da  
 Ex II 2D Ex ib IIIC T120 °C Db  
 Ex II 3D Ex ic IIIC T120 °C Dc  
 -40 ... +80 °C (-40 ... +176 °F)  
 -40 ... +100 °C (-40 ... +212 °F)  
 To certified intrinsically safe circuits with the peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$   
 $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

## • Effective internal inductance/capacitance

## • Type of protection for Zone 2

- Marking
- Permissible ambient temperature "ec"
- Permissible ambient temperature "ic"
- Permissible temperature of measuring medium
- "ec" connection
- "ic" connection

Ex II 3G Ex ec IIC T4/T6 Gc  
 Ex II 3G Ex ic IIC T4/T6 Gc  
 -40 ... +80 °C (-40 ... +176 °F) temperature class T4  
 -40 ... +40 °C (-40 ... +104 °F) temperature class T6  
 -40 ... +80 °C (-40 ... +176 °F) temperature class T4  
 -40 ... +80 °C (-40 ... +176 °F) temperature class T6  
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6  
 To a circuit with the operating values:  
 $U_n = 10.5 \text{ to } 30 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$   
 To certified intrinsically safe circuits with the peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$   
 Effective internal inductance/capacitance:  
 $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

## • Explosion protection acc. to FM

- Marking (XP/DIP) or IS; NI; S

Available soon  
 CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

## • Explosion protection according to CSA

- Marking (XP/DIP) or (IS)

Available soon  
 CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

1) Han 8D is identical to Han 8U.

**HART communication**

|                       |                       |
|-----------------------|-----------------------|
| HART                  | 230 ... 1100 $\Omega$ |
| Protocol              | HART 7                |
| Software for computer | SIMATIC PDM           |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (pressure series)

## Selection and ordering data

|   | Article No.      |
|---|------------------|
| <b>Pressure transmitters for absolute pressure (pressure series)</b>                  |                  |
| <b>SITRANS P320</b>   | 7MF032 - - - - - |
| <b>SITRANS P420</b>   | 7MF042 - - - - - |
| ➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal. |                  |
| <b>Communication</b>  |                  |
| HART, 4 ... 20 mA   | 0                |
| <b>Measuring cell filling</b>   |                  |
| Silicone oil  | 1                |
| Inert liquid  | 3                |
| Neobee oil  | 4                |
| <b>Maximum measuring span</b>   |                  |
| 250 mbar a (100.5 inH <sub>2</sub> O a)   | F                |
| 1 300 mbar a (522 inH <sub>2</sub> O a)   | L                |
| 5000 mbar a (72.5 psi a)  | P                |
| 30 bar a (435 psi a)  | R                |
| 160 bar a (2 321 psi a)   | V                |
| 400 bar a (5 802 psi a)   | W                |
| 700 bar a (10 153 psi a)  | X                |
| <b>Process connection</b>   |                  |
| Male thread M20 x 1.5   | B                |
| Male thread G½ (DIN EN 837-1)   | D                |
| Female thread ½-14 NPT  | E                |
| Male thread ½-14 NPT  | F                |
| Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)                                 | G                |
| Oval flange, mounting thread: M10 (DIN 19213)   | H                |
| Oval flange, mounting thread: M12 (DIN 19213)   | J                |
| Version for diaphragm seal pressure   | U                |
| <b>Wetted parts materials: Process connection, seal diaphragm</b>                     |                  |
| Stainless steel 316L/1.4404, stainless steel 316L/1.4404                              | 0                |
| Stainless steel 316L/1.4404, alloy C276/2.4819  | 1                |
| Alloy C22/2.4602, alloy C276/2.4819   | 2                |
| <b>Non-wetted parts materials</b>   |                  |
| Die-cast aluminum   | 1                |
| Stainless steel precision casting CF3M/1.4409 similar to 316L                         | 2                |
| <b>Enclosure</b>  |                  |
| Dual chamber device   | 5                |
| <b>Type of protection</b>   |                  |
| Without Ex  | A                |
| Intrinsic safety  | B                |
| Flameproof enclosure  | C                |
| Flameproof enclosure, intrinsic safety  | D                |
| Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2                | L                |
| Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2             | M                |
| Combination of options B, C and L (zone model)  | S                |
| Combination of options B, C and M (zone model, Class Division)                        | T                |
| <b>Electrical connections/cable entries</b>   |                  |
| Thread for cable gland  |                  |
| • 2 x M20 x 1.5   | F                |
| • 2 x ½-14 NPT  | M                |
| <b>Local operation/display</b>  |                  |
| Without display (cover closed)  | 0                |
| With display (cover closed)   | 1                |
| With display (cover with glass pane)  | 2                |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (pressure series)

1

#### Selection and ordering data

| Options  | Order code | Options  | Order code |
|--|------------|--|------------|
| Add "-Z" to article no. and specify order code.  |            | <b>Device options</b>  |            |
| <b>Cable glands included</b>   |            | PDF file with device settings  | <b>D10</b> |
| Plastic  | <b>A00</b> | Double layer coating (epoxy resin and polyurethane)<br>120 µm of enclosure and cover | <b>D20</b> |
| Metal  | <b>A01</b> | FVMQ enclosure sealing   | <b>D21</b> |
| Stainless steel  | <b>A02</b> | IP66/IP68 degree of protection (not for M12 and Han device plugs)                    | <b>D30</b> |
| Stainless steel 316L/1.4404  | <b>A03</b> | TAG label empty  | <b>D40</b> |
| CMP, for XP devices  | <b>A10</b> | Without labeling of the measuring range on the TAG label                             | <b>D41</b> |
| CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm            | <b>A11</b> | Stainless steel Ex plate 1.4404/316L   | <b>D42</b> |
| CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm | <b>A12</b> | Increase of pressure stage from PN 420 to PN 500                                     | <b>D50</b> |
| <b>Han device plug mounted left</b>  |            | Overvoltage protection up to 6 kV (external)   | <b>D71</b> |
| Han 7D device plug (plastic, straight)   | <b>A30</b> | Adhesive labels on transport packaging (supplied by customer)                        | <b>D90</b> |
| Han 7D device plug (plastic, angled)   | <b>A31</b> |  |            |
| Han 7D device plug (metal, straight)   | <b>A32</b> | <b>General approval without Ex approval</b>  |            |
| Han 7D device plug (metal, angled)   | <b>A33</b> | Worldwide (CE, RCM) except EAC, FM, CSA, KCC   | <b>E00</b> |
| Han 8D device plug (plastic, straight)   | <b>A34</b> | Worldwide (CE, RCM, EAC, FM, CSA, KCC)   | <b>E01</b> |
| Han 8D device plug (plastic, angled)   | <b>A35</b> | CSA  | <b>E06</b> |
| Han 8D device plug (metal, straight)   | <b>A36</b> | EAC  | <b>E07</b> |
| Han 8D device plug (metal, angled)   | <b>A37</b> | FM   | <b>E08</b> |
| <b>Cable socket included</b>   |            | KCC  | <b>E09</b> |
| Plastic, for Han 7D/8D device plugs  | <b>A40</b> | UL   | <b>E10</b> |
| Metal, for Han 7D/8D device plugs  | <b>A41</b> | <b>Explosion protection approvals</b>  |            |
| <b>M12 device plug mounted left</b>  |            | ATEX (Europe)  | <b>E20</b> |
| Stainless steel, without cable socket  | <b>A62</b> | CSA (USA and Canada)   | <b>E21</b> |
| Stainless steel, with cable socket   | <b>A63</b> | FM (USA and Canada)  | <b>E22</b> |
| <b>Cable entry/connector mounting</b>  |            | IECEX (Worldwide)  | <b>E23</b> |
| 2x sealing plugs M20 x 1.5, IP66/68 installed on both sides  | <b>A90</b> | EACEx (GOST-R, -K, -B)   | <b>E24</b> |
| 2x sealing plugs ½-14 NPT, IP66/68 installed on both sides   | <b>A91</b> | INMETRO (Brazil)   | <b>E25</b> |
| Cable gland/connector mounted left   | <b>A97</b> | KCs (Korea)  | <b>E26</b> |
| Cable gland/connector mounted on right   | <b>A99</b> | NEPSI (China)  | <b>E27</b> |
| <b>Nameplate labeling</b>  |            | PESO (India)   | <b>E28</b> |
| German (bar)   | <b>B11</b> | TIIS Hazardous (Japan)   | <b>E29</b> |
| French (bar)   | <b>B12</b> | UKR Sepro (Ukraine)  | <b>E30</b> |
| Spanish (bar)  | <b>B13</b> | ATEX (Europe) and IECEX (Worldwide)  | <b>E47</b> |
| Italian (bar)  | <b>B14</b> | CSA (Canada) and FM (USA)  | <b>E48</b> |
| Chinese (bar)  | <b>B15</b> | ATEX (Europe) and IECEX (Worldwide) + CSA (Canada) and FM (USA)                      | <b>E49</b> |
| Russian (bar)  | <b>B16</b> | <b>Marine approvals</b>  |            |
| English (psi)  | <b>B20</b> | DNV-GL (Det Norske Veritas/Germanischer Lloyd)                                       | <b>E50</b> |
| Chinese (Pa)   | <b>B35</b> | LR (Lloyds Register)   | <b>E51</b> |
| <b>Certificates</b>  |            | BV (Bureau Veritas)  | <b>E52</b> |
| Quality test certificate, 5-point factory calibration (IEC 60770-2)                                | <b>C11</b> | ABS (American Bureau of Shipping)  | <b>E53</b> |
| Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts                   | <b>C12</b> | KR (Korean Register of Shipping)   | <b>E56</b> |
| Test report - NACE (MR 0103-2012 and MR 0175-2009)   | <b>C13</b> | RINA (Registro Italiano Navale)  | <b>E57</b> |
| Test report (EN 10204-2.2) - Wetted parts  | <b>C14</b> | CCS (China Classification Society)   | <b>E58</b> |
| Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts                   | <b>C15</b> | <b>Country-specific approvals</b>  |            |
| <b>Certificates for functional safety</b>  |            | CRN approval Canada (Canadian Registration Number)                                   | <b>E60</b> |
| Functional safety (IEC 61508) - SIL2/3   | <b>C20</b> |  |            |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

## for absolute pressure (pressure series)

| Options  | Order code |
|--|------------|
| <b>Special approvals</b>   |            |
| Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))   | <b>E80</b> |
| Dual seal  | <b>E81</b> |
| WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM   | <b>E83</b> |
| NSF61 (drinking water)   | <b>E84</b> |
| ACS (drinking water)   | <b>E85</b> |
| <b>Mounting bracket</b>  |            |
| Steel, galvanized  | <b>H01</b> |
| Stainless steel 1.4301/304   | <b>H02</b> |
| Stainless steel 1.4404/316L  | <b>H03</b> |
| <b>Flange connections with flange EN 1092-1</b>  |            |
| With flange adapter G½ Form B1   |            |
| • DN 25 PN 40, stainless steel 1.4571/316Ti  | <b>J80</b> |
| • DN 50 PN 40, stainless steel 1.4571/316Ti  | <b>J81</b> |
| • DN 80 PN 40, stainless steel 1.4571/316Ti  | <b>J82</b> |
| With siphon G½ Form B1   |            |
| • DN 25 PN 40, stainless steel 1.4571/316Ti  | <b>J83</b> |
| • DN 50 PN 40, stainless steel 1.4571/316Ti  | <b>J84</b> |
| • DN 80 PN 40, stainless steel 1.4571/316Ti  | <b>J85</b> |
| • DN 25 PN 100, stainless steel 1.4571/316Ti   | <b>J86</b> |
| <b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>  |            |
| Seal (EN 837-1) material Fe (soft iron)  | <b>K60</b> |
| Seal (EN 837-1) material 1.4571  | <b>K61</b> |
| Seal (EN 837-1) material Cu  | <b>K62</b> |
| <b>Process connection</b>  |            |
| Process connection male thread G½, bore hole 11 mm   | <b>K80</b> |
| <b>Shut-off valves, pneumatic blocks</b>   |            |
| With mounted pneumatic block 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in test report (EN 10204-2.2)                                  | <b>T02</b> |
| With mounted pneumatic block 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in test report (EN 10204-2.2) | <b>T03</b> |
| With mounted pneumatic block 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in test report (EN 10204-2.2)             | <b>T05</b> |
| With mounted pneumatic block 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in test report (EN 10204-2.2)   | <b>T06</b> |

## Selection and ordering data

| Customer-specific device settings  | Order code |
|--|------------|
| Add "-Z" to article no., specify order code and plain text or drop-down list selection.  |            |
| <b>Measuring span</b><br><b>Start of scale value (max. 5 characters),</b><br><b>full scale value (max. 5 characters),</b><br><b>unit [mbar, bar, kPa, MPa, psi, ...],</b><br><b>example: -0.5 ... 10.5 psi</b>   | <b>Y01</b> |
| Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm², kg/cm², kgf/cm², inH₂O, inH₂O (4°C), ftH₂O, mmH₂O, mmH₂O (4°C), mH₂O (4°C), mmHg, inHg, atm, torr |            |
| <b>TAG</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b>  | <b>Y15</b> |
| Input field: Free text, max. 32 characters   |            |
| <b>Measuring point description</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b>  | <b>Y16</b> |
| Input field: Free text, max. 32 characters   |            |
| <b>TAG short</b><br><b>(device parameters, max. 8 characters)</b>  | <b>Y17</b> |
| Input field: Free text, max. 8 characters  |            |
| <b>Local display</b><br><b>[Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge</b>  | <b>Y21</b> |
| Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge  |            |
| <b>Local display</b><br><b>Scaling with standard units</b><br><b>[m³/s, l/s, m, inch, ...], example 1 ... 5 m</b>  | <b>Y22</b> |
| Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: m, cm, mm, in, ft, m³, l, hl, in³, ft³, yd³, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm³, NI.  |            |
| <b>Local display</b><br><b>Scaling with user-specific units (max. 12 characters),</b><br><b>example 1 ... 5 m</b>  | <b>Y23</b> |
| Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Input field 3: Free text, max. 8 characters   |            |
| <b>Saturation limits instead of 3.8 ... 20.5 mA,</b><br><b>example: 3.8 ... 22.0 mA</b>  | <b>Y30</b> |
| Drop-down list 1: 3.9, 4<br>Drop-down list 2: 20.8, 22   |            |
| <b>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</b>  | <b>Y31</b> |
| Drop-down list: 3.75; 21.75; 22.5; 22.6  |            |
| <b>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</b>   | <b>Y32</b> |
| Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.  |            |
| <b>ID number of special version</b>  | <b>Y99</b> |
| Input field: max. 4 characters and only natural numbers from 0 ... 9999  |            |

# Pressure Measurement

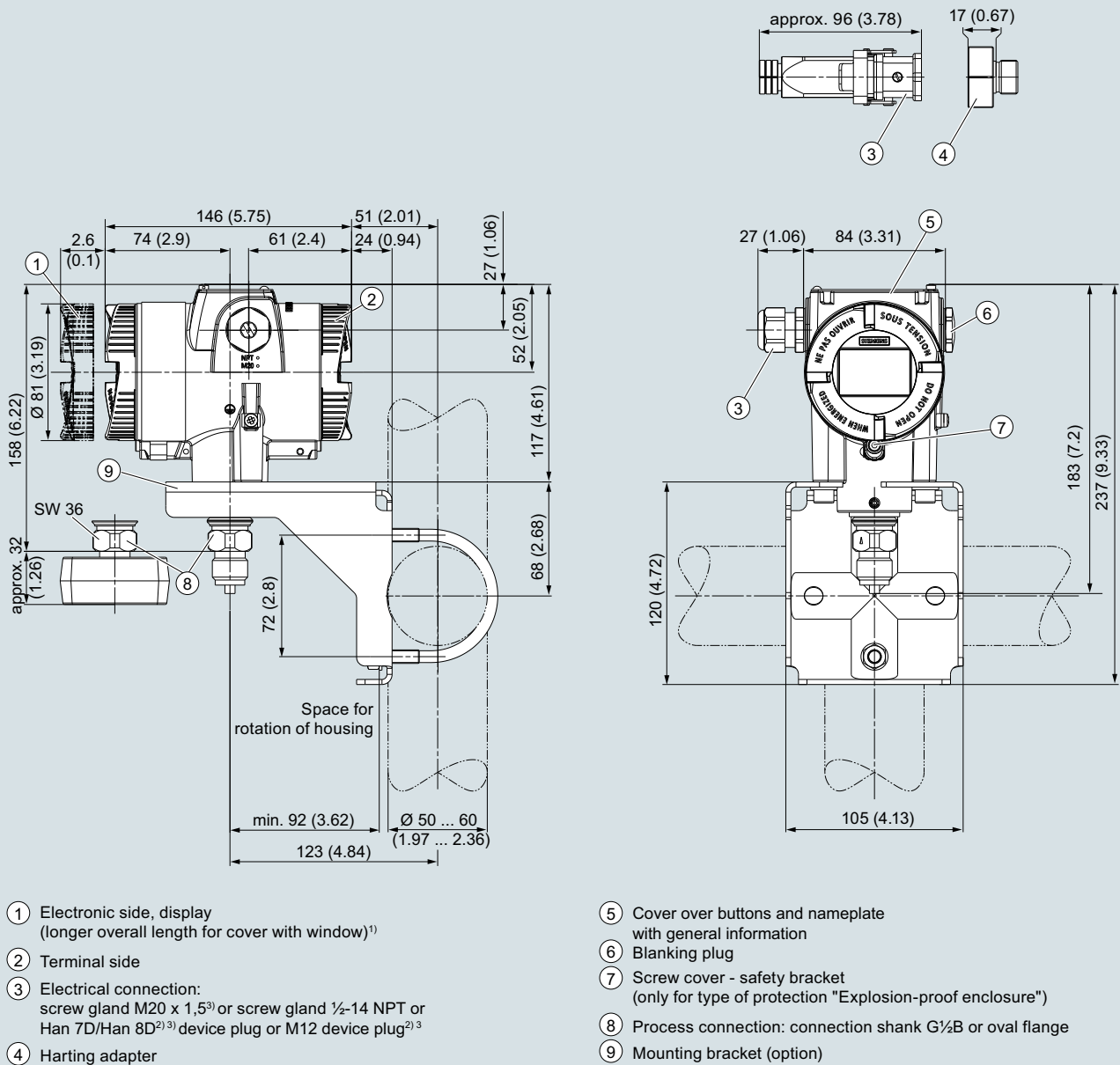
## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (pressure series)

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#### Dimensional drawings



SITRANS P320/P420 pressure transmitter for absolute pressure (pressure series), dimensions in mm (inch)

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (differential pressure series)

## Technical specifications

### SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)

#### Input

Measured variable

Absolute pressure

Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)

Span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

8.3 ... 250 mbar a

32 bar a

48 bar a

0.83 ... 25 kPa a

3.2 MPa a

4.8 MPa a

3.3 ... 100.5 inH<sub>2</sub>O a

464 psi a

696 psi a

43 ... 1300 mbar a

32 bar a

48 bar a

4.3 ... 130 kPa a

3.2 MPa a

4.8 MPa a

17.3 ... 522 inH<sub>2</sub>O a

464 psi a

696 psi a

166 ... 5000 mbar a

32 bar a

240 bar a

16.6 ... 500 kPa a

3.2 MPa a

24 MPa a

2.41 ... 72.5 psi a

464 psi a

3480 psi a

1 ... 30 bar a

160 bar a

240 bar a

0.1 ... 3 MPa a

16 MPa a

24 MPa a

14.5 ... 435 psi a

2320 psi a

3480 psi a

5 ... 100 bar a

160 bar a

240 bar a

0.5 ... 10 MPa a

16 MPa a

24 MPa a

76.9 ... 1450 psi a

2320 psi a

3480 psi a

Measuring limits

- Low measuring limit
  - Measuring cell with silicone oil filling
  - Measuring cell with inert liquid

0 mbar a/kPa a/psi a

For process temperature  $-20^{\circ}\text{C} < \vartheta \leq +60^{\circ}\text{C}$  ( $-4^{\circ}\text{F} < \vartheta \leq +140^{\circ}\text{F}$ )

30 mbar a/3 kPa a/0.44 psi a

For process temperature  $60^{\circ}\text{C} < \vartheta \leq +100^{\circ}\text{C}$  (max.  $85^{\circ}\text{C}$  for measuring cell 30 bar) ( $140^{\circ}\text{F} < \vartheta \leq +212^{\circ}\text{F}$  (max.  $185^{\circ}\text{F}$  for measuring cell 435 psi))

30 mbar a + 20 mbar a · ( $\vartheta - 60^{\circ}\text{C}$ )/ $^{\circ}\text{C}$

3 kPa a + 2 kPa a · ( $\vartheta - 60^{\circ}\text{C}$ )/ $^{\circ}\text{C}$

0.44 psi a + 0.29 psi a · ( $\vartheta - 140^{\circ}\text{F}$ )/ $^{\circ}\text{F}$

- Upper measuring limit

100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and  $60^{\circ}\text{C}$  ( $140^{\circ}\text{F}$ ) ambient temperature/process temperature)

- Start of scale

Between the measuring limits (infinitely adjustable)

#### Output

#### HART

Output signal

4 ... 20 mA

- Low saturation limit (infinitely adjustable)
- High saturation limit (infinitely adjustable)
- Ripple (without HART communication)

3.55 mA, factory preset to 3.8 mA

22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA

$I_{pp} \leq 0.5\%$  of max. output current

Adjustable damping

0 ... 100 s, continuously adjustable over remote operation

0 ... 100 s, in increments of 0.1 s, adjustable over display

- Current transmitter
- Failure signal

3.55 ... 22.8 mA

3.55 ... 22.8 mA

Load

Resistor R [ $\Omega$ ]

- Without HART communication

$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$ ,

$U_H$ : Power supply in V

- With HART communication

$R = 230 \dots 1100 \Omega$  (HART communicator (handheld))

$R = 230 \dots 500 \Omega$  (SIMATIC PDM)

Characteristic curve

- Linearly increasing or linearly decreasing

- Linear increase or decrease or according to the square root (only for differential pressure and flow)

Physical bus

-

Polarity-independent

-

#### Measuring accuracy

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Start of scale value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature  $25^{\circ}\text{C}$  ( $77^{\circ}\text{F}$ )



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (differential pressure series)

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**SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)**

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

- Linear characteristic (all measuring cells)

- $r \leq 10$
- $10 < r \leq 30$

 $r$  = maximum measuring span/set measuring span or nominal measuring range

- $\leq 0.1\%$
- $\leq 0.2\%$

Influence of ambient temperature (in % per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a
- 1300 mbar a/130 kPa a/18.8 psi a
- 5 bar a/500 kPa a/72.5 psi a
- 30 bar a/3000 kPa a/435 psi a
- 100 bar a/10 MPa a/1450 psi a
- 160 bar a/16 MPa a/2321 psi a
- 400 bar a/40 MPa a/5802 psi a
- 700 bar a/70 MPa a/10152 psi a

- $\leq (0.15 \cdot r + 0.1)\%$
- $\leq (0.08 \cdot r + 0.16)\%$

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)In 5 years  $\leq (0.25 \cdot r)\%$ Step response time  $T_{63}$  (without electrical damping)

Approx. 0.2 s

Effect of mounting position (in pressure per change of angle)

 $\leq 0.7$  mbar/0.07 kPa/0.001015 psi per 10° incline (zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

**Rated conditions**

Temperature of medium

- Measuring cell with silicone oil filling
  - Measuring cell 30 bar (435 psi), PN 420
- Measuring cell with inert oil
  - Measuring cell 30 bar (435 psi), PN 420
- Measuring cell with FDA-compliant oil
- In conjunction with dust explosion protection

- 40 ... +100 °C (-40 ... +212 °F)
- 20 ... +85 °C (-4 ... +185 °F)
- 20 ... +100 °C (-4 ... +212 °F)
- 20 ... +85 °C (-4 ... +185 °F)
- 10 ... +100 °C (14 ... +212 °F)
- 40 ... +85 °C (-4 ... +185 °F)

Ambient conditions

- Ambient temperature/enclosure
  - Measuring cell with silicone oil filling
  - Measuring cell with silicone oil filling, measuring cell 30 bar (435 psi), PN 420
  - Measuring cell with inert oil
  - Measuring cell with FDA-compliant oil
  - Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
  - According to IEC 60529
  - According to NEMA 250
- Electromagnetic compatibility
  - Emitted interference and interference immunity

- Observe the temperature class in areas subject to explosion hazard.
- 40 ... +85 °C (-40 ... +185 °F)
- 20 ... +85 °C (-4 ... +185 °F)
- 20 ... +85 °C (-4 ... +185 °F)
- 10 ... +85 °C (14 ... +185 °F)
- 20 ... +80 °C (-4 ... +176 °F)
- 50 ... +85 °C (-58 ... +185 °F); with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F)
- 4K4H
- IP66, IP68
- Type 4X
- According to IEC 61326 and NAMUR NE 21

**Design**

Weight

- Approx. 3.9 kg (8.5 lb) with aluminum enclosure
- Approx. 5.8 kg (12.7 lb) with stainless steel enclosure

Material

- Wetted parts materials
  - Seal diaphragm
  - Process flanges and sealing plugs
  - O-ring
- Non-wetted parts materials
  - Electronics housing
  - Pressure flange screws
  - Mounting bracket

- Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
- FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
- Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
- Standard: Powder coating with polyurethane
- Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
- Stainless steel type plate (1.4404/316L)
- Stainless steel ISO 3506-1 A4-70
- Steel, electrogalvanized steel, or stainless steel
- 1/2-18 NPT female thread and flat connection with 7/16-20 UNF fastening screw thread in accordance with EN 61518 or M10 fastening screw thread in accordance with DIN 19213 (M12 for PN 420 (MWP 6092 psi))
- Screw terminals
- Cable entry via the following screwed glands:
  - M20 x 1.5
  - 1/2-14 NPT
  - Han 7D/Han 8D device plug<sup>1)</sup>
  - M12 device plug

Process connection

Electrical connection

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

## for absolute pressure (differential pressure series)

### SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)

#### Displays and controls

|         |  |
|---------|--|
| Keys    | 4 keys for operation directly on the device  |
| Display | <ul style="list-style-type: none"> <li>• With or without integrated display (optional)</li> <li>• Cover with inspection window (optional)</li> </ul> |

#### Auxiliary power $U_H$

|  |   |
|--|---|
| Terminal voltage on pressure transmitter | 10.5 ... 45 V DC<br>10.5 ... 30 V DC in intrinsically safe mode |
| Ripple                                   | $U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)                     |
| Noise                                    | $U_{eff} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz)                  |
| Auxiliary power                          | –   |
| Separate supply voltage                  | –   |

#### Certificates and approvals

|   |   |
|---|---|
| Classification according to pressure equipment directive (PED 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)  |
| Drinking water  |   |
| • WRAS (England)  | Available soon  |
| • ACS (France)  | Available soon  |
| • DVGW (Germany)  | Available soon  |
| • NSF (USA)   | Available soon  |
| CRN (Canada)  | Available soon  |
| Explosion protection acc. to NEPSI (China)                                | Available soon  |
| Explosion protection acc. to INMETRO (Brazil)                             | Available soon  |
| BAM (Germany), oxygen expenditures  | Available soon  |
| Explosion protection  |   |
| • Intrinsic safety "i"  |   |
| - Marking   | II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb   |
| - Permissible ambient temperature   | -40 ... +80 °C (-40 ... +176 °F) temperature class T4<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T6  |
| - Permissible temperature of measuring medium                             | -40 ... +100 °C (-40 ... +212 °F) temperature class T4<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T6   |
| - Connection  | To certified intrinsically safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$<br>$U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$<br>$L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$     |
| - Effective internal inductance/capacitance                               |   |
| • Flameproof enclosure "d"  |   |
| - Marking   | Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb  |
| - Permissible ambient temperature   | -40 ... +80 °C (-40 ... +176 °F) temperature class T4<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T6  |
| - Permissible temperature of measuring medium                             | -40 ... +100 °C (-40 ... +212 °F) temperature class T4<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T6   |
| - Connection  | To a circuit with the operating values:<br>$U_n = 10.5 \text{ to } 45 \text{ V}$ , $4 \text{ ... } 20 \text{ mA}$   |
| • Dust explosion protection for Zone 20, 21, 22                           |   |
| - Marking   | Ex II 1D Ex tb IIIC T120 °C Da<br>Ex II 2D Ex tb IIIC T120 °C Db<br>Ex II 3D Ex tc IIIC T120 °C Dc  |
| - Permissible ambient temperature   | -40 ... +80 °C (-40 ... +176 °F)  |
| - Permissible temperature of measuring medium                             | -40 ... +100 °C (-40 ... +212 °F)   |
| - Max. surface temperature  | 120 °C (248 °F)   |
| - Connection  | To a circuit with the operating values:<br>$U_n = 10.5 \text{ to } 45 \text{ V}$ , $4 \text{ ... } 20 \text{ mA}$   |
| • Dust explosion protection for Zone 20, 21, 22                           |   |
| - Marking   | Ex II 1D Ex ia IIIC T120 °C Da<br>Ex II 2D Ex ib IIIC T120 °C Db<br>Ex II 3D Ex ic IIIC T120 °C Dc  |
| - Permissible ambient temperature   | -40 ... +80 °C (-40 ... +176 °F)  |
| - Permissible temperature of measuring medium                             | -40 ... +100 °C (-40 ... +212 °F)   |
| - Connection  | To certified intrinsically safe circuits with the peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$<br>$U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$<br>$L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$ |
| - Effective internal inductance/capacitance                               |   |

**SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)**

|   |  |
|---|--|
| • Type of protection for Zone 2               | Ex II 3G Ex ec IIC T4/T6 Gc<br>Ex II 3G Ex ic IIC T4/T6 Gc   |
| - Marking                                     |  |
| - Permissible ambient temperature "ec"        | -40 ... +80 °C (-40 ... +176 °F) temperature class T4<br>-40 ... +40 °C (-40 ... +104 °F) temperature class T6   |
| - Permissible ambient temperature "ic"        | -40 ... +80 °C (-40 ... +176 °F) temperature class T4<br>-40 ... +80 °C (-40 ... +176 °F) temperature class T6   |
| - Permissible temperature of measuring medium | -40 ... +100 °C (-40 ... +212 °F) temperature class T4<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T6  |
| - "ec" connection                             | To a circuit with the operating values:<br>$U_n = 10.5$ to $30$ V, $4$ ... $20$ mA   |
| - "ic" connection                             | To certified intrinsically safe circuits with the peak values:<br>$U_i = 30$ V, $I_i = 101$ mA, $P_i = 760$ mW<br>$U_i = 29$ V, $I_i = 110$ mA, $P_i = 800$ mW<br>Effective internal inductance/capacitance:<br>$L_i = 0.24$ μH/ $C_i = 3.29$ nF<br>Available soon |
| • Explosion protection acc. to FM             | CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III   |
| - Marking (XP/DIP) or IS; NI; S               | Available soon   |
| • Explosion protection according to CSA       | CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III   |
| - Marking (XP/DIP) or (IS)                    |  |

<sup>1)</sup> Han 8D is identical to Han 8U.

**HART communication**

|                       |                |
|-----------------------|----------------|
| HART                  | 230 ... 1100 Ω |
| Protocol              | HART 7         |
| Software for computer | SIMATIC PDM    |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

for absolute pressure (differential pressure series)

## Selection and ordering data

|   | Article No.      |
|---|------------------|
| <b>Pressure transmitters for absolute pressure (differential pressure series)</b>     |                  |
| <b>SITRANS P320</b>   | 7MF033 - - - - - |
| <b>SITRANS P420</b>   | 7MF043 - - - - - |
| ➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal. |                  |
| <b>Communication</b>  |                  |
| HART, 4 ... 20 mA   | 0                |
| <b>Measuring cell filling</b>   |                  |
| Silicone oil  | 1                |
| Inert liquid  | 3                |
| Neobee oil  | 4                |
| <b>Maximum measuring span</b>   |                  |
| 250 mbar a (100.5 inH <sub>2</sub> O a)   | G                |
| 1 300 mbar a (522 inH <sub>2</sub> O a)   | L                |
| 5000 mbar a (72.5 psi a)  | P                |
| 30 bar a (435 psi a)  | R                |
| 100 bar a (1450 psi a)  | U                |
| <b>Process connection</b>   |                  |
| Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)                                 | Q                |
| Oval flange, mounting thread: M10 (DIN 19213)   | R                |
| Oval flange, mounting thread: 7/16-20 UNF (IEC 61518) with lateral ventilation        | S                |
| Oval flange, mounting thread: M10 (DIN 19213) with lateral ventilation                | T                |
| Version for diaphragm seal with mounting thread 7/16-20 UNF (IEC 61518)               | V                |
| Version for diaphragm seal with mounting thread M10 (DIN 19213)                       | W                |
| <b>Wetted parts materials: Process connection, seal diaphragm</b>                     |                  |
| Stainless steel 316L/1.4404, stainless steel 316L/1.4404                              | 0                |
| Stainless steel 316L/1.4404, alloy C276/2.4819  | 1                |
| Alloy C22/2.4602, alloy C276/2.4819   | 2                |
| Tantalum/tantalum   | 4                |
| Monel 00/2.4360, Monel 400/2.4360   | 6                |
| Stainless steel 316L/1.4404, gold-plated  | 8                |
| <b>Non-wetted parts materials</b>   |                  |
| Die-cast aluminum   | 1                |
| Stainless steel precision casting CF3M/1.4409 similar to 316L                         | 2                |
| <b>Enclosure</b>  |                  |
| Dual chamber device   | 5                |
| <b>Type of protection</b>   |                  |
| Without Ex  | A                |
| Intrinsic safety  | B                |
| Flameproof enclosure  | C                |
| Flameproof enclosure, intrinsic safety  | D                |
| Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2                | L                |
| Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2             | M                |
| Combination of options B, C and L (zone model)  | S                |
| Combination of options B, C and M (zone model, Class Division)                        | T                |
| <b>Electrical connections/cable entries</b>   |                  |
| Thread for cable gland  |                  |
| • 2 x M20 x 1.5   | F                |
| • 2 x 1/2-14 NPT  | M                |
| <b>Local operation/display</b>  |                  |
| Without display (cover closed)  | 0                |
| With display (cover closed)   | 1                |
| With display (cover with glass pane)  | 2                |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (differential pressure series)

1

**Selection and ordering data**

| Options  | Order code | Options  | Order code |
|--|------------|--|------------|
| Add "-Z" to article no. and specify order code.  |            | <b>Device options</b>  |            |
| <b>Cable glands included</b>   |            | PDF file with device settings  | <b>D10</b> |
| Plastic  | <b>A00</b> | Double layer coating (epoxy resin and polyurethane)<br>120 µm of enclosure and cover | <b>D20</b> |
| Metal  | <b>A01</b> | FVMQ enclosure sealing   | <b>D21</b> |
| Stainless steel  | <b>A02</b> | IP66/IP68 degree of protection (not for M12 and Han device plugs)                    | <b>D30</b> |
| Stainless steel 316L/1.4404  | <b>A03</b> | TAG label empty  | <b>D40</b> |
| CMP, for XP devices  | <b>A10</b> | Without labeling of the measuring range on the TAG label                             | <b>D41</b> |
| CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm            | <b>A11</b> | Stainless steel Ex plate 1.4404/316L   | <b>D42</b> |
| CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm | <b>A12</b> | Increase of pressure stage from PN 420 to PN 500                                     | <b>D50</b> |
| <b>Han device plug mounted left</b>  |            | Overvoltage protection up to 6 kV (external)   | <b>D71</b> |
| Han 7D device plug (plastic, straight)   | <b>A30</b> | Adhesive labels on transport packaging (supplied by customer)                        | <b>D90</b> |
| Han 7D device plug (plastic, angled)   | <b>A31</b> |  |            |
| Han 7D device plug (metal, straight)   | <b>A32</b> | <b>General approval without Ex approval</b>  |            |
| Han 7D device plug (metal, angled)   | <b>A33</b> | Worldwide (CE, RCM) except EAC, FM, CSA, KCC   | <b>E00</b> |
| Han 8D device plug (plastic, straight)   | <b>A34</b> | Worldwide (CE, RCM, EAC, FM, CSA, KCC)   | <b>E01</b> |
| Han 8D device plug (plastic, angled)   | <b>A35</b> | CSA  | <b>E06</b> |
| Han 8D device plug (metal, straight)   | <b>A36</b> | EAC  | <b>E07</b> |
| Han 8D device plug (metal, angled)   | <b>A37</b> | FM   | <b>E08</b> |
| <b>Cable socket included</b>   |            | KCC  | <b>E09</b> |
| Plastic, for Han 7D/8D device plugs  | <b>A40</b> | UL   | <b>E10</b> |
| Metal, for Han 7D/8D device plugs  | <b>A41</b> | <b>Explosion protection approvals</b>  |            |
| <b>M12 device plug mounted left</b>  |            | ATEX (Europe)  | <b>E20</b> |
| Stainless steel, without cable socket  | <b>A62</b> | CSA (USA and Canada)   | <b>E21</b> |
| Stainless steel, with cable socket   | <b>A63</b> | FM (USA and Canada)  | <b>E22</b> |
| <b>Cable entry/connector mounting</b>  |            | IECEx (Worldwide)  | <b>E23</b> |
| 2x sealing plugs M20 x 1.5, IP66/68 installed on both sides  | <b>A90</b> | EACEx (GOST-R, -K, -B)   | <b>E24</b> |
| 2x sealing plugs ½-14 NPT, IP66/68 installed on both sides   | <b>A91</b> | INMETRO (Brazil)   | <b>E25</b> |
| Cable gland/connector mounted left   | <b>A97</b> | KCs (Korea)  | <b>E26</b> |
| Cable gland/connector mounted on right   | <b>A99</b> | NEPSI (China)  | <b>E27</b> |
| <b>Nameplate labeling</b>  |            | PESO (India)   | <b>E28</b> |
| German (bar)   | <b>B11</b> | TIIS Hazardous (Japan)   | <b>E29</b> |
| French (bar)   | <b>B12</b> | UKR Sepro (Ukraine)  | <b>E30</b> |
| Spanish (bar)  | <b>B13</b> | ATEX (Europe) and IECEx (Worldwide)  | <b>E47</b> |
| Italian (bar)  | <b>B14</b> | CSA (Canada) and FM (USA)  | <b>E48</b> |
| Chinese (bar)  | <b>B15</b> | ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)                      | <b>E49</b> |
| Russian (bar)  | <b>B16</b> | <b>Marine approvals</b>  |            |
| English (psi)  | <b>B20</b> | DNV-GL (Det Norske Veritas/Germanischer Lloyd)                                       | <b>E50</b> |
| Chinese (Pa)   | <b>B35</b> | LR (Lloyds Register)   | <b>E51</b> |
| <b>Certificates</b>  |            | BV (Bureau Veritas)  | <b>E52</b> |
| Quality test certificate, 5-point factory calibration (IEC 60770-2)                                | <b>C11</b> | ABS (American Bureau of Shipping)  | <b>E53</b> |
| Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts                   | <b>C12</b> | KR (Korean Register of Shipping)   | <b>E56</b> |
| Test report - NACE (MR 0103-2012 and MR 0175-2009)   | <b>C13</b> | RINA (Registro Italiano Navale)  | <b>E57</b> |
| Test report (EN 10204-2.2) - Wetted parts  | <b>C14</b> | CCS (China Classification Society)   | <b>E58</b> |
| Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts                   | <b>C15</b> | <b>Country-specific approvals</b>  |            |
| <b>Certificates for functional safety</b>  |            | CRN approval Canada (Canadian Registration Number)                                   | <b>E60</b> |
| Functional safety (IEC 61508) - SIL2/3   | <b>C20</b> |  |            |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

### for absolute pressure (differential pressure series)

| Options  | Order code | Options  | Order code |
|--|------------|--|------------|
| <b>Special approvals</b>   |            | <b>Process flange options</b>  |            |
| Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))                             | <b>E80</b> | Process flanges for vertical differential pressure lines (half process flange)   | <b>K81</b> |
| Dual seal  | <b>E81</b> | Process flanges (+) - side front   | <b>K82</b> |
| WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM                                       | <b>E83</b> | Process flange screws, process flange nuts, material Monel 400/2.4360  | <b>K83</b> |
| NSF61 (drinking water)   | <b>E84</b> | Valve ¼-18 NPT, material same as process flanges   | <b>K84</b> |
| ACS (drinking water)   | <b>E85</b> | Valve mounted on the side, measured medium: Gas  | <b>K85</b> |
| <b>Mounting bracket</b>  |            | Oval flange enclosed, gasket PTFE + mounting screws  | <b>K86</b> |
| Steel, galvanized  | <b>H01</b> | <b>Pneumatic blocks</b>  |            |
| Stainless steel 1.4301/304   | <b>H02</b> | With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2) | <b>U01</b> |
| Stainless steel 1.4404/316L  | <b>H03</b> | With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)     | <b>U02</b> |
| <b>Process flanges; screw plug with vent valve</b>   |            | With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2) | <b>U03</b> |
| Welded in on right   | <b>J08</b> | With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)     | <b>U04</b> |
| Welded in on left  | <b>J09</b> |  |            |
| Glued in on right  | <b>J10</b> |  |            |
| Glued in on left   | <b>J11</b> |  |            |
| <b>Flange connections with flange EN 1092-1</b>  |            |  |            |
| Form B1  |            |  |            |
| • DN 25 PN 40, stainless steel 1.4571/316Ti  | <b>J70</b> |  |            |
| • DN 50 PN 40, stainless steel 1.4571/316Ti  | <b>J71</b> |  |            |
| • DN 80 PN 40, stainless steel 1.4571/316Ti  | <b>J72</b> |  |            |
| • DN 15 PN 40, stainless steel 1.4571/316Ti  | <b>J78</b> |  |            |
| Form C   |            |  |            |
| • DN 25 PN 40, stainless steel 1.4571/316Ti  | <b>J73</b> |  |            |
| • DN 50 PN 40, stainless steel 1.4571/316Ti  | <b>J74</b> |  |            |
| • DN 80 PN 40, stainless steel 1.4571/316Ti  | <b>J75</b> |  |            |
| <b>Flange connection options</b>   |            |  |            |
| Flange connection and temperature extension  | <b>J76</b> |  |            |
| Flange connection with epoxy resin coating   | <b>J77</b> |  |            |
| <b>Process flanges; special materials</b>  |            |  |            |
| Reserved for 7MF7: without process flanges, without screws, without gaskets                                    | <b>K00</b> |  |            |
| Process flange material alloy C4/2.4610  | <b>K01</b> |  |            |
| Process flange material Monel 400/2.4360   | <b>K02</b> |  |            |
| Process connection material PVDF, on the side ½-14 NPT   | <b>K05</b> |  |            |
| Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar | <b>K06</b> |  |            |
| Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar | <b>K07</b> |  |            |
| <b>Process flanges; process connection option</b>  |            |  |            |
| Process flange with process connection G½ welded on  | <b>K20</b> |  |            |
| Process connection (oval flange) NAM (ASTAVA)  | <b>K21</b> |  |            |
| <b>Process flanges chambered with gaskets</b>  |            |  |            |
| 1x chambered, graphite   | <b>K40</b> |  |            |
| 1x chambered, PTFE   | <b>K41</b> |  |            |
| 2x chambered, PTFE   | <b>K42</b> |  |            |
| <b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>  |            |  |            |
| O-ring, process flanges, PTFE  | <b>K50</b> |  |            |
| O-ring, process flanges, FEP (with silicone core, approved for food)   | <b>K51</b> |  |            |
| O-ring, process flanges, FFKM (FFPM)   | <b>K52</b> |  |            |
| O-ring, process flanges, NBR   | <b>K53</b> |  |            |
| O-ring, process flanges, EPDM  | <b>K54</b> |  |            |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (differential pressure series)

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#### Selection and ordering data

| Customer-specific device settings   | Order code |
|---|------------|
| Add "-Z" to article no., specify order code and plain text or drop-down list selection.   |            |
| <b>Measuring span</b><br><b>Start of scale value (max. 5 characters),</b><br><b>full scale value (max. 5 characters),</b><br><b>unit [mbar, bar, kPa, MPa, psi, ...],</b><br><b>example: -0.5 ... 10.5 psi</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr | Y01        |
| <b>TAG</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b><br><br>Input field: Free text, max. 32 characters   | Y15        |
| <b>Measuring point description</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b><br><br>Input field: Free text, max. 32 characters   | Y16        |
| <b>TAG short</b><br><b>(device parameters, max. 8 characters)</b><br><br>Input field: Free text, max. 8 characters  | Y17        |
| <b>Local display</b><br><b>[Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge</b><br><br>Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge  | Y21        |
| <b>Local display</b><br><b>Scaling with standard units</b><br><b>[m<sup>3</sup>/s, l/s, m, inch, ...], example 1 ... 5 m</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.  | Y22        |
| <b>Local display</b><br><b>Scaling with user-specific units (max. 12 characters),</b><br><b>example 1 ... 5 m</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Input field 3: Free text, max. 8 characters   | Y23        |
| <b>Saturation limits instead of 3.8 ... 20.5 mA,</b><br><b>example: 3.8 ... 22.0 mA</b><br><br>Drop-down list 1: 3.9, 4<br>Drop-down list 2: 20.8, 22   | Y30        |
| <b>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</b><br><br>Drop-down list: 3.75; 21.75; 22.5; 22.6  | Y31        |
| <b>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</b><br><br>Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.   | Y32        |
| <b>ID number of special version</b><br><br>Input field: max. 4 characters and only natural numbers from 0 ... 9999  | Y99        |

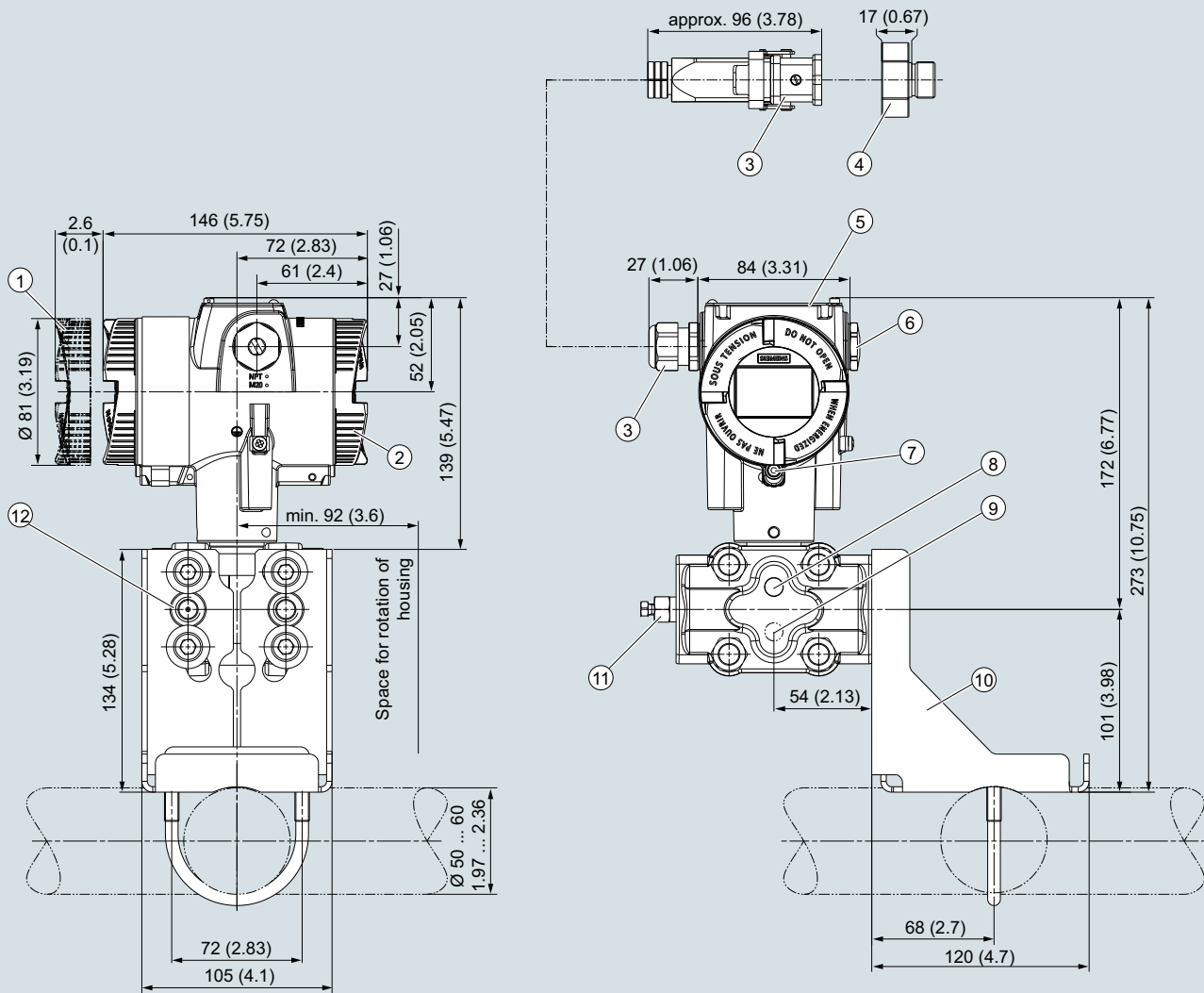
## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (differential pressure series)

### Dimensional drawings



- |  |   |
|--|---|
| ① Electronic side, display<br>(longer overall length for cover with window) <sup>1)</sup>  | ⑥ Blanking plug   |
| ② Terminal side  | ⑦ Screw cover - safety bracket<br>(only for type of protection "Explosion-proof enclosure") |
| ③ Electrical connection:<br>screw gland M20 x 1,5 <sup>3)</sup> or screw gland ½-14 NPT or<br>Han 7D/Han 8D <sup>2)</sup> device plug or M12 device plug <sup>2)</sup> 3 | ⑧ Lateral venting for liquid measurement (Standard)   |
| ④ Harting adapter  | ⑨ Lateral venting for gas measurement (suffix K85)  |
| ⑤ Cover over buttons and nameplate with general information  | ⑩ Mounting bracket (option)   |
|  | ⑪ Sealing screw with valve (option)   |
|  | ⑫ Process connection: ¼-18 NPT (IEC 61518)  |

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for absolute pressure (differential pressure series), dimensions in mm (inch)



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for differential pressure and flow

1

#### Technical specifications

##### SITRANS P320 / SITRANS P420 for differential pressure and flow

###### Input

Measured variable

Differential pressure and flow

Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)

Span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

1 ... 20 mbar

160 bar

240 bar

0.1 ... 2 kPa

16 MPa

24 MPa

0.4019 ... 8.037 inH<sub>2</sub>O

2320 psi

3480 psi

1 ... 60 mbar

160 bar

240 bar

0.1 ... 6 kPa

16 MPa

24 MPa

0.4019 ... 24.11 inH<sub>2</sub>O

2320 psi

3480 psi

2.5 ... 250 mbar

160 bar

240 bar

0.2 ... 25 kPa

16 MPa

24 MPa

1.005 ... 100.5 inH<sub>2</sub>O

2320 psi

3480 psi

6 ... 600 mbar

160 bar

240 bar

0.6 ... 60 kPa

16 MPa

24 MPa

2.41 ... 241.1 inH<sub>2</sub>O

2320 psi

3480 psi

16 ... 1600 mbar

160 bar

240 bar

1.6 ... 160 kPa

16 MPa

24 MPa

6.43 ... 643 inH<sub>2</sub>O

2320 psi

3480 psi

50 ... 5000 mbar

160 bar

240 bar

5 ... 500 kPa

16 MPa

24 MPa

20.09 ... 2009 inH<sub>2</sub>O

2320 psi

3480 psi

0.3 ... 30 bar

160 bar

240 bar

0.03 ... 3 MPa

16 MPa

24 MPa

4.35 ... 435 psi

2320 psi

3480 psi

2.5 ... 250 mbar

420 bar

630 bar

0.25 ... 25 kPa

42 MPa

63 MPa

1.005 ... 100.5 inH<sub>2</sub>O

6092 psi

9137 psi

6 ... 600 mbar

420 bar

630 bar

0.6 ... 60 kPa

42 MPa

63 MPa

2.41 ... 241.1 inH<sub>2</sub>O

6092 psi

9137 psi

16 ... 1600 mbar

420 bar

630 bar

1.6 ... 160 kPa

42 MPa

63 MPa

6.43 ... 643 inH<sub>2</sub>O

6092 psi

9137 psi

50 ... 5000 mbar

420 bar

630 bar

5 ... 500 kPa

42 MPa

63 MPa

20.09 ... 2009 inH<sub>2</sub>O

6092 psi

9137 psi

0.3 ... 30 bar

420 bar

630 bar

0.03 ... 3 MPa

42 MPa

63 MPa

4.35 ... 435 psi

6092 psi

9137 psi

Measuring limits

- Low measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert liquid

-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a

For process temperature -20 °C <  $\vartheta$  ≤ +60 °C (-4 °F <  $\vartheta$  ≤ +140 °F)

-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a

For process temperature 60 °C <  $\vartheta$  ≤ +100 °C (max. 85 °C for measuring cell 30 bar with PN 420) (140 °F <  $\vartheta$  ≤ +212 °F (max. 185 °F for measuring cell 435 psi))-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a  
30 mbar a + 20 mbar a · ( $\vartheta$  - 60 °C)/°C 3 kPa a + 2 kPa a · ( $\vartheta$  - 60 °C)/°C 0.44 psi a + 0.29 psi a · ( $\vartheta$  - 140 °F)/°F

- Measuring cell with FDA-compliant oil

For process temperature -10 °C <  $\vartheta$  ≤ +100 °C (-14 °F <  $\vartheta$  ≤ +212 °F)

-100% of maximum measuring range or 100 mbar a /10 kPa a /14.5 psi a

- Upper measuring limit

100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/process temperature)

- Start of scale

Between the measuring limits (infinitely adjustable)

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

## for differential pressure and flow

### SITRANS P320 / SITRANS P420 for differential pressure and flow

| Output   | HART   |
|--|--|
| Output signal  | 4 ... 20 mA  |
| <ul style="list-style-type: none"> <li>Low saturation limit (infinitely adjustable)</li> <li>High saturation limit (infinitely adjustable)</li> <li>Ripple (without HART communication)</li> </ul> | 3.55 mA, factory preset to 3.8 mA<br>22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA<br>$I_{pp} \leq 0.5\%$ of max. output current   |
| Adjustable damping   | 0 ... 100 s, continuously adjustable over remote operation   |
| <ul style="list-style-type: none"> <li>Current transmitter</li> <li>Failure signal</li> </ul>  | 0 ... 100 s, in increments of 0.1 s, adjustable over display<br>3.55 ... 22.8 mA<br>3.55 ... 22.8 mA   |
| Load   | Resistor R [ $\Omega$ ]  |
| <ul style="list-style-type: none"> <li>Without HART communication</li> </ul>   | $R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$ ,<br>$U_H$ : Power supply in V<br>$R = 230 \dots 1100 \Omega$ (HART communicator (handheld))<br>$R = 230 \dots 500 \Omega$ (SIMATIC PDM)  |
| <ul style="list-style-type: none"> <li>With HART communication</li> </ul>  |  |
| Characteristic curve   | <ul style="list-style-type: none"> <li>Linearly increasing or linearly decreasing</li> <li>Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>  |
| Physical bus   | -  |
| Polarity-independent   | -  |
| Measuring accuracy   |  |
| Reference conditions   | <ul style="list-style-type: none"> <li>According to EN 60770-1</li> <li>Rising characteristic curve</li> <li>Start of scale value 0 bar/kPa/psi</li> <li>Seal diaphragm stainless steel</li> <li>Measuring cell with silicone oil filling</li> <li>Room temperature 25 °C (77 °F)</li> </ul> |
| Conformity error at limit point setting, including hysteresis and repeatability  |  |
| Measuring span ratio r (spread, Turn-Down)   | r = maximum measuring span/set measuring span or nominal measuring range   |
| <ul style="list-style-type: none"> <li>Linear characteristic</li> </ul>  |  |
| - 20 mbar/2 kPa/0.29 psi   | $r \leq 5$ : $\leq 0.075\%$<br>$5 < r \leq 20$ : $\leq (0.005 \cdot r + 0.05)\%$   |
| - 60 mbar/6 kPa/0.87 psi   | $r \leq 5$ : $\leq 0.075\%$<br>$5 < r \leq 60$ : $\leq (0.005 \cdot r + 0.05)\%$   |
| - 250 mbar/25 kPa/3.63 psi   | $r \leq 5$ : $\leq 0.065\%$ (SITRANS P320)   |
| - 600 mbar/60 kPa/8.7 psi  | $5 < r \leq 100$ : $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P320)   |
| - 1600 mbar/160 MPa/23.21 psi  |  |
| - 5 bar/500 kPa/72.5 psi   |  |
| - 30 bar/3 MPa/435 psi   |  |
| - 250 mbar/25 kPa/3.63 psi (PN 160)  | $r \leq 5$ : $\leq 0.04\%$ (SITRANS P420)  |
| - 600 mbar/60 kPa/8.7 psi  | $5 < r \leq 100$ : $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P420)   |
| - 1600 mbar/160 MPa/23.21 psi  |  |
| - 5 bar/500 kPa/72.5 psi   |  |
| - 30 bar/3 MPa/435 psi   |  |
| - 250 mbar/25 kPa/3.63 psi (PN 420)  | $r \leq 5$ : $\leq 0.065\%$ (SITRANS P420)   |
| <ul style="list-style-type: none"> <li>Square-rooted characteristic (flow &gt; 50%)</li> </ul>   |  |
| - 20 mbar/2 kPa/0.29 psi   | $r \leq 5$ : $\leq 0.075\%$<br>$5 < r \leq 20$ : $\leq (0.005 \cdot r + 0.05)\%$   |
| - 60 mbar/6 kPa/0.87 psi   | $r \leq 5$ : $\leq 0.075\%$<br>$5 < r \leq 60$ : $\leq (0.005 \cdot r + 0.05)\%$   |
| - 250 mbar/25 kPa/3.63 psi   | $r \leq 5$ : $\leq 0.065\%$ (SITRANS P320)   |
| - 600 mbar/60 kPa/8.7 psi  | $5 < r \leq 100$ : $\leq 0.04\%$ (SITRANS P420)  |
| - 1600 mbar/160 MPa/23.21 psi  | $\leq (0.004 \cdot r + 0.045)\%$   |
| - 5 bar/500 kPa/72.5 psi   |  |
| - 30 bar/3 MPa/435 psi   |  |
| <ul style="list-style-type: none"> <li>Square-rooted characteristic (flow 25 ... 50%)</li> </ul>   |  |
| - 20 mbar/2 kPa/0.29 psi   | $r \leq 5$ : $\leq 0.15\%$<br>$5 < r \leq 20$ : $\leq (0.01 \cdot r + 0.1)\%$  |
| - 60 mbar/6 kPa/0.87 psi   | $r \leq 5$ : $\leq 0.15\%$<br>$5 < r \leq 60$ : $\leq (0.01 \cdot r + 0.1)\%$  |
| - 250 mbar/25 kPa/3.63 psi   | $r \leq 5$ : $\leq 0.13\%$ (SITRANS P320)  |
| - 600 mbar/60 kPa/8.7 psi  | $5 < r \leq 100$ : $\leq 0.008\%$ (SITRANS P420)   |
| - 1600 mbar/160 MPa/23.21 psi  | $\leq (0.008 \cdot r + 0.09)\%$  |
| - 5 bar/500 kPa/72.5 psi   |  |
| - 30 bar/3 MPa/435 psi   |  |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for differential pressure and flow

1

**SITRANS P320 / SITRANS P420 for differential pressure and flow**

Influence of ambient temperature (in % per 28 °C (50 °F))

|                               |   |
|-------------------------------|---|
| - 20 mbar/2 kPa/0.29 psi      | $\leq (0.15 \cdot r + 0.1)\%$                     |
| - 60 mbar/6 kPa/0.87 psi      | $\leq (0.075 \cdot r + 0.1)\%$                    |
| - 250 mbar/25 kPa/3.63 psi    | $\leq (0.025 \cdot r + 0.125)\%$ (SITRANS P320)   |
| - 600 mbar/60 kPa/8.7 psi     |   |
| - 1600 mbar/160 MPa/23.21 psi |   |
| - 5 bar/500 kPa/72.5 psi      |   |
| - 30 bar/3 MPa/435 psi        |   |
| - 250 mbar/25 kPa/3.63 psi    | $\leq (0.025 \cdot r + 0.0625)\%$ (SITRANS P420)  |
| - 5 bar/500 kPa/72.5 psi      |   |
| - 30 bar/3 MPa/435 ps         |   |
| - 600 mbar/60 kPa/8.7 psi     | $\leq (0.0125 \cdot r + 0.0625)\%$ (SITRANS P420) |
| - 1600 mbar/160 MPa/23.21 psi |   |
| - 30 bar/3 MPa/435 psi        |   |

Effect of static pressure

|                               |  |
|-------------------------------|--|
| • on the start of scale       | Zero-point correction is possible with position error compensation |
| - 20 mbar/2 kPa/0.29 psi      | $\leq (0.15 \cdot r)\%$ per 70 bar                                 |
| - 60 mbar/6 kPa/0.87 psi      | $\leq (0.1 \cdot r)\%$ per 70 bar                                  |
| - 250 mbar/25 kPa/3.63 psi    |  |
| - 600 mbar/60 kPa/8.7 psi     |  |
| - 1600 mbar/160 MPa/23.21 psi |  |
| - 5 bar/500 kPa/72.5 psi      |  |
| - 30 bar/3 MPa/435 psi        |  |
| - 5 bar/500 kPa/72.5 psi      | $\leq (0.1 \cdot r)\%$ per 70 bar (SITRANS P320)                   |
|                               | $\leq (0.15 \cdot r)\%$ per 70 bar (SITRANS P420)                  |
| • on the span                 |  |
| - 20 mbar/2 kPa/0.29 psi      | $\leq 0.2\%$ per 70 bar  |
| - 60 mbar/6 kPa/0.87 psi      | $\leq 0.1\%$ per 70 bar  |
| - 250 mbar/25 kPa/3.63 psi    |  |
| - 600 mbar/60 kPa/8.7 psi     |  |
| - 1600 mbar/160 MPa/23.21 psi |  |
| - 30 bar/3 MPa/435 psi        |  |
| - 5 bar/500 kPa/72.5 psi      | $\leq 0.15\%$ per 70 bar (SITRANS P320)                            |
|                               | $\leq 0.1\%$ per 70 bar (SITRANS P420)                             |

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

|                               |  |
|-------------------------------|--|
| • 20 mbar/2 kPa/0.29 psi      | Static pressure max. 70 bar/7 MPa/1015 psi |
| • 60 mbar/6 kPa/0.87 psi      | $\leq (0.2 \cdot r)\%$ per year            |
| • 250 mbar/25 kPa/3.63 psi    | In 5 years $\leq (0.25 \cdot r)\%$         |
| • 600 mbar/60 kPa/8.7 psi     | In 5 years $\leq (0.125 \cdot r)\%$        |
| • 1600 mbar/160 MPa/23.21 psi | In 10 years $\leq (0.15 \cdot r)\%$        |
| • 5 bar/500 kPa/72.5 psi      |  |
| • 30 bar/3 MPa/435 psi        | In 5 years $\leq (0.25 \cdot r)\%$         |
|                               | In 10 years $\leq (0.35 \cdot r)\%$        |

Step response time  $T_{63}$  (without electrical damping)

|                               |                 |
|-------------------------------|-----------------|
| • 20 mbar/2 kPa/0.29 psi      | Approx. 0.295 s |
| • 60 mbar/6 kPa/0.87 psi      | Approx. 0.245 s |
| • 250 mbar/25 kPa/3.63 psi    | Approx. 0.195 s |
| • 600 mbar/60 kPa/8.7 psi     | Approx. 0.145 s |
| • 1600 mbar/160 MPa/23.21 psi |                 |
| • 5 bar/500 kPa/72.5 psi      |                 |
| • 30 bar/3 MPa/435 psi        |                 |

Effect of mounting position (in pressure per change of angle)

 $\leq 0.7$  mbar/0.07 kPa/0.028 inH<sub>2</sub>O per 10° incline (zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

## for differential pressure and flow

### SITRANS P320 / SITRANS P420 for differential pressure and flow

#### Rated conditions

Temperature of medium

- Measuring cell with silicone oil filling
  - Measuring cell 30 bar (435 psi), PN 420
- Measuring cell with inert oil
  - Measuring cell 30 bar (435 psi), PN 420
- Measuring cell with FDA-compliant oil
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)  
 -20 ... +85 °C (-4 ... +185 °F)  
 -20 ... +100 °C (-4 ... +212 °F)  
 -20 ... +85 °C (-4 ... +185 °F)  
 -10 ... +100 °C (14 ... +212 °F)  
 -40 ... +85 °C (-4 ... +185 °F)

Ambient conditions

- Ambient temperature/enclosure
  - Measuring cell with silicone oil filling
  - Measuring cell with silicone oil filling, measuring cell 30 bar (435 psi), PN 420
  - Measuring cell with inert oil
  - Measuring cell with FDA-compliant oil
  - Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
  - According to IEC 60529
  - According to NEMA 250
- Electromagnetic compatibility
  - Emitted interference and interference immunity

Observe the temperature class in areas subject to explosion hazard.  
 -40 ... +85 °C (-40 ... +185 °F)  
 -20 ... +85 °C (-4 ... +185 °F)  
 -20 ... +85 °C (-4 ... +185 °F)  
 -10 ... +85 °C (14 ... +185 °F)  
 -20 ... +80 °C (-4 ... +176 °F)  
 -50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))  
 4K4H

IP66, IP68  
 Type 4X

According to IEC 61326 and NAMUR NE 21

#### Design

Weight

Approx. 3.9 kg (8.5 lb) with aluminum enclosure  
 Approx. 5.8 kg (12.7 lb) with stainless steel enclosure

Material

- Wetted parts materials
  - Seal diaphragm
  - Process flanges and sealing plugs
  - O-ring
- Non-wetted parts materials
  - Electronics housing

Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold  
 Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360  
 FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR

- Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
- Standard: Powder coating with polyurethane  
 Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
- Stainless steel type plate (1.4404/316L)  
 Stainless steel ISO 3506-1 A4-70  
 Steel, electrogalvanized steel, or stainless steel

Process connection

1/2-18 NPT female thread and flat connection with 7/16-20 UNF fastening screw thread in accordance with EN 61518 or M10 fastening screw thread in accordance with DIN 19213 (M12 for PN 420 (MWP 6092 psi))

Electrical connection

Screw terminals  
 Cable entry via the following screwed glands:
 

- M20 x 1.5
- 1/2-14 NPT
- Han 7D/Han 8D device plug<sup>1)</sup>
- M12 device plug

#### Displays and controls

Keys

4 keys for operation directly on the device

Display

- With or without integrated display (optional)
- Cover with inspection window (optional)

#### Auxiliary power U<sub>H</sub>

Terminal voltage on pressure transmitter

10.5 ... 45 V DC  
 10.5 ... 30 V DC in intrinsically safe mode

Ripple

U<sub>SS</sub> ≤ 0.2 V (47 ... 125 Hz)

Noise

U<sub>eff</sub> ≤ 1.2 mV (0.5 ... 10 kHz)

Auxiliary power

—

Separate supply voltage

—

**SITRANS P320 / SITRANS P420 for differential pressure and flow****Certificates and approvals**

Classification according to pressure equipment directive (PED 2014/68/EU)

Drinking water

- WRAS (England)
- ACS (France)
- DVGW (Germany)
- NSF (USA)

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

BAM (Germany), oxygen expenditures

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Effective internal inductance/capacitance

- Flameproof enclosure "d"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Dust explosion protection for Zone 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Max. surface temperature
- Connection

- Dust explosion protection for Zone 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Effective internal inductance/capacitance

- Type of protection for Zone 2

- Marking
- Permissible ambient temperature "ec"
- Permissible ambient temperature "ic"
- Permissible temperature of measuring medium
- "ec" connection
- "ic" connection

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

**For flow only**

For gases of fluid group 1 and liquids of fluid group 1; fulfills the basic safety requirements as per article 3, paragraph 1 (appendix 1); classified as category III, module H conformity evaluation by TÜV Nord

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

Ex II 1D Ex tb IIIC T120 °C Da

Ex II 2D Ex tb IIIC T120 °C Db

Ex II 3D Ex tc IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

120 °C (248 °F)

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

Ex II 1D Ex ia IIIC T120 °C Da

Ex II 2D Ex ib IIIC T120 °C Db

Ex II 3D Ex ic IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 3G Ex ec IIC T4/T6 Gc

Ex II 3G Ex ic IIC T4/T6 Gc

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +40 °C (-40 ... +104 °F) temperature class T6

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +80 °C (-40 ... +176 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 30 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

Effective internal inductance/capacitance:

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

### for differential pressure and flow

#### SITRANS P320 / SITRANS P420 for differential pressure and flow

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Explosion protection acc. to FM           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or IS; NI; S</li> </ul> </li> <li>• Explosion protection according to CSA           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or (IS)</li> </ul> </li> </ul> | <p>Available soon</p> <p>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p> <p>Available soon</p> <p>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p> |
|---|---|

#### HART communication

|                       |                |
|-----------------------|----------------|
| HART                  | 230 ... 1100 Ω |
| Protocol              | HART 7         |
| Software for computer | SIMATIC PDM    |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for differential pressure and flow

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## Selection and ordering data





|   | Article No.   |
|---|---------------|
| <b>Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)</b>   |               |
| <b>SITRANS P320</b>   | <b>7MF034</b> |
| <b>SITRANS P420</b>   | <b>7MF044</b> |
| ➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.   |               |
| <b>Communication</b>  |               |
| HART, 4 ... 20 mA   | 0             |
| <b>Measuring cell filling</b>   |               |
| Silicone oil  | 1             |
| Inert liquid  | 3             |
| Neobee oil  | 4             |
| <b>Maximum measuring span</b>   |               |
| 20 mbar (8.037 inH <sub>2</sub> O)  | B             |
| 60 mbar (24.11 inH <sub>2</sub> O)  | D             |
| 250 mbar (100.5 inH <sub>2</sub> O)   | G             |
| 600 mbar (241.1 inH <sub>2</sub> O)   | H             |
| 1 600 mbar (643 inH <sub>2</sub> O)   | M             |
| 5000 mbar (2009 inH <sub>2</sub> O)   | P             |
| 30 bar (435 psi)  | R             |
| <b>Process connection</b>   |               |
| Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518)  | L             |
| Oval flange, mounting thread: M10 (PN 160) (DIN 19213)  | M             |
| Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518) with lateral ventilation   | N             |
| Oval flange, mounting thread: M10 (PN 160) (DIN 19213) with lateral ventilation   | P             |
| Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518)  | Q             |
| Oval flange, mounting thread: M10 (DIN 19213); only for 100 bar (1450 psi)  | R             |
| Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518) with lateral ventilation   | S             |
| Oval flange, mounting thread: M10 (DIN 19213) with lateral ventilation  | T             |
| <b>Wetted parts materials: Process connection, seal diaphragm</b>   |               |
| Stainless steel 316L/1.4404, stainless steel 316L/1.4404  | 0             |
| Stainless steel 316L/1.4404, alloy C276/2.4819  | 1             |
| Alloy C22/2.4602, alloy C276/2.4819   | 2             |
| Tantalum/tantalum (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))                        | 4             |
| Monel 00/2.4360, Monel 400/2.4360 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))        | 6             |
| Stainless steel 316L/1.4404, gold-plated (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi)) | 8             |
| <b>Non-wetted parts materials</b>   |               |
| Die-cast aluminum   | 1             |
| Stainless steel precision casting CF3M/1.4409 similar to 316L   | 2             |
| <b>Enclosure</b>  |               |
| Dual chamber device   | 5             |
| <b>Type of protection</b>   |               |
| Without Ex  | A             |
| Intrinsic safety  | B             |
| Flameproof enclosure  | C             |
| Flameproof enclosure, intrinsic safety  | D             |
| Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2  | L             |
| Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2   | M             |
| Combination of options B, C and L (zone model)  | S             |
| Combination of options B, C and M (zone model, Class Division)  | T             |
| <b>Electrical connections/cable entries</b>   |               |
| Thread for cable gland  |               |
| • 2 x M20 x 1.5   | F             |
| • 2 x 1/2-14 NPT  | M             |

Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

for differential pressure and flow

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|  |  | Article No.  |
|--|--|--|
| Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi) |  |  |
| SITRANS P320   |  | 7MF034 -  -  |
| SITRANS P420   |  | 7MF044 -  -  |
| Local operation/display  |  |  |
| Without display (cover closed)   |  | 0  |
| With display (cover closed)  |  | 1  |
| With display (cover with glass pane)   |  | 2  |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for differential pressure and flow

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Article No.

**Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)****SITRANS P320**

7MF035 - - - - -

**SITRANS P420**

7MF045 - - - - -

[Click on the Article no. for the online configuration in the PIA Life Cycle Portal.](#)
**Communication**

HART, 4 ... 20 mA

**Measuring cell filling**

Silicone oil

Inert liquid

Neobee oil

**Maximum measuring span**250 mbar (100.5 inH<sub>2</sub>O)600 mbar (241.1 inH<sub>2</sub>O)1 600 mbar (643 inH<sub>2</sub>O)5000 mbar (2009 inH<sub>2</sub>O)

30 bar (435 psi)

**Process connection**

Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)

Oval flange, mounting thread: M12 (PN 420) (DIN 19213)

Oval flange, mounting thread: 7/16-20 UNF (IEC 61518) with lateral ventilation

Oval flange, mounting thread: M12 (PN 420) (DIN 19213) with lateral ventilation

Version for diaphragm seal with mounting thread 7/16-20 UNF (IEC 61518)

Version for diaphragm seal with mounting thread M10 (DIN 19213)

Version for diaphragm seal (level and capillary) with mounting thread 7/16-20 UNF (IEC 61518)

**Wetted parts materials: Process connection, seal diaphragm**

Stainless steel 316L/1.4404, stainless steel 316L/1.4404

Stainless steel 316L/1.4404, alloy C276/2.4819

Alloy C22/2.4602, alloy C276/2.4819

Tantalum/tantalum

Monel 00/2.4360, Monel 400/2.4360

Stainless steel 316L/1.4404, gold-plated

**Non-wetted parts materials**

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

**Enclosure**

Dual chamber device

**Type of protection**

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class Division)

**Electrical connections/cable entries**

Thread for cable gland

- 2 x M20 x 1.5
- 2 x 1/2-14 NPT

**Local operation/display**

Without display (cover closed)

With display (cover closed)

With display (cover with glass pane)

0

1

3

4

G

H

M

P

R

L

M

N

P

V

W

X

0

1

2

4

6

8

1

2

5

A

B

C

D

L

M

S

T

F

M

0

1

2

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for differential pressure and flow

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## Selection and ordering data

| Options  | Order code | Options  | Order code |
|--|------------|--|------------|
| Add "-Z" to article no. and specify order code.  |            | <b>Device options</b>  |            |
| <b>Cable glands included</b>   |            | PDF file with device settings  | <b>D10</b> |
| Plastic  | <b>A00</b> | Double layer coating (epoxy resin and polyurethane)<br>120 µm of enclosure and cover | <b>D20</b> |
| Metal  | <b>A01</b> | FVMQ enclosure sealing   | <b>D21</b> |
| Stainless steel  | <b>A02</b> | IP66/IP68 degree of protection (not for M12 and Han device plugs)                    | <b>D30</b> |
| Stainless steel 316L/1.4404  | <b>A03</b> | TAG label empty  | <b>D40</b> |
| CMP, for XP devices  | <b>A10</b> | Without labeling of the measuring range on the TAG label                             | <b>D41</b> |
| CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm            | <b>A11</b> | Stainless steel Ex plate 1.4404/316L   | <b>D42</b> |
| CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm | <b>A12</b> | Increase of pressure stage from PN 420 to PN 500                                     | <b>D50</b> |
| <b>Han device plug mounted left</b>  |            | Overvoltage protection up to 6 kV (external)   | <b>D71</b> |
| Han 7D device plug (plastic, straight)   | <b>A30</b> | Adhesive labels on transport packaging (supplied by customer)                        | <b>D90</b> |
| Han 7D device plug (plastic, angled)   | <b>A31</b> |  |            |
| Han 7D device plug (metal, straight)   | <b>A32</b> | <b>General approval without Ex approval</b>  |            |
| Han 7D device plug (metal, angled)   | <b>A33</b> | Worldwide (CE, RCM) except EAC, FM, CSA, KCC   | <b>E00</b> |
| Han 8D device plug (plastic, straight)   | <b>A34</b> | Worldwide (CE, RCM, EAC, FM, CSA, KCC)   | <b>E01</b> |
| Han 8D device plug (plastic, angled)   | <b>A35</b> | CSA  | <b>E06</b> |
| Han 8D device plug (metal, straight)   | <b>A36</b> | EAC  | <b>E07</b> |
| Han 8D device plug (metal, angled)   | <b>A37</b> | FM   | <b>E08</b> |
| <b>Cable socket included</b>   |            | KCC  | <b>E09</b> |
| Plastic, for Han 7D/8D device plugs  | <b>A40</b> | UL   | <b>E10</b> |
| Metal, for Han 7D/8D device plugs  | <b>A41</b> | <b>Explosion protection approvals</b>  |            |
| <b>M12 device plug mounted left</b>  |            | ATEX (Europe)  | <b>E20</b> |
| Stainless steel, without cable socket  | <b>A62</b> | CSA (USA and Canada)   | <b>E21</b> |
| Stainless steel, with cable socket   | <b>A63</b> | FM (USA and Canada)  | <b>E22</b> |
| <b>Cable entry/connector mounting</b>  |            | IECEx (Worldwide)  | <b>E23</b> |
| 2x sealing plugs M20 x 1.5, IP66/68 installed on both sides  | <b>A90</b> | EACEx (GOST-R, -K, -B)   | <b>E24</b> |
| 2x sealing plugs ½-14 NPT, IP66/68 installed on both sides   | <b>A91</b> | INMETRO (Brazil)   | <b>E25</b> |
| Cable gland/connector mounted left   | <b>A97</b> | KCs (Korea)  | <b>E26</b> |
| Cable gland/connector mounted on right   | <b>A99</b> | NEPSI (China)  | <b>E27</b> |
| <b>Nameplate labeling</b>  |            | PESO (India)   | <b>E28</b> |
| German (bar)   | <b>B11</b> | TIIS Hazardous (Japan)   | <b>E29</b> |
| French (bar)   | <b>B12</b> | UKR Sepro (Ukraine)  | <b>E30</b> |
| Spanish (bar)  | <b>B13</b> | ATEX (Europe) and IECEx (Worldwide)  | <b>E47</b> |
| Italian (bar)  | <b>B14</b> | CSA (Canada) and FM (USA)  | <b>E48</b> |
| Chinese (bar)  | <b>B15</b> | ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)                      | <b>E49</b> |
| Russian (bar)  | <b>B16</b> | <b>Marine approvals</b>  |            |
| English (psi)  | <b>B20</b> | DNV-GL (Det Norske Veritas/Germanischer Lloyd)                                       | <b>E50</b> |
| Chinese (Pa)   | <b>B35</b> | LR (Lloyds Register)   | <b>E51</b> |
| <b>Certificates</b>  |            | BV (Bureau Veritas)  | <b>E52</b> |
| Quality test certificate, 5-point factory calibration (IEC 60770-2)                                | <b>C11</b> | ABS (American Bureau of Shipping)  | <b>E53</b> |
| Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts                   | <b>C12</b> | KR (Korean Register of Shipping)   | <b>E56</b> |
| Test report - NACE (MR 0103-2012 and MR 0175-2009)   | <b>C13</b> | RINA (Registro Italiano Navale)  | <b>E57</b> |
| Test report (EN 10204-2.2) - Wetted parts  | <b>C14</b> | CCS (China Classification Society)   | <b>E58</b> |
| Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts                   | <b>C15</b> | <b>Country-specific approvals</b>  |            |
| <b>Certificates for functional safety</b>  |            | CRN approval Canada (Canadian Registration Number)                                   | <b>E60</b> |
| Functional safety (IEC 61508) - SIL2/3   | <b>C20</b> |  |            |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for differential pressure and flow

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| Options  | Order code |
|--|------------|
| <b>Special approvals</b>   |            |
| Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))                             | <b>E80</b> |
| Dual seal  | <b>E81</b> |
| WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM                                       | <b>E83</b> |
| NSF61 (drinking water)   | <b>E84</b> |
| ACS (drinking water)   | <b>E85</b> |
| <b>Mounting bracket</b>  |            |
| Steel, galvanized  | <b>H01</b> |
| Stainless steel 1.4301/304   | <b>H02</b> |
| Stainless steel 1.4404/316L  | <b>H03</b> |
| <b>Process flanges; screw plug with vent valve</b>   |            |
| Welded in on right   | <b>J08</b> |
| Welded in on left  | <b>J09</b> |
| Glued in on right  | <b>J10</b> |
| Glued in on left   | <b>J11</b> |
| <b>Flange connections with flange EN 1092-1</b>  |            |
| Form B1  |            |
| • DN 25 PN 40, stainless steel 1.4571/316Ti  | <b>J70</b> |
| • DN 50 PN 40, stainless steel 1.4571/316Ti  | <b>J71</b> |
| • DN 80 PN 40, stainless steel 1.4571/316Ti  | <b>J72</b> |
| • DN 15 PN 40, stainless steel 1.4571/316Ti  | <b>J78</b> |
| Form C   |            |
| • DN 25 PN 40, stainless steel 1.4571/316Ti  | <b>J73</b> |
| • DN 50 PN 40, stainless steel 1.4571/316Ti  | <b>J74</b> |
| • DN 80 PN 40, stainless steel 1.4571/316Ti  | <b>J75</b> |
| <b>Flange connection options</b>   |            |
| Flange connection and temperature extension  | <b>J76</b> |
| Flange connection with epoxy resin coating   | <b>J77</b> |
| <b>Process flanges; special materials</b>  |            |
| Reserved for 7MF7: without process flanges, without screws, without gaskets                                    | <b>K00</b> |
| Process flange material alloy C4/2.4610  | <b>K01</b> |
| Process flange material Monel 400/2.4360   | <b>K02</b> |
| Process connection material PVDF, on the side ½-14 NPT   | <b>K05</b> |
| Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar | <b>K06</b> |
| Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar | <b>K07</b> |
| <b>Process flanges; process connection option</b>  |            |
| Process flange with process connection G½ welded on  | <b>K20</b> |
| Process connection (oval flange) NAM (ASTAVA)  | <b>K21</b> |
| <b>Process flanges chambered with gaskets</b>  |            |
| 1x chambered, graphite   | <b>K40</b> |
| 1x chambered, PTFE   | <b>K41</b> |
| 2x chambered, PTFE   | <b>K42</b> |
| <b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>  |            |
| O-ring, process flanges, PTFE  | <b>K50</b> |
| O-ring, process flanges, FEP (with silicone core, approved for food)   | <b>K51</b> |
| O-ring, process flanges, FFKM (FFPM)   | <b>K52</b> |
| O-ring, process flanges, NBR   | <b>K53</b> |
| O-ring, process flanges, EPDM  | <b>K54</b> |

| Options  | Order code |
|--|------------|
| <b>Process flange options</b>  |            |
| Process flanges for vertical differential pressure lines (half process flange)   | <b>K81</b> |
| Process flanges (+) - side front   | <b>K82</b> |
| Process flange screws, process flange nuts, material Monel 400/2.4360  | <b>K83</b> |
| Valve ¼-18 NPT, material same as process flanges   | <b>K84</b> |
| Valve mounted on the side, measured medium: Gas  | <b>K85</b> |
| Oval flange enclosed, gasket PTFE + mounting screws  | <b>K86</b> |
| <b>Pneumatic blocks</b>  |            |
| With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2) | <b>U01</b> |
| With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)     | <b>U02</b> |
| With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2) | <b>U03</b> |
| With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)     | <b>U04</b> |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

for differential pressure and flow

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## Selection and ordering data

| Customer-specific device settings   | Order code |
|---|------------|
| Add "-Z" to article no., specify order code and plain text or drop-down list selection.   |            |
| <b>Measuring span</b><br><b>Start of scale value (max. 5 characters),</b><br><b>full scale value (max. 5 characters),</b><br><b>unit [mbar, bar, kPa, MPa, psi, ...],</b><br><b>example: -0.5 ... 10.5 psi</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr   | Y01        |
| <b>Square-rooted characteristic [VSLN2, MSLN2],</b><br><b>example: VSLN2</b><br><br>Drop-down list: VSLN2, MSLN2  | Y02        |
| <b>TAG</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b><br><br>Input field: Free text, max. 32 characters   | Y15        |
| <b>Measuring point description</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b><br><br>Input field: Free text, max. 32 characters   | Y16        |
| <b>TAG short</b><br><b>(device parameters, max. 8 characters)</b><br><br>Input field: Free text, max. 8 characters  | Y17        |
| <b>Local display</b><br><b>[Pressure, Percent], reference [None, Absolute, Relative],</b><br><b>example: Pressure gauge</b><br><br>Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge  | Y21        |
| <b>Local display</b><br><b>Scaling with standard units</b><br><b>[m<sup>3</sup>/s, l/s, m, inch, ...], example 1 ... 5 m<sup>3</sup>/s</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI, m <sup>3</sup> /sec, m <sup>3</sup> /h, m <sup>3</sup> /d, l/sec, l/min, l/h, Ml/d, ft <sup>3</sup> /sec, ft <sup>3</sup> /h, ft <sup>3</sup> /d, SCF/min, SCF/h, NI/h, Nm <sup>3</sup> /h, gal/sec, gal/min, gal/h, gal/d, Mgal/d, gal (UK)/sec, gal (UK)/min, gal (UK)/h, gal (UK)/d, bbl/sec, bbl/min, bbl/h, bbl/d, kg/sec, kg/min, kg/h, kg/d, g/sec, g/min, g/h, t/min, t/h, t/d, lb/sec, lb/min, lb/h, lb/d, ton/min, ton/h, ton/d, ton (UK)/h, ton (UK)/d. | Y22        |
| <b>Local display</b><br><b>Scaling with user-specific units (max. 12 characters),</b><br><b>example 1 ... 5 m</b><br><br>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Input field 3: Free text, max. 8 characters   | Y23        |
| <b>Saturation limits instead of 3.8 ... 20.5 mA,</b><br><b>example: 3.8 ... 22.0 mA</b><br><br>Drop-down list 1: 3.9, 4<br>Drop-down list 2: 20.8, 22   | Y30        |
| <b>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</b><br><br>Drop-down list: 3.75; 21.75; 22.5; 22.6  | Y31        |
| <b>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</b><br><br>Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.   | Y32        |
| <b>ID number of special version</b><br><br>Input field: max. 4 characters and only natural numbers from 0 ... 9999  | Y99        |

# Pressure Measurement

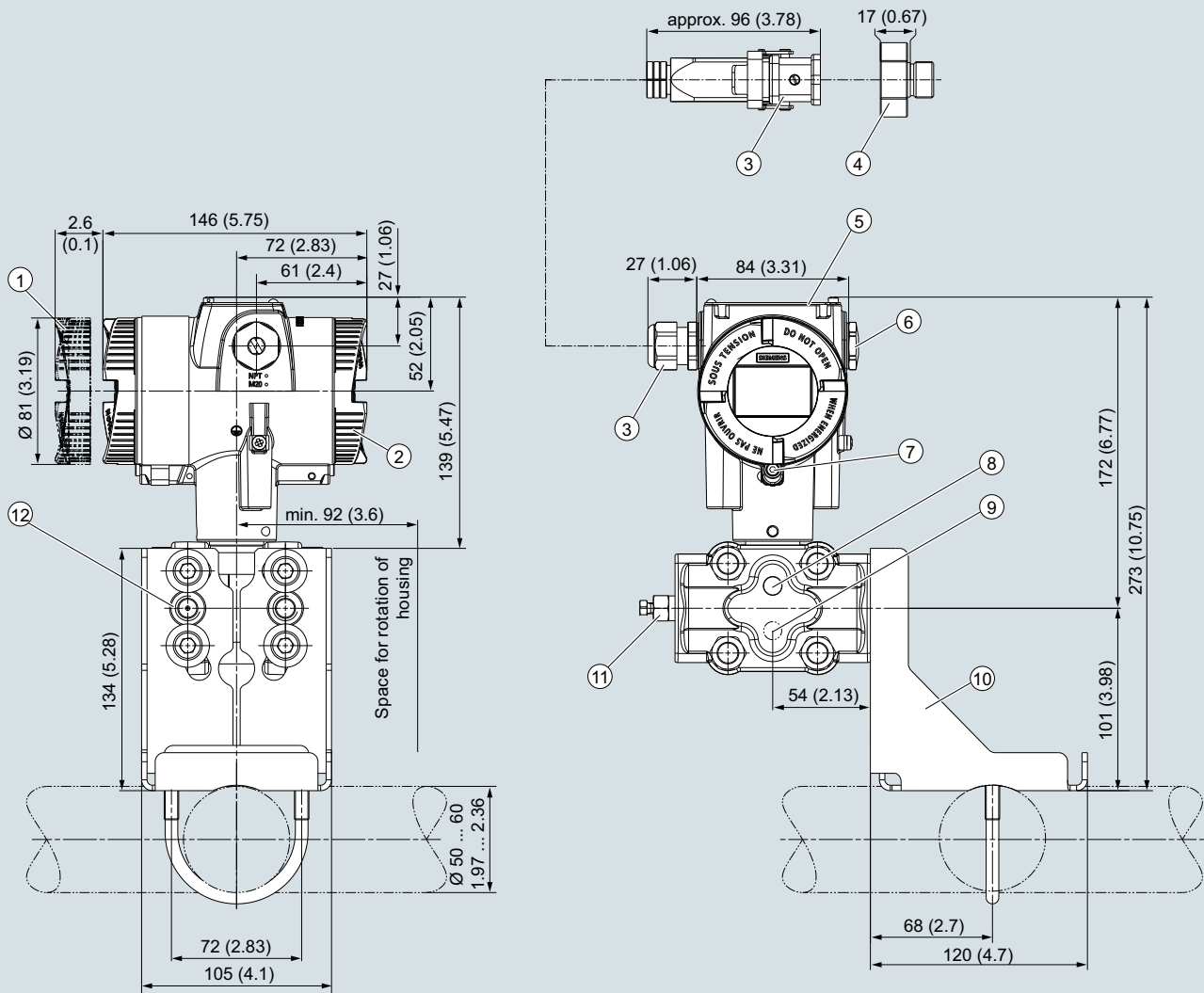
## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for differential pressure and flow

1

#### Dimensional drawings



- ① Electronic side, display  
(longer overall length for cover with window)<sup>1)</sup>
- ② Terminal side
- ③ Electrical connection:  
screw gland M20 x 1,5<sup>3)</sup> or screw gland ½-14 NPT or  
Han 7D/Han 8D<sup>2)</sup> device plug or M12 device plug<sup>2)</sup> 3
- ④ Harting adapter
- ⑤ Cover over buttons and nameplate with general information

- ⑥ Blanking plug
- ⑦ Screw cover - safety bracket  
(only for type of protection "Explosion-proof enclosure")
- ⑧ Lateral venting for liquid measurement (Standard)
- ⑨ Lateral venting for gas measurement (suffix K85)
- ⑩ Mounting bracket (option)
- ⑪ Sealing screw with valve (option)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

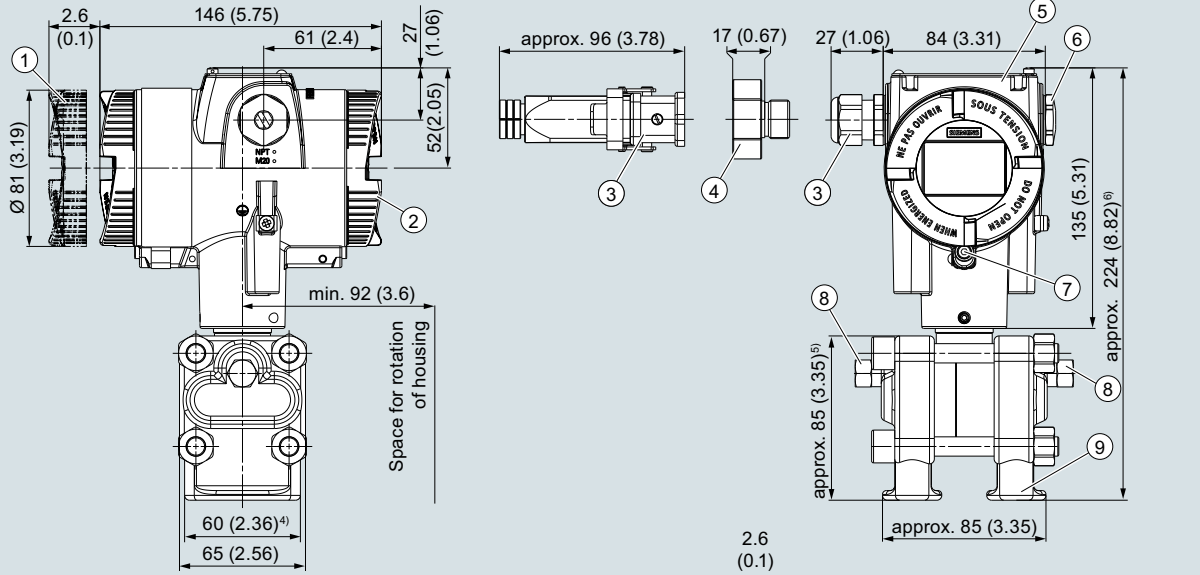
SITRANS P320/P420 pressure transmitter for differential pressure and flow, dimensions in mm (inch)

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for differential pressure and flow



- ① Electronic side, display  
(longer overall length for cover with window)<sup>1)</sup>
- ② Terminal side
- ③ Electrical connection:  
screw gland M20 x 1.5<sup>3)</sup> or screw gland ½-14 NPT or  
Han 7D/Han 8D<sup>2)</sup> 3) device plug or M12 device plug<sup>2)</sup> 3)
- ④ Harting adapter

- ⑤ Cover over buttons and nameplate  
with general information
- ⑥ Blanking plug
- ⑦ Screw cover - safety bracket  
(only for type of protection "Explosion-proof enclosure")
- ⑧ Sealing screw with valve (option)
- ⑨ Process connection: ¼-18 NPT (IEC 61518)

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

<sup>4)</sup> 74 mm (2.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

<sup>5)</sup> 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

<sup>6)</sup> 226 mm (8.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

SITRANS P320/P420 pressure transmitter for differential pressure and flow with process covers for vertical differential pressure lines (option "K81"), dimensions in mm (inch)

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for level

1

#### Technical specifications

##### SITRANS P320 / SITRANS P420 for level

###### Input

|   |  |   |                                   |
|---|--|---|-----------------------------------|
| Measured variable   | Level  |   |                                   |
| Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU) | Span   | Max. permissible operating pressure MAWP (PS) | Maximum permissible test pressure |
|   | 25 ... 250 mbar  | See "Mounting flange"                         |                                   |
|   | 2.5 ... 25 kPa   |   |                                   |
|   | 10 ... 100.5 inH <sub>2</sub> O  |   |                                   |
|   | 25 ... 600 mbar  |   |                                   |
|   | 2.5 ... 60 kPa   |   |                                   |
|   | 10 ... 241 inH <sub>2</sub> O  |   |                                   |
|   | 53 ... 1600 mbar   |   |                                   |
|   | 5.3 ... 160 kPa  |   |                                   |
|   | 21 ... 643 inH <sub>2</sub> O  |   |                                   |
|   | 166 ... 5000 mbar  |   |                                   |
|   | 16.6 ... 500 kPa   |   |                                   |
|   | 2.41 ... 72.5 psi  |   |                                   |
| Measuring limits  |  |   |                                   |
| • Low measuring limit   |  |   |                                   |
| - Measuring cell with silicone oil filling  | -100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange |   |                                   |
| - Measuring cell with inert oil   | -100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange |   |                                   |
| - Measuring cell with FDA-compliant oil   | -100% of max. measuring range or 100 mbar a/10 kPa a/1.45 psi a                                |   |                                   |
| • Upper measuring limit   | 100% of max. span  |   |                                   |
| • Start of scale  | Between the measuring limits (infinitely adjustable)   |   |                                   |

###### Output

|   |   |
|---|---|
| Output signal                                   | <b>HART</b>   |
| • Low saturation limit (infinitely adjustable)  | 4 ... 20 mA   |
| • High saturation limit (infinitely adjustable) | 3.55 mA, factory preset to 3.8 mA   |
| • Ripple (without HART communication)           | 22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA   |
|   | $I_{pp} \leq 0.5\%$ of max. output current  |
| Adjustable damping                              | 0 ... 100 s, continuously adjustable over remote operation  |
|   | 0 ... 100 s, in increments of 0.1 s, adjustable over display  |
| • Current transmitter                           | 3.55 ... 22.8 mA  |
| • Failure signal                                | 3.55 ... 22.8 mA  |
| Load  | Resistor R [ $\Omega$ ]   |
| • Without HART communication                    | $R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$ ,<br>$U_H$ : Power supply in V   |
|   | $R = 230 \dots 1100 \Omega$ (HART communicator (handheld))  |
| • With HART communication                       | $R = 230 \dots 500 \Omega$ (SIMATIC PDM)  |
| Characteristic curve                            | <ul style="list-style-type: none"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul> |
| Physical bus                                    | -   |
| Polarity-independent                            | -   |

###### Measuring accuracy

|   |  |
|---|--|
| Reference conditions  | <ul style="list-style-type: none"> <li>• According to EN 60770-1</li> <li>• Rising characteristic curve</li> <li>• Start of scale value 0 bar/kPa/psi</li> <li>• Seal diaphragm stainless steel</li> <li>• Measuring cell with silicone oil filling</li> <li>• Room temperature 25 °C (77 °F)</li> </ul> |
| Conformity error at limit point setting, including hysteresis and repeatability |  |
| Measuring span ratio r (spread, Turn-Down)                                      | $r = \text{maximum measuring span/set measuring span or nominal measuring range}$  |
| • Linear characteristic   |  |
| - 250 mbar/25 kPa/3.6 psi   | $r \leq 5:$  |
| - 600 mbar/60 kPa/8.7 psi   | $\leq 0.065\%$ (SITRANS P320)  |
| - 1600 mbar/160 kPa/23.21 psi   | $\leq 0.004\%$ (SITRANS P420)  |
| - 5 bar/500 kPa/72.5 psi  | $5 < r \leq 10:$   |
|   | $\leq (0.004 \cdot r + 0.045)\%$   |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced) SITRANS P320/P420

### for level

#### SITRANS P320 / SITRANS P420 for level

Influence of ambient temperature<sup>1)</sup>  
in % per 28 °C (50 °F)

|                               |                                  |
|-------------------------------|----------------------------------|
| • SITRANS P320                | $\leq (0.025 \cdot r + 0.125)\%$ |
| - 250 mbar/25 kPa/3.6 psi     |                                  |
| - 600 mbar/60 kPa/8.7 psi     |                                  |
| - 1600 mbar/160 kPa/23.21 psi |                                  |
| - 5 bar/500 kPa/72.5 psi      |                                  |
| • SITRANS P420                | $\leq (0.025 \cdot r + 0.625)\%$ |
| - 250 mbar/25 kPa/3.6 psi     |                                  |
| - 5 bar/500 kPa/72.5 psi      |                                  |
| - 600 mbar/60 kPa/8.7 psi     | $\leq (0.125 \cdot r + 0.625)\%$ |
| - 1600 mbar/160 kPa/23.21 psi |                                  |

Effect of static pressure

|                               |  |
|-------------------------------|--|
| • on the start of scale       |  |
| - 50 mbar/25 kPa/3.63 psi     | $\leq (0.1 \cdot r)\%$ per nominal pressure  |
| - 600 mbar/60 kPa/8.70 psi    |  |
| - 1600 mbar/160 kPa/23.21 psi |  |
| - 5 bar/500 kPa/72.52 psi     | $\leq (0.15 \cdot r)\%$ per nominal pressure |
| • on the span                 | $\leq (0.1 \cdot r)\%$ per nominal pressure  |

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

|                       |   |
|-----------------------|---|
| • all measuring cells | In 5 years $\leq (0.25 \cdot r)\%$ static pressure max. 70 bar/7 MPa/1015 psi |
|-----------------------|---|

Step response time  $T_{63}$  (without electrical damping) Approx. 0.2 s

Influence of mounting position Depends on the fill fluid in the mounting flange

Effect of auxiliary power (in % per voltage change) 0.005% per 1 V

#### Rated conditions

Temperature of medium

|  |   |
|--|---|
| Measuring cell with silicone oil filling | <ul style="list-style-type: none"> <li>• High-pressure side: See "Mounting flange"</li> <li>• Low-pressure side: -40 ... +100 °C (-40 ... +212 °F)</li> </ul> |
|--|---|

Ambient conditions

|   |  |
|---|--|
| • Ambient temperature/enclosure                   | Always consider the assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection. |
| - Measuring cell with silicone oil filling        | -40 ... +85 °C (-40 ... +185 °F)   |
| - Display   | -20 ... +80 °C (-4 ... +176 °F)  |
| • Storage temperature                             | -50 ... +85 °C (-58 ... +185 °F)   |
| • Climatic class in accordance with IEC 60721-3-4 | 4K4H   |
| • Degree of protection                            |  |
| - According to IEC 60529                          | IP66, IP68   |
| - According to NEMA 250                           | Type 4X  |
| • Electromagnetic compatibility                   |  |
| - Emitted interference and interference immunity  | According to IEC 61326 and NAMUR NE 21   |

Vibration resistance

|   |   |
|---|---|
| • Reference conditions                                      | Specifications apply to devices without mounting bracket  |
| • General operating conditions                              |   |
| - Oscillations (sine) IEC 60068-2-6                         | 10 ... 58 Hz, 0.3 mm (0.01 inch)<br>58 ... 500 Hz, 20 m/s <sup>2</sup> (65.62 ft/s <sup>2</sup> )<br>1 octave/min<br>5 cycles/axis  |
| - Continuous shocks (half-sine) IEC 60068-2-27              | 250 m/s <sup>2</sup> (820 ft/s <sup>2</sup> )<br>6 ms<br>2000 shocks/axis   |
| - Noise (digitally controlled) IEC 60068-2-64               | 10 ... 200 Hz; 1 (m/s <sup>2</sup> ) <sup>2</sup> /Hz (3.28 (ft/s <sup>2</sup> ) <sup>2</sup> /Hz)<br>200 ... 500 Hz; 0.3 (m/s <sup>2</sup> ) <sup>2</sup> /Hz (0.98 (ft/s <sup>2</sup> ) <sup>2</sup> /Hz)<br>4 hours/axle |
| • Rated conditions for marine applications                  |   |
| - IEC 60068-2-6   | 2 ... 25 Hz, 1.6 mm (0.06 inch)   |
| - DNVGL-CG-0339, clause 6                                   | 25 ... 100 Hz, 40 m/s <sup>2</sup> (131.23 ft/s <sup>2</sup> )  |
| - Lloyd's Register Test Specification Number 1, section 12. | 1 octave/min  |
| - Bureau Veritas Pt C, Ch 3, Sec 6, Table 1, No 7           |   |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for level

1

**SITRANS P320 / SITRANS P420 for level****Design**

## Weight

- According to EN (pressure transmitter with mounting flange, without tube)
- According to ASME (pressure transmitter with mounting flange, without tube)

## Material

- Wetted parts materials

- High-pressure side

Seal diaphragm of mounting flange

Stainless steel, mat. no. 1.4404/316L, Monel 400, mat. no. 2.4360, Alloy B2, mat. no. 2.4617, Alloy C276, mat. no. 2.4819, Alloy C22, mat. no. 2.4602, tantalum, PTFE, PFA, ECTFE

Sealing surface

Smooth according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA for stainless steel 316L, EN 2092-1 form B2 or ASME B16.5 RFSF for the remaining materials

- Sealing material in the process flanges

For standard applications

Viton

For underpressure applications on the mounting flange

Copper

- Low-pressure side

Seal diaphragm

Stainless steel, mat. no. 1.4404/316L

Process flange locking screws

Stainless steel, mat. no. 1.4408

Screw plug

Stainless steel ISO 3506-1 A4-70

O-ring

FPM (Viton)

- Non-wetted parts materials

- Electronics housing

- Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
- Standard: Powder coating with polyurethane
- Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
- Stainless steel type plate (1.4404/316L)

## Pressure flange screws

Stainless steel ISO 3506-1 A4-70

## Measuring cell filling

- Mounting flange fill fluid

Silicone oil

Silicone oil or other material

## Process connection

- High-pressure side
- Low-pressure side

Flange according to EN and ASME

1/4-18 NPT female thread and flat connection with M10 fastening screw thread in accordance with DIN 19213 (M12 for PN 420 (MWP 6092 psi)) or 7/16-20 UNF in accordance with EN 61518

## Electrical connection

Screw terminals

Cable entry via the following screwed glands:

- M20 x 1.5
- 1/2-14 NPT
- Han 7D/Han 8D device plug<sup>2)</sup>
- M12 device plug

**Displays and controls**

## Keys

4 keys for operation directly on the device

## Display

- With or without integrated display (optional)
- Cover with inspection window (optional)

**Auxiliary power  $U_H$** 

## Terminal voltage on pressure transmitter

10.5 ... 45 V DC  
10.5 ... 30 V DC in intrinsically safe mode

## Ripple

$U_{SS} \leq 0.2 \text{ V}$  (47 ... 125 Hz)

## Noise

$U_{eff} \leq 1.2 \text{ mV}$  (0.5 ... 10 kHz)

## Auxiliary power

—

## Separate supply voltage

—

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

## SITRANS P320 / SITRANS P420 for level

### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)

Drinking water

- WRAS (England)
- ACS (France)
- DVGW (Germany)
- NSF (USA)

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

BAM (Germany), oxygen expenditures

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Effective internal inductance/capacitance

- Flameproof enclosure "d"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Dust explosion protection for Zone 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Max. surface temperature
- Connection

- Dust explosion protection for Zone 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Effective internal inductance/capacitance

- Type of protection for Zone 2

- Marking
- Permissible ambient temperature "ec"
- Permissible ambient temperature "ic"
- Permissible temperature of measuring medium
- "ec" connection
- "ic" connection

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

Ex II 1D Ex tb IIIC T120 °C Da

Ex II 2D Ex tb IIIC T120 °C Db

Ex II 3D Ex tc IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

120 °C (248 °F)

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

Ex II 1D Ex ia IIIC T120 °C Da

Ex II 2D Ex ib IIIC T120 °C Db

Ex II 3D Ex ic IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 3G Ex ec IIC T4/T6 Gc

Ex II 3G Ex ic IIC T4/T6 Gc

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +40 °C (-40 ... +104 °F) temperature class T6

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +80 °C (-40 ... +176 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 30 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

Effective internal inductance/capacitance:

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

**SITRANS P320 / SITRANS P420 for level**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Explosion protection acc. to FM           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or IS; NI; S</li> </ul> </li> <li>• Explosion protection according to CSA           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or (IS)</li> </ul> </li> </ul> | Available soon<br>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III<br>Available soon<br>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III |
|---|--|

1) Specification only applies to the basic unit. The remote seal error must be considered additively.

2) Han 8D is identical to Han 8U.

**HART communication**

|                       |                |
|-----------------------|----------------|
| HART                  | 230 ... 1100 Ω |
| Protocol              | HART 7         |
| Software for computer | SIMATIC PDM    |

**Mounting flange**

|                           |                      |
|---------------------------|----------------------|
| Nominal diameter          | Nominal pressure     |
| • Acc. to EN 1092-1       |                      |
| - DN 80                   | PN 40                |
| - DN100                   | PN 16, PN 40         |
| • According to ASME B16.5 |                      |
| - 3 inch                  | Class 150, class 300 |
| - 4 inch                  | Class 150, class 300 |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

## Selection and ordering data

|   | Article No. |
|---|-------------|
| <b>Pressure transmitters for level</b>  |             |
| <b>SITRANS P320</b>   | 7MF036      |
| <b>SITRANS P420</b>   | 7MF046      |
| Click on the Article no. for the online configuration in the PIA Life Cycle Portal. |             |
| <b>Communication</b>  |             |
| HART, 4 ... 20 mA   | 0           |
| <b>Measuring cell filling</b>   |             |
| Silicone oil  | 1           |
| Inert liquid  | 3           |
| Neobee oil  | 4           |
| <b>Maximum measuring span</b>   |             |
| 250 mbar (100.5 inH <sub>2</sub> O)   | G           |
| 600 mbar (241 inH <sub>2</sub> O)   | H           |
| 1 600 mbar (643 inH <sub>2</sub> O)   | M           |
| 5000 mbar (72.5 psi)  | P           |
| <b>Process connection</b>   |             |
| Version for diaphragm seal with mounting thread 7/16"-20 UNF (IEC 61518)            | V           |
| <b>Wetted parts materials: Process connection, seal diaphragm</b>                   |             |
| Stainless steel 316L/1.4404, stainless steel 316L/1.4404                            | 0           |
| <b>Non-wetted parts materials</b>   |             |
| Die-cast aluminum   | 1           |
| Stainless steel precision casting CF3M/1.4409 similar to 316L                       | 2           |
| <b>Enclosure</b>  |             |
| Dual chamber device   | 5           |
| <b>Type of protection</b>   |             |
| Without Ex  | A           |
| Intrinsic safety  | B           |
| Flameproof enclosure  | C           |
| Flameproof enclosure, intrinsic safety  | D           |
| Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2              | L           |
| Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2           | M           |
| Combination of options B, C and L (zone model)                                      | S           |
| Combination of options B, C and M (zone model, Class Division)                      | T           |
| <b>Electrical connections/cable entries</b>   |             |
| Thread for cable gland  |             |
| • 2 x M20 x 1.5   | F           |
| • 2 x 1/2-14 NPT  | M           |
| <b>Local operation/display</b>  |             |
| Without display (cover closed)  | 0           |
| With display (cover closed)   | 1           |
| With display (cover with glass pane)  | 2           |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for level

1

#### Selection and ordering data

| Options  | Order code | Options  | Order code |
|--|------------|--|------------|
| Add "-Z" to article no. and specify order code.  |            | <b>Device options</b>  |            |
| <b>Cable glands included</b>   |            | PDF file with device settings  | <b>D10</b> |
| Plastic  | <b>A00</b> | Double layer coating (epoxy resin and polyurethane)<br>120 µm of enclosure and cover | <b>D20</b> |
| Metal  | <b>A01</b> | FVMQ enclosure sealing   | <b>D21</b> |
| Stainless steel  | <b>A02</b> | IP66/IP68 degree of protection (not for M12 and Han device plugs)                    | <b>D30</b> |
| Stainless steel 316L/1.4404  | <b>A03</b> | TAG label empty  | <b>D40</b> |
| CMP, for XP devices  | <b>A10</b> | Without labeling of the measuring range on the TAG label                             | <b>D41</b> |
| CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm            | <b>A11</b> | Stainless steel Ex plate 1.4404/316L   | <b>D42</b> |
| CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm | <b>A12</b> | Increase of pressure stage from PN 420 to PN 500                                     | <b>D50</b> |
| <b>Han device plug mounted left</b>  |            | Overvoltage protection up to 6 kV (external)   | <b>D71</b> |
| Han 7D device plug (plastic, straight)   | <b>A30</b> | Adhesive labels on transport packaging (supplied by customer)                        | <b>D90</b> |
| Han 7D device plug (plastic, angled)   | <b>A31</b> |  |            |
| Han 7D device plug (metal, straight)   | <b>A32</b> | <b>General approval without Ex approval</b>  |            |
| Han 7D device plug (metal, angled)   | <b>A33</b> | Worldwide (CE, RCM) except EAC, FM, CSA, KCC   | <b>E00</b> |
| Han 8D device plug (plastic, straight)   | <b>A34</b> | Worldwide (CE, RCM, EAC, FM, CSA, KCC)   | <b>E01</b> |
| Han 8D device plug (plastic, angled)   | <b>A35</b> | CSA  | <b>E06</b> |
| Han 8D device plug (metal, straight)   | <b>A36</b> | EAC  | <b>E07</b> |
| Han 8D device plug (metal, angled)   | <b>A37</b> | FM   | <b>E08</b> |
| <b>Cable socket included</b>   |            | KCC  | <b>E09</b> |
| Plastic, for Han 7D/8D device plugs  | <b>A40</b> | UL   | <b>E10</b> |
| Metal, for Han 7D/8D device plugs  | <b>A41</b> | <b>Explosion protection approvals</b>  |            |
| <b>M12 device plug mounted left</b>  |            | ATEX (Europe)  | <b>E20</b> |
| Stainless steel, without cable socket  | <b>A62</b> | CSA (USA and Canada)   | <b>E21</b> |
| Stainless steel, with cable socket   | <b>A63</b> | FM (USA and Canada)  | <b>E22</b> |
| <b>Cable entry/connector mounting</b>  |            | IECEX (Worldwide)  | <b>E23</b> |
| 2x sealing plugs M20 x 1.5, IP66/68 installed on both sides  | <b>A90</b> | EACEx (GOST-R, -K, -B)   | <b>E24</b> |
| 2x sealing plugs ½-14 NPT, IP66/68 installed on both sides   | <b>A91</b> | INMETRO (Brazil)   | <b>E25</b> |
| Cable gland/connector mounted left   | <b>A97</b> | KCs (Korea)  | <b>E26</b> |
| Cable gland/connector mounted on right   | <b>A99</b> | NEPSI (China)  | <b>E27</b> |
| <b>Nameplate labeling</b>  |            | PESO (India)   | <b>E28</b> |
| German (bar)   | <b>B11</b> | TiIS Hazardous (Japan)   | <b>E29</b> |
| French (bar)   | <b>B12</b> | UKR Sepro (Ukraine)  | <b>E30</b> |
| Spanish (bar)  | <b>B13</b> | ATEX (Europe) and IECEX (Worldwide)  | <b>E47</b> |
| Italian (bar)  | <b>B14</b> | CSA (Canada) and FM (USA)  | <b>E48</b> |
| Chinese (bar)  | <b>B15</b> | ATEX (Europe) and IECEX (Worldwide) + CSA (Canada) and FM (USA)                      | <b>E49</b> |
| Russian (bar)  | <b>B16</b> | <b>Marine approvals</b>  |            |
| English (psi)  | <b>B20</b> | DNV-GL (Det Norske Veritas/Germanischer Lloyd)                                       | <b>E50</b> |
| Chinese (Pa)   | <b>B35</b> | LR (Lloyds Register)   | <b>E51</b> |
| <b>Certificates</b>  |            | BV (Bureau Veritas)  | <b>E52</b> |
| Quality test certificate, 5-point factory calibration (IEC 60770-2)                                | <b>C11</b> | ABS (American Bureau of Shipping)  | <b>E53</b> |
| Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts                   | <b>C12</b> | KR (Korean Register of Shipping)   | <b>E56</b> |
| Test report - NACE (MR 0103-2012 and MR 0175-2009)   | <b>C13</b> | RINA (Registro Italiano Navale)  | <b>E57</b> |
| Test report (EN 10204-2.2) - Wetted parts  | <b>C14</b> | CCS (China Classification Society)   | <b>E58</b> |
| Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts                   | <b>C15</b> | <b>Country-specific approvals</b>  |            |
| <b>Certificates for functional safety</b>  |            | CRN approval Canada (Canadian Registration Number)                                   | <b>E60</b> |
| Functional safety (IEC 61508) - SIL2/3   | <b>C20</b> |  |            |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

1

## for level

| Options  | Order code |
|--|------------|
| <b>Special approvals</b>   |            |
| Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F)) | <b>E80</b> |
| Dual seal  | <b>E81</b> |
| WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM           | <b>E83</b> |
| NSF61 (drinking water)   | <b>E84</b> |
| ACS (drinking water)   | <b>E85</b> |

## Selection and ordering data

| Customer-specific device settings   | Order code |
|---|------------|
| Add <b>"-Z"</b> to article no., specify order code and plain text or drop-down list selection.  |            |
| <b>Measuring span</b><br><b>Start of scale value (max. 5 characters),</b><br><b>full scale value (max. 5 characters),</b><br><b>unit [mbar, bar, kPa, MPa, psi, ...],</b><br><b>example: -0.5 ... 10.5 psi</b>  | <b>Y01</b> |
| Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr |            |
| <b>TAG</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b>   | <b>Y15</b> |
| Input field: Free text, max. 32 characters  |            |
| <b>Measuring point description</b><br><b>(on stainless steel plate and device parameters,</b><br><b>max. 32 characters)</b>   | <b>Y16</b> |
| Input field: Free text, max. 32 characters  |            |
| <b>TAG short</b><br><b>(device parameters, max. 8 characters)</b>   | <b>Y17</b> |
| Input field: Free text, max. 8 characters   |            |
| <b>Local display</b><br><b>[Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge</b>   | <b>Y21</b> |
| Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge   |            |
| <b>Local display</b><br><b>Scaling with standard units</b><br><b>[m<sup>3</sup>/s, l/s, m, inch, ...], example 1 ... 5 m</b>  | <b>Y22</b> |
| Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.  |            |
| <b>Local display</b><br><b>Scaling with user-specific units (max. 12 characters),</b><br><b>example 1 ... 5 m</b>   | <b>Y23</b> |
| Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).<br><br>Input field 3: Free text, max. 8 characters  |            |
| <b>Saturation limits instead of 3.8 ... 20.5 mA,</b><br><b>example: 3.8 ... 22.0 mA</b>   | <b>Y30</b> |
| Drop-down list 1: 3.9, 4<br>Drop-down list 2: 20.8, 22  |            |
| <b>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</b>   | <b>Y31</b> |
| Drop-down list: 3.75; 21.75; 22.5; 22.6   |            |
| <b>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</b>  | <b>Y32</b> |
| Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.   |            |
| <b>ID number of special version</b>   | <b>Y99</b> |
| Input field: max. 4 characters and only natural numbers from 0 ... 9999   |            |

| Selection and Ordering data  |                         | Article No. | Order code |
|--|-------------------------|-------------|------------|
| <b>Diaphragm seal</b>  |                         | 7MF0814 -   |            |
| Flange type design, direct connected to a SITRANS P transmitter for level 7MF03../7MF04.. (order separately)<br>Scope of delivery: 1 off |                         | 03 - 0      |            |
| Click on the Article No. for the online configuration in the PIA Life Cycle Portal.  |                         |             |            |
| <b>Connecting standard EN 1092-1</b>   |                         |             |            |
| <b>Nominal diameter</b>  | <b>Nominal pressure</b> |             |            |
| DN 40  | PN 10/16/25/40          | 0DD         |            |
|  | PN 63/100               | 0DF         |            |
|  | PN 160                  | 0DG         |            |
| DN 50  | PN 10/16/25/40          | 0ED         |            |
|  | PN 63/100               | 0EE         |            |
|  | PN 160                  | 0EF         |            |
| DN 80  | PN 10/16/25/40          | 0GD         |            |
|  | PN 100                  | 0GF         |            |
| DN 100   | PN 10/16                | 0HB         |            |
|  | PN 25/40                | 0HD         |            |
| DN 125   | PN 16                   | 0JB         |            |
|  | PN 40                   | 0JD         |            |
| <b>Connecting standard ASME B16.5</b>  |                         |             |            |
| <b>Nominal diameter</b>  | <b>Nominal pressure</b> |             |            |
| 1½ inch  | class 150               | 1LA         |            |
|  | class 300               | 1LB         |            |
|  | class 400/600           | 1LD         |            |
|  | class 900/1500          | 1LF         |            |
| 2 inch   | class 150               | 1MA         |            |
|  | class 300               | 1MB         |            |
|  | class 400/600           | 1MD         |            |
|  | class 900/1500          | 1MF         |            |
| 3 inch   | class 150               | 1PA         |            |
|  | class 300               | 1PB         |            |
|  | class 600               | 1PD         |            |
|  | class 1500              | 1PF         |            |
| 4 inch   | class 150               | 1QA         |            |
|  | class 300               | 1QB         |            |
|  | class 400               | 1QD         |            |
|  | class 1500              | 1QF         |            |
| 5 inch   | class 150               | 1RA         |            |
|  | class 300               | 1RB         |            |
|  | class 400               | 1RC         |            |
| <b>Connecting standard J.I.S.</b>  |                         |             |            |
| <b>Nominal diameter</b>  | <b>Nominal pressure</b> |             |            |
| DN 50  | 10K                     | 2ES         |            |
|  | 20k                     | 2ET         |            |
|  | 50K                     | 2EU         |            |
| DN 80  | 10K                     | 2GS         |            |
|  | 20k                     | 2GT         |            |
|  | 50K                     | 2GU         |            |
| DN 100   | 10K                     | 2HS         |            |
|  | 20k                     | 2HT         |            |
|  | 50K                     | 2HU         |            |
| Other version  |                         | 9AA         | H1Y        |
| Add Order code and plain text  |                         |             |            |
| Selection and Ordering data  |                         | Article No. | Order code |
| <b>Diaphragm seal</b>  |                         | 7MF0814 -   |            |
| Flange type design, direct connected to a SITRANS P transmitter for level 7MF03../7MF04.. (order separately)<br>Scope of delivery: 1 off |                         | 03 - 0      |            |
| <b>Filling liquid</b>  |                         |             |            |
| Silicone oil M5  |                         | A           |            |
| Silicone oil M50   |                         | B           |            |
| High-temperature oil   |                         | C           |            |
| Halocarbon oil   |                         | D           |            |
| Food-grade oil (FDA listed)  |                         | E           |            |
| Other version, add Order code and plain text:  |                         | Z           | P1Y        |
| Filling liquid: ...  |                         |             |            |
| <b>Wetted parts materials</b>  |                         |             |            |
| Stainless steel 316L   |                         |             |            |
| • Without coating  |                         | A           |            |
| • With PFA coating   |                         | D           |            |
| • With PTFE coating  |                         | E0          |            |
| • With ECTFFE coating  |                         | F           |            |
| Monel 400, 2.4360  |                         | G           |            |
| Hastelloy C276, 2.4819   |                         | J           |            |
| Tantalum   |                         | K           |            |
| Titanium, 3.7035   |                         | L0          |            |
| Nickel 201   |                         | M0          |            |
| Diaphragm Duplex, 1.4462   |                         | Q           |            |
| Diaphragm plus flange Duplex, 1.4462   |                         | R           |            |
| Stainless steel 316L with gold coating   |                         | S0          |            |
| Hastelloy C4, 2.4610   |                         | U0          |            |
| Hastelloy C22, 2.4602  |                         | V0          |            |
| Other version  |                         | Z8          | Q1Y        |
| Add Order code and plain text  |                         |             |            |
| <b>Extension length</b>  |                         |             |            |
| • without  |                         | 0           |            |
| • 50 mm (2")   |                         | 1           |            |
| • 100 mm (4")  |                         | 2           |            |
| • 150 mm (6")  |                         | 3           |            |
| • 200 mm (8")  |                         | 4           |            |
| • 250 mm (10")   |                         | 5           |            |
| Other version  |                         | Z8          | Q1Y        |
| Add Order code and plain text  |                         |             |            |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

1

| Selection and Ordering data   |                 | Article No.      | Order code |
|---|-----------------|------------------|------------|
| <b>Diaphragm seal</b>   |                 | <b>7MF0814 -</b> |            |
| Flange type design, direct connected to a SITRANS P transmitter for level<br>7MF03../7MF04.. (order separately)<br>Scope of delivery: 1 off |                 | <b>03 - 0</b>    |            |
| <b>Customer-specific extension length</b>   |                 |                  |            |
| Wetted parts stainless steel without coating  |                 |                  |            |
| Range   | Standard length |                  |            |
| 20 ... 50 mm<br>(0.79 ... 1.97")  | 50 mm (1.97")   | <b>A 1</b>       |            |
| 51 ... 100 mm<br>(2.01 ... 3.94")   | 100 mm (3.94")  | <b>A 2</b>       |            |
| 101 ... 150 mm<br>(3.98 ... 5.91")  | 150 mm (5.91")  | <b>A 3</b>       |            |
| 151 ... 200 mm<br>(5.94 ... 7.87")  | 200 mm (7.87")  | <b>A 4</b>       |            |
| 201 ... 250 mm<br>(7.91 ... 9.84")  | 250 mm (9.84")  | <b>A 5</b>       |            |
| Wetted parts stainless steel with ECTFE coating   |                 |                  |            |
| Range   | Standard length |                  |            |
| 20 ... 50 mm<br>(0.79 ... 1.97")  | 50 mm (1.97")   | <b>F 1</b>       |            |
| 51 ... 100 mm<br>(2.01 ... 3.94")   | 100 mm (3.94")  | <b>F 2</b>       |            |
| 101 ... 150 mm<br>(3.98 ... 5.91")  | 150 mm (5.91")  | <b>F 3</b>       |            |
| 151 ... 200 mm<br>(5.94 ... 7.87")  | 200 mm (7.87")  | <b>F 4</b>       |            |
| 201 ... 250 mm<br>(7.91 ... 9.84")  | 250 mm (9.84")  | <b>F 5</b>       |            |
| Wetted parts stainless steel with PFA coating   |                 |                  |            |
| Range   | Standard length |                  |            |
| 20 ... 50 mm<br>(0.79 ... 1.97")  | 50 mm (1.97")   | <b>D 1</b>       |            |
| 51 ... 100 mm<br>(2.01 ... 3.94")   | 100 mm (3.94")  | <b>D 2</b>       |            |
| 101 ... 150 mm<br>(3.98 ... 5.91")  | 150 mm (5.91")  | <b>D 3</b>       |            |
| 151 ... 200 mm<br>(5.94 ... 7.87")  | 200 mm (7.87")  | <b>D 4</b>       |            |
| 201 ... 250 mm<br>(7.91 ... 9.84")  | 250 mm (9.84")  | <b>D 5</b>       |            |
| • Wetted parts Monel 400  |                 |                  |            |
| Range   | Standard length |                  |            |
| 20 ... 50 mm<br>(0.79 ... 1.97")  | 50 mm (1.97")   | <b>G 1</b>       |            |
| 51 ... 100 mm<br>(2.01 ... 3.94")   | 100 mm (3.94")  | <b>G 2</b>       |            |
| 101 ... 150 mm<br>(3.98 ... 5.91")  | 150 mm (5.91")  | <b>G 3</b>       |            |
| 151 ... 200 mm<br>(5.94 ... 7.87")  | 200 mm (7.87")  | <b>G 4</b>       |            |
| • Wetted parts Hastelloy C276   |                 |                  |            |
| Range   | Standard length |                  |            |
| 20 ... 50 mm<br>(0.79 ... 1.97")  | 50 mm (1.97")   | <b>J 1</b>       |            |
| 51 ... 100 mm<br>(2.01 ... 3.94")   | 100 mm (3.94")  | <b>J 2</b>       |            |
| 101 ... 150 mm<br>(3.98 ... 5.91")  | 150 mm (5.91")  | <b>J 3</b>       |            |
| 151 ... 200 mm<br>(5.94 ... 7.87")  | 200 mm (7.87")  | <b>J 4</b>       |            |

| Selection and Ordering data   |                 | Article No.      | Order code |
|---|-----------------|------------------|------------|
| <b>Diaphragm seal</b>   |                 | <b>7MF0814 -</b> |            |
| Flange type design, direct connected to a SITRANS P transmitter for level<br>7MF03../7MF04.. (order separately)<br>Scope of delivery: 1 off |                 | <b>03 - 0</b>    |            |
| • Wetted parts Tantalum   |                 |                  |            |
| Range   | Standard length |                  |            |
| 20 ... 50 mm<br>(0.79 ... 1.97")  | 50 mm (1.97")   | <b>K 1</b>       |            |
| 51 ... 100 mm<br>(2.01 ... 3.94")   | 100 mm (3.94")  | <b>K 2</b>       |            |
| 101 ... 150 mm<br>(3.98 ... 5.91")  | 150 mm (5.91")  | <b>K 3</b>       |            |
| 151 ... 200 mm<br>(5.94 ... 7.87")  | 200 mm (7.87")  | <b>K 4</b>       |            |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for level

1

| Selection and Ordering data  | Order code | Selection and Ordering data   | Order code |
|--|------------|---|------------|
| <b>Further designs</b>   |            | <b>Further designs</b>  |            |
| Add "-Z" to Article No. and specify Order code.  |            | Add "-Z" to Article No. and specify Order code.                                     |            |
| <b>Factory certificates</b>  |            | <b>Sealing surface</b>  |            |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2  | <b>C11</b> | Operating Temperature; Lower range value ... °C (°F), upper range value ... °C (°F) | <b>Y10</b> |
| Inspection certificate to EN 10204-3.1 - material of body and wetted parts   | <b>C12</b> | Static pressure: ... bar (psi)  | <b>Y11</b> |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)                                      | <b>C13</b> | Customer specific extension length (enter required length in plain text)            | <b>Y44</b> |
| Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts   | <b>C15</b> |   |            |
| Certificate of FDA-approved fill oil (to EN10204-2.2)  | <b>C17</b> |   |            |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)   | <b>C20</b> |   |            |
| <b>Accessories</b>   |            |   |            |
| Spark arrester (for differential pressure and level transmitter)   | <b>D62</b> |   |            |
| Low-temperature version (for Silicon Oil M50 only)   | <b>D67</b> |   |            |
| <b>Negative pressure services</b>  |            |   |            |
| Certification acc. to NACE MR-0103   | <b>D83</b> |   |            |
| Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)   | <b>D88</b> |   |            |
| <b>General product approvals without explosion proof approvals</b>   |            |   |            |
| Oil-and grease-free cleaned version (for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar) | <b>E80</b> |   |            |
| Oil-and grease-free cleaned version (not for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)   | <b>E87</b> |   |            |
| <b>Sealing surface</b>   |            |   |            |
| Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)  | <b>M50</b> |   |            |
| Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)   | <b>M54</b> |   |            |
| Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)   | <b>M64</b> |   |            |
| Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)   |            |   |            |
| • DN 40  | <b>M71</b> |   |            |
| • DN 50  | <b>M72</b> |   |            |
| • DN 80  | <b>M73</b> |   |            |
| • DN 100   | <b>M74</b> |   |            |
| • DN 125   | <b>M75</b> |   |            |
| Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)   |            |   |            |
| • DN 40  | <b>M77</b> |   |            |
| • DN 50  | <b>M78</b> |   |            |
| • DN 80  | <b>M79</b> |   |            |
| • DN 100   | <b>M80</b> |   |            |
| • DN 125   | <b>M81</b> |   |            |
| Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)   |            |   |            |
| • DN 50  | <b>M84</b> |   |            |
| • DN 80  | <b>M85</b> |   |            |
| • DN 100   | <b>M86</b> |   |            |
| • DN 125   | <b>M87</b> |   |            |

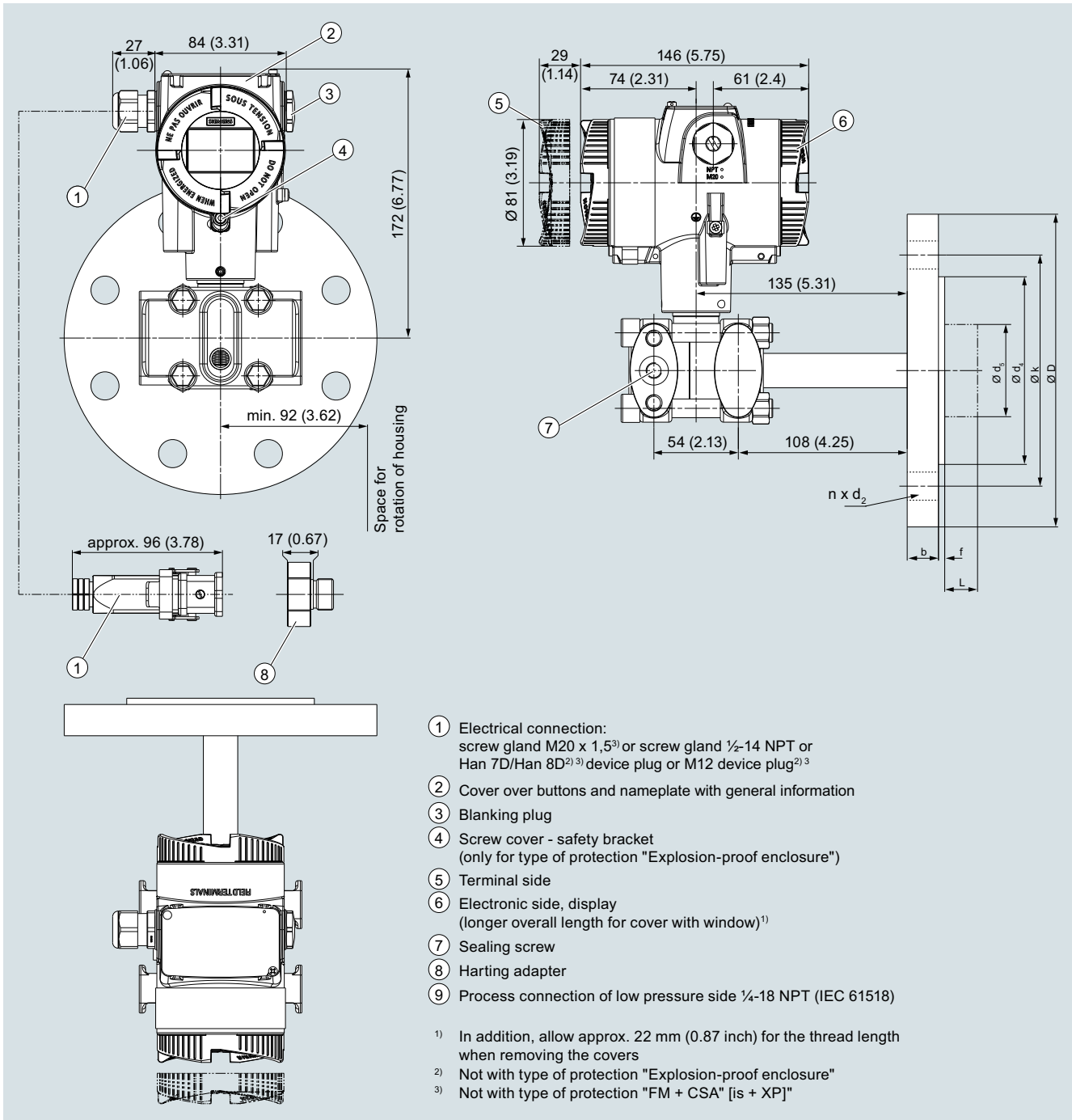
## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

### Dimensional drawings



SITRANS P320/P420 pressure transmitter for level, including mounting flange, dimensions in mm (inch)

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for level

1

## Connection to EN 1092-1

| Nominal diameter | Nominal pressure | b  | D   | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub> with tube | d <sub>M</sub> without tube | f  | k   | n  | L                      |
|------------------|------------------|----|-----|----------------|----------------|----------------|--------------------------|-----------------------------|----|-----|----|------------------------|
|                  |                  | mm | mm  | mm             | mm             | mm             | mm                       | mm                          | mm | mm  | mm | mm                     |
| DN 40            | PN 10/16/25/40   | 16 | 150 | 18             | 88             | 38             | 30                       | 42                          | 2  | 110 | 4  | 0, 50, 100, 150 or 200 |
|                  | PN 63/100        | 24 | 170 | 22             | 88             | 38             | 30                       | 42                          | 2  | 125 | 4  |                        |
|                  | PN 160           | 26 | 170 | 22             | 88             | 38             | 30                       | 42                          | 2  | 125 | 4  |                        |
| DN 50            | PN 10/16/25/40   | 18 | 165 | 18             | 102            | 48.3           | 40                       | 51                          | 2  | 125 | 4  |                        |
|                  | PN 63/100        | 26 | 195 | 26             | 102            | 48.3           | 40                       | 51                          | 2  | 145 | 4  |                        |
|                  | PN 160           | 28 | 195 | 26             | 102            | 48.3           | 40                       | 51                          | 2  | 145 | 4  |                        |
| DN 80            | PN 10/16/25/40   | 22 | 200 | 18             | 138            | 76             | 65                       | 85                          | 2  | 160 | 8  |                        |
|                  | PN 100           | 30 | 230 | 26             | 138            | 76             | 65                       | 85                          | 2  | 180 | 8  |                        |
| DN 100           | PN 10/16         | 18 | 220 | 18             | 158            | 94             | 85                       | 85                          | 2  | 180 | 8  |                        |
|                  | PN 25/40         | 22 | 235 | 22             | 162            | 94             | 85                       | 85                          | 2  | 190 | 8  |                        |
| DN 125           | PN 16            | 20 | 250 | 18             | 188            | 127            | 85                       | 116                         | 2  | 210 | 8  |                        |
|                  | PN 40            | 24 | 270 | 26             | 188            | 127            | 85                       | 116                         | 2  | 220 | 8  |                        |

## Connection according to ASME B16.5

| Nominal diameter | Nominal pressure | b           | D           | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub> with tube | d <sub>M</sub> without tube | f         | k            | n | L   |
|------------------|------------------|-------------|-------------|----------------|----------------|----------------|--------------------------|-----------------------------|-----------|--------------|---|---|
|                  | lb/sq.in.        | inch (mm)   | inch (mm)   | inch (mm)      | inch (mm)      | inch (mm)      | inch (mm)                | inch (mm)                   | inch (mm) | inch (mm)    |   | inch (mm)   |
| 1½ inch          | 150              | 0.63 (15.9) | 4.92 (125)  | 0.63 (15.9)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                | 1.42 (36)                   | 0.08 (2)  | 3.87 (98.4)  | 4 | 0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200) |
|                  | 300              | 0.75 (19.1) | 6.10 (155)  | 0.87 (22.2)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                | 1.42 (36)                   | 0.08 (2)  | 4.5 (114.3)  | 4 |   |
|                  | 400/600          | 0.88 (22.3) | 6.10 (155)  | 0.87 (22.2)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                | 1.42 (36)                   | 0.28 (7)  | 4.5 (114.3)  | 4 |   |
|                  | 900/1500         | 1.25 (31.8) | 7.09 (180)  | 1.13 (28.6)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                | 1.42 (36)                   | 0.28 (7)  | 4.87 (123.8) | 4 |   |
| 2 inch           | 150              | 0.69 (17.5) | 5.91 (150)  | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                | 2.01 (51)                   | 0.08 (2)  | 4.75 (120.7) | 4 |   |
|                  | 300              | 0.81 (20.7) | 6.5 (165)   | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                | 2.01 (51)                   | 0.08 (2)  | 5 (127)      | 8 |   |
|                  | 400/600          | 1.00 (25.4) | 6.5 (165)   | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                | 2.01 (51)                   | 0.28 (7)  | 5 (127)      | 8 |   |
|                  | 900/1500         | 1.5 (38.1)  | 8.46 (215)  | 1.00 (25.4)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                | 2.01 (51)                   | 0.28 (7)  | 6.5 (165.1)  | 8 |   |
| 3 inch           | 150              | 0.88 (22.3) | 7.48 (190)  | 0.75 (19.1)    | 5 (127)        | 3 (76)         | 2.65 (65)                | 3.35 (85)                   | 0.08 (2)  | 6 (152.4)    | 4 |   |
|                  | 300              | 1.06 (27)   | 8.27 (210)  | 0.87 (22.2)    | 5 (127)        | 3 (76)         | 2.65 (65)                | 3.35 (85)                   | 0.08 (2)  | 6.63 (168.3) | 8 |   |
|                  | 600              | 1.23 (31.8) | 8.27 (210)  | 0.87 (22.2)    | 5 (127)        | 3 (76)         | 2.65 (65)                | 3.35 (85)                   | 0.28 (7)  | 6.63 (168.3) | 8 |   |
|                  | 1500             | 1.88 (47.7) | 10.43 (265) | 1.25 (31.8)    | 5 (127)        | 3 (76)         | 2.65 (65)                | 3.35 (85)                   | 0.28 (7)  | 8 (203.2)    | 8 |   |
| 4 inch           | 150              | 0.88 (22.3) | 9.06 (230)  | 0.75 (19.1)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                | 3.35 (85)                   | 0.08 (2)  | 7.5 (190.5)  | 8 |   |
|                  | 300              | 1.19 (30.2) | 10.04 (255) | 0.87 (22.2)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                | 3.35 (85)                   | 0.08 (2)  | 7.87 (200)   | 8 |   |
|                  | 400              | 1.38 (35)   | 10.04 (255) | 0.87 (22.2)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                | 3.35 (85)                   | 0.28 (7)  | 7.87 (200)   | 8 |   |
|                  | 1500             | 2.13 (54)   | 12.20 (310) | 1.37 (34.9)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                | 3.35 (85)                   | 0.28 (7)  | 9.5 (241.3)  | 8 |   |
| 5 inch           | 150              | 0.88 (22.3) | 10.04 (255) | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)               | 4.57 (116)                  | 0.08 (2)  | 8.5 (215.9)  | 8 |   |
|                  | 300              | 1.31 (33.4) | 11.02 (280) | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)               | 4.57 (116)                  | 0.08 (2)  | 9.25 (235)   | 8 |   |
|                  | 400              | 1.50 (38.1) | 11.02 (280) | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)               | 4.57 (116)                  | 0.28 (7)  | 9.25 (235)   | 8 |   |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

Process connection according to J.I.S

| Nominal diameter | Nominal pressure | b            | D            | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub><br>with tube | d <sub>M</sub><br>without tube | f            | k            | n | L   |
|------------------|------------------|--------------|--------------|----------------|----------------|----------------|-----------------------------|--------------------------------|--------------|--------------|---|---|
|                  |                  | mm<br>(inch) | mm<br>(inch) | mm<br>(inch)   | mm<br>(inch)   | mm<br>(inch)   | mm<br>(inch)                | mm<br>(inch)                   | mm<br>(inch) | mm<br>(inch) |   | mm<br>(inch)  |
| DN 50            | 10K              | 14 (0.55)    | 155 (6.10)   | 19 (0.75)      | 96 (3.78)      | 48.3 (1.9)     | 40 (1.57)                   | 51 (2.01)                      | 2            | 120 (4.72)   | 4 | 0, 50, 100,<br>150 or 200<br>(0, 2, 3.94,<br>5.94 or<br>7.87) |
|                  | 20K              | 16 (0.63)    | 165 (6.50)   | 19 (0.75)      | 96 (3.78)      | 48.3 (1.9)     | 40 (1.57)                   | 51 (2.01)                      | 2            | 120 (4.72)   | 8 |   |
|                  | 40K              | 26 (1.02)    | 165 (6.50)   | 19 (0.75)      | 105 (4.13)     | 48.3 (1.9)     | 40 (1.57)                   | 51 (2.01)                      | 2            | 130 (5.12)   | 8 |   |
| DN 80            | 10K              | 16 (0.63)    | 185 (7.28)   | 19 (0.75)      | 126 (4.96)     | 76 (2.99)      | 65 (2.56)                   | 85 (3.35)                      | 2            | 150 (5.91)   | 8 |   |
|                  | 20K              | 20 (0.79)    | 200 (7.87)   | 23 (0.91)      | 132 (5.20)     | 76 (2.99)      | 65 (2.56)                   | 85 (3.35)                      | 2            | 160 (6.30)   | 8 |   |
|                  | 40K              | 32 (1.26)    | 210 (8.27)   | 23 (0.91)      | 140 (5.51)     | 76 (2.99)      | 65 (2.56)                   | 85 (3.35)                      | 2            | 170 (6.30)   | 8 |   |
| DN 100           | 10K              | 16 (0.63)    | 210 (8.27)   | 19 (0.75)      | 151 (5.94)     | 94 (3.7)       | 85 (3.35)                   | 85 (3.35)                      | 2            | 175 (6.89)   | 8 |   |
|                  | 20K              | 22 (0.87)    | 225 (8.86)   | 23 (0.91)      | 160 (6.30)     | 94 (3.7)       | 85 (3.35)                   | 85 (3.35)                      | 2            | 185 (7.28)   | 8 |   |
|                  | 40K              | 36 (1.42)    | 250 (9.84)   | 25 (0.98)      | 165 (6.50)     | 94 (3.7)       | 85 (3.35)                   | 85 (3.35)                      | 2            | 205 (8.07)   | 8 |   |

d: Internal diameter of seal according to DIN 2690

d<sub>M</sub>: Effective diaphragm diameter

**Overview**

SITRANS P DS III pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys or via HART, PROFIBUS-PA or FOUNDATION Fieldbus interface.

Extensive functionality enables the pressure transmitter to be precisely adapted to the plant's requirements. Operation is very simple in spite of the numerous setting options.

Transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

Various versions of the DS III pressure transmitters are available for measuring:

- Gauge pressure
- Absolute pressure
- Differential pressure
- Level
- Volume level
- Mass level
- Volume flow
- Mass flow

**Benefits**

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Minimum conformity error
- Good long-term stability
- Wetted parts made of high-grade materials (e.g. stainless steel, Hastelloy, gold, Monel, tantalum)

- Infinitely adjustable span from 0.01 bar to 700 bar (0.15 psi to 10153 psi) for DS III with HART interface
- Nominal measuring range from 1 bar to 700 bar (14.5 psi to 10153 psi) for DS III with PROFIBUS PA and FOUNDATION Fieldbus interface
- High measuring accuracy
- Parameterization over control keys and HART or PROFIBUS PA, or FOUNDATION Fieldbus interface.

**Application**

The pressure transmitters of the DS III series, can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes the DS III pressure transmitters suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be programmed locally using the 3 control buttons or externally via HART or PROFIBUS PA or FOUNDATION Fieldbus interface.

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P DS III

### Technical description

#### Pressure transmitter for gauge pressure

Measured variable: Gauge pressure of aggressive and non-aggressive gases, vapors and liquids.

Span (infinitely adjustable)

for DS III with HART: 0.01 bar to 700 bar (0.15 psi to 10153 psi)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:  
1 bar to 700 bar (14.5 psi to 10153 psi)

#### Pressure transmitters for absolute pressure

Measured variable: Absolute pressure of aggressive and non-aggressive gases, vapors and liquids.

Span (infinitely adjustable)

for DS III with HART: 8.3 mbar a ... 100 bar a (0.12 ... 1450 psi a)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:  
250 mbar a ... 100 bar a (3.6 ... 1450 psi a)

There are two series:

- Gauge pressure series
- Differential pressure series

#### Pressure transmitters for differential pressure and flow

Measured variables:

- Differential pressure
- Small positive or negative pressure
- Flow  $q \sim \sqrt{\Delta p}$  (together with a primary differential pressure device (see Chapter "Flow Meters"))

Span (infinitely adjustable)

for DS III with HART: 1 mbar ... 30 bar (0.0145 ... 435 psi)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:  
20 mbar ... 30 bar (0.29 ... 435 psi)

#### Pressure transmitters for level

Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.

Span (infinitely adjustable)

for DS III with HART: 25 mbar ... 5 bar (0.363 ... 72.5 psi)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:  
250 mbar ... 5 bar (3.63 ... 72.5 psi)

Nominal diameter of the mounting flange

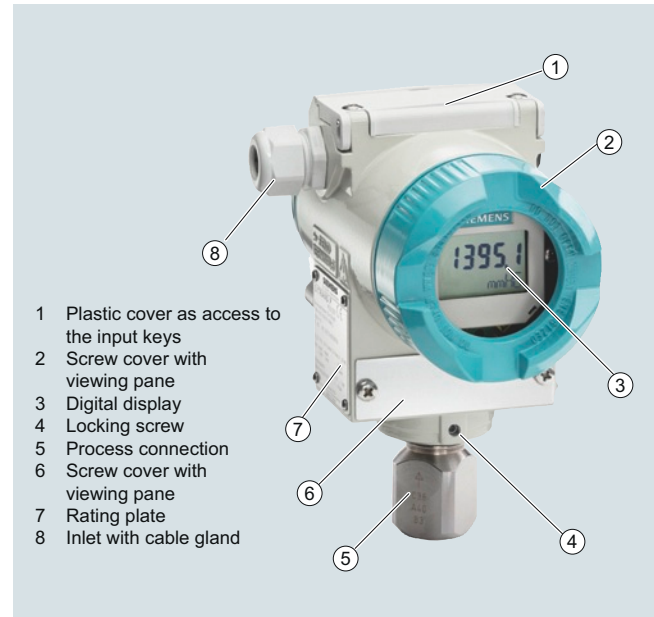
- DN 80 or DN 100
- 3 inch or 4 inch

In the case of level measurements in open containers, the low-pressure connection of the measuring cell remains open (measurement "compared to atmospheric").

In the case of measurements in closed containers, the lower-pressure connection has to be connected to the container in order to compensate the static pressure.

The wetted parts are made from a variety of materials, depending on the degree of corrosion resistance required.

### Design



Front view

The transmitter consists of various components depending on the order. The possible versions are listed in the ordering information. The components described below are the same for all transmitters.

The rating plate (7, Figure "Front view") with the Article No. is located on the side of the housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

The approval label is located on the opposite side.

The housing is made of die-cast aluminium or stainless steel precision casting. A round cover (6) is screwed on at the front and rear of the housing. The front cover can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the housing.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

At the top of the housing is a plastic cover (1), which hides the input keys.

#### Example for an attached measuring point label

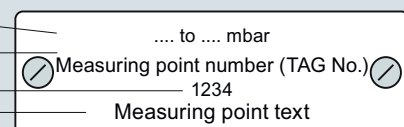
Y01 or Y02

= max. 27 char.

Y15 = max. 16 char.

Y99 = max. 10 char.

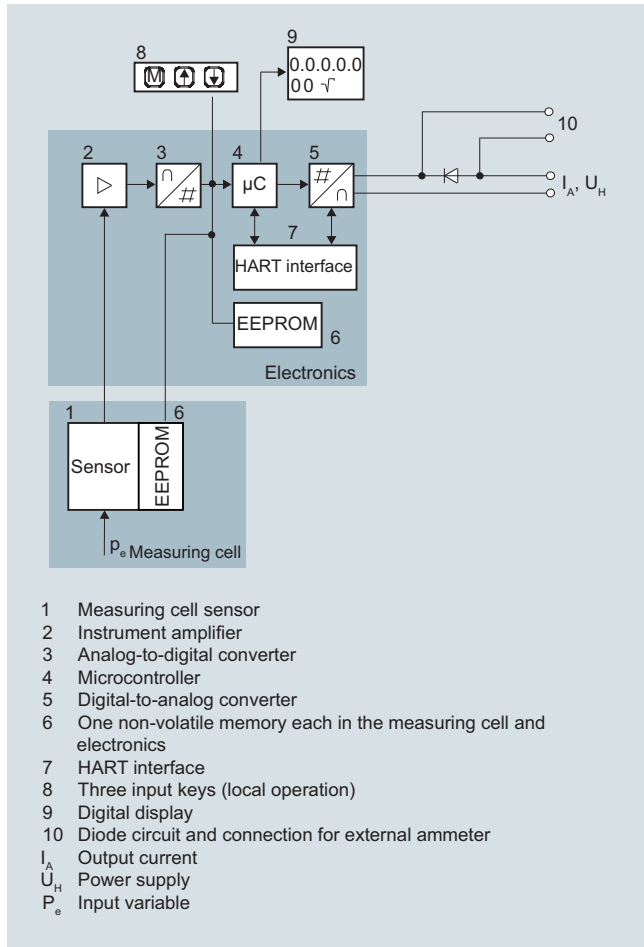
Y16 = max. 27 char.





## Function

## Operation of electronics with HART communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

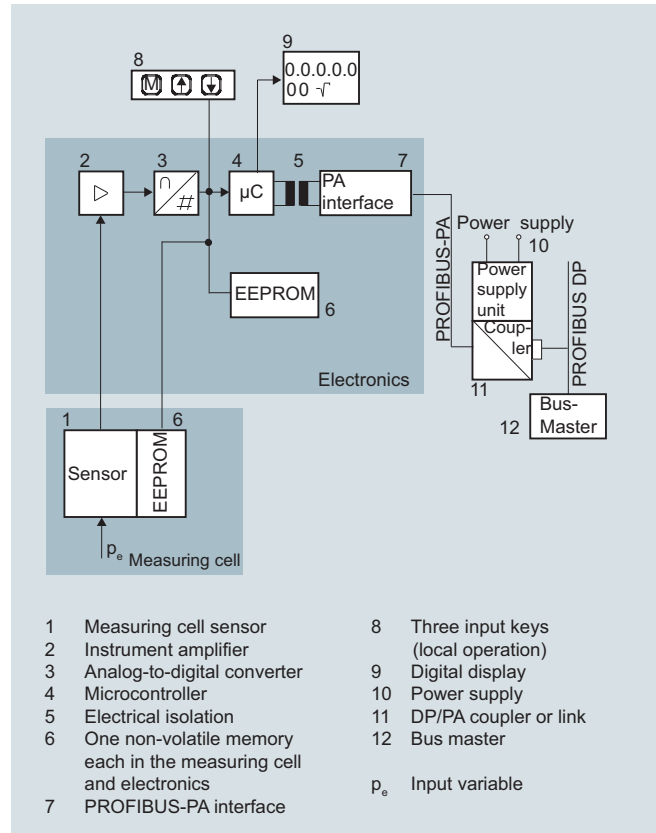
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with spans  $\leq 63$  bar measure the input pressure compared to atmosphere, transmitters with spans  $\geq 160$  bar compared to vacuum.

## Operation of electronics with PROFIBUS PA communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the PROFIBUS PA through an electrically isolated PA interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

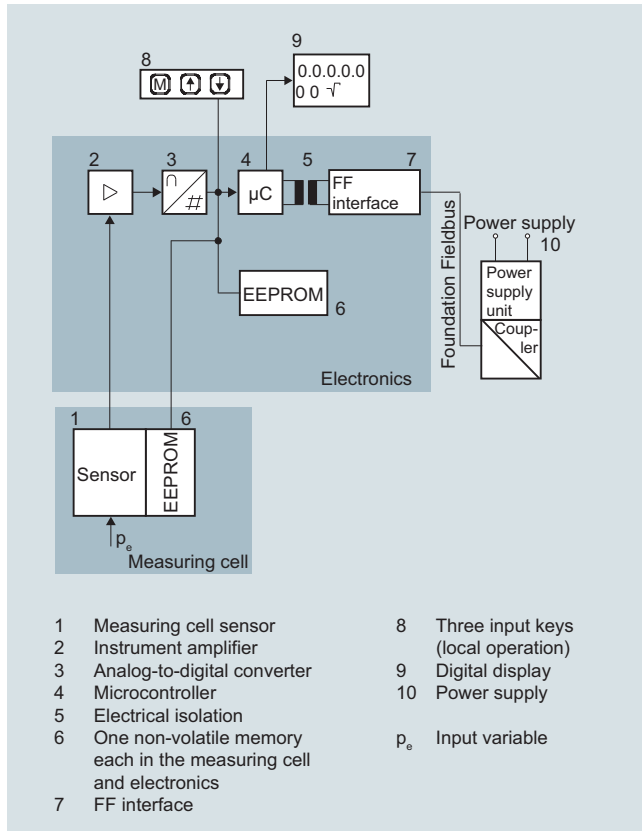
The results with status values and diagnostic values are transferred by cyclic data transmission on the PROFIBUS PA. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as SIMATIC PDM is required for this.

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P DS III

### Technical description

#### Operation of electronics with FOUNDATION Fieldbus communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus interface (7).

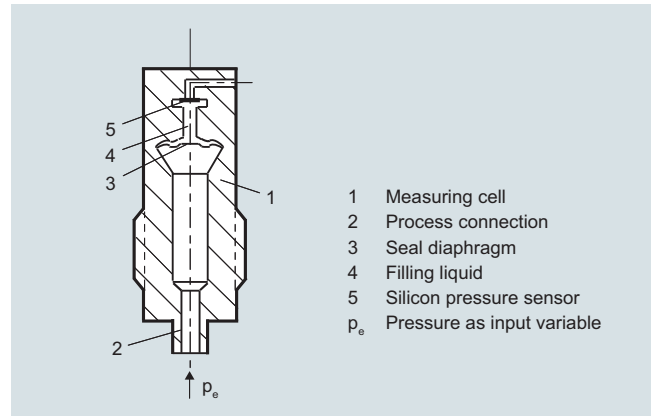
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

#### Mode of operation of the measuring cells

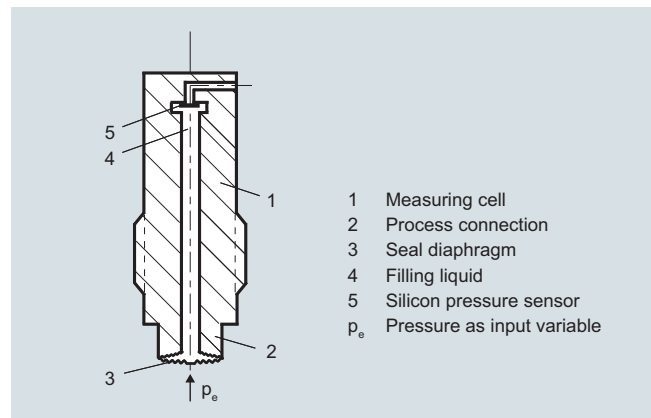
##### Measuring cell for gauge pressure



Measuring cell for gauge pressure, function diagram

The pressure  $p_e$  is applied through the process connection (2, Figure "Measuring cell for gauge pressure, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

##### Measuring cell for gauge pressure with front-flush diaphragm



Measuring cell for gauge pressure, with front-flush diaphragm for paper industry, function diagram

The pressure  $p_e$  is applied through the process connection (2, Figure "Measuring cell for gauge pressure, with front-flush diaphragm for paper industry, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.



# Pressure Measurement

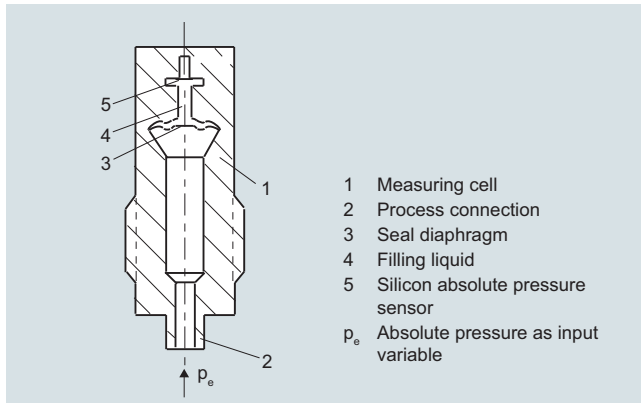
## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

#### Technical description

1

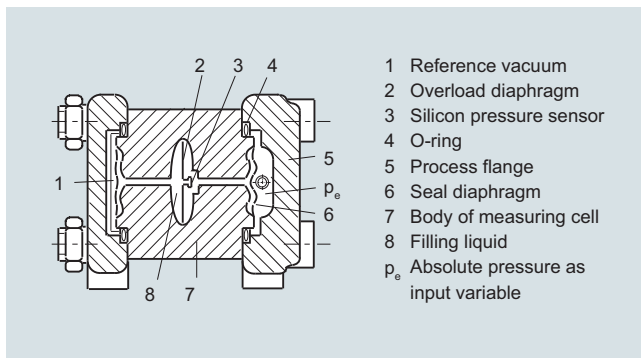
#### Measuring cell for absolute pressure from gauge pressure series



Measuring cell for absolute pressure from the pressure series, function diagram

The absolute pressure  $p_e$  is transmitted through the seal diaphragm (3, Figure "Measuring cell for absolute pressure from pressure series, gauge pressure, function diagram") and the filling liquid (4) to the silicon absolute pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

#### Measuring cell for absolute pressure from differential pressure series



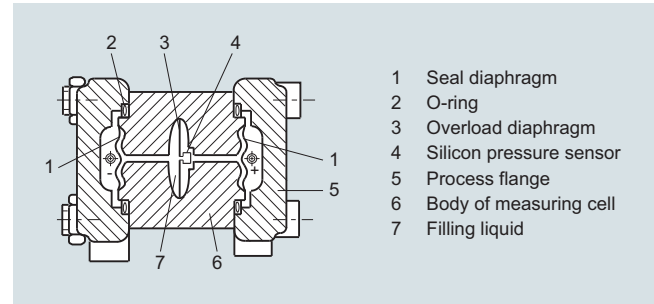
Measuring cell for absolute pressure from differential pressure series, function diagram

The input pressure  $p_e$  is transmitted through the seal diaphragm (6, Figure "Measuring cell for absolute pressure from differential pressure series, function diagram") and the filling liquid (8) to the silicon pressure sensor (3).

The difference in pressure between the input pressure  $p_e$  and the reference vacuum (1) on the low-pressure side of the measuring cell flexes the measuring diaphragm. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (2) is flexed until the seal diaphragm rests on the body of the measuring cell (7), thus protecting the silicon pressure sensor from overloads.

#### Measuring cell for differential pressure and flow



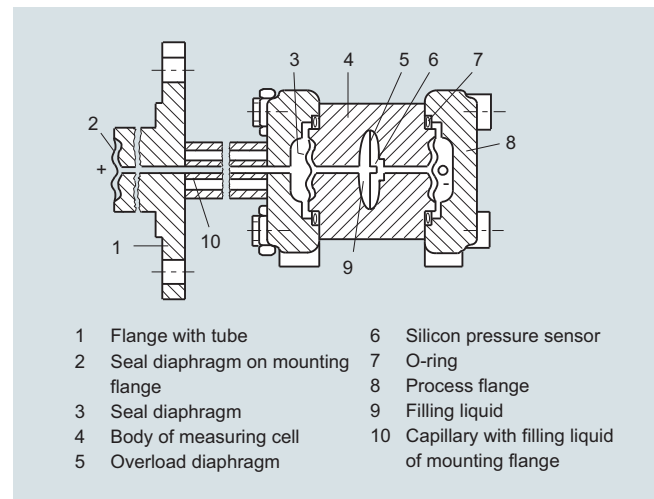
Measuring cell for differential pressure and flow, function diagram

The differential pressure is transmitted through the seal diaphragms (1, Figure "Measuring cell for differential pressure and flow, function diagram") and the filling liquid (7) to the silicon pressure sensor (4).

The measuring diaphragm is flexed by the applied differential pressure. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the differential pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (3) is flexed until the seal diaphragm rests on the body of the measuring cell (6), thus protecting the silicon pressure sensor from overloads.

#### Measuring cell for level



Measuring cell for level, function diagram

The input pressure (hydrostatic pressure) acts hydraulically on the measuring cell through the seal diaphragm on the mounting flange (2, Figure "Measuring cell for level, function diagram"). This differential pressure is subsequently transmitted further through the measuring cell (3) and the filling liquid (9) to the silicon pressure sensor (6) whose measuring diaphragm is then flexed.

This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit.

This change in resistance results in a bridge output voltage proportional to the differential pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (5) is flexed until the seal diaphragm rests on the body of the measuring cell (4), thus protecting the silicon pressure sensor from overloads.

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

1

### Technical description

#### Parameterization DS III

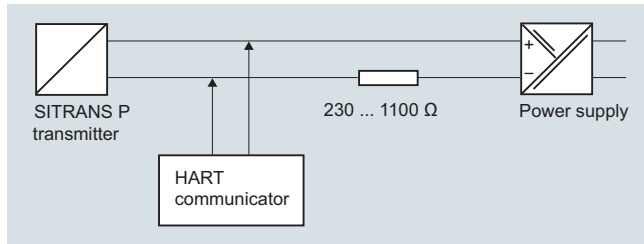
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

##### Parameterization using the input buttons (local operation)

With the input buttons you can easily set the most important parameters without any additional equipment.

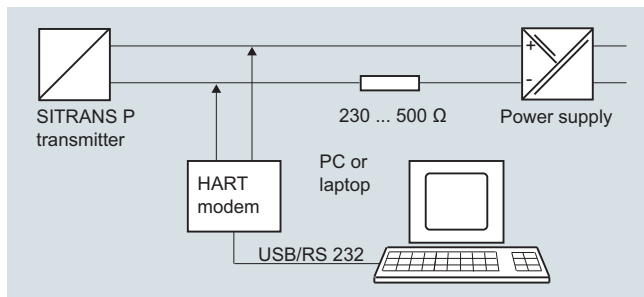
##### Parameterization using HART

Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

##### Adjustable parameters, DS III with HART

| Parameters   | Input keys (DS III HART) | HART communication |
|--|--------------------------|--------------------|
| Start of scale   | x                        | x                  |
| Full-scale value   | x                        | x                  |
| Electrical damping   | x                        | x                  |
| Start-of-scale value without application of a pressure ("Blind setting") | x                        | x                  |
| Full-scale value without application of a pressure ("Blind setting")     | x                        | x                  |
| Zero adjustment  | x                        | x                  |
| current transmitter  | x                        | x                  |
| Fault current  | x                        | x                  |
| Disabling of buttons, write protection                                   | x                        | x <sup>1)</sup>    |
| Type of dimension and actual dimension                                   | x                        | x                  |
| Characteristic (linear / square-rooted)                                  | x <sup>2)</sup>          | x <sup>2)</sup>    |
| Input of characteristic  |                          | x                  |
| Freely-programmable LCD  |                          | x                  |
| Diagnostic functions   |                          | x                  |

<sup>1)</sup> Cancel apart from write protection

<sup>2)</sup> Only differential pressure

##### Diagnostic functions for DS III with HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

##### Available physical units of display for DS III with HART

Table style: Technical specifications 2

| Physical variable                                  | Physical dimensions   |
|--|---|
| Pressure (setting can also be made in the factory) | Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O, ftH <sub>2</sub> O (20 °C), inHg, mmHg |
| Level (height data)                                | m, cm, mm, ft, in   |
| Volume   | m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid  |
| Mass   | g, kg, t, lb, Ston, Lton, oz  |
| volume flow  | m <sup>3</sup> /d, m <sup>3</sup> /h, m <sup>3</sup> /s, l/min, l/s, ft <sup>3</sup> /d, ft <sup>3</sup> /min, ft <sup>3</sup> /s, US gallon/min, US gallon/s                               |
| Mass flow  | t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min   |
| Temperature  | K, °C, °F, °R   |
| Miscellaneous                                      | %, mA   |

##### Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. Through the PROFIBUS the DS III with PROFIBUS PA is connected to a process control system, e. g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

##### Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III with FOUNDATION Fieldbus is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

##### Adjustable parameters for DS III with PROFIBUS PA and FOUNDATION Fieldbus

| Parameters                               | Input keys | PROFIBUS PA and FOUNDATION Fieldbus interface |
|--|------------|---|
| Electrical damping                       | x          | x   |
| Zero adjustment (correction of position) | x          | x   |
| Buttons and/or function disabling        | x          | x   |
| Source of measured-value display         | x          | x   |
| Physical dimension of display            | x          | x   |
| Position of decimal point                | x          | x   |
| Bus address                              | x          | x   |
| Adjustment of characteristic             | x          | x   |
| Input of characteristic                  |            | x   |
| Freely-programmable LCD                  |            | x   |
| Diagnostics functions                    |            | x   |

Diagnostic functions for DS III with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

Physical dimensions available for the display

| Physical variable                                  | Physical dimensions  |
|--|--|
| Pressure (setting can also be made in the factory) | MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O (20 °C), mmHg, inHg   |
| Level (height data)                                | m, cm, mm, ft, in, yd  |
| Volume   | m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid   |
| volume flow  | m <sup>3</sup> /s, m <sup>3</sup> /min, m <sup>3</sup> /h, m <sup>3</sup> /d, l/s, l/min, l/h, l/d, Ml/d, ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d |
| Mass flow  | g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d   |
| Total mass flow                                    | t, kg, g, lb, oz, LTon, STon   |
| Temperature  | K, °C, °F, °R  |
| Miscellaneous                                      | %  |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P DS III

for gauge pressure

## Technical specifications

### SITRANS P, DS III series for gauge pressure

#### Input

Measured variable

Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

(for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/process temperature)

Gauge pressure

#### HART

#### PROFIBUS PA/ FOUNDATION Fieldbus

| Span  | Nominal measuring range        | Max. operating pressure MAWP (PS) | Max. perm. test pressure       |
|---|--------------------------------|-----------------------------------|--------------------------------|
| 8.3 ... 250 mbar<br>0.83 ... 25 kPa<br>0.12 ... 3.6 psi | 250 mbar<br>25 kPa<br>3.6 psi  | 4 bar<br>400 kPa<br>58 psi        | 6 bar<br>600 kPa<br>87 psi     |
| 0.01 ... 1 bar<br>1 ... 100 kPa<br>0.15 ... 14.5 psi    | 1 bar<br>100 kPa<br>14.5 psi   | 4 bar<br>400 kPa<br>58 psi        | 6 bar<br>600 kPa<br>87 psi     |
| 0.04 ... 4 bar<br>4 ... 400 kPa<br>0.58 ... 58 psi      | 4 bar<br>400 kPa<br>58 psi     | 7 bar<br>0.7 MPa<br>102 psi       | 10 bar<br>1 MPa<br>145 psi     |
| 0.16 ... 16 bar<br>16 ... 1600 kPa<br>2.3 ... 232 psi   | 16 bar<br>1600 kPa<br>232 psi  | 21 bar<br>2.1 MPa<br>305 psi      | 32 bar<br>3.2 MPa<br>464 psi   |
| 0.63 ... 63 bar<br>63 ... 6300 kPa<br>9.1 ... 914 psi   | 63 bar<br>6300 kPa<br>914 psi  | 67 bar<br>6.7 MPa<br>972 psi      | 100 bar<br>10 MPa<br>1450 psi  |
| 1.6 ... 160 bar<br>0.16 ... 16 MPa<br>23 ... 2321 psi   | 160 bar<br>16 MPa<br>2321 psi  | 167 bar<br>16.7 MPa<br>2422 psi   | 250 bar<br>25 MPa<br>3626 psi  |
| 4 ... 400 bar<br>0.4 ... 40 MPa<br>58 ... 5802 psi      | 400 bar<br>40 MPa<br>5802 psi  | 400 bar<br>40 MPa<br>5802 psi     | 600 bar<br>60 MPa<br>8702 psi  |
| 7 ... 700 bar<br>0.7 ... 70 MPa<br>102 ... 10153 psi    | 700 bar<br>70 MPa<br>10153 psi | 800 bar<br>80 MPa<br>11603 psi    | 800 bar<br>80 MPa<br>11603 psi |

Lower measuring limit

(for 250mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.)

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

Upper measuring limit

30 mbar a/3 kPa a/0.44 psi a

30 mbar a/3 kPa a/0.44 psi a

100% of max. span (max. 100 bar/10 MPa/1450 psi for oxygen measurement) ambient temperature/process temperature 60 °C (140 °F)

#### Output

Output signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

Load

- Without HART
- With HART

Physical bus

Protection against polarity reversal

Electrical damping (step width 0.1 s)

#### HART

4 ... 20 mA

3.55 mA, factory preset to 3.84 mA

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$  in  $\Omega$ ,  
 $U_H$ : Power supply in V

$R_B = 230 \dots 500 \Omega$  (SIMATIC PDM) bzw.  
 $R_B = 230 \dots 1100 \Omega$  (HART-Communicator)

-

Protected against short-circuit and polarity reversal.  
Each connection against the other with max. supply voltage.

Set to 2 s (0 ... 100 s)

#### PROFIBUS PA/FOUNDATION Fieldbus

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

-

-

-

-

IEC 61158-2

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for gauge pressure

1

**SITRANS P, DS III series for gauge pressure****Measuring accuracy**

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nom. pressure range}$ 

Error in measurement at limit setting incl. hysteresis and reproducibility

## • Linear characteristic

- 250 mbar/25 kPa/3.6 psi

 $r \leq 1.25 :$   $\leq 0.065 \%$   
 $1.25 < r \leq 30 :$   $\leq (0.008 \cdot r + 0.055) \%$ 

- 1 bar/100 kPa/3.6 psi  
 4 bar/400 kPa/58 psi  
 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi

 $r \leq 5 :$   $\leq 0.065 \%$   
 $5 < r \leq 100 :$   $\leq (0.004 \cdot r + 0.045) \%$ 

- 400 bar/40 MPa/5802 psi  
 700 bar/70 MPa/10152 psi

 $r \leq 3 :$   $\leq 0.075 \%$   
 $3 < r \leq 10 :$   $\leq (0.0029 \cdot r + 0.071) \%$   
 $10 < r \leq 100 :$   $\leq (0.005 \cdot r + 0.05) \%$ 
Influence of ambient temperature  
(in percent per 28 °C (50 °F))

## • 250 mbar/25 kPa/3.6 psi

 $\leq (0.16 \cdot r + 0.1) \%$ 

## • 1 bar/100 kPa/3.6 psi

 $\leq (0.05 \cdot r + 0.1) \%$ 

• 4 bar/400 kPa/58 psi  
 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi  
 400 bar/40 MPa/5802 psi

 $\leq (0.025 \cdot r + 0.125) \%$ 

## • 700 bar/70 MPa/10152 psi

 $\leq (0.08 \cdot r + 0.16) \%$ Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

## • 250 mbar/25 kPa/3.6 psi

 $\leq (0.25 \cdot r) \%$  per year

• 1 bar/100 kPa/3.6 psi  
 4 bar/400 kPa/58 psi

 $\leq (0.25 \cdot r) \%$  in 5 years

• 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi  
 400 bar/40 MPa/5802 psi

 $\leq (0.125 \cdot r) \%$  in 5 years

## • 700 bar/70 MPa/10152 psi

 $\leq (0.25 \cdot r) \%$  in 5 years

Effect of mounting position

 $\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi}$  per 10° inclination  
 (zero point correction is possible with position error compensation)
Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

 $3 \cdot 10^{-5}$  of nominal measuring range

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

## SITRANS P, DS III series for gauge pressure

### Rated conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

-40 ... +100 °C (-40 ... +212 °F)

- 1 bar/100 kPa/3.6 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

-40 ... +85 °C (-40 ... +185 °F)

- 160 bar/16 MPa/2321 psi
- 400 bar/40 MPa/5802 psi
- 700 bar/70 MPa/10152 psi

-20 ... +100 °C (-4 ... +212 °F)

- Measuring cell with Neobee fill fluid (FDA-compliant)
- In conjunction with dust explosion protection

-10 ... +100 °C (+14 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature (silicone oil and inert oil)

- Transmitter
- Display readable

-40 ... +85 °C (-40 ... +185 °F)

-30 ... +85 °C (-22 ... +185 °F)

- Ambient temperature (Neobee fill fluid)

- Transmitter

-10 ... +85 °C (+14 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %/Condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

### Design

Weight (without options)

Die-cast aluminum: ≈ 2.0 kg (≈ 4.4 lb)  
Stainless steel precision casting: ≈ 4.6 kg (≈ 10.1 lb)

Enclosure material

Low-copper die-cast aluminum, GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Connection shank
- Oval flange
- Seal diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602

Stainless steel, mat. no. 1.4404/316L

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

Measuring cell filling

Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))

Process connection

Connection shank G $\frac{1}{2}$ B to DIN EN 837-1, female thread  $\frac{1}{2}$  -14 NPT or oval flange (PN 160 (MAWP 2320 psi)) to DIN 19213 with mounting thread M10 or  $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518

Material of mounting bracket

- Steel
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

### Power supply $U_H$

Terminal voltage on transmitter

**HART**  
10.5 ... 45 V DC  
10.5 ... 30 V DC in intrinsically-safe mode

### PROFIBUS PA/FOUNDATION Fieldbus

-

Power supply

-

Supplied through bus

Separate 24 V power supply

-

Not necessary

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for gauge pressure

1

| SITRANS P, DS III series for gauge pressure | HART  | PROFIBUS PA/ FOUNDATION Fieldbus   |
|---|---|--|
| <b>Certificates and approvals</b>           |   |  |
| Classification according to PED 2014/68/EU  | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)                                |  |
| Explosion protection                        | PTB 13 ATEX 2007 X  |  |
| • Intrinsic safety "i"                      | Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb   |  |
| - Marking                                   | -40 ... +85 °C (-40 ... +185 °F) temperature class T4;<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T5;<br>-40 ... +60 °C (-40 ... +140 °F) temperature class T6 |  |
| - Permissible ambient temperature           | To certified intrinsically-safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ ,<br>$P_i = 750 \text{ mW}$ ; $R_i = 300 \Omega$              |  |
| - Connection                                | $L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$   | FISCO supply unit:<br>$U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$<br>Linear barrier:<br>$U_o = 24 \text{ V}$ , $I_o = 174 \text{ mA}$ , $P_o = 1 \text{ W}$<br>$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$   |
| - Effective internal inductance/capacitance | PTB 99 ATEX 1160  |  |
| • Explosion-proof "d"                       | Ex II 1/2 G Ex d IIC T4/T6 Gb   |  |
| - Marking                                   | -40 ... +85 °C (-40 ... +185 °F) temperature class T4;<br>-40 ... +60 °C (-40 ... +140 °F) temperature class T6   |  |
| - Permissible ambient temperature           | To circuits with values:<br>$U_H = 10.5 \dots 45 \text{ V DC}$  |  |
| - Connection                                | PTB 01 ATEX 2055  | To circuits with values:<br>$U_H = 9 \dots 32 \text{ V DC}$  |
| • Dust explosion protection for zone 20     | Ex II 1 D Ex ta IIIC T120°C Da<br>Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db  |  |
| - Marking                                   | -40 ... +85 °C (-40 ... +185 °F)  |  |
| - Permissible ambient temperature           | 120 °C (248 °F)   |  |
| - Max. surface temperature                  | To certified intrinsically-safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ ,<br>$P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$              |  |
| - Connection                                | $L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$   | FISCO supply unit:<br>$U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$<br>Linear barrier:<br>$U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1 \text{ W}$<br>$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$   |
| - Effective internal inductance/capacitance | PTB 01 ATEX 2055  |  |
| • Dust explosion protection for zone 21/22  | Ex II 2 D Ex tb IIIC T120°C Db  |  |
| - Marking                                   | To circuits with values:<br>$U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\max} = 1.2 \text{ W}$   |  |
| - Connection                                | PTB 13 ATEX 2007 X  | To circuits with values:<br>$U_H = 9 \dots 32 \text{ V DC}$ ; $P_{\max} = 1 \text{ W}$   |
| • Type of protection "n" (zone 2)           | Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc<br>Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc  |  |
| - Marking                                   | $U_m = 45 \text{ V}$  |  |
| - Connection (Ex nA)                        | To circuits with values:<br>$U_i = 45 \text{ V}$  |  |
| - Connections (Ex ic)                       | $L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$   | $U_m = 32 \text{ V}$<br>FISCO supply unit ic:<br>$U_o = 17.5 \text{ V}$ , $I_o = 570 \text{ mA}$<br>Linear barrier:<br>$U_o = 32 \text{ V}$ , $I_o = 132 \text{ mA}$ , $P_o = 1 \text{ W}$<br>$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$ |
| - Effective internal inductance/capacitance | Certificate of Compliance 3008490   |  |
| • Explosion protection acc. to FM           | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III                    |  |
| - Identification (XP/DIP) or (IS); (NI)     | Certificate of Compliance 1153651   |  |
| • Explosion protection to CSA               | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III                                  |  |
| - Identification (XP/DIP) or (IS)           |   |  |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

## for gauge pressure

|   |  |  |   |
|---|--|--|---|
| <b>HART communication</b>   |  | <b>FOUNDATION Fieldbus communication</b>   |   |
| HART  | 230 ... 1100 Ω   | Function blocks  | 3 function blocks analog input, 1 function block PID                    |
| Protocol  | HART Version 5.x   | • Analog input   | Yes, linearly rising or falling characteristic                          |
| Software for computer   | SIMATIC PDM  | - Adaptation to customer-specific process variables  | 0 ... 100 s   |
| <b>PROFIBUS PA communication</b>  |  | - Electrical damping, adjustable   | Output/input (can be locked within the device with a bridge)            |
| Simultaneous communication with master class 2 (max.)                           | 4  | - Simulation function  | parameterizable (last good value, substitute value, incorrect value)    |
| The address can be set using  | Configuration tool or local operation (standard setting address 126)                                   | - Failure mode   | Yes, one upper and lower warning limit and one alarm limit respectively |
| Cyclic data usage   |  | - Limit monitoring   | Yes   |
| • Output byte   | 5 (one measured value) or 10 (two measured values)   | - Square-rooted characteristic for flow measurement  | Standard FOUNDATION Fieldbus function block                             |
| • Input byte  | 0, 1, or 2 (register operating mode and reset function for metering)                                   | • PID  | 1 resource block  |
| Internal preprocessing  |  | • Physical block   | 1 transducer block Pressure with calibration, 1 transducer block LCD    |
| Device profile  | PROFIBUS PA Profile for Process Control Devices Version 3.0, class B                                   | Transducer blocks  |   |
| Function blocks   | 2  | • Pressure transducer block  |   |
| • Analog input  |  | - Can be calibrated by applying two pressures  | Yes   |
| - Adaptation to customer-specific process variables                             | Yes, linearly rising or falling characteristic   | - Monitoring of sensor limits  | Yes   |
| - Electrical damping, adjustable  | 0 ... 100 s  | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function                    |
| - Simulation function   | Input /Output  |  |   |
| - Failure mode  | parameterizable (last good value, substitute value, incorrect value)                                   |  |   |
| - Limit monitoring  | Yes, one upper and lower warning limit and one alarm limit respectively                                |  |   |
| • Register (totalizer)  | Can be reset, preset, optional direction of counting, simulation function of register output           |  |   |
| - Failure mode  | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |  |   |
| - Limit monitoring  | One upper and lower warning limit and one alarm limit respectively                                     |  |   |
| • Physical block  | 1  |  |   |
| Transducer blocks   | 2  |  |   |
| • Pressure transducer block   |  |  |   |
| - Can be calibrated by applying two pressures                                   | Yes  |  |   |
| - Monitoring of sensor limits   | Yes  |  |   |
| - Specification of a container characteristic with                              | Max. 30 nodes  |  |   |
| - Square-rooted characteristic for flow measurement                             | Yes  |  |   |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable  |  |   |
| - Simulation function for measured pressure value and sensor temperature        | Constant value or over parameterizable ramp function   |  |   |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for gauge pressure

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| Selection and Ordering data  |                                    | Article No.  | Selection and Ordering data  |  | Article No.   |
|--|------------------------------------|--|--|--|---|
| <b>Pressure transmitter for gauge pressure, SITRANS P DS III with HART</b>   |                                    | <b>7MF4033 -</b>   | <b>Pressure transmitter for gauge pressure, SITRANS P DS III with HART</b>   |  | <b>7MF4033 -</b>  |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |                                    |  | <b>Explosion protection</b>  |  |   |
| <b>Measuring cell filling</b>  |                                    |  | <ul style="list-style-type: none"> <li>None</li> </ul>   |  | <b>A</b>  |
| <b>Measuring cell cleaning</b>   |                                    |  | <ul style="list-style-type: none"> <li>With ATEX, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>8)</sup></li> <li>"Intrinsic safety and flameproof enclosure (Ex ia + Ex d)"<sup>9)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>10)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"<sup>8)11)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>12)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>9)11)12)</sup></li> <li>With FM + CSA, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>7)12)</sup></li> </ul> </li> </ul> |  | <b>B</b><br><b>D</b><br><b>P</b><br><b>E</b><br><b>R</b><br><b>F</b><br><b>S</b><br><b>NC</b> |
| Silicone oil   | normal                             | <b>1</b>   | <b>Electrical connection / cable entry</b>   |  |   |
| Inert liquid <sup>1)</sup>   | grease-free to cleanliness level 2 | <b>3</b>   | <ul style="list-style-type: none"> <li>Screwed gland M20 x1 .5</li> <li>Screwed gland ½-14 NPT</li> <li>Han 7D device plug (plastic housing) incl. mating connector<sup>13)</sup></li> <li>M12 device plugs (stainless steel)<sup>13)14)</sup></li> </ul>  |  | <b>B</b><br><b>C</b><br><b>D</b><br><b>F</b>  |
| FDA compliant fill fluid <sup>2)</sup>   |                                    |  | <b>Display</b>   |  |   |
| • Neobee oil   | normal                             | <b>4</b>   | <ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: mA)</li> <li>With visible display (setting: mA)</li> <li>with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)</li> </ul>   |  | <b>0</b><br><b>1</b><br><b>6</b><br><b>7</b>  |
| <b>Measuring span (min. ... max.)</b>  |                                    |  | <b>Power supply units</b> see Chap. 7 "Supplementary Components".  |  |   |
| 8.3 ... 250 mbar   | (0.12 ... 3.6 psi)                 | <b>A</b>   | A quick-start guide is included in the scope of delivery of the device.  |  |   |
| 0.01 ... 1 bar   | (0.15 ... 14.5 psi)                | <b>B</b>   | <sup>1)</sup> For oxygen application, add Order code E10.  |  |   |
| 0.04 ... 4 bar   | (0.58 ... 58 psi)                  | <b>C</b>   | <sup>2)</sup> Available for measuring ranges 1 ... 63 bar.   |  |   |
| 0.16 ... 16 bar  | (2.32 ... 232 psi)                 | <b>D</b>   | <sup>3)</sup> When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.  |  |   |
| 0.63 ... 63 bar  | (9.14 ... 914 psi)                 | <b>E</b>   | <sup>4)</sup> If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.   |  |   |
| 1.6 ... 160 bar  | (23.2 ... 2320 psi)                | <b>F</b>   | <sup>5)</sup> The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y... and 7MF4900-1...-B   |  |   |
| 4.0 ... 400 bar  | (58.0 ... 5802 psi)                | <b>G</b>   | <sup>6)</sup> The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.   |  |   |
| 7.0 ... 700 bar  | (102.0 ... 10153 psi)              | <b>J</b>   | <sup>7)</sup> Not in conjunction with Electrical connection "Han 7D device plug".  |  |   |
| <b>Wetted parts materials</b>  |                                    |  | <sup>8)</sup> Without cable gland, with blanking plug  |  |   |
| Seal diaphragm   | Process connection                 |  | <sup>9)</sup> With enclosed cable gland Ex ia and blanking plug  |  |   |
| Stainless steel  | Stainless steel                    | <b>A</b>   | <sup>10)</sup> Configurations with Han and M12 device plugs are only available in Ex ic.   |  |   |
| Hastelloy  | Stainless steel                    | <b>B</b>   | <sup>11)</sup> Only in connection with IP66.   |  |   |
| Hastelloy  | Hastelloy                          | <b>C</b>   | <sup>12)</sup> Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.   |  |   |
| Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" (recommended version) <sup>3) 4) 5) 6)</sup>  |                                    | <b>Y 1</b>   | <sup>13)</sup> Only in connection with Ex approval A, B or E.  |  |   |
| Version for diaphragm seals in conjunction with process connector "G½B connection shank" <sup>3) 4) 5) 6)</sup>  |                                    | <b>Y 0</b>   | <sup>14)</sup> M12 delivered without cable socket  |  |   |
| <b>Process connection</b>  |                                    |  |  |  |   |
| <ul style="list-style-type: none"> <li>Connection shank G½B to EN 837-1</li> <li>Female thread ½-14 NPT</li> <li>Stainless steel oval flange with process connection (Oval flange has no female thread) <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213</li> <li>Mounting thread M12 to DIN 19213</li> </ul> </li> <li>Male thread M20 x 1.5</li> <li>Male thread ½-14 NPT</li> </ul> |                                    | <b>0</b><br><b>1</b><br><b>2</b><br><b>3</b><br><b>4</b><br><b>5</b><br><b>6</b> |  |  |   |
| <b>Non-wetted parts materials</b>  |                                    |  |  |  |   |
| <ul style="list-style-type: none"> <li>Housing made of die-cast aluminium</li> <li>Housing stainless steel precision casting<sup>7)</sup></li> </ul>   |                                    | <b>0</b><br><b>3</b>   |  |  |   |
| <b>Version</b>   |                                    |  |  |  |   |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>  |                                    | <b>1</b><br><b>2</b><br><b>3</b>   |  |  |   |
| All versions include DVD with compact operating instructions in various EU languages.  |                                    |  |  |  |   |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

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| Selection and Ordering data   |                                    | Article No.     |
|---|------------------------------------|-----------------|
| <b>Pressure transmitter for gauge pressure</b>  |                                    |                 |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>   |                                    | <b>7MF4034-</b> |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>   |                                    | <b>7MF4035-</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>                                       |                                    |                 |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b>     |                 |
| Silicone oil  | normal                             | 1               |
| Inert liquid <sup>1)</sup>  | grease-free to cleanliness level 2 | 3               |
| FDA compliant fill fluid <sup>2)</sup>  |                                    |                 |
| • Neobee oil  | normal                             | 4               |
| <b>Nominal measuring range</b>  |                                    |                 |
| 250 mbar  | (3.6 psi)                          | A               |
| 1 bar   | (14.5 psi)                         | B               |
| 4 bar   | (58 psi)                           | C               |
| 16 bar  | (232 psi)                          | D               |
| 63 bar  | (914 psi)                          | E               |
| 160 bar   | (2320 psi)                         | F               |
| 400 bar   | (5802 psi)                         | G               |
| 700 bar   | (10153 psi)                        | J               |
| <b>Wetted parts materials</b>   |                                    |                 |
| Seal diaphragm  | Process connection                 |                 |
| Stainless steel   | Stainless steel                    | A               |
| Hastelloy   | Stainless steel                    | B               |
| Hastelloy   | Hastelloy                          | C               |
| Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" (recommended version) <sup>3) 4) 5) 6)</sup> |                                    | Y 1             |
| Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" <sup>3) 4) 5) 6)</sup>                         |                                    | Y 0             |
| <b>Process connection</b>   |                                    |                 |
| • Connection shank G1/2B to EN 837-1  |                                    | 0               |
| • Female thread 1/2-14 NPT  |                                    | 1               |
| • Stainless steel oval flange with process connection (Oval flange has no female thread) <sup>7)</sup>                                    |                                    |                 |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518   |                                    | 2               |
| - Mounting thread M10 to DIN 19213  |                                    | 3               |
| - Mounting thread M12 to DIN 19213  |                                    | 4               |
| • Male thread M20 x 1.5   |                                    | 5               |
| • Male thread 1/2-14 NPT  |                                    | 6               |
| <b>Non-wetted parts materials</b>   |                                    |                 |
| • Housing made of die-cast aluminium  |                                    | 0               |
| • Housing stainless steel precision casting   |                                    | 3               |
| <b>Version</b>  |                                    |                 |
| • Standard version, German label inscription, setting of pressure unit: bar   |                                    | 1               |
| • International version, English label inscription, setting of pressure unit: psi   |                                    | 2               |
| • Chinese version, English label inscription, setting of pressure unit: kPa   |                                    | 3               |
| All versions include DVD with compact operating instructions in various EU languages.   |                                    |                 |

| Selection and Ordering data  |  | Article No.     |
|--|--|-----------------|
| <b>Pressure transmitter for gauge pressure</b>   |  |                 |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>  |  | <b>7MF4034-</b> |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>  |  | <b>7MF4035-</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |  |                 |
| <b>Explosion protection</b>  |  |                 |
| • None   |  | A               |
| • With ATEX, Type of protection:   |  |                 |
| - "Intrinsic safety (Ex ia)"   |  | B               |
| - "Explosion-proof (Ex d)" <sup>8)</sup>   |  | D               |
| - "Intrinsic safety and flameproof enclosure (Ex ia + Ex d)" <sup>9)</sup>   |  | P               |
| - "Ex nA/ic (Zone 2)" <sup>10)</sup>   |  | E               |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>9) 11)</sup>  |  | R               |
| • FM + CSA intrinsic safe (is) <sup>12)</sup>  |  | F               |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>9) 11) 12)</sup>  |  | S               |
| • With FM + CSA, Type of protection:   |  |                 |
| - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>7) 12)</sup>   |  | NC              |
| <b>Electrical connection/cable entry</b>   |  |                 |
| • Screwed gland M20 x 1.5  |  | B               |
| • Screwed gland 1/2-14 NPT   |  | C               |
| • M12 device plugs (stainless steel) <sup>13) 14)</sup>  |  | F               |
| <b>Display</b>   |  |                 |
| • Without display  |  | 0               |
| • Without visible display (display concealed, setting: bar)  |  | 1               |
| • With visible display (setting: bar)  |  | 6               |
| • with customer-specific display (setting as specified, Order code "Y21" required)   |  | 7               |
| A quick-start guide is included in the scope of delivery of the device.  |  |                 |
| <sup>1)</sup> For oxygen application, add Order code E10.<br><sup>2)</sup> Available for measuring ranges 1 ... 63 bar.<br><sup>3)</sup> When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.<br><sup>4)</sup> If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.<br><sup>5)</sup> The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y... and 7MF4900-1...-B<br><sup>6)</sup> The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.<br><sup>7)</sup> M10 fastening thread: Max. span 160 bar (2320 psi)<br>7/16-20 UNF and M12 fastening thread: Max. span 400 bar (5802 psi)<br><sup>8)</sup> Without cable gland, with blanking plug.<br><sup>9)</sup> With enclosed cable gland Ex ia and blanking plug.<br><sup>10)</sup> Configurations with Han and M12 device plugs are only available in Ex ic.<br><sup>11)</sup> Only in connection with IP66.<br><sup>12)</sup> Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.<br><sup>13)</sup> M12 delivered without cable socket.<br><sup>14)</sup> Only in connection with Ex approval A, B, E or F. |  |                 |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for gauge pressure

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| Selection and Ordering data  | Order code        |      |    |    |
|--|-------------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.  |                   | HART | PA | FF |
| <b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>                |                   |      |    |    |
| • Steel  | A01               | ✓    | ✓  | ✓  |
| • Stainless steel 304  | A02               | ✓    | ✓  | ✓  |
| • Stainless steel 316L   | A03               | ✓    | ✓  | ✓  |
| <b>Device plugs<sup>1)</sup></b>   |                   |      |    |    |
| • Han 7D (metal)   | A30               | ✓    |    |    |
| • Han 8D (instead of Han 7D)   | A31               | ✓    |    |    |
| • Angled   | A32               | ✓    |    |    |
| • Han 8D (metal)   | A33               | ✓    |    |    |
| <b>Cable sockets for M12 device plugs (metal (CuZn))</b>   | A50               | ✓    | ✓  | ✓  |
| <b>Rating plate inscription</b><br>(instead of German)   |                   |      |    |    |
| • English  | B11               | ✓    | ✓  | ✓  |
| • French   | B12               | ✓    | ✓  | ✓  |
| • Spanish  | B13               | ✓    | ✓  | ✓  |
| • Italian  | B14               | ✓    | ✓  | ✓  |
| • Cyrillic (russian)   | B16               | ✓    | ✓  | ✓  |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi   | B21               | ✓    | ✓  | ✓  |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>2)</sup></b>  | C11               | ✓    | ✓  | ✓  |
| <b>Inspection certificate<sup>3)</sup></b><br>Acc. to EN 10204-3.1   | C12               | ✓    | ✓  | ✓  |
| <b>Factory certificate</b><br>Acc. to EN 10204-2.2   | C14               | ✓    | ✓  | ✓  |
| <b>Acceptance certificate (EN 10204-3.1)</b><br>PMI test of parts in contact with medium   | C15               | ✓    | ✓  | ✓  |
| <b>Functional safety (SIL2)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration                    | C20               | ✓    |    |    |
| <b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>  | C21 <sup>4)</sup> |      | ✓  |    |
| <b>Functional safety (SIL2/3)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration                  | C23               | ✓    |    |    |
| <b>PED for Russia with initial calibration mark</b>  | C99               | ✓    | ✓  | ✓  |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>   | D05               | ✓    |    |    |
| <b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>   | D07               | ✓    | ✓  | ✓  |
| <b>Degree of protection IP66/IP68</b><br>(only for M20x1.5 and ½-14 NPT)   | D12               | ✓    | ✓  | ✓  |
| <b>Supplied with oval flange</b><br>(1 item), PTFE packing and screws in thread of oval flange   | D37               | ✓    | ✓  | ✓  |
| <b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>  | D59               | ✓    | ✓  | ✓  |
| <b>Use in or on zone 1D/2D<sup>5)</sup></b><br>(only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66) | E01               | ✓    | ✓  | ✓  |
| <b>Oxygen application</b><br>(In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))                               | E10               | ✓    | ✓  | ✓  |
| <b>Export approval Korea</b>   | E11               | ✓    | ✓  | ✓  |

| Selection and Ordering data   | Order code        |      |    |    |
|---|-------------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |                   | HART | PA | FF |
| <b>CRN approval Canada</b><br>(Canadian Registration Number)  | E22 <sup>6)</sup> | ✓    | ✓  | ✓  |
| <b>Dual seal</b>  | E24               | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-B..)                                   | E25 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>"Flameproof" explosion protection according to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-D..)                                  | E26 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-P..)                            | E28 <sup>7)</sup> | ✓    | ✓  |    |
| <b>Ex Approval IEC Ex (Ex ia)</b><br>(only for transmitter 7MF4...-.....-B..)   | E45 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Ex Approval IEC Ex (Ex d)</b><br>(only for transmitter 7MF4...-.....-D..)  | E46 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-B..)  | E5 <sup>7)</sup>  | ✓    | ✓  | ✓  |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-D..)  | E56 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-E..)  | E57 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-R..)                                      | E58 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b><br>(only for transmitter 7MF4...-.....-[B, D]..-Z + E11) | E70 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b><br>(only for transmitter 7MF4...-.....-B..)   | E80               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b><br>(only for transmitter 7MF4...-.....-D..)  | E81               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b><br>(only for transmitter 7MF4...-.....-E..)                                     | E82               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b><br>(only for transmitter 7MF4...-.....-R..)                             | E83               | ✓    | ✓  | ✓  |
| <b>Two coats of lacquer on casing and cover (PU on epoxy)</b>   | G10               | ✓    | ✓  | ✓  |
| <b>Transient protector 6 kV (lightning protection)</b>  | J01               | ✓    | ✓  | ✓  |
| <b>Process connection Astava</b>  | J06               | ✓    | ✓  | ✓  |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

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| Selection and Ordering data   | Order code |      |    |    |
|---|------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code. |            | HART | PA | FF |
| <b>Marine approvals</b>   |            |      |    |    |
| • Det Norske Veritas<br>Germanischer Lloyd (DNV-GL)                       | <b>S10</b> | ✓    | ✓  | ✓  |
| • Lloyds Register (LR)  | <b>S11</b> | ✓    | ✓  | ✓  |
| • French marine classification society<br>Bureau Veritas (BV)             | <b>S12</b> | ✓    | ✓  | ✓  |
| • American Bureau of Shipping (ABS)                                       | <b>S14</b> | ✓    | ✓  | ✓  |
| • Russian Maritime Register (RMR)   | <b>S16</b> | ✓    | ✓  | ✓  |
| • Korean Register of Shipping (KR)  | <b>S17</b> | ✓    | ✓  | ✓  |

1) Han device plug IP65

2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

3) If the acceptance test certificate 3.1. is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

| Selection and Ordering data   | Order code              |      |                 |    |
|---|-------------------------|------|-----------------|----|
| <b>Additional data</b><br>Please add "-Z" to Article No. and specify Order code(s) and plain text.  |                         | HART | PA              | FF |
| <b>Measuring range to be set</b><br>Specify in plain text (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi   | <b>Y01</b>              | ✓    | ✓ <sup>1)</sup> |    |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....   | <b>Y15<sup>2)</sup></b> | ✓    | ✓               | ✓  |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 characters, specify in plain text:<br>Y16: .....  | <b>Y16</b>              | ✓    | ✓               | ✓  |
| <b>Entry of HART address (TAG)</b><br>Max. 8 characters, specify in plain text:<br>Y17: .....   | <b>Y17</b>              | ✓    |                 |    |
| <b>Setting of pressure indication in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>3)</sup> , inH <sub>2</sub> O <sup>3)</sup> , ftH <sub>2</sub> O <sup>3)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>*) ref. temperature 20 °C | <b>Y21</b>              | ✓    | ✓               | ✓  |
| <b>Setting of pressure indication in non-pressure units<sup>3)</sup></b><br>Specify in plain text:<br>Y22: .... up to .... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)  | <b>Y22 + Y01</b>        | ✓    |                 |    |
| <b>Preset bus address</b><br>possible between 1 and 126<br>Specify in plain text:<br>Y25: .....   | <b>Y25</b>              |      | ✓               | ✓  |
| <b>Damping adjustment in seconds (0 ... 100 s)</b>  | <b>Y30</b>              | ✓    | ✓               | ✓  |

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

## Ordering example

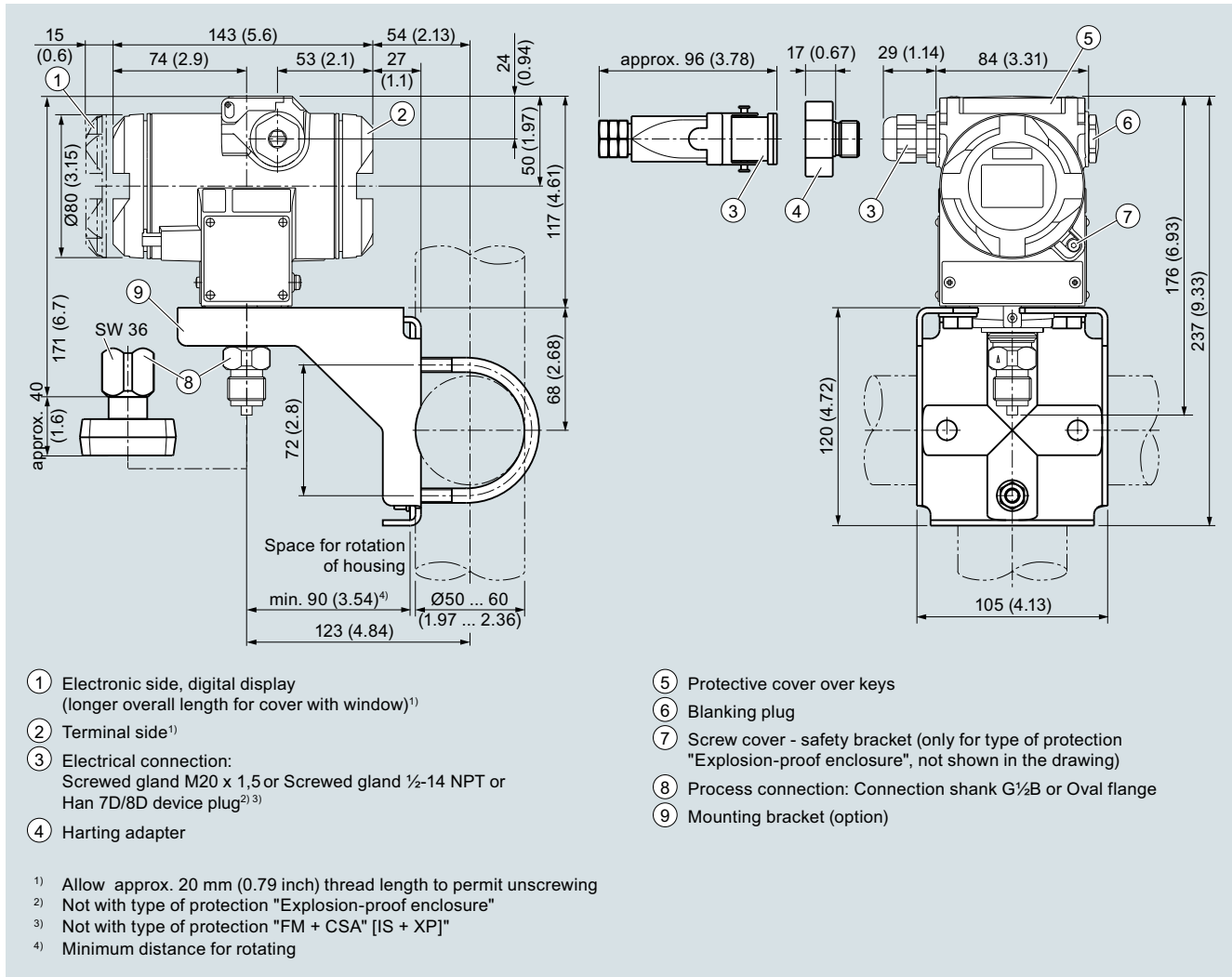
Item line: 7MF4033-1EA00-1AA7-Z  
B line: A01 + Y01 + Y21  
C line: Y01: 10 ... 20 bar (145 ... 290 psi)  
C line: Y21: bar (psi)

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) If you do not wish to have any text engraved for Y15, then do not make any further text entries as "Y15:".

3) Preset values can only be changed over SIMATIC PDM.

## Dimensional drawings



SITRANS P DS III pressure transmitters for gauge pressure, dimensions in mm (inch)

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

## Technical specifications

### SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm

#### Input of gauge pressure, with front-flush diaphragm

Measured variable

Span (continuously adjustable) or measuring range, max. operating pressure and max. test pressure

Gauge pressure, front-flush

| HART  | PROFIBUS PA/<br>FOUNDATION<br>Fieldbus |                                   |                               |
|---|--|-----------------------------------|-------------------------------|
| Span  | Nominal measuring range                | Max. operating pressure MAWP (PS) | Max. perm. test pressure      |
| 0.01 ... 1 bar<br>1 ... 100 kPa<br>0.15 ... 14.5 psi  | 1 bar<br>100 kPa<br>14.5 psi           | 4 bar<br>400 kPa<br>58 psi        | 6 bar<br>600 kPa<br>87 psi)   |
| 0.04 ... 4 bar<br>4 ... 400 kPa<br>0.58 ... 58 psi    | 4 bar<br>400 kPa<br>58 psi             | 7 bar<br>0.7 MPa<br>102 psi       | 10 bar<br>1 MPa<br>145 psi    |
| 0.16 ... 16 bar<br>16 ... 1600 kPa<br>2.3 ... 232 psi | 16 bar<br>1600 kPa<br>232 psi          | 21 bar<br>2.1 MPa<br>305 psi      | 32 bar<br>3.2 MPa<br>464 psi  |
| 0.63 ... 63 bar<br>63 ... 6300 kPa<br>9.1 ... 914 psi | 63 bar<br>6300 kPa<br>914 psi          | 67 bar<br>6.7 MPa<br>972 psi      | 100 bar<br>10 MPa<br>1450 psi |

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- Measuring cell with Neobee

Upper measuring limit

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100 % of max. span

#### Input of absolute pressure, with front-flush diaphragm

Measured variable

Span (continuously adjustable) or measuring range, max. operating pressure and max. test pressure

Absolute pressure, front-flush

| HART   | PROFIBUS PA/<br>FOUNDATION<br>Fieldbus               |                                      |                                     |
|--|--|--------------------------------------|-------------------------------------|
| Span   | Nominal measuring range                              | Max. operating pressure MAWP (PS)    | Max. perm. test pressure            |
| 43.34 ... 1300 mbar a<br>4.33 ... 130 kPa a<br>17 ... 525 inH <sub>2</sub> O a | 1300 mbar a<br>130 kPa a<br>525 inH <sub>2</sub> O a | 2.6 bar a<br>260 kPa a<br>37.7 psi a | 10 bar a<br>1 MPa a<br>145 psi a    |
| 160 ... 5000 mbar a<br>16 ... 500 kPa a<br>2.32 ... 72.5 psi a                 | 5000 mbar a<br>500 kPa a<br>72.5 psi a               | 10 bar a<br>1 MPa a<br>145 psi a     | 30 bar a<br>3 MPa a<br>435 psi a    |
| 1 ... 30 bar a<br>0.1 ... 3 MPa a<br>14.6 ... 435 psi a                        | 30 bar a<br>3 MPa a<br>435 psi a                     | 45 bar a<br>4.5 MPa a<br>653 psi a   | 100 bar a<br>10 MPa a<br>1450 psi a |

Depending on the process connection, the span may differ from these values

Lower measuring limit

Upper measuring limit

0 mbar a/0 kPa a/0 psi a

100 % of max. span

#### Output

Output signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

Load

- Without HART
- With HART

Physical bus

Protection against polarity reversal

Electrical damping (step width 0.1 s)

| HART   | PROFIBUS PA/FOUNDATION Fieldbus                    |
|--|--|
| 4 ... 20 mA  | Digital PROFIBUS PA and FOUNDATION Fieldbus signal |
| 3.55 mA, factory preset to 3.84 mA   | -  |
| 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA  | -  |
| $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in $\Omega$ ,<br>$U_H$ : Power supply in V                       | -  |
| $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or<br>$R_B = 230 \dots 1100 \Omega$ (HART Communicator)                 | -  |
| -  | IEC 61158-2  |
| Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage. |  |
| Set to 2 s (0 ... 100 s)   |  |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

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#### SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm

##### Measuring accuracy

Reference conditions  
(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

##### Gauge pressure, front-flush

##### Absolute pressure, front-flush

-  $r \leq 5$

$\leq 0.075 \%$

-

-  $5 < r \leq 100$

$\leq (0.005 \cdot r + 0.05) \%$

-

-  $r \leq 10$

-

$\leq 0.2 \%$

-  $10 < r \leq 30$

-

$\leq 0.4 \%$

Influence of ambient temperature (in percent per 28 °C (50 °F))  $\leq (0.08 \cdot r + 0.16) \%$

$\leq (0.16 \cdot r + 0.24) \%$

Effect of ambient temperature  
(in pressure per temperature change)

- Temperature difference between medium temperature and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

$\leq (0.25 \cdot r) \%$  in 5 years

Effect of mounting position (in pressure per change in angle)

0.4 mbar/0.04 kPa/0.006 per 10° inclination  
(zero point correction is possible with position error compensation)

Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of nominal measuring range

##### Rated conditions

##### Installation conditions

Ambient temperature

Observe the temperature class in areas subject to explosion hazard.

- Measuring cell with silicone oil

-40 ... +85 °C (-40 ... +185 °F)

- Measuring cell with Neobee oil (with front-flush diaphragm)

-10 ... +85 °C (14 ... +185 °F)

- Measuring cell with inert liquid

-40 ... +85 °C (-40 ... +185 °F)

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)  
(in the case of Neobee: -20 ... +85 °C (-4 ... +185 °F))  
(for high temperature oil: -10 ... +85 °C (14 ... 185 °F))

Climatic class

- Condensation

Relative humidity 0 ... 100 %  
Condensation permissible, suitable for use in the tropics

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

##### Medium conditions

The max. medium temperature of the front-flush process connections is to be taken into account in accordance with the relevant connection standards (e. g. DIN 32676, DIN 11851 etc.).

Temperature of medium

- Measuring cell with silicone oil

-40 ... +100 °C (-40 ... +212 °F)

- Measuring cell with silicone oil (with front-flush diaphragm)

-40 ... +150 °C (-40 ... +302 °F)

- Measuring cell with Neobee oil (with front-flush diaphragm)

-10 ... +150 °C (14 ... 302 °F)

- Measuring cell with silicone oil, with temperature decoupler (only for gauge pressure version with front-flush diaphragm)

-40 ... +200 °C (-40 ... +392 °F)

- Measuring cell with Neobee oil, with temp. decoupler (only for gauge pressure version with flush-mounted diaphragm)

-10 ... +200 °C (14 ... 392 °F)

- Measuring cell with inert filling liquid

-20 ... +100 °C (-4 ... +212 °F)

- Measuring cell with high-temperature oil (only for gauge pressure version with front-flush diaphragm)

-10 ... +250 °C (14 ... 482 °F)



## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

### SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm

#### Design

|                                  |  |
|----------------------------------|--|
| Weight (without options)         | ≈ 1.5 kg (≈ 3.3 lb)  |
| Enclosure material               | Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408  |
| Wetted parts materials           | Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819   |
| Measuring cell filling           | Silicone oil or inert filling liquid   |
| Process connection               | <ul style="list-style-type: none"> <li>• Flanges as per EN and ASME</li> <li>• F&amp;B and pharmaceutical flanges</li> </ul>   |
| Surface quality touched-by-media | $R_a$ -values $\leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$ )/welds $R_a \leq 1.6 \mu\text{m}$ (64 $\mu\text{-inch}$ )<br>(Process connections acc. to 3A; $R_a$ -values $\leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$ )/welds $R_a \leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$ )) |

#### Power supply $U_H$

|   | HART  | PROFIBUS PA/FOUNDATION Fieldbus |
|---|---|---------------------------------|
| Terminal voltage on transmitter                 | 10.5 ... 45 V DC<br>10.5 ... 30 V DC in intrinsically-safe mode | -                               |
| Power supply                                    | -   | Supplied through bus            |
| Separate 24 V power supply necessary            | -   | No                              |
| Bus voltage                                     |   |                                 |
| • Not Ex  | -   | 9 ... 32 V                      |
| • With intrinsically-safe operation             | -   | 9 ... 24 V                      |
| Current consumption                             |   |                                 |
| • Basic current (max.)                          | -   | 12.5 mA                         |
| • Start-up current $\leq$ basic current         | -   | Yes                             |
| • Max. current in event of fault                | -   | 15.5 mA                         |
| Fault disconnection electronics (FDE) available | -   | Yes                             |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

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#### SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm

##### Certificates and approvals

|   |   |  |
|---|---|--|
| Classification according to PED 2014/68/EU  | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)                                |  |
| Explosion protection                        | PTB 13 ATEX 2007 X  |  |
| • Intrinsic safety "i"                      | Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb   |  |
| - Marking                                   | -40 ... +85 °C (-40 ... +185 °F) temperature class T4;<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T5;<br>-40 ... +60 °C (-40 ... +140 °F) temperature class T6 |  |
| - Permissible ambient temperature           |   |  |
| - Connection                                | To certified intrinsically-safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ ,<br>$P_i = 750 \text{ mW}$ ; $R_i = 300 \Omega$              | FISCO supply unit:<br>$U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$<br>Linear barrier:<br>$U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1.2 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$   | $L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$   |
| • Explosion-proof "d"                       | PTB 99 ATEX 1160  |  |
| - Marking                                   | Ex II 1/2 G Ex d IIC T4/T6 Gb   |  |
| - Permissible ambient temperature           | -40 ... +85 °C (-40 ... +185 °F) temperature class T4;<br>-40 ... +60 °C (-40 ... +140 °F) temperature class T6   |  |
| - Connection                                | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$   | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$   |
| • Dust explosion protection for zone 20     | PTB 01 ATEX 2055  |  |
| - Marking                                   | Ex II 1 D Ex ta IIIC T120°C Da<br>Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db  |  |
| - Permissible ambient temperature           | -40 ... +85 °C (-40 ... +185 °F)  |  |
| - Max. surface temperature                  | 120 °C (248 °F)   |  |
| - Connection                                | To certified intrinsically-safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ ,<br>$P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$              | FISCO supply unit:<br>$U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$<br>Linear barrier:<br>$U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1 \text{ W}$   |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$   | $L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$   |
| • Dust explosion protection for zone 21/22  | Ex II 2 D Ex tb IIIC T120°C Db  |  |
| - Marking                                   | Ex II 2 D IP65 T 120 °C   |  |
| - Connection                                | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\max} = 1.2 \text{ W}$  | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$ ;<br>$P_{\max} = 1 \text{ W}$   |
| • Type of protection "n" (zone 2)           | PTB 13 ATEX 2007 X  |  |
| - Marking                                   | Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc<br>Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc  |  |
| - Connection (Ex nA)                        | $U_m = 45 \text{ V}$  | $U_m = 32 \text{ V}$   |
| - Connections (Ex ic)                       | To circuits with values:<br>$U_i = 45 \text{ V}$  | FISCO supply unit ic:<br>$U_o = 17.5 \text{ V}$ , $I_o = 570 \text{ mA}$<br>Linear barrier:<br>$U_o = 32 \text{ V}$ , $I_o = 132 \text{ mA}$ , $P_o = 1 \text{ W}$                         |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$   | $L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$   |
| • Explosion protection acc. to FM           | Certificate of Compliance 3008490   |  |
| - Identification (XP/DIP) or (IS); (NI)     | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III                    |  |
| • Explosion protection to CSA               | Certificate of Compliance 1153651   |  |
| - Identification (XP/DIP) or (IS)           | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III                                  |  |

##### Hygiene version

In the case of SITRANS P DSIII with 7MF413x front-flush diaphragm, selected connections comply with the requirements of EHEDG.

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

| <b>HART communication</b>   |  | <b>FOUNDATION Fieldbus communication</b>   |   |
|---|--|--|---|
| HART  | 230 ... 1100 Ω   | Function blocks  | 3 function blocks analog input, 1 function block PID                    |
| Protocol  | HART Version 5.x   |  |   |
| Software for computer   | SIMATIC PDM  |  |   |
| <b>PROFIBUS PA communication</b>  |  |  |   |
| Simultaneous communication with master class 2 (max.)                           | 4  | • Analog input   | Yes, linearly rising or falling characteristic                          |
| The address can be set using  | Configuration tool or local operation (standard setting address 126)                                   | - Adaptation to customer-specific process variables  | 0 ... 100 s   |
|   |  | - Electrical damping, adjustable   | Output/input (can be locked within the device with a bridge)            |
|   |  | - Simulation function  | parameterizable (last good value, substitute value, incorrect value)    |
| Cyclic data usage   |  | - Failure mode   | Yes, one upper and lower warning limit and one alarm limit respectively |
| • Output byte   | 5 (one measured value) or 10 (two measured values)   | - Limit monitoring   | Yes   |
| • Input byte  | 0, 1, or 2 (register operating mode and reset function for metering)                                   | - Square-rooted characteristic for flow measurement  |   |
| Internal preprocessing  |  | • PID  | Standard FOUNDATION Fieldbus function block                             |
| Device profile  | PROFIBUS PA Profile for Process Control Devices Version 3.0, class B                                   | • Physical block   | 1 resource block  |
| Function blocks   | 2  | Transducer blocks  | 1 transducer block Pressure with calibration, 1 transducer block LCD    |
| • Analog input  |  |  |   |
| - Adaptation to customer-specific process variables                             | Yes, linearly rising or falling characteristic   | • Pressure transducer block  |   |
| - Electrical damping, adjustable  | 0 ... 100 s  | - Can be calibrated by applying two pressures  | Yes   |
| - Simulation function   | Input /Output  | - Monitoring of sensor limits  | Yes   |
| - Failure mode  | parameterizable (last good value, substitute value, incorrect value)                                   | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function                    |
| - Limit monitoring  | Yes, one upper and lower warning limit and one alarm limit respectively                                |  |   |
| • Register (totalizer)  | Can be reset, preset, optional direction of counting, simulation function of register output           |  |   |
| - Failure mode  | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |  |   |
| - Limit monitoring  | One upper and lower warning limit and one alarm limit respectively                                     |  |   |
| • Physical block  | 1  |  |   |
| Transducer blocks   | 2  |  |   |
| • Pressure transducer block   |  |  |   |
| - Can be calibrated by applying two pressures                                   | Yes  |  |   |
| - Monitoring of sensor limits   | Yes  |  |   |
| - Specification of a container characteristic with                              | Max. 30 nodes  |  |   |
| - Square-rooted characteristic for flow measurement                             | Yes  |  |   |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable  |  |   |
| - Simulation function for measured pressure value and sensor temperature        | Constant value or over parameterizable ramp function   |  |   |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

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| Selection and Ordering data   | Article No.      |
|---|------------------|
| <b>Pressure transmitter for gauge and absolute pressure, front-flush diaphragm, SITRANS P DS III HART</b> | <b>7MF4133 -</b> |
| Click on the Article No. for the online configuration in the PIA Life Cycle Portal.                       |                  |
| <b>Measuring cell filling</b>   |                  |
| Silicone oil  | 1                |
| Inert liquid  | 3                |
| FDA compliant fill fluid  |                  |
| • Neobee oil  | 4                |
| <b>Measuring cell cleaning</b>  |                  |
| normal  |                  |
| <b>Measuring span (min. ... max.)</b>   |                  |
| 0.01 ... 1 bar (0.15 ... 14.5 psi)  | B                |
| 0.04 ... 4 bar (0.58 ... 58 psi)  | C                |
| 0.16 ... 16 bar (2.32 ... 232 psi)  | D                |
| 0.63 ... 63 bar (9.14 ... 914 psi)  | E                |
| 43.34 ... 1300 mbar a <sup>1)</sup> (0.63 ... 18.86 psi a <sup>1)</sup> )                                 | S                |
| 0.17 ... 5 bar a <sup>1)</sup> (2.43 ... 72.5 psi a <sup>1)</sup> )                                       | T                |
| 1 ... 30 bar a <sup>1)</sup> (4.35 ... 435 psi a <sup>1)</sup> )  | U                |
| <b>Wetted parts materials</b>   |                  |
| Seal diaphragm  | Connection shank |
| Stainless steel   | Stainless steel  |
| Hastelloy <sup>2)</sup>   | Stainless steel  |
| <b>Process connection</b>   |                  |
| • Flange version with Order code M..., N..., R... or Q...   | 7                |
| <b>Non-wetted parts materials</b>   |                  |
| • Housing made of die-cast aluminium  | 0                |
| • Housing stainless steel precision casting   | 3                |
| <b>Version</b>  |                  |
| • Standard version, German plate inscription, setting for pressure unit: bar                              | 1                |
| • International version, English plate inscription, setting for pressure unit: bar                        | 2                |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal                           | 3                |
| All versions include DVD with compact operating instructions in various EU languages.                     |                  |
| <b>Explosion protection</b>   |                  |
| • None  | A                |
| • With ATEX, Type of protection:  |                  |
| - "Intrinsic safety (Ex ia)"  | B                |
| - "Explosion-proof (Ex d)" <sup>3)</sup>  | D                |
| - „Ex nA/ic (Zone 2)" <sup>4)</sup>   | E                |
| • FM + CSA intrinsic safe (is) <sup>5)</sup>  | F                |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>5)6)7)</sup>                                 | S                |
| • With FM + CSA, Type of protection:  |                  |
| - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>3)5)</sup>  | NC               |
| <b>Electrical connection/cable entry</b>  |                  |
| • Inner thread M20 x 1.5  | B                |
| • Female thread ½-14 NPT  | C                |
| • Han 7D device plug (plastic housing) incl. mating connector <sup>8)</sup>                               | D                |
| • M12 device plugs (stainless steel) <sup>9) 10)</sup>  | F                |

| Selection and Ordering data   | Article No.      |
|---|------------------|
| <b>Pressure transmitter for gauge and absolute pressure, front-flush diaphragm, SITRANS P DS III HART</b>   | <b>7MF4133 -</b> |
| <b>Display</b>  |                  |
| • Without display   | 0                |
| • Without visible display (display concealed, setting: mA)  | 1                |
| • With visible display (setting: mA)  | 6                |
| • With customer-specific display (setting as specified, Order code "Y21" or "Y22" required)   | 7                |
| <b>Power supply units</b> see Chap. 7 "Supplementary Components".   |                  |
| A quick-start guide is included in the scope of delivery of the device.   |                  |
| 1) Not with temperature decoupler P00, not for process connections R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil. |                  |
| 2) Only available for flanges with options M..., N... and Q...  |                  |
| 3) Without cable gland, with blanking plug  |                  |
| 4) Configurations with Han and M12 device plugs are only available in Ex ic.  |                  |
| 5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.  |                  |
| 6) Only in connection with IP66.  |                  |
| 7) With enclosed cable gland Ex ia and blanking plug.   |                  |
| 8) Only in connection with Ex approval A, B or E.   |                  |
| 9) Only in connection with Ex approval A, B, E or F.  |                  |
| 10) M12 delivered without cable socket  |                  |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

| Selection and Ordering data   |                                | Article No.            |
|---|--------------------------------|------------------------|
| <b>Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm:</b>               |                                |                        |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>   |                                | <b>7 M F 4 1 3 4 -</b> |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>   |                                | <b>7 M F 4 1 3 5 -</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a> |                                |                        |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b> |                        |
| Silicone oil  | normal                         | 1                      |
| Inert liquid  |                                | 3                      |
| FDA compliant fill fluid  |                                |                        |
| • Neobee oil  | normal                         | 4                      |
| <b>Nominal measuring range</b>  |                                |                        |
| 1 bar   | (14.5 psi)                     | B                      |
| 4 bar   | (58 psi)                       | C                      |
| 16 bar  | (232 psi)                      | D                      |
| 63 bar  | (914 psi)                      | E                      |
| 1300 mbar a <sup>1)</sup>   | (18.86 psi a <sup>1)</sup> )   | S                      |
| 5 bar a <sup>1)</sup>   | (72.5 psi a <sup>1)</sup> )    | T                      |
| 30 bar a <sup>1)</sup>  | (435 psi a <sup>1)</sup> )     | U                      |
| <b>Wetted parts materials</b>   |                                |                        |
| Seal diaphragm  | Connection shank               |                        |
| Stainless steel   | Stainless steel                | A                      |
| Hastelloy <sup>2)</sup>   | Stainless steel                | B                      |
| <b>Process connection</b>   |                                |                        |
| • Flange version with Order code M.., N.., R.. or Q..   |                                | 7                      |
| <b>Non-wetted parts materials</b>   |                                |                        |
| • Housing made of die-cast aluminium  |                                | 0                      |
| • Housing stainless steel precision casting   |                                | 3                      |
| <b>Version</b>  |                                |                        |
| • Standard version, German plate inscription, setting for pressure unit: bar                        |                                | 1                      |
| • International version, English plate inscription, setting for pressure unit: bar                  |                                | 2                      |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal                     |                                | 3                      |
| All versions include DVD with compact operating instructions in various EU languages.               |                                |                        |
| <b>Explosion protection</b>   |                                |                        |
| • None  |                                | A                      |
| • With ATEX, Type of protection:  |                                |                        |
| - "Intrinsic safety (Ex ia)"  |                                | B                      |
| - "Explosion-proof (Ex d)" <sup>3)</sup>  |                                | D                      |
| - „Ex nA/ic (Zone 2)" <sup>4)</sup>   |                                | E                      |
| • FM + CSA intrinsic safe (is) <sup>5)</sup>  |                                | F                      |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>5)6)7)</sup>                           |                                | S                      |
| • With FM + CSA, Type of protection:  |                                |                        |
| - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>3)5)</sup> (available soon)                   |                                | NC                     |
| <b>Electrical connection/cable entry</b>  |                                |                        |
| • Screwed gland M20 x 1.5   |                                | B                      |
| • Screwed gland ½-14 NPT  |                                | C                      |
| • M12 device plugs (stainless steel) <sup>8) 9)</sup>   |                                | F                      |

| Selection and Ordering data  |  | Article No.            |
|--|--|------------------------|
| <b>Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm:</b>  |  |                        |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>  |  | <b>7 M F 4 1 3 4 -</b> |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>  |  | <b>7 M F 4 1 3 5 -</b> |
|  |  |                        |
| <b>Display</b>   |  |                        |
| • Without display  |  | 0                      |
| • Without visible display (display concealed, setting: bar)  |  | 1                      |
| • With visible display (setting: bar)  |  | 6                      |
| • With customer-specific display (setting as specified, Order code "Y21" required)   |  | 7                      |
| A quick-start guide is included in the scope of delivery of the device.  |  |                        |
| 1) Not with temperature decoupler P00, not for process connections R01, R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil. |  |                        |
| 2) Only available for flanges with options M.., N.. and Q.   |  |                        |
| 3) Without cable gland, with blanking plug   |  |                        |
| 4) Configurations with Han and M12 device plugs are only available in Ex ic.   |  |                        |
| 5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.   |  |                        |
| 6) Only in connection with IP66.   |  |                        |
| 7) With enclosed cable gland Ex ia and blanking plug.  |  |                        |
| 8) Only in connection with Ex approval A, B, E or F.   |  |                        |
| 9) M12 delivered without cable socket  |  |                        |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

| Selection and Ordering data   |  | Order code        |      |    |    |
|---|--|-------------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |  |                   | HART | PA | FF |
| <b>Device plugs<sup>1)</sup></b>  |  |                   |      |    |    |
| • Han 7D (metal)  |  | A30               | ✓    |    |    |
| • Han 8D (instead of Han 7D)  |  | A31               | ✓    |    |    |
| • Angled  |  | A32               | ✓    |    |    |
| • Han 8D (metal)  |  | A33               | ✓    |    |    |
| <b>Cable sockets for M12 device plugs (metal (CuZn))</b>  |  | A50               | ✓    | ✓  | ✓  |
| <b>Rating plate inscription</b> (instead of German)   |  |                   |      |    |    |
| • English   |  | B11               | ✓    | ✓  | ✓  |
| • French  |  | B12               | ✓    | ✓  | ✓  |
| • Spanish   |  | B13               | ✓    | ✓  | ✓  |
| • Italian   |  | B14               | ✓    | ✓  | ✓  |
| • Cyrillic (russian)  |  | B16               | ✓    | ✓  | ✓  |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi  |  | B21               | ✓    | ✓  | ✓  |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>  |  | C11               | ✓    | ✓  | ✓  |
| <b>Inspection certificate</b><br>Acc. to EN 10204-3.1   |  | C12               | ✓    | ✓  | ✓  |
| <b>Factory certificate</b><br>Acc. to EN 10204-2.2  |  | C14               | ✓    | ✓  | ✓  |
| <b>Functional safety (SIL2)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration               |  | C20               | ✓    |    |    |
| <b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>   |  | C21 <sup>2)</sup> |      | ✓  |    |
| <b>Functional safety (SIL2/3)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration             |  | C23               | ✓    |    |    |
| <b>PED for Russia with initial calibration mark</b>   |  | C99               | ✓    | ✓  | ✓  |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>  |  | D05               | ✓    |    |    |
| <b>Degree of protection IP66/IP68</b><br>(only for M20x1.5 and ½-14 NPT)  |  | D12               | ✓    | ✓  | ✓  |
| <b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>   |  | D59               | ✓    | ✓  | ✓  |
| <b>Oxygen application</b><br>(In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))                          |  | E10               | ✓    | ✓  | ✓  |
| <b>Export approval Korea</b>  |  | E11               | ✓    | ✓  | ✓  |
| <b>CRN approval Canada</b><br>(Canadian Registration Number)  |  | E22 <sup>3)</sup> | ✓    | ✓  | ✓  |
| <b>Dual seal</b>  |  | E24               | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-B..)                                   |  | E25 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>"Flameproof" explosion protection according to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-D..)                                  |  | E26 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-P..)                            |  | E28 <sup>4)</sup> | ✓    | ✓  |    |
| <b>Ex Approval IEC Ex (Ex ia)</b><br>(only for transmitter 7MF4...-.....-B..)   |  | E45 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Ex Approval IEC Ex (Ex d)</b><br>(only for transmitter 7MF4...-.....-D..)  |  | E46 <sup>4)</sup> | ✓    | ✓  | ✓  |
| Selection and Ordering data   |  | Order code        |      |    |    |
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |  |                   | HART | PA | FF |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-B..)  |  | E55 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-D..)  |  | E56 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-E..)  |  | E57 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-R..)                                      |  | E58 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b><br>(only for transmitter 7MF4...-.....-[B, D]..-Z + E11) |  | E70 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b>   |  | E80               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b>  |  | E81               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>   |  | E82               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>   |  | E83               | ✓    | ✓  | ✓  |
| <b>Two coats of lacquer on casing and cover (PU on epoxy)</b>   |  | G10               | ✓    | ✓  | ✓  |
| <b>Transient protector 6 kV (lightning protection)</b>  |  | J01               | ✓    | ✓  | ✓  |
| <b>Flanges to EN 1092-1, Form B1</b>  |  |                   |      |    |    |
| • DN 25, PN 40 <sup>5)</sup>  |  | M11               | ✓    | ✓  | ✓  |
| • DN 40, PN 40  |  | M13               | ✓    | ✓  | ✓  |
| • DN 40, PN 100   |  | M23               | ✓    | ✓  | ✓  |
| • DN 50, PN 16  |  | M04               | ✓    | ✓  | ✓  |
| • DN 50, PN 40  |  | M14               | ✓    | ✓  | ✓  |
| • DN 80, PN 16  |  | M06               | ✓    | ✓  | ✓  |
| • DN 80, PN 40  |  | M16               | ✓    | ✓  | ✓  |
| <b>Flanges to ASME B16.5</b>  |  |                   |      |    |    |
| • Stainless steel flange 1" class 150 <sup>5)</sup>   |  | M40               | ✓    | ✓  | ✓  |
| • Stainless steel flange 1½" class 150  |  | M41               | ✓    | ✓  | ✓  |
| • Stainless steel flange 2" class 150   |  | M42               | ✓    | ✓  | ✓  |
| • Stainless steel flange 3" class 150   |  | M43               | ✓    | ✓  | ✓  |
| • Stainless steel flange 4" class 150   |  | M44               | ✓    | ✓  | ✓  |
| • Stainless steel flange 1½" class 300  |  | M46               | ✓    | ✓  | ✓  |
| • Stainless steel flange 2" class 300   |  | M47               | ✓    | ✓  | ✓  |
| • Stainless steel flange 3" class 300   |  | M48               | ✓    | ✓  | ✓  |
| • Stainless steel flange 4" class 300   |  | M49               | ✓    | ✓  | ✓  |
| <b>Threaded connector to DIN 3852-2, form A, thread to ISO 228</b>  |  |                   |      |    |    |
| • G ¾"-A, front-flush <sup>6)</sup>   |  | R01               | ✓    | ✓  | ✓  |
| • G 1"-A, front-flush <sup>6)</sup>   |  | R02               | ✓    | ✓  | ✓  |
| • G 2"-A, front-flush   |  | R04               | ✓    | ✓  | ✓  |
| <b>Tank connection<sup>7)</sup></b><br>Sealing is included in delivery  |  |                   |      |    |    |
| • TG 52/50, PN 40   |  | R10               | ✓    | ✓  | ✓  |
| • TG 52/150, PN 40  |  | R11               | ✓    | ✓  | ✓  |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

| Selection and Ordering data  |           | Order code |      |    |    |
|--|-----------|------------|------|----|----|
| <i>Further designs</i><br>Add "-Z" to Article No. and specify Order code.                        |           |            | HART | PA | FF |
| <b>Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut)</b> |           |            |      |    |    |
| • DN 50, PN 25   | N04       | ✓          | ✓    | ✓  |    |
| • DN 80, PN 25   | N06       | ✓          | ✓    | ✓  |    |
| <b>Tri-Clamp connection according DIN 32676/ISO 2852</b>   |           |            |      |    |    |
| • DN 50/2", PN 16  | N14       | ✓          | ✓    | ✓  |    |
| • DN 65/2.5", PN 10  | N15       | ✓          | ✓    | ✓  |    |
| <b>Varivent connection</b><br>EHEDG compliant  |           |            |      |    |    |
| • Type N = 68 for Varivent housing<br>DN 40 ... 125 and 1½" ... 6", PN 40                        | N28       | ✓          | ✓    | ✓  |    |
| <b>Temperature decoupler up to 200 °C<sup>8)</sup></b><br>for version with front-flush diaphragm |           | P00        | ✓    | ✓  | ✓  |
| <b>Sanitary process connection to DRD</b>  |           |            |      |    |    |
| • DN 50, PN 40   | M32       | ✓          | ✓    | ✓  |    |
| <b>SMS socket with union nut</b>   |           |            |      |    |    |
| • 2"   | M67       | ✓          | ✓    | ✓  |    |
| • 2½"  | M68       | ✓          | ✓    | ✓  |    |
| • 3"   | M69       | ✓          | ✓    | ✓  |    |
| <b>SMS threaded socket</b>   |           |            |      |    |    |
| • 2"   | M73       | ✓          | ✓    | ✓  |    |
| • 2½"  | M74       | ✓          | ✓    | ✓  |    |
| • 3"   | M75       | ✓          | ✓    | ✓  |    |
| <b>IDF socket with union nut ISO 2853</b>  |           |            |      |    |    |
| • 2"   | M82       | ✓          | ✓    | ✓  |    |
| • 2½"  | M83       | ✓          | ✓    | ✓  |    |
| • 3"   | M84       | ✓          | ✓    | ✓  |    |
| <b>IDF threaded socket ISO 2853</b>  |           |            |      |    |    |
| • 2"   | M92       | ✓          | ✓    | ✓  |    |
| • 2½"  | M93       | ✓          | ✓    | ✓  |    |
| • 3"   | M94       | ✓          | ✓    | ✓  |    |
| <b>Sanitary process connection to NEUMO Bio-Connect screw connection</b><br>EHEDG compliant      |           |            |      |    |    |
| • DN 50, PN 16   | Q05       | ✓          | ✓    | ✓  |    |
| • DN 65, PN 16   | Q06       | ✓          | ✓    | ✓  |    |
| • DN 80, PN 16   | Q07       | ✓          | ✓    | ✓  |    |
| • DN 100, PN 16  | Q08       | ✓          | ✓    | ✓  |    |
| • DN 2", PN 16   | Q13       | ✓          | ✓    | ✓  |    |
| • DN 2½", PN 16  | Q14       | ✓          | ✓    | ✓  |    |
| • DN 3", PN 16   | Q15       | ✓          | ✓    | ✓  |    |
| • DN 4", PN 16   | Q16       | ✓          | ✓    | ✓  |    |
| <b>Sanitary process connection to NEUMO Bio-Connect flange connection</b><br>EHEDG compliant     |           |            |      |    |    |
| • DN 50, PN 16   | Q23       | ✓          | ✓    | ✓  |    |
| • DN 65, PN 16   | Q24       | ✓          | ✓    | ✓  |    |
| • DN 80, PN 16   | Q25       | ✓          | ✓    | ✓  |    |
| • DN 100, PN 16  | Q26       | ✓          | ✓    | ✓  |    |
| • DN 2", PN 16   | Q31       | ✓          | ✓    | ✓  |    |
| • DN 2½", PN 16  | Q32       | ✓          | ✓    | ✓  |    |
| • DN 3", PN 16   | Q33       | ✓          | ✓    | ✓  |    |
| • DN 4", PN 16   | Q34       | ✓          | ✓    | ✓  |    |
| Selection and Ordering data  |           | Order code |      |    |    |
| <i>Further designs</i><br>Add "-Z" to Article No. and specify Order code.                        |           |            | HART | PA | FF |
| <b>Sanitary process connection to NEUMO Bio-Connect clamp connection</b><br>EHEDG compliant      |           |            |      |    |    |
| • DN 50, PN 16   | Q39       | ✓          | ✓    | ✓  |    |
| • DN 65, PN 10   | Q40       | ✓          | ✓    | ✓  |    |
| • DN 80, PN 10   | Q41       | ✓          | ✓    | ✓  |    |
| • DN 100, PN 10  | Q42       | ✓          | ✓    | ✓  |    |
| • DN 2½", PN 16  | Q48       | ✓          | ✓    | ✓  |    |
| • DN 3", PN 10   | Q49       | ✓          | ✓    | ✓  |    |
| • DN 4", PN 10   | Q50       | ✓          | ✓    | ✓  |    |
| <b>Bio-Control sanitary process connection</b>   |           |            |      |    |    |
| • DN 50, PN 16   | Q53       | ✓          | ✓    | ✓  |    |
| • DN 65, PN 16   | Q54       | ✓          | ✓    | ✓  |    |
| <b>Sanitary process connection to NEUMO Bio-Connect S flange connection</b>                      |           |            |      |    |    |
| • DN 2", PN 16   | Q72       | ✓          | ✓    | ✓  |    |
| <b>Aseptic threaded socket to DIN 11864-1 Form A</b>   |           |            |      |    |    |
| • DN 50, PN 25   | N33       | ✓          | ✓    | ✓  |    |
| • DN 65, PN 25   | N34       | ✓          | ✓    | ✓  |    |
| • DN 80, PN 25   | N35       | ✓          | ✓    | ✓  |    |
| • DN 100, PN 25  | N36       | ✓          | ✓    | ✓  |    |
| <b>Aseptic flange with notch to DIN 11864-2 Form A</b>   |           |            |      |    |    |
| • DN 50, PN 16   | N43       | ✓          | ✓    | ✓  |    |
| • DN 65, PN 16   | N44       | ✓          | ✓    | ✓  |    |
| • DN 80, PN 16   | N45       | ✓          | ✓    | ✓  |    |
| • DN 100, PN 16  | N46       | ✓          | ✓    | ✓  |    |
| <b>Aseptic flange with groove to DIN 11864-2 Form A</b>  |           |            |      |    |    |
| • DN 50, PN 16   | N43 + P11 | ✓          | ✓    | ✓  |    |
| • DN 65, PN 16   | N44 + P11 | ✓          | ✓    | ✓  |    |
| • DN 80, PN 16   | N45 + P11 | ✓          | ✓    | ✓  |    |
| • DN 100, PN 16  | N46 + P11 | ✓          | ✓    | ✓  |    |
| <b>Aseptic clamp with groove to DIN 11864-3 Form A</b>   |           |            |      |    |    |
| • DN 50, PN 25   | N53       | ✓          | ✓    | ✓  |    |
| • DN 65, PN 25   | N54       | ✓          | ✓    | ✓  |    |
| • DN 80, PN 16   | N55       | ✓          | ✓    | ✓  |    |
| • DN 100, PN 16  | N56       | ✓          | ✓    | ✓  |    |

1) Han device plug IP65

2) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H.

3) Cannot be ordered with remote seal.

4) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

5) Special seal in Viton included in the scope of delivery.  
FKM; temperature range -20 ... +200 °C (-4 ... +392 °C)

6) Cannot be combined with Order code P00. Can only be ordered with silicone oil measuring cell filling.

7) The weldable socket can be ordered under accessories.

8) 3A and EHEDG compliant. The maximum permissible temperatures of the medium depend on the respective cell fillings (see medium conditions).

| Selection and Ordering data   | Order code       |             |                 |           |
|---|------------------|-------------|-----------------|-----------|
| <b>Additional data</b>  |                  | <b>HART</b> | <b>PA</b>       | <b>FF</b> |
| Please add <b>"-Z"</b> to Article No. and specify Order code(s) and plain text.   |                  |             |                 |           |
| <b>Measuring range to be set</b><br>Specify in plain text (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi   | <b>Y01</b>       | ✓           | ✓ <sup>1)</sup> |           |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....   | <b>Y15</b>       | ✓           | ✓               | ✓         |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 characters, specify in plain text:<br>Y16: .....  | <b>Y16</b>       | ✓           | ✓               | ✓         |
| <b>Entry of HART address (TAG)</b><br>Max. 8 characters, specify in plain text:<br>Y17: .....   | <b>Y17</b>       | ✓           |                 |           |
| <b>Setting of pressure indicator in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>1)</sup> , inH <sub>2</sub> O <sup>1)</sup> , ftH <sub>2</sub> O <sup>1)</sup> ,<br>mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> ,<br>kg/cm <sup>2</sup> , Torr, ATM or %<br><sup>1)</sup> ref. temperature 20 °C | <b>Y21</b>       | ✓           | ✓               | ✓         |
| <b>Setting of pressure indication in non-pressure units<sup>2)</sup></b><br>Specify in plain text:<br>Y22: .... up to .... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)  | <b>Y22 + Y01</b> | ✓           |                 |           |
| <b>Preset bus address</b><br>possible between 1 and 126<br>Specify in plain text:<br>Y25: .....   | <b>Y25</b>       |             | ✓               | ✓         |
| <b>Damping adjustment in seconds (0 ... 100 s)</b>  | <b>Y30</b>       | ✓           | ✓               | ✓         |

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

#### ordering example

Item line: 7MF4133-1DB20-1AB7-Z  
B line: A22 + Y01 + Y21  
C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)  
C line: Y21: bar (psi)

<sup>1)</sup> Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.



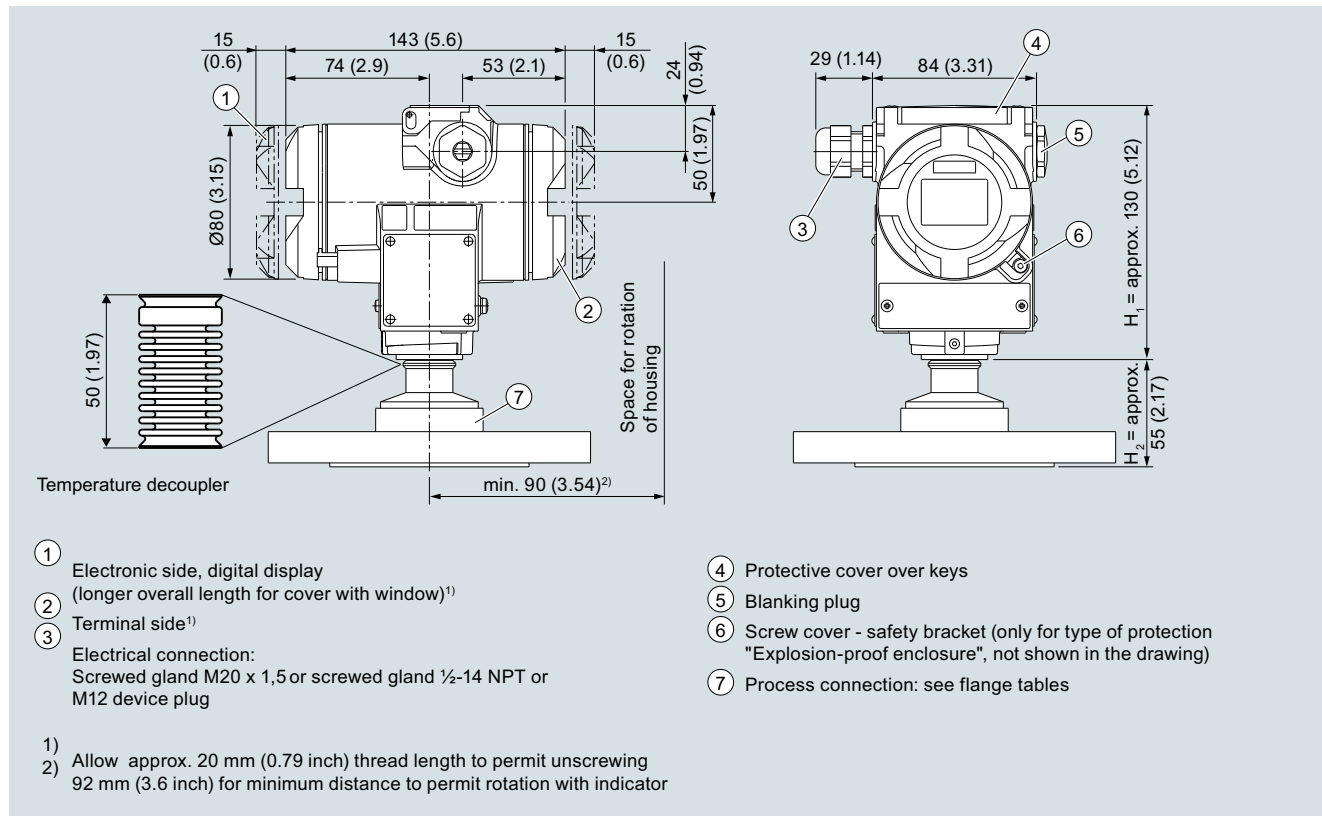
## Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

**for gauge/absolute pressure, with front-flush diaphragm**

## Dimensional drawings



SITRANS P pressure transmitters, DS III series for gauge pressure, with front-flush diaphragm, dimensions in mm (inch)

The diagram shows a SITRANS P DS III with an example of a flange. In this drawing the height is subdivided into  $H_1$  and  $H_2$ .

$H_1$  = Height of the SITRANS P300 up to a defined cross-section

$H_2$  = Height of the flange up to this defined cross-section

Only the height  $H_2$  is indicated in the dimensions of the flanges.



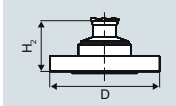
# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P DS III

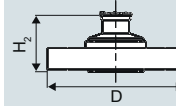
for gauge/absolute pressure, with front-flush diaphragm

1

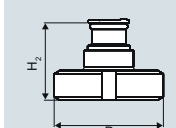
**Flanges as per EN and ASME**Flange to EN**EN 1092-1**

|  | Order code | DN | PN  | ØD            | H <sub>2</sub>        |
|---|------------|----|-----|---------------|-----------------------|
|   | <b>M11</b> | 25 | 40  | 115 mm (4.5") | Approx.<br>52 mm (2") |
|   | <b>M13</b> | 40 | 40  | 150 mm (5.9") |                       |
|   | <b>M23</b> | 40 | 100 | 170 mm (6.7") |                       |
|   | <b>M04</b> | 50 | 16  | 165 mm (6.5") |                       |
|   | <b>M14</b> | 50 | 40  | 165 mm (6.5") |                       |
|   | <b>M06</b> | 80 | 16  | 200 mm (7.9") |                       |
|   | <b>M16</b> | 80 | 40  | 200 mm (7.9") |                       |

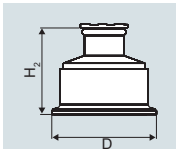
Flanges to ASME**ASME B16.5**

|  | Order code | DN  | PN  | ØD             | H <sub>2</sub>        |
|---|------------|-----|-----|----------------|-----------------------|
|   | <b>M40</b> | 1"  | 150 | 110 mm (4.3")  | Approx.<br>52 mm (2") |
|   | <b>M41</b> | 1½" | 150 | 130 mm (5.1")  |                       |
|   | <b>M42</b> | 2"  | 150 | 150 mm (5.9")  |                       |
|   | <b>M43</b> | 3"  | 150 | 190 mm (7.5")  |                       |
|   | <b>M44</b> | 4"  | 150 | 230 mm (9.1")  |                       |
|   | <b>M46</b> | 1½" | 300 | 155 mm (6.1")  |                       |
|   | <b>M47</b> | 2"  | 300 | 165 mm (6.5")  |                       |
|   | <b>M48</b> | 3"  | 300 | 210 mm (8.1")  |                       |
|   | <b>M49</b> | 4"  | 300 | 255 mm (10.0") |                       |

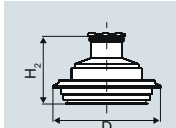
**NuG and pharmaceutical connections**Connections to DIN**DIN 11851 (milk pipe union with slotted union nut)**

|  | Order code | DN | PN | ØD            | H <sub>2</sub>        |
|---|------------|----|----|---------------|-----------------------|
|   | <b>N04</b> | 50 | 25 | 92 mm (3.6")  | Approx.<br>52 mm (2") |
|   | <b>N06</b> | 80 | 25 | 127 mm (5.0") |                       |

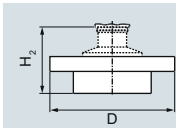
**Tri-Clamp nach DIN 32676**

|  | Order code | DN | PN | ØD           | H <sub>2</sub>        |
|---|------------|----|----|--------------|-----------------------|
|   | <b>N14</b> | 50 | 16 | 64 mm (2.5") | Approx.<br>52 mm (2") |
|   | <b>N15</b> | 65 | 10 | 91 mm (3.6") |                       |

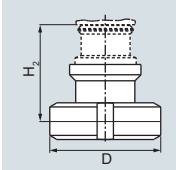
Other connections**Varivent connection**

|  | Order code | DN         | PN | ØD           | H <sub>2</sub>        |
|---|------------|------------|----|--------------|-----------------------|
|   | <b>N28</b> | 40 ... 125 | 40 | 84 mm (3.3") | Approx.<br>52 mm (2") |

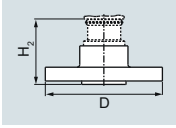
**Sanitary process connection to DRD**

|  | Order code | DN | PN | ØD            | H <sub>2</sub>        |
|---|------------|----|----|---------------|-----------------------|
|   | <b>M32</b> | 50 | 40 | 105 mm (4.1") | Approx.<br>52 mm (2") |

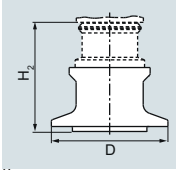
**Sanitary process screw connection to NEUMO Bio-Connect**

|  | Order code | DN  | PN | ØD            | H <sub>2</sub>        |
|---|------------|-----|----|---------------|-----------------------|
|   | <b>Q05</b> | 50  | 16 | 82 mm (3.2")  | Approx.<br>52 mm (2") |
|   | <b>Q06</b> | 65  | 16 | 105 mm (4.1") |                       |
|   | <b>Q07</b> | 80  | 16 | 115 mm (4.5") |                       |
|   | <b>Q08</b> | 100 | 16 | 145 mm (5.7") |                       |
|   | <b>Q13</b> | 2"  | 16 | 82 mm (3.2")  |                       |
|   | <b>Q14</b> | 2½" | 16 | 105 mm (4.1") |                       |
|   | <b>Q15</b> | 3"  | 16 | 105 mm (4.1") |                       |
|   | <b>Q16</b> | 4"  | 16 | 145 mm (5.7") |                       |

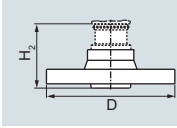
**Sanitary process connection to NEUMO Bio-Connect flange connection**

|  | Order code | DN  | PN | ØD            | H <sub>2</sub>        |
|---|------------|-----|----|---------------|-----------------------|
|   | <b>Q23</b> | 50  | 16 | 110 mm (4.3") | Approx.<br>52 mm (2") |
|   | <b>Q24</b> | 65  | 16 | 140 mm (5.5") |                       |
|   | <b>Q25</b> | 80  | 16 | 150 mm (5.9") |                       |
|   | <b>Q26</b> | 100 | 16 | 175 mm (6.9") |                       |
|   | <b>Q31</b> | 2"  | 16 | 100 mm (3.9") |                       |
|   | <b>Q32</b> | 2½" | 16 | 110 mm (4.3") |                       |
|   | <b>Q33</b> | 3"  | 16 | 140 mm (5.5") |                       |
|   | <b>Q34</b> | 4"  | 16 | 175 mm (6.9") |                       |

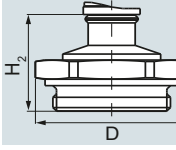
**Sanitary process connection to NEUMO Bio-Connect clamp connection**

|  | Order code | DN  | PN | ØD             | H <sub>2</sub>        |
|--|------------|-----|----|----------------|-----------------------|
|  | <b>Q39</b> | 50  | 16 | 77.4 mm (3.0") | Approx.<br>52 mm (2") |
|  | <b>Q40</b> | 65  | 10 | 90.9 mm (3.6") |                       |
|  | <b>Q41</b> | 80  | 10 | 106 mm (4.2")  |                       |
|  | <b>Q42</b> | 100 | 10 | 119 mm (4.7")  |                       |
|  | <b>Q48</b> | 2½" | 16 | 90.9 mm (3.6") |                       |
|  | <b>Q49</b> | 3"  | 10 | 106 mm (4.2")  |                       |
|  | <b>Q50</b> | 4"  | 10 | 119 mm (4.7")  |                       |

**Sanitary process connection to NEUMO Bio-Connect S flange connection**

|  | Order code | DN | PN | ØD            | H <sub>2</sub>        |
|---|------------|----|----|---------------|-----------------------|
|   | <b>Q72</b> | 2" | 16 | 125 mm (4.9") | Approx.<br>52 mm (2") |

**Threaded connection G¾", G1" and G2" acc. to DIN 3852**

|  | Order code | DN | PN | ØD           | H <sub>2</sub>          |
|---|------------|----|----|--------------|-------------------------|
|   | <b>R01</b> | ¾" | 60 | 37 mm (1.5") | Approx.<br>45 mm (1.8") |
|   | <b>R02</b> | 1" | 60 | 48 mm (1.9") | Approx.<br>47 mm (1.9") |
|   | <b>R04</b> | 2" | 60 | 78 mm (3.1") | Approx.<br>52 mm (2")   |

# Pressure Measurement

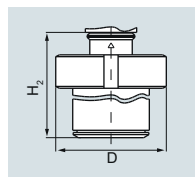
Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

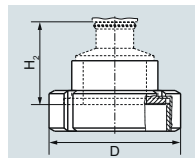
1

## Tank connection TG 52/50 and TG52/150



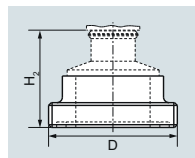
| Order code | DN | PN | ØD           | H <sub>2</sub>        |
|------------|----|----|--------------|-----------------------|
| <b>R10</b> | 25 | 40 | 63 mm (2.5") | Approx. 63 mm (2.5")  |
| <b>R11</b> | 25 | 40 | 63 mm (2.5") | Approx. 170 mm (6.7") |

## SMS socket with union nut



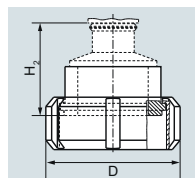
| Order code | DN  | PN | ØD            | H <sub>2</sub>     |
|------------|-----|----|---------------|--------------------|
| <b>M67</b> | 2"  | 25 | 84 mm (3.3")  | Approx. 52 mm (2") |
| <b>M68</b> | 2½" | 25 | 100 mm (3.9") |                    |
| <b>M69</b> | 3"  | 25 | 114 mm (4.5") |                    |

## SMS threaded socket



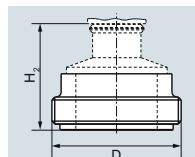
| Order code | DN  | PN | ØD          | H <sub>2</sub>     |
|------------|-----|----|-------------|--------------------|
| <b>M73</b> | 2"  | 25 | 70 x 1/6 mm | Approx. 52 mm (2") |
| <b>M74</b> | 2½" | 25 | 85 x 1/6 mm |                    |
| <b>M75</b> | 3"  | 25 | 98 x 1/6 mm |                    |

## IDF socket with union nut



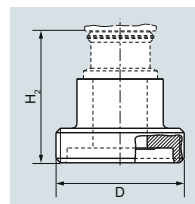
| Order code | DN  | PN | ØD            | H <sub>2</sub>     |
|------------|-----|----|---------------|--------------------|
| <b>M82</b> | 2"  | 25 | 77 mm (3")    | Approx. 52 mm (2") |
| <b>M83</b> | 2½" | 25 | 91 mm (3.6")  |                    |
| <b>M84</b> | 3"  | 25 | 106 mm (4.2") |                    |

## IDF threaded socket



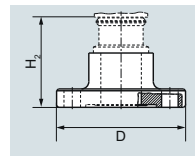
| Order code | DN  | PN | ØD             | H <sub>2</sub>     |
|------------|-----|----|----------------|--------------------|
| <b>M92</b> | 2"  | 25 | 64 mm (2.5")   | Approx. 52 mm (2") |
| <b>M93</b> | 2½" | 25 | 77.5 mm (3.1") |                    |
| <b>M94</b> | 3"  | 25 | 91 mm (3.6")   |                    |

## Aseptic threaded socket to DIN 11864-1 Form A



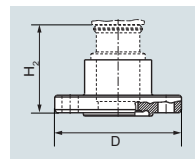
| Order code | DN  | PN | ØD         | H <sub>2</sub>     |
|------------|-----|----|------------|--------------------|
| <b>N33</b> | 50  | 25 | 78 x 1/6"  | Approx. 52 mm (2") |
| <b>N34</b> | 65  | 25 | 95 x 1/6"  |                    |
| <b>N35</b> | 80  | 25 | 110 x 1/4" |                    |
| <b>N36</b> | 100 | 25 | 130 x 1/4" |                    |

## Aseptic flange with notch to DIN 11864-2 Form A



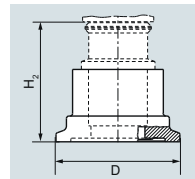
| Order code | DN  | PN | ØD  | H <sub>2</sub>     |
|------------|-----|----|-----|--------------------|
| <b>N43</b> | 50  | 16 | 94  | Approx. 52 mm (2") |
| <b>N44</b> | 65  | 16 | 113 |                    |
| <b>N45</b> | 80  | 16 | 133 |                    |
| <b>N46</b> | 100 | 16 | 159 |                    |

## Aseptic flange with groove to DIN 11864-2 Form A



| Order code       | DN  | PN | ØD  | H <sub>2</sub>     |
|------------------|-----|----|-----|--------------------|
| <b>N43 + P11</b> | 50  | 16 | 94  | Approx. 52 mm (2") |
| <b>N44 + P11</b> | 65  | 16 | 113 |                    |
| <b>N45 + P11</b> | 80  | 16 | 133 |                    |
| <b>N46 + P11</b> | 100 | 16 | 159 |                    |

## Aseptic clamp with groove to DIN 11864-3 Form A



| Order code | DN  | PN | ØD   | H <sub>2</sub>     |
|------------|-----|----|------|--------------------|
| <b>N53</b> | 50  | 25 | 77.5 | Approx. 52 mm (2") |
| <b>N54</b> | 65  | 25 | 91   |                    |
| <b>N55</b> | 80  | 16 | 106  |                    |
| <b>N56</b> | 100 | 16 | 130  |                    |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for absolute pressure (from gauge pressure series)

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#### Technical specifications

##### SITRANS P DS III series for absolute pressure (from the gauge pressure series)

###### Input

Measured variable

Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

Absolute pressure

###### HART

###### PROFIBUS PA/ FOUNDATION Fieldbus

Span

Nominal measuring range

Max. operating pressure MAWP (PS)

Max. perm. test pressure

8.34 ... 250 mbar a  
0.83 ... 25 kPa a  
3.35 ... 100 inH<sub>2</sub>O a  
43.34 ... 1300 mbar a  
4.33 ... 130 kPa a  
17.42 ... 522.4 inH<sub>2</sub>O a

250 mbar a  
25 kPa a  
100 inH<sub>2</sub>O a  
1300 mbar a  
130 kPa a  
525 inH<sub>2</sub>O a

1.5 bar a  
150 kPa a  
21.8 psi a  
2.6 bar a  
260 kPa a  
37.7 psi a

6 bar a  
600 kPa a  
87 psi a  
10 bar a  
1 MPa a  
145 psi a

170 ... 5000 mbar a  
17 ... 500 kPa a  
2.43 ... 72.5 psi a

5000 mbar a  
500 kPa a  
72.5 psi a

10 bar a  
1 MPa a  
145 psi a

30 bar a  
3 MPa a  
435 psi a

1 ... 30 bar a  
0.1 ... 3 MPa a  
14.6 ... 435 psi a

30 bar a  
3 MPa a  
435 psi a

45 bar a  
4.5 MPa a  
653 psi a

100 bar a  
10 MPa a  
1450 psi a

5.34 ... 160 bar a  
0.53 ... 16 MPa a  
77.4 ... 2321 psi a

160 bar a  
16 MPa a  
2321 psi

167 bar a  
16.7 MPa a  
2422 psi

250 bar a  
25 MPa a  
3626 psi

13.34 ... 400 bar a  
1.3 ... 40 MPa a  
193.4 ... 5802 psi a

400 bar a  
40 MPa a  
5802 psi a

400 bar a  
40 MPa a  
5802 psi a

600 bar a  
60 MPa a  
8702 psi a

23.34 ... 700 bar a  
2.33 ... 70 MPa a  
338.43 ... 10153 psi a

700 bar a  
70 MPa a  
10153 psi a

800 bar a  
80 MPa a  
11603 psi a

800 bar a  
80 MPa a  
11603 psi a

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
  - for process temperature -20 °C <  $\vartheta$  ≤ +60 °C (-4 °F <  $\vartheta$  ≤ +140 °F)
  - for process temperature 60 °C <  $\vartheta$  ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F <  $\vartheta$  ≤ +212 °F (max. 185 °F for measuring cell 435 psi))

0 mbar a/0 kPa a/0 psi a

30 mbar a/3 kPa a/0.44 psi a

30 mbar a + 20 mbar a · ( $\vartheta$  - 60 °C)/°C  
3 kPa a + 2 kPa a · ( $\vartheta$  - 60 °C)/°C  
0.44 psi a + 0.29 psi a · ( $\vartheta$  - 140 °F)/°F

Upper measuring limit

100 % of max. span  
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/process temperature)

Start of scale value

Between the measuring limits (fully adjustable)

###### Output

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

Load

- Without HART
- With HART

 $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$  in  $\Omega$ ,  
 $U_H$ : Power supply in V

 $R_B = 230 \dots 500 \Omega$  (SIMATIC PDM) or  
 $R_B = 230 \dots 1100 \Omega$  (HART Communicator)

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal.  
Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced) SITRANS P DS III

### for absolute pressure (from gauge pressure series)

#### SITRANS P DS III series for absolute pressure (from the gauge pressure series)

##### Measuring accuracy

Reference conditions  
(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl.  
hysteresis and reproducibility

- Linear characteristic

-  $r \leq 10$

$\leq 0.1 \%$

-  $10 < r \leq 30$

$\leq 0.2 \%$

Influence of ambient temperature  
(in percent per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a

$\leq (0.15 \cdot r + 0.1) \%$

- 1300 mbar a/130 kPa a/18.8 psi a  
5 bar a/500 kPa a/72.5 psi a  
30 bar a/3000 kPa a/435 psi a  
100 bar a/10 MPa a/1450 psi a  
160 bar a/16 MPa a/2321 psi a  
400 bar a/40 MPa a/5802 psi a  
700 bar a/50 MPa a/10152 psi a

$\leq (0.08 \cdot r + 0.16) \%$

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

$\leq (0.25 \cdot r) \%$  in 5 years

Effect of mounting position (in pressure per change in angle)

$\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi}$  per 10° inclination  
(zero point correction is possible with position error compensation)

Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and  
FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of nominal measuring range

##### Rated conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F) with 30 bar a measuring cell

- Measuring cell with inert filling liquid

-20 ... +100 °C (-4 ... +212 °F)

- In conjunction with dust explosion protection

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %  
Condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

**SITRANS P DS III series for absolute pressure (from the gauge pressure series)****Design**

|                              |  |
|------------------------------|--|
| Weight (without options)     | ≈ 1.5 kg (≈ 3.3 lb)  |
| Enclosure material           | Low-copper die-cast aluminum, GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4408   |
| Wetted parts materials       |  |
| • Connection shank           | Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602   |
| • Oval flange                | Stainless steel, mat. no. 1.4404/316L  |
| • Seal diaphragm             | Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819   |
| Measuring cell filling       | Silicone oil or inert filling liquid<br>(maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))  |
| Process connection           | Connection shank G½B to EN 837-1, female thread ½ -14 NPT or oval flange (PN 160 (MAWP 2320 psi a)) to DIN 19213 with mounting thread M10 or 7/16-20 UNF to IEC 61518/DIN EN 61518 |
| Material of mounting bracket |  |
| • Steel                      | Sheet-steel, Mat. No. 1.0330, chrome-plated  |
| • Stainless steel 304        | Sheet stainless steel, mat. no. 1.4301 (SS 304)  |
| • Stainless steel 316L       | Sheet stainless steel, mat. no. 1.4404 (SS 316L)   |

**Power supply  $U_H$** 

|   | <b>HART</b>   | <b>PROFIBUS PA/FOUNDATION Fieldbus</b> |
|---|---|--|
| Terminal voltage on transmitter                 | 10.5 ... 45 V DC<br>10.5 ... 30 V DC in intrinsically-safe mode | -                                      |
| Power supply                                    |   | Supplied through bus                   |
| Separate 24 V power supply necessary            | -   | No                                     |
| Bus voltage                                     |   |  |
| • Not Ex  | -   | 9 ... 32 V                             |
| • With intrinsically-safe operation             | -   | 9 ... 24 V                             |
| Current consumption                             |   |  |
| • Basic current (max.)                          | -   | 12.5 mA                                |
| • Start-up current ≤ basic current              | -   | Yes                                    |
| • Max. current in event of fault                | -   | 15.5 mA                                |
| Fault disconnection electronics (FDE) available | -   | Yes                                    |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from gauge pressure series)

1

## SITRANS P DS III series for absolute pressure (from the gauge pressure series)

### Certificates and approvals

Classification according to PED 2014/68/EU

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

- Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

- Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

- Dust explosion protection for zone 21/22

- Marking
- Connection

- Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

- Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

- Explosion protection to CSA

- Identification (XP/DIP) or (IS)

### HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
-40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To certified intrinsically-safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ;  $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:  $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIC T120°C Da

Ex II 1/2 D Ex ta/tb IIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIC T120°C Db

To circuits with values:  $U_H = 10.5 \dots 45 \text{ V DC}$ ;  $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

$U_m = 45 \text{ V}$

To circuits with values:

$U_i = 45 \text{ V}$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

Certificate of Compliance 1153651

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

### PROFIBUS PA/ FOUNDATION Fieldbus

FISCO supply unit:

$U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$

Linear barrier:

$U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

To circuits with values:  $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:

$U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$

Linear barrier:

$U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

To circuits with values:  $U_H = 9 \dots 32 \text{ V DC}$ ;  
 $P_{\max} = 1 \text{ W}$

$U_m = 32 \text{ V}$

FISCO supply unit ic:

$U_o = 17.5 \text{ V}$ ,  $I_o = 570 \text{ mA}$

Linear barrier:

$U_o = 32 \text{ V}$ ,  $I_o = 132 \text{ mA}$ ,  $P_o = 1 \text{ W}$

$L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

|   |  |  |   |
|---|--|--|---|
| <b>HART communication</b>   |  | <b>FOUNDATION Fieldbus communication</b>   |   |
| HART  | 230 ... 1100 Ω   | Function blocks  | 3 function blocks analog input, 1 function block PID                    |
| Protocol  | HART Version 5.x   |  |   |
| Software for computer   | SIMATIC PDM  |  |   |
| <b>PROFIBUS PA communication</b>  |  | • Analog input   | Yes, linearly rising or falling characteristic                          |
| Simultaneous communication with master class 2 (max.)                           | 4  | - Adaptation to customer-specific process variables  | 0 ... 100 s   |
| The address can be set using  | Configuration tool or local operation (standard setting address 126)                                   | - Electrical damping, adjustable   | Output/input (can be locked within the device with a bridge)            |
| Cyclic data usage   |  | - Simulation function  | parameterizable (last good value, substitute value, incorrect value)    |
| • Output byte   | 5 (one measured value) or 10 (two measured values)   | - Failure mode   | Yes, one upper and lower warning limit and one alarm limit respectively |
| • Input byte  | 0, 1, or 2 (register operating mode and reset function for metering)                                   | - Limit monitoring   | Yes   |
| Internal preprocessing  |  | - Square-rooted characteristic for flow measurement  | Standard FOUNDATION Fieldbus function block                             |
| Device profile  | PROFIBUS PA Profile for Process Control Devices Version 3.0, class B                                   | • PID  | 1 resource block  |
| Function blocks   | 2  | • Physical block   | 1 transducer block Pressure with calibration, 1 transducer block LCD    |
| • Analog input  |  | Transducer blocks  |   |
| - Adaptation to customer-specific process variables                             | Yes, linearly rising or falling characteristic   | • Pressure transducer block  |   |
| - Electrical damping, adjustable  | 0 to 100 s   | - Can be calibrated by applying two pressures  | Yes   |
| - Simulation function   | Input /Output  | - Monitoring of sensor limits  | Yes   |
| - Failure mode  | parameterizable (last good value, substitute value, incorrect value)                                   | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function                    |
| - Limit monitoring  | Yes, one upper and lower warning limit and one alarm limit respectively                                |  |   |
| • Register (totalizer)  | Can be reset, preset, optional direction of counting, simulation function of register output           |  |   |
| - Failure mode  | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |  |   |
| - Limit monitoring  | One upper and lower warning limit and one alarm limit respectively                                     |  |   |
| • Physical block  | 1  |  |   |
| Transducer blocks   | 2  |  |   |
| • Pressure transducer block   |  |  |   |
| - Can be calibrated by applying two pressures                                   | Yes  |  |   |
| - Monitoring of sensor limits   | Yes  |  |   |
| - Specification of a container characteristic with                              | Max. 30 nodes  |  |   |
| - Square-rooted characteristic for flow measurement                             | Yes  |  |   |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable  |  |   |
| - Simulation function for measured pressure value and sensor temperature        | Constant value or over parameterizable ramp function   |  |   |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from gauge pressure series)

1

| Selection and Ordering data  |                                    | Article No.      |
|--|------------------------------------|------------------|
| <b>Pressure transmitters for absolute pressure from gauge pressure series SITRANS P DS III with HART</b>                                     |                                    | <b>7MF4233 -</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |                                    |                  |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b>     |                  |
| Silicone oil   | normal                             | 1                |
| Inert liquid <sup>1)</sup>   | grease-free to cleanliness level 2 | 3                |
| <b>Measuring span (min. ... max.)</b>  |                                    |                  |
| 8.34 ... 250 mbar a  | (0.13 ... 3.63 psi a)              | D                |
| 43.34 ... 1300 mbar a  | (0.63 ... 18.86 psi a)             | F                |
| 0.17 ... 5 bar a   | (2.43 ... 72.5 psi a)              | G                |
| 1 ... 30 bar a   | (14.6 ... 435 psi a)               | H                |
| 5.34 ... 160 bar a <sup>2)</sup>   | (77.4 ... 2 321 psi a)             | L                |
| 13.34 ... 400 bar a <sup>2)</sup>  | (193.4 ... 5 802 psi a)            | M                |
| 23.34 ... 700 bar a <sup>2)</sup>  | (338.43 ... 10 153 psi a)          | N                |
| <b>Wetted parts materials</b>  |                                    |                  |
| Seal diaphragm   | Process connection                 |                  |
| Stainless steel  | Stainless steel                    | A                |
| Hastelloy  | Stainless steel                    | B                |
| Hastelloy  | Hastelloy                          | C                |
| Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" (recommended version) <sup>3) 4) 5) 6) 7)</sup> |                                    | Y 1              |
| Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" <sup>3) 4) 5) 6) 7)</sup>                         |                                    | Y 0              |
| <b>Process connection</b>  |                                    |                  |
| • Connection shank G1/2B to EN 837-1   |                                    | 0                |
| • Female thread 1/2-14 NPT   |                                    | 1                |
| • Stainless steel oval flange with process connection (Oval flange has no female thread)   |                                    |                  |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518  |                                    | 2                |
| - Mounting thread M10 to DIN 19213   |                                    | 3                |
| - Mounting thread M12 to DIN 19213   |                                    | 4                |
| • Male thread M20 x 1.5  |                                    | 5                |
| • Male thread 1/2-14 NPT   |                                    | 6                |
| <b>Non-wetted parts materials</b>  |                                    |                  |
| • Housing made of die-cast aluminium   |                                    | 0                |
| • Housing stainless steel precision casting <sup>8)</sup>  |                                    | 3                |
| <b>Version</b>   |                                    |                  |
| • Standard version, German plate inscription, setting for pressure unit: bar   |                                    | 1                |
| • International version, English plate inscription, setting for pressure unit: bar   |                                    | 2                |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal  |                                    | 3                |
| All versions include DVD with compact operating instructions in various EU languages.  |                                    |                  |
| <b>Explosion protection</b>  |                                    |                  |
| • None   |                                    | A                |
| • With ATEX, Type of protection:   |                                    |                  |
| - "Intrinsic safety (Ex ia)"   |                                    | B                |
| - "Explosion-proof (Ex d)" <sup>9)</sup>   |                                    | D                |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" <sup>10)</sup>   |                                    | P                |
| - "Ex nA/ic (Zone 2)" <sup>11)</sup>   |                                    | E                |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)" <sup>10)12)</sup>                   |                                    | R                |
| • FM + CSA intrinsic safe (is) <sup>13)</sup>  |                                    | F                |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>10)12)13)</sup>   |                                    | S                |
| • With FM + CSA, Type of protection:   |                                    |                  |
| - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>9)13)</sup>  |                                    | NC               |

| Selection and Ordering data  |  | Article No.      |
|--|--|------------------|
| <b>Pressure transmitters for absolute pressure from gauge pressure series SITRANS P DS III with HART</b>   |  | <b>7MF4233 -</b> |
| <b>Electrical connection/cable entry</b>   |  |                  |
| • Screwed gland M20x1.5  |  | B                |
| • Screwed gland 1/2-14 NPT   |  | C                |
| • Han 7D device plug (plastic housing) incl. mating connector <sup>14)</sup>   |  | D                |
| • M12 device plugs (stainless steel) <sup>15) 16)</sup>  |  | F                |
| <b>Display</b>   |  |                  |
| • Without display  |  | 0                |
| • Without visible display (display concealed, setting: mA)   |  | 1                |
| • With visible display (setting: mA)   |  | 6                |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)  |  | 7                |
| Power supply units see Chap. 7 "Supplementary Components".   |  |                  |
| A quick-start guide is included in the scope of delivery of the device.  |  |                  |
| 1) For oxygen application, add Order code E10.   |  |                  |
| 2) Available soon  |  |                  |
| 3) Version 7MF4233-1DY... only up to max. span 200 mbar a (80 inH <sub>2</sub> O a).   |  |                  |
| 4) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here. If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. |  |                  |
| 5) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.  |  |                  |
| 6) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF423-...Y... and 7MF4900-1...-B  |  |                  |
| 7) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.   |  |                  |
| 8) Not in conjunction with Electrical connection "Han 7D device plug".   |  |                  |
| 9) Without cable gland, with blanking plug.  |  |                  |
| 10) With enclosed cable gland Ex ia and blanking plug.   |  |                  |
| 11) Configurations with Han and M12 device plugs are only available in Ex ic.  |  |                  |
| 12) Only in connection with IP66.  |  |                  |
| 13) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.  |  |                  |
| 14) Only in connection with Ex approval A, B or E.   |  |                  |
| 15) Only in connection with Ex approval A, B, E or F.  |  |                  |
| 16) M12 delivered without cable socket   |  |                  |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for absolute pressure (from gauge pressure series)

1

| Selection and Ordering data  |                                    | Article No.    | Selection and Ordering data   |  | Article No.    |
|--|------------------------------------|----------------|---|--|----------------|
| <b>Pressure transmitters for absolute pressure from gauge pressure series</b>  |                                    |                | <b>Pressure transmitters for absolute pressure from gauge pressure series</b>   |  |                |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>  |                                    | 7 MF 4 2 3 4 - | <b>SITRANS P DS III with PROFIBUS PA (PA)</b>   |  | 7 MF 4 2 3 4 - |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>  |                                    | 7 MF 4 2 3 5 - | <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>   |  | 7 MF 4 2 3 5 - |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |                                    |                |   |  |                |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b>     |                | <b>Explosion protection</b>   |  |                |
| Silicone oil   | normal                             | 1              | • None  |  | A              |
| Inert liquid <sup>1)</sup>   | grease-free to cleanliness level 2 | 3              | • With ATEX, Type of protection:  |  |                |
|  |                                    |                | - "Intrinsic safety (Ex ia)"  |  | B              |
|  |                                    |                | - "Explosion-proof (Ex d)" <sup>8)</sup>  |  | D              |
|  |                                    |                | - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) <sup>9)</sup>  |  | P              |
|  |                                    |                | - "Ex nA/ic (Zone 2)" <sup>10)</sup>  |  | E              |
|  |                                    |                | - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>9) 11)</sup>   |  | R              |
|  |                                    |                | • FM + CSA intrinsic safe (is) <sup>12)</sup>   |  | F              |
|  |                                    |                | • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>9) 11) 12)</sup>   |  | S              |
|  |                                    |                | • With FM + CSA, Type of protection:  |  |                |
|  |                                    |                | - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>8) 12)</sup>  |  | NC             |
|  |                                    |                | <b>Electrical connection/cable entry</b>  |  |                |
|  |                                    |                | • Screwed gland M20 x 1.5   |  | B              |
|  |                                    |                | • Screwed gland ½-14 NPT  |  | C              |
|  |                                    |                | • M12 device plugs (stainless steel) <sup>13) 14)</sup>   |  | F              |
|  |                                    |                | <b>Display</b>  |  |                |
|  |                                    |                | • Without display   |  | 0              |
|  |                                    |                | • Without visible display (display concealed, setting: bar)   |  | 1              |
|  |                                    |                | • With visible display (setting: bar)   |  | 6              |
|  |                                    |                | • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)   |  | 7              |
| <b>Nominal measuring range</b>   |                                    |                | A quick-start guide is included in the scope of delivery of the device.   |  |                |
| 250 mbar a   | (3.63 psi a)                       | D              | 1) For oxygen application, add Order code E10.  |  |                |
| 1300 mbar a  | (18.86 psi a)                      | F              | 2) Available soon   |  |                |
| 5 bar a  | (72.5 psi a)                       | G              | 3) Version 7MF4233-1DY... only up to max. span 200 mbar a (2.9 psi a).  |  |                |
| 30 bar a   | (435 psi a)                        | H              | 4) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here. |  |                |
| 160 bar a <sup>2)</sup>  | (2 321 psi a)                      | L              | 5) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.   |  |                |
| 400 bar a <sup>2)</sup>  | (5 802 psi a)                      | M              | 6) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF423-...Y... and 7MF4900-1...-B   |  |                |
| 700 bar a <sup>2)</sup>  | (10 153 psi a)                     | N              | 7) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.  |  |                |
| <b>Wetted parts materials</b>  |                                    |                | 8) Without cable gland, with blanking plug.   |  |                |
| Seal diaphragm   | Process connection                 |                | 9) With enclosed cable gland Ex ia and blanking plug.   |  |                |
| Stainless steel  | Stainless steel                    | A              | 10) Configurations with Han and M12 device plugs are only available in Ex ic.   |  |                |
| Hastelloy  | Stainless steel                    | B              | 11) Only in connection with IP66.   |  |                |
| Hastelloy  | Hastelloy                          | C              | 12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.   |  |                |
| Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" (recommended version) <sup>3) 4) 5) 6) 7)</sup> |                                    | Y 1            | 13) Only in connection with Ex approval A, B, E or F.   |  |                |
| Version for diaphragm seals in conjunction with process connector "G½B connection shank" <sup>3) 4) 5) 6) 7)</sup>                         |                                    | Y 0            | 14) M12 delivered without cable socket.   |  |                |
| <b>Process connection</b>  |                                    |                |   |  |                |
| • Connection shank G½B to EN 837-1   |                                    | 0              |   |  |                |
| • Female thread ½-14 NPT   |                                    | 1              |   |  |                |
| • Stainless steel oval flange with process connection (Oval flange has no female thread)   |                                    |                |   |  |                |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518  |                                    | 2              |   |  |                |
| - Mounting thread M10 to DIN 19213   |                                    | 3              |   |  |                |
| - Mounting thread M12 to DIN 19213   |                                    | 4              |   |  |                |
| • Male thread M20 x 1.5  |                                    | 5              |   |  |                |
| • Male thread ½-14 NPT   |                                    | 6              |   |  |                |
| <b>Non-wetted parts materials</b>  |                                    |                |   |  |                |
| • Housing made of die-cast aluminium   |                                    | 0              |   |  |                |
| • Housing stainless steel precision casting  |                                    | 3              |   |  |                |
| <b>Version</b>   |                                    |                |   |  |                |
| • Standard version, German plate inscription, setting for pressure unit: bar   |                                    | 1              |   |  |                |
| • International version, English plate inscription, setting for pressure unit: bar   |                                    | 2              |   |  |                |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal  |                                    | 3              |   |  |                |
| All versions include DVD with compact operating instructions in various EU languages.  |                                    |                |   |  |                |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from gauge pressure series)

1

| Selection and Ordering data   | Order code        |             |           |           |
|---|-------------------|-------------|-----------|-----------|
| <b>Further designs</b>  |                   | <b>HART</b> | <b>PA</b> | <b>FF</b> |
| Add "-Z" to Article No. and specify Order code.   |                   |             |           |           |
| <b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>             |                   |             |           |           |
| • Steel   | A01               | ✓           | ✓         | ✓         |
| • Stainless steel 304   | A02               | ✓           | ✓         | ✓         |
| • Stainless steel 316L  | A03               | ✓           | ✓         | ✓         |
| <b>Device plugs<sup>1)</sup></b>  |                   |             |           |           |
| • Han 7D (metal)  | A30               | ✓           |           |           |
| • Han 8D (instead of Han 7D)  | A31               | ✓           |           |           |
| • Angled  | A32               | ✓           |           |           |
| • Han 8D (metal)  | A33               | ✓           |           |           |
| <b>Cable sockets for M12 device plugs (metal (CuZn))</b>  | A50               | ✓           | ✓         | ✓         |
| <b>Rating plate inscription</b> (instead of German)   |                   |             |           |           |
| • English   | B11               | ✓           | ✓         | ✓         |
| • French  | B12               | ✓           | ✓         | ✓         |
| • Spanish   | B13               | ✓           | ✓         | ✓         |
| • Italian   | B14               | ✓           | ✓         | ✓         |
| • Cyrillic (russian)  | B16               | ✓           | ✓         | ✓         |
| <b>English rating plate</b>   | B21               | ✓           | ✓         | ✓         |
| Pressure units in inH <sub>2</sub> O and/or psi   |                   |             |           |           |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>2)</sup></b>                                       | C11               | ✓           | ✓         | ✓         |
| <b>Inspection certificate<sup>3)</sup></b>  | C12               | ✓           | ✓         | ✓         |
| Acc. to EN 10204-3.1  |                   |             |           |           |
| <b>Factory certificate</b>  | C14               | ✓           | ✓         | ✓         |
| Acc. to EN 10204-2.2  |                   |             |           |           |
| <b>Acceptance certificate (EN 10204-3.1)</b>  | C15               | ✓           | ✓         | ✓         |
| PMI test of parts in contact with medium  |                   |             |           |           |
| <b>Functional safety (SIL2)</b>   | C20               | ✓           |           |           |
| Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration  |                   |             |           |           |
| <b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>   | C21 <sup>4)</sup> |             | ✓         |           |
| <b>Functional safety (SIL2/3)</b>   | C23               | ✓           |           |           |
| Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration  |                   |             |           |           |
| <b>PED for Russia with initial calibration mark</b>   | C99               | ✓           | ✓         | ✓         |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>  | D05               | ✓           |           |           |
| <b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>  | D07               | ✓           | ✓         | ✓         |
| <b>Degree of protection IP66/IP68</b> (only for M20 x 1.5 and ½-14 NPT)   | D12               | ✓           | ✓         | ✓         |
| <b>Supplied with oval flange</b> (1 item), PTFE packing and screws in thread of oval flange   | D37               | ✓           | ✓         | ✓         |
| <b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>   | D59               | ✓           | ✓         | ✓         |
| <b>Use in or on zone 1D/2D<sup>5)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP65) | E01               | ✓           | ✓         | ✓         |
| <b>Oxygen application</b> (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))                               | E10               | ✓           | ✓         | ✓         |
| <b>Export approval Korea</b>  | E11               | ✓           | ✓         | ✓         |

| Selection and Ordering data  | Order code        |             |           |           |
|--|-------------------|-------------|-----------|-----------|
| <b>Further designs</b>   |                   | <b>HART</b> | <b>PA</b> | <b>FF</b> |
| Add "-Z" to Article No. and specify Order code.  |                   |             |           |           |
| <b>CRN approval Canada</b> (Canadian Registration Number)  | E22 <sup>6)</sup> | ✓           | ✓         | ✓         |
| <b>Dual seal</b>   | E24               | ✓           | ✓         | ✓         |
| <b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-B..)                                   | E25 <sup>7)</sup> | ✓           | ✓         | ✓         |
| <b>"Flameproof" explosion protection according to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-D..)                                  | E26 <sup>7)</sup> | ✓           | ✓         | ✓         |
| <b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-P..)                            | E28 <sup>7)</sup> | ✓           | ✓         |           |
| <b>Ex Approval IEC Ex (Ex ia)</b> (only for transmitter 7MF4...-.....-B..)   | E45 <sup>7)</sup> | ✓           | ✓         | ✓         |
| <b>Ex Approval IEC Ex (Ex d)</b> (only for transmitter 7MF4...-.....-D..)  | E46 <sup>7)</sup> | ✓           | ✓         | ✓         |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)  | E55 <sup>7)</sup> | ✓           | ✓         | ✓         |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)  | E56 <sup>7)</sup> | ✓           | ✓         | ✓         |
| <b>Explosion-proof "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)  | E57 <sup>7)</sup> | ✓           | ✓         | ✓         |
| <b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)                                      | E58 <sup>7)</sup> | ✓           | ✓         | ✓         |
| <b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (only for transmitter 7MF4...-.....-[B, D]..-Z + E11) | E70 <sup>7)</sup> | ✓           | ✓         | ✓         |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b>  | E80               | ✓           | ✓         | ✓         |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b>   | E81               | ✓           | ✓         | ✓         |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>  | E82               | ✓           | ✓         | ✓         |
| <b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>  | E83               | ✓           | ✓         | ✓         |
| <b>Two coats of lacquer on casing and cover (PU on epoxy)</b>  | G10               | ✓           | ✓         | ✓         |
| <b>Transient protector 6 kV (lightning protect.)</b>   | J01               | ✓           | ✓         | ✓         |
| <b>Oval flange NAM (ASTAVA)</b>  | J06               | ✓           | ✓         | ✓         |
| <b>Marine approvals</b>  |                   |             |           |           |
| • Det Norske Veritas Germanischer Lloyd (DNV-GL)   | S10               | ✓           | ✓         | ✓         |
| • Lloyds Register (LR)   | S11               | ✓           | ✓         | ✓         |
| • French marine classification society Bureau Veritas (BV)   | S12               | ✓           | ✓         | ✓         |
| • American Bureau of Shipping (ABS)  | S14               | ✓           | ✓         | ✓         |
| • Russian Maritime Register (RMR)  | S16               | ✓           | ✓         | ✓         |
| • Korean Register of Shipping (KR)   | S17               | ✓           | ✓         | ✓         |

<sup>1)</sup> Han device plug IP65

<sup>2)</sup> When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

<sup>3)</sup> If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

<sup>4)</sup> Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H.

<sup>5)</sup> Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

<sup>6)</sup> Cannot be ordered with remote seal.

<sup>7)</sup> When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for absolute pressure (from gauge pressure series)

1

| Selection and Ordering data   | Order code |      |                 |    |
|---|------------|------|-----------------|----|
| Additional data   |            | HART | PA              | FF |
| Please add "-Z" to Article No. and specify Order code(s) and plain text.  |            |      |                 |    |
| <b>Measuring range to be set</b><br>Specify in plain text (max. 5 characters):<br>Y01: ... up to ... mbar a, bar a, kPa <sub>abs</sub> , MPa <sub>abs</sub> , psi a <sup>2)</sup>   | Y01        | ✓    | ✓ <sup>1)</sup> |    |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....   | Y15        | ✓    | ✓               | ✓  |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 characters, specify in plain text:<br>Y16: .....  | Y16        | ✓    | ✓               | ✓  |
| <b>Entry of HART address (TAG)</b><br>Max. 8 characters, specify in plain text:<br>Y17: .....   | Y17        | ✓    |                 |    |
| <b>Setting of pressure indication in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>*)</sup> , inH <sub>2</sub> O <sup>*)</sup> , ftH <sub>2</sub> O <sup>*)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>*) ref. temperature 20 °C | Y21        | ✓    | ✓               | ✓  |
| <b>Setting of pressure indication in non-pressure units<sup>3)</sup></b><br>Specify in plain text:<br>Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)  | Y22 + Y01  | ✓    |                 |    |
| <b>Preset bus address</b><br>possible between 1 and 126<br>Specify in plain text:<br>Y25: .....   | Y25        |      | ✓               | ✓  |
| <b>Damping adjustment in seconds (0 ... 100 s)</b>  | Y30        | ✓    | ✓               | ✓  |

Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

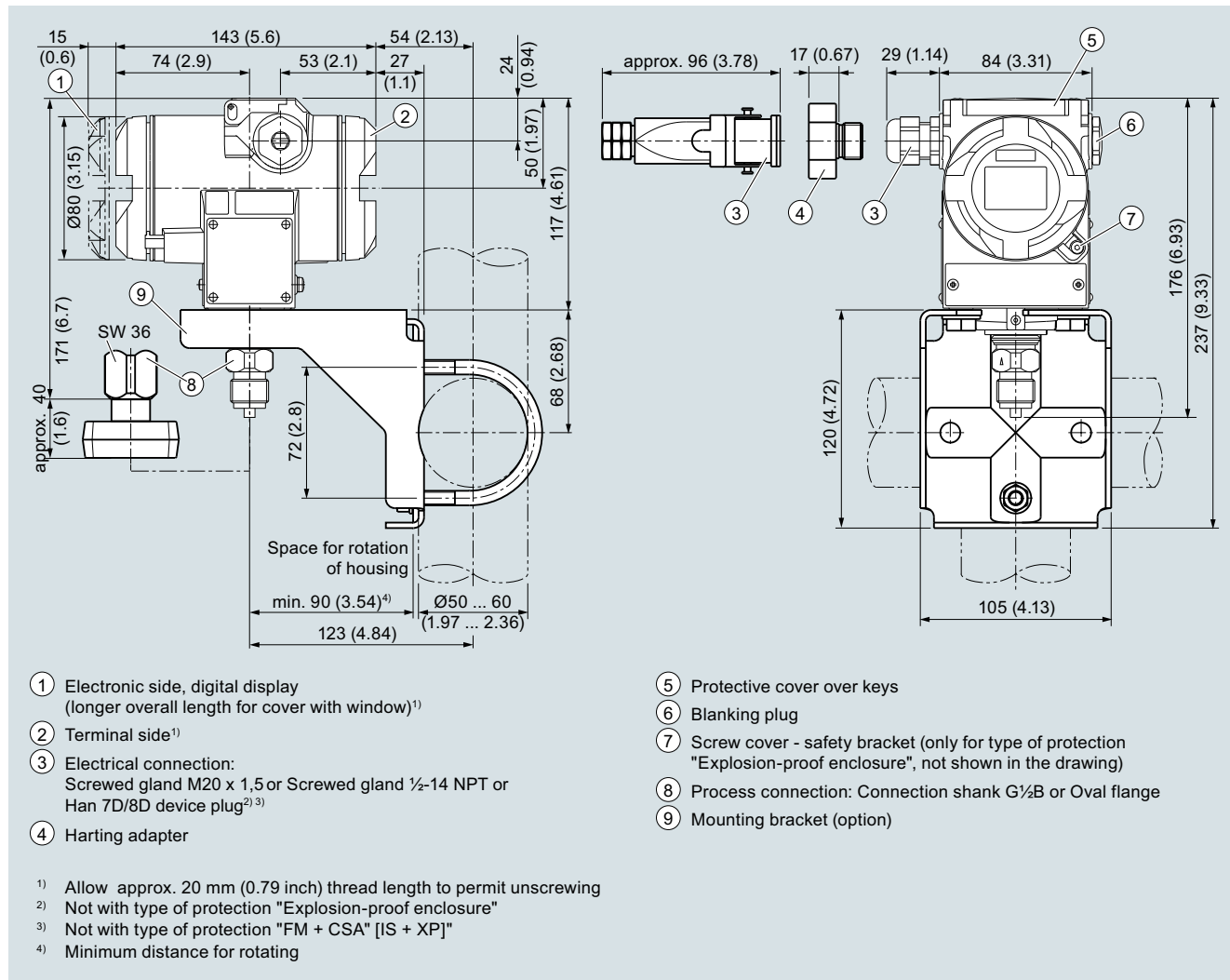
2) Only absolute pressure units selectable. Negative pressure values not permitted.

3) Preset values can only be changed over SIMATIC PDM.

## Transmitters for applications with advanced requirements (Advanced)

for absolute pressure (from gauge pressure series)

## Dimensional drawings



SITRANS P DS III pressure transmitters for absolute pressure, from the pressure series, dimensions in mm (inch)

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for absolute pressure (from differential pressure series)

1

#### Technical specifications

##### SITRANS P, DS III for absolute pressure (from the differential pressure series)

###### Input

Measured variable

Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

Absolute pressure

###### HART

###### PROFIBUS PA/ FOUNDATION Fieldbus

Span

Nominal measuring range

Max. operating pressure MAWP (PS)

8.34 ... 250 mbar a  
0.834 ... 25 kPa a  
3 ... 100 inH<sub>2</sub>O a

250 mbar a  
25 kPa a  
100 inH<sub>2</sub>O a

32 bar a  
3.2 MPa a  
464 psi a

43.34 ... 1300 mbar a  
4.33 ... 130 kPa a  
17 ... 525 inH<sub>2</sub>O a

1300 mbar a  
130 kPa a  
525 inH<sub>2</sub>O a

32 bar a  
3.2 MPa a  
464 psi a

170 ... 5000 mbar a  
17 ... 500 kPa a  
2.43 ... 72.5 psi a

5000 mbar a  
500 kPa a  
72.5 psi a

32 bar a  
3.2 MPa a  
464 psi a

1 ... 30 bar a  
0.1 ... 3 MPa a  
14.6 ... 435 psi a

30 bar a  
3 MPa a  
435 psi a

160 bar a  
16 MPa a  
2320 psi a

5.3 ... 100 bar a  
0.5 ... 10 MPa a  
76.9 ... 1450 psi a

100 bar a  
10 MPa a  
1450 psi a

160 bar a  
16 MPa a  
2320 psi a

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

0 mbar a/0 kPa a/0 psi a

- for process temperature  $-20\text{ °C} < \vartheta \leq +60\text{ °C}$   
( $-4\text{ °F} < \vartheta \leq +140\text{ °F}$ )

30 mbar a/3 kPa a/0.44 psi a

- for process temperature  
 $60\text{ °C} < \vartheta \leq +100\text{ °C}$  (max. 85 °C for measuring cell 30 bar)  
( $140\text{ °F} < \vartheta \leq +212\text{ °F}$  (max. 185 °F for measuring cell 435 psi))

$30\text{ mbar a} + 20\text{ mbar a} \cdot (\vartheta - 60\text{ °C})/\text{°C}$   
 $3\text{ kPa a} + 2\text{ kPa a} \cdot (\vartheta - 60\text{ °C})/\text{°C}$   
 $0.44\text{ psi a} + 0.29\text{ psi a} \cdot (\vartheta - 140\text{ °F})/\text{°F}$

Upper measuring limit

100 % of max. span  
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F)  
ambient temperature/process temperature)

Start of scale value

Between the measuring limits (fully adjustable)

###### Output

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

-

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

-

Load

- Without HART

$R_B \leq (U_H - 10.5\text{ V})/0.023\text{ A}$  in  $\Omega$ ,  
 $U_H$ : Power supply in V

-

- With HART

$R_B = 230 \dots 500\ \Omega$  (SIMATIC PDM) or  
 $R_B = 230 \dots 1100\ \Omega$  (HART Communicator)

-

Physical bus

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal.  
Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

1

## for absolute pressure (from differential pressure series)

### SITRANS P, DS III for absolute pressure (from the differential pressure series)

#### Measuring accuracy

Reference conditions  
(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl.  
hysteresis and reproducibility

- Linear characteristic

-  $r \leq 10$

$\leq 0.1 \%$

-  $10 < r \leq 30$

$\leq 0.2 \%$

Influence of ambient temperature  
(in percent per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a

$\leq (0.15 \cdot r + 0.1) \%$

- 1300 mbar a/130 kPa a/18.8 psi a  
5 bar a/500 kPa a/72.5 psi a  
30 bar a/3000 kPa a/435 psi a  
100 bar a/10 MPa a/1450 psi a

$\leq (0.08 \cdot r + 0.16) \%$

Long-term stability  
(temperature change  $\pm 30$  °C ( $\pm 54$  °F))

$\leq (0.25 \cdot r) \%$  in 5 years

Effect of mounting position (in pressure per change in angle)

$\leq 0.7 \text{ mbar}/0.07 \text{ kPa}/0.001015 \text{ psi}$  per 10° inclination  
(zero point correction is possible with position error compensation)

Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and  
FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of nominal measuring range

#### Rated conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %  
Condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

**SITRANS P, DS III for absolute pressure (from the differential pressure series)****Design**

|                                     |   |
|-------------------------------------|---|
| Weight (without options)            | ≈ 4.5 kg (≈ 9.9 (lb))   |
| Enclosure material                  | Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408                                 |
| Wetted parts materials              |   |
| • Seal diaphragm                    | Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold            |
| • Process flanges and sealing screw | Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602 or Monel, mat. no. 2.4360                                     |
| • O-Ring                            | FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR  |
| Measuring cell filling              | Silicone oil or inert filling liquid<br>(maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F)) |
| Process connection                  | 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518               |
| Material of mounting bracket        |   |
| • Steel                             | Sheet-steel, Mat. No. 1.0330, chrome-plated   |
| • Stainless steel 304               | Sheet stainless steel, mat. no. 1.4301 (SS 304)   |
| • Stainless steel 316L              | Sheet stainless steel, mat. no. 1.4404 (SS 316L)  |

**Power supply  $U_H$** 

|   | <b>HART</b>   | <b>PROFIBUS PA/FOUNDATION Fieldbus</b> |
|---|---|--|
| Terminal voltage on transmitter                 | 10.5 ... 45 V DC<br>10.5 ... 30 V DC in intrinsically-safe mode | -                                      |
| Power supply                                    |   | Supplied through bus                   |
| Separate 24 V power supply necessary            | -   | No                                     |
| Bus voltage                                     |   |  |
| • Not Ex  | -   | 9 ... 32 V                             |
| • With intrinsically-safe operation             | -   | 9 ... 24 V                             |
| Current consumption                             |   |  |
| • Basic current (max.)                          | -   | 12.5 mA                                |
| • Start-up current ≤ basic current              | -   | Yes                                    |
| • Max. current in event of fault                | -   | 15.5 mA                                |
| Fault disconnection electronics (FDE) available | -   | Yes                                    |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

| SITRANS P, DS III for absolute pressure (from the differential pressure series) |   |  |
|---|---|--|
| Certificates and approvals  | HART  | PROFIBUS PA/ FOUNDATION Field-bus  |
| Classification according to PED 2014/68/EU                                      | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)                                |  |
| Explosion protection  | PTB 13 ATEX 2007 X  |  |
| • Intrinsic safety "i"  | Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb   |  |
| - Marking   | -40 ... +85 °C (-40 ... +185 °F) temperature class T4;<br>-40 ... +70 °C (-40 ... +158 °F) temperature class T5;<br>-40 ... +60 °C (-40 ... +140 °F) temperature class T6 |  |
| - Permissible ambient temperature   |   |  |
| - Connection  | To certified intrinsically-safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ ,<br>$P_i = 750 \text{ mW}$ ; $R_i = 300 \Omega$              | FISCO supply unit:<br>$U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$<br>Linear barrier:<br>$U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1.2 \text{ W}$ |
| - Effective internal inductance/capacitance                                     | $L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$   | $L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$   |
| • Explosion-proof "d"   | PTB 99 ATEX 1160  |  |
| - Marking   | Ex II 1/2 G Ex d IIC T4/T6 Gb   |  |
| - Permissible ambient temperature   | -40 ... +85 °C (-40 ... +185 °F) temperature class T4;<br>-40 ... +60 °C (-40 ... +140 °F) temperature class T6   |  |
| - Connection  | To circuits with values:<br>$U_H = 10.5 \dots 45 \text{ V DC}$  | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$   |
| • Dust explosion protection for zone 20   | PTB 01 ATEX 2055  |  |
| - Marking   | Ex II 1 D Ex ta IIIC T120°C Da<br>Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db  |  |
| - Permissible ambient temperature   | -40 ... +85 °C (-40 ... +185 °F)  |  |
| - Max. surface temperature  | 120 °C (248 °F)   |  |
| - Connection  | To certified intrinsically-safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ ,<br>$P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$              | FISCO supply unit:<br>$U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$<br>Linear barrier:<br>$U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1.2 \text{ W}$ |
| - Effective internal inductance/capacitance                                     | $L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$   | $L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$   |
| • Dust explosion protection for zone 21/22                                      | PTB 01 ATEX 2055  |  |
| - Marking   | Ex II 2 D Ex tb IIIC T120°C Db  |  |
| - Connection  | To circuits with values:<br>$U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\max} = 1.2 \text{ W}$   | To circuits with values:<br>$U_H = 9 \dots 32 \text{ V DC}$ ; $P_{\max} = 1 \text{ W}$   |
| • Type of protection "n" (zone 2)   | PTB 13 ATEX 2007 X  |  |
| - Marking   | Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc<br>Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc  |  |
| - Connection (Ex nA)  | $U_m = 45 \text{ V}$  | $U_m = 32 \text{ V}$   |
| - Connection (Ex ic)  | To circuits with values:<br>$U_i = 45 \text{ V}$  | FISCO supply unit ic:<br>$U_o = 17.5 \text{ V}$ , $I_o = 570 \text{ mA}$<br>Linear barrier:<br>$U_o = 32 \text{ V}$ , $I_o = 132 \text{ mA}$ , $P_o = 1 \text{ W}$                         |
| - Effective internal inductance/capacitance                                     | $L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$   | $L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$   |
| • Explosion protection acc. to FM   | Certificate of Compliance 3008490   |  |
| - Identification (XP/DIP) or (IS); (NI)   | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III                    |  |
| • Explosion protection to CSA   | Certificate of Compliance 1153651   |  |
| - Identification (XP/DIP) or (IS)   | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III                                  |  |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for absolute pressure (from differential pressure series)

1

|   |  |  |   |
|---|--|--|---|
| <b>HART communication</b>   |  | <b>FOUNDATION Fieldbus communication</b>   |   |
| HART  | 230 ... 1100 Ω   | Function blocks  | 3 function blocks analog input, 1 function block PID                    |
| Protocol  | HART Version 5.x   |  |   |
| Software for computer   | SIMATIC PDM  |  |   |
| <b>PROFIBUS PA communication</b>  |  | • Analog input   | Yes, linearly rising or falling characteristic                          |
| Simultaneous communication with master class 2 (max.)                           | 4  | - Adaptation to customer-specific process variables  | 0 to 100 s  |
| The address can be set using  | Configuration tool or local operation (standard setting address 126)                                   | - Electrical damping, adjustable   | Output/input (can be locked within the device with a bridge)            |
| Cyclic data usage   |  | - Simulation function  | parameterizable (last good value, substitute value, incorrect value)    |
| • Output byte   | 5 (one measured value) or 10 (two measured values)   | - Failure mode   | Yes, one upper and lower warning limit and one alarm limit respectively |
| • Input byte  | 0, 1, or 2 (register operating mode and reset function for metering)                                   | - Limit monitoring   | Yes   |
| Internal preprocessing  |  | - Square-rooted characteristic for flow measurement  | Standard FOUNDATION Fieldbus function block                             |
| Device profile  | PROFIBUS PA Profile for Process Control Devices Version 3.0, class B                                   | • PID  | 1 resource block  |
| Function blocks   | 2  | • Physical block   | 1 transducer block Pressure with calibration, 1 transducer block LCD    |
| • Analog input  |  | Transducer blocks  |   |
| - Adaptation to customer-specific process variables                             | Yes, linearly rising or falling characteristic   | • Pressure transducer block  |   |
| - Electrical damping, adjustable  | 0 ... 100 s  | - Can be calibrated by applying two pressures  | Yes   |
| - Simulation function   | Input /Output  | - Monitoring of sensor limits  | Yes   |
| - Failure mode  | parameterizable (last good value, substitute value, incorrect value)                                   | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function                    |
| - Limit monitoring  | Yes, one upper and lower warning limit and one alarm limit respectively                                |  |   |
| • Register (totalizer)  | Can be reset, preset, optional direction of counting, simulation function of register output           |  |   |
| - Failure mode  | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |  |   |
| - Limit monitoring  | One upper and lower warning limit and one alarm limit respectively                                     |  |   |
| • Physical block  | 1  |  |   |
| Transducer blocks   | 2  |  |   |
| • Pressure transducer block   |  |  |   |
| - Can be calibrated by applying two pressures                                   | Yes  |  |   |
| - Monitoring of sensor limits   | Yes  |  |   |
| - Specification of a container characteristic with                              | Max. 30 nodes  |  |   |
| - Square-rooted characteristic for flow measurement                             | Yes  |  |   |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable  |  |   |
| - Simulation function for measured pressure value and sensor temperature        | Constant value or over parameterizable ramp function   |  |   |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

1

| Selection and Ordering data  |   | Article No.      |
|--|---|------------------|
| <b>Pressure transmitters for absolute pressure from differential pressure series, SITRANS P DS III with HART</b>           |   | <b>7MF4333 -</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>                        |   |                  |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b>                  |                  |
| Silicone oil   | normal  | 1                |
| Inert liquid <sup>1)</sup>   | grease-free to cleanliness level 2              | 3                |
| <b>Measuring span (min. ... max.)</b>  |   |                  |
| 8.34 ... 250 mbar a  | (0.13 ... 3.63 psi a)                           | D                |
| 43.34 ... 1300 mbar a  | (0.63 ... 18.86 psi a)                          | F                |
| 0.17 ... 5 bar a   | (2.43 ... 72.5 psi a)                           | G                |
| 1 ... 30 bar a   | (14.6 ... 435 psi a)                            | H                |
| 5.3 ... 100 bar a  | (76.9 ... 1450 psi a)                           | KE               |
| <b>Wetted parts materials</b>  |   |                  |
| Seal diaphragm   | Parts of measuring cell                         |                  |
| Stainless steel  | Stainless steel                                 | A                |
| Hastelloy  | Stainless steel                                 | B                |
| Hastelloy  | Hastelloy                                       | C                |
| Tantalum   | Tantalum  | E                |
| Monel  | Monel   | H                |
| Gold   | Gold  | L                |
| Version for diaphragm seal <sup>2) 3) 4) 5) 6)</sup>   |   | Y                |
| <b>Process connection</b>  |   |                  |
| Female thread 1/4-18 NPT with flange connection  |   |                  |
| • Sealing screw opposite process connection  |   |                  |
| - Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518   |   | 2                |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement)  |   | 0                |
| • Vent on side of process flange <sup>7)</sup>   |   |                  |
| - Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518   |   | 6                |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement)  |   | 4                |
| <b>Non-wetted parts materials</b>  |   |                  |
| process flange screws  | Electronics housing                             |                  |
| Stainless steel  | Die-cast aluminum                               | 2                |
| Stainless steel  | Stainless steel precision casting <sup>8)</sup> | 3                |
| <b>Version</b>   |   |                  |
| • Standard version, German plate inscription, setting for pressure unit: bar   |   | 1                |
| • International version, English plate inscription, setting for pressure unit: bar   |   | 2                |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal  |   | 3                |
| All versions include DVD with compact operating instructions in various EU languages.                                      |   |                  |
| <b>Explosion protection</b>  |   |                  |
| • None   |   | A                |
| • With ATEX, Type of protection:   |   |                  |
| - "Intrinsic safety (Ex ia)"   |   | B                |
| - "Explosion-proof (Ex d)" <sup>9)</sup>   |   | D                |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" <sup>10)</sup>   |   | P                |
| - "Ex nA/ic (Zone 2)" <sup>11)</sup>   |   | E                |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)" <sup>10)12)</sup> |   | R                |
| • FM + CSA intrinsic safe (is) <sup>13)</sup>  |   | F                |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>10)12)13)</sup>   |   | S                |
| • With FM + CSA, Type of protection:   |   |                  |
| - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>9)13)</sup>  |   | NC               |

| Selection and Ordering data  |  | Article No.      |
|--|--|------------------|
| <b>Pressure transmitters for absolute pressure from differential pressure series, SITRANS P DS III with HART</b> |  | <b>7MF4333 -</b> |
| <b>Electrical connection/cable entry</b>   |  |                  |
| • Screwed gland M20 x 1.5  |  | B                |
| • Screwed gland 1/2-14 NPT   |  | C                |
| • Han 7D device plug (plastic housing) incl. mating connector <sup>14)</sup>                                     |  | D                |
| • M12 device plugs (stainless steel) <sup>15) 16)</sup>  |  | F                |
| <b>Display</b>   |  |                  |
| • Without display  |  | 0                |
| • Without visible display (display concealed, setting: mA)   |  | 1                |
| • With visible display (setting: mA)   |  | 6                |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)                      |  | 7                |

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- For oxygen applications, add Order code E10.
- Version 7MF4333-1DY... only up to max. span 200 mbar a (2.9 psi a).
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF433-...Y... and 7MF4900-1...-B
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Not for span "5.3 ... 100 bar a (76.9 ... 1450 psi a)". Position of the top vent valve in the process flange (see dimensional drawing).
- Not in conjunction with Electrical connection "Han 7D device plug".
- Without cable gland, with blanking plug
- With enclosed cable gland Ex ia and blanking plug
- Configurations with Han and M12 device plugs are only available in Ex ic.
- Only in connection with IP66.
- Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- Only in connection with Ex approval A, B or E.
- Only in connection with Ex approval A, B, E or F.
- M12 delivered without cable socket.

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for absolute pressure (from differential pressure series)

1

| Selection and Ordering data   |                                    | Article No. |  |
|---|------------------------------------|-------------|--|
| <b>Pressure transmitter for absolute pressure from differential pressure series</b>   |                                    |             |  |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>   |                                    | 7MF4334-    |  |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>   |                                    | 7MF4335-    |  |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |                                    |             |  |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b>     |             |  |
| Silicone oil  | normal                             | 1           |  |
| Inert liquid <sup>1)</sup>  | grease-free to cleanliness level 2 | 3           |  |
| <b>Nominal measuring range</b>  |                                    |             |  |
| 250 mbar a  | (3.63 psi a)                       | D           |  |
| 1300 mbar a   | (18.86 psi a)                      | F           |  |
| 5 bar a   | (72.5 psi a)                       | G           |  |
| 30 bar a  | (435 psi a)                        | H           |  |
| 100 bar a   | (1450 psi a)                       | KE          |  |
| <b>Wetted parts materials</b>   |                                    |             |  |
| Seal diaphragm  | Parts of measuring cell            |             |  |
| Stainless steel   | Stainless steel                    | A           |  |
| Hastelloy   | Stainless steel                    | B           |  |
| Hastelloy   | Hastelloy                          | C           |  |
| Tantalum  | Tantalum                           | E           |  |
| Monel   | Monel                              | H           |  |
| Gold  | Gold                               | L           |  |
| Version as diaphragm seal 2) 3) 4) 5) 6)  |                                    | Y           |  |
| <b>Process connection</b>   |                                    |             |  |
| Female thread 1/4-18 NPT with flange connection   |                                    |             |  |
| <ul style="list-style-type: none"> <li>Sealing screw opposite process connection               <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> </ul> </li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul>   |                                    | 2           |  |
| <ul style="list-style-type: none"> <li>Vent on side of process flange<sup>7)</sup> <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> </ul> </li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul>   |                                    | 0           |  |
|   |                                    | 6           |  |
|   |                                    | 4           |  |
| <b>Non-wetted parts materials</b>   |                                    |             |  |
| process flange screws   | Electronics housing                |             |  |
| Stainless steel   | Die-cast aluminum                  | 2           |  |
| Stainless steel   | Stainless steel precision casting  | 3           |  |
| <b>Version</b>  |                                    |             |  |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> </ul>  |                                    | 1           |  |
| <ul style="list-style-type: none"> <li>International version, English plate inscription, setting for pressure unit: bar</li> </ul>  |                                    | 2           |  |
| <ul style="list-style-type: none"> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>   |                                    | 3           |  |
| All versions include DVD with compact operating instructions in various EU languages.   |                                    |             |  |
| <b>Explosion protection</b>   |                                    |             |  |
| <ul style="list-style-type: none"> <li>None</li> </ul>  |                                    | A           |  |
| <ul style="list-style-type: none"> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>8)</sup></li> <li>"Intrinsic safety and flameproof enclosure (Ex ia + Ex d)"<sup>9)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>10)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"<sup>9) 11)</sup></li> </ul> </li> </ul> |                                    | B           |  |
|   |                                    | D           |  |
|   |                                    | P           |  |
|   |                                    | E           |  |
|   |                                    | R           |  |
| <ul style="list-style-type: none"> <li>FM + CSA intrinsic safe (is)<sup>12)</sup></li> </ul>  |                                    | F           |  |
| <ul style="list-style-type: none"> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>9) 11) 12)</sup></li> </ul>  |                                    | S           |  |
| <ul style="list-style-type: none"> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>8) 12)</sup></li> </ul> </li> </ul>   |                                    | NC          |  |

| Selection and Ordering data   |  | Article No. |  |
|---|--|-------------|--|
| <b>Pressure transmitter for absolute pressure from differential pressure series</b>   |  |             |  |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>   |  | 7MF4334-    |  |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>   |  | 7MF4335-    |  |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |  |             |  |
| <b>Electrical connection/cable entry</b>  |  |             |  |
| <ul style="list-style-type: none"> <li>Screwed gland M20 x 1.5</li> <li>Screwed gland 1/2-14 NPT</li> <li>M12 device plugs (stainless steel)<sup>13) 14)</sup></li> </ul> |  | B           |  |
|   |  | C           |  |
|   |  | F           |  |
| <b>Display</b>  |  |             |  |
| <ul style="list-style-type: none"> <li>Without display</li> </ul>   |  | 0           |  |
| <ul style="list-style-type: none"> <li>Without visible display (display concealed, setting: bar)</li> </ul>   |  | 1           |  |
| <ul style="list-style-type: none"> <li>With visible display (setting: bar)</li> </ul>   |  | 6           |  |
| <ul style="list-style-type: none"> <li>With customer-specific display (setting as specified, Order code "Y21" required)</li> </ul>  |  | 7           |  |

Included in delivery of the device:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- For oxygen application, add Order code E10.
- Version 7MF4334-1DY... only up to max. span 200 mbar a (80 inH<sub>2</sub>O a).
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1. is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF433-...Y... and 7MF4900-1...-B
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Not for nominal measuring range 100 bar a (1450 psi a). Position of the top vent valve in the process flange (see dimensional drawing).
- Without cable gland, with blanking plug
- With enclosed cable gland Ex ia and blanking plug
- Configurations with Han and M12 device plugs are only available in Ex ic.
- Only in connection with IP66.
- Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) Only in connection with Ex approval A, B, E or F.
- M12 delivered without cable socket

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P DS III

for absolute pressure (from differential pressure series)

1

| Selection and Ordering data   |     | Order code        |      |    |    |
|---|-----|-------------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |     |                   | HART | PA | FF |
| <b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b> |     |                   |      |    |    |
| • Steel   | A01 | ✓                 | ✓    | ✓  |    |
| • Stainless steel 304   | A02 | ✓                 | ✓    | ✓  |    |
| • Stainless steel 316L  | A03 | ✓                 | ✓    | ✓  |    |
| <b>O-rings for process flanges</b><br>(instead of FPM (Viton))  |     |                   |      |    |    |
| • PTFE (Teflon)   | A20 | ✓                 | ✓    | ✓  |    |
| • FEP (with silicone core, approved for food)   | A21 | ✓                 | ✓    | ✓  |    |
| • FFP (Kalrez, compound 4079), for measured medium temperatures -15 ... 100 °C (5 ... 212 °F)   | A22 | ✓                 | ✓    | ✓  |    |
| • NBR (Buna N)  | A23 | ✓                 | ✓    | ✓  |    |
| <b>Device plugs<sup>1)</sup></b>  |     |                   |      |    |    |
| • Han 7D (metal)  | A30 | ✓                 |      |    |    |
| • Han 8D (instead of Han 7D)  | A31 | ✓                 |      |    |    |
| • Angled  | A32 | ✓                 |      |    |    |
| • Han 8D (metal)  | A33 | ✓                 |      |    |    |
| <b>Sealing screw</b><br>1/4-18 NPT, with valve in mat. of process flanges   |     | A40               | ✓    | ✓  | ✓  |
| <b>Cable sockets for M12 device plugs (metal (CuZn))</b>  |     | A50               | ✓    | ✓  | ✓  |
| <b>Rating plate inscription</b><br>(instead of German)  |     |                   |      |    |    |
| • English   | B11 | ✓                 | ✓    | ✓  |    |
| • French  | B12 | ✓                 | ✓    | ✓  |    |
| • Spanish   | B13 | ✓                 | ✓    | ✓  |    |
| • Italian   | B14 | ✓                 | ✓    | ✓  |    |
| • Cyrillic (russian)  | B16 | ✓                 | ✓    | ✓  |    |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi  |     | B21               | ✓    | ✓  | ✓  |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>2)</sup></b>                           |     | C11               | ✓    | ✓  | ✓  |
| <b>Inspection certificate<sup>3)</sup></b><br>Acc. to EN 10204-3.1  |     | C12               | ✓    | ✓  | ✓  |
| <b>Factory certificate</b><br>Acc. to EN 10204-2.2  |     | C14               | ✓    | ✓  | ✓  |
| <b>Acceptance certificate (EN 10204-3.1)</b><br>PMI test of parts in contact with medium  |     | C15               | ✓    | ✓  | ✓  |
| <b>Functional safety (SIL2)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration     |     | C20               | ✓    |    |    |
| <b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>   |     | C21 <sup>4)</sup> |      | ✓  |    |
| <b>Functional safety (SIL2/3)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration   |     | C23               | ✓    |    |    |
| <b>PED for Russia with initial calibration mark</b>   |     | C99               | ✓    | ✓  | ✓  |

| Selection and Ordering data   |  | Order code |      |    |    |
|---|--|------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |  |            | HART | PA | FF |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>  |  | D05        | ✓    |    |    |
| <b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b><br>(only together with seal diaphragm made of Hastelloy and stainless steel) |  | D07        | ✓    | ✓  | ✓  |
| <b>Degree of protection IP66/IP68</b><br>(only for M20 x 1.5 and 1/2-14 NPT)  |  | D12        | ✓    | ✓  | ✓  |
| <b>Supplied with oval flange</b><br>(1 item), PTFE packing and screws in thread of process flange   |  | D37        | ✓    | ✓  | ✓  |
| <b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>   |  | D59        | ✓    | ✓  | ✓  |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for absolute pressure (from differential pressure series)

1

| Selection and Ordering data   | Order code              |             |           |           |
|---|-------------------------|-------------|-----------|-----------|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |                         | <b>HART</b> | <b>PA</b> | <b>FF</b> |
| <b>Use in or on zone 1D/2D<sup>5)</sup></b><br>(only together with type of protection "Intrinsic safety" (transmitter 7MF4...-...-B.. Ex ia)" and IP66) | <b>E01</b>              | ✓           | ✓         | ✓         |
| <b>Oxygen application</b><br>(In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))                              | <b>E10</b>              | ✓           | ✓         | ✓         |
| <b>Export approval Korea</b>  | <b>E11</b>              | ✓           | ✓         | ✓         |
| <b>CRN approval Canada</b><br>(Canadian Registration Number)  | <b>E22<sup>6)</sup></b> | ✓           | ✓         | ✓         |
| <b>Dual seal</b>  | <b>E24</b>              | ✓           | ✓         | ✓         |
| <b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-...-B..)   | <b>E25<sup>7)</sup></b> | ✓           | ✓         | ✓         |
| <b>"Flameproof" explosion protection according to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-...-D..)  | <b>E26<sup>7)</sup></b> | ✓           | ✓         | ✓         |
| <b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-...-P..)                                  | <b>E28<sup>7)</sup></b> | ✓           | ✓         | ✓         |
| <b>Ex Approval IEC Ex (Ex ia)</b><br>(only for transmitter 7MF4...-...-B..)   | <b>E45<sup>7)</sup></b> | ✓           | ✓         | ✓         |
| <b>Ex Approval IEC Ex (Ex d)</b><br>(only for transmitter 7MF4...-...-D..)  | <b>E46<sup>7)</sup></b> | ✓           | ✓         | ✓         |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF4...-...-B..)  | <b>E55<sup>7)</sup></b> | ✓           | ✓         | ✓         |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF4...-...-D..)  | <b>E56<sup>7)</sup></b> | ✓           | ✓         | ✓         |
| <b>Explosion-proof "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-...-E..)  | <b>E57<sup>7)</sup></b> | ✓           | ✓         | ✓         |
| <b>Ex protection „Ex ia“, „Ex d" and „Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-...-R..)  | <b>E58<sup>7)</sup></b> | ✓           | ✓         | ✓         |
| <b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b><br>(only for transmitter 7MF4...-...-[B, D]..-Z + E11)       | <b>E70<sup>7)</sup></b> | ✓           | ✓         | ✓         |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b>   | <b>E80</b>              | ✓           | ✓         | ✓         |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b>  | <b>E81</b>              | ✓           | ✓         | ✓         |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>   | <b>E82</b>              | ✓           | ✓         | ✓         |
| <b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>   | <b>E83</b>              | ✓           | ✓         | ✓         |
| <b>Two coats of lacquer on casing and cover (PU on epoxy)</b>   | <b>G10</b>              | ✓           | ✓         | ✓         |
| <b>Interchanging of process connection side</b>   | <b>H01</b>              | ✓           | ✓         | ✓         |
| <b>Vent on side for gas measurements</b>  | <b>H02</b>              | ✓           | ✓         | ✓         |
| <b>Stainless steel process flanges for vertical differential pressure lines</b><br>(not together with K01, K02 and K04) <sup>8)</sup>                   | <b>H03</b>              | ✓           | ✓         | ✓         |

| Selection and Ordering data   | Order code |             |           |           |
|---|------------|-------------|-----------|-----------|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |            | <b>HART</b> | <b>PA</b> | <b>FF</b> |
| <b>Transient protector 6 kV (lightning protection)</b>  | <b>J01</b> | ✓           | ✓         | ✓         |
| <b>Chambered graphite gasket for process flange</b>   | <b>J02</b> | ✓           | ✓         | ✓         |
| <b>Chambered PTFE graphite gasket</b>   | <b>J03</b> | ✓           | ✓         | ✓         |
| <b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>   | <b>J05</b> | ✓           | ✓         | ✓         |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>9)</sup></b>  | <b>J08</b> | ✓           | ✓         | ✓         |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>9)</sup></b>   | <b>J09</b> | ✓           | ✓         | ✓         |
| <b>Process flange</b>   |            |             |           |           |
| • Hastelloy   | <b>K01</b> | ✓           | ✓         | ✓         |
| • Monel   | <b>K02</b> | ✓           | ✓         | ✓         |
| • Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F)<br>For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible | <b>K04</b> | ✓           | ✓         | ✓         |
| <b>Marine approvals</b>   |            |             |           |           |
| • Det Norske Veritas Germanischer Lloyd (DNV-GL)  | <b>S10</b> | ✓           | ✓         | ✓         |
| • Lloyds Register (LR)  | <b>S11</b> | ✓           | ✓         | ✓         |
| • French marine classification society Bureau Veritas (BV)  | <b>S12</b> | ✓           | ✓         | ✓         |
| • American Bureau of Shipping (ABS)   | <b>S14</b> | ✓           | ✓         | ✓         |
| • Russian Maritime Register (RMR)   | <b>S16</b> | ✓           | ✓         | ✓         |
| • Korean Register of Shipping (KR)  | <b>S17</b> | ✓           | ✓         | ✓         |

1) Han device plug IP65

2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

3) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

8) Not suitable for connection of remote seals.

9) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P DS III

for absolute pressure (from differential pressure series)

| Selection and Ordering data  | Order code |      |                 |    |
|--|------------|------|-----------------|----|
| Additional data  |            | HART | PA              | FF |
| Please add "-Z" to Article No. and specify Order code(s) and plain text.   |            |      |                 |    |
| <b>Measuring range to be set</b><br>Specify in plain text (max. 5 characters):<br>Y01: ... up to ... mbar a, bar a, kPa <sub>abs</sub> , MPa <sub>abs</sub> , psi a <sup>2</sup> )   | Y01        | ✓    | ✓ <sup>1)</sup> |    |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....  | Y15        | ✓    | ✓               | ✓  |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 characters, specify in plain text:<br>Y16: .....   | Y16        | ✓    | ✓               | ✓  |
| <b>Entry of HART address (TAG)</b><br>Max. 8 characters, specify in plain text:<br>Y17: .....  | Y17        | ✓    |                 |    |
| <b>Setting of pressure indication in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>*)</sup> , inH <sub>2</sub> O <sup>*)</sup> , ftH <sub>2</sub> O <sup>*)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>) ref. temperature 20 °C | Y21        | ✓    | ✓               | ✓  |
| <b>Setting of pressure indication in non-pressure units<sup>3)</sup></b><br>Specify in plain text:<br>Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)   | Y22 + Y01  | ✓    |                 |    |
| <b>Preset bus address</b><br>possible between 1 and 126<br>Specify in plain text:<br>Y25: .....  | Y25        |      | ✓               | ✓  |
| <b>Damping adjustment in seconds (0 ... 100 s)</b>   | Y30        | ✓    | ✓               | ✓  |

Factory mounting of valve manifolds, see accessories.

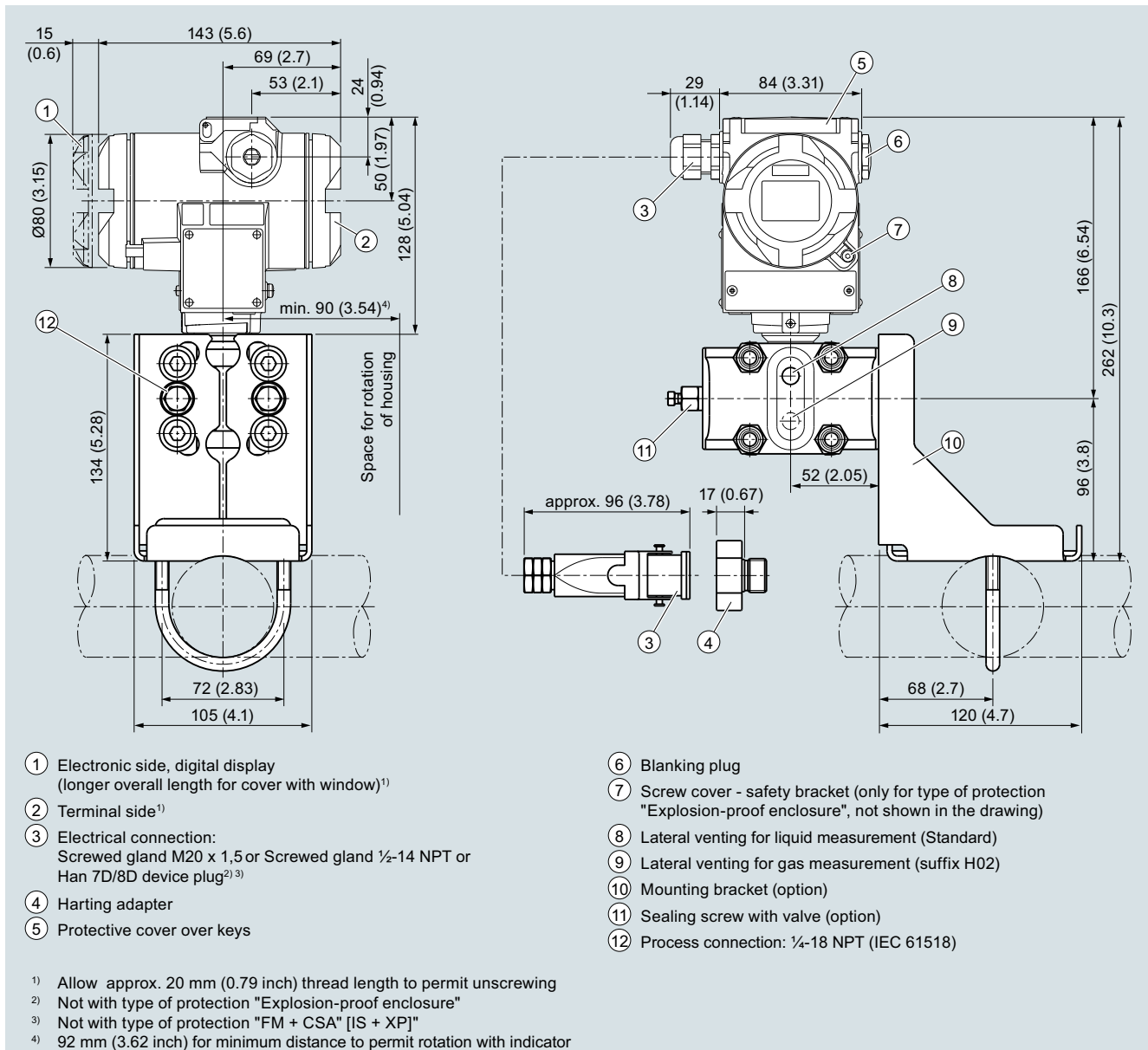
Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) Only absolute pressure units selectable. Negative pressure values not permitted.

3) Preset values can only be changed over SIMATIC PDM.

**Dimensional drawings**

SITRANS P DS III pressure transmitters for absolute pressure, from the differential pressure series, dimensions in mm (inch)



# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

## Technical specifications

### SITRANS P, DS III for differential pressure and flow

#### Input

Measured variable

Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

Differential pressure and flow

| HART  | PROFIBUS PA/<br>FOUNDATION<br>Fieldbus          |   |
|---|---|---|
| Span  | Nominal measuring range                         | Max. operating pressure MAWP (PS)   |
| 1 ... 20 mbar<br>0.1 ... 2 kPa<br>0.4 ... 8 inH <sub>2</sub> O        | 20 mbar<br>2 kPa<br>8 inH <sub>2</sub> O        | 32 bar<br>3.2 MPa<br>464 psi  |
| 1 ... 60 mbar<br>0.1 ... 6 kPa<br>0.4 ... 24 inH <sub>2</sub> O       | 60 mbar<br>6 kPa<br>24.1 inH <sub>2</sub> O     | 160 bar<br>16 MPa<br>2320 psi   |
| 2.5 ... 250 mbar<br>0.2 ... 25 kPa<br>1 ... 100 inH <sub>2</sub> O    | 250 mbar<br>25 kPa<br>100 inH <sub>2</sub> O    |   |
| 6 ... 600 mbar<br>0.6 ... 60 kPa<br>2.4 ... 240 inH <sub>2</sub> O    | 600 mbar<br>60 kPa<br>240 inH <sub>2</sub> O    |   |
| 16 ... 1600 mbar<br>1.6 ... 160 kPa<br>6.4 ... 642 inH <sub>2</sub> O | 1600 mbar<br>160 kPa<br>642 inH <sub>2</sub> O  |   |
| 50 ... 5000 mbar<br>5 ... 500 kPa<br>20 ... 2000 inH <sub>2</sub> O   | 5000 mbar<br>500 kPa<br>2000 inH <sub>2</sub> O |   |
| 0.3 ... 30 bar<br>0.03 ... 3 MPa<br>4.35 ... 435 psi                  | 30 bar<br>3 MPa<br>435 psi                      |   |
| 2.5 ... 250 mbar<br>0.2 ... 25 kPa<br>1 ... 100 inH <sub>2</sub> O    | 250 mbar<br>25 kPa<br>100 inH <sub>2</sub> O    | 420 bar<br>42 MPa<br>6091 psi   |
| 6 ... 600 mbar<br>0.6 ... 60 kPa<br>2.4 ... 240 inH <sub>2</sub> O    | 600 mbar<br>60 kPa<br>240 inH <sub>2</sub> O    | (500 bar/50 MPa/7250 psi<br>can be ordered optionally with Order<br>Code D56) |
| 16 ... 1600 mbar<br>1.6 ... 160 kPa<br>6.4 ... 642 inH <sub>2</sub> O | 1600 mbar<br>160 kPa<br>642 inH <sub>2</sub> O  |   |
| 50 ... 5000 mbar<br>5 ... 500 kPa<br>20 ... 2000 inH <sub>2</sub> O   | 5000 mbar<br>500 kPa<br>2000 inH <sub>2</sub> O |   |
| 0.3 ... 30 bar<br>0.03 ... 3 MPa<br>4.35 ... 435 psi                  | 30 bar<br>3 MPa<br>435 psi                      |   |

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
  - for process temperature  $-20\text{ °C} < \vartheta \leq +60\text{ °C}$   
( $-4\text{ °F} < \vartheta \leq +140\text{ °F}$ )
  - for process temperature  
 $60\text{ °C} < \vartheta \leq +100\text{ °C}$  (max. 85 °C for measuring cell 30 bar)  
( $140\text{ °F} < \vartheta \leq +212\text{ °F}$  (max. 185 °F for measuring cell 435 psi))

-100 % of max. span (-33 % with measuring cell 30 bar/3 MPa/435 psi)  
or 30 mbar a/3 kPa a/0.44 psi a-100 % of max. span (-33 % with measuring cell 30 bar/3 MPa/435 psi)  
or 30 mbar a/3 kPa a/0.44 psi a
 $30\text{ mbar a} + 20\text{ mbar a} \cdot (\vartheta - 60\text{ °C})/\text{°C}$   
 $3\text{ kPa a} + 2\text{ kPa a} \cdot (\vartheta - 60\text{ °C})/\text{°C}$   
 $0.44\text{ psi a} + 0.29\text{ psi a} \cdot (\vartheta - 140\text{ °F})/\text{°F}$ 

Upper measuring limit

100 % of max. span  
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F)  
ambient temperature/process temperature)

Start of scale value

Between the measuring limits (fully adjustable)



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for differential pressure and flow

1

**SITRANS P, DS III for differential pressure and flow**

| Output   | HART  | PROFIBUS PA/FOUNDATION Fieldbus   |
|--|---|---|
| Output signal  | 4 ... 20 mA   | Digital PROFIBUS PA and FOUNDATION Fieldbus signal  |
| • Lower limit (infinitely adjustable)  | 3.55 mA, factory preset to 3.84 mA  | -   |
| • Upper limit (infinitely adjustable)  | 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA (with order code D05)   | -   |
| Load   |   |   |
| • Without HART   | $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$<br>$U_H$ : Power supply in V   | -   |
| • With HART  | $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or<br>$R_B = 230 \dots 1100 \Omega$ (HART Communicator)  | -   |
| Physical bus   | -   | IEC 61158-2   |
| Protection against polarity reversal   | Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.  |   |
| Electrical damping (step width 0.1 s)  | Set to 2 s (0 ... 100 s)  |   |
| <b>Measuring accuracy</b>  | Acc. to IEC 60770-1   |   |
| Reference conditions<br>(All error data refer always refer to the set span)  | <ul style="list-style-type: none"> <li>Increasing characteristic</li> <li>Start-of-scale value 0 bar/kPa/psi</li> <li>Stainless steel seal diaphragm</li> <li>Silicone oil filling</li> <li>Room temperature 25 °C (77 °F)</li> </ul> |   |
| Measuring span ratio r (spread, Turn-Down)   | $r = \text{max. measuring span/set measuring span or nom. pressure range}$  |   |
| Error in measurement at limit setting incl. hysteresis and reproducibility   |   |   |
| • Linear characteristic  |   |   |
| - 20 mbar/2 kPa/0.29 psi   | $r \leq 5 :$<br>$5 < r \leq 10 :$<br>$10 < r \leq 20 :$   | $\leq 0.075 \%$<br>$\leq (0.0029 \cdot r + 0.071) \%$<br>$\leq (0.0045 \cdot r + 0.071) \%$ |
| - 60 mbar/6 kPa/0.87 psi   | $r \leq 5 :$<br>$5 < r \leq 60 :$   | $\leq 0.075 \%$<br>$\leq (0.005 \cdot r + 0.05) \%$   |
| - 250 mbar/25 kPa/3.63 psi<br>600 mbar/60 kPa/8.7 psi<br>1600 mbar/160 kPa/23.21 psi<br>5 bar/500 kPa/72.5 psi<br>30 bar/3 MPa/435 psi | $r \leq 5 :$<br>$5 < r \leq 100 :$  | $\leq 0.065 \%$<br>$\leq (0.004 \cdot r + 0.045) \%$  |
| • Square-rooted characteristic (flow > 50 %)   |   |   |
| - 20 mbar/2 kPa/0.29 psi   | $r \leq 5 :$<br>$5 < r \leq 10 :$<br>$10 < r \leq 20 :$   | $\leq 0.075 \%$<br>$\leq (0.0029 \cdot r + 0.071) \%$<br>$\leq (0.0045 \cdot r + 0.071) \%$ |
| - 60 mbar/6 kPa/0.87 psi   | $r \leq 5 :$<br>$5 < r \leq 60 :$   | $\leq 0.075 \%$<br>$\leq (0.005 \cdot r + 0.05) \%$   |
| - 250 mbar/25 kPa/3.63 psi<br>600 mbar/60 kPa/8.7 psi<br>1600 mbar/160 kPa/23.21 psi<br>5 bar/500 kPa/72.5 psi<br>30 bar/3 MPa/435 psi | $r \leq 5 :$<br>$5 < r \leq 100 :$  | $\leq 0.065 \%$<br>$\leq (0.004 \cdot r + 0.045) \%$  |
| • Square-rooted characteristic (flow > 25 ... 50 %)  |   |   |
| - 20 mbar/2 kPa/0.29 psi   | $r \leq 5 :$<br>$5 < r \leq 10 :$<br>$10 < r \leq 20 :$   | $\leq 0.15 \%$<br>$\leq (0.0058 \cdot r + 0.142) \%$<br>$\leq (0.009 \cdot r + 0.142) \%$   |
| - 60 mbar/6 kPa/0.87 psi   | $r \leq 5 :$<br>$5 < r \leq 60 :$   | $\leq 0.015 \%$<br>$\leq (0.01 \cdot r + 0.1) \%$   |
| - 250 mbar/25 kPa/3.63 psi<br>600 mbar/60 kPa/8.7 psi<br>1600 mbar/160 kPa/23.21 psi<br>5 bar/500 kPa/72.5 psi<br>30 bar/3 MPa/435 psi | $r \leq 5 :$<br>$5 < r \leq 100 :$  | $\leq 0.13 \%$<br>$\leq (0.008 \cdot r + 0.09) \%$  |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P DS III

## for differential pressure and flow

### SITRANS P, DS III for differential pressure and flow

#### Measuring accuracy (continued)

Acc. IEC 60770-1

Influence of ambient temperature  
(in percent per 28 °C (50 °F))

- 20 mbar/2 kPa/0.29 psi  $\leq (0.15 \cdot r + 0.1) \%$
- 60 mbar/6 kPa/0.87 psi  $\leq (0.075 \cdot r + 0.1) \%$
- 250 mbar/25 kPa/3.63 psi  $\leq (0.025 \cdot r + 0.125) \%$
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

Influence of static pressure

- on the zero point
  - 20 mbar/2 kPa/0.29 psi  $\leq (0.15 \cdot r) \%$  per 32 bar  
(zero-point correction is possible with position error adjustment)
  - 60 mbar/6 kPa/0.87 psi  $\leq (0.1 \cdot r) \%$  per 70 bar  
250 mbar/25 kPa/3.63 psi  
(zero-point correction is possible with position error adjustment)
  - 600 mbar/60 kPa/8.7 psi
  - 1600 mbar/160 kPa/23.21 psi
  - 5 bar/500 kPa/72.5 psi  $\leq (0.2 \cdot r) \%$  per 70 bar  
30 bar/3 MPa/435 psi  
(zero-point correction is possible with position error adjustment)
- on the span
  - 20 mbar/2 kPa/0.29 psi  $\leq 0.2 \%$  per 32 bar
  - 60 mbar/6 kPa/0.87 psi  $\leq 0.14 \%$  per 70 bar
  - 250 mbar/25 kPa/3.63 psi
  - 600 mbar/60 kPa/8.7 psi
  - 1600 mbar/160 kPa/23.21 psi
  - 5 bar/500 kPa/72.5 psi
  - 30 bar/3 MPa/435 psi

Long-term stability  
(temperature change  $\pm 30$  °C ( $\pm 54$  °F))

Static pressure max. 70 bar/7 MPa/ 1015 psi

- 20 mbar/2 kPa/0.29 psi  $\leq (0.2 \cdot r) \%$  per year
- 60 mbar/6 kPa/0.87 psi  $\leq (0.25 \cdot r) \%$  in 5 years
- 30 bar/3 MPa/435 psi
- 250 mbar/25 kPa/3.63 psi  $\leq (0.125 \cdot r) \%$  in 5 years
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi

Effect of mounting position (in pressure per change in angle)

$\leq 0.7$  mbar/0.07 kPa/0.028 inH<sub>2</sub>O per 10° inclination  
(zero-point correction is possible with position error adjustment)

Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and  
FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of nominal measuring range

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for differential pressure and flow

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**SITRANS P, DS III for differential pressure and flow****Rated conditions**

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling

-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F)  
with 30 bar measuring cell

- Measuring cell with inert filling liquid
- Measuring cell with Neobee fill fluid (FDA-compliant)
- In conjunction with dust explosion protection

-20 ... +100 °C (-4 ... +212 °F)

-10 ... +100 °C (+14 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature (silicone oil and inert oil)
  - Transmitter

-40 ... +85 °C (-40 ... +185 °F)

-20 ... +85 °C (-4 ... +185 °F) with 30 bar measuring cell

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Ambient temperature (Neobee fill fluid)

- Transmitter

-10 ... +85 °C (+14 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

**Design**

Weight (without options)

Die-cast aluminum: ≈ 4.5 kg (≈ 9.9 lb)

Stainless steel precision casting: ≈ 7.1 kg (≈ 15.6 lb)

Enclosure material

Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Seal diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold

- Process flanges and sealing screw

Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602 or Monel, mat. no. 2.4360

- O-Ring

FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR

Measuring cell filling

Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))

Process connection

Female thread 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518

Material of mounting bracket

- Steel
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

**Power supply  $U_H$** 

Terminal voltage on transmitter

10.5 ... 45 V DC

10.5 ... 30 V DC in intrinsically-safe mode

Power supply

-

Supplied through bus

Separate 24 V power supply necessary

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

## for differential pressure and flow

### SITRANS P, DS III for differential pressure and flow

#### Certificates and approvals

Classification according to PED 2014/68/EU

#### Explosion protection

- Intrinsic safety "i"
  - Marking
  - Permissible ambient temperature
  - Connection
  - Effective internal inductance/capacitance
- Explosion-proof "d"
  - Marking
  - Permissible ambient temperature
  - Connection
- Dust explosion protection for zone 20
  - Marking
  - Permissible ambient temperature
  - Max. surface temperature
  - Connection
  - Effective internal inductance/capacitance
- Dust explosion protection for zone 21/22
  - Marking
  - Connection
- Type of protection "n" (zone 2)
  - Marking
  - Connection (Ex nA)
  - Connection (Ex ic)
  - Effective internal inductance/capacitance
- Explosion protection acc. to FM
  - Identification (XP/DIP) or (IS); (NI)
- Explosion protection to CSA
  - Identification (XP/DIP) or (IS)

#### HART

- PN 32/160 (MAWP 464/2320 psi) for gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
- PN 420 (MAWP 6092) for gases of fluid group 1 and liquids of fluid group 1; complies with basic safety requirements of Article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord.

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/Ib IIC T4/T5/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ;  
 $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:  
 $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:  $U_H = 10.5 \dots 45 \text{ V DC}$ ;  
 $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

 $U_m = 45 \text{ V}$ 

To circuits with values:  
 $U_i = 45 \text{ V}$

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

Certificate of Compliance 3008490

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

Certificate of Compliance 1153651

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

#### PROFIBUS PA/ FOUNDATION Fieldbus

FISCO supply unit:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$

Linear barrier:  
 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$ 

To circuits with values:  
 $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$

Linear barrier:  
 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1 \text{ W}$

 $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$ 

To circuits with values:  $U_H = 9 \dots 32 \text{ V DC}$ ;  
 $P_{\max} = 1 \text{ W}$

 $U_m = 32 \text{ V}$ 

FISCO supply unit ic:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 570 \text{ mA}$

Linear barrier:  
 $U_o = 32 \text{ V}$ ,  $I_o = 132 \text{ mA}$ ,  $P_o = 1 \text{ W}$

 $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for differential pressure and flow

1

|   |  |  |   |
|---|--|--|---|
| <b>HART communication</b>   |  | <b>FOUNDATION Fieldbus communication</b>   |   |
| HART  | 230 ... 1100 Ω   | Function blocks  | 3 function blocks analog input, 1 function block PID                    |
| Protocol  | HART Version 5.x   |  |   |
| Software for PC   | SIMATIC PDM  |  |   |
| <b>PROFIBUS PA communication</b>  |  |  |   |
| Simultaneous communication with master class 2 (max.)                           | 4  | • Analog input   | Yes, linearly rising or falling characteristic                          |
| The address can be set using  | Configuration tool or local operation (standard setting address 126)                                   | - Adaptation to customer-specific process variables  | 0 ... 100 s   |
| Cyclic data usage   |  | - Electrical damping, adjustable   | Output/input (can be locked within the device with a bridge)            |
| • Output byte   | 5 (one measured value) or 10 (two measured values)   | - Simulation function  | parameterizable (last good value, substitute value, incorrect value)    |
| • Input byte  | 0, 1, or 2 (register operating mode and reset function for metering)                                   | - Failure mode   | Yes, one upper and lower warning limit and one alarm limit respectively |
| Internal preprocessing  |  | - Limit monitoring   | Yes   |
| Device profile  | PROFIBUS PA Profile for Process Control Devices Version 3.0, class B                                   | - Square-rooted characteristic for flow measurement  |   |
| Function blocks   | 2  | • PID  | Standard FOUNDATION Fieldbus function block                             |
| • Analog input  |  | • Physical block   | 1 resource block  |
| - Adaptation to customer-specific process variables                             | Yes, linearly rising or falling characteristic   | Transducer blocks  | 1 transducer block Pressure with calibration, 1 transducer block LCD    |
| - Electrical damping, adjustable  | 0 ... 100 s  |  |   |
| - Simulation function   | Input /Output  | • Pressure transducer block  |   |
| - Failure mode  | parameterizable (last good value, substitute value, incorrect value)                                   | - Can be calibrated by applying two pressures  | Yes   |
| - Limit monitoring  | Yes, one upper and lower warning limit and one alarm limit respectively                                | - Monitoring of sensor limits  | Yes   |
| • Register (totalizer)  | Can be reset, preset, optional direction of counting, simulation function of register output           | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function                    |
| - Failure mode  | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |  |   |
| - Limit monitoring  | One upper and lower warning limit and one alarm limit respectively                                     |  |   |
| • Physical block  | 1  |  |   |
| Transducer blocks   | 2  |  |   |
| • Pressure transducer block   |  |  |   |
| - Can be calibrated by applying two pressures                                   | Yes  |  |   |
| - Monitoring of sensor limits   | Yes  |  |   |
| - Specification of a container characteristic with                              | Max. 30 nodes  |  |   |
| - Square-rooted characteristic for flow measurement                             | Yes  |  |   |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable  |  |   |
| - Simulation function for measured pressure value and sensor temperature        | Constant value or over parameterizable ramp function   |  |   |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

| Selection and Ordering data   |   | Article No.      |
|---|---|------------------|
| <b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)</b> |   | <b>7MF4433 -</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>                       |   |                  |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b>                  |                  |
| Silicone oil  | normal  | 1                |
| Inert liquid <sup>1)</sup>  | grease-free to cleanliness level 2              | 3                |
| FDA compliant fill fluid <sup>2)</sup>  |   |                  |
| • Neobee oil  | normal  | 4                |
| <b>Measuring span (min. ... max.)</b>   |   |                  |
| PN 32 (MAWP 464 psi)  |   |                  |
| 1 ... 20 mbar <sup>3)</sup>   | (0.4 ... 8 inH <sub>2</sub> O)                  | B                |
| PN 160 (MAWP 2320 psi)  |   |                  |
| 1 ... 60 mbar   | (0.4 ... 24 inH <sub>2</sub> O)                 | C                |
| 2.5 ... 250 mbar  | (1.004 ... 100.4 inH <sub>2</sub> O)            | D                |
| 6 ... 600 mbar  | (2.4 ... 240 inH <sub>2</sub> O)                | E                |
| 16 ... 1600 mbar  | (6.4 ... 642 inH <sub>2</sub> O)                | F                |
| 50 ... 5000 mbar  | (20 ... 2000 inH <sub>2</sub> O)                | G                |
| 0.3 ... 30 bar  | (4.35 ... 435 psi)                              | H                |
| <b>Wetted parts materials</b>   |   |                  |
| (stainless steel process flanges)   |   |                  |
| Seal diaphragm  | Parts of measuring cell                         |                  |
| Stainless steel   | Stainless steel                                 | A                |
| Hastelloy   | Stainless steel                                 | B                |
| Hastelloy   | Hastelloy                                       | C                |
| Tantalum <sup>4)</sup>  | Tantalum  | E                |
| Monel <sup>4)</sup>   | Monel   | H                |
| Gold <sup>4)</sup>  | Gold  | L                |
| Version for diaphragm seal <sup>5) 6) 7) 8)</sup>   |   | Y                |
| <b>Process connection</b>   |   |                  |
| Female thread 1/4-18 NPT with flange connection   |   |                  |
| • Sealing screw opposite process connection   |   |                  |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518   |   | 2                |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement)   |   | 0                |
| • Vent on side of process flange <sup>3)</sup>  |   |                  |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518   |   | 6                |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement)   |   | 4                |
| <b>Non-wetted parts materials</b>   |   |                  |
| process flange screws Electronics housing   |   |                  |
| Stainless steel   | Die-cast aluminum                               | 2                |
| Stainless steel   | Stainless steel precision casting <sup>9)</sup> | 3                |
| <b>Version</b>  |   |                  |
| • Standard version, German plate inscription, setting for pressure unit: bar  |   | 1                |
| • International version, English plate inscription, setting for pressure unit: bar  |   | 2                |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal   |   | 3                |
| All versions include DVD with compact operating instructions in various EU languages.                                     |   |                  |

| Selection and Ordering data  |  | Article No.      |
|--|--|------------------|
| <b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)</b>  |  | <b>7MF4433 -</b> |
| <b>Explosion protection</b>  |  |                  |
| • None   |  | A                |
| • With ATEX, Type of protection:   |  |                  |
| - "Intrinsic safety (Ex ia)"   |  | B                |
| - "Explosion-proof (Ex d)" <sup>10)</sup>  |  | D                |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" <sup>11)</sup>   |  | P                |
| - "Ex nA/ic (Zone 2)" <sup>12)</sup>   |  | E                |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>11)13)</sup>  |  | R                |
| • FM + CSA intrinsic safe (is)" <sup>14)</sup>   |  | F                |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D" <sup>11)13)14)</sup>  |  | S                |
| • With FM + CSA, Type of protection:   |  |                  |
| - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>10)14)</sup>   |  | NC               |
| <b>Electrical connection/cable entry</b>   |  |                  |
| • Screwed gland M20 x 1.5  |  | B                |
| • Screwed gland 1/2-14 NPT   |  | C                |
| • Han 7D device plug (plastic housing) incl. mating connector <sup>15)16)</sup>  |  | D                |
| • M12 device plugs (stainless steel) <sup>17)18)</sup>   |  | F                |
| <b>Display</b>   |  |                  |
| • Without display  |  | 0                |
| • Without visible display (display concealed, setting: mA)   |  | 1                |
| • With visible display (setting: mA)   |  | 6                |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)  |  | 7                |
| <b>Power supply units</b> see Chap. 7 "Supplementary Components".  |  |                  |
| Included in delivery of the device:  |  |                  |
| • Quick-start guide  |  |                  |
| • Sealing plug(s) or sealing screw(s) for the process flanges(s)   |  |                  |
| 1) For oxygen application, add Order code E10.   |  |                  |
| 2) Available for measuring ranges 250 mbar ... 5 bar.  |  |                  |
| 3) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).   |  |                  |
| 4) Not in conjunction with max. span 20 and 60 mbar (8.03 and 24.09 inH <sub>2</sub> O))   |  |                  |
| 5) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. |  |                  |
| 6) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.  |  |                  |
| 7) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-...Y-... and 7MF4900-1-...-B  |  |                  |
| 8) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.   |  |                  |
| 9) Not in conjunction with Electrical connection "Han 7D device plug".   |  |                  |
| 10) Without cable gland, with blanking plug  |  |                  |
| 11) With enclosed cable gland Ex ia and blanking plug  |  |                  |
| 12) Configurations with Han and M12 device plugs are only available in Ex ic.  |  |                  |
| 13) Only in connection with IP66.  |  |                  |
| 14) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.  |  |                  |
| 15) Only in connection with Ex approval A, B or E.   |  |                  |
| 16) Permissible only for crimp-contact of conductor cross-section 1 mm <sup>2</sup>  |  |                  |
| 17) Only in connection with Ex approval A, B, E or F.  |  |                  |
| 18) M12 delivered without cable socket.  |  |                  |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for differential pressure and flow

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| Selection and Ordering data   |                                    | Article No.    | Selection and Ordering data   |  | Article No.    |
|---|------------------------------------|----------------|---|--|----------------|
| <b>Pressure transmitters for differential pressure and flow PN 32/160 (MAWP 464/2320 psi)</b>                       |                                    |                | <b>Pressure transmitters for differential pressure and flow PN 32/160 (MAWP 464/2320 psi)</b>                               |  |                |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>   |                                    | 7 MF 4 4 3 4 - | <b>SITRANS P DS III with PROFIBUS PA (PA)</b>   |  | 7 MF 4 4 3 4 - |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>   |                                    | 7 MF 4 4 3 5 - | <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>   |  | 7 MF 4 4 3 5 - |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>                 |                                    |                |   |  |                |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b>     |                | <b>Explosion protection</b>   |  |                |
| Silicone oil  | normal                             | 1              | • None  |  | A              |
| Inert liquid <sup>1)</sup>  | grease-free to cleanliness level 2 | 3              | • With ATEX, Type of protection:  |  |                |
| FDA compliant fill fluid <sup>2)</sup>  |                                    |                | - "Intrinsic safety (Ex ia)"  |  | B              |
| • Neobee oil  | normal                             | 4              | - "Explosion-proof (Ex d)" <sup>9)</sup>  |  | D              |
|   |                                    |                | - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" <sup>10)</sup>  |  | P              |
|   |                                    |                | - "Ex nA/ic (Zone 2)" <sup>11)</sup>  |  | E              |
|   |                                    |                | - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>10)12)</sup> |  | R              |
| <b>Nominal measuring range</b>  |                                    |                | • FM + CSA intrinsic safe (is) <sup>13)</sup>   |  | F              |
| PN 32 (MAWP 464 psi)  |                                    |                | • FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D <sup>10)12)13)</sup>   |  | S              |
| 20 mbar <sup>3)</sup>   | (8.03 inH <sub>2</sub> O)          | B              | • With FM + CSA, Type of protection:  |  |                |
| PN 160 (MAWP 2320 psi)  |                                    |                | - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>9)13)</sup>   |  | NC             |
| 60 mbar   | (24 inH <sub>2</sub> O)            | C              |   |  |                |
| 250 mbar  | (100 inH <sub>2</sub> O)           | D              | <b>Electrical connection/cable entry</b>  |  |                |
| 600 mbar  | (240 inH <sub>2</sub> O)           | E              | • Screwed gland M20 x 1.5   |  | B              |
| 1600 mbar   | (642 inH <sub>2</sub> O)           | F              | • Screwed gland ½-14 NPT  |  | C              |
| 5 bar   | (2000 inH <sub>2</sub> O)          | G              | • M12 device plugs (stainless steel) <sup>14) 15)</sup>   |  | F              |
| 30 bar  | (435 psi)                          | H              |   |  |                |
| <b>Wetted parts materials</b>   |                                    |                | <b>Display</b>  |  |                |
| (stainless steel process flanges)   |                                    |                | • Without display   |  | 0              |
| Seal diaphragm  | Parts of measuring cell            |                | • Without visible display (display concealed, setting: bar)   |  | 1              |
| Stainless steel   | Stainless steel                    | A              | • With visible display (setting: bar)   |  | 6              |
| Hastelloy   | Stainless steel                    | B              | • With customer-specific display (setting as specified, Order code "Y21" required)  |  | 7              |
| Hastelloy   | Hastelloy                          | C              |   |  |                |
| Tantalum <sup>4)</sup>  | Tantalum                           | E              |   |  |                |
| Monel <sup>4)</sup>   | Monel                              | H              |   |  |                |
| Gold <sup>4)</sup>  | Gold                               | L              |   |  |                |
| Version as diaphragm seal <sup>5) 6) 7) 8)</sup>  |                                    | Y              |   |  |                |
| <b>Process connection</b>   |                                    |                | Included in delivery of the device:   |  |                |
| Female thread ¼-18 NPT with flange connection   |                                    |                | • Quick-start guide   |  |                |
| • Sealing screw opposite process connection   |                                    |                | • Sealing plug(s) or sealing screw(s) for the process flanges(s)  |  |                |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518   |                                    | 2              |   |  |                |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement)   |                                    | 0              |   |  |                |
| • Venting on side of process flanges <sup>3)</sup>  |                                    |                |   |  |                |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518   |                                    | 6              |   |  |                |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement)   |                                    | 4              |   |  |                |
| <b>Non-wetted parts materials</b>   |                                    |                |   |  |                |
| process flange screws   | Electronics housing                |                |   |  |                |
| Stainless steel   | Die-cast aluminum                  | 2              |   |  |                |
| Stainless steel   | Stainless steel precision casting  | 3              |   |  |                |
| <b>Version</b>  |                                    |                |   |  |                |
| • Standard versions   |                                    | 1              |   |  |                |
| • International version, English label inscriptions, documentation in 5 languages on DVD (no Order code selectable) |                                    | 2              |   |  |                |
| <b>Version</b>  |                                    |                |   |  |                |
| • Standard version, German plate inscription, setting for pressure unit: bar  |                                    | 1              |   |  |                |
| • International version, English plate inscription, setting for pressure unit: bar                                  |                                    | 2              |   |  |                |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal                                     |                                    | 3              |   |  |                |
| All versions include DVD with compact operating instructions in various EU languages.                               |                                    |                |   |  |                |

- For oxygen application, add Order code E10.
- Available for measuring ranges 250 mbar ... 5 bar.
- Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).
- Not in conjunction with max. span 20 and 60 mbar (8.03 and 24.09 inH<sub>2</sub>O))
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-...Y... and 7MF4900-1...-B
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Without cable gland, with blanking plug.
- With enclosed cable gland Ex ia and blanking plug.
- Configurations with Han and M12 device plugs are only available in Ex ic.
- Only in connection with IP66.
- Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- Only in connection with Ex approval A, B, E or F.
- M12 delivered without cable socket



## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

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| Selection and Ordering data   | Order code        |      |    |    |
|---|-------------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |                   | HART | PA | FF |
| <b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b> |                   |      |    |    |
| • Steel   | A01               | ✓    | ✓  | ✓  |
| • Stainless steel 304   | A02               | ✓    | ✓  | ✓  |
| • Stainless steel 316L  | A03               | ✓    | ✓  | ✓  |
| <b>O-rings for process flanges</b><br>(instead of FPM (Viton))  |                   |      |    |    |
| • PTFE (Teflon)   | A20               | ✓    | ✓  | ✓  |
| • FEP (with silicone core, approved for food)   | A21               | ✓    | ✓  | ✓  |
| • FFFM (Kalrez, compound 4079), for measured medium temperatures -15 ... 100 °C (5 ... 212 °F)  | A22               | ✓    | ✓  | ✓  |
| • NBR (Buna N)  | A23               | ✓    | ✓  | ✓  |
| <b>Device plugs<sup>1)</sup></b>  |                   |      |    |    |
| • Han 7D (metal)  | A30               | ✓    |    |    |
| • Han 8D (instead of Han 7D)  | A31               | ✓    |    |    |
| • Angled  | A32               | ✓    |    |    |
| • Han 8D (metal)  | A33               | ✓    |    |    |
| <b>Sealing screws (2 units)</b><br>1/4-18 NPT, with valve in mat. of process flanges  | A40               | ✓    | ✓  | ✓  |
| <b>Cable sockets for M12 device plugs (metal (CuZn))</b>  | A50               | ✓    | ✓  | ✓  |
| <b>Rating plate inscription</b><br>(instead of German)  |                   |      |    |    |
| • English   | B11               | ✓    | ✓  | ✓  |
| • French  | B12               | ✓    | ✓  | ✓  |
| • Spanish   | B13               | ✓    | ✓  | ✓  |
| • Italian   | B14               | ✓    | ✓  | ✓  |
| • Cyrillic (russian)  | B16               | ✓    | ✓  | ✓  |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi  | B21               | ✓    | ✓  | ✓  |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>2)</sup></b>                           | C11               | ✓    | ✓  | ✓  |
| <b>Inspection certificate<sup>3)</sup> to EN 10204-3.1</b>  | C12               | ✓    | ✓  | ✓  |
| <b>Factory certificate to EN 10204-2.2</b>  | C14               | ✓    | ✓  | ✓  |
| <b>Acceptance certificate (EN 10204-3.1)</b><br>PMI test of parts in contact with medium  | C15               | ✓    | ✓  | ✓  |
| <b>Functional safety (SIL2)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration     | C20               | ✓    |    |    |
| <b>Functional safety (PROFIsafe)</b><br>Certificate and PROFIsafe protocol  | C21 <sup>4)</sup> |      | ✓  |    |
| <b>Functional safety (SIL2/3)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration   | C23               | ✓    |    |    |
| <b>PED for Russia with initial calibration mark</b>   | C99               | ✓    | ✓  | ✓  |

| Selection and Ordering data   | Order code        |      |    |    |
|---|-------------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |                   | HART | PA | FF |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>  | D05               | ✓    |    |    |
| <b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b><br>(only together with seal diaphragm made of Hastelloy and stainless steel)   | D07               | ✓    | ✓  | ✓  |
| <b>Degree of protection IP66/IP68</b><br>(only for M20 x 1.5 and 1/2-14 NPT)  | D12               | ✓    | ✓  | ✓  |
| <b>Process flange screws made of Monel</b><br>(max. nominal pressure PN20)  | D34               | ✓    | ✓  | ✓  |
| <b>Supplied with oval flange set</b><br>(2 items), PTFE packings and screws in thread of process flanges  | D37               | ✓    | ✓  | ✓  |
| <b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>   | D59               | ✓    | ✓  | ✓  |
| <b>Use in or on zone 1D/2D<sup>5)</sup></b><br>(only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)" and IP66)   | E01               | ✓    | ✓  | ✓  |
| <b>Overfilling safety device for flammable and non-flammable liquids</b><br>(max. PN 32 (MAWP 464 psi), basic device with type of protection "Intrinsic safety (Ex ia)", to WHG and VbF, not together with measuring cell filling "inert liquid") | E08               | ✓    |    |    |
| <b>Oxygen application</b><br>(In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))  | E10               | ✓    | ✓  | ✓  |
| <b>Export approval Korea</b>  | E11               | ✓    | ✓  | ✓  |
| <b>CRN approval Canada</b><br>(Canadian Registration Number)  | E22 <sup>6)</sup> | ✓    | ✓  | ✓  |
| <b>Dual seal</b>  | E24               | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-B..)   | E25 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>"Flameproof" explosion protection according to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-D..)  | E26 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-P..)  | E28 <sup>7)</sup> | ✓    | ✓  |    |
| <b>Ex Approval IEC Ex (Ex ia)</b><br>(only for transmitter 7MF4...-.....-B..)   | E45 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Ex Approval IEC Ex (Ex d)</b><br>(only for transmitter 7MF4...-.....-D..)  | E46 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-B..)  | E55 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-D..)  | E56 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-E..)  | E57 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-R..)  | E58 <sup>7)</sup> | ✓    | ✓  | ✓  |
| <b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b><br>(only for transmitter 7MF4...-.....-[B, D]..-Z + E11)   | E70 <sup>7)</sup> | ✓    | ✓  | ✓  |



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for differential pressure and flow

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| Selection and Ordering data  |  | Order code                     |      |                 |    |
|--|--|--------------------------------|------|-----------------|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.  |  |                                | HART | PA              | FF |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b>  |  | E80                            | ✓    | ✓               | ✓  |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b>   |  | E81                            | ✓    | ✓               | ✓  |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>  |  | E82                            | ✓    | ✓               | ✓  |
| <b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>  |  | E83                            | ✓    | ✓               | ✓  |
| <b>Two coats of lacquer on casing and cover (PU on epoxy)</b>  |  | G10                            | ✓    | ✓               | ✓  |
| <b>Interchanging of process connection side</b>  |  | H01                            | ✓    | ✓               | ✓  |
| <b>Vent on side for gas measurements</b>   |  | H02                            | ✓    | ✓               | ✓  |
| <b>Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04<sup>8)</sup>)</b>  |  | H03                            | ✓    | ✓               | ✓  |
| <b>Transient protector 6 kV (lightning protection)</b>   |  | J01                            | ✓    | ✓               | ✓  |
| <b>Chambered graphite gasket for process flange</b>  |  | J02                            | ✓    | ✓               | ✓  |
| <b>Chambered PTFE graphite gasket</b>  |  | J03                            | ✓    | ✓               | ✓  |
| <b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>  |  | J05                            | ✓    | ✓               | ✓  |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display<sup>9)</sup>)</b>   |  | J08                            | ✓    | ✓               | ✓  |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display<sup>9)</sup>)</b>  |  | J09                            | ✓    | ✓               | ✓  |
| <b>Process flange</b>  |  |                                |      |                 |    |
| • Hastelloy  |  | K01                            | ✓    | ✓               | ✓  |
| • Monel  |  | K02                            | ✓    | ✓               | ✓  |
| • Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F), for ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible  |  | K04                            | ✓    | ✓               | ✓  |
| <b>Marine approvals</b>  |  |                                |      |                 |    |
| • Det Norske Veritas Germanischer Lloyd (DNV-GL)   |  | S10                            | ✓    | ✓               | ✓  |
| • Lloyds Register (LR)   |  | S11                            | ✓    | ✓               | ✓  |
| • French marine classification society Bureau Veritas (BV)   |  | S12                            | ✓    | ✓               | ✓  |
| • American Bureau of Shipping (ABS)  |  | S14                            | ✓    | ✓               | ✓  |
| • Russian Maritime Register (RMR)  |  | S16                            | ✓    | ✓               | ✓  |
| • Korean Register of Shipping (KR)   |  | S17                            | ✓    | ✓               | ✓  |
| Factory mounting of valve manifolds, see accessories.<br>✓ = available   |  |                                |      |                 |    |
| <b>Additional data</b><br>Please add "-Z" to Article No. and specify Order code(s) and plain text.   |  |                                | HART | PA              | FF |
| <b>Measuring range to be set</b><br>Specify in plain text:<br>• in the case of linear characteristic curve (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi<br>• in the case of square rooted characteristic (max. 5 characters):<br>Y02: ... up to ... mbar, bar, kPa, MPa, psi  |  | Y01                            | ✓    | ✓ <sup>1)</sup> |    |
|  |  | Y02                            | ✓    |                 |    |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text: Y15: .....   |  | Y15                            | ✓    | ✓               | ✓  |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 char., specify in plain text: Y16: .....   |  | Y16                            | ✓    | ✓               | ✓  |
| <b>Entry of HART address (TAG)</b><br>Max. 8 char., specify in plain text: Y17: .....  |  | Y17                            | ✓    |                 |    |
| <b>Setting of pressure indicator in pressure units</b><br>Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ...<br>Note: The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>+</sup> , inH <sub>2</sub> O <sup>+</sup> , ftH <sub>2</sub> O <sup>+</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>) ref. temperature 20 °C |  | Y21                            | ✓    | ✓               | ✓  |
| <b>Setting of pressure indicator in non-pressure units<sup>2)</sup></b><br>Specify in plain text:<br>Y22: .... up to .... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)   |  | Y22 <sup>3)</sup> + Y01 or Y02 | ✓    |                 |    |
| <b>Preset bus address</b><br>possible between 1 and 126<br>Specify in plain text: Y25: .....   |  | Y25                            |      | ✓               | ✓  |
| <b>Damping adjustment in seconds (0 ... 100 s)</b>   |  | Y30                            | ✓    | ✓               | ✓  |
| Factory mounting of valve manifolds, see accessories.<br>Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset<br>✓ = available   |  |                                |      |                 |    |

1) Han device plug IP65

2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

3) If the acceptance test certificate 3.1.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

8) Not suitable for connection of remote seal.

9) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

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| Selection and Ordering data   |   | Article No.                                |
|---|---|--|
| <b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>  |   | <b>7MF4533 -</b>                           |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |   |  |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b>                  |  |
| Silicone oil  | normal  | 1  |
| Inert liquid <sup>1)</sup>  | grease-free to cleanliness level 2              | 3  |
| <b>Measuring span (min. ... max.)</b>   |   |  |
| 2.5 ... 250 mbar  | (1.004 ... 100 inH <sub>2</sub> O)              | D  |
| 6 ... 600 mbar  | (2.4 ... 240 inH <sub>2</sub> O)                | E  |
| 16 ... 1600 mbar  | (6.4 ... 642 inH <sub>2</sub> O)                | F  |
| 50 ... 5000 mbar  | (20 ... 2000 inH <sub>2</sub> O)                | G  |
| 0.3 ... 30 bar  | (4.35 ... 435 psi)                              | H  |
| <b>Wetted parts materials</b>   |   |  |
| (stainless steel process flanges)   |   |  |
| Seal diaphragm  | Parts of measuring cell                         |  |
| Stainless steel   | Stainless steel                                 | A  |
| Hastelloy   | Stainless steel                                 | B  |
| Gold <sup>2)</sup>  | Gold  | L  |
| Version for diaphragm seal 3) 4) 5) 6)  |   | Y  |
| <b>Process connection</b>   |   |  |
| Female thread 1/4-18 NPT with flange connection   |   |  |
| <ul style="list-style-type: none"> <li>Sealing screw opposite process connection               <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M12 to DIN 19213 (only for replacement requirement)</li> </ul> </li> <li>Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing)               <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M12 to DIN 19213 (only for replacement requirement)</li> </ul> </li> </ul>   |   | 3<br>1<br>7<br>5                           |
| <b>Non-wetted parts materials</b>   |   |  |
| process flange screws   | Electronics housing                             |  |
| Stainless steel   | Die-cast aluminum                               | 2  |
| Stainless steel   | Stainless steel precision casting <sup>7)</sup> | 3  |
| <b>Version</b>  |   |  |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>   |   | 1<br>2<br>3                                |
| All versions include DVD with compact operating instructions in various EU languages.   |   |  |
| <b>Explosion protection</b>   |   |  |
| <ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>8)</sup></li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>9)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>10)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"<sup>9)11)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>12)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>9)11)12)</sup></li> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety and explosion-proof (is + xp)"<sup>8)12)</sup>, max PN 360</li> </ul> </li> </ul> |   | A<br>B<br>D<br>P<br>E<br>R<br>F<br>S<br>NC |

| Selection and Ordering data  |  | Article No.      |
|--|--|------------------|
| <b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>   |  | <b>7MF4533 -</b> |
| <b>Electrical connection/cable entry</b>   |  |                  |
| <ul style="list-style-type: none"> <li>Screwed gland M20x1.5</li> <li>Screwed gland 1/2-14 NPT</li> <li>Han 7D device plug (plastic housing) incl. mating connector<sup>13)14)</sup></li> <li>M12 device plugs (stainless steel)<sup>15) 16)</sup></li> </ul>                      |  | B<br>C<br>D<br>F |
| <b>Display</b>   |  |                  |
| <ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: mA)</li> <li>With visible display (setting: mA)</li> <li>with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)</li> </ul> |  | 0<br>1<br>6<br>7 |

Power supply units see Chap. 7 "Supplementary Components".

Scope of delivery: Pressure transmitter as ordered (Instruction Manual is extra ordering item)

- For oxygen application, add Order code E10.
- Not in conjunction with max. span 600 mbar (240.9 inH<sub>2</sub>O)
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453-...Y...-... and 7MF4900-1...-B
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Not in conjunction with Electrical connection "Han 7D device plug".
- Without cable gland, with blanking plug
- With enclosed cable gland Ex ia and blanking plug
- Configurations with Han and M12 device plugs are only available in Ex ic.
- Only in connection with IP66.
- Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- Only in connection with Ex approval A, B or E.
- Permissible only for crimp-contact of conductor cross-section 1 mm<sup>2</sup>
- Only in connection with Ex approval A, B, E or F.
- M12 delivered without cable socket.

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for differential pressure and flow

1

| Selection and Ordering data  |                                    | Article No.     |  |
|--|------------------------------------|-----------------|--|
| <b>Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>  |                                    |                 |  |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>  |                                    | <b>7MF4534-</b> |  |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>  |                                    | <b>7MF4535-</b> |  |
| ➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.  |                                    |                 |  |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b>     |                 |  |
| Silicone oil   | normal                             | <b>1</b>        |  |
| Inert liquid <sup>1)</sup>   | grease-free to cleanliness level 2 | <b>3</b>        |  |
| <b>Nominal measuring range</b>   |                                    |                 |  |
| 250 mbar   | (100 inH <sub>2</sub> O)           | <b>D</b>        |  |
| 600 mbar   | (240 inH <sub>2</sub> O)           | <b>E</b>        |  |
| 1600 mbar  | (642 inH <sub>2</sub> O)           | <b>F</b>        |  |
| 5 bar  | (2000 inH <sub>2</sub> O)          | <b>G</b>        |  |
| 30 bar   | (435 psi)                          | <b>H</b>        |  |
| <b>Wetted parts materials</b>  |                                    |                 |  |
| (stainless steel process flanges)  |                                    |                 |  |
| Seal diaphragm   | Parts of measuring cell            |                 |  |
| Stainless steel  | Stainless steel                    | <b>A</b>        |  |
| Hastelloy  | Stainless steel                    | <b>B</b>        |  |
| Gold <sup>2)</sup>   | Gold                               | <b>L</b>        |  |
| Version for diaphragm seal <sup>3) 4) 5) 6)</sup>  |                                    | <b>Y</b>        |  |
| <b>Process connection</b>  |                                    |                 |  |
| Female thread 1/4-18 NPT with flange connection  |                                    |                 |  |
| • Sealing screw opposite process connection  |                                    |                 |  |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518  |                                    | <b>3</b>        |  |
| - Mounting thread M12 to DIN 19213 (only for replacement requirement)  |                                    | <b>1</b>        |  |
| • Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing).  |                                    |                 |  |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518  |                                    | <b>7</b>        |  |
| - Mounting thread M12 to DIN 19213 (only for replacement requirement)  |                                    | <b>5</b>        |  |
| <b>Non-wetted parts materials</b>  |                                    |                 |  |
| Process flange screws  | Electronics housing                |                 |  |
| Stainless steel  | Die-cast aluminum                  | <b>2</b>        |  |
| Stainless steel  | Stainless steel precision casting  | <b>3</b>        |  |
| <b>Version</b>   |                                    |                 |  |
| • Standard version, German plate inscription, setting for pressure unit: bar   |                                    | <b>1</b>        |  |
| • International version, English plate inscription, setting for pressure unit: bar   |                                    | <b>2</b>        |  |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal  |                                    | <b>3</b>        |  |
| All versions include DVD with compact operating instructions in various EU languages.  |                                    |                 |  |
| Selection and Ordering data  |                                    | Article No.     |  |
| <b>Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>  |                                    |                 |  |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>  |                                    | <b>7MF4534-</b> |  |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>  |                                    | <b>7MF4535-</b> |  |
|  |                                    |                 |  |
| <b>Explosion protection</b>  |                                    |                 |  |
| • None   |                                    | <b>A</b>        |  |
| • With ATEX, Type of protection:   |                                    |                 |  |
| - "Intrinsic safety (Ex ia)"   |                                    | <b>B</b>        |  |
| - "Explosion-proof (Ex d)" <sup>7)</sup>   |                                    | <b>D</b>        |  |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) <sup>8)</sup>   |                                    | <b>P</b>        |  |
| - "Ex nA/ic (Zone 2)" <sup>9)</sup>  |                                    | <b>E</b>        |  |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>8) 10)</sup>  |                                    | <b>R</b>        |  |
| • FM + CSA intrinsic safe (is) <sup>11)</sup>  |                                    | <b>F</b>        |  |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D <sup>9) 10) 11)</sup>   |                                    | <b>S</b>        |  |
| • With FM + CSA, Type of protection:   |                                    |                 |  |
| - "Intrinsic safety and explosion-proof (is + xp)" <sup>7) 11)</sup> , max PN 360  |                                    | <b>NC</b>       |  |
| <b>Electrical connection/cable entry</b>   |                                    |                 |  |
| • Screwed gland M20 x 1.5  |                                    | <b>B</b>        |  |
| • Screwed gland 1/2-14 NPT   |                                    | <b>C</b>        |  |
| • M12 device plugs (stainless steel) <sup>12) 13)</sup>  |                                    | <b>F</b>        |  |
| <b>Display</b>   |                                    |                 |  |
| • Without (display hidden)   |                                    | <b>0</b>        |  |
| • Without visible display (display concealed, setting: bar)  |                                    | <b>1</b>        |  |
| • With visible display (setting: bar)  |                                    | <b>6</b>        |  |
| • With customer-specific display (setting as specified, Order code "Y21" required)   |                                    | <b>7</b>        |  |
| Included in delivery of the device:  |                                    |                 |  |
| • Quick-start guide  |                                    |                 |  |
| • Sealing plug(s) or sealing screw(s) for the process flanges(s)   |                                    |                 |  |
| 1) For oxygen application, add Order code E10.   |                                    |                 |  |
| 2) Not in conjunction with max. span 600 mbar (240.9 inH <sub>2</sub> O)   |                                    |                 |  |
| 3) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. |                                    |                 |  |
| 4) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.  |                                    |                 |  |
| 5) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453-...Y-... and 7MF4900-1...-B   |                                    |                 |  |
| 6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.   |                                    |                 |  |
| 7) Without cable gland, with blanking plug.  |                                    |                 |  |
| 8) With enclosed cable gland Ex ia and blanking plug.  |                                    |                 |  |
| 9) Configurations with Han and M12 device plugs are only available in Ex ic.   |                                    |                 |  |
| 10) Only in connection with IP66.  |                                    |                 |  |
| 11) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.  |                                    |                 |  |
| 12) Only in connection with Ex approval A, B, E or F.  |                                    |                 |  |
| 13) M12 delivered without cable socket   |                                    |                 |  |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

| Selection and Ordering data   |  | Order code              |             |           |
|---|--|-------------------------|-------------|-----------|
| <b>Further designs</b>  |  |                         | <b>HART</b> | <b>PA</b> |
| Add "-Z" to Article No. and specify Order code.   |  |                         |             | <b>FF</b> |
| <b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b> |  |                         |             |           |
| • Steel   |  | <b>A01</b>              | ✓           | ✓         |
| • Stainless steel 304   |  | <b>A02</b>              | ✓           | ✓         |
| • Stainless steel 316L  |  | <b>A03</b>              | ✓           | ✓         |
| <b>O-rings for process flanges</b>  |  |                         |             |           |
| (instead of FPM (Viton))  |  |                         |             |           |
| • PTFE (Teflon)   |  | <b>A20</b>              | ✓           | ✓         |
| • FEP (with silicone core, approved for food)   |  | <b>A21</b>              | ✓           | ✓         |
| • FFKM (Kalrez, compound 4079), for measured medium temperatures -15 ... 100 °C (5 ... 212 °F)  |  | <b>A22</b>              | ✓           | ✓         |
| • NBR (Buna N)  |  | <b>A23</b>              | ✓           | ✓         |
| <b>Device plugs<sup>1)</sup></b>  |  |                         |             |           |
| • Han 7D (metal)  |  | <b>A30</b>              | ✓           |           |
| • Han 8D (instead of Han 7D)  |  | <b>A31</b>              | ✓           |           |
| • Angled  |  | <b>A32</b>              | ✓           |           |
| • Han 8D (metal)  |  | <b>A33</b>              | ✓           |           |
| <b>Sealing screws (2 units)</b>   |  | <b>A40</b>              | ✓           | ✓         |
| ¼-18 NPT, with valve in mat. of process flanges   |  |                         |             |           |
| <b>Cable sockets for M12 device plugs (metal (CuZn))</b>  |  | <b>A50</b>              | ✓           | ✓         |
| <b>Rating plate inscription (instead of German)</b>   |  |                         |             |           |
| • English   |  | <b>B11</b>              | ✓           | ✓         |
| • French  |  | <b>B12</b>              | ✓           | ✓         |
| • Spanish   |  | <b>B13</b>              | ✓           | ✓         |
| • Italian   |  | <b>B14</b>              | ✓           | ✓         |
| • Cyrillic (russian)  |  | <b>B16</b>              | ✓           | ✓         |
| <b>English rating plate</b>   |  | <b>B21</b>              | ✓           | ✓         |
| Pressure units in inH <sub>2</sub> O and/or psi   |  |                         |             |           |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>  |  | <b>C11</b>              | ✓           | ✓         |
| <b>Inspection certificate</b>   |  | <b>C12</b>              | ✓           | ✓         |
| Acc. to EN 10204-3.1  |  |                         |             |           |
| <b>Factory certificate</b>  |  | <b>C14</b>              | ✓           | ✓         |
| Acc. to EN 10204-2.2  |  |                         |             |           |
| <b>Acceptance certificate (EN 10204-3.1)</b>  |  | <b>C15</b>              | ✓           | ✓         |
| PMI test of parts in contact with medium  |  |                         |             |           |
| <b>Functional safety (SIL2)</b>   |  | <b>C20</b>              | ✓           |           |
| Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration  |  |                         |             |           |
| <b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>   |  | <b>C21<sup>2)</sup></b> |             | ✓         |
| <b>Functional safety (SIL2/3)</b>   |  | <b>C23</b>              | ✓           |           |
| Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration  |  |                         |             |           |
| <b>PED for Russia with initial calibration mark</b>   |  | <b>C99</b>              | ✓           | ✓         |
|   |  |                         |             |           |
| Selection and Ordering data   |  | Order code              |             |           |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>  |  | <b>D05</b>              | ✓           |           |
| <b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>  |  | <b>D07</b>              | ✓           | ✓         |
| (only together with seal diaphragm made of Hastelloy and stainless steel)   |  |                         |             |           |
| <b>Degree of protection IP66/IP68</b>   |  | <b>D12</b>              | ✓           | ✓         |
| (only for M20 x 1.5 and ½-14 NPT)   |  |                         |             |           |
| <b>Nom. press. rating PN 500 (MAWP 7250 psi)</b>  |  | <b>D56</b>              | ✓           |           |
| (Only for measuring cell 600 mbar ... 30 bar (240 inH <sub>2</sub> O ... 435 psi), SIL- and Ex-options not possible) <sup>3)</sup>        |  |                         |             |           |
| <b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>   |  | <b>D59</b>              | ✓           | ✓         |
| <b>Use in or on zone 1D/2D<sup>4)</sup></b>   |  | <b>E01</b>              | ✓           | ✓         |
| (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)                                 |  |                         |             |           |
| <b>Export approval Korea</b>  |  | <b>E11</b>              | ✓           | ✓         |
| <b>CRN approval Canada</b>  |  | <b>E22<sup>5)</sup></b> | ✓           | ✓         |
| (Canadian Registration Number)  |  |                         |             |           |
| <b>Dual seal</b>  |  | <b>E24</b>              | ✓           | ✓         |
| <b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b>   |  | <b>E25<sup>6)</sup></b> | ✓           | ✓         |
| (only for transmitter 7MF4...-.....-B..)  |  |                         |             |           |
| <b>"Flameproof" explosion protection according to INMETRO (Brazil)</b>  |  | <b>E26<sup>6)</sup></b> | ✓           | ✓         |
| (only for transmitter 7MF4...-.....-D..)  |  |                         |             |           |
| <b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b>  |  | <b>E28<sup>6)</sup></b> | ✓           | ✓         |
| (only for transmitter 7MF4...-.....-P..)  |  |                         |             |           |
| <b>Ex Approval IEC Ex (Ex ia)</b>   |  | <b>E45<sup>6)</sup></b> | ✓           | ✓         |
| (only for transmitter 7MF4...-.....-B..)  |  |                         |             |           |
| <b>Ex Approval IEC Ex (Ex d)</b>  |  | <b>E46<sup>6)</sup></b> | ✓           | ✓         |
| (only for transmitter 7MF4...-.....-D..)  |  |                         |             |           |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b>  |  | <b>E55<sup>6)</sup></b> | ✓           | ✓         |
| (only for transmitter 7MF4...-.....-B..)  |  |                         |             |           |
| <b>Ex prot. "Explosion-proof" to NEPSI (China)</b>  |  | <b>E56<sup>6)</sup></b> | ✓           | ✓         |
| (only for transmitter 7MF4...-.....-D..)  |  |                         |             |           |
| <b>Explosion-proof "Zone 2" to NEPSI (China)</b>  |  | <b>E57<sup>6)</sup></b> | ✓           | ✓         |
| (only for transmitter 7MF4...-.....-E..)  |  |                         |             |           |
| <b>Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China)</b>  |  | <b>E58<sup>6)</sup></b> | ✓           | ✓         |
| (only for transmitter 7MF4...-.....-R..)  |  |                         |             |           |
| <b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b>  |  | <b>E70<sup>6)</sup></b> | ✓           | ✓         |
| (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)   |  |                         |             |           |
| <b>Ex-protection Ex ia acc. to EAC Ex (Russia)</b>  |  | <b>E80</b>              | ✓           | ✓         |
| <b>Ex-protection Ex d acc. to EAC Ex (Russia)</b>   |  | <b>E81</b>              | ✓           | ✓         |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>   |  | <b>E82</b>              | ✓           | ✓         |
| <b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>   |  | <b>E83</b>              | ✓           | ✓         |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for differential pressure and flow

1

| Selection and Ordering data  | Order code |             |           |           |
|--|------------|-------------|-----------|-----------|
| <b>Further designs</b>   |            | <b>HART</b> | <b>PA</b> | <b>FF</b> |
| Add "-Z" to Article No. and specify Order code.  |            |             |           |           |
| <b>Two coats of lacquer on casing and cover (PU on epoxy)</b>  | <b>G10</b> | ✓           | ✓         | ✓         |
| <b>Interchanging of process connection side</b>  | <b>H01</b> | ✓           | ✓         | ✓         |
| <b>Stainless steel process flanges for vertical differential pressure lines</b>  | <b>H03</b> | ✓           | ✓         | ✓         |
| <b>Transient protector 6 kV (lightning protection)</b>   | <b>J01</b> | ✓           | ✓         | ✓         |
| <b>Chambered graphite gasket for process flange</b>  | <b>J02</b> | ✓           | ✓         | ✓         |
| <b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>  | <b>J05</b> | ✓           | ✓         | ✓         |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>7)</sup></b> | <b>J08</b> | ✓           | ✓         | ✓         |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>7)</sup></b>  | <b>J09</b> | ✓           | ✓         | ✓         |
| <b>Marine approvals</b>  |            |             |           |           |
| • Det Norske Veritas   | <b>S10</b> | ✓           | ✓         | ✓         |
| • Germanischer Lloyd (DNV-GL)  |            |             |           |           |
| • Lloyds Register (LR)   | <b>S11</b> | ✓           | ✓         | ✓         |
| • French marine classification society Bureau Veritas (BV)   | <b>S12</b> | ✓           | ✓         | ✓         |
| • American Bureau of Shipping (ABS)  | <b>S14</b> | ✓           | ✓         | ✓         |
| • Russian Maritime Register (RMR)  | <b>S16</b> | ✓           | ✓         | ✓         |
| • Korean Register of Shipping (KR)   | <b>S17</b> | ✓           | ✓         | ✓         |

1) Han device plug IP65

2) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

3) Tested according to IEC 61010. Only for measuring materials of the group of fluids 2 in accordance with PED permissible. Not for use with dangerous media suitable.

4) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

5) Cannot be ordered with remote seal.

6) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

7) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

| Selection and Ordering data   | Order code              |             |                 |           |
|---|-------------------------|-------------|-----------------|-----------|
| <b>Additional data</b>  |                         | <b>HART</b> | <b>PA</b>       | <b>FF</b> |
| Please add "-Z" to Article No. and specify Order code(s) and plain text.  |                         |             |                 |           |
| <b>Measuring range to be set</b>  |                         |             |                 |           |
| Specify in plain text:  |                         |             |                 |           |
| • in the case of linear characteristic curve (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi  | <b>Y01</b>              | ✓           | ✓ <sup>1)</sup> |           |
| • in the case of square rooted characteristic (max. 5 characters):<br>Y02: ... up to ... mbar, bar, kPa, MPa, psi   | <b>Y02</b>              | ✓           |                 |           |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b>   | <b>Y15</b>              | ✓           | ✓               | ✓         |
| Max. 16 characters, specify in plain text:<br>Y15: .....  |                         |             |                 |           |
| <b>Measuring point text (entry in device variable)</b>  | <b>Y16</b>              | ✓           | ✓               | ✓         |
| Max. 27 char., specify in plain text: Y16: .....  |                         |             |                 |           |
| <b>Entry of HART address (TAG)</b>  | <b>Y17</b>              | ✓           |                 |           |
| Max. 8 char., specify in plain text: Y17: .....   |                         |             |                 |           |
| <b>Setting of pressure indication in pressure units</b>   | <b>Y21</b>              | ✓           | ✓               | ✓         |
| Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...  |                         |             |                 |           |
| Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>3)</sup> , inH <sub>2</sub> O <sup>3)</sup> , ftH <sub>2</sub> O <sup>3)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>) ref. temperature 20 °C |                         |             |                 |           |
| <b>Setting of pressure indication in non-pressure units<sup>2)</sup></b>  | <b>Y22 + Y01 or Y02</b> | ✓           |                 |           |
| Specify in plain text:<br>Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)   |                         |             |                 |           |
| <b>Preset bus address</b>   | <b>Y25</b>              |             | ✓               | ✓         |
| possible between 1 and 126<br>Specify in plain text: Y25: .....   |                         |             |                 |           |
| <b>Damping adjustment in seconds (0 ... 100 s)</b>  | <b>Y30</b>              | ✓           | ✓               | ✓         |

Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset.

✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) Preset values can only be changed over SIMATIC PDM.

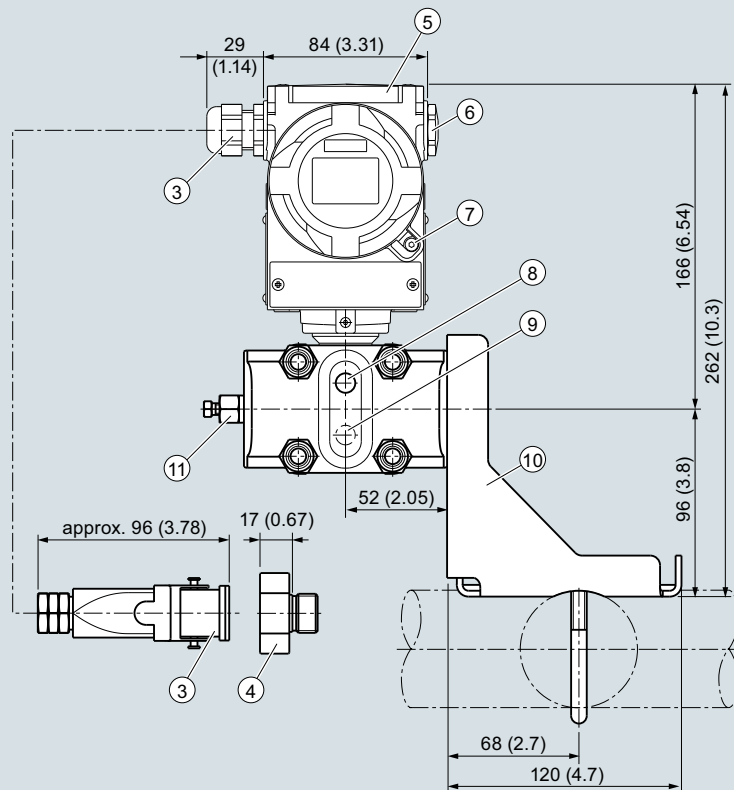
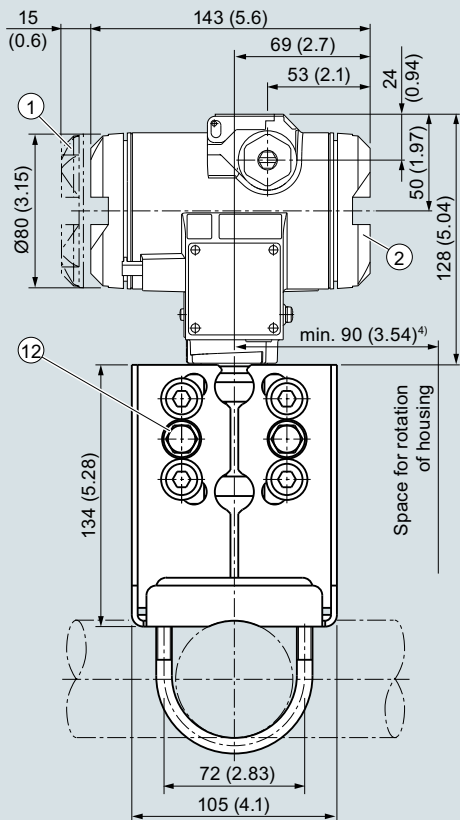
## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

### Dimensional drawings



- ① Electronic side, digital display (longer overall length for cover with window)<sup>1)</sup>
- ② Terminal side<sup>1)</sup>
- ③ Electrical connection: Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/8D device plug<sup>2) 3)</sup>
- ④ Harting adapter
- ⑤ Protective cover over keys

- ⑥ Blanking plug
- ⑦ Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- ⑧ Lateral venting for liquid measurement (Standard)
- ⑨ Lateral venting for gas measurement (suffix H02)
- ⑩ Mounting bracket (option)
- ⑪ Sealing screw with valve (option)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

<sup>1)</sup> Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [IS + XP]"

<sup>4)</sup> 92 mm (3.62 inch) for minimum distance to permit rotation with indicator

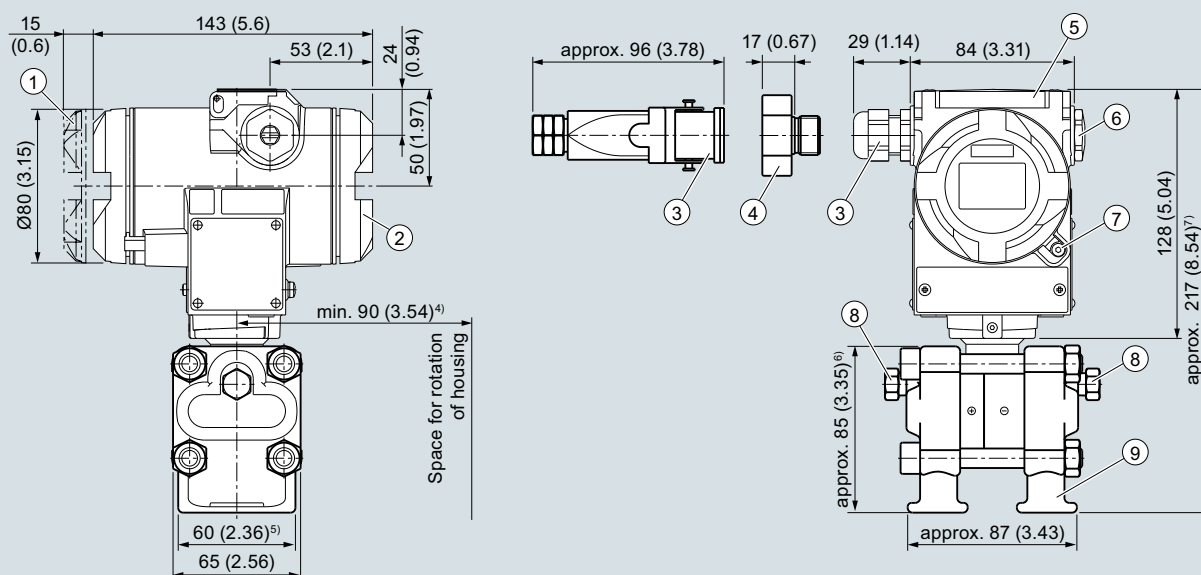
SITRANS P DS III pressure transmitters for differential pressure and flow, dimensions in mm (inch)



Transmitters for applications with advanced requirements (Advanced)  
SITRANS P DS III

for differential pressure and flow

1



- |  |   |
|--|---|
| ① Electronic side, digital display<br>(longer overall length for cover with window) <sup>1)</sup>                          | ⑤ Protective cover over keys  |
| ② Terminal side <sup>1)</sup>  | ⑥ Blanking plug   |
| ③ Electrical connection:<br>Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or<br>Han 7D/8D device plug <sup>2) 3)</sup> | ⑦ Screw cover - safety bracket (only for type of protection<br>"Explosion-proof enclosure", not shown in the drawing) |
| ④ Harting adapter  | ⑧ Sealing screw with valve (option)   |
|  | ⑨ Process connection: ¼-18 NPT (IEC 61518)  |

- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "Explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA" [IS + XP]"
- 4) 92 mm (3.6 inch) for minimum distance to permit rotation with indicator
- 5) 74 mm (2.9 inch) for PN  $\geq 420$  (MAWP  $\geq 6092$  psi)
- 6) 91 mm (3.6 inch) for PN  $\geq 420$  (MAWP  $\geq 6092$  psi)
- 7) 219 mm (8.62 inch) for PN  $\geq 420$  (MAWP  $\geq 6092$  psi)

SITRANS P DS III pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines, optional "H03",  
dimensional drawing, dimensions in mm (inch)



SITRANS P DS III pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

## Technical specifications

### SITRANS P DS III for level

#### Input

Measured variable

Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

Level

#### HART

#### PROFIBUS PA/ FOUNDATION Fieldbus

Span

Nominal measuring range

Max. operating pressure MAWP (PS)

25 ... 250 mbar  
2.5 ... 25 kPa  
10 ... 100 inH<sub>2</sub>O250 mbar  
25 kPa  
100 inH<sub>2</sub>O

See "Mounting flange"

25 ... 600 mbar  
2.5 ... 60 kPa  
10 ... 240 inH<sub>2</sub>O600 mbar  
60 kPa  
240 inH<sub>2</sub>O53 ... 1600 mbar  
5.3 ... 160 kPa  
21 ... 640 inH<sub>2</sub>O1600 mbar  
160 kPa  
642 inH<sub>2</sub>O160 ... 5000 mbar  
16 ... 500 kPa  
2.32 ... 72.5 psi5000 mbar  
500 kPa  
72.5 psi

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

-100 % of max. span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange

-100 % of max. span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange

Upper measuring limit

100 % of max. span

Start of scale value

Between the measuring limits (fully adjustable)

#### Output

Output signal

#### HART

#### PROFIBUS PA/FOUNDATION Fieldbus

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

-

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

-

Load

- Without HART

 $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$   
 $U_H$ : Power supply in V

-

- With HART

 $R_B = 230 \dots 500 \Omega$  (SIMATIC PDM) or  
 $R_B = 230 \dots 1100 \Omega$  (HART Communicator)

-

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal.  
Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for level

1

**SITRANS P DS III for level****Measuring accuracy**

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nom. pressure range}$ 

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

 $r \leq 5 : \leq 0.125 \%$   
 $5 < r \leq 10 : \leq (0.007 \cdot r + 0.09) \%$ 

- 600 mbar/60 kPa/8.7 psi

 $r \leq 5 : \leq 0.125 \%$   
 $5 < r \leq 25 : \leq (0.007 \cdot r + 0.09) \%$ 
- 1600 mbar/160 kPa/23.21 psi  
5 bar/500 kPa/72.5 psi
 $r \leq 5 : \leq 0.125 \%$   
 $5 < r \leq 30 : \leq (0.007 \cdot r + 0.09) \%$ 
Influence of ambient temperature  
(in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

 $\leq (0.4 \cdot r + 0.16) \%$ 

- 600 mbar/60 kPa/8.7 psi

 $\leq (0.24 \cdot r + 0.16) \%$ 

- 1600 mbar/160 kPa/23.21 psi  
5 bar/500 kPa/72.5 psi

 $\leq (0.2 \cdot r + 0.16) \%$ 

Influence of static pressure

- on the zero point

- 250 mbar/25 kPa/3.6 psi

 $\leq (0.3 \cdot r) \% \text{ per nominal pressure}$ 

- 600 mbar/60 kPa/8.7 psi

 $\leq (0.15 \cdot r) \% \text{ per nominal pressure}$ - 1600 mbar/160 kPa/23.21 psi  
5 bar/500 kPa/72.5 psi $\leq (0.1 \cdot r) \% \text{ per nominal pressure}$ 

- on the span

 $\leq (0.1 \cdot r) \% \text{ per nominal pressure}$ Long-term stability  
(temperature change  $\pm 30$  °C ( $\pm 54$  °F))
 $\leq (0.25 \cdot r) \% \text{ in 5 years}$   
 static pressure max. 70 bar/7 MPa/1015 psi

Effect of mounting position

Depending on filling liquid of mounting flange

Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

 $3 \cdot 10^{-5}$  of nominal measuring range**Rated conditions**

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

**Note:** Always take into account assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection!

- Measuring cell with silicone oil filling

- High-pressure side

 $-40 \dots +100^{(1)} \text{ °C } (-40 \dots +212^{(1)} \text{ °F})$  $p_{\text{abs}} \geq 1 \text{ bar: } -40 \dots +175 \text{ °C } (-40 \dots +347 \text{ °F})$  $p_{\text{abs}} < 1 \text{ bar: } -40 \dots +80 \text{ °C } (-40 \dots +176 \text{ °F})$ 

- Low-pressure side

 $-40 \dots +100 \text{ °C } (-40 \dots +212 \text{ °F})$  $-20 \dots +60 \text{ °C } (-4 \dots +140 \text{ °F})$  in conjunction with dust explosion protection

Ambient conditions

- Ambient temperature
  - Transmitter
  - Display readable
- Storage temperature
- Climatic class
  - Condensation

 $-40 \dots +85 \text{ °C } (-40 \dots +185 \text{ °F})$  $-30 \dots +85 \text{ °C } (-22 \dots +185 \text{ °F})$  $-50 \dots +85 \text{ °C } (-58 \dots +185 \text{ °F})$ 

Relative humidity 0 ... 100 %, condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

### for level

#### SITRANS P DS III for level

##### Design

Weight (without options)

- To EN (pressure transmitter with mounting flange, without tube)

≈ 11 ... 13 kg (≈ 24.2 ... 28.7 lb)

- To ASME (pressure transmitter with mounting flange, without tube)

≈ 11 ... 18 kg (≈ 24.2 ... 39.7 lb)

Enclosure material

Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

High-pressure side

- Seal diaphragm of mounting flange

- Stainless steel, W.-Nr. 1.4404/316L
  - coated with PFA
  - coated with PTFE
  - coated with ECTFE
  - gold plated
- Monel 400, mat. no. 2.4360
- Hastelloy C276, mat. no. 2.4619
- Hastelloy C4, mat. no. 2.4602
- Hastelloy C22, mat. no. 2.4602
- Tantalum
- Titanium, mat. no. 3.7035
- Nickel 201
- Duplex 2205, mat. no. 1.4462

Measuring cell filling

Silicone oil

Process connection

- High-pressure side

Flange to EN and ASME

- Low-pressure side

Female thread 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518

##### Power supply $U_H$

Terminal voltage on transmitter

10.5 ... 45 V DC  
10.5 ... 30 V DC in intrinsically-safe mode

##### PROFIBUS PA/FOUNDATION Fieldbus

-

Power supply

Supplied through bus

Separate 24 V power supply necessary

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for level

1

**SITRANS P DS III for level****Certificates and approvals**

Classification according to PED 2014/68/EU

Explosion protection

## • Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

## • Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

## • Dust explosion protection for zone 20

- Marking

- Permissible ambient temperature

- Max. surface temperature

- Connection

- Effective internal inductance/capacitance

## • Dust explosion protection for zone 21/22

- Marking

- Connection

## • Type of protection "n" (zone 2)

- Marking

- Connection (Ex nA)

- Connection (Ex ic)

- Effective internal inductance/capacitance

## • Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

## • Explosion protection to CSA

- Identification (XP/DIP) or (IS)

**HART**

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ;  $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:  
 $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:  
 $U_H = 10.5 \dots 45 \text{ V DC}$ ;  $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

 $U_m = 45 \text{ V}$ 

To circuits with values:  
 $U_i = 45 \text{ V}$

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

Certificate of Compliance 3008490

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

Certificate of Compliance 1153651

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

**PROFIBUS PA/ FOUNDATION Fieldbus**

FISCO supply unit:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$

Linear barrier:  
 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$ 

To circuits with values:  
 $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$

Linear barrier:  
 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$ 

To circuits with values:  $U_H = 9 \dots 32 \text{ V DC}$ ;  $P_{\max} = 1 \text{ W}$

 $U_m = 32 \text{ V}$ 

FISCO supply unit ic:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 570 \text{ mA}$

Linear barrier:  
 $U_o = 32 \text{ V}$ ,  $I_o = 132 \text{ mA}$ ,  $P_o = 1 \text{ W}$

 $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$ 

1) This value may be increased if the process connection is sufficiently insulated.

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

1

## for level

|   |  |  |   |
|---|--|--|---|
| <b>HART communication</b>   |  | <b>FOUNDATION Fieldbus communication</b>   |   |
| HART  | 230 ... 1100 Ω   | Function blocks  | 3 function blocks analog input, 1 function block PID                    |
| Protocol  | HART Version 5.x   | • Analog input   | Yes, linearly rising or falling characteristic                          |
| Software for computer   | SIMATIC PDM  | - Adaptation to customer-specific process variables  | 0 ... 100 s   |
| <b>PROFIBUS PA communication</b>  |  | - Electrical damping, adjustable   | Output/input (can be locked within the device with a bridge)            |
| Simultaneous communication with master class 2 (max.)                           | 4  | - Simulation function  | parameterizable (last good value, substitute value, incorrect value)    |
| The address can be set using  | Configuration tool or local operation (standard setting address 126)                                   | - Failure mode   | Yes, one upper and lower warning limit and one alarm limit respectively |
| Cyclic data usage   |  | - Limit monitoring   | Yes   |
| • Output byte   | 5 (one measured value) or 10 (two measured values)   | - Square-rooted characteristic for flow measurement  |   |
| • Input byte  | 0, 1, or 2 (register operating mode and reset function for metering)                                   | • PID  | Standard FOUNDATION Fieldbus function block                             |
| Internal preprocessing  |  | • Physical block   | 1 resource block  |
| Device profile  | PROFIBUS PA Profile for Process Control Devices Version 3.0, class B                                   | Transducer blocks  | 1 transducer block Pressure with calibration, 1 transducer block LCD    |
| Function blocks   | 2  | • Pressure transducer block  |   |
| • Analog input  |  | - Can be calibrated by applying two pressures  | Yes   |
| - Adaptation to customer-specific process variables                             | Yes, linearly rising or falling characteristic   | - Monitoring of sensor limits  | Yes   |
| - Electrical damping, adjustable  | 0 ... 100 s  | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function                    |
| - Simulation function   | Input/Output   |  |   |
| - Failure mode  | parameterizable (last good value, substitute value, incorrect value)                                   |  |   |
| - Limit monitoring  | Yes, one upper and lower warning limit and one alarm limit respectively                                |  |   |
| • Register (totalizer)  | Can be reset, preset, optional direction of counting, simulation function of register output           | <b>Mounting flange</b>   |   |
| - Failure mode  | parameterizable (summation with last good value, continuous summation, summation with incorrect value) | Nominal diameter   | Nominal pressure  |
| - Limit monitoring  | One upper and lower warning limit and one alarm limit respectively                                     | • Acc. to EN 1092-1  |   |
| • Physical block  | 1  | - DN 80  | PN 40   |
| Transducer blocks   | 2  | - DN100  | PN16, PN40  |
| • Pressure transducer block   |  | • To ASME B16.5  |   |
| - Can be calibrated by applying two pressures                                   | Yes  | - 3 inch   | class 150, class 300  |
| - Monitoring of sensor limits   | Yes  | - 4 inch   | class 150, class 300  |
| - Specification of a container characteristic with                              | Max. 30 nodes  |  |   |
| - Square-rooted characteristic for flow measurement                             | Yes  |  |   |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable  |  |   |
| - Simulation function for measured pressure value and sensor temperature        | Constant value or over parameterizable ramp function   |  |   |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for level

1

| Selection and Ordering data  |   | Article No.      |
|--|---|------------------|
| <b>Pressure transmitter for level, SITRANS P DS III with HART</b>  |   | <b>7MF4633 -</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |   | <b>Y -</b>       |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b>                  |                  |
| Silicone oil   | normal  | <b>1</b>         |
| <b>Measuring span (min. ... max.)</b>  |   |                  |
| 25 ... 250 mbar  | (10 ... 100 inH <sub>2</sub> O)                 | <b>D</b>         |
| 25 ... 600 mbar  | (10 ... 240 inH <sub>2</sub> O)                 | <b>E</b>         |
| 53 ... 1600 mbar   | (21 ... 642 inH <sub>2</sub> O)                 | <b>F</b>         |
| 0.16 ... 5 bar   | (64.3 ... 2000 inH <sub>2</sub> O)              | <b>G</b>         |
| <b>Process connection of low-pressure side</b>   |   |                  |
| Female thread 1/4-18 NPT with flange connection  |   |                  |
| <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul>   |   | <b>2</b>         |
| <b>Non-wetted parts materials</b>  |   |                  |
| process flange screws  | Electronics housing                             |                  |
| Stainless steel  | Die-cast aluminum                               | <b>2</b>         |
| Stainless steel  | Stainless steel precision casting <sup>1)</sup> | <b>3</b>         |
| <b>Version</b>   |   |                  |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>  |   | <b>1</b>         |
| All versions include DVD with compact operating instructions in various EU languages.  |   | <b>2</b>         |
| <b>Explosion protection</b>  |   |                  |
| <ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>2)</sup></li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"<sup>3)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>4)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"<sup>3)5)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>6)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>3)5)6)</sup></li> <li>With FM + CSA, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>1)6)</sup></li> </ul> </li> </ul> |   | <b>A</b>         |
|  |   | <b>B</b>         |
|  |   | <b>D</b>         |
|  |   | <b>P</b>         |
|  |   | <b>E</b>         |
|  |   | <b>R</b>         |
|  |   | <b>F</b>         |
|  |   | <b>S</b>         |
|  |   | <b>NC</b>        |
| <b>Electrical connection/cable entry</b>   |   |                  |
| <ul style="list-style-type: none"> <li>Screwed gland M20x1.5</li> <li>Screwed gland 1/2-14 NPT</li> <li>Han 7D device plug (plastic housing) incl. mating connector<sup>7)</sup></li> <li>M12 device plugs (stainless steel)<sup>8) 9)</sup></li> </ul>  |   | <b>B</b>         |
|  |   | <b>C</b>         |
|  |   | <b>D</b>         |
|  |   | <b>F</b>         |
| <b>Display</b>   |   |                  |
| <ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: mA)</li> <li>With visible display (setting mA)</li> <li>With customer-specific display (setting as specified, Order code "Y21" or "Y22" required)</li> </ul>  |   | <b>0</b>         |
|  |   | <b>1</b>         |
|  |   | <b>6</b>         |
|  |   | <b>7</b>         |

**Ordering information**

1st order item: Pressure transmitter 7MF4633-...  
 2nd order item: Mounting flange 7MF4912-3...

**ordering example**

Item line 1: 7MF4633-1EY20-1AA1-Z  
 B line: Y01  
 C line: Y01: 80 to 143 mbar (1.16 to 2.1 psi)  
 Item line 2: 7MF4912-3GE01

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Quick-start guide
  - Sealing plug(s) or sealing screw(s) for the process flanges(s)
- 1) Not in conjunction with Electrical connection "Han 7D device plug".
  - 2) Without cable gland, with blanking plug.
  - 3) With enclosed cable gland Ex ia and blanking plug.
  - 4) Configurations with Han and M12 device plugs are only available in Ex ic.
  - 5) Only in connection with IP66.
  - 6) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
  - 7) Only in connection with Ex approval A, B or E.
  - 8) M12 delivered without cable socket
  - 9) Only in connection with Ex approval A, B, E or F.

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

| Selection and Ordering data  |                                   | Article No.            |
|--|-----------------------------------|------------------------|
| <b>Pressure transmitters for level</b>   |                                   |                        |
| <b>SITRANS P DS III with PROFIBUS PA (PA)</b>  |                                   | <b>7 M F 4 6 3 4 -</b> |
| <b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>  |                                   | <b>7 M F 4 6 3 5 -</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |                                   | <b>1 Y - - - -</b>     |
| <b>Nominal measuring range</b>   |                                   |                        |
| 250 mbar   | (100 inH <sub>2</sub> O)          | <b>D</b>               |
| 600 mbar   | (240 inH <sub>2</sub> O)          | <b>E</b>               |
| 1600 mbar  | (642 inH <sub>2</sub> O)          | <b>F</b>               |
| 5 bar  | (2000 inH <sub>2</sub> O)         | <b>G</b>               |
| <b>Process connection of low-pressure side</b>   |                                   |                        |
| Female thread 1/4-18 NPT with flange connection  |                                   |                        |
| <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> </ul>  |                                   | <b>2</b>               |
| <ul style="list-style-type: none"> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul>  |                                   | <b>0</b>               |
| <b>Non-wetted parts materials</b>  |                                   |                        |
| process flange screws  | Electronics housing               |                        |
| Stainless steel  | Die-cast aluminum                 | <b>2</b>               |
| Stainless steel  | Stainless steel precision casting | <b>3</b>               |
| <b>Version</b>   |                                   |                        |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar)</li> </ul>  |                                   | <b>1</b>               |
| <ul style="list-style-type: none"> <li>International version, English plate inscription, setting for pressure unit: bar</li> </ul>   |                                   | <b>2</b>               |
| <ul style="list-style-type: none"> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>  |                                   | <b>3</b>               |
| All versions include DVD with compact operating instructions in various EU languages.  |                                   |                        |
| <b>Explosion protection</b>  |                                   |                        |
| <ul style="list-style-type: none"> <li>None</li> </ul>   |                                   | <b>A</b>               |
| <ul style="list-style-type: none"> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> </ul> </li> </ul>   |                                   | <b>B</b>               |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>"Explosion-proof (Ex d)<sup>1)</sup>"</li> </ul> </li> </ul>  |                                   | <b>D</b>               |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>"Intrinsic safety and flameproof enclosure (Ex ia + Ex d)<sup>2)</sup>"</li> </ul> </li> </ul>  |                                   | <b>P</b>               |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>"Ex nA/ic (Zone 2)<sup>3)</sup>"</li> </ul> </li> </ul>   |                                   | <b>E</b>               |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)<sup>2)4)</sup>"</li> </ul> </li> </ul> |                                   | <b>R</b>               |
| <ul style="list-style-type: none"> <li>FM + CSA intrinsic safe (is)<sup>5)</sup></li> </ul>  |                                   | <b>F</b>               |
| <ul style="list-style-type: none"> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>2)4)5)</sup></li> </ul>   |                                   | <b>S</b>               |
| <ul style="list-style-type: none"> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)<sup>1)5)</sup>"</li> </ul> </li> </ul>          |                                   | <b>NC</b>              |
| <b>Electrical connection/cable entry</b>   |                                   |                        |
| <ul style="list-style-type: none"> <li>Screwed gland M20 x 1.5</li> </ul>  |                                   | <b>B</b>               |
| <ul style="list-style-type: none"> <li>Screwed gland 1/2-14 NPT</li> </ul>   |                                   | <b>C</b>               |
| <ul style="list-style-type: none"> <li>M12 device plugs (stainless steel)<sup>6) 7)</sup></li> </ul>   |                                   | <b>F</b>               |
| <b>Display</b>   |                                   |                        |
| <ul style="list-style-type: none"> <li>Without display</li> </ul>  |                                   | <b>0</b>               |
| <ul style="list-style-type: none"> <li>Without visible display (display concealed, setting: bar)</li> </ul>  |                                   | <b>1</b>               |
| <ul style="list-style-type: none"> <li>With visible display (setting: bar)</li> </ul>  |                                   | <b>6</b>               |
| <ul style="list-style-type: none"> <li>With customer-specific display (setting as specified, Order code "Y21" required)</li> </ul>   |                                   | <b>7</b>               |

## Ordering information

1st order item: Pressure transmitter 7MF4634-...

2nd order item: Mounting flange 7MF4912-...

## ordering example

Item line 1: 7MF4634-1EY20-1AA1

Item line 2: 7MF4912-3GE01

Included in delivery of the device:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- 1) Without cable gland, with blanking plug.
- 2) With enclosed cable gland Ex ia and blanking plug.
- 3) Configurations with Han and M12 device plugs are only available in Ex ic.
- 4) Only in connection with IP66.
- 5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 6) M12 delivered without cable socket
- 7) Only in connection with Ex approval A, B, E or F.

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for level

1

| Selection and Ordering data   |     | Order code        |      |    |    |
|---|-----|-------------------|------|----|----|
| Further designs   |     |                   | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code.   |     |                   |      |    |    |
| <b>O-rings for process flanges on low-pressure side</b><br>(instead of FPM (Viton))   |     |                   |      |    |    |
| • PTFE (Teflon)   | A20 | ✓                 | ✓    | ✓  | ✓  |
| • FEP (with silicone core, approved for food)   | A21 | ✓                 | ✓    | ✓  | ✓  |
| • FFPM (Kalrez, compound 4079),<br>for measured medium temperatures<br>-15 ... 100 °C (5 ... 212 °F)                                    | A22 | ✓                 | ✓    | ✓  | ✓  |
| • NBR (Buna N)  | A23 | ✓                 | ✓    | ✓  | ✓  |
| <b>Device plugs<sup>1)</sup></b>  |     |                   |      |    |    |
| • Han 7D (metal)  | A30 | ✓                 |      |    |    |
| • Han 8D (instead of Han 7D)  | A31 | ✓                 |      |    |    |
| • Angled  | A32 | ✓                 |      |    |    |
| • Han 8D (metal)  | A33 | ✓                 |      |    |    |
| <b>Sealing screw</b><br>¼-18 NPT, with valve in mat. of process flanges   |     | A40               | ✓    | ✓  | ✓  |
| <b>Cable sockets for M12 device plugs (metal (CuZn))</b>  |     | A50               | ✓    | ✓  | ✓  |
| <b>Rating plate inscription</b><br>(instead of German)  |     |                   |      |    |    |
| • English   | B11 | ✓                 | ✓    | ✓  | ✓  |
| • French  | B12 | ✓                 | ✓    | ✓  | ✓  |
| • Spanish   | B13 | ✓                 | ✓    | ✓  | ✓  |
| • Italian   | B14 | ✓                 | ✓    | ✓  | ✓  |
| • Cyrillic (russian)  | B16 | ✓                 | ✓    | ✓  | ✓  |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi  | B21 | ✓                 | ✓    | ✓  | ✓  |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>                                      |     | C11               | ✓    | ✓  | ✓  |
| <b>Inspection certificate</b><br>Acc. to EN 10204-3.1   |     | C12               | ✓    | ✓  | ✓  |
| <b>Factory certificate</b><br>Acc. to EN 10204-2.2  |     | C14               | ✓    | ✓  | ✓  |
| <b>Acceptance certificate (EN 10204-3.1)</b><br>PMI test of parts in contact with medium  |     | C15               | ✓    | ✓  | ✓  |
| <b>Functional safety (SIL2)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration   |     | C20               | ✓    |    |    |
| <b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>   |     | C21 <sup>2)</sup> |      | ✓  |    |
| <b>Functional safety (SIL2/3)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration |     | C23               | ✓    |    |    |
| <b>PED for Russia with initial calibration mark</b>   |     | C99               | ✓    | ✓  | ✓  |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>  |     | D05               | ✓    |    |    |
| <b>Degree of protection IP66/IP68</b><br>(only for M20x1.5 and ½-14 NPT)  |     | D12               | ✓    | ✓  | ✓  |
| <b>Supplied with oval flange</b><br>(1 item), PTFE packing and screws in thread of process flange                                       |     | D37               | ✓    | ✓  | ✓  |
| <b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>   |     | D59               | ✓    | ✓  | ✓  |

| Selection and Ordering data   |  | Order code        |      |    |    |
|---|--|-------------------|------|----|----|
| Further designs   |  |                   | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code.   |  |                   |      |    |    |
| <b>Use on zone 1D / 2D<sup>3)</sup></b><br>(only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)  |  | E01               | ✓    | ✓  | ✓  |
| <b>Overfilling safety device for flammable and non-flammable liquids</b><br>(max. PN 32 (MAWP 464 psi), basic device with type of protection "Intrinsic safety (Ex ia)", to WHG and VbF, not together with measuring cell filling "inert liquid") |  | E08               | ✓    |    |    |
| <b>Export approval Korea</b>  |  | E11               | ✓    | ✓  | ✓  |
| <b>Dual seal</b>  |  | E24               | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-B..)   |  | E25 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>"Flameproof" explosion protection according to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-D..)  |  | E26 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b><br>(only for transmitter 7MF4...-.....-P..)  |  | E28 <sup>4)</sup> | ✓    | ✓  |    |
| <b>Ex Approval IEC Ex (Ex ia)</b><br>(only for transmitter 7MF4...-.....-B..)   |  | E45 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Ex Approval IEC Ex (Ex d)</b><br>(only for transmitter 7MF4...-.....-D..)  |  | E46 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-B..)  |  | E55 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-D..)  |  | E56 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-E..)  |  | E57 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-R..)  |  | E58 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b><br>(only for transmitter 7MF4...-.....-[B, D]..-Z + E11)   |  | E70 <sup>4)</sup> | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b>   |  | E80               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b>  |  | E81               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>   |  | E82               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>   |  | E83               | ✓    | ✓  | ✓  |
| <b>Two coats of lacquer on casing and cover (PU on epoxy)</b>   |  | G10               | ✓    | ✓  | ✓  |
| <b>Replacement of process connection side</b>   |  | H01               | ✓    | ✓  | ✓  |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

| Selection and Ordering data  | Order code |             |           |           |
|--|------------|-------------|-----------|-----------|
| <b>Further designs</b>   |            | <b>HART</b> | <b>PA</b> | <b>FF</b> |
| Add "-Z" to Article No. and specify Order code.  |            |             |           |           |
| <b>Transient protector 6 kV (lightning protection)</b>   | <b>J01</b> | ✓           | ✓         | ✓         |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>5)</sup></b> | <b>J08</b> | ✓           | ✓         | ✓         |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>5)</sup></b>  | <b>J09</b> | ✓           | ✓         | ✓         |

1) Han device plug IP65

2) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

3) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

4) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

5) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

| Selection and Ordering data  | Order code                    |             |                 |           |
|--|-------------------------------|-------------|-----------------|-----------|
| <b>Additional data</b>   |                               | <b>HART</b> | <b>PA</b>       | <b>FF</b> |
| Please add "-Z" to Article No. and specify Order code(s) and plain text.   |                               |             |                 |           |
| <b>Measuring range to be set</b><br>Specify in plain text (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi  | <b>Y01</b>                    | ✓           | ✓ <sup>1)</sup> |           |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....  | <b>Y15</b>                    | ✓           | ✓               | ✓         |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 characters, specify in plain text:<br>Y16: .....   | <b>Y16</b>                    | ✓           | ✓               | ✓         |
| <b>Entry of HART address (TAG)</b><br>Max. 8 characters, specify in plain text:<br>Y17: .....  | <b>Y17</b>                    | ✓           |                 |           |
| <b>Setting of pressure indicator in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>*)</sup> , inH <sub>2</sub> O <sup>*)</sup> , ftH <sub>2</sub> O <sup>*)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>*) ref. temperature 20 °C | <b>Y21</b>                    | ✓           | ✓               | ✓         |
| <b>Setting of pressure indicator in non-pressure units<sup>2)</sup></b><br>Specify in plain text:<br>Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)  | <b>Y22<sup>3)</sup> + Y01</b> | ✓           |                 |           |
| <b>Preset bus address</b><br>possible between 1 and 126<br>Specify in plain text:<br>Y25: .....  | <b>Y25</b>                    |             | ✓               | ✓         |
| <b>Damping adjustment in seconds (0 ... 100 s)</b>   | <b>Y30</b>                    | ✓           | ✓               | ✓         |

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) Preset values can only be changed over SIMATIC PDM.

3) Not in conjunction with over-filling safety device for flammable and non-flammable liquids (Order code "E08")



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for level

1

| Selection and Ordering data   |                         | Article No.    | Order code   |
|---|-------------------------|----------------|--------------|
| <b>Mounting flange</b>  |                         | <b>7MF4912</b> |              |
| Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series  |                         | <b>3</b>       |              |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |                         |                |              |
| <b>Connection to EN 1092-1</b>  |                         |                |              |
| <b>Nominal diameter</b>   | <b>Nominal pressure</b> |                |              |
| DN 25   | PN 10/16/25/40          | <b>Z</b>       | <b>J 0 A</b> |
|   | PN 63/100/160           | <b>Z</b>       | <b>J 0 B</b> |
| DN 40   | PN 10/16/25/40          | <b>Z</b>       | <b>J 0 C</b> |
|   | PN 63/100               | <b>Z</b>       | <b>J 0 D</b> |
|   | PN 160                  | <b>Z</b>       | <b>J 0 E</b> |
| DN 50   | PN 10/16/25/40          | <b>A</b>       |              |
|   | PN 100                  | <b>B</b>       |              |
| DN 80   | PN 10/16/25/40          | <b>D</b>       |              |
| DN 100  | PN 10/16                | <b>G</b>       |              |
|   | PN 25/40                | <b>H</b>       |              |
| <b>Connection to ASME B16.5</b>   |                         |                |              |
| <b>Nominal diameter</b>   | <b>Nominal pressure</b> |                |              |
| 1 inch  | class 150               | <b>Z</b>       | <b>J 6 A</b> |
|   | class 300               | <b>Z</b>       | <b>J 6 B</b> |
|   | class 400/600           | <b>Z</b>       | <b>J 6 C</b> |
|   | class 900/1500          | <b>Z</b>       | <b>J 6 D</b> |
| 1½ inch   | class 150               | <b>Z</b>       | <b>J 6 E</b> |
|   | class 300               | <b>Z</b>       | <b>J 6 F</b> |
|   | class 400/600           | <b>Z</b>       | <b>J 6 G</b> |
|   | class 900/1500          | <b>Z</b>       | <b>J 6 H</b> |
| 2 inch  | class 150               | <b>L</b>       |              |
|   | class 300               | <b>M</b>       |              |
|   | class 400/600           | <b>N</b>       |              |
|   | class 900/1500          | <b>P</b>       |              |
| 3 inch  | class 150               | <b>Q</b>       |              |
|   | class 300               | <b>R</b>       |              |
| 4 inch  | class 150               | <b>T</b>       |              |
|   | class 300               | <b>U</b>       |              |
| <b>Flange acc. to JIS</b>   |                         |                |              |
| <b>Nominal diameter</b>   | <b>Nominal pressure</b> |                |              |
| JIS DN 50   | 10 K 316L               | <b>Z</b>       | <b>J 7 A</b> |
|   | 20 K 316L               | <b>Z</b>       | <b>J 7 B</b> |
| JIS DN 80   | 10 K 316L               | <b>Z</b>       | <b>J 7 C</b> |
|   | 20 K 316L               | <b>Z</b>       | <b>J 7 D</b> |
| Other version, add Order code and plain text:<br>Nominal diameter: ...; Nominal press.: ...   |                         | <b>Z</b>       | <b>J 1 Y</b> |
| <b>Wetted parts materials</b>   |                         |                |              |
| <ul style="list-style-type: none"> <li>Stainless steel 316L <ul style="list-style-type: none"> <li>- Coated with PFA</li> <li>- Coated with PTFE</li> <li>- Coated with ECTFE<sup>1)</sup></li> </ul> </li> <li>Monel 400, mat. no. 2.4360</li> <li>Hastelloy C276, mat. no. 2.4819</li> <li>Hastelloy C4, mat. no. 2.4602</li> <li>Hastelloy C22, mat. no. 2.4602</li> <li>Tantalum</li> <li>Titanium, mat. no. 3.7035 (max. 150 °C (302 °F))</li> <li>Nickel 201 (max. 260 °C (500 °F))</li> <li>Duplex 2205, mat. no. 1.4462</li> <li>Duplex 2205, mat. no. 1.4462, incl. main body</li> <li>Stainless steel 316L, gold plated, thickness approx. 25 µm</li> </ul> |                         | <b>A</b>       |              |
|   |                         | <b>D</b>       |              |
|   |                         | <b>E</b>       | <b>0</b>     |
|   |                         | <b>F</b>       |              |
|   |                         | <b>G</b>       |              |
|   |                         | <b>J</b>       |              |
|   |                         | <b>U</b>       |              |
|   |                         | <b>V</b>       | <b>0</b>     |
|   |                         | <b>K</b>       |              |
|   |                         | <b>L</b>       | <b>0</b>     |
|   |                         | <b>M</b>       | <b>0</b>     |
|   |                         | <b>Q</b>       |              |
|   |                         | <b>R</b>       |              |
|   |                         | <b>S</b>       | <b>0</b>     |
| <b>Tube length</b>  |                         |                |              |
| <ul style="list-style-type: none"> <li>without tube</li> </ul>  |                         | <b>0</b>       |              |
| Other version: add Order code and plain text:<br>material of parts in contact with medium: .....,<br>tubus length: .....  |                         | <b>Z 8</b>     | <b>K 1 Y</b> |

| Selection and Ordering data   |                 | Article No.    | Order code   |
|---|-----------------|----------------|--------------|
| <b>Mounting flange</b>  |                 | <b>7MF4912</b> |              |
| Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series  |                 | <b>3</b>       |              |
| <b>Customer-specific tubus length</b>   |                 |                |              |
| Specify customer-specific length with Y44, see Order Code   |                 |                |              |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Stainless steel without foil</li> </ul>  |                 |                |              |
| Range   | Standard length |                |              |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>A 1</b>     |              |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>A 2</b>     |              |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>A 3</b>     |              |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>A 4</b>     |              |
| 201 ... 250 mm (7.91 ... 9.84")   | 250 mm (9.84")  | <b>A 5</b>     |              |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Stainless steel coated with ECTFE</li> </ul>   |                 |                |              |
| Range   | Standard length |                |              |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>F 1</b>     |              |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>F 2</b>     |              |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>F 3</b>     |              |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>F 4</b>     |              |
| 201 ... 250 mm (7.91 ... 9.84")   | 250 mm (9.84")  | <b>F 5</b>     |              |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Stainless steel coated with PFA</li> </ul>   |                 |                |              |
| Range   | Standard length |                |              |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>D 1</b>     |              |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>D 2</b>     |              |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>D 3</b>     |              |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>D 4</b>     |              |
| 201 ... 250 mm (7.91 ... 9.84")   | 250 mm (9.84")  | <b>D 5</b>     |              |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Monel 400</li> </ul>   |                 |                |              |
| Range   | Standard length |                |              |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>G 1</b>     |              |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>G 2</b>     |              |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>G 3</b>     |              |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>G 4</b>     |              |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Hastelloy C276</li> </ul>  |                 |                |              |
| Range   | Standard length |                |              |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>J 1</b>     |              |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>J 2</b>     |              |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>J 3</b>     |              |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>J 4</b>     |              |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Tantalum</li> </ul>  |                 |                |              |
| Range   | Standard length |                |              |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>K 1</b>     |              |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>K 2</b>     |              |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>K 3</b>     |              |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>K 4</b>     |              |
| <b>Filling liquid</b>   |                 |                |              |
| <ul style="list-style-type: none"> <li>Silicone oil M5</li> <li>Silicone oil M50</li> <li>High-temperature oil</li> <li>Halocarbon oil (for O<sub>2</sub>-measurement)<sup>2)</sup></li> <li>Food oil (FDA-listed)</li> </ul> |                 | <b>1</b>       |              |
|   |                 | <b>2</b>       |              |
|   |                 | <b>3</b>       |              |
|   |                 | <b>4</b>       |              |
|   |                 | <b>7</b>       |              |
| Other version, add Order code and plain text:<br>filling liquid: ...  |                 | <b>9</b>       | <b>M 1 Y</b> |

1) For vacuum on request

2) Oil and grease-free cleaning according to DIN 25410, level 2, and packaging included in scope of delivery. Refer to "Further designs" C10 and E10.

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

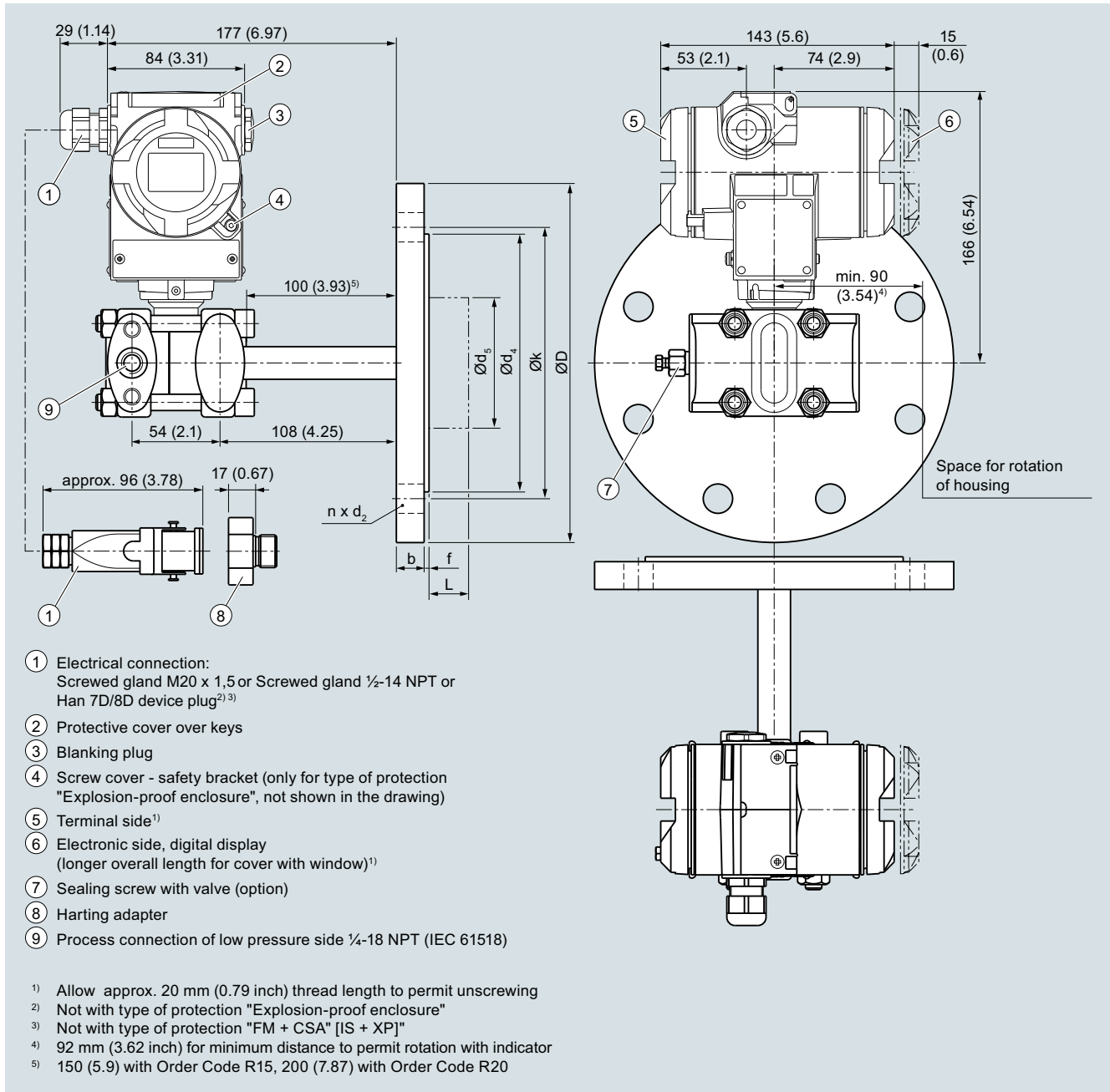
for level

1

| Selection and Ordering data  |            | Order code |             |           |           |
|--|------------|------------|-------------|-----------|-----------|
| <b>Further designs</b>   |            |            | <b>HART</b> | <b>PA</b> | <b>FF</b> |
| Add "-Z" to Article No. and specify Order code.  |            |            |             |           |           |
| <b>Customer-specific tubus length</b>  | <b>Y44</b> | ✓          | ✓           | ✓         |           |
| Select range, enter desired length in plain text (No entry = standard length)  |            |            |             |           |           |
| <b>Spark arrester</b>  | <b>A01</b> | ✓          | ✓           | ✓         |           |
| For mounting on zone 0 (incl. documentation)   |            |            |             |           |           |
| <b>Remote seal nameplate</b>   | <b>B20</b> | ✓          | ✓           | ✓         |           |
| attached out of stainless steel, contains Article No. and order number of the remote seal supplier   |            |            |             |           |           |
| <b>Oil- and grease-free cleaned version</b>  | <b>C10</b> | ✓          | ✓           | ✓         |           |
| Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2   |            |            |             |           |           |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>   | <b>C11</b> | ✓          | ✓           | ✓         |           |
| <b>Inspection certificate</b>  | <b>C12</b> | ✓          | ✓           | ✓         |           |
| Acc. to EN 10204-3.1   |            |            |             |           |           |
| <b>2.2 Certificate of FDA approval of fill oil</b>   | <b>C17</b> | ✓          | ✓           | ✓         |           |
| Only in conjunction with filling liquid "Food oil" (FDA listed)"   |            |            |             |           |           |
| <b>"Functional safety (SIL2)" certificate to IEC 61508</b>   | <b>C20</b> | ✓          | ✓           |           |           |
| (only for conjunction with the Order code "C20" in the case of SITRANS P DS III transmitter)   |            |            |             |           |           |
| <b>"Functional safety (SIL2/3)" certificate to IEC 61508</b>   | <b>C23</b> | ✓          | ✓           |           |           |
| (only for conjunction with the Order code "C23" in the case of SITRANS P DS III transmitter)   |            |            |             |           |           |
| <b>Certification acc. to NACE MR-0175</b>  | <b>D07</b> | ✓          | ✓           | ✓         |           |
| Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)   |            |            |             |           |           |
| <b>Certification acc. to NACE MR-0103</b>  | <b>D08</b> | ✓          | ✓           | ✓         |           |
| Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)   |            |            |             |           |           |
| <b>Oil- and grease-free cleaned version</b>  | <b>E10</b> | ✓          | ✓           | ✓         |           |
| Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2                           |            |            |             |           |           |
| <b>Epoxy painting</b>  | <b>E15</b> | ✓          | ✓           | ✓         |           |
| Not possible with negative pressure service<br>Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42..., only possible with process connection G½B according to EN 837-1. |            |            |             |           |           |

| Selection and Ordering data  |            | Order code |             |           |           |
|--|------------|------------|-------------|-----------|-----------|
| <b>Further designs</b>   |            |            | <b>HART</b> | <b>PA</b> | <b>FF</b> |
| Add "-Z" to Article No. and specify Order code.  |            |            |             |           |           |
| <b>One sided-mounting, sealing surface below</b>   | <b>H20</b> |            |             |           |           |
| <b>Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm)</b>   | <b>J11</b> | ✓          | ✓           | ✓         |           |
| previously DIN 2501, form E  |            |            |             |           |           |
| <b>Sealing surface groove, EN 1092-1, form D</b>   | <b>J14</b> | ✓          | ✓           | ✓         |           |
| instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)   |            |            |             |           |           |
| <b>Sealing surface with spring according to EN 1092-1, form F, (previously DIN 2512, form F) in stainless steel 316L</b>   |            |            |             |           |           |
| DN 25  | <b>J30</b> | ✓          | ✓           | ✓         |           |
| DN 40  | <b>J31</b> | ✓          | ✓           | ✓         |           |
| DN 50  | <b>J32</b> | ✓          | ✓           | ✓         |           |
| DN 80  | <b>J33</b> | ✓          | ✓           | ✓         |           |
| DN 100   | <b>J34</b> | ✓          | ✓           | ✓         |           |
| DN 125   | <b>J35</b> | ✓          | ✓           | ✓         |           |
| <b>Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L</b>   |            |            |             |           |           |
| DN 25  | <b>J40</b> | ✓          | ✓           | ✓         |           |
| DN 40  | <b>J41</b> | ✓          | ✓           | ✓         |           |
| DN 50  | <b>J42</b> | ✓          | ✓           | ✓         |           |
| DN 80  | <b>J43</b> | ✓          | ✓           | ✓         |           |
| DN 100   | <b>J44</b> | ✓          | ✓           | ✓         |           |
| DN 125   | <b>J45</b> | ✓          | ✓           | ✓         |           |
| <b>Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L</b>   |            |            |             |           |           |
| DN 25  | <b>J50</b> | ✓          | ✓           | ✓         |           |
| DN 40  | <b>J51</b> | ✓          | ✓           | ✓         |           |
| DN 50  | <b>J52</b> | ✓          | ✓           | ✓         |           |
| DN 80  | <b>J53</b> | ✓          | ✓           | ✓         |           |
| DN 100   | <b>J54</b> | ✓          | ✓           | ✓         |           |
| DN 125   | <b>J55</b> | ✓          | ✓           | ✓         |           |
| <b>Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA</b>  | <b>J12</b> | ✓          | ✓           | ✓         |           |
| instead of sealing surface B2 or RFSF (only for wetted parts made of Hastelloy C276 (2.4819), tantalum and Duplex 2205 (1.4462) and for nominal sizes 2", 3", DN 50 and DN 80) |            |            |             |           |           |
| <b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b>   | <b>J24</b> | ✓          | ✓           | ✓         |           |
| instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)   |            |            |             |           |           |
| <b>Elongated pipe, 150 mm instead of 100 mm,</b>   | <b>R15</b> | ✓          | ✓           | ✓         |           |
| max. medium temperature 250 °C, observe the maximum permissible media temperature of the filling liquid.   |            |            |             |           |           |
| <b>Elongated pipe, 200 mm instead of 100 mm,</b>   | <b>R20</b> | ✓          | ✓           | ✓         |           |
| max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.   |            |            |             |           |           |
| <b>Negative pressure service</b>   | <b>V04</b> | ✓          | ✓           | ✓         |           |
| for use in the low-pressure measuring range for transmitter for level<br>Note: suffix "Y01" required with pressure transmitter   |            |            |             |           |           |
| <b>Extended negative pressure service</b>  | <b>V54</b> | ✓          | ✓           | ✓         |           |
| for use in the low-pressure measuring range for transmitter for level<br>Note: suffix "Y01" required with pressure transmitter<br>✓ = available                                |            |            |             |           |           |

## Dimensional drawings



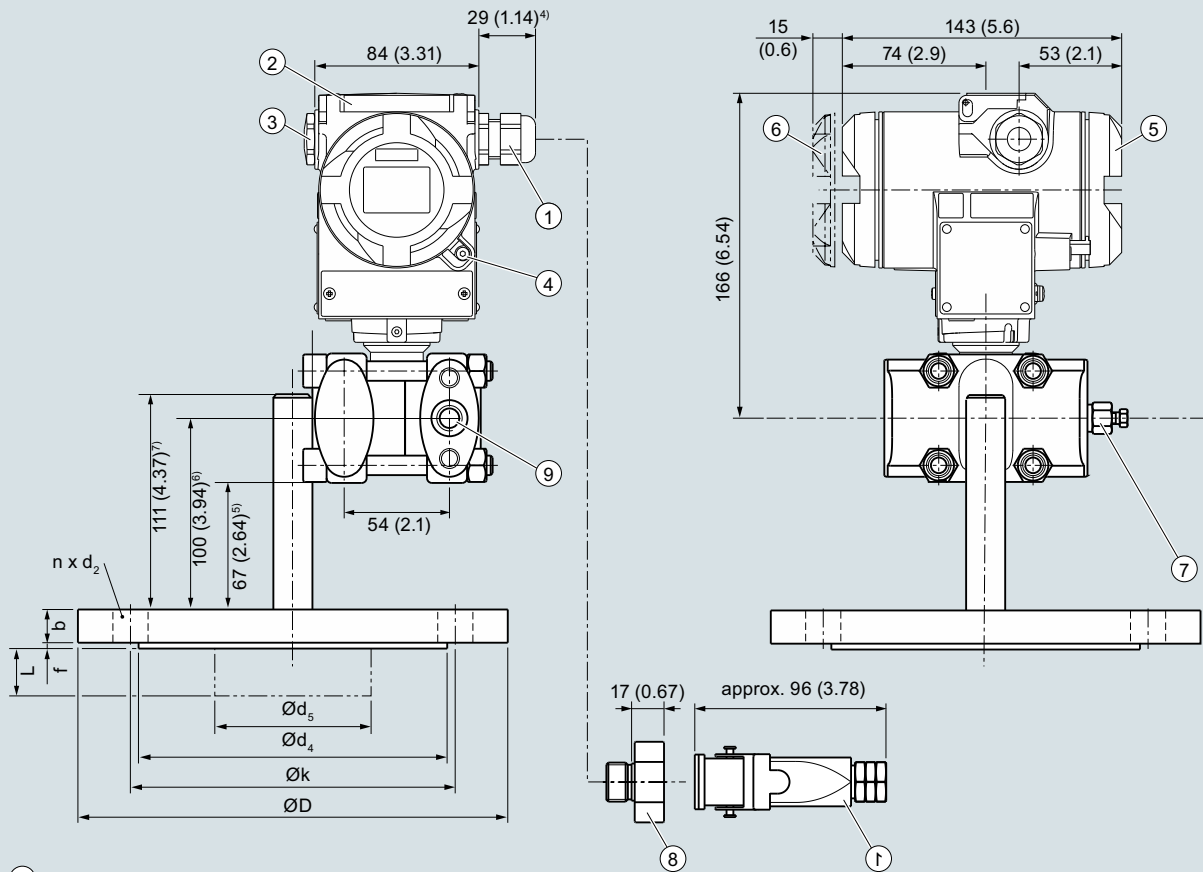
SITRANS P DS III with HART pressure transmitters for level, including mounting flange, dimensions in mm (inch)

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

for level



- ① Electrical connection:  
Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or  
Han 7D/8D device plug<sup>2) 3)</sup>
- ② Protective cover over keys
- ③ Blanking plug
- ④ Screw cover - safety bracket (only for type of protection  
"Explosion-proof enclosure", not shown in the drawing)
- ⑤ Terminal side<sup>1)</sup>
- ⑥ Electronic side, digital display  
(longer overall length for cover with window)<sup>1)</sup>
- ⑦ Sealing screw with valve (option)
- ⑧ Harting adapter
- ⑨ Process connection of low pressure side ¼-18 NPT (IEC 61518)

<sup>1)</sup> Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [IS + XP]"

<sup>4)</sup> For Pg 13,5 with adapter approx. 45 mm (1.77 inch)

<sup>5)</sup> 117 (4.61) with Order Code R15, 167 (6.57) with Order Code R20

<sup>6)</sup> 150 (5.19) with Order Code R15, 200 (7.87) with Order Code R20

<sup>7)</sup> 161 (6.34) with Order Code R15, 211 (8.31) with Order Code R20

SITRANS P DS III with HART pressure transmitters for level, including mounting flange, one sided-mounting, sealing surface below (order code H20), dimensions in mm (inch)

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

for level

1

#### Connection to EN 1092-1

| Nominal diameter | Nominal pressure | b  | D   | d   | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub>   | f  | k   | n  | L                      |
|------------------|------------------|----|-----|-----|----------------|----------------|----------------|------------------|----|-----|----|------------------------|
|                  |                  | mm | mm  | mm  | mm             | mm             | mm             | mm               | mm | mm  | mm | mm                     |
| DN 50            | PN 10/16/25/40   | 20 | 165 | 90  | 18             | 102            | 48.3           | 45 <sup>1)</sup> | 2  | 125 | 4  | 0, 50, 100, 150 or 200 |
|                  | PN 100           | 28 | 195 | 90  | 26             | 102            | 48.3           | 45 <sup>1)</sup> | 2  | 145 | 8  |                        |
| DN 80            | PN 10/16/25/40   | 24 | 200 | 90  | 18             | 138            | 76             | 72 <sup>2)</sup> | 2  | 160 | 8  |                        |
|                  | PN 100           | 32 | 230 | 90  | 26             | 138            | 76             | 72 <sup>2)</sup> | 2  | 180 | 8  |                        |
| DN 100           | PN 10/16         | 20 | 220 | 115 | 18             | 158            | 94             | 89               | 2  | 180 | 8  |                        |
|                  | PN 25/40         | 24 | 235 | 115 | 22             | 162            | 94             | 89               | 2  | 190 | 8  |                        |

#### Connection to ASME B16.5

| Nominal diameter | Nominal pressure | b           | D           | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub>          | f         | k            | n         | L   |
|------------------|------------------|-------------|-------------|----------------|----------------|----------------|-------------------------|-----------|--------------|-----------|---|
|                  | lb./sq.in        | inch (mm)   | inch (mm)   | inch (mm)      | inch (mm)      | inch (mm)      | inch (mm)               | inch (mm) | inch (mm)    | inch (mm) | inch (mm)   |
| 2 inch           | 150              | 0.77 (19.5) | 5.91 (150)  | 0.79 (20)      | 3.62 (92)      | 1.9 (48.3)     | 1.77 <sup>1)</sup> (45) | 0.08 (2)  | 4.74 (120.5) | 4         | 0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200) |
|                  | 300              | 0.89 (22.7) | 6.5 (165)   | 0.79 (20)      | 3.62 (92)      | 1.9 (48.3)     | 1.77 <sup>1)</sup> (45) | 0.08 (2)  | 5 (127)      | 8         |   |
|                  | 400/600          | 1.28 (32.4) | 6.5 (165)   | 0.79 (20)      | 3.62 (92)      | 1.9 (48.3)     | 1.77 <sup>1)</sup> (45) | 0.28 (7)  | 5 (127)      | 8         |   |
|                  | 900/1500         | 1.78 (45.1) | 8.46 (215)  | 1.02 (26)      | 5 (127)        | 1.9 (48.3)     | 1.77 <sup>1)</sup> (45) | 0.28 (7)  | 6.5 (165)    | 8         |   |
| 3 inch           | 150              | 0.96 (24.3) | 7.48 (190)  | 0.79 (20)      | 5 (127)        | 3 (76)         | 2.83 <sup>2)</sup> (72) | 0.08 (2)  | 6 (152.5)    | 4         |   |
|                  | 300              | 1.14 (29)   | 8.27 (210)  | 0.87 (22)      | 5 (127)        | 3 (76)         | 2.83 <sup>2)</sup> (72) | 0.08 (2)  | 6.63 (168.5) | 8         |   |
|                  | 600              | 1.53 (38.8) | 8.27 (210)  | 0.87 (22)      | 5 (127)        | 3 (76)         | 2.83 <sup>2)</sup> (72) | 0.28 (7)  | 6.63 (168.5) | 8         |   |
| 4 inch           | 150              | 0.96 (24.3) | 9.06 (230)  | 0.79 (20)      | 6.22 (158)     | 3.69 (94)      | 3.5 (89)                | 0.08 (2)  | 7.5 (190.5)  | 8         |   |
|                  | 300              | 1.27 (32.2) | 10.04 (255) | 0.87 (22)      | 6.22 (158)     | 3.69 (94)      | 3.5 (89)                | 0.08 (2)  | 7.87 (200)   | 8         |   |
|                  | 400              | 1.65 (42)   | 10.04 (255) | 1.02 (26)      | 6.22 (158)     | 3.69 (94)      | 3.5 (89)                | 0.28 (7)  | 7.87 (200)   | 8         |   |

d: Internal diameter of gasket to DIN 2690

d<sub>M</sub>: Effective diaphragm diameter<sup>1)</sup> 59 mm = 2.32 inch with tube length L=0.<sup>2)</sup> 89 mm = 3½ inch with tube length L=0.

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

1

### Accessories/Spare Parts

| Selection and Ordering data   |                                    | Article No.                 |
|---|------------------------------------|-----------------------------|
| <b>Replacement measuring cell for pressure for SITRANS P DS III</b>   |                                    | <b>7MF4990 - 0 - 0 DB 0</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |                                    |                             |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b>     |                             |
| Silicone oil  | Normal                             | 1                           |
| Inert liquid  | grease-free to cleanliness level 2 | 3                           |
| <b>Measured span (min. ... max.)</b>  |                                    |                             |
| 8.3 ... 250 mbar  | (0.12 ... 3.6 psi)                 | A                           |
| 0.01 ... 1 bar  | (0.15 ... 14.5 psi)                | B                           |
| 0.04 ... 4 bar  | (0.6 ... 58 psi)                   | C                           |
| 0.16 ... 16 bar   | (2.32 ... 232 psi)                 | D                           |
| 0.63 ... 63 bar   | (9.14 ... 914 psi)                 | E                           |
| 1.6 ... 160 bar   | (23.2 ... 2 320 psi)               | F                           |
| 4.0 ... 400 bar   | (58.0 ... 5 802 psi)               | G                           |
| 7.0 ... 700 bar   | (102.0 ... 10 153 psi)             | J                           |
| <b>Wetted parts materials</b>   |                                    |                             |
| Seal diaphragm  | Process connection                 |                             |
| Stainless steel   | Stainless steel                    | A                           |
| Hastelloy   | Stainless steel                    | B                           |
| Hastelloy   | Hastelloy                          | C                           |
| <b>Process connection</b>   |                                    |                             |
| <ul style="list-style-type: none"> <li>• Connection shank G<math>\frac{1}{2}</math>B to EN 837-1</li> <li>• Female thread <math>\frac{1}{2}</math>-14 NPT</li> <li>• Oval flange made of stainless steel, max. span 160 bar (2320 psi) <ul style="list-style-type: none"> <li>- Mounting thread <math>\frac{7}{16}</math>-20 UNF to IEC 61518/DIN EN 61518</li> <li>- Mounting thread M10 to DIN 19213</li> </ul> </li> </ul> |                                    | 0                           |
|   |                                    | 1                           |
|   |                                    | 2                           |
|   |                                    | 3                           |
| <b>Further designs</b>  |                                    | Order code                  |
| Please add "-Z" to Article No. and specify Order code.  |                                    |                             |
| <b>Inspection certificate</b>   |                                    | <b>C12</b>                  |
| to EN 10204-3.1   |                                    |                             |

| Selection and Ordering data   |                                    | Article No.                 |
|---|------------------------------------|-----------------------------|
| <b>Replacement measuring cell for absolute pressure for SITRANS P DS III (from the pressure series)</b>   |                                    | <b>7MF4992 - 0 - 0 DB 0</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |                                    |                             |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b>     |                             |
| Silicone oil  | Normal                             | 1                           |
| Inert liquid  | grease-free to cleanliness level 2 | 3                           |
| <b>Measured span (min. ... max.)</b>  |                                    |                             |
| 8.3 ... 250 mbar a  | (0.12 ... 3.63 psi a)              | D                           |
| 43 ... 1300 mbar a  | (0.62 ... 18.86 psi a)             | F                           |
| 0.16 ... 5 bar a  | (2.32 ... 72.5 psi a)              | G                           |
| 1 ... 30 bar a  | (14.5 ... 435 psi a)               | H                           |
| <b>Wetted parts materials</b>   |                                    |                             |
| Seal diaphragm  | Process connection                 |                             |
| Stainless steel   | Stainless steel                    | A                           |
| Hastelloy   | Stainless steel                    | B                           |
| Hastelloy   | Hastelloy                          | C                           |
| <b>Process connection</b>   |                                    |                             |
| <ul style="list-style-type: none"> <li>• Connection shank G<math>\frac{1}{2}</math>B to EN 837-1</li> <li>• Female thread <math>\frac{1}{2}</math>-14 NPT</li> <li>• Oval flange made of stainless steel, max. span 160 bar (2320 psi) <ul style="list-style-type: none"> <li>- Mounting thread <math>\frac{7}{16}</math>-20 UNF to IEC 61518/DIN EN 61518</li> <li>- Mounting thread M10 to DIN 19213</li> </ul> </li> </ul> |                                    | 0                           |
|   |                                    | 1                           |
|   |                                    | 2                           |
|   |                                    | 3                           |
| <b>Further designs</b>  |                                    | Order code                  |
| Please add "-Z" to Article No. and specify Order code.  |                                    |                             |
| <b>Inspection certificate</b>   |                                    | <b>C12</b>                  |
| to EN 10204-3.1   |                                    |                             |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

#### Accessories/Spare Parts

1

| Selection and Ordering data   | Article No.                  |
|---|------------------------------|
| <b>Replacement measuring cell for absolute pressure (from the differential pressure series)</b> for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series                      | <b>7MF4993 -</b><br>- 0 DC 0 |
| ➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.   |                              |
| <b>Measuring cell filling Measuring cell cleaning</b>   |                              |
| Silicone oil Normal   | 1                            |
| Inert liquid grease-free to cleanliness level 2   | 3                            |
| <b>Measured span (min. ... max.)</b>  |                              |
| 8.3 ... 250 mbar a (0.12 ... 3.63 psi a)  | D                            |
| 43 ... 1300 mbar a (0.62 ... 18.86 psi a)   | F                            |
| 0.16 ... 5 bar a (2.32 ... 72.5 psi a)  | G                            |
| 1 ... 30 bar a (14.5 ... 435 psi a)   | H                            |
| 5.3 ... 100 bar a (76.9 ... 1450 psi a)   | KE                           |
| <b>Wetted parts materials</b>   |                              |
| Seal diaphragm Parts of measuring cell  |                              |
| Stainless steel Stainless steel   | A                            |
| Hastelloy Stainless steel   | B                            |
| Hastelloy Hastelloy   | C                            |
| Tantalum Tantalum   | E                            |
| Monel Monel   | H                            |
| Gold Gold   | L                            |
| <b>Process connection</b>   |                              |
| Female thread 1/4-18 NPT with flange connection   |                              |
| • Sealing screw opposite process connection   |                              |
| - Mounting thread M10 to DIN 19213  | 0                            |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518   | 2                            |
| • Vent on side of process flange <sup>1)</sup>  |                              |
| - Mounting thread M10 to DIN 19213  | 4                            |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518   | 6                            |
| <b>Non-wetted parts materials</b>   |                              |
| • Stainless steel process flange screws   | 2                            |
| <b>Further designs</b>  | Order code                   |
| Please add "-Z" to Article No. and specify Order code.  |                              |
| <b>O-rings for process flanges</b> (instead of FPM (Viton))   |                              |
| • PTFE (Teflon)   | A20                          |
| • FEP (with silicone core, approved for food)   | A21                          |
| • FFPM (Kalrez, compound 4079), for measured medium temperatures -15 ... 100 °C (5 ... 212 °F)  | A22                          |
| • NBR (Buna N)  | A23                          |
| <b>Inspection certificate</b> to EN 10204-3.1   | C12                          |
| <b>Process connection G1/2B</b>   | D16                          |
| <b>Remote seal flanges</b> (not together with K01, K02 and K04)   | D20                          |
| <b>Vent on side for gas measurements</b>  | H02                          |
| <b>Process flanges</b>  |                              |
| • without   | K00                          |
| • with process flange made of   |                              |
| - Hastelloy   | K01                          |
| - Monel   | K02                          |
| - Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi) max. temperature of medium 90 °C (194 °F) For 1/2-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible | K04                          |

<sup>1)</sup> Not for span 5.3 ... 100 bar (76.9 ... 1450 psi)

| Selection and Ordering data  | Article No.                  |
|--|------------------------------|
| <b>Replacement measuring cell for differential pressure and PN 32/160 (MAWP 464/2320 psi)</b> for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series                           | <b>7MF4994 -</b><br>- 0 DC 0 |
| ➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.  |                              |
| <b>Measuring cell filling Measuring cell cleaning</b>  |                              |
| Silicone oil Normal  | 1                            |
| Inert liquid grease-free to cleanliness level 2  | 3                            |
| <b>Measured span (min. ... max.)</b>   |                              |
| <b>PN 32 (MAWP 464 psi)</b>  |                              |
| 1 ... 20 mbar <sup>1)</sup> (0.4 ... 8 inH <sub>2</sub> O)   | B                            |
| <b>PN 160 (MAWP 2320 psi)</b>  |                              |
| 1 ... 60 mbar (0.4 ... 24 inH <sub>2</sub> O)  | C                            |
| 2.5 ... 250 mbar (1 ... 100 inH <sub>2</sub> O)  | D                            |
| 6 ... 600 mbar (2.4 ... 240 inH <sub>2</sub> O)  | E                            |
| 16 ... 1600 mbar (6.4 ... 642 inH <sub>2</sub> O)  | F                            |
| 50 ... 5000 mbar (20 ... 2000 inH <sub>2</sub> O)  | G                            |
| 0.3 ... 30 bar (4.35 ... 435 psi)  | H                            |
| <b>Wetted parts materials</b> (stainless steel process flanges)  |                              |
| Seal diaphragm Parts of measuring cell   |                              |
| Stainless steel Stainless steel  | A                            |
| Hastelloy Stainless steel  | B                            |
| Hastelloy Hastelloy  | C                            |
| Tantalum <sup>2)</sup> Tantalum  | E                            |
| Monel <sup>2)</sup> Monel  | H                            |
| Gold <sup>2)</sup> Gold  | L                            |
| <b>Process connection</b>  |                              |
| Female thread 1/4-18 NPT with flange connection  |                              |
| • Sealing screw opposite process connection  |                              |
| - Mounting thread M10 to DIN 19213   | 0                            |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518  | 2                            |
| • Vent on side of process flange   |                              |
| - Mounting thread M10 to DIN 19213   | 4                            |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518  | 6                            |
| <b>Non-wetted parts materials</b>  |                              |
| Stainless steel process flange screws  | 2                            |
| <b>Further designs</b>   | Order code                   |
| Please add "-Z" to Article No. and specify Order code.   |                              |
| <b>O-rings for process flanges</b> (instead of FPM (Viton))  |                              |
| • PTFE (Teflon)  | A20                          |
| • FEP (with silicone core, approved for food)  | A21                          |
| • FFPM (Kalrez, compound 4079), for measured medium temperatures -15 ... 100 °C (5 ... 212 °F)   | A22                          |
| • NBR (Buna N)   | A23                          |
| <b>Inspection certificate</b> to EN 10204-3.1  | C12                          |
| <b>Remote seal flanges</b> (not together with K01, K02 and K04)  | D20                          |
| <b>Vent on side for gas measurements</b>   | H02                          |
| <b>Stainless steel process flanges for vertical differential pressure lines</b> (not together with K01, K02 and K04)   | H03                          |
| <b>Process flanges</b>   |                              |
| • without  | K00                          |
| • with process flange made of  |                              |
| - Hastelloy  | K01                          |
| - Monel  | K02                          |
| - Stainless steel with PVDF insert, max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F). For 1/2-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible | K04                          |

<sup>1)</sup> Not suitable for connection of remote seal

<sup>2)</sup> Only together with max. spans 250, 1600, 5000 and 30000 mbar (100 inH<sub>2</sub>O, 642 inH<sub>2</sub>O, 2000 inH<sub>2</sub>O and 435 psi).





# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

#### Accessories/Spare Parts

1

| Selection and Ordering data  | Article No.  | Selection and Ordering data   | Article No.  |
|--|--|---|--|
| <b>Spare parts/Accessories</b>   |  | <b>Digital indicator</b>  | <b>7MF4997-1BR</b>   |
| <b>Mounting bracket and fastening parts</b><br>for pressure transmitters<br>SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF403-.....-..C.)<br>For absolute pressure transmitters<br>SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF423-.....-..C.)<br>• made of steel<br>• made of stainless steel 304/1.4301<br>• made of stainless steel 316L/1.4404   | <b>7MF4997-1AB</b><br><b>7MF4997-1AH</b><br><b>7MF4997-1AP</b> | Including mounting material for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus   |  |
| <b>Mounting bracket and fastening parts</b><br>for pressure transmitters<br>SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF403-.....-..A., ..B., ..D. and ..F.)<br>For absolute pressure transmitters<br>SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF423-.....-..A., ..B., ..D. and ..F.)<br>• made of steel<br>• made of stainless steel 304/1.4301<br>• made of stainless steel 316L/1.4404 | <b>7MF4997-1AC</b><br><b>7MF4997-1AJ</b><br><b>7MF4997-1AQ</b> | <b>Measuring point label</b><br>• without inscription (5 units)<br>• Printed (1 unit)<br>Data according to Y01 or Y02, Y15, Y16 and Y99 (see "Pressure transmitters")                                 | <b>7MF4997-1CA</b><br><b>7MF4997-1CB-Z</b><br><b>Y...: .....</b>   |
| <b>Mounting and fastening brackets</b><br>For differential pressure transmitters with flange thread M10<br>SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF433-.... and 7MF443-....)<br>• made of steel<br>• made of stainless steel 304/1.4301<br>• made of stainless steel 316L/1.4404   | <b>7MF4997-1AD</b><br><b>7MF4997-1AK</b><br><b>7MF4997-1AR</b> | <b>Mounting screws</b><br>For measuring point label, grounding and connection terminals or for display (50 units)   | <b>7MF4997-1CD</b>   |
| <b>Mounting and fastening brackets</b><br>For differential pressure transmitters with flange thread M12<br>SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF453-....)<br>• made of steel<br>• made of stainless steel 304/1.4301<br>• made of stainless steel 316L/1.4404   | <b>7MF4997-1AE</b><br><b>7MF4997-1AL</b><br><b>7MF4997-1AS</b> | <b>Sealing screws</b><br>(1 set = 2 units) for process flange<br>• made of stainless steel<br>• made of Hastelloy   | <b>7MF4997-1CG</b><br><b>7MF4997-1CH</b>   |
| <b>Mounting and fastening brackets</b><br>For differential and absolute pressure transmitters with flange thread 7/16 -20 UNF<br>SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF433-...., 7MF443-.... and 7MF453-....)<br>• made of steel<br>• made of stainless steel 304/1.4301<br>• made of stainless steel 316L/1.4404  | <b>7MF4997-1AF</b><br><b>7MF4997-1AM</b><br><b>7MF4997-1AT</b> | <b>Sealing screws with vent valve</b><br>Complete (1 set = 2 units)<br>• made of stainless steel<br>• made of Hastelloy   | <b>7MF4997-1CP</b><br><b>7MF4997-1CQ</b>   |
| <b>Cover</b><br>Made of die-cast aluminum, including gasket, for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus.<br>Compatible for Ex and non-Ex transmitters<br>• without window<br>• with window  | <b>7MF4997-1BB</b><br><b>7MF4997-1BE</b>                       | <b>Application electronics</b><br>• for SITRANS P DS III with HART<br>• for SITRANS P DS III with PROFIBUS PA<br>• for SITRANS P DS III with FOUNDATION Fieldbus                                      | <b>7MF4997-1DK</b><br><b>7MF4997-1DL</b><br><b>7MF4997-1DM</b>   |
| <b>Cover</b><br>Made of stainless steel, including gasket, for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus.<br>Compatible for Ex and non-Ex transmitters<br>• without window<br>• with window  | <b>7MF4997-1BC</b><br><b>7MF4997-1BF</b>                       | <b>Connection board</b><br>• for SITRANS P DS III<br>• for SITRANS P DS III PROFIBUS PA and FOUNDATION Fieldbus   | <b>7MF4997-1DN</b><br><b>7MF4997-1DP</b>   |
|  |  | <b>O-rings for process flanges made of:</b><br>• FPM (Viton)<br>• PTFE (Teflon)<br>• FEP (with silicone core, approved for food)<br>• FFPM (Kalrez, compound 4079)<br>• NBR (Buna N)                  | <b>7MF4997-2DA</b><br><b>7MF4997-2DB</b><br><b>7MF4997-2DC</b><br><b>7MF4997-2DD</b><br><b>7MF4997-2DE</b> |
|  |  | <b>Sealing ring</b> for process connection  | see "Fittings"   |
|  |  | <b>Weldable sockets for PMC connection</b><br>• PMC Style Standard: Thread 1½"<br>• PMC Style Minibolt: front-flush 1"  | <b>7MF4997-2HA</b><br><b>7MF4997-2HB</b>   |
|  |  | <b>Gaskets for PMC connection</b><br>(packing unit = 5 units)<br>• PTFE seal for PMC Style Standard: Thread 1½"<br>• Gasket made of Viton for PMC Style Minibolt: front-flush 1"                      | <b>7MF4997-2HC</b><br><b>7MF4997-2HD</b>   |
|  |  | <b>Weldable socket for TG52/50 and TG52/150 connection</b><br>• TG52/50 connection<br>• TG52/150 connection   | <b>7MF4997-2HE</b><br><b>7MF4997-2HF</b>   |
|  |  | <b>Seals for TG 52/50 and TG 52/150 made of silicone (FDA compliant)</b>  | <b>7MF4997-2HG</b>   |
|  |  | <b>Seals for flange connection with front-flush diaphragm</b><br>Material FKM (Viton); temperature range: -20 ... +200 °C (-4 ... +392 °F), 10 units<br>• DN 25, PN 40 (M11)<br>• 1", class 150 (M40) | <b>7MF4997-2HH</b><br><b>7MF4997-2HK</b>   |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

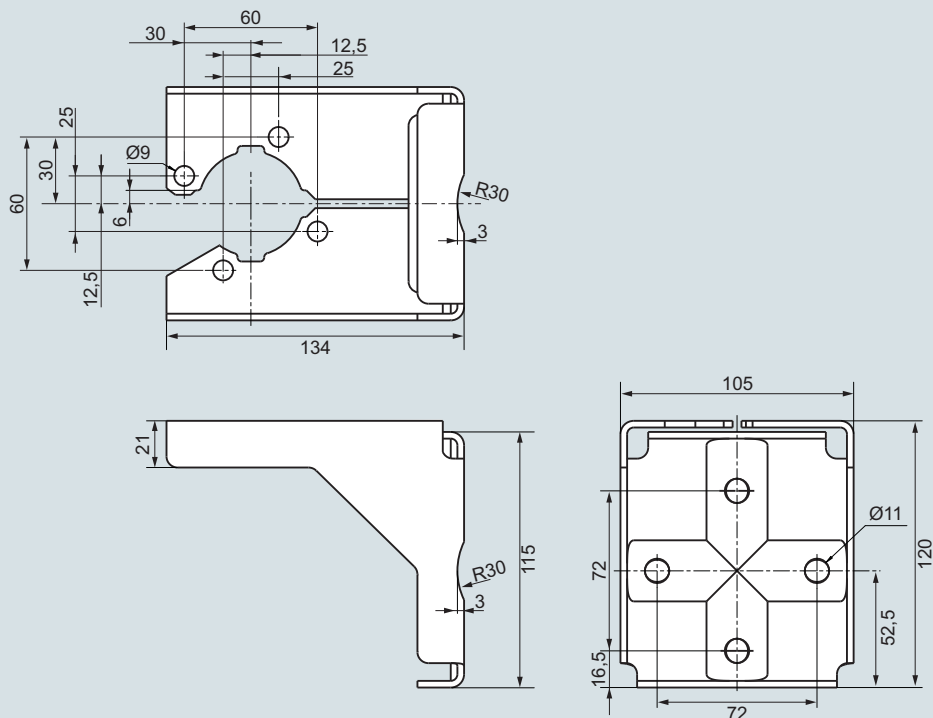
SITRANS P DS III

### Accessories/Spare Parts

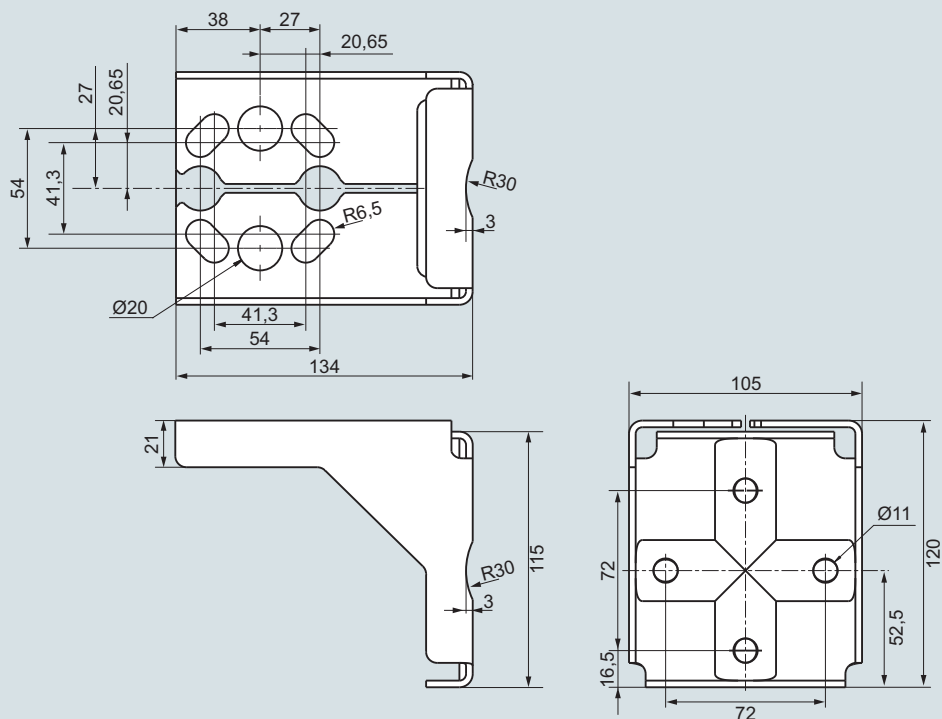
| Selection and Ordering data  | Article No.                              |
|--|--|
| <b>Documentation</b><br>The entire documentation is available for download free-of-charge in various languages at: <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a><br>Compact operating instructions SITRANS P DS III/P410<br>• English, German, Spanish, French, Italian, Dutch | <b>A5E03434626</b>                       |
| <b>Certificates (order only via SAP)</b><br>instead of Internet download<br>• hard copy (to order)<br>• on DVD (to order)  | <b>A5E03252406</b><br><b>A5E03252407</b> |
| <b>HART modem</b><br>with USB interface  | <b>7MF4997-1DB</b>                       |

Power supply units see Chap. 7 "Supplementary Components".

## Dimensional drawings



Mounting bracket for SITRANS P DS III, SITRANS P410 and SITRANS P280 gauge and absolute pressure-transmitters, dimensions in mm  
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



Mounting bracket for SITRANS P DS III and SITRANS P410 differential pressure transmitter, dimensions in mm  
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

1

### Factory-mounting of valve manifolds on transmitters

#### Overview

SITRANS P transmitters

- DS III for relative and absolute pressure (both designs) and
- DS III for differential pressure

can be delivered factory-fitted with the following valve manifolds:

- 7MF9011-4EA and 7MF9011-4FA valve manifolds for gauge pressure and absolute pressure transmitters
- 7MF9411-5BA and 7MF9411-5CA valve manifolds for absolute pressure and differential pressure transmitters

#### Design

The 7MF9011-4EA valve manifolds are sealed with gaskets made of PTFE between transmitter and the valve manifold as standard. Soft iron, stainless steel and copper gaskets are also available for sealing purposes if preferred.

The 7MF9011-4FA valve manifolds are sealed with PTFE sealing tape between the transmitter and the valve manifold.

The 7MF9411-5BA and 7MF9411-5CA valve manifolds are sealed with PTFE sealing rings between the transmitter and the valve manifold.

Once installed, the complete unit is checked under pressure for leaks (compressed air 6 bar (87 psi)) and is certified leak-proof with a test report to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the respective mounting brackets. The transmitters are mounted on the valve manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of valve manifolds", you will receive a mounting bracket for the valve manifold instead of a bracket for mounting the transmitter.

If you order an acceptance test certificate 3.1 to EN 10204 when choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitters and the valve manifolds respectively.

#### Selection and Ordering data

##### 7MF9411-5AA valve manifold for relative and absolute pressure transmitters



Add „-Z“ to the Article No. of the transmitter and add order codes.

SITRANS P DSIII  
7MF403-...2-..., 7MF423-...2-... ,  
7MF403-...3-..., 7MF423-...3-... ,  
7MF403-...4-..., 7MF423-...4-...

With process connection oval flange with PTFE gasket and **steel** mounting screws.

Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2

##### Additional versions:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)

Supplied acceptance test certificate to EN 10204- 3.1 for transmitters and mounted valve manifold

With manufacturer declaration according to NACE, MR-0175

Order code

**T05**

**A02**

**C12**

**D07**

##### 7MF9411-5AA valve manifold for relative and absolute pressure transmitters



Add „-Z“ to the Article No. of the transmitter and add order codes.

SITRANS P DSIII  
7MF403-...2-..., 7MF423-...2-... ,  
7MF403-...3-..., 7MF423-...3-... ,  
7MF403-...4-..., 7MF423-...4-...

With process connection oval flange with PTFE gasket and **stainless steel** mounting screws.

Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2

##### Additional versions:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)

Supplied acceptance test certificate to EN 10204- 3.1 for transmitters and mounted valve manifold

With manufacturer declaration according to NACE, MR-0175

Order code

**T06**

**A02**

**C12**

**D07**

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P DS III

#### Factory-mounting of valve manifolds on transmitters

1

#### 7MF9011-4FA valve manifold on relative and absolute pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII  
7MF403-...1-..., 7MF423-...1-...  
With process connection  
female thread 1/2-14 NPT  
in-sealed with PTFE sealing tape  
Delivery incl. high-pressure test certified  
by test report to EN 10204-2.2

Order  
code

**T03**

#### Further designs:

Delivery includes mounting brackets and  
mounting clips made of stainless steel  
(instead of the mounting bracket supplied  
with the transmitter)

**A02**

Supplied acceptance test certificate to  
EN 10204- 3.1 for transmitters and  
mounted valve manifold

**C12**

With manufacturer declaration according  
to NACE, MR-0175

**D07**

#### 7MF9011-4EA valve manifold on relative and absolute pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII  
7MF403-...0-..., 7MF423-...0-...  
with process connection  
collar G1/2 A to EN 837-1  
with gasket made of PTFE between valve  
manifold and transmitter

Order  
code

**T02**

#### Alternative sealing material:

- Soft iron
- Stainless steel, Mat. No. 14571
- copper

**A70**

**A71**

**A72**

Delivery incl. high-pressure test certified  
by test report to EN 10204-2.2

#### Further designs:

Delivery includes mounting brackets and  
mounting clips made of stainless steel  
(instead of the mounting bracket supplied  
with the transmitter)

**A02**

Supplied acceptance test certificate to  
EN 10204- 3.1 for transmitters and  
mounted valve manifold

**C12**

With manufacturer declaration according  
to NACE, MR-0175

**D07**

#### 7MF9411-5BA valve manifold on absolute and differential pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII  
7MF433-..., 7MF443-... and  
7MF453-...<sup>1)</sup>  
mounted with gaskets made of PTFE and  
screws made of  
• chromized steel  
• made of stainless steel  
Delivery incl. high-pressure test certified  
by test report to EN 10204-2.2

Order  
code

**U01**

**U02**

#### Further designs:

Delivery includes mounting bracket and  
mounting clips made of  
• Steel  
• Stainless steel  
(instead of the mounting bracket supplied  
with the transmitter)

**A01**

**A02**

Supplied acceptance test certificate to  
EN 10204-3.1 for transmitters and  
mounted valve manifold

**C12**

With manufacturer declaration according  
to NACE, MR-0175

**D07**

#### 7MF9411-5CA valve manifold on differential pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII  
7MF443-... and 7MF453-...<sup>1)</sup>  
mounted with gaskets made of PTFE and  
screws made of  
• chromized steel  
• Stainless steel  
Delivery incl. high-pressure test certified  
by test report to EN 10204-2.2

Order  
code

**U03**

**U04**

#### Further designs:

Delivery includes mounting bracket and  
mounting clips made of  
• Steel  
• Stainless steel  
(instead of the mounting bracket supplied  
with the transmitter)

**A01**

**A02**

Supplied acceptance test certificate to  
EN 10204-3.1 for transmitters and  
mounted valve manifold

**C12**

With manufacturer declaration according  
to NACE, MR-0175

**D07**

<sup>1)</sup> For 7MF453-... transmitters, you require a 7/10-20 UNF connection thread in the process flange

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P DS III

1

### Factory-mounting of valve manifolds on transmitters

#### Dimensional drawings

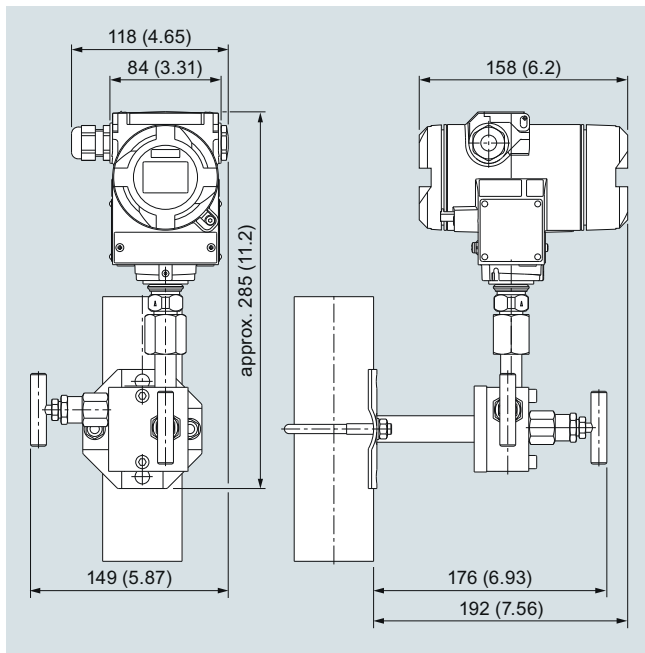
##### Valve manifolds mounted on SITRANS P DS III



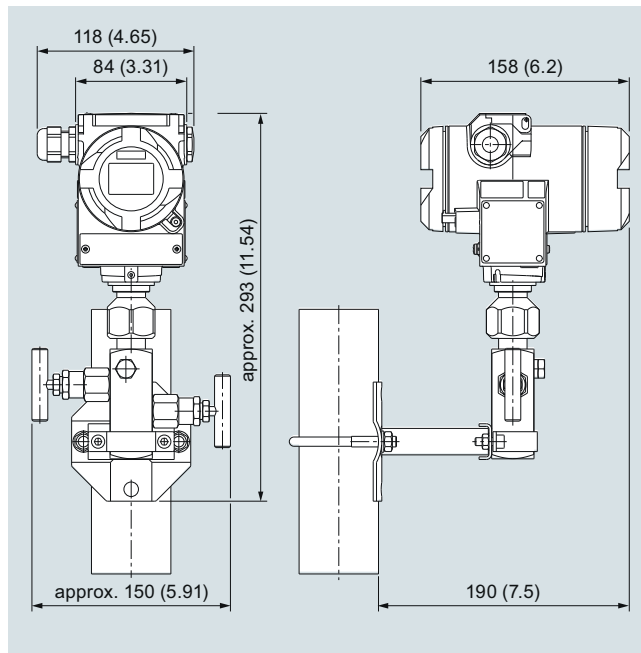
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters



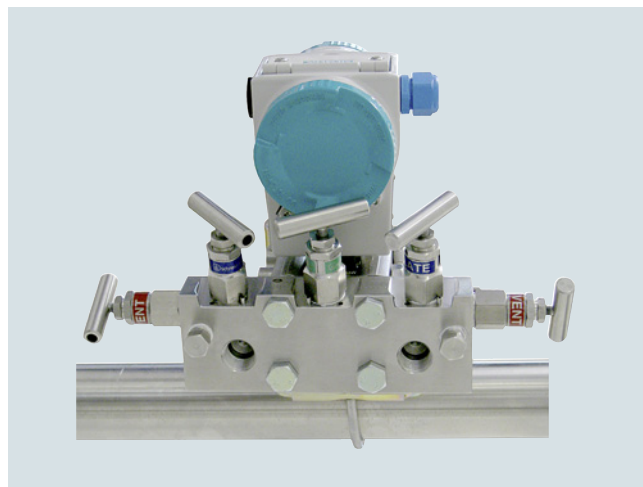
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)



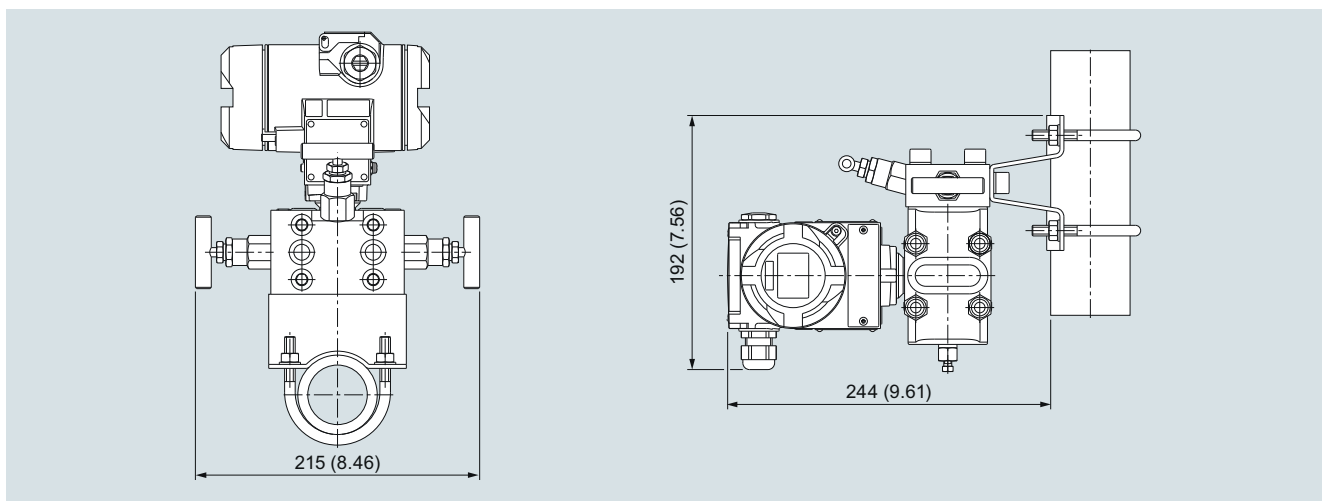
7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)



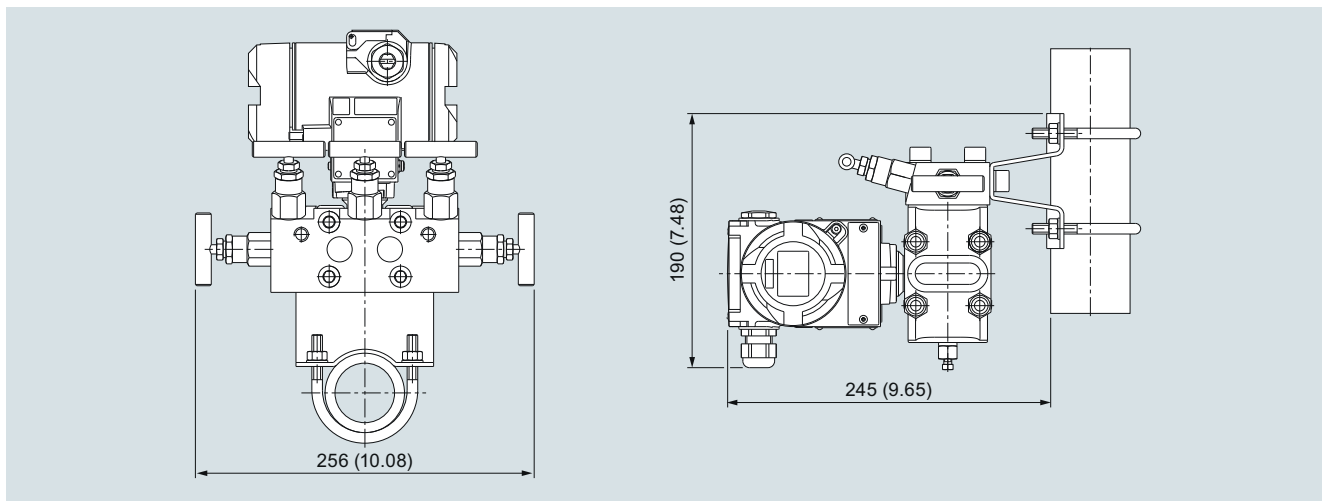
7MF9411-5BA valve manifold with mounted differential pressure transmitter



7MF9411-5CA valve manifold with mounted differential pressure transmitter



7MF9411-5BA valve manifold with mounted differential pressure transmitter, dimensions in mm (inch)



7MF9411-5CA valve manifold with mounted differential pressure transmitter, dimensions in mm (inch)



## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P410

### Technical description

1

#### Overview



SITRANS P410 pressure transmitters are digital pressure transmitters with a high level of operating convenience. Technically, they are based on the SITRANS P DS III but offer an increased measuring accuracy of 0.04%. This means the SITRANS P 410 is perfectly suited for measuring tasks with increased accuracy requirements. The parameterization is performed using input buttons or via HART or via PROFIBUS PA or FOUNDATION Fieldbus interface.

The comprehensive functionality makes for precise adjustment of the pressure transmitter to the requirements of the plant. Operation is very simple, despite the variety of setting options.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed in hazardous areas (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the respective harmonized European standards (ATEX).

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

SITRANS P410 pressure transmitters are available in various versions for measuring:

- Gauge pressure
- Differential pressure
- Volume flow
- Mass flow

#### Benefits

- High quality and service life
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnostics and simulation functions
- Minimal conformity error
- Good long-term stability
- Wetted parts made of high-grade materials (e.g., stainless steel, Hastelloy)
- Infinitely adjustable spans from 0.01 bar to 160 bar (0.15 psi to 2321 psi) for P410 with HART interface
- Nominal measuring ranges from 1 bar to 160 bar (14.5 psi to 2321 psi) for P410 with PROFIBUS PA and FOUNDATION Fieldbus interface
- High measuring accuracy
- Parameterization over input buttons and HART, PROFIBUS PA or FOUNDATION Fieldbus interface.

#### Application

SITRANS P410 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes the P410 suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Flameproof enclosure" may be installed in hazardous areas (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 3 input buttons or programmed externally over HART or over PROFIBUS PA or FOUNDATION Fieldbus interface.

#### **Pressure transmitter for gauge pressure**

Measured variable: Gauge pressure of aggressive and non-aggressive gases, vapors and liquids.

Span (infinitely adjustable)

for P410 with HART: 0.01 bar to 160 bar (0.15 psi to 2321 psi)

Nominal measuring range

for P410 with PROFIBUS PA and FOUNDATION Fieldbus:  
1 bar to 160 bar (14.5 psi to 2321 psi)

#### **Pressure transmitters for differential pressure and flow**

Measured variables:

- Differential pressure
- Small positive or negative pressure
- Flow  $q \sim \sqrt{\Delta p}$  (together with a primary differential pressure device (see Chapter "Flow Meters"))

Span (infinitely adjustable)

for P410 with HART: 1 mbar ... 30 bar (0.0145 ... 435 psi)

Nominal measuring range

for P410 with PROFIBUS PA and FOUNDATION Fieldbus:  
20 mbar ... 30 bar (0.29 ... 435 psi)



## Design



Front view

The transmitter consists of various components depending on the order. The possible versions are listed in the ordering information. The components described below are the same for all transmitters.

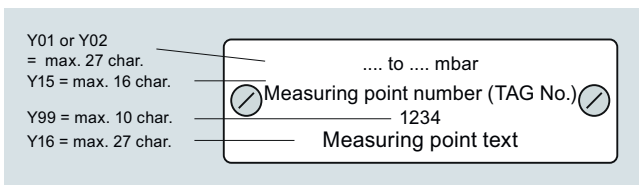
The rating plate (7, Figure "Front view") with the Article No. is located on the side of the housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

The approval label is located on the opposite side.

The housing is made of die-cast aluminium or stainless steel precision casting. A round cover (6) is screwed on at the front and rear of the housing. The front cover can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the housing.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

At the top of the housing is a plastic cover (1), which hides the input keys.

**Example for an attached measuring point label**

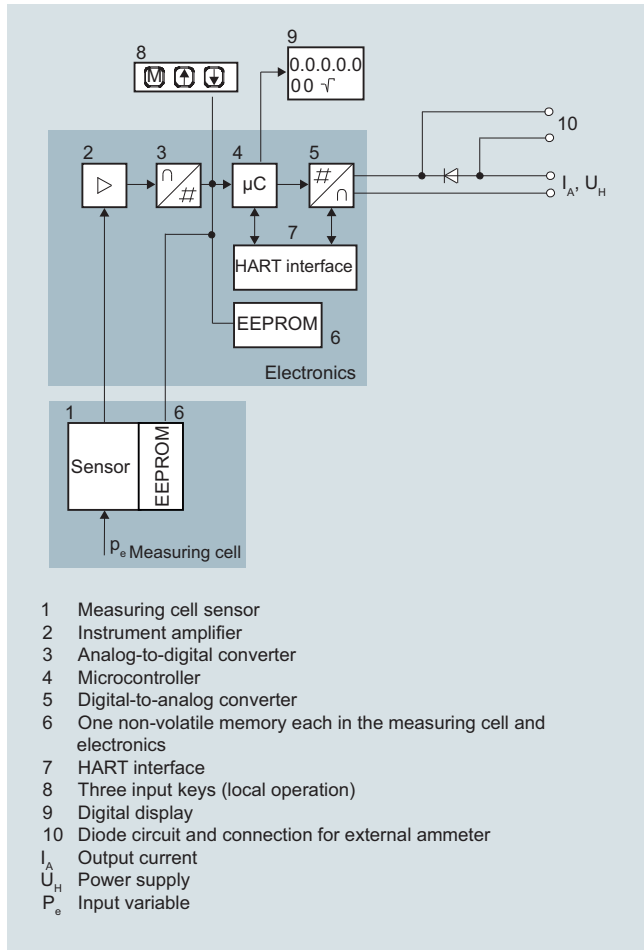
## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P410

### Technical description

#### Function

##### Operation of electronics with HART communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

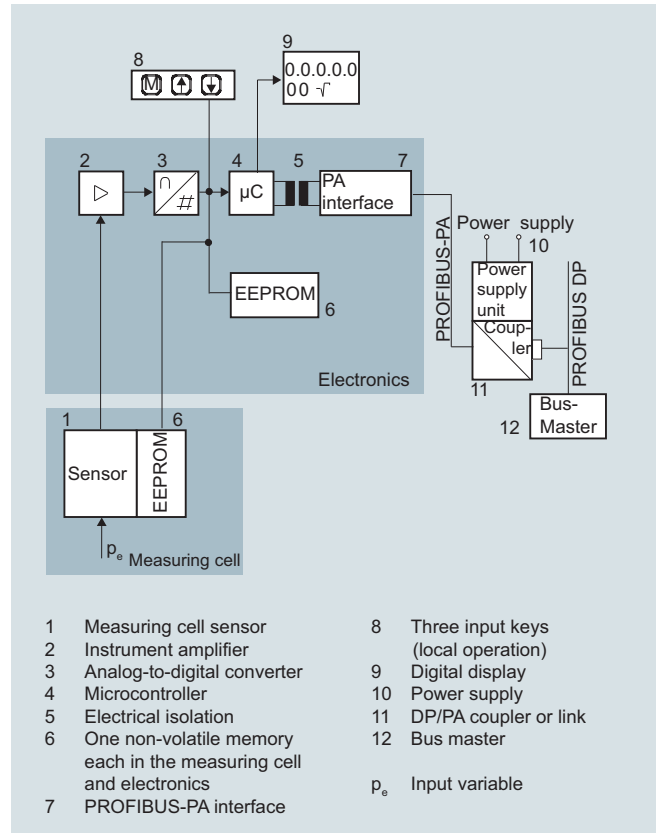
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with spans  $\leq 63$  bar measure the input pressure compared to atmosphere, transmitters with spans  $\geq 160$  bar compared to vacuum.

##### Operation of electronics with PROFIBUS PA communication



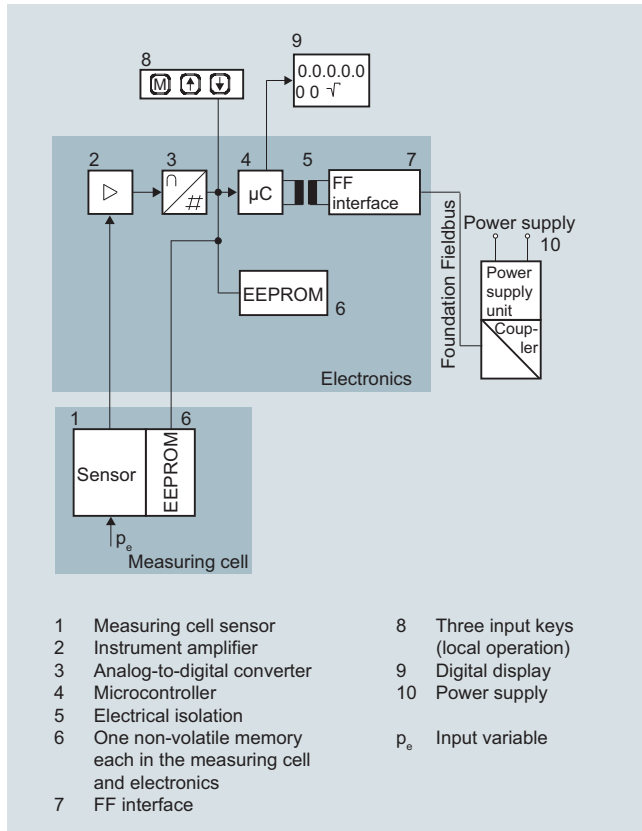
Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the PROFIBUS PA through an electrically isolated PA interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the PROFIBUS PA. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as SIMATIC PDM is required for this.

**Operation of electronics with FOUNDATION Fieldbus communication**

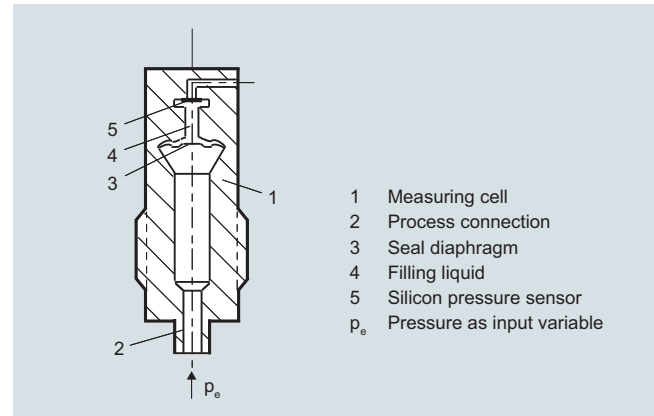
Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

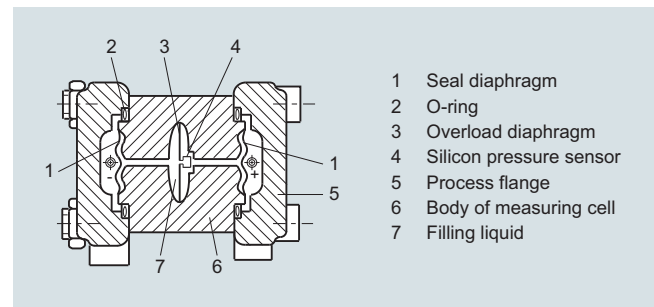
Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

**Mode of operation of the measuring cells**Measuring cell for gauge pressure

Measuring cell for gauge pressure, function diagram

The pressure  $p_e$  is applied through the process connection (2, Figure "Measuring cell for gauge pressure, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the differential pressure.

Measuring cell for differential pressure and flow

Measuring cell for differential pressure and flow, function diagram

The differential pressure is transmitted through the seal diaphragms (1, Figure "Measuring cell for differential pressure and flow, function diagram") and the filling liquid (7) to the silicon pressure sensor (4).

The measuring diaphragm is flexed by the applied differential pressure. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the differential pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (3) is flexed until the seal diaphragm rests on the body of the measuring cell (6), thus protecting the silicon pressure sensor from overloads.

## Pressure Measurement

### Transmitters for applications with advanced requirements (Advanced) SITRANS P410

#### Technical description

##### Parameterization SITRANS P410

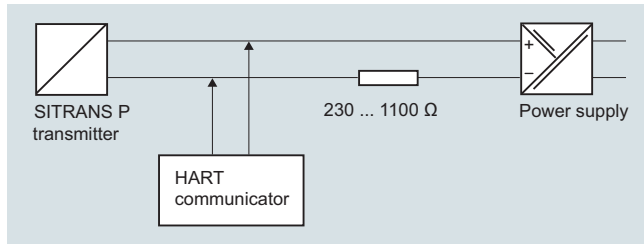
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

##### Parameterization using the input buttons (local operation)

With the input buttons you can easily set the most important parameters without any additional equipment.

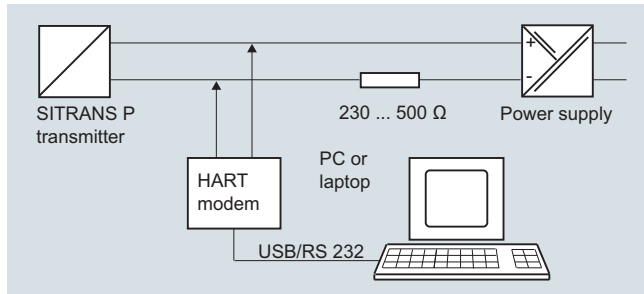
##### Parameterization using HART

Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

##### Adjustable parameters, SITRANS P410 with HART

| Parameters   | Input keys (DS III HART) | HART communication |
|--|--------------------------|--------------------|
| Start of scale   | x                        | x                  |
| Full-scale value   | x                        | x                  |
| Electrical damping   | x                        | x                  |
| Start-of-scale value without application of a pressure ("Blind setting") | x                        | x                  |
| Full-scale value without application of a pressure ("Blind setting")     | x                        | x                  |
| Zero adjustment  | x                        | x                  |
| current transmitter  | x                        | x                  |
| Fault current  | x                        | x                  |
| Disabling of buttons, write protection                                   | x                        | x <sup>1)</sup>    |
| Type of dimension and actual dimension                                   | x                        | x                  |
| Characteristic (linear / square-rooted)                                  | x <sup>2)</sup>          | x <sup>2)</sup>    |
| Input of characteristic  |                          | x                  |
| Freely-programmable LCD  |                          | x                  |
| Diagnostic functions   |                          | x                  |

<sup>1)</sup> Cancel apart from write protection

<sup>2)</sup> Only differential pressure

##### Diagnostic functions for SITRANS P410 with HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

##### Available physical units of display for SITRANS P410 with HART

| Physical variable                                  | Physical dimensions   |
|--|---|
| Pressure (setting can also be made in the factory) | Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O, ftH <sub>2</sub> O (20 °C), inHg, mmHg |
| Level (height data)                                | m, cm, mm, ft, in   |
| Volume   | m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid  |
| Mass   | g, kg, t, lb, Ston, Lton, oz  |
| volume flow  | m <sup>3</sup> /d, m <sup>3</sup> /h, m <sup>3</sup> /s, l/min, l/s, ft <sup>3</sup> /d, ft <sup>3</sup> /min, ft <sup>3</sup> /s, US gallon/min, US gallon/s                               |
| Mass flow  | t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, Lton/d, Lton/h, Ston/d, Ston/h, Ston/min   |
| Temperature  | K, °C, °F, °R   |
| Miscellaneous                                      | %, mA   |

##### Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. Through the PROFIBUS the DS III with PROFIBUS PA is connected to a process control system, e. g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

##### Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III with FOUNDATION Fieldbus is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

##### Adjustable parameters for SITRANS P410 with PROFIBUS PA and FOUNDATION Fieldbus

| Parameters                               | Input keys | PROFIBUS PA and FOUNDATION Fieldbus interface |
|--|------------|---|
| Electrical damping                       | x          | x   |
| Zero adjustment (correction of position) | x          | x   |
| Buttons and/or function disabling        | x          | x   |
| Source of measured-value display         | x          | x   |
| Physical dimension of display            | x          | x   |
| Position of decimal point                | x          | x   |
| Bus address                              | x          | x   |
| Adjustment of characteristic             | x          | x   |
| Input of characteristic                  |            | x   |
| Freely-programmable LCD                  |            | x   |
| Diagnostics functions                    |            | x   |

Diagnostic functions for SITRANS P410 with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

Physical dimensions available for the display

| Physical variable                                  | Physical dimensions  |
|--|--|
| Pressure (setting can also be made in the factory) | MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O (20 °C), mmHg, inHg   |
| Level (height data)                                | m, cm, mm, ft, in, yd  |
| Volume   | m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid   |
| volume flow  | m <sup>3</sup> /s, m <sup>3</sup> /min, m <sup>3</sup> /h, m <sup>3</sup> /d, l/s, l/min, l/h, l/d, Ml/d, ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d |
| Mass flow  | g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d   |
| Total mass flow                                    | t, kg, g, lb, oz, LTon, STon   |
| Temperature  | K, °C, °F, °R  |
| Miscellaneous                                      | %  |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

## Technical specifications

### SITRANS P410 for gauge pressure

#### Input

Measured variable

Gauge pressure

Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

| HART  | PROFIBUS PA/<br>FOUNDATION<br>Fieldbus |                                   |                                |
|---|--|-----------------------------------|--------------------------------|
| Span  | Nominal measuring range                | Max. operating pressure MAWP (PS) | Max. perm. test pressure       |
| 0.01 ... 1 bar<br>1 ... 100 kPa<br>0.15 ... 14.5 psi  | 1 bar<br>100 kPa<br>14.5 psi           | 4 bar<br>400 kPa<br>58 psi        | 6 bar<br>600 kPa<br>87 psi     |
| 0.04 ... 4 bar<br>4 ... 400 kPa<br>0.58 ... 58 psi    | 4 bar<br>400 kPa<br>58 psi             | 7 bar<br>0.7 MPa<br>102 psi       | 10 bar<br>1 MPa<br>145 psi     |
| 0.16 ... 16 bar<br>16 ... 1600 kPa<br>2.3 ... 232 psi | 16 bar<br>1600 kPa<br>232 psi          | 21 bar<br>2.1 MPa<br>305 psi      | 32 bar<br>3.2 MPa<br>464 psi   |
| 0.63 ... 63 bar<br>63 ... 6300 kPa<br>9.1 ... 914 psi | 63 bar<br>6300 kPa<br>914 psi          | 67 bar<br>6.7 MPa<br>972 psi      | 100 bar<br>10 MPa<br>1450 psi  |
| 1.6 ... 160 bar<br>0.16 ... 16 MPa<br>23 ... 2321 psi | 160 bar<br>16 MPa<br>2321 psi          | 167 bar<br>16.7 MPa<br>2422 psi   | 250 bar<br>2.5 MPa<br>3626 psi |

Lower measuring limit

- Measuring cell with silicone oil filling

30 mbar a/3 kPa a/0.44 psi a

Upper measuring limit

100 % of max. span

#### Output

Output signal

4 ... 20 mA

#### PROFIBUS PA/FOUNDATION Fieldbus

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA  
23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

-

-

Load

- Without HART

$$R_B \leq (U_H - 10.5 \text{ V}) / 0.023 \text{ A in } \Omega$$

$$U_H: \text{Power supply in V}$$

-

- With HART

$$R_B = 230 \dots 500 \Omega \text{ (SIMATIC PDM) or}$$

$$R_B = 230 \dots 1100 \Omega \text{ (HART Communicator)}$$

-

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

for gauge pressure

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**SITRANS P410 for gauge pressure****Measuring accuracy**

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nom. pressure range}$ 

Error in measurement at limit setting incl. hysteresis and reproducibility

## • Linear characteristic

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi

 $r \leq 5 : \leq 0.04 \%$   
 $5 < r \leq 100 : \leq (0.004 \cdot r + 0.045) \%$ 
Influence of ambient temperature  
(in percent per 28 °C (50 °F))

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi

 $\leq (0.05 \cdot r + 0.1) \%$   
 $\leq (0.025 \cdot r + 0.125) \%$ 
Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi

 $\leq (0.25 \cdot r) \% \text{ in 5 years}$   
 $\leq (0.125 \cdot r) \% \text{ in 5 years}$ 

Effect of mounting position

 $\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi per } 10^\circ \text{ inclination}$   
 (zero point correction is possible with position error compensation)
Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

 $3 \cdot 10^{-5}$  of nominal measuring range

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

### for gauge pressure

#### SITRANS P410 for gauge pressure

##### Rated conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

##### Design

Weight (without options)

Die-cast aluminum: ≈ 2.0 kg (≈ 4.4 lb)

Stainless steel precision casting: ≈ 4.6 kg (≈ 10.1 lb)

Enclosure material

Low-copper die-cast aluminum, GD-AISI 12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Connection shank
- Oval flange
- Seal diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602

Stainless steel, mat. no. 1.4404/316L

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

Measuring cell filling

Silicone oil or inert filling liquid  
(maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))

Process connection

Connection shank G $\frac{1}{2}$ B to DIN EN 837-1, female thread  $\frac{1}{2}$  -14 NPT or oval flange (PN 160 (MAWP 2320 psi)) to DIN 19213 with mounting thread M10 or  $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518

Material of mounting bracket

- Steel
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

##### Power supply $U_H$

Terminal voltage on transmitter

10.5 ... 45 V DC

10.5 ... 30 V DC in intrinsically-safe mode

##### PROFIBUS PA/ FOUNDATION Fieldbus

-

Power supply

Supplied through bus

Separate 24 V power supply necessary

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

for gauge pressure

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**SITRANS P410 for gauge pressure****Certificates and approvals**

Classification according to PED 2014/68/EU

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Explosion protection

## • Intrinsic safety "i"

PTB 13 ATEX 2007 X

- Marking

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

- Permissible ambient temperature

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

- Connection

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ;  $R_i = 300 \Omega$

FISCO supply unit:

 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$ 

Linear barrier:

 $U_o = 24 \text{ V}$ ,  $I_o = 174 \text{ mA}$ ,  $P_o = 1 \text{ W}$ 

- Effective internal inductance/capacitance

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$  $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$ 

## • Explosion-proof "d"

PTB 99 ATEX 1160

- Marking

Ex II 1/2 G Ex d IIC T4/T6 Ga/Gb

- Permissible ambient temperature

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

- Connection

To circuits with values:  $U_H = 10.5 \dots 45 \text{ V DC}$

To circuits with values:  $U_H = 9 \dots 32 \text{ V DC}$ 

## • Dust explosion protection for zone 20 (pending)

PTB 01 ATEX 2055

- Marking

Ex II 1 D Ex ta IIIC T120°C Da  
 Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

- Permissible ambient temperature

-40 ... +85 °C (-40 ... +185 °F)

- Max. surface temperature

120 °C (248 °F)

- Connection

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

FISCO supply unit:

 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$ 

Linear barrier:

 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1 \text{ W}$ 

- Effective internal inductance/capacitance

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$  $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$ 

## • Dust explosion protection for zone 21/22 (pending)

PTB 01 ATEX 2055

- Marking

Ex II 2 D Ex tb IIIC T120°C Db

- Connection

To circuits with values:  
 $U_H = 10.5 \dots 45 \text{ V DC}$ ;  $P_{\max} = 1.2 \text{ W}$

To circuits with values:

 $U_H = 9 \dots 32 \text{ V DC}$ ;  $P_{\max} = 1 \text{ W}$ 

## • Type of protection "n" (zone 2)

PTB 13 ATEX 2007 X

- Marking

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc  
 Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

- Connection (Ex nA)

 $U_m = 45 \text{ V}$  $U_m = 32 \text{ V}$ 

- Connections (Ex ic)

To circuits with values:  
 $U_i = 45 \text{ V}$

FISCO supply unit ic:

 $U_o = 17.5 \text{ V}$ ,  $I_o = 570 \text{ mA}$ 

Linear barrier:

 $U_o = 32 \text{ V}$ ,  $I_o = 132 \text{ mA}$ ,  $P_o = 1 \text{ W}$ 

- Effective internal inductance/capacitance

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$  $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$ 

## • Explosion protection acc. to FM (pending)

Certificate of Compliance 3008490

- Identification (XP/DIP) or (IS); (NI)

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

## • Explosion protection to CSA (pending)

Certificate of Compliance 1153651

- Identification (XP/DIP) or (IS)

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P410

## for gauge pressure

|   |  |  |   |
|---|--|--|---|
| <b>HART communication</b>   |  | <b>FOUNDATION Fieldbus communication</b>   |   |
| HART  | 230 ... 1100 Ω   | Function blocks  | 3 function blocks analog input, 1 function block PID                    |
| Protocol  | HART Version 5.x   | • Analog input   | Yes, linearly rising or falling characteristic                          |
| Software for computer   | SIMATIC PDM  | - Adaptation to customer-specific process variables  | 0 ... 100 s   |
| <b>PROFIBUS PA communication</b>  |  | - Electrical damping, adjustable   | Output/input (can be locked within the device with a bridge)            |
| Simultaneous communication with master class 2 (max.)                           | 4  | - Simulation function  | parameterizable (last good value, substitute value, incorrect value)    |
| The address can be set using  | Configuration tool or local operation (standard setting address 126)                                   | - Failure mode   | Yes, one upper and lower warning limit and one alarm limit respectively |
| Cyclic data usage   |  | - Limit monitoring   | Yes   |
| • Output byte   | 5 (one measured value) or 10 (two measured values)   | - Square-rooted characteristic for flow measurement  | Standard FOUNDATION Fieldbus function block                             |
| • Input byte  | 0, 1, or 2 (register operating mode and reset function for metering)                                   | • PID  | 1 resource block  |
| Internal preprocessing  |  | • Physical block   | 1 transducer block Pressure with calibration, 1 transducer block LCD    |
| Device profile  | PROFIBUS PA Profile for Process Control Devices Version 3.0, class B                                   | Transducer blocks  |   |
| Function blocks   | 2  | • Pressure transducer block  |   |
| • Analog input  |  | - Can be calibrated by applying two pressures  | Yes   |
| - Adaptation to customer-specific process variables                             | Yes, linearly rising or falling characteristic   | - Monitoring of sensor limits  | Yes   |
| - Electrical damping, adjustable  | 0 ... 100 s  | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function                    |
| - Simulation function   | Input /Output  |  |   |
| - Failure mode  | parameterizable (last good value, substitute value, incorrect value)                                   |  |   |
| - Limit monitoring  | Yes, one upper and lower warning limit and one alarm limit respectively                                |  |   |
| • Register (totalizer)  | Can be reset, preset, optional direction of counting, simulation function of register output           |  |   |
| - Failure mode  | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |  |   |
| - Limit monitoring  | One upper and lower warning limit and one alarm limit respectively                                     |  |   |
| • Physical block  | 1  |  |   |
| Transducer blocks   | 2  |  |   |
| • Pressure transducer block   |  |  |   |
| - Can be calibrated by applying two pressures                                   | Yes  |  |   |
| - Monitoring of sensor limits   | Yes  |  |   |
| - Specification of a container characteristic with                              | Max. 30 nodes  |  |   |
| - Square-rooted characteristic for flow measurement                             | Yes  |  |   |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable  |  |   |
| - Simulation function for measured pressure value and sensor temperature        | Constant value or over parameterizable ramp function   |  |   |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

for gauge pressure

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| Selection and Ordering data   |                                | Article No.     | Order code    |
|---|--------------------------------|-----------------|---------------|
| <b>Pressure transmitter for gauge pressure, SITRANS P410 with HART</b>  |                                | <b>7MF4033-</b> | <b>-Z C41</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>                       |                                |                 |               |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b> |                 |               |
| Silicone oil  | normal                         | 1               |               |
| <b>Measuring span (min. ... max.)</b>   |                                |                 |               |
| 0.01 ... 1 bar (0.15 ... 14.5 psi)  |                                | B               |               |
| 0.04 ... 4 bar (0.58 ... 58 psi)  |                                | C               |               |
| 0.16 ... 16 bar (2.32 ... 232 psi)  |                                | D               |               |
| 0.63 ... 63 bar (9.14 ... 914 psi)  |                                | E               |               |
| 1.6 ... 160 bar (23.2 ... 2320 psi)   |                                | F               |               |
| <b>Wetted parts materials</b>   |                                |                 |               |
| Seal diaphragm  | Process connection             |                 |               |
| Stainless steel   | Stainless steel                | A               |               |
| Hastelloy   | Stainless steel                | B               |               |
| Hastelloy   | Hastelloy                      | C               |               |
| Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT"                              |                                | Y 1             |               |
| <b>(recommended version)</b> <sup>1) 2) 3) 4)</sup>   |                                |                 |               |
| Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" <sup>1) 2) 3) 4)</sup>         |                                | Y 0             |               |
| <b>Process connection</b>   |                                |                 |               |
| • Connection shank G1/2B to EN 837-1  |                                | 0               |               |
| • Female thread 1/2-14 NPT  |                                | 1               |               |
| • Stainless steel oval flange with process connection (Oval flange has no female thread)                                  |                                |                 |               |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518   |                                | 2               |               |
| - Mounting thread M10 to DIN 19213  |                                | 3               |               |
| - Mounting thread M12 to DIN 19213  |                                | 4               |               |
| • Male thread M20 x 1.5   |                                | 5               |               |
| • Male thread 1/2-14 NPT  |                                | 6               |               |
| <b>Non-wetted parts materials</b>   |                                |                 |               |
| • Housing made of die-cast aluminium  |                                | 0               |               |
| • Housing stainless steel precision casting <sup>5)</sup>   |                                | 3               |               |
| <b>Version</b>  |                                |                 |               |
| • Standard version, German plate inscription, setting for pressure unit: bar  |                                | 1               |               |
| • International version, English plate inscription, setting for pressure unit: bar  |                                | 2               |               |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal   |                                | 3               |               |
| All versions include DVD with compact operating instructions in various EU languages.                                     |                                |                 |               |
| <b>Explosion protection</b>   |                                |                 |               |
| • None  |                                |                 | A             |
| • With ATEX, Type of protection:  |                                |                 |               |
| - "Intrinsic safety (Ex ia)"  |                                |                 | B             |
| - "Explosion-proof (Ex d)" <sup>6)</sup>  |                                |                 | D             |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" <sup>7)</sup>   |                                |                 | P             |
| - "Ex nA/ic (Zone 2)" <sup>8)</sup>   |                                |                 | E             |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>7)9)</sup> |                                |                 | R             |
| • FM + CSA intrinsic safe (is) (pending) <sup>10)</sup>   |                                |                 | F             |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>7)9)10)</sup>  |                                |                 | S             |
| • With FM + CSA, Type of protection:  |                                |                 |               |
| - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>6)10)</sup>   |                                |                 | NC            |
| <b>Electrical connection / cable entry</b>  |                                |                 |               |
| • Screwed gland M20 x1 .5   |                                |                 | B             |
| • Screwed gland 1/2-14 NPT  |                                |                 | C             |
| • Han 7D device plug (plastic housing) incl. mating connector <sup>11)</sup>  |                                |                 | D             |
| • M12 device plugs (stainless steel) <sup>11)12)</sup>  |                                |                 | F             |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

### Selection and Ordering data

Article No.

Order code

**Pressure transmitter for gauge pressure, SITRANS P410 with HART**

**7MF4033-**

**-Z**

**C41**

#### Display

- Without display
- Without visible display (display concealed, setting: mA)
- With visible display (setting: mA)
- with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)

0

1

6

7

Power supply units see Chap. 7 "Supplementary Components".

A quick-start guide is included in the scope of delivery of the device.

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y.-... and 7MF4900-1...-B
- 4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
- 5) Not in conjunction with Electrical connection "Han 7D device plug".
- 6) Without cable gland, with blanking plug
- 7) With enclosed cable gland Ex ia and blanking plug
- 8) Configurations with Han and M12 device plugs are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) Only in connection with Ex approval A, B or E.
- 12) M12 delivered without cable socket

| Selection and Ordering data  |                                | Article No. | Order code |
|--|--------------------------------|-------------|------------|
| <b>Pressure transmitter for gauge pressure</b>   |                                |             |            |
| <b>SITRANS P410 with PROFIBUS PA (PA)</b>  |                                | 7MF4034-    | -Z C41     |
| <b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>  |                                | 7MF4035-    | -Z C41     |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |                                |             |            |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b> |             |            |
| Silicone oil   | normal                         |             |            |
| <b>Nominal measuring range</b>   |                                |             |            |
| 1 bar  | (14.5 psi)                     |             |            |
| 4 bar  | (58 psi)                       |             |            |
| 16 bar   | (232 psi)                      |             |            |
| 63 bar   | (914 psi)                      |             |            |
| 160 bar  | (2320 psi)                     |             |            |
| <b>Wetted parts materials</b>  |                                |             |            |
| Seal diaphragm   | Process connection             |             |            |
| Stainless steel  | Stainless steel                |             |            |
| Hastelloy  | Stainless steel                |             |            |
| Hastelloy  | Hastelloy                      |             |            |
| Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT"   |                                |             |            |
| <b>(recommended version)</b> <sup>1) 2) 3) 4)</sup>  |                                |             |            |
| Version for diaphragm seals in conjunction with process connector "G½B connection shank" <sup>1) 2) 3) 4)</sup>  |                                |             |            |
| <b>Process connection</b>  |                                |             |            |
| <ul style="list-style-type: none"> <li>• Connection shank G½B to EN 837-1</li> <li>• Female thread ½-14 NPT</li> <li>• Stainless steel oval flange with process connection (Oval flange has no female thread) <sup>5)</sup> <ul style="list-style-type: none"> <li>- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>- Mounting thread M10 to DIN 19213</li> <li>- Mounting thread M12 to DIN 19213</li> </ul> </li> <li>• Male thread M20 x 1.5</li> <li>• Male thread ½ -14 NPT</li> </ul>  |                                |             |            |
| <b>Non-wetted parts materials</b>  |                                |             |            |
| <ul style="list-style-type: none"> <li>• Housing made of die-cast aluminium</li> <li>• Housing stainless steel precision casting</li> </ul>  |                                |             |            |
| <b>Version</b>   |                                |             |            |
| <ul style="list-style-type: none"> <li>• Standard version, German label inscription, setting of pressure unit: bar</li> <li>• International version, English label inscription, setting of pressure unit: psi</li> <li>• Chinese version, English label inscription, setting of pressure unit: kPa</li> </ul>  |                                |             |            |
| All versions include DVD with compact operating instructions in various EU languages.  |                                |             |            |
| <b>Explosion protection</b>  |                                |             |            |
| <ul style="list-style-type: none"> <li>• None</li> <li>• With ATEX, Type of protection: <ul style="list-style-type: none"> <li>- "Intrinsic safety (Ex ia)"</li> <li>- "Explosion-proof (Ex d)"<sup>6)</sup></li> <li>- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>7)</sup></li> <li>- "Ex nA/ic (Zone 2)"<sup>8)</sup></li> <li>- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"<sup>7) 9)</sup></li> </ul> </li> <li>• FM + CSA intrinsic safe (is)<sup>10)</sup></li> <li>• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>7)9)10)</sup></li> <li>• With FM + CSA, Type of protection: <ul style="list-style-type: none"> <li>- "Intrinsic Safe and Explosion Proof (is + xp)"<sup>6)10)</sup></li> </ul> </li> </ul> |                                |             |            |
| <b>Electrical connection/cable entry</b>   |                                |             |            |
| <ul style="list-style-type: none"> <li>• Screwed gland M20 x 1.5</li> <li>• Screwed gland ½-14 NPT</li> <li>• M12 device plugs (stainless steel)<sup>11) 12)</sup></li> </ul>  |                                |             |            |





## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

1

| Selection and Ordering data  | Article No.   | Order code    |
|--|---|---------------|
| <b>Pressure transmitter for gauge pressure</b>                                     |   |               |
| <b>SITRANS P410 with PROFIBUS PA (PA)</b>  | <b>7MF4034-</b>  -  | <b>-Z C41</b> |
| <b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>                                  | <b>7MF4035-</b>  -  | <b>-Z C41</b> |
| <b>Display</b>   |   |               |
| • Without display  |   | <b>0</b>      |
| • Without visible display (display concealed, setting: bar)                        |   | <b>1</b>      |
| • With visible display (setting: bar)  |   | <b>6</b>      |
| • with customer-specific display (setting as specified, Order code "Y21" required) |   | <b>7</b>      |

A quick-start guide is included in the scope of delivery of the device.

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y.-... and 7MF4900-1...-B
- 4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
- 5) M10 fastening thread: Max. span 160 bar (2320 psi)  
7/16-20 UNF and M12 fastening thread: Max. span 400 bar (5802 psi)
- 6) Without cable gland, with blanking plug.
- 7) With enclosed cable gland Ex ia and blanking plug.
- 8) Configurations with Han and M12 device plugs are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) M12 delivered without cable socket.
- 12) Only in connection with Ex approval A, B, E or F.

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

for gauge pressure

1

| Selection and Ordering data   | Order code |      |    |    |
|---|------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |            | HART | PA | FF |
| <b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>       |            |      |    |    |
| • Steel   | A01        | ✓    | ✓  | ✓  |
| • Stainless steel 304   | A02        | ✓    | ✓  | ✓  |
| • Stainless steel 316L  | A03        | ✓    | ✓  | ✓  |
| <b>Device plugs<sup>1)</sup></b>  |            |      |    |    |
| • Han 7D (metal)  | A30        | ✓    |    |    |
| • Han 8D (instead of Han 7D)  | A31        | ✓    |    |    |
| • Angled  | A32        | ✓    |    |    |
| • Han 8D (metal)  | A33        | ✓    |    |    |
| <b>Cable sockets for M12 device plugs (metal (CuZn))</b>  | A50        | ✓    | ✓  | ✓  |
| <b>Rating plate inscription</b><br>(instead of German)  |            |      |    |    |
| • English   | B11        | ✓    | ✓  | ✓  |
| • French  | B12        | ✓    | ✓  | ✓  |
| • Spanish   | B13        | ✓    | ✓  | ✓  |
| • Italian   | B14        | ✓    | ✓  | ✓  |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi  | B21        | ✓    | ✓  | ✓  |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>2)</sup></b>                                 | C11        | ✓    | ✓  | ✓  |
| <b>Inspection certificate<sup>3)</sup></b><br>Acc. to EN 10204-3.1  | C12        | ✓    | ✓  | ✓  |
| <b>Factory certificate</b><br>Acc. to EN 10204-2.2  | C14        | ✓    | ✓  | ✓  |
| <b>Acceptance certificate (EN 10204-3.1)</b><br>PMI test of parts in contact with medium  | C15        | ✓    | ✓  | ✓  |
| <b>Functional safety (SIL2) (pending)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | C20        | ✓    |    |    |
| <b>Functional safety (SIL2/3)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration         | C23        | ✓    |    |    |
| <b>Increased measuring accuracy</b><br>(mandatory specification for SITRANS P410)   | C41        | ✓    | ✓  | ✓  |
| <b>PED for Russia with initial calibration mark</b>   | C99        | ✓    | ✓  | ✓  |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>  | D05        | ✓    |    |    |
| <b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>  | D07        | ✓    | ✓  | ✓  |
| <b>Degree of protection IP66/IP68</b><br>(only for M20x1.5 and ½-14 NPT)  | D12        | ✓    | ✓  | ✓  |
| <b>Supplied with oval flange</b><br>(1 item), PTFE packing and screws in thread of oval flange  | D37        | ✓    | ✓  | ✓  |
| <b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>   | D59        | ✓    | ✓  | ✓  |
| <b>TAG plate empty (no inscription)</b>   | D61        | ✓    | ✓  | ✓  |

| Selection and Ordering data  | Order code        |      |    |    |
|--|-------------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.  |                   | HART | PA | FF |
| <b>Use in or on zone 1D/2D<sup>4)</sup></b><br>(only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)     | E01               | ✓    | ✓  | ✓  |
| <b>CRN approval Canada</b><br>(Canadian Registration Number)   | E22 <sup>5)</sup> | ✓    | ✓  | ✓  |
| <b>Dual seal</b>   | E24               | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-B..)   | E55 <sup>6)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-D..)   | E56 <sup>6)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-E..)   | E57 <sup>6)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection „Ex ia“, „Ex d" and „Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-R..)   | E58 <sup>6)</sup> | ✓    | ✓  | ✓  |
| <b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (pending)</b><br>(only for transmitter 7MF4...-.....-B, D]..-Z + E11) | E70 <sup>6)</sup> | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b>  | E80               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b>   | E81               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>  | E82               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>  | E83               | ✓    | ✓  | ✓  |
| <b>Two coats of lacquer on casing and cover (PU on epoxy)</b>  | G10               | ✓    | ✓  | ✓  |
| <b>Transient protector 6 kV (lightning protection)</b>   | J01               | ✓    | ✓  | ✓  |
| <b>Oval flange NAM (ASTAVA)</b>  | J06               | ✓    | ✓  | ✓  |
| <b>Marine approvals</b>  |                   |      |    |    |
| • Det Norske Veritas Germanischer Lloyd (DNV-GL)   | S10               | ✓    | ✓  | ✓  |
| • Lloyds Register (LR)   | S11               | ✓    | ✓  | ✓  |
| • French marine classification society Bureau Veritas (BV)   | S12               | ✓    | ✓  | ✓  |
| • American Bureau of Shipping (ABS)  | S14               | ✓    | ✓  | ✓  |
| • Russian Maritime Register (RMR)  | S16               | ✓    | ✓  | ✓  |
| • Korean Register of Shipping (KR)   | S17               | ✓    | ✓  | ✓  |

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/280).

<sup>1)</sup> Han device plug IP65

<sup>2)</sup> When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

<sup>3)</sup> If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

<sup>4)</sup> Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

<sup>5)</sup> Cannot be ordered with remote seal.

<sup>6)</sup> When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P410

## for gauge pressure

| Selection and Ordering data   | Order code       |             |                 |           |
|---|------------------|-------------|-----------------|-----------|
| <b>Additional data</b><br>Please add "-Z" to Article No. and specify Order code(s) and plain text.  |                  | <b>HART</b> | <b>PA</b>       | <b>FF</b> |
| <b>Measuring range to be set</b><br>Specify in plain text (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi   | <b>Y01</b>       | ✓           | ✓ <sup>1)</sup> |           |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....   | <b>Y15</b>       | ✓           | ✓               | ✓         |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 characters, specify in plain text:<br>Y16: .....  | <b>Y16</b>       | ✓           | ✓               | ✓         |
| <b>Entry of HART address (TAG)</b><br>Max. 8 characters, specify in plain text:<br>Y17: .....   | <b>Y17</b>       | ✓           |                 |           |
| <b>Setting of pressure indication in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>*)</sup> , inH <sub>2</sub> O <sup>*)</sup> , ftH <sub>2</sub> O <sup>*)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>*) ref. temperature 20 °C | <b>Y21</b>       | ✓           | ✓               | ✓         |
| <b>Setting of pressure indication in non-pressure units<sup>2)</sup></b><br>Specify in plain text:<br>Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)  | <b>Y22 + Y01</b> | ✓           |                 |           |

✓ = available

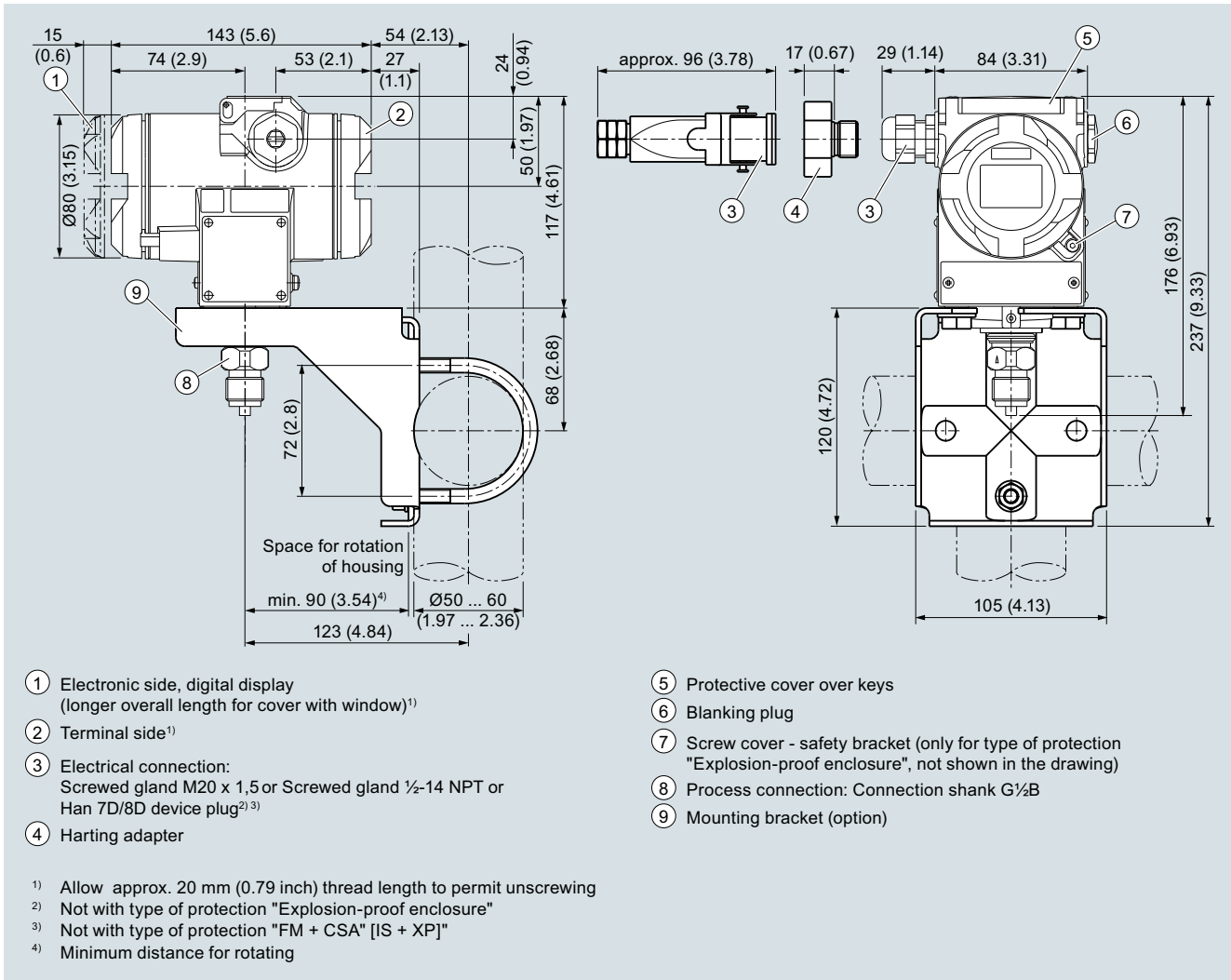
### Ordering example

Item line: 7MF4033-1EA00-1AA7-Z C41  
B line: A01 + Y01 + Y21  
C line: Y01: 10 ... 20 bar (145 ... 290 psi)  
C line: Y21: bar (psi)

<sup>1)</sup> Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.



**Dimensional drawings**

SITRANS P410 pressure transmitters for gauge pressure, dimensions in mm (inch)

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

## Technical specifications

### SITRANS P410 for differential pressure and flow

#### Input

Measured variable

Differential pressure and flow

Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive)

#### HART

#### PROFIBUS PA/ FOUNDATION Fieldbus

Span

Nominal measuring range

Max. operating pressure MAWP (PS)

2.5 ... 250 mbar  
0.2 ... 25 kPa  
1 ... 100 inH<sub>2</sub>O250 mbar  
25 kPa  
100 inH<sub>2</sub>O160 bar  
16 MPa  
2320 psi6 ... 600 mbar  
0.6 ... 60 kPa  
2.4 ... 240 inH<sub>2</sub>O600 mbar  
60 kPa  
240 inH<sub>2</sub>O16 ... 1600 mbar  
1.6 ... 160 kPa  
6.4 ... 642 inH<sub>2</sub>O1600 mbar  
160 kPa  
642 inH<sub>2</sub>O50 ... 5000 mbar  
5 ... 500 kPa  
20 ... 2000 inH<sub>2</sub>O5000 mbar  
500 kPa  
2000 inH<sub>2</sub>O0.3 ... 30 bar  
0.03 ... 3 MPa  
4.35 ... 435 psi30 bar  
3 MPa  
435 psi6 ... 600 mbar  
0.6 ... 60 kPa  
2.4 ... 240 inH<sub>2</sub>O600 mbar  
60 kPa  
240 inH<sub>2</sub>O420 bar  
42 MPa  
6091 psi16 ... 1600 mbar  
1.6 ... 160 kPa  
6.4 ... 642 inH<sub>2</sub>O1600 mbar  
160 kPa  
642 inH<sub>2</sub>O50 ... 5000 mbar  
5 ... 500 kPa  
20 ... 2000 inH<sub>2</sub>O5000 mbar  
500 kPa  
2000 inH<sub>2</sub>O0.3 ... 30 bar  
0.03 ... 3 MPa  
4.35 ... 435 psi30 bar  
3 MPa  
435 psi

Lower measuring limit

- Measuring cell with silicone oil filling

-100 % of max. span (-33 % with measuring cell 30 bar/3 MPa/435 psi)  
or 30 mbar a/3 kPa a/0.44 psi a

Upper measuring limit

100 % of max. span

Start of scale value

Between the measuring limits (fully adjustable)

#### Output

#### HART

#### PROFIBUS PA/ FOUNDATION Fieldbus

Output signal

4 ... 20 mA

Digital PROFIBUS PA and  
FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

-

- Upper limit (infinitely adjustable)

23 mA, factory preset to 20.5 mA or  
optionally set to 22.0 mA

-

Load

- Without HART

 $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$  in  $\Omega$ ,  
 $U_H$ : Power supply in V

-

- With HART

 $R_B = 230 \dots 500 \Omega$  (SIMATIC PDM) or  
 $R_B = 230 \dots 1100 \Omega$  (HART Communica-  
tor)

-

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal.  
Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

for differential pressure and flow

1

**SITRANS P410 for differential pressure and flow****Measuring accuracy**

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nom. pressure range}$ 

Error in measurement at limit setting incl. hysteresis and reproducibility

## • Linear characteristic

- 250 mbar/25 kPa/3.63 psi
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

$$\begin{aligned} r \leq 5 : & \leq 0.04 \% \\ 5 < r \leq 100 : & \leq (0.004 \cdot r + 0.045) \% \end{aligned}$$

## • Square-rooted characteristic (flow &gt; 50 %)

- 250 mbar/25 kPa/3.63 psi
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

$$\begin{aligned} r \leq 5 : & \leq 0.04 \% \\ 5 < r \leq 100 : & \leq (0.004 \cdot r + 0.045) \% \end{aligned}$$

## • Square-rooted characteristic (flow &gt; 25 ... 50 %)

- 250 mbar/25 kPa/3.63 psi
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

$$\begin{aligned} r \leq 5 : & \leq 0.08 \% \\ 5 < r \leq 100 : & \leq (0.008 \cdot r + 0.09) \% \end{aligned}$$

Influence of ambient temperature (in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.63 psi
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

$$\leq (0.025 \cdot r + 0.125) \%$$

Influence of static pressure

## • on the zero point (PKN)

- 250 mbar/25 kPa/3.63 psi
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi

$$\leq (0.1 \cdot r) \% \text{ per 70 bar}$$

(zero-point correction is possible with position error adjustment)

- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

$$\leq (0.2 \cdot r) \% \text{ per 70 bar}$$

(zero-point correction is possible with position error adjustment)

## • on the span (PKS)

- 250 mbar/25 kPa/3.63 psi
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

$$\leq 0.14 \% \text{ per 70 bar}$$

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

Static pressure max. 70 bar/7 MPa/1015 psi

- 250 mbar/25 kPa/3.63 psi
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi

$$\leq (0.125 \cdot r) \% \text{ in 5 years}$$

- 30 bar/3 MPa/435 psi

$$\leq (0.25 \cdot r) \% \text{ in 5 years}$$

Effect of mounting position (in pressure per change in angle)

$$\leq 0.7 \text{ mbar}/0.07 \text{ kPa}/0.028 \text{ inH}_2\text{O} \text{ per } 10^\circ \text{ inclination}$$

(zero-point correction is possible with position error adjustment)

Effect of auxiliary power supply (in percent per change in voltage)

$$0.005 \% \text{ per } 1 \text{ V}$$

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

$$3 \cdot 10^{-5} \text{ of nominal measuring range}$$

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

## for differential pressure and flow

### SITRANS P410 for differential pressure and flow

#### Rated conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

Temperature of medium

- Measuring cell with silicone oil filling

- In conjunction with dust explosion protection

Ambient conditions

- Ambient temperature

- Transmitter

- Display readable

- Storage temperature

- Climatic class

- Condensation

- Electromagnetic Compatibility

- Emitted interference and interference immunity

IP66 (optional IP66/IP68)

Type 4X

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F) with 30 bar measuring cell

-20 ... +60 °C (-4 ... +140 °F)

-40 ... +85 °C (-40 ... +185 °F)

-30 ... +85 °C (-22 ... +185 °F)

-50 ... +85 °C (-58 ... +185 °F)

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

Acc. to IEC 61326 and NAMUR NE 21

#### Design

Weight (without options)

Die-cast aluminum: ≈ 4.5 kg (≈ 9.9 lb)

Stainless steel precision casting: ≈ 7.1 kg (≈ 15.6 lb)

Enclosure material

Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Seal diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

- Process flanges and sealing screw

Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602

- O-Ring

FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR

Measuring cell filling

Silicone oil or inert filling liquid

(maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))

Process connection

Female thread 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518

Material of mounting bracket

- Steel

Sheet-steel, Mat. No. 1.0330, chrome-plated

- Stainless steel 304

Sheet stainless steel, mat. no. 1.4301 (SS 304)

- Stainless steel 316L

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

#### Power supply $U_H$

Terminal voltage on transmitter

10.5 ... 45 V DC

10.5 ... 30 V DC in intrinsically-safe mode

#### PROFIBUS PA/ FOUNDATION Fieldbus

-

Power supply

Supplied through bus

Separate 24 V power supply necessary

-

No

Bus voltage

- Not Ex

-

9 ... 32 V

- With intrinsically-safe operation

-

9 ... 24 V

Current consumption

- Basic current (max.)

-

12.5 mA

- Start-up current ≤ basic current

-

Yes

- Max. current in event of fault

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

for differential pressure and flow

1

**SITRANS P410 for differential pressure and flow****Certificates and approvals**

Classification according to PED 2014/68/EU

Explosion protection

## • Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

## • Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

## • Dust explosion protection for zone 20 (pending)

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

## • Dust explosion protection for zone 21/22 (pending)

- Marking
- Connection

## • Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

## • Explosion protection acc. to FM (pending)

- Identification (XP/DIP) or (IS); (NI)

## • Explosion protection to CSA (pending)

- Identification (XP/DIP) or (IS)

**HART**

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30\text{ V}$ ,  $I_i = 100\text{ mA}$ ,  $P_i = 750\text{ mW}$ ;  
 $R_i = 300\ \Omega$

 $L_i = 0.4\text{ mH}$ ,  $C_i = 6\text{ nF}$ 

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:  $U_H = 10.5 \dots 45\text{ V}$  DC

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)  
 120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30\text{ V}$ ,  $I_i = 100\text{ mA}$ ,  
 $P_i = 750\text{ mW}$ ,  $R_i = 300\ \Omega$

 $L_i = 0.4\text{ mH}$ ,  $C_i = 6\text{ nF}$ 

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:  $U_H = 10.5 \dots 45\text{ V}$  DC;  $P_{\max} = 1.2\text{ W}$ 

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

 $U_m = 45\text{ V}$ To circuits with values:  
 $U_i = 45\text{ V}$  $L_i = 0.4\text{ mH}$ ,  $C_i = 6\text{ nF}$ 

Certificate of Compliance 3008490

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

Certificate of Compliance 1153651

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

**PROFIBUS PA/ FOUNDATION Fieldbus**FISCO supply unit:  
 $U_o = 17.5\text{ V}$ ,  $I_o = 380\text{ mA}$ ,  $P_o = 5.32\text{ W}$ Linear barrier:  
 $U_o = 24\text{ V}$ ,  $I_o = 250\text{ mA}$ ,  $P_o = 1.2\text{ W}$  $L_i = 7\ \mu\text{H}$ ,  $C_i = 1.1\text{ nF}$ To circuits with values:  $U_H = 9 \dots 32\text{ V}$  DCFISCO supply unit:  
 $U_o = 17.5\text{ V}$ ,  $I_o = 380\text{ mA}$ ,  $P_o = 5.32\text{ W}$ Linear barrier:  
 $U_o = 24\text{ V}$ ,  $I_o = 250\text{ mA}$ ,  $P_o = 1\text{ W}$  $L_i = 7\ \mu\text{H}$ ,  $C_i = 1.1\text{ nF}$ To circuits with values:  $U_H = 9 \dots 32\text{ V}$  DC;  
 $P_{\max} = 1\text{ W}$  $U_m = 32\text{ V}$ FISCO supply unit ic:  
 $U_o = 17.5\text{ V}$ ,  $I_o = 570\text{ mA}$ Linear barrier:  
 $U_o = 32\text{ V}$ ,  $I_o = 132\text{ mA}$ ,  $P_o = 1\text{ W}$  $L_i = 7\ \mu\text{H}$ ,  $C_i = 1.1\text{ nF}$

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

## for differential pressure and flow

| <b>HART communication</b>   |  | <b>FOUNDATION Fieldbus communication</b>   |   |
|---|--|--|---|
| HART  | 230 ... 1100 Ω   | Function blocks  | 3 function blocks analog input, 1 function block PID                    |
| Protocol  | HART Version 5.x   |  |   |
| Software for PC   | SIMATIC PDM  |  |   |
| <b>PROFIBUS PA communication</b>  |  |  |   |
| Simultaneous communication with master class 2 (max.)                           | 4  | • Analog input   | Yes, linearly rising or falling characteristic                          |
| The address can be set using  | Configuration tool or local operation (standard setting address 126)                                   | - Adaptation to customer-specific process variables  | 0 ... 100 s   |
| Cyclic data usage   |  | - Electrical damping, adjustable   | Output/input (can be locked within the device with a bridge)            |
| • Output byte   | 5 (one measured value) or 10 (two measured values)   | - Simulation function  | parameterizable (last good value, substitute value, incorrect value)    |
| • Input byte  | 0, 1, or 2 (register operating mode and reset function for metering)                                   | - Failure mode   | Yes, one upper and lower warning limit and one alarm limit respectively |
| Internal preprocessing  |  | - Limit monitoring   | Yes   |
| Device profile  | PROFIBUS PA Profile for Process Control Devices Version 3.0, class B                                   | - Square-rooted characteristic for flow measurement  |   |
| Function blocks   | 2  | • PID  | Standard FOUNDATION Fieldbus function block                             |
| • Analog input  |  | • Physical block   | 1 resource block  |
| - Adaptation to customer-specific process variables                             | Yes, linearly rising or falling characteristic   | Transducer blocks  | 1 transducer block Pressure with calibration, 1 transducer block LCD    |
| - Electrical damping, adjustable  | 0 ... 100 s  |  |   |
| - Simulation function   | Input /Output  | • Pressure transducer block  |   |
| - Failure mode  | parameterizable (last good value, substitute value, incorrect value)                                   | - Can be calibrated by applying two pressures  | Yes   |
| - Limit monitoring  | Yes, one upper and lower warning limit and one alarm limit respectively                                | - Monitoring of sensor limits  | Yes   |
| • Register (totalizer)  | Can be reset, preset, optional direction of counting, simulation function of register output           | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function                    |
| - Failure mode  | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |  |   |
| - Limit monitoring  | One upper and lower warning limit and one alarm limit respectively                                     |  |   |
| • Physical block  | 1  |  |   |
| Transducer blocks   | 2  |  |   |
| • Pressure transducer block   |  |  |   |
| - Can be calibrated by applying two pressures                                   | Yes  |  |   |
| - Monitoring of sensor limits   | Yes  |  |   |
| - Specification of a container characteristic with                              | Max. 30 nodes  |  |   |
| - Square-rooted characteristic for flow measurement                             | Yes  |  |   |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable  |  |   |
| - Simulation function for measured pressure value and sensor temperature        | Constant value or over parameterizable ramp function   |  |   |

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

for differential pressure and flow

1

| Selection and Ordering data  |   | Article No.     | Order Code    |
|--|---|-----------------|---------------|
| <b>SITRANS P410 with HART pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)</b>   |   | <b>7MF4433-</b> | <b>-Z C41</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |   |                 |               |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b>                  |                 |               |
| Silicone oil   | normal  |                 |               |
| <b>Measuring span (min. ... max.)</b>  |   |                 |               |
| 2.5 ... 250 mbar   | (1.004 ... 100.4 inH <sub>2</sub> O)            |                 |               |
| 6 ... 600 mbar   | (2.409 ... 240.9 inH <sub>2</sub> O)            |                 |               |
| 16 ... 1600 mbar   | (6.424 ... 642.4 inH <sub>2</sub> O)            |                 |               |
| 50 ... 5000 mbar   | (20.08 ... 2008 inH <sub>2</sub> O)             |                 |               |
| 0.3 ... 30 bar   | (4.35 ... 435 psi)                              |                 |               |
| <b>Wetted parts materials</b>  |   |                 |               |
| (stainless steel process flanges)  |   |                 |               |
| Seal diaphragm   | Parts of measuring cell                         |                 |               |
| Stainless steel  | Stainless steel                                 |                 |               |
| Hastelloy  | Stainless steel                                 |                 |               |
| Hastelloy  | Hastelloy                                       |                 |               |
| Version for diaphragm seal <sup>1) 2) 3) 4)</sup>  |   |                 |               |
| <b>Process connection</b>  |   |                 |               |
| Female thread 1/4-18 NPT with flange connection  |   |                 |               |
| <ul style="list-style-type: none"> <li>Sealing screw opposite process connection               <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul> </li> <li>Vent on side of process flange<sup>5)</sup> <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul> </li> </ul>   |   |                 |               |
| <b>Non-wetted parts materials</b>  |   |                 |               |
| process flange screws  | Electronics housing                             |                 |               |
| Stainless steel  | Die-cast aluminum                               |                 |               |
| Stainless steel  | Stainless steel precision casting <sup>6)</sup> |                 |               |
| <b>Version</b>   |   |                 |               |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul> All versions include DVD with compact operating instructions in various EU languages.  |   |                 |               |
| <b>Explosion protection</b>  |   |                 |               |
| <ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>7)</sup></li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>8)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>9)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"<sup>8)10)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is) (pending)<sup>11)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>8)10)11)</sup></li> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>7)11)</sup></li> </ul> </li> </ul> |   |                 |               |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1

## Selection and Ordering data

Article No.

Order Code

**SITRANS P410 with HART pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)**

7MF4433-

-

-Z C41

### Electrical connection/cable entry

- Screwed gland M20 x 1.5
- Screwed gland ½-14 NPT
- Han 7D device plug (plastic housing) incl. mating connector<sup>12)13)</sup>
- M12 device plugs (stainless steel)<sup>14)15)</sup>

B  
C  
D  
F

### Display

- Without display
- Without visible display (display concealed, setting: mA)
- With visible display (setting: mA)
- with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)

0  
1  
6  
7

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

<sup>1)</sup> When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

<sup>2)</sup> If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

<sup>3)</sup> The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF4433-...Y... and 7MF4900-1...-B

<sup>4)</sup> The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.

<sup>5)</sup> Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).

<sup>6)</sup> Not in conjunction with Electrical connection "Han 7D device plug".

<sup>7)</sup> Without cable gland, with blanking plug

<sup>8)</sup> With enclosed cable gland Ex ia and blanking plug

<sup>9)</sup> Configurations with Han and M12 device plugs are only available in Ex ic.

<sup>10)</sup> Only in connection with IP66.

<sup>11)</sup> Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.

<sup>12)</sup> Only in connection with Ex approval A, B or E.

<sup>13)</sup> Permissible only for crimp-contact of conductor cross-section 1 mm<sup>2</sup>

<sup>14)</sup> Only in connection with Ex approval A, B, E or F.

<sup>15)</sup> M12 delivered without cable socket.



| Selection and Ordering data  |                                   | Article No. | Order code |
|--|-----------------------------------|-------------|------------|
| <b>Pressure transmitters for differential pressure and flow PN 160 (MAWP 2320 psi)</b>   |                                   |             |            |
| <b>SITRANS P410 with PROFIBUS PA (PA)</b>  |                                   | 7MF4434-    | -Z C41     |
| <b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>  |                                   | 7MF4435-    | -Z C41     |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |                                   |             |            |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b>    |             |            |
| Silicone oil   | normal                            |             |            |
| <b>Nominal measuring range</b>   |                                   |             |            |
| 250 mbar (100.4 inH <sub>2</sub> O)  |                                   |             |            |
| 600 mbar (240.9 inH <sub>2</sub> O)  |                                   |             |            |
| 1600 mbar (642.4 inH <sub>2</sub> O)   |                                   |             |            |
| 5 bar (2008 inH <sub>2</sub> O)  |                                   |             |            |
| 30 bar (435 psi)   |                                   |             |            |
| <b>Wetted parts materials</b>  |                                   |             |            |
| (stainless steel process flanges)  |                                   |             |            |
| Seal diaphragm   | Parts of measuring cell           |             |            |
| Stainless steel  | Stainless steel                   |             |            |
| Hastelloy  | Stainless steel                   |             |            |
| Hastelloy  | Hastelloy                         |             |            |
| Version as diaphragm seal 1) 2) 3) 4)  |                                   |             |            |
| <b>Process connection</b>  |                                   |             |            |
| Female thread 1/4-18 NPT with flange connection  |                                   |             |            |
| <ul style="list-style-type: none"> <li>Sealing screw opposite process connection <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul> </li> <li>Venting on side of process flanges 5) <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul> </li> </ul>   |                                   |             |            |
| <b>Non-wetted parts materials</b>  |                                   |             |            |
| process flange screws  | Electronics housing               |             |            |
| Stainless steel  | Die-cast aluminum                 |             |            |
| Stainless steel  | Stainless steel precision casting |             |            |
| <b>Version</b>   |                                   |             |            |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul> All versions include DVD with compact operating instructions in various EU languages.  |                                   |             |            |
| <b>Explosion protection</b>  |                                   |             |            |
| <ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>6)</sup></li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>7)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>8)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)<sup>7)</sup> 9)(not for DS III FF)</li> </ul> </li> <li>FM + CSA intrinsic safe (is) (pending)<sup>10)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>7)</sup>9)10)</li> <li>With FM + CSA, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>8)</sup>10)</li> </ul> </li> </ul> |                                   |             |            |
| <b>Electrical connection/cable entry</b>   |                                   |             |            |
| <ul style="list-style-type: none"> <li>Screwed gland M20 x 1.5</li> <li>Screwed gland 1/2-14 NPT</li> <li>M12 device plugs (stainless steel)<sup>11)</sup> 12)</li> </ul>  |                                   |             |            |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

### Selection and Ordering data

Article No.

Order code

**Pressure transmitters for differential pressure and flow PN 160 (MAWP 2320 psi)**

**SITRANS P410 with PROFIBUS PA (PA)**

**7MF4434-**  -  **-Z C41**

**SITRANS P410 with FOUNDATION Fieldbus (FF)**

**7MF4435-**  -  **-Z C41**

### Display

- Without display
- Without visible display (display concealed, setting: bar)
- With visible display (setting: bar)
- With customer-specific display (setting as specified, Order code "Y21" required)

0  
1  
6  
7

Included in delivery of the device:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- <sup>1)</sup> When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- <sup>2)</sup> If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- <sup>3)</sup> The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-...Y... and 7MF4900-1...-B
- <sup>4)</sup> The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- <sup>5)</sup> Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).
- <sup>6)</sup> Without cable gland, with blanking plug.
- <sup>7)</sup> With enclosed cable gland Ex ia and blanking plug.
- <sup>8)</sup> Configurations with Han and M12 device plugs are only available in Ex ic.
- <sup>9)</sup> Only in connection with IP66.
- <sup>10)</sup> Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- <sup>11)</sup> Only in connection with Ex approval A, B, E or F.
- <sup>12)</sup> M12 delivered without cable socket

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

for differential pressure and flow

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| Selection and Ordering data   | Order code |      |    |    |
|---|------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |            | HART | PA | FF |
| <b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>       |            |      |    |    |
| • Steel   | A01        | ✓    | ✓  | ✓  |
| • Stainless steel 304   | A02        | ✓    | ✓  | ✓  |
| • Stainless steel 316L  | A03        | ✓    | ✓  | ✓  |
| <b>O-rings for process flanges</b><br>(instead of FPM (Viton))  |            |      |    |    |
| • PTFE (Teflon)   | A20        | ✓    | ✓  | ✓  |
| • FEP (with silicone core, approved for food)   | A21        | ✓    | ✓  | ✓  |
| • FFKM (Kalrez, compound 4079), for measured medium temperatures -15 ... 100 °C (5 ... 212 °F)  | A22        | ✓    | ✓  | ✓  |
| • NBR (Buna N)  | A23        | ✓    | ✓  | ✓  |
| <b>Device plugs<sup>1)</sup></b>  |            |      |    |    |
| • Han 7D (metal)  | A30        | ✓    |    |    |
| • Han 8D (instead of Han 7D)  | A31        | ✓    |    |    |
| • Angled  | A32        | ✓    |    |    |
| • Han 8D (metal)  | A33        | ✓    |    |    |
| <b>Sealing screws (2 units)</b><br>1/4-18 NPT, with valve in mat. of process flanges  | A40        | ✓    | ✓  | ✓  |
| <b>Cable sockets for M12 device plugs (metal (CuZn))</b>  | A50        | ✓    | ✓  | ✓  |
| <b>Rating plate inscription</b><br>(instead of German)  |            |      |    |    |
| • English   | B11        | ✓    | ✓  | ✓  |
| • French  | B12        | ✓    | ✓  | ✓  |
| • Spanish   | B13        | ✓    | ✓  | ✓  |
| • Italian   | B14        | ✓    | ✓  | ✓  |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi  | B21        | ✓    | ✓  | ✓  |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>2)</sup></b>                                 | C11        | ✓    | ✓  | ✓  |
| <b>Inspection certificate<sup>3)</sup> to EN 10204-3.1</b>  | C12        | ✓    | ✓  | ✓  |
| <b>Factory certificate to EN 10204-2.2</b>  | C14        | ✓    | ✓  | ✓  |
| <b>Acceptance certificate (EN 10204-3.1)</b><br>PMI test of parts in contact with medium  | C15        | ✓    | ✓  | ✓  |
| <b>Functional safety (SIL2) (pending)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | C20        | ✓    |    |    |
| <b>Functional safety (SIL2/3)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration         | C23        | ✓    |    |    |
| <b>Increased measuring accuracy</b><br>(mandatory specification for SITRANS P410)   | C41        | ✓    | ✓  | ✓  |
| <b>PED for Russia with initial calibration mark</b>   | C99        | ✓    | ✓  | ✓  |

| Selection and Ordering data   | Order code        |      |    |    |
|---|-------------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |                   | HART | PA | FF |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>  | D05               | ✓    |    |    |
| <b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b><br>(only together with seal diaphragm made of Hastelloy and stainless steel)   | D07               | ✓    | ✓  | ✓  |
| <b>Degree of protection IP66/IP68</b><br>(only for M20 x 1.5 and 1/2-14 NPT)  | D12               | ✓    | ✓  | ✓  |
| <b>Supplied with oval flange set</b><br>(2 items), PTFE packings and screws in thread of process flanges  | D37               | ✓    | ✓  | ✓  |
| <b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>   | D59               | ✓    | ✓  | ✓  |
| <b>TAG plate empty (no inscription)</b>   | D61               | ✓    | ✓  | ✓  |
| <b>Use in or on zone 1D/2D<sup>4)</sup></b><br>(only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)      | E01               | ✓    | ✓  | ✓  |
| <b>Dual seal</b>  | E24               | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-B..)  | E55 <sup>5)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion protection "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-D..)  | E56 <sup>5)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-E..)  | E57 <sup>5)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-R..)  | E58 <sup>5)</sup> | ✓    | ✓  | ✓  |
| <b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (pending)</b><br>(only for transmitter 7MF4...-.....-[B, D]..-Z + E11) | E70 <sup>5)</sup> | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b>   | E80               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b>  | E81               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>   | E82               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>   | E83               | ✓    | ✓  | ✓  |
| <b>Two coats of lacquer on casing and cover (PU on epoxy)</b>   | G10               | ✓    | ✓  | ✓  |
| <b>Interchanging of process connection side</b>   | H01               | ✓    | ✓  | ✓  |
| <b>Vent on side for gas measurements</b>  | H02               | ✓    | ✓  | ✓  |
| <b>Stainless steel process flanges for vertical differential pressure lines</b><br>(not together with K01, K02 and K04) <sup>6)</sup>                         | H03               | ✓    | ✓  | ✓  |

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1

| Selection and Ordering data  | Order code |      |    |    |
|--|------------|------|----|----|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.  |            | HART | PA | FF |
| <b>Transient protector 6 kV (lightning protection)</b>   | J01        | ✓    | ✓  | ✓  |
| <b>Chambered graphite gasket for process flange</b>  | J02        | ✓    | ✓  | ✓  |
| <b>Chambered PTFE graphite gasket</b>  | J03        | ✓    | ✓  | ✓  |
| <b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>  | J05        | ✓    | ✓  | ✓  |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>7)</sup></b> | J08        | ✓    | ✓  | ✓  |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>7)</sup></b>  | J09        | ✓    | ✓  | ✓  |
| <b>Marine approvals</b>  |            |      |    |    |
| • Det Norske Veritas Germanischer Lloyd (DNV-GL)   | S10        | ✓    | ✓  | ✓  |
| • Lloyds Register (LR)   | S11        | ✓    | ✓  | ✓  |
| • French marine classification society Bureau Veritas (BV)   | S12        | ✓    | ✓  | ✓  |
| • American Bureau of Shipping (ABS)  | S14        | ✓    | ✓  | ✓  |
| • Russian Maritime Register (RMR)  | S16        | ✓    | ✓  | ✓  |
| • Korean Register of Shipping (KR)   | S17        | ✓    | ✓  | ✓  |

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/280).

✓ = available

- 1) Han device plug IP65
- 2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 3) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 4) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D
- 5) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.
- 6) Not suitable for connection of remote seal.
- 7) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

| Selection and Ordering data  | Order code                              |        |                      |    |
|--|---|--------|----------------------|----|
| <b>Additional data</b><br>Please add "-Z" to Article No. and specify Order code(s) and plain text.   |   | HART   | PA                   | FF |
| <b>Measuring range to be set</b><br>Specify in plain text:<br>• in the case of linear characteristic curve (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi<br>• in the case of square rooted characteristic (max. 5 characters):<br>Y02: ... up to ... mbar, bar, kPa, MPa, psi  | Y01<br>Y02                              | ✓<br>✓ | ✓ <sup>1)</sup><br>✓ |    |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....  | Y15                                     | ✓      | ✓                    | ✓  |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 char., specify in plain text: Y16: .....   | Y16                                     | ✓      | ✓                    | ✓  |
| <b>Entry of HART address (TAG)</b><br>Max. 8 char., specify in plain text: Y17: .....  | Y17                                     | ✓      |                      |    |
| <b>Setting of pressure indicator in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note: The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>*) ref. temperature 20 °C | Y21                                     | ✓      | ✓                    | ✓  |
| <b>Setting of pressure indicator in non-pressure units<sup>2)</sup></b><br>Specify in plain text:<br>Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)   | Y22 <sup>3)</sup><br>+<br>Y01 or<br>Y02 | ✓      |                      |    |
| <b>Preset bus address</b><br>possible between 1 and 126<br>Specify in plain text: Y25: .....   | Y25                                     |        | ✓                    | ✓  |
| <b>Damping adjustment in seconds (0 ... 100 s)</b>   | Y30                                     | ✓      | ✓                    | ✓  |

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

- 1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
- 2) Preset values can only be changed over SIMATIC PDM.
- 3) Not in conjunction with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

for differential pressure and flow

1

| Selection and Ordering data  |   | Article No.     | Order code    |
|--|---|-----------------|---------------|
| <b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>       |   | <b>7MF4533-</b> | <b>-Z C41</b> |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>                      |   |                 |               |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b>                  |                 |               |
| Silicone oil   | normal  | 1               |               |
| <b>Measuring span (min. ... max.)</b>  |   |                 |               |
| 6 ... 600 mbar   | (2.4 ... 240 inH <sub>2</sub> O)                | E               |               |
| 16 ... 1600 mbar   | (6.4 ... 642 inH <sub>2</sub> O)                | F               |               |
| 50 ... 5000 mbar   | (20 ... 2000 inH <sub>2</sub> O)                | G               |               |
| 0.3 ... 30 bar   | (4.35 ... 435 psi)                              | H               |               |
| <b>Wetted parts materials</b>  |   |                 |               |
| (stainless steel process flanges)  |   |                 |               |
| Seal diaphragm   | Parts of measuring cell                         |                 |               |
| Stainless steel  | Stainless steel                                 | A               |               |
| Hastelloy  | Stainless steel                                 | B               |               |
| Version for diaphragm seal <sup>1) 2) 3) 4)</sup>  |   | Y               |               |
| <b>Process connection</b>  |   |                 |               |
| Female thread 1/4-18 NPT with flange connection  |   |                 |               |
| • Sealing screw opposite process connection  |   |                 |               |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518  |   | 3               |               |
| - Mounting thread M12 to DIN 19213 (only for replacement requirement)  |   | 1               |               |
| • Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing)         |   |                 |               |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518  |   | 7               |               |
| - Mounting thread M12 to DIN 19213 (only for replacement requirement)  |   | 5               |               |
| <b>Non-wetted parts materials</b>  |   |                 |               |
| process flange screws  | Electronics housing                             |                 |               |
| Stainless steel  | Die-cast aluminum                               | 2               |               |
| Stainless steel  | Stainless steel precision casting <sup>5)</sup> | 3               |               |
| <b>Version</b>   |   |                 |               |
| • Standard version, German plate inscription, setting for pressure unit: bar   |   | 1               |               |
| • International version, English plate inscription, setting for pressure unit: bar                                       |   | 2               |               |
| • Chinese version, English plate inscription, setting for pressure unit: Pascal  |   | 3               |               |
| All versions include DVD with compact operating instructions in various EU languages.                                    |   |                 |               |
| <b>Explosion protection</b>  |   |                 |               |
| • None   |   |                 | A             |
| • With ATEX, Type of protection:   |   |                 |               |
| - "Intrinsic safety (Ex ia)"   |   |                 | B             |
| - "Explosion-proof (Ex d)" <sup>6)</sup>   |   |                 | D             |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" <sup>7)</sup>  |   |                 | P             |
| - "Ex nA/ic (Zone 2)" <sup>8)</sup>  |   |                 | E             |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)" <sup>7)9)</sup> |   |                 | R             |
| • FM + CSA intrinsic safe (is) (pending) <sup>10)</sup>  |   |                 | F             |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>7)9)10)</sup>   |   |                 | S             |
| • With FM + CSA, Type of protection:   |   |                 |               |
| - "Intrinsic safety and explosion-proof (is + xp)" <sup>6)10)</sup> , max PN 360   |   |                 | NC            |
| <b>Electrical connection/cable entry</b>   |   |                 |               |
| • Screwed gland M20x1.5  |   |                 | B             |
| • Screwed gland 1/2-14 NPT   |   |                 | C             |
| • Han 7D device plug (plastic housing) incl. mating connector <sup>11) 12)</sup>   |   |                 | D             |
| • M12 device plugs (stainless steel) <sup>13)14)</sup>   |   |                 | F             |

## Transmitters for applications with advanced requirements (Advanced)

**for differential pressure and flow**

Scope of delivery: Pressure transmitter as ordered (Instruction Manual is extra ordering item)

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| Selection and Ordering data  |                                   | Article No.          | Order Code                                 |
|--|-----------------------------------|----------------------|--|
| <b>Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>  |                                   |                      |  |
| <b>SITRANS P410 with PROFIBUS PA (PA)</b>  |                                   | 7MF4534-             | -Z C41                                     |
| <b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>  |                                   | 7MF4535-             | -Z C41                                     |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |                                   |                      |  |
| <b>Measuring cell filling</b>  | <b>Measuring cell cleaning</b>    |                      |  |
| Silicone oil   | normal                            | 1                    |  |
| <b>Nominal measuring range</b>   |                                   |                      |  |
| 600 mbar   | (240 inH <sub>2</sub> O)          | E                    |  |
| 1600 mbar  | (642 inH <sub>2</sub> O)          | F                    |  |
| 5 bar  | (2000 inH <sub>2</sub> O)         | G                    |  |
| 30 bar   | (435 psi)                         | H                    |  |
| <b>Wetted parts materials</b>  |                                   |                      |  |
| (stainless steel process flanges)  |                                   |                      |  |
| Seal diaphragm   | Parts of measuring cell           |                      |  |
| Stainless steel  | Stainless steel                   | A                    |  |
| Hastelloy  | Stainless steel                   | B                    |  |
| Version for diaphragm seal <sup>1) 2) 3) 4)</sup>  |                                   | Y                    |  |
| <b>Process connection</b>  |                                   |                      |  |
| Female thread 1/4-18 NPT with flange connection  |                                   |                      |  |
| <ul style="list-style-type: none"> <li>Sealing screw opposite process connection <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M12 to DIN 19213 (only for replacement requirement)</li> </ul> </li> <li>Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing). <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M12 to DIN 19213 (only for replacement requirement)</li> </ul> </li> </ul>   |                                   | 3<br>1<br><br>7<br>5 |  |
| <b>Non-wetted parts materials</b>  |                                   |                      |  |
| Process flange screws  | Electronics housing               |                      |  |
| Stainless steel  | Die-cast aluminum                 | 2                    |  |
| Stainless steel  | Stainless steel precision casting | 3                    |  |
| <b>Version</b>   |                                   |                      |  |
| <ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul> All versions include DVD with compact operating instructions in various EU languages.  |                                   | 1<br>2<br>3          |  |
| <b>Explosion protection</b>  |                                   |                      |  |
| <ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>5)</sup></li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>6)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>7)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"<sup>6)8)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is) (pending)<sup>9)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>6)7)9)</sup></li> <li>With FM + CSA, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic safety and explosion-proof (is + xp)"<sup>6)9)</sup>, max PN 360</li> </ul> </li> </ul> |                                   |                      | A<br>B<br>D<br>P<br>E<br>R<br>F<br>S<br>NC |
| <b>Electrical connection/cable entry</b>   |                                   |                      |  |
| <ul style="list-style-type: none"> <li>Screwed gland M20 x 1.5</li> <li>Screwed gland 1/2-14 NPT</li> <li>M12 device plugs (stainless steel) <sup>10) 11)</sup></li> </ul>   |                                   |                      | B<br>C<br>F                                |

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

### for differential pressure and flow

| Selection and Ordering data   | Article No.   | Order Code    |
|---|---|---------------|
| <b>Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b> |   |               |
| <b>SITRANS P410 with PROFIBUS PA (PA)</b>   | <b>7MF4534-</b>  -  | <b>-Z C41</b> |
| <b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>                                       | <b>7MF4535-</b>  -  | <b>-Z C41</b> |
| <b>Display</b>  |   |               |
| • Without (display hidden)  |   | <b>0</b>      |
| • Without visible display (display concealed, setting: bar)                             |   | <b>1</b>      |
| • With visible display (setting: bar)   |   | <b>6</b>      |
| • With customer-specific display (setting as specified, Order code "Y21" required)      |   | <b>7</b>      |

Included in delivery of the device:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- <sup>1)</sup> When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- <sup>2)</sup> If the acceptance test certificate 3.1. is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- <sup>3)</sup> The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453-...Y...-.... and 7MF4900-1....-B
- <sup>4)</sup> The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- <sup>5)</sup> Without cable gland, with blanking plug.
- <sup>6)</sup> With enclosed cable gland Ex ia and blanking plug.
- <sup>7)</sup> Configurations with Han and M12 device plugs are only available in Ex ic.
- <sup>8)</sup> Only in connection with IP66.
- <sup>9)</sup> Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- <sup>10)</sup> Only in connection with Ex approval A, B, E or F.
- <sup>11)</sup> M12 delivered without cable socket



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

for differential pressure and flow

1

| Selection and Ordering data   |     | Order code |      |    |    |
|---|-----|------------|------|----|----|
| Further designs   |     |            | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code.   |     |            |      |    |    |
| <b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>                   |     |            |      |    |    |
| • Steel   | A01 | ✓          | ✓    | ✓  | ✓  |
| • Stainless steel 304   | A02 | ✓          | ✓    | ✓  | ✓  |
| • Stainless steel 316L  | A03 | ✓          | ✓    | ✓  | ✓  |
| <b>O-rings for process flanges</b><br>(instead of FPM (Viton))  |     |            |      |    |    |
| • PTFE (Teflon)   | A20 | ✓          | ✓    | ✓  | ✓  |
| • FEP (with silicone core, approved for food)   | A21 | ✓          | ✓    | ✓  | ✓  |
| • FFP (Kalrez, compound 4079), for measured medium temperatures -15 ... 100 °C (5 ... 212 °F)   | A22 | ✓          | ✓    | ✓  | ✓  |
| • NBR (Buna N)  | A23 | ✓          | ✓    | ✓  | ✓  |
| <b>Device plugs<sup>1)</sup></b>  |     |            |      |    |    |
| • Han 7D (metal)  | A30 | ✓          |      |    |    |
| • Han 8D (instead of Han 7D)  | A31 | ✓          |      |    |    |
| • Angled  | A32 | ✓          |      |    |    |
| • Han 8D (metal)  | A33 | ✓          |      |    |    |
| <b>Sealing screws (2 units)</b><br>1/4-18 NPT, with valve in mat. of process flanges  |     | A40        | ✓    | ✓  | ✓  |
| <b>Cable sockets for M12 device plugs (metal (CuZn))</b>  |     | A50        | ✓    | ✓  | ✓  |
| <b>Rating plate inscription</b> (instead of German)   |     |            |      |    |    |
| • English   | B11 | ✓          | ✓    | ✓  | ✓  |
| • French  | B12 | ✓          | ✓    | ✓  | ✓  |
| • Spanish   | B13 | ✓          | ✓    | ✓  | ✓  |
| • Italian   | B14 | ✓          | ✓    | ✓  | ✓  |
| <b>English rating plate</b><br>Pressure units in inH <sub>2</sub> O and/or psi  |     | B21        | ✓    | ✓  | ✓  |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>  |     | C11        | ✓    | ✓  | ✓  |
| <b>Inspection certificate</b><br>Acc. to EN 10204-3.1   |     | C12        | ✓    | ✓  | ✓  |
| <b>Factory certificate</b><br>Acc. to EN 10204-2.2  |     | C14        | ✓    | ✓  | ✓  |
| <b>Functional safety (SIL2)</b> (pending)<br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration             |     | C20        | ✓    |    |    |
| <b>Functional safety (SIL2/3)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration                     |     | C23        | ✓    |    |    |
| <b>Increased measuring accuracy</b><br>(mandatory specification for SITRANS P410)   |     | C41        | ✓    | ✓  | ✓  |
| <b>PED for Russia with initial calibration mark</b>   |     | C99        | ✓    | ✓  | ✓  |
| <b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>  |     | D05        | ✓    |    |    |
| <b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b><br>(only together with seal diaphragm made of Hastelloy and stainless steel) |     | D07        | ✓    | ✓  | ✓  |
| <b>Degree of protection IP66/IP68</b><br>(only for M20 x 1.5 and 1/2-14 NPT)  |     | D12        | ✓    | ✓  | ✓  |
| <b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>   |     | D59        | ✓    | ✓  | ✓  |
| <b>TAG plate empty (no inscription)</b>   |     | D61        | ✓    | ✓  | ✓  |

| Selection and Ordering data  |     | Order code        |      |    |    |
|--|-----|-------------------|------|----|----|
| Further designs  |     |                   | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code.  |     |                   |      |    |    |
| <b>Use in or on zone 1D/2D<sup>2)</sup></b><br>(only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)         |     | E01               | ✓    | ✓  | ✓  |
| <b>Dual seal</b>   |     | E24               | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-B..)   |     | E55 <sup>3)</sup> | ✓    | ✓  | ✓  |
| <b>Ex prot. "Explosion-proof" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-D..)   |     | E56 <sup>3)</sup> | ✓    | ✓  | ✓  |
| <b>Explosion-proof "Zone 2" to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-E..)   |     | E57 <sup>3)</sup> | ✓    | ✓  | ✓  |
| <b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b><br>(only for transmitter 7MF4...-.....-R..)   |     | E58 <sup>3)</sup> | ✓    | ✓  | ✓  |
| <b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b><br>(pending)<br>(only for transmitter 7MF4...-.....-[B, D]..-Z + E11) |     | E70 <sup>3)</sup> | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia according to EAC Ex (Russia)</b>  |     | E80               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex d according to EAC Ex (Russia)</b>   |     | E81               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>  |     | E82               | ✓    | ✓  | ✓  |
| <b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>  |     | E83               | ✓    | ✓  | ✓  |
| <b>Two coats of lacquer on casing and cover (PU on epoxy)</b>  |     | G10               | ✓    | ✓  | ✓  |
| <b>Interchanging of process connection side</b>  |     | H01               | ✓    | ✓  | ✓  |
| <b>Vent on side for gas measurements</b>   |     | H02               | ✓    | ✓  | ✓  |
| <b>Stainless steel process flanges for vertical differential pressure lines</b>  |     | H03               | ✓    | ✓  | ✓  |
| <b>Transient protector 6 kV (lightning protection)</b>   |     | J01               | ✓    | ✓  | ✓  |
| <b>Chambered graphite gasket for process flange</b>  |     | J02               | ✓    | ✓  | ✓  |
| <b>Chambered PTFE graphite gasket</b>  |     | J03               | ✓    | ✓  | ✓  |
| <b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>  |     | J05               | ✓    | ✓  | ✓  |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>4)</sup></b>                                     |     | J08               | ✓    | ✓  | ✓  |
| <b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>4)</sup></b>                                      |     | J09               | ✓    | ✓  | ✓  |
| <b>Marine approvals</b>  |     |                   |      |    |    |
| • Det Norske Veritas Germanischer Lloyd (DNV-GL)   | S10 | ✓                 | ✓    | ✓  | ✓  |
| • Lloyds Register (LR)   | S11 | ✓                 | ✓    | ✓  | ✓  |
| • French marine classification society Bureau Veritas (BV)   | S12 | ✓                 | ✓    | ✓  | ✓  |
| • American Bureau of Shipping (ABS)  | S14 | ✓                 | ✓    | ✓  | ✓  |
| • Russian Maritime Register (RMR)  | S16 | ✓                 | ✓    | ✓  | ✓  |
| • Korean Register of Shipping (KR)   | S17 | ✓                 | ✓    | ✓  | ✓  |

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/280).

<sup>1)</sup> Han device plug IP65

<sup>2)</sup> Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

<sup>3)</sup> When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

<sup>4)</sup> Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

# Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)  
SITRANS P410

## for differential pressure and flow

1

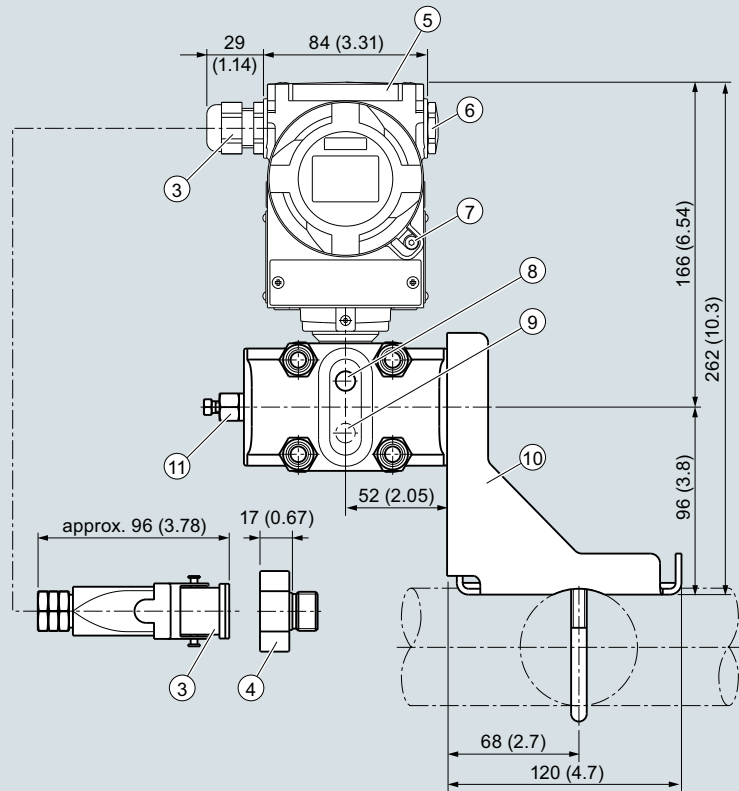
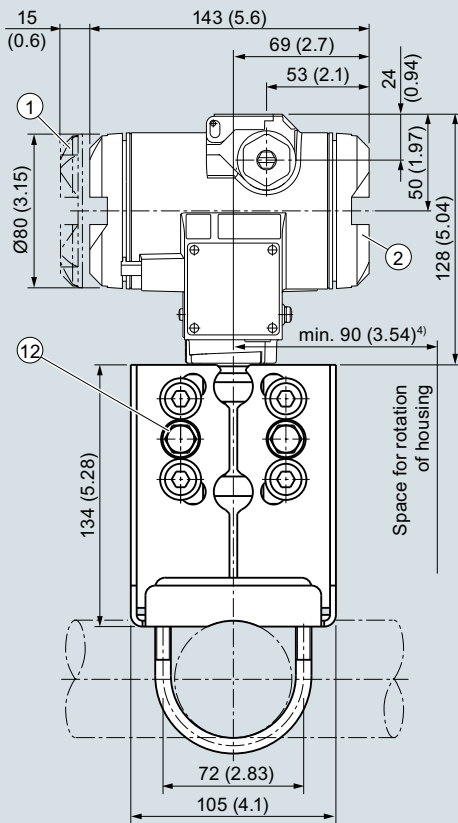
| Selection and Ordering data   | Order code             |      |                 |    |
|---|------------------------|------|-----------------|----|
| Additional data   |                        | HART | PA              | FF |
| Please add "-Z" to Article No. and specify Order code(s) and plain text.  |                        |      |                 |    |
| <b>Measuring range to be set</b><br>Specify in plain text:<br>• in the case of linear characteristic curve (max. 5 characters):<br>Y01: ... up to ... mbar, bar, kPa, MPa, psi<br>• in the case of square rooted characteristic (max. 5 characters):<br>Y02: ... up to ... mbar, bar, kPa, MPa, psi   | Y01                    | ✓    | ✓ <sup>1)</sup> |    |
|   | Y02                    | ✓    |                 |    |
| <b>Stainless steel tag plate and entry in device variable (measuring point description)</b><br>Max. 16 characters, specify in plain text:<br>Y15: .....   | Y15                    | ✓    | ✓               | ✓  |
| <b>Measuring point text (entry in device variable)</b><br>Max. 27 char., specify in plain text: Y16: .....  | Y16                    | ✓    | ✓               | ✓  |
| <b>Entry of HART address (TAG)</b><br>Max. 8 char., specify in plain text: Y17: .....   | Y17                    | ✓    |                 |    |
| <b>Setting of pressure indication in pressure units</b><br>Specify in plain text (standard setting: bar):<br>Y21: mbar, bar, kPa, MPa, psi, ...<br>Note:<br>The following pressure units can be selected:<br>bar, mbar, mm H <sub>2</sub> O <sup>*)</sup> , inH <sub>2</sub> O <sup>*)</sup> , ftH <sub>2</sub> O <sup>*)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or %<br>*) ref. temperature 20 °C | Y21                    | ✓    | ✓               | ✓  |
| <b>Setting of pressure indication in non-pressure units<sup>2)</sup></b><br>Specify in plain text:<br>Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)   | Y22 +<br>Y01 or<br>Y02 | ✓    |                 |    |
| <b>Preset bus address</b><br>possible between 1 and 126<br>Specify in plain text: Y25: .....  | Y25                    |      | ✓               | ✓  |
| <b>Damping adjustment in seconds (0 ... 100 s)</b>  | Y30                    | ✓    | ✓               | ✓  |

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset.

✓ = available

<sup>1)</sup> Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.

**Dimensional drawings**

- ① Electronic side, digital display (longer overall length for cover with window)<sup>1)</sup>
- ② Terminal side<sup>1)</sup>
- ③ Electrical connection: Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/8D device plug<sup>2) 3)</sup>
- ④ Harting adapter
- ⑤ Protective cover over keys

- ⑥ Blanking plug
- ⑦ Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- ⑧ Lateral venting for liquid measurement (Standard)
- ⑨ Lateral venting for gas measurement (suffix H02)
- ⑩ Mounting bracket (option)
- ⑪ Sealing screw with valve (option)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

<sup>1)</sup> Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [IS + XP]"

<sup>4)</sup> 92 mm (3.62 inch) for minimum distance to permit rotation with indicator

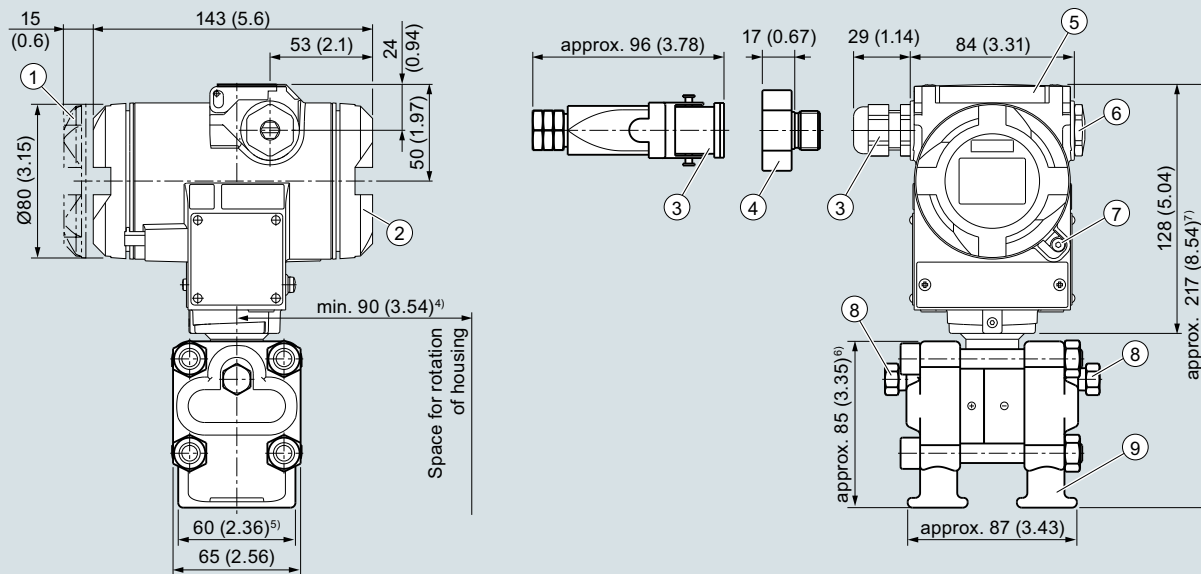
SITRANS P410 pressure transmitters for differential pressure and flow, dimensions in mm (inch)

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow



<sup>1)</sup> Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [IS + XP]"

<sup>4)</sup> 92 mm (3.6 inch) for minimum distance to permit rotation with indicator

<sup>5)</sup> 74 mm (2.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

<sup>6)</sup> 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

<sup>7)</sup> 219 mm (8.62 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

SITRANS P410 pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines, optional "H03", dimensional drawing, dimensions in mm (inch)



SITRANS P410 pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P410

#### Accessories/Spare parts

1

| Selection and Ordering data   | Article No.   | Selection and Ordering data   | Article No.  |
|---|---|---|--|
| <b>Accessories/Spare parts</b>  |   | <b>Mounting screws</b>  |  |
| <b>Mounting bracket and fastening parts</b><br>for pressure transmitters<br>SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF403-.....-..C.)   |   | For measuring point label, grounding and connection terminals or for display (50 units)   | <b>7MF4997-1CD</b>   |
| <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>  | <b>7MF4997-1AB</b><br><b>7MF4997-1AH</b><br><b>7MF4997-1AP</b>  | <b>Sealing screws</b><br>(1 set = 2 units) for process flange   | <b>7MF4997-1CG</b><br><b>7MF4997-1CH</b>   |
| <b>Mounting bracket and fastening parts</b><br>for pressure transmitters<br>SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF403-.....-..A., ..B., ..D. and ..F.)                              |   | <ul style="list-style-type: none"> <li>made of stainless steel</li> <li>made of Hastelloy</li> </ul>  |  |
| <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>  | <b>7MF4997-1AC</b><br><b>7MF4997-1AJ</b><br><b>7MF4997-1AQ</b>  | <b>Sealing screws with vent valve</b><br>Complete (1 set = 2 units)   | <b>7MF4997-1CP</b><br><b>7MF4997-1CQ</b>   |
| <b>Mounting and fastening brackets</b><br>For differential pressure transmitters with flange thread M10<br>SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF443-....)                          |   | <ul style="list-style-type: none"> <li>made of stainless steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>                                    |  |
| <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>  | <b>7MF4997-1AD</b><br><b>7MF4997-1AK</b><br><b>7MF4997-1AR</b>  | <b>Connection board</b>   | <b>7MF4997-1DN</b><br><b>7MF4997-1DP</b>   |
| <b>Mounting and fastening brackets</b><br>For differential pressure transmitters with flange thread M12<br>SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF453-....)                          |   | <ul style="list-style-type: none"> <li>for SITRANS P410</li> <li>for SITRANS P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus</li> </ul>   |  |
| <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>  | <b>7MF4997-1AE</b><br><b>7MF4997-1AL</b><br><b>7MF4997-1AS</b>  | <b>O-rings for process flanges made of:</b>   | <b>7MF4997-2DA</b><br><b>7MF4997-2DB</b><br><b>7MF4997-2DC</b><br><b>7MF4997-2DD</b><br><b>7MF4997-2DE</b> |
| <b>Mounting and fastening brackets</b><br>For differential pressure transmitters with flange thread 7/16 -20 UNF<br>SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF443-.... and 7MF453-....) |   | <ul style="list-style-type: none"> <li>FPM (Viton)</li> <li>PTFE (Teflon)</li> <li>FEP (with silicone core, approved for food)</li> <li>FFPM (Kalrez, compound 4079)</li> <li>NBR (Buna N)</li> </ul> |  |
| <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>  | <b>7MF4997-1AF</b><br><b>7MF4997-1AM</b><br><b>7MF4997-1AT</b>  | <b>Sealing ring</b> for process connection  | <b>see "Fittings"</b>  |
| <b>Cover</b><br>Made of die-cast aluminum, including gasket, for SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus.<br>Compatible for Ex and non-Ex transmitters                                    |   |   |  |
| <ul style="list-style-type: none"> <li>without window</li> <li>with window</li> </ul>   | <b>7MF4997-1BB</b><br><b>7MF4997-1BE</b>                        |   |  |
| <b>Cover</b><br>Made of stainless steel, including gasket, or SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus.<br>Compatible for Ex and non-Ex transmitters                                       |   |   |  |
| <ul style="list-style-type: none"> <li>without window</li> <li>with window</li> </ul>   | <b>7MF4997-1BC</b><br><b>7MF4997-1BF</b><br><b>7MF4997-1BR</b>  |   |  |
| <b>Digital indicator</b><br>Including mounting material, for SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus  |   |   |  |
| <b>Measuring point label</b>  |   |   |  |
| <ul style="list-style-type: none"> <li>without inscription (5 units)</li> <li>Printed (1 unit)<br/>Data according to Y01 or Y02, Y15, Y16 and Y99 (see "Pressure transmitters")</li> </ul>  | <b>7MF4997-1CA</b><br><b>7MF4997-1CB-Z</b><br><b>Y..: .....</b> |   |  |

## Pressure Measurement

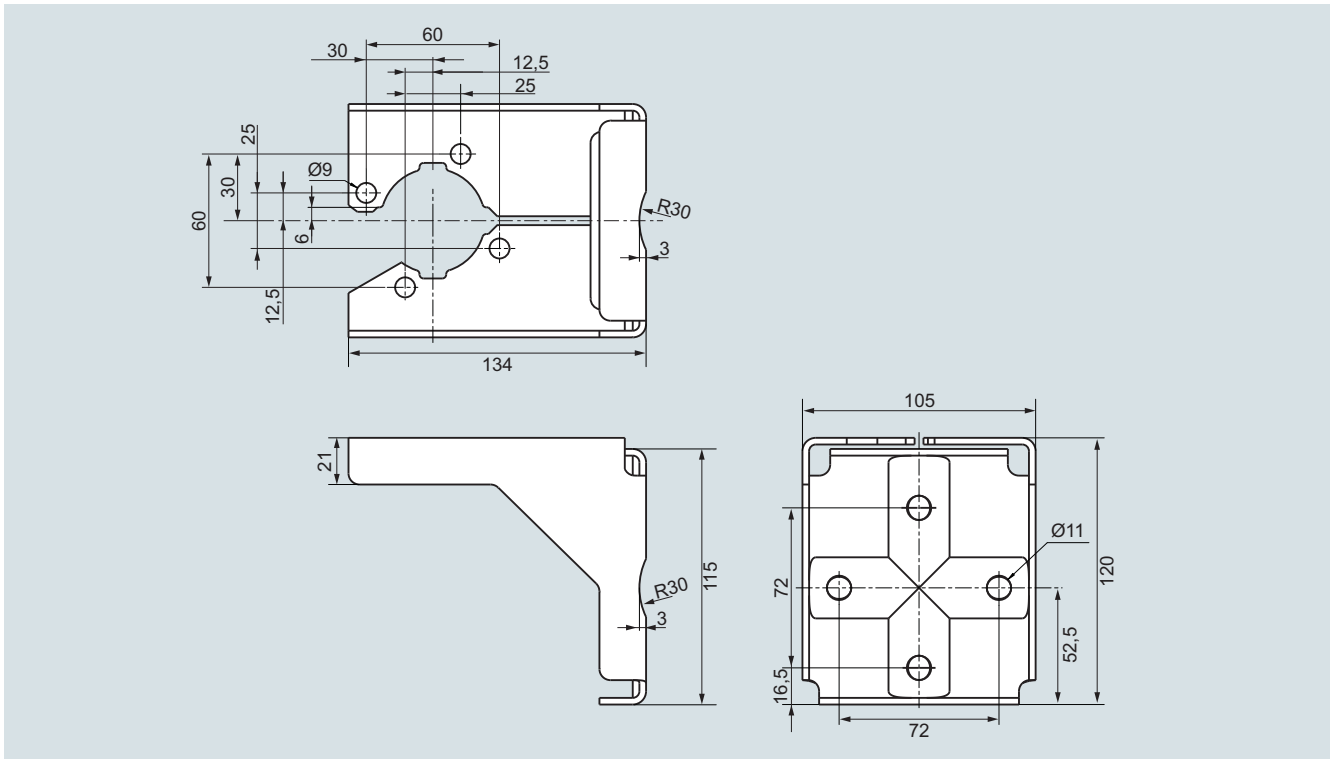
Transmitters for applications with advanced requirements (Advanced)

SITRANS P410

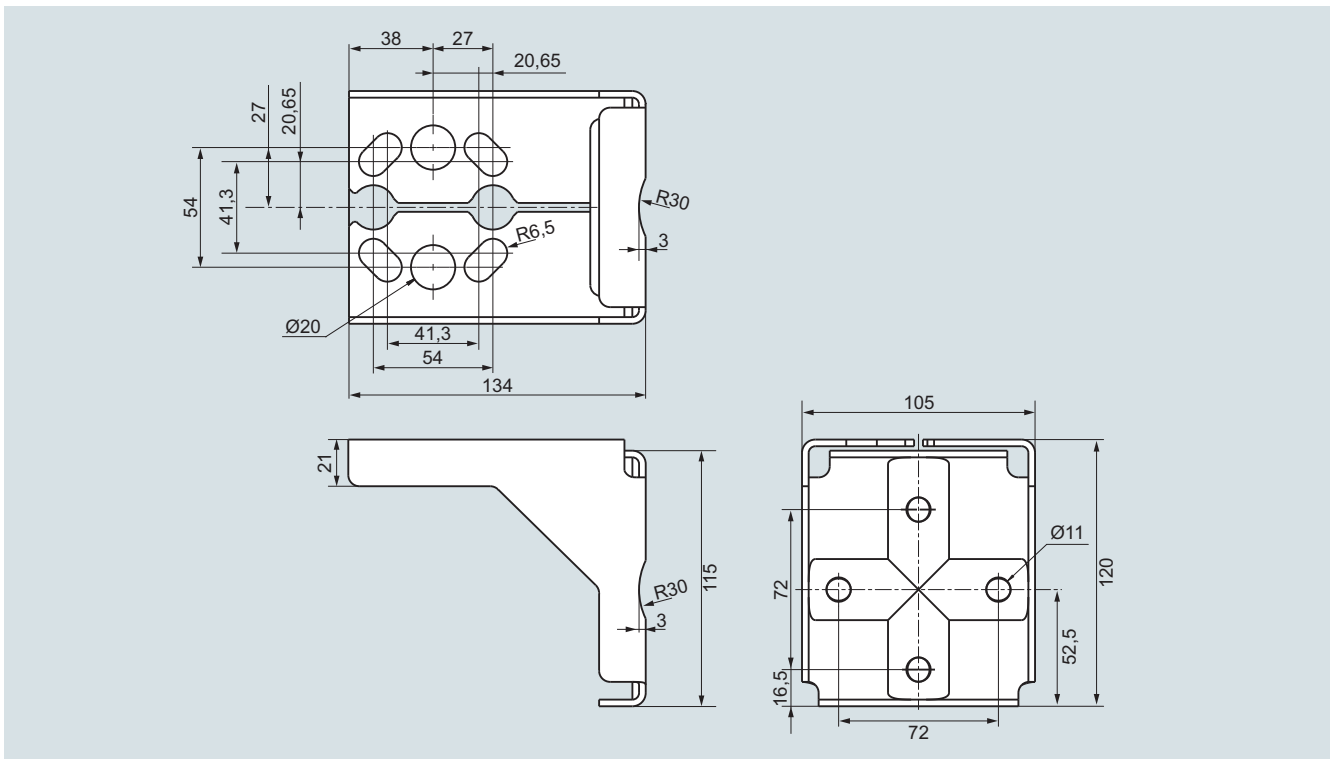
### Accessories/Spare parts

| Selection and Ordering data  | Article No.                              |
|--|--|
| <b>Documentation</b><br>The entire documentation is available for download free-of-charge in various languages at: <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a><br>Compact operating instructions SITRANS P DS III/P410<br>• English, German, Spanish, French, Italian, Dutch | <b>A5E03434626</b>                       |
| <b>Certificates (order only via SAP)</b><br>instead of Internet download<br>• hard copy (to order)<br>• on DVD (to order)  | <b>A5E03252406</b><br><b>A5E03252407</b> |
| <b>HART modem</b><br>with USB interface  | <b>7MF4997-1DB</b>                       |

Power supply units see Chap. 7 "Supplementary Components".

**Dimensional drawings**

Mounting bracket for SITRANS P410 gauge pressure-transmitters, dimensions in mm  
 mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



Mounting bracket for SITRANS P410 differential pressure transmitter, dimensions in mm  
 mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



## Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

### Technical description

#### Overview



SITRANS P500 pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and which fulfil the most stringent demands of accuracy, long-term stability, speed and lots more.

Extensive functionality allows you to set the pressure transmitter specifically to your own requirements. Despite their many settings options, local set-up is easy. A multi-lingual menu with clear text instructions guides you through the process. There are also help texts available.

The innovative EDD with integrated QuickStart assistance is also quick and easy to configure by computer using the HART protocol.

Extensive diagnostic functions, e.g. min/max pointer for pressure and temperature, or limit value indicator, make sure you always have the process under control. You can also display additional process values such as temperature or static pressure. The simultaneous display of mass, resulting from a volume, is also easy.

The SITRANS P500 pressure transmitters can be configured to measure:

- Differential pressure
- Level
- Volume
- Mass
- Volume flow
- Mass flow

#### Benefits

- High measuring accuracy
- Very fast response time
- Extremely good long-term stability
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions which can be used both on site as well as via HART.
- Optional separate replacement of measuring cell and electronics without recalibration.
- Extremely low conformity error values

- Infinitely adjustable spans of 1 mbar to 32 bar (0.0145 to 465 psi; 0.4 to 12860 inH<sub>2</sub>O)
- Extremely good total performance and conformity error values with no loss of performance up to a turndown of 10 guaranteed.
- Additional integrated sensor for static pressure
- Parameterization via on-site control keys or HART
- Short process flanges enable space-saving installation.

#### Application

The SITRANS P500 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes them suitable for locations with high electromagnetic emissions.

Pressure transmitters with ratings "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitter comes with a CE-declaration of conformity and fulfils the corresponding unified European directives (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

With newly designed measuring cell, it is possible to work with process temperatures of -40 to 125 °C (-40 to +257 °F) without having to use a remote seal.

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous fluids.

The pressure transmitter can be fully parameterized locally via the three operating keys and externally via HART.



**Pressure transmitters for differential pressure and flow**

- Measured variables:
  - Differential pressure
  - Small positive or negative pressure
  - Flow  $q \sim \sqrt{\Delta p}$  (together with a primary element (see Chapter "Flow Meters"))
- Span (freely adjustable)  
for SITRANS P500: 1 mbar to 32 bar (0.0145 to 465 psi; 0.4 to 12860 inH<sub>2</sub>O)

**Pressure transmitters for level**

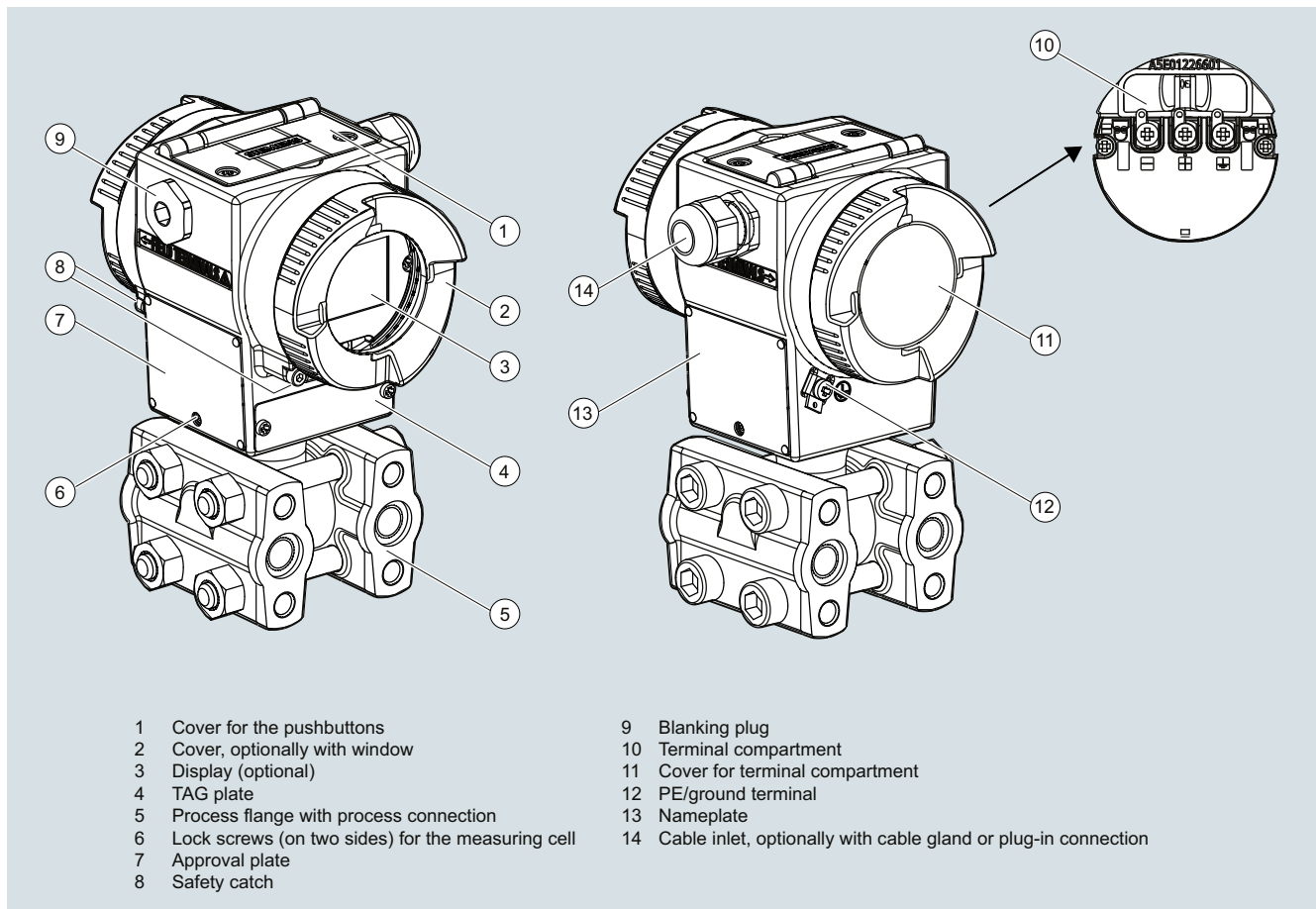
- Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.
- Span (freely adjustable)  
for SITRANS P500: 1.25 to 6250 mbar (0.5 to 2509 inH<sub>2</sub>O)

- Nominal diameter of the mounting flange
  - DN 50 / PN 40
  - DN 80 / PN 40
  - DN 100/ PN 16, PN 40
  - 2 inch/class 150, class 300
  - 3 inch/class 150, class 300
  - 4 inch/ class 150, class 300
  - customized special version

In the case of level measurements in open vessels, the low-pressure connection of the measuring cell remains open (measurement "compared to atmospheric").

In the case of measurements in closed vessels, the lower-pressure connection has to be connected to the vessel in order to compensate the static pressure.

The wetted parts are made from a variety of materials, depending on the degree of corrosion resistance required.

**Design****View of transmitter**

- The electronics housing is made of coated die-cast aluminum.
- The casing has round screwed covers front and back.
- Depending on the design the front cover is fitted with an inspection window. You can read off the measured value directly from the optional display through the window.
- The inlet to the terminal compartment is located either on the left or right side. The unused opening in each case is sealed by a blanking plug.
- The PE/ground terminal is on the back of the housing.
- Access to the terminal compartment for auxiliary power and shielding by unscrewing the cover.
- Beneath the electronic housing is the measuring cell with its process flanges at which the process connections are available. The modular design of the pressure transmitter lets you replace the measuring cell, electronics and connection board as required.
- On the top of the housing you can see the screwed cover of the three local pushbuttons of the transmitter.

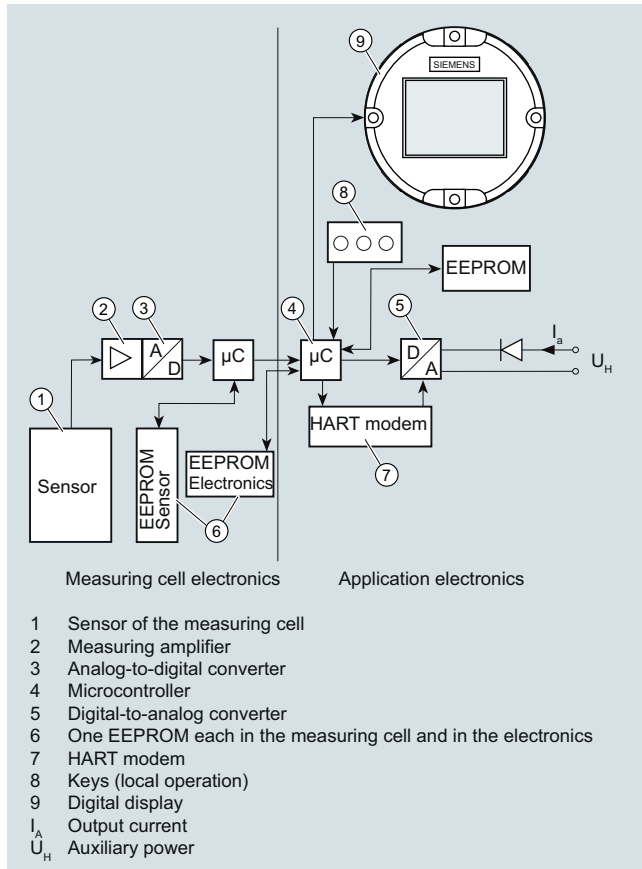
## Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

### Technical description

#### Function

##### Operation of electronics with HART communication



##### Function diagram of electronics

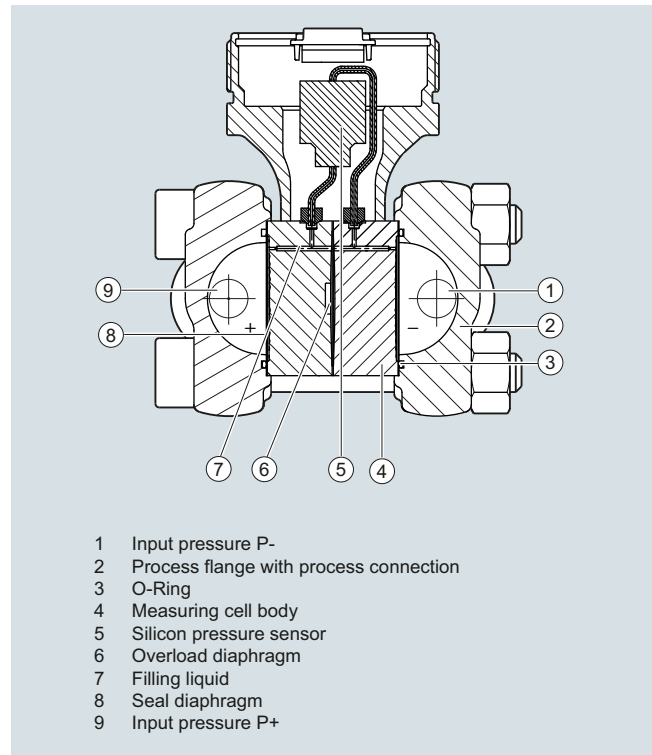
- The input pressure is converted into an electrical signal by the sensor.
- This signal is amplified by the measuring amplifier and digitalized in an analog-to-digital converter.
- The digital signal is analyzed in a microcontroller and corrected according to linearity and thermal characteristics.
- In a digital-to-analog converter it is then converted into the output current of 4 to 20 mA. When connected to supply lines, a diode circuit provides reverse polarity protection.
- The measuring cell-specific data, the electronic data and the parameterization data is held in two EEPROMs. One EEPROM is incorporated into the measuring cell electronics, the other is incorporated into the application electronics.

##### Operation

- The three local pushbuttons enable you both to navigate and carry out configuration and to visually track messages and process values, provided a display is available.
- If you have a device without a display, you can carry out zero adjustment using the three local pushbuttons. It is possible to retrofit a display at any time.
- You can also carry out settings by computer via a HART modem.

##### Mode of operation of the measuring cells

##### Measuring cell for differential pressure and flow



##### Measuring cell for differential pressure and flow, function diagram

- The differential pressure is transmitted via the seal diaphragm and the filling liquid to the silicon pressure sensor.
- If the measuring limits are exceeded, the overload diaphragm flexes until the seal diaphragm touches the body of the measuring cell. This protects the sensor module from overload.
- The differential pressure causes the measuring diaphragm of the silicon pressure sensor to flex.
- The displacement changes the resistance value of the 4 piezo resistors in the measuring diaphragm in a bridge circuit.
- The change in the resistance causes a bridge output voltage proportional to the input pressure.

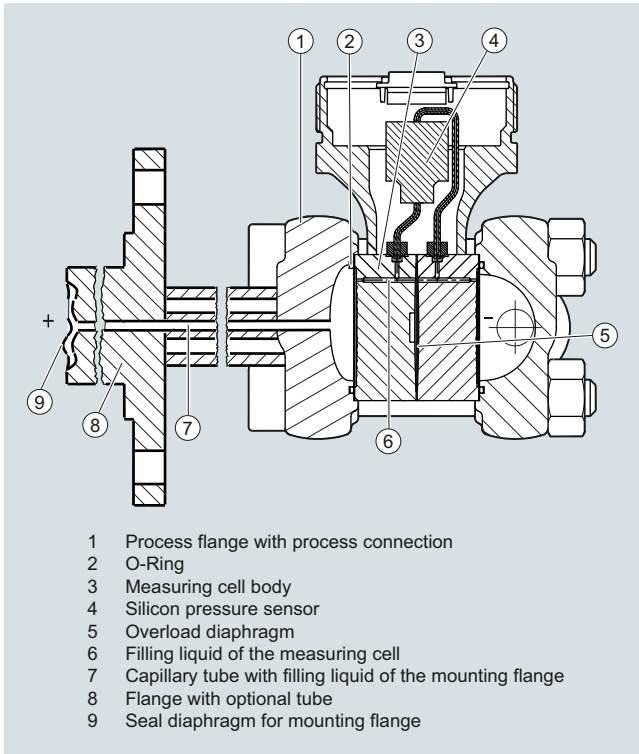
# Pressure Measurement

## Transmitters for applications with highest requirements (Premium)

### SITRANS P500

#### Technical description

#### Measuring cell for level



Measuring cell for level, function diagram

- The input pressure (hydrostatic pressure) acts hydraulically on the measuring cell via the seal diaphragm on the mounting flange.
- The differential pressure applied to the measuring cell is transmitted via the seal diaphragm and the filling liquid to the silicon pressure sensor.
- If the measuring limits are exceeded, the overload diaphragm flexes until the seal diaphragm touches the body of the measuring cell. This protects the sensor module from overload.
- The differential pressure causes the measuring diaphragm of the silicon pressure sensor to flex.
- The displacement changes the resistance value of the 4 piezo resistors in the measuring diaphragm in a bridge circuit.
- The change in the resistance causes a differential pressure proportional to the input pressure.

#### Configuration of SITRANS P500 HART

Depending on the version, there are a range of options for configuring the pressure transmitter and for setting or reading the parameters.

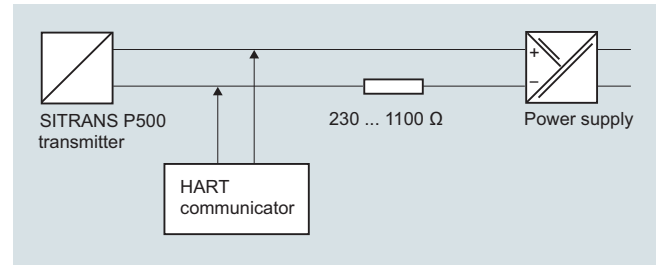
#### Configuration using the pushbuttons (local operation)

You can configure the transmitter in situ using the three keys provided a display is available. If you have no display, you can only carry out zero adjustment.

It is possible to retrofit a display. See accessories.

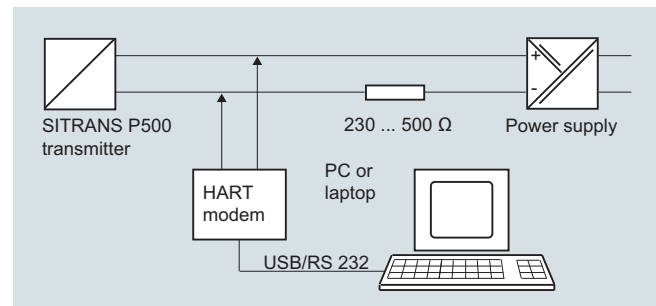
#### Configuration using HART

Parameterization using HART is carried out using a HART Communicator or a PC in conjunction with a HART modem.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

For configuring via PC a HART modem is used which connects the transmitter to the PC.

The signals needed for communication in conformity with the HART 6.0 protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

The necessary device files are available for download on the Internet.

#### SITRANS P500 configuration options

The transmission offers you full configuring options both via HART as well as in situ provided the optional display is available.

For simple parameterizing we also offer the easy to understand QuickStart function with guided commissioning.

#### SITRANS P500 diagnostic functions

- Maintenance timer
- Min/Max pointer (both resetable and non-resetable)
  - Pressure (incl. time and temperature stamp)
  - Static pressure (incl. time and temperature stamp)
  - Sensor temperature (incl. time stamp)
  - Electronic temperature (incl. time stamp)
- Limit monitor block
- Diagnostic warning
- Diagnostic alarm
- Simulation functions
- Display of trends and histograms
- Operating hours meter

## Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

### Technical description

Physical dimensions available for the SITRANS P500 HART display

| Physical variable                                  | Physical dimensions   |
|--|---|
| Pressure (setting can also be made in the factory) | Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O (4 °C), inH <sub>2</sub> O (4 °C), inH <sub>2</sub> O (20 °C), mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O (20 °C), inHg, mmHg, hPA  |
| Level  | m, cm, mm, ft, in   |
| Volume   | m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , gallon, Imp. gallon, bushel, barrel, barrel liquid, l; Norm (standard) l; Norm (standard) m <sup>3</sup> , Norm (standard) feet <sup>3</sup>   |
| Mass   | g, kg, t (metric), lb, Ston, Lton, oz   |
| Volume flow  | m <sup>3</sup> /d, m <sup>3</sup> /h, m <sup>3</sup> /s, l/min, l/s, ft <sup>3</sup> /d, ft <sup>3</sup> /min, ft <sup>3</sup> /s, US gallon/min, gallon/s, l/h, milL/d, gallon/d, gallon/h, milgallon/d, Imp.gallon/s, Imp.gallon/m, Imp.gallon/h, Imp.gallon/d, Norm (standard) m <sup>3</sup> /h, Norm (standard) l/h, Norm (standard) ft <sup>3</sup> /h, Norm (standard) ft <sup>3</sup> /m, barrel liquid/s, barrel liquid/m, barrel liquid/h |
| Mass flow  | t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/h, g/min, g/s, lb/d, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min  |
| Temperature  | K, °C, °F, °R   |
| Miscellaneous                                      | %, mA   |

# Pressure Measurement

## Transmitters for applications with highest requirements (Premium)

### SITRANS P500

for differential pressure and flow

1

#### Technical specifications

| Input                                      |   | Measuring accuracy   |   |
|--|---|--|---|
| Measured variable                          | Differential pressure and flow                          | Reference conditions (in accordance with IEC 60770-1)                      | <ul style="list-style-type: none"> <li>• Rising characteristic curve</li> <li>• Start of scale 0 bar</li> <li>• Stainless steel seal diaphragm</li> <li>• Measuring cell with silicone oil filling</li> <li>• Room temperature (25 °C (77 °F))</li> </ul> |
| Span (infinitely adjustable)               | Span (min. ... max.)                                    | All error information always refers to the set span.                       |   |
|  | Maximum operating pressure (static pressure)            | Error in measurement at limit setting incl. hysteresis and reproducibility |   |
|  | 1.00 ... 50 mbar (0.4 ... 20 inH <sub>2</sub> O)        | r: Span ratio  |   |
|  | 1.25 ... 250 mbar (0.5 ... 100 inH <sub>2</sub> O)      | (r: Span ratio (r = max. span / set span))                                 |   |
|  | 6.25 ... 1250 mbar (2.5 ... 502 inH <sub>2</sub> O)     | Linear characteristic  | r ≤ 10  |
|  | 31.25 ... 6250 mbar (12.54 ... 2509 inH <sub>2</sub> O) | • 50 mbar (20 inH <sub>2</sub> O)  | ≤ 0.06 %  |
|  | 0.16 ... 32 bar (2.33 ... 465 psi)                      | • 250 mbar (100 inH <sub>2</sub> O)  | ≤ 0.03 %  |
|  |   | 1250 mbar (502 inH <sub>2</sub> O)   |   |
|  |   | 6250 mbar (2509 inH <sub>2</sub> O)  |   |
|  |   | 32 bar (465 psi)   |   |
| Lower range limit                          | -100 % of max. span and/or 30 mbar a (0.44 psi a)       | Square-rooted characteristic   | r ≤ 10  |
| • Measuring cell with silicone oil filling |   | • Flow > 50 %  | r ≥ 10  |
| Upper range limit                          | 100 % of max. span                                      | - 50 mbar (20 inH <sub>2</sub> O)  | ≤ 0.06 %  |
| Start of scale                             | Between measuring limits (freely adjustable)            | - 250 mbar (100 inH <sub>2</sub> O)  | ≤ 0.03 %  |
|  |   | 1250 mbar (502 inH <sub>2</sub> O)   |   |
|  |   | 6250 mbar (2509 inH <sub>2</sub> O)  |   |
|  |   | 32 bar (465 psi)   |   |
|  |   | • Flow 25 % ... 50 %   | r ≤ 10  |
|  |   | - 50 mbar (20 inH <sub>2</sub> O)  | ≤ 0.12 %  |
|  |   | - 250 mbar (100 inH <sub>2</sub> O)  | ≤ 0.06 %  |
|  |   | 1250 mbar (502 inH <sub>2</sub> O)   |   |
|  |   | 6250 mbar (2509 inH <sub>2</sub> O)  |   |
|  |   | 32 bar (465 psi)   |   |
|  |   | Influence of ambient temperature per 28 °C (50 °F)                         |   |
|  |   | • 50 mbar (20 inH <sub>2</sub> O)  | ≤ (0.04 · r + 0.05) %   |
|  |   | • 250 mbar (100 inH <sub>2</sub> O)  | ≤ (0.025 · r + 0.014) %   |
|  |   | • 1250 mbar (502 inH <sub>2</sub> O)                                       | ≤ (0.006 · r + 0.03) %  |
|  |   | 6250 mbar (2509 inH <sub>2</sub> O)  |   |
|  |   | 32 bar (465 psi)   |   |
|  |   | Influence of static pressure   |   |
|  |   | • At the start of scale value (PKN)  |   |
|  |   | - 50 mbar (20 inH <sub>2</sub> O)  | ≤ (0.1 · r) % per 70 bar (1015 psi) correction via zero point correction  |
|  |   | - 250 mbar (100 inH <sub>2</sub> O)  | ≤ (0.035 · r) % per 70 bar (1015 psi) correction via zero point correction  |
|  |   | - 1250 mbar (502 inH <sub>2</sub> O)                                       | ≤ (0.007 · r) % per 70 bar (1015 psi) correction via zero point correction  |
|  |   | 6250 mbar (2509 inH <sub>2</sub> O)  |   |
|  |   | 32 bar (465 psi)   |   |
|  |   | • On the span (PKS)  |   |
|  |   | - 50 mbar (20 inH <sub>2</sub> O)  | ≤ 0.13 % per 70 bar (1015 psi)  |
|  |   | - 250 mbar (100 inH <sub>2</sub> O)  | ≤ 0.03 % per 70 bar (1015 psi)  |
|  |   | 1250 mbar (502 inH <sub>2</sub> O)   |   |
|  |   | 6250 mbar (2509 inH <sub>2</sub> O)  |   |
|  |   | 32 bar (465 psi)   |   |
|  |   | - 6250 mbar (2509 inH <sub>2</sub> O)                                      | ≤ 0.09 % per 70 bar (1015 psi)  |
|  |   | - 32 bar (465 psi)   | ≤ 0.05 % per 70 bar (1015 psi)  |

## Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

### for differential pressure and flow

|  |   |                 |   |   |
|--|---|-----------------|---|---|
| <b>Total Performance<sup>1)</sup></b>  |   |                 | <b>Design</b>                                 |   |
| • Linear characteristic  | $r \leq 5$  | $5 < r \leq 10$ | Weight (without options)                      | Approx. 3.3 kg (7.3 lb)   |
| - 50 mbar (20 inH <sub>2</sub> O)  | $\leq 0.27 \%$  | $\leq 0.46 \%$  | Material of parts in contact with the medium  |   |
| - 250 mbar (100 inH <sub>2</sub> O)  | $\leq 0.14 \%$  | $\leq 0.27 \%$  | • Seal diaphragm                              | Stainless steel, mat. no. 1.4404/316L, Hastelloy C276, Monel 400  |
| - 1250 mbar (502 inH <sub>2</sub> O)<br>6250 mbar (2509 inH <sub>2</sub> O)<br>32 bar (465 psi)                                      | $\leq 0.09 \%$  | $\leq 0.14 \%$  | • Process connection and sealing screw        | PN 160: stainless steel, mat.-No. 1.4404/316L   |
| Square rooted characteristic   |   |                 | • Sealing material in the process connections |   |
| • Flow > 50 %  | $r \leq 5$  | $5 < r \leq 10$ | - O-Ring                                      | • Standard:<br>Viton (FKM (FPM))  |
| - 50 mbar (20 inH <sub>2</sub> O)  | $\leq 0.27 \%$  | $\leq 0.46 \%$  |   | • Optional:<br>NBR<br>PTFE (virginal)<br>PTFE (glass fiber-reinforced)<br>FFPM (Kalrez) <sup>2)</sup><br>Graphite                                       |
| - 250 mbar (100 inH <sub>2</sub> O)  | $\leq 0.14 \%$  | $\leq 0.27 \%$  |   |   |
| - 1250 mbar (502 inH <sub>2</sub> O)<br>6250 mbar (2509 inH <sub>2</sub> O)<br>32 bar (465 psi)                                      | $\leq 0.09 \%$  | $\leq 0.14 \%$  |   |   |
| • Flow 25 % ... 50 %   | $r \leq 5$  | $5 < r \leq 10$ |   |   |
| - 50 mbar (20 inH <sub>2</sub> O)  | $\leq 0.54 \%$  | $\leq 0.92 \%$  | Material of parts not in contact with media   |   |
| - 250 mbar (100 inH <sub>2</sub> O)  | $\leq 0.28 \%$  | $\leq 0.54 \%$  | Die-cast aluminum housing                     | • Low copper die-cast aluminum<br>AC-AlSi12 (Fe) or AC-AlSi 10 Mg (Fe)<br>to DIN EN 1706  |
| - 1250 mbar (502 inH <sub>2</sub> O)<br>6250 mbar (2509 inH <sub>2</sub> O)<br>32 bar (465 psi)                                      | $\leq 0.18 \%$  | $\leq 0.28 \%$  |   | • Lacquer on polyurethane base, optional epoxy-based primer   |
| Step response time $T_{63}$ without electrical damping   |   |                 | Stainless steel precision cast housing        | • Stainless steel name plates<br>(mat. no. 1.4404/316L)   |
| • 50 mbar (20 inH <sub>2</sub> O)  | $\leq 140$ ms, contains a dead time of $\leq 45$ ms                           |                 | Process connection screws                     | Stainless steel, mat. no. 1.4404/316L   |
| • 250 mbar (100 inH <sub>2</sub> O)<br>1250 mbar (502 inH <sub>2</sub> O)<br>6250 mbar (2509 inH <sub>2</sub> O)<br>32 bar (465 psi) | $\leq 88$ ms, contains a dead time of $\leq 45$ ms                            |                 | Mounting bracket                              | Steel or stainless steel<br>mat. no. 1.4301   |
| Long-term stability  | $\leq (0.05 \cdot r) \%$ per 5 years<br>$\leq (0.08 \cdot r) \%$ per 10 years |                 | Measuring cell filling                        | Silicone oil  |
| Influence of power supply  | $\leq 0.005 \%$ /1 V  |                 | Process connection                            | 1/4-18 NPT female thread and flange connection with M10 to DIN 19213 or 7/16-20 UNF mounting thread to IEC 61518/DIN EN 61518                           |
| <b>Rated conditions</b>  |   |                 | Electrical connection                         | • Screw terminals<br>• Cable entry via the following screwed glands:<br>- M20 x 1.5<br>- 1/2-14 NPT<br>- Han 7D/Han 8D device plug<br>- M12 plug device |
| Mounting position  | Any   |                 |   |   |
| Ambient conditions   |   |                 | Displays and controls                         |   |
| • Ambient temperature<br>(Note: Observe the temperature class in areas subject to explosion hazard.)                                 |   |                 | Pushbuttons                                   | 3 for local programming directly on transmitter   |
| - Total device   | -40 ... +85 °C (-40 ... +185 °F)  |                 | Display                                       | • With or without integrated display<br>• Cover with or without window  |
| - Readable display   | -20 ... +85 °C (-4 ... +185 °F)   |                 |   |   |
| - Storage temperature  | -50 ... +90 °C (-58 ... +194 °F)  |                 |   |   |
| Climatic class   |   |                 |   |   |
| • Condensation   | Relative humidity 0 ... 100 %<br>(condensation permissible)                   |                 |   |   |
| Degree of protection<br>(to IEC 60529)   | IP66/IP 68 and NEMA 4X (with corresponding cable gland)                       |                 |   |   |
| Electromagnetic Compatibility  |   |                 |   |   |
| • Emitted interference and interference immunity   | Acc. to IEC 61326 and NAMUR NE 21   |                 |   |   |
| Permissible pressures  | According to 2014/68/EU pressure equipment directive                          |                 |   |   |
| Temperature of medium  |   |                 |   |   |
| • Measuring cell with silicone oil filling   | -40 ... +125 °C (-40 ... +257 °F)   |                 |   |   |
|  |   |                 | <b>Auxiliary power supply</b>                 |   |
|  |   |                 | Terminal voltage on transmitter               | • DC 10.6 ... 44 V<br>• With intrinsically-safe operation<br>DC 10.6 ... 30 V   |



# Pressure Measurement

## Transmitters for applications with highest requirements (Premium)

### SITRANS P500

for differential pressure and flow

1

**Certificates and approvals**

Classification according to PED 2014/68/EU

- PN 160 (MAWP 2320 psi)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Explosion protection

Explosion protection for Europe (to ATEX)

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature
- Connection

PTB 09 ATEX 2004 X

Ex II 1/2 G Ex ia/ib IIC T4

-40 ... +85 °C (-40 ... +185 °F)

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ;  
 $R_i = 300 \Omega$   
 $L_i = 400 \mu\text{H}$

- Effective internal inductance:
- Effective inner capacitance:

 $C_i = 6 \text{ nF}$ 

- Explosion-proof "d"

- Marking
- Permissible ambient temperature

BVS 09 ATEX E 027

Ex II 1/2 G Ex db ia IIC T4/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F)

temperature class T4;

-40 ... +60 °C (-40 ... +140 °F)

temperature class T6

- Connection

To circuits with values:  
 $U_m = \text{DC } 10.5 \dots 45 \text{ V}$

- Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

BVS 09 ATEX E 027

Ex II 1 D Ex ta ia IIC T120°C Da

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$   
 $L_i = 400 \mu\text{H}$

- Effective internal inductance:
- Effective inner capacitance:

 $C_i = 6 \text{ nF}$ 

- Dust explosion protection for zone 21/22

- Marking
- Connection

Ex II 2D Ex tb ia IIC T120°C Db

To circuits with values:  
 $U_m = 10.5 \dots 45 \text{ V DC}$ ;  $P_{\text{max}} = 1.2 \text{ W}$

- Type of protection "n" (zone 2)

- Marking

PTB 09 ATEX 2004 X

Ex II 3 G Ex nA II T4/T6

Ex II 2/3 G Ex ib/nL IIC T4/T6

Ex II 2/3 G Ex ib/ic IIC T4/T6

- "nA" connection
- "nL, ic" connection
- Effective internal inductance:
- Effective inner capacitance:

 $U_m = 45 \text{ V DC}$  $U_i = 45 \text{ V}$  $L_i = 400 \mu\text{H}$  $C_i = 6 \text{ nF}$ Explosion protection for USA (to FM)

Certificate of Compliance

- Identification (XP/DIP) or (IS)

No. 3033013

XP CL I, DIV 1, GP ABCDEFG T4 / T6  
 DIP CL II, III, DIV1, GP EFG T4/T6  
 IS CL I, II, III, DIV1, GP ABCDEFG T4

CL I, Zone 0, AEx ia IIC T4

CL I, Zone 1, AEx ib IIC T4

- Permissible Ambient Temperature

 $T_a = \text{T4: } -40 \dots +85 \text{ °C}$ 

(-40 ... +185 °F)

 $T_a = \text{T6: } -40 \dots +60 \text{ °C}$ 

(-40 ... +140 °F)

- Entity parameters

According to "control drawing":

A5E02189134N

 $U_m = 30 \text{ V}$ ,  $I_m = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ ,  $L_i = 400 \mu\text{H}$ ,  $C_i = 6 \text{ nF}$ 

- Marking (NI/NO)

NI CL I, DIV 2, GP ABCD T4/T6

NI CL I, Zone 2, GP IIC T4/T6

S CL II, III, GPFG T4/T6

NI CL I, DIV 2, GP ABCD T4/T6, NIFW

NI CL I, Zone 2, GP IIC T4/T6, NIFW

NI CLII, III, DIV 2, GP FG T4/T6, NIFW

- Permissible Ambient Temperature

 $T_a = \text{T4: } -40 \dots +85 \text{ °C}$ 

(-40 ... +185 °F)

 $T_a = \text{T6: } -40 \dots +60 \text{ °C}$ 

(-40 ... +140 °F)

- (NI/S) parameters

According to "control drawing":

A5E02189134N

 $U_m = 45 \text{ V}$ ,  $L_i = 400 \mu\text{H}$ ,  $C_i = 6 \text{ nF}$ ,Explosion protection for Canada (to cCSA US)

Certificate of Compliance

- Marking (XP/DIP)

No. 2280963

CL I, DIV 1, GP ABCD T4 /T6;

CL II, DIV 1, GP EFG T4/T6

- Permissible ambient temperature

 $T_a = \text{T4: } -40 \dots +85 \text{ °C (-40 ... +185 °F)}$  $T_a = \text{T6: } -40 \dots +60 \text{ °C (-40 ... +140 °F)}$ 

- Entity parameters

According to "control drawing":

A5E02189134N

 $U_m = 45 \text{ V}$ 

- Marking (ia/ib)

CL I, Ex ia/Ex ib IIC, T4

CL II, III, Ex ia/Ex ib, GP EFG, T4

CL I, AEx ia/AEx ib IIC, T4

CL II, III, AEx ia/ AEx ib, GP EFG, T4

- Permissible ambient temperature

 $T_a = \text{T4: } -40 \dots +85 \text{ °C}$ 

(-40 ... +185 °F)

- Entity parameters

 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$ ,  $L_i = 400 \mu\text{H}$ ,  $C_i = 6 \text{ nF}$ 

- Marking (NI/n)

CL I, DIV 2, GP ABCD T4/T6

CL II, III, DIV 2, GP FG T4/T6

Ex nA IIC T4/T6

AEx nA IIC T4/T6

Ex nL IIC T4/T6

AEx nL IIC T4/T6

- Permissible ambient temperature

 $T_a = \text{T4: } -40 \dots +85 \text{ °C (-40 ... +185 °F)}$  $T_a = \text{T6: } -40 \dots +60 \text{ °C (-40 ... +140 °F)}$ 

- NI/nA parameters

According to "control drawing":

A5E02189134N

 $U_m = 45 \text{ V}$ 

- nL parameters

According to "control drawing":

A5E02189134N

 $U_i = 45 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $L_i = 400 \mu\text{H}$ , $C_i = 6 \text{ nF}$

## Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

### for differential pressure and flow

#### Explosion protection for China (acc. to NEPSI)

|  |   |
|--|---|
| • Intrinsic safety "i"                     | GYJ111111X  |
| - Marking                                  | Ex ia/ib IIB/IIC T4   |
| - Perm. ambient temperature                | 40 ... +85 °C (-40 ... +185 °F)   |
| - Connection                               | To certified intrinsically-safe circuits with maximum values:<br>$U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ |
| - Effective internal inductance            | $L_i = 400 \text{ mH}$  |
| - Effective inner capacitance              | $C_i = 6 \text{ nF}$  |
| • Explosion-proof "d"                      | GYJ111112   |
| - Marking                                  | Ex dia IIC T4/T6  |
| - Permissible ambient temperature          | -40 ... +85 °C (-40 ... +185 °F)<br>temperature class T4;<br>-40 ... +60 °C (-40 ... +140 °F)<br>temperature class T6                 |
| - Connection                               | To circuits with values:<br>$U_m = \text{DC } 10.5 \dots 45 \text{ V}$  |
| • Dust explosion protection for zone 21/22 | GYJ111112   |
| - Marking                                  | DIP A21 TA,T120 °C IP68 D21   |
| - Connection                               | To circuits with values:<br>$U_m = \text{DC } 10.5 \dots 45 \text{ V}$  |
| • Type of protection "n" (zone 2)          | GYJ111111X  |
| - Marking                                  | Ex nL IIB/IIC T4/T6<br>Ex nA II T4/T6   |
| - Connection                               | $U_i = 45 \text{ V DC}$   |
| - Effective internal inductance            | $L_i = 400 \text{ mH}$  |
| - Effective inner capacitance              | $C_i = 6 \text{ nF}$  |

1) The total performance includes the errors caused by temperature effects, static pressure effects and conformity error, including hysteresis and repeatability.

2) Not in combination with span "G".

#### HART communication

|                         |   |
|-------------------------|---|
| Load with connection of |   |
| • HART communicator     | $R_B = 230 \dots 1100 \Omega$   |
| • HART modem            | $R_B = 230 \dots 500 \Omega$  |
| Cable                   | 2 wire shielded: $\leq 3.0 \text{ km}$<br>(1.86 miles),<br>multiwire shielded: $\leq 1.5 \text{ km}$<br>(0.93 miles)                        |
| Protocol                | HART Version 6.0  |
| PC/laptop requirements  | IBM compatible, RAM > 32 MByte,<br>hard disk > 70 MByte, depending<br>on modem type: RS 232-interface<br>or USB connection,<br>VGA graphics |
| Software for computer   | SIMATIC PDM 6.0   |



# Pressure Measurement

## Transmitters for applications with highest requirements (Premium)

### SITRANS P500

for differential pressure and flow

1

**Selection and Ordering data**

Article No.

**Pressure transmitters for differential pressure and flow, SITRANS P500 HART, PN 160 (MAWP 2320 psi)**

7MF54- - - - 0

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

**Enclosure****Thread for cable gland<sup>1)</sup>**

Die-cast aluminum, dual compartment

M20x1.5

Die-cast aluminum, dual compartment

½-14 NPT

Stainless steel precision casting, two-chamber housing

M20x1.5

Stainless steel precision casting, two-chamber housing

½-14 NPT

**Output**

4 ... 20 mA, HART

**Measuring cell filling**

Silicone oil

**Measuring cell cleaning**

normal

**Measuring span**1.00 ... 50 mbar (0.4 ... 20 inH<sub>2</sub>O)1.25 ... 250 mbar (0.5 ... 100.4 inH<sub>2</sub>O)6.25 ... 1250 mbar (2.5 ... 502 inH<sub>2</sub>O)31.25 ... 6250 mbar (12.54 ... 2509 inH<sub>2</sub>O)

0.16 ... 32 bar (2.33 ... 465 psi)

**Wetted parts materials**

Seal diaphragm

Process flange

Stainless steel 1.4404/316L

Stainless steel 1.4404/316L

Hastelloy C276<sup>2)</sup>

Stainless steel 1.4404/316L

Monel 400<sup>2)</sup>

Stainless steel 1.4404/316L

Hastelloy

Hastelloy

**Process connection**

Female thread ¼-18 NPT

## • Sealing screw opposite process connection

- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518
- Mounting thread M10 to DIN 19213

• Vent on side of process flange<sup>3)</sup>

- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518
- Mounting thread M10 to DIN 19213

<sup>1)</sup> Cable glands must be ordered separately from "Further designs" (add "-Z" to Article No. and specify order code).

<sup>2)</sup> Not together with Measuring span "C".

<sup>2)</sup> Not in conjunction with remote seals (option V00).

# Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

for differential pressure and flow

1

## Selection and Ordering data

Order code

### Further designs

Add "-Z" to Article No. and specify Order code.

### Attachments

|   |            |
|---|------------|
| Mounting bracket made of steel                | <b>A01</b> |
| Mounting bracket made of stainless steel 304  | <b>A02</b> |
| Mounting bracket made of stainless steel 316L | <b>A03</b> |

### Display

(Standard: no display, cover closed)

|                                 |            |
|---------------------------------|------------|
| With display and blanking cover | <b>A10</b> |
| With display and glass cover    | <b>A11</b> |

### Special casing / cover version

|   |            |
|---|------------|
| Two coats of lacquer on casing, cover (PU on epoxy) | <b>A20</b> |
|---|------------|

### Electrical connection and cable entry

(Standard: no cable gland, only dust protection caps)

|  |            |
|--|------------|
| Cable gland made of plastic (IP66/68) <sup>4)</sup>  | <b>A50</b> |
| Cable glands made of metal (IP66/68)   | <b>A51</b> |
| Cable glands made of stainless steel (IP66/68)   | <b>A52</b> |
| M12 device plug without cable socket (IP66/67) <sup>4)</sup>   | <b>A60</b> |
| M12 device plug complete with cable socket (IP66/67) <sup>4)</sup>                                   | <b>A61</b> |
| Han 7D device plug, plastic, straight (with cable socket) (IP65) <sup>4)</sup>                       | <b>A71</b> |
| Han 7D device plug, plastic, angled (with cable socket) (IP65) <sup>4)</sup>                         | <b>A72</b> |
| Han 7D device plug, metal enclosure, straight (with cable socket) (IP65) <sup>4)</sup>               | <b>A73</b> |
| Han 7D device plug, metal enclosure, angled (with cable socket) (IP65) <sup>4)</sup>                 | <b>A74</b> |
| Han 8D device plug, plastic, straight (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>         | <b>A75</b> |
| Han 8D device plug, plastic, angled (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>           | <b>A76</b> |
| Han 8D device plug, metal enclosure, straight (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup> | <b>A77</b> |
| Han 8D device plug, metal enclosure, angled (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>   | <b>A78</b> |
| PG 13.5 adapters <sup>4)</sup>   | <b>A82</b> |

### Language for labels, quick-start guide, menu language default<sup>9)</sup>

(instead of English as standard)

|  |            |
|--|------------|
| German                                       | <b>B10</b> |
| French                                       | <b>B12</b> |
| Spanish                                      | <b>B13</b> |
| Italian                                      | <b>B14</b> |
| Chinese                                      | <b>B15</b> |
| Russian                                      | <b>B16</b> |
| Japanese                                     | <b>B17</b> |
| English with units psi/inH <sub>2</sub> O/°F | <b>B21</b> |

### Special version: Supplementary menu languages

(Standard: English, German, French, Spanish, Italian)

|   |            |
|---|------------|
| Asia language package (in addition: Chinese, Japanese, Russian) | <b>B80</b> |
|---|------------|

### Certificates

(available online for downloading)<sup>1)</sup>

|   |            |
|---|------------|
| Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2 <sup>2)</sup> | <b>C11</b> |
| Acceptance test certificate according to EN 10204-3.1 <sup>3)</sup>                                       | <b>C12</b> |
| Acceptance certificate (EN 10204-3.1); PMI test of parts in contact with medium                           | <b>C15</b> |

### Functional Safety (SIL2)

Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration

**C20**

## Selection and Ordering data

Order code

### Further designs

Add "-Z" to Article No. and specify Order code.

### Degree of protection approvals: Ex ia/ib (intrinsic safety)

|   |            |
|---|------------|
| Ex ia/ib protection (ATEX) (T4)             | <b>E00</b> |
| Ex IS protection (FM) (T4)                  | <b>E01</b> |
| Ex IS protection (cCSA <sub>US</sub> ) (T4) | <b>E02</b> |
| Ex ia/ib protection (NEPSI) (T4)            | <b>E06</b> |

### Degree of protection approvals: Ex d (flameproof)

|  |            |
|--|------------|
| Ex d explosion-proof (ATEX)(T4/T6)                         | <b>E20</b> |
| Ex XP explosion-proof and DIP (FM)(T4/T6)                  | <b>E21</b> |
| Ex XP explosion-proof and DIP (cCSA <sub>US</sub> )(T4/T6) | <b>E22</b> |
| Ex d explosion-proof (NEPSI)(T4/T6)                        | <b>E26</b> |

### Degree of protection approvals: n/Nl

|  |            |
|--|------------|
| Zone 2 (nA, nL, ic) (ATEX) (T4/T6)                     | <b>E40</b> |
| Div2 NI, Div2 NI-field wiring (FM) (T4/T6)             | <b>E41</b> |
| Zone 2 (nA, nL), Div2 NI (cCSA <sub>US</sub> ) (T4/T6) | <b>E42</b> |
| Zone 2 (nA, nL) (NEPSI) (T4/T6)                        | <b>E46</b> |

### Degree of protection approvals: Dust Zone 20/21/22

|  |            |
|--|------------|
| Use in Zone 21/22 (Ex tD) (ATEX) Ex tb     | <b>E60</b> |
| Use in Zone 20/21/22 (Ex iaD) (ATEX) Ex ta | <b>E61</b> |
| Use in Zone 21/22 (Ex DIP) (NEPSI)         | <b>E66</b> |

### Degree of protection approvals: Combinations

|   |            |
|---|------------|
| IS protection and XP and DIP (FM)                     | <b>E71</b> |
| IS protection and XP and DIP (cCSA <sub>US</sub> )    | <b>E72</b> |
| IS protection and XP and DIP (FM/cCSA <sub>US</sub> ) | <b>E73</b> |

### Supplementary approvals/degree of protection

|  |            |
|--|------------|
| Ex-protection Ex ia according to EAC Ex (Russia) | <b>E80</b> |
| Ex-protection Ex d according to EAC Ex (Russia)  | <b>E81</b> |
| Dual Seal approval <sup>5)</sup>                 | <b>E85</b> |
| Export approval Korea                            | <b>E86</b> |

### Special process connection versions (diff. pressure)

|  |            |
|--|------------|
| Side vents for gas measurements <sup>9)</sup>        | <b>L32</b> |
| Swap process connection: high-pressure side at front | <b>L33</b> |

### Mosquito protection

|                              |            |
|------------------------------|------------|
| 4 pcs. for 1/4-18 NPT thread | <b>L36</b> |
|------------------------------|------------|

### Process flanges, O-rings, special material Standard: Viton (FKM (FPM))

|  |            |
|--|------------|
| Process conn. sealing rings made of PTFE (Teflon), virginal                    | <b>L60</b> |
| Process connection sealing rings made of PTFE (Teflon), glass fiber-reinforced | <b>L61</b> |
| Process connection sealing rings made of FFPM (Kalrez) <sup>10)</sup>          | <b>L62</b> |
| Process connection sealing rings made of NBR                                   | <b>L63</b> |
| Process connection sealing rings made of graphite                              | <b>L64</b> |

### Drain/Vent valve (1 set = 2 units)

|   |            |
|---|------------|
| 2 ventilation valves 1/4- 18 NPT, in material of process flanges) | <b>L80</b> |
|---|------------|

### Remote seals

|  |            |
|--|------------|
| Transmitters with connection of remote seal <sup>6)</sup><br>(For premounted valve manifolds see page 1/349) | <b>V00</b> |
|--|------------|

<sup>1)</sup> Enclosed in print or as DVD: see page 1/347.

<sup>2)</sup> When also ordering the quality inspection certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

<sup>3)</sup> When also ordering the acceptance test certificate according to EN 10204-3.1 for transmitters with mounted diaphragm seals: Order this certificate as well in addition to the respective remote seals.

<sup>4)</sup> Not together with types of protection "Explosion-proof", "Ex nA" and "Intrinsic safety and explosion-proof"

<sup>5)</sup> Only in conjunction with FM and/or cCSA<sub>US</sub>

<sup>6)</sup> Please select a remote seal separately. Also refer to the information under footnote 2). Remote seals see page 1/422.

<sup>7)</sup> The Han 8D device plug is identical with the former Han 8U version.

<sup>8)</sup> For option B15, B16 and B17 the menu language default is english. Otherwise the Option B80 (Asia language package) is necessary.

<sup>9)</sup> Only in conjunction with process connection "Vent on side".

<sup>10)</sup> Not together with Measuring span "G".

# Pressure Measurement

## Transmitters for applications with highest requirements (Premium)

### SITRANS P500

for differential pressure and flow

1

| Selection and Ordering data  | Order code              |
|--|-------------------------|
| <b>Additional data</b><br>Please add <b>"-Z"</b> to Article No. and specify Order code(s) and plain text.  |                         |
| <b>Measuring range to be set</b><br>Specify in plain text:   |                         |
| <ul style="list-style-type: none"> <li>In the case of linear characteristic curve (max. 5 characters):<br/>Y01: ... up to ... mbar, bar, kPa, MPa, psi</li> </ul>  | <b>Y01</b>              |
| <ul style="list-style-type: none"> <li>In the case of square rooted characteristic (max. 5 characters):<br/>Y02: ... up to ... mbar, bar, kPa, MPa, psi</li> </ul>   | <b>Y02</b>              |
| <b>Measuring point number and measuring point identifier (only standard ASCII character set)</b><br>Specify in plain text:   |                         |
| Measuring point number (TAG No.), max. 16 characters<br>Y15: .....   | <b>Y15</b>              |
| Measuring point text (max. 27 char.)<br>Y16: .....   | <b>Y16</b>              |
| Entry of HART address (TAG), max. 32 characters<br>Y17: .....  | <b>Y17</b>              |
| <b>Setting of pressure indication in pressure units</b>  | <b>Y21</b>              |
| Specify in plain text (standard setting: mbar)<br>Y21: bar, kPa, MPa, psi, ...<br><br>Note: The following pressure units are selectable:<br>bar, mbar, mm H <sub>2</sub> O*, in H <sub>2</sub> O*, ftH <sub>2</sub> O*, mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM, % or mA<br>*) Reference temperature 20 °C |                         |
| <b>Setting of pressure indication in non-pressure units<sup>1)</sup></b><br>Specify in plain text:   | <b>Y22 + Y01 or Y02</b> |
| Y22: ... up to ... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)   |                         |
| <b>Customer-specific settings</b>  |                         |
| Damping setting (range: 0 ... 100 s)<br>(Standard setting: 2 s)  | <b>Y30</b>              |

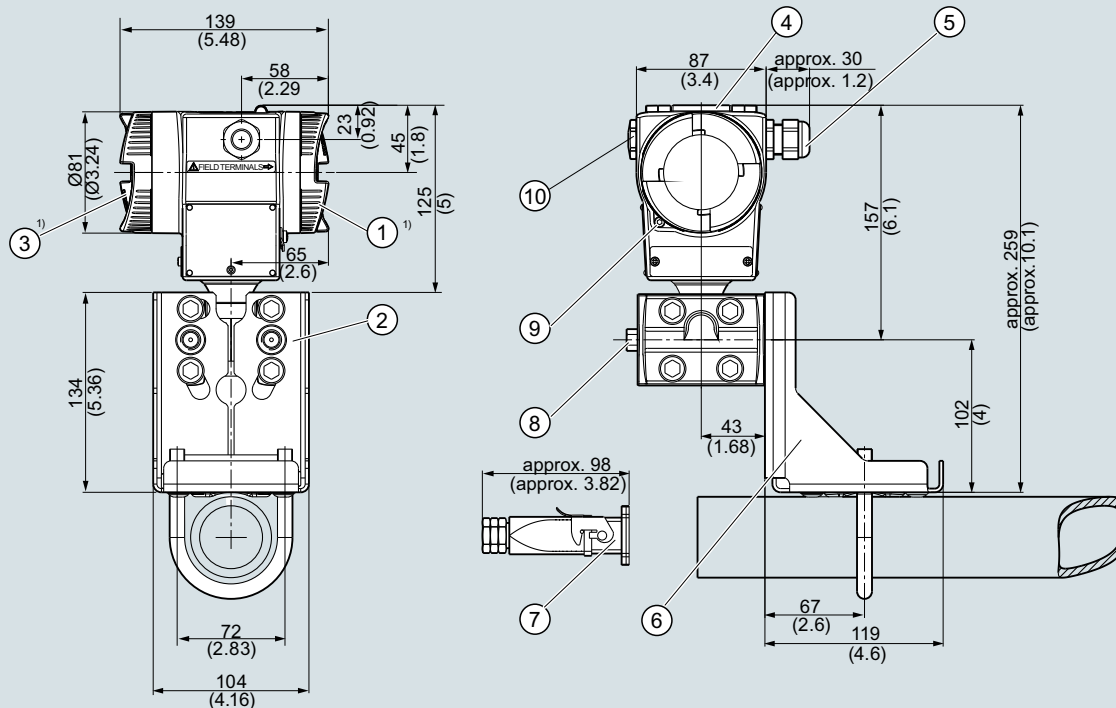
<sup>1)</sup> Preset values can only be changed over SIMATIC PDM.

## Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

for differential pressure and flow

### Dimensional drawings



- 1 Terminal side
- 2 Process connection: 1/4-18 NPT (EN 61518)
- 3 Electronics side, digital display
- 4 Protective cover for the pushbuttons
- 5 Cable entry:
  - Screwed gland M20 x 1.5<sup>3)</sup>
  - Screwed gland 1/2-14 NPT
  - Han 7D/8D device plug<sup>2)3)</sup>
  - M12 device plug
- 6 Mounting bracket (optional)

- 7 Electrical connection:
  - Han 7D/Han 8D device plug/socket<sup>2)3)</sup>
- 8 Vent valve (optional)
- 9 Safety catch
- 10 Blanking plug

<sup>1)</sup> Allow approx. 20 mm (0.79 inch) additional thread length

<sup>2)</sup> Not with type of protection "Explosion-proof"

<sup>3)</sup> Not with type of protection "FM + cCSA<sub>US</sub> [IS + XP]"

SITRANS P pressure transmitter for differential pressure and flow, P500 series, measurements in mm (inch)

# Pressure Measurement

## Transmitters for applications with highest requirements (Premium)

### SITRANS P500

for level

1

#### Technical specifications

| Input  |   |                            | Long-term stability   |  |
|--|---|----------------------------|---|--|
| Measured variable  | Level   |                            | ≤ (0.05 · r) % per 5 years  |  |
| Span (infinitely adjustable)   | Span (min. ... max.)  | Maximum operating pressure | ≤ (0.08 · r) % per 10 years   |  |
|  | 1.25 ... 250 mbar<br>(0.5 ... 100 inH <sub>2</sub> O)   | See "Mounting flange"      | Influence of ambient temperature per 28 °C (50 °F) <sup>1)</sup>  |  |
|  | 6.25 ... 1250 mbar<br>(2.5 ... 500 inH <sub>2</sub> O)  |                            | • 250 mbar (100 inH <sub>2</sub> O) ≤ (0.025 · r + 0.014) %   |  |
|  | 31.25 ... 6250 mbar<br>(12.54 ... 2509 inH <sub>2</sub> O)  |                            | • 1250 mbar (502 inH <sub>2</sub> O)<br>6250 mbar (2509 inH <sub>2</sub> O) ≤ (0.006 · r + 0.03) %  |  |
| Lower range limit  |   |                            | Influence of static pressure  |  |
| • Measuring cell with silicone oil filling   | -100 % of max. span or 500 mbar a (7.25 psi a) vacuum resistance<br>Also available as vacuum-resistant remote seal: 30 mbar a (0.44 psi a)                                      |                            | • At the start of scale value (PKN) <sup>1) 2)</sup>  |  |
| Upper range limit  | 100% of max. span   |                            | - 250 mbar (100 inH <sub>2</sub> O) ≤ (0.035 · r) % je 70 bar (1015 psi) correction via zero point correction   |  |
| Start of scale   | Between measuring limits (freely adjustable)  |                            | - 1250 mbar (502 inH <sub>2</sub> O)<br>6250 mbar (2509 inH <sub>2</sub> O) ≤ (0.007 · r) % je 70 bar (1015 psi) correction via zero point correction |  |
|  |   |                            | • On the span (PKS) <sup>1)</sup>   |  |
|  |   |                            | - 250 mbar (100 inH <sub>2</sub> O)<br>1250 mbar (502 inH <sub>2</sub> O) ≤ 0.03 % je 70 bar (1015 psi)   |  |
|  |   |                            | - 6250 mbar (2509 inH <sub>2</sub> O) ≤ 0.09 % je 70 bar (1015 psi)   |  |
|  |   |                            | Influence of power supply ≤ 0.005 %/1 V   |  |
| Output   |   |                            | Rated conditions  |  |
| Output current signal  | 4 ... 20 mA   |                            | Mounting position   |  |
| • Lower current limit (freely adjustable)  | 3.55 mA, factory setting 3.8 mA   |                            | Ambient conditions  |  |
| • Upper current limit (freely adjustable)  | 23 mA, factory setting 20.5 mA  |                            | • Ambient temperature (Note: Observe the temperature class in areas subject to explosion hazard.)   |  |
| • Ripple (without HART communication)  | I <sub>pp</sub> ≤ 0.4 of max. output current  |                            | - total device -40 ... +85 °C (-40 ... +185 °F)   |  |
| • adjustable damping   | 0... 100 s in steps of 0.1 s, factory setting 2 s   |                            | - Readable display -20 ... +85 °C (-4 ... +185 °F)  |  |
| • current transmitter  | 3.55 ... 23 mA  |                            | - Storage temperature -50 ... +90 °C (-58 ... +194 °F)  |  |
| • Failure signal   | Adjustable within limits:<br>• Lower: 3.55 ... 3.7 mA (factory setting 3.6 mA)<br>• Upper: 21.0 ... 23 mA (factory setting 22.8 mA)   |                            | Climatic class  |  |
|  |   |                            | • Condensation  |  |
|  |   |                            | Degree of protection to IEC 60529   |  |
|  |   |                            | Electromagnetic Compatibility   |  |
|  |   |                            | • Emitted interference and interference immunity  |  |
|  |   |                            | Permissible pressures   |  |
|  |   |                            | Medium temperature of high-pressure side  |  |
|  |   |                            | • Measuring cell with silicone oil filling  |  |
|  |   |                            | - p <sub>abs</sub> ≥ 1 bar -40 ... +175 <sup>3)</sup> °C (-40 ... +347 <sup>3)</sup> °F)  |  |
|  |   |                            | - p <sub>abs</sub> < 1 bar -40 ... +80 °C (-40 ... +176 °F)   |  |
| Measuring accuracy   |   |                            | Design  |  |
| Reference conditions (in accordance with IEC 60770-1)  | • Rising characteristic curve<br>• Start of scale 0 bar<br>• Stainless steel seal diaphragm<br>• Measuring cell with silicone oil filling<br>• Room temperature (25 °C (77 °F)) |                            | Weight  |  |
| All error information always refers to the set span.   |   |                            | • To EN (pressure transmitter with mounting flange, without tube) approx. 9.8 ... 11.8 kg (21.6... 26.0 (lb))   |  |
| Error in measurement at limit setting incl. hysteresis and reproducibility                                       |   |                            | • To ASME (pressure transmitter with mounting flange, without tube) approx. 9.8 ... 16.8 kg (21.6 ... 37.0 lb)  |  |
| r: Span ratio (r = max. span / set span)   |   |                            |   |  |
| Linear characteristic  | r ≤ 10  | r ≥ 10                     |   |  |
| • 250 mbar (100 inH <sub>2</sub> O)<br>1250 mbar (502 inH <sub>2</sub> O)<br>6250 mbar (2509 inH <sub>2</sub> O) | ≤ 0.03 %  | ≤ (0.003 · r) %            |   |  |

# Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

## for level

|  |   |  |   |
|--|---|--|---|
| Material of wetted parts at the high-pressure side |   | <b>Auxiliary power supply</b>                    |   |
| • Seal diaphragm of mounting flange                | Stainless steel 1.4404/316L, Hastelloy C276, mat. no. 2.4819, Monel 400, mat. no. 2.4360, Tantal, PFA auf Edelstahl 1.4404/316L, PTFE auf Edelstahl 1.4404/316L   | Terminal voltage on transmitter                  | <ul style="list-style-type: none"> <li>• DC 10.6 ... 44 V</li> <li>• With intrinsically-safe operation DC 10.6 ... 30 V</li> </ul>                        |
| • Sealing face                                     | Smooth to EN 1092-1, Form B1 and/or ASME B16.5 RF 125 ... 250 AA for stainless steel 316L, EN 1092-1 Form B2 and/or ASME B16.5 RF SF in the case of other materials   | <b>Certificates and approvals</b>                |   |
| • Sealing material in the process connection       |   | Classification according to PED 2014/68/EU       |   |
| - O-Ring   | <ul style="list-style-type: none"> <li>• Standard: Viton (FKM (FPM))</li> <li>• Optional: NBR, PTFE (virginal), PTFE (glas fiber-reinforced), FPM (Kalrez), Graphite</li> </ul>   | • PN 160 (MAWP 2320 psi)                         | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)                |
| - For vacuum application of mounting flange        | Copper  | Explosion protection                             |   |
| Material of wetted parts at the low-pressure side  |   | <u>Explosion protection for Europe (to ATEX)</u> |   |
| • Seal diaphragm                                   | Stainless steel, mat. no. 1.4404/316L, Hastelloy C276, Monel 400  | • Intrinsic safety "i"                           | PTB 09 ATEX 2004 X  |
| • Process connection and sealing screw             | • Stainless steel, mat. no. 1.4404/316L   | - Marking  | Ex II 1/2 G Ex ia/ib IIC T4   |
| • Sealing material in the process connection       | <ul style="list-style-type: none"> <li>• Standard: Viton (FKM (FPM))</li> <li>• Optional: NBR, PTFE (virginal), PTFE (glas fiber-reinforced), FPM (Kalrez), Graphite</li> </ul>   | - Permissible ambient temperature                | -40 ... +85 °C (-40 ... +185 °F)  |
| - O-Ring   |   | - Connection                                     | To certified intrinsically-safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ ; $R_i = 300 \Omega$ |
| Material of parts not in contact with media        |   | - Effective internal inductance:                 | $L_i = 400 \mu\text{H}$   |
| Die-cast aluminum housing                          | <ul style="list-style-type: none"> <li>• Low copper die-cast aluminum AC-AlSi12 (Fe) or AC-AlSi 10 Mg (Fe) to DIN EN 1706</li> <li>• Lacquer on polyurethane base, optional epoxy-based primer</li> <li>• Stainless steel serial plate</li> </ul>                                 | - Effective inner capacitance:                   | $C_i = 6 \text{ nF}$  |
| Stainless steel precision cast housing             | Stainless steel, mat. no. 1.4404/316L   | • Explosion-proof "d"                            | BVS 09 ATEX E 027   |
| Process connection screws                          | Stainless steel   | - Marking  | Ex II 1/2 G Ex db ia IIC T4/T6 Ga/Gb  |
| Measuring cell filling                             | Silicone oil  | - Permissible ambient temperature                | -40 ... +85 °C (-40 ... +185 °F)<br>temperature class T4;<br>-40 ... +60 °C (-40 ... +140 °F)<br>temperature class T6                                     |
| • Liquid mounting flange                           | Silicone oil or other material  | - Connection                                     | To circuits with values:<br>$U_m = \text{DC } 10.5 \dots 45 \text{ V}$  |
| Process connection                                 |   | • Dust explosion protection for zone 20          | BVS 09 ATEX E 027   |
| • High-pressure side                               | Flange to EN and ASME   | - Marking  | Ex II 1 D Ex ta ia IIC T120°C Da  |
| • Low-pressure side                                | 1/4-18 NPT female thread and flange connection with M10 to DIN 19213 or 7/16-20 UNF mounting thread to IEC 61518/DIN EN 61518   | - Permissible ambient temperature                | -40 ... +85 °C (-40 ... +185 °F)  |
| Electrical connection                              | <ul style="list-style-type: none"> <li>• Screw terminals</li> <li>• Cable entry via the following screwed glands: <ul style="list-style-type: none"> <li>- M20 x 1.5</li> <li>- 1/2-14 NPT</li> <li>- Han 7D/Han 8D device plug</li> <li>- M12 plug device</li> </ul> </li> </ul> | - Max. surface temperature                       | 120 °C (248 °F)   |
| Displays and controls                              |   | - Connection                                     | To certified intrinsically-safe circuits with peak values:<br>$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$ |
| Push buttons                                       | 3; for operation directly on the device   | - Effective internal inductance:                 | $L_i = 400 \mu\text{H}$   |
| Display  | <ul style="list-style-type: none"> <li>• With or without integrated display</li> <li>• Cover with or without window</li> </ul>  | - Effective inner capacitance:                   | $C_i = 6 \text{ nF}$  |
|  |   | • Dust explosion protection for zone 21/22       | BVS 09 ATEX E 027   |
|  |   | - Marking  | Ex II 2 D Ex tb ia IIC T120°C Db  |
|  |   | - Connection                                     | To circuits with values:<br>$U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\text{max}} = 1.2 \text{ W}$   |
|  |   | • Type of protection "n" (zone 2)                | PTB 09 ATEX 2004 X  |
|  |   | - Marking  | Ex II 3 G Ex nA II T4/T6<br>Ex II 2/3 G Ex ib/nL IIC T4/T6<br>Ex II 2/3 G Ex ib/ic IIC T4/T6  |
|  |   | - "nA" connection                                | $U_m = 45 \text{ V DC}$   |
|  |   | - "nL, ic" connection                            | $U_i = 45 \text{ V}$  |
|  |   | - Effective internal inductance                  | $L_i = 400 \mu\text{H}$   |
|  |   | - Effective inner capacitance                    | $C_i = 6 \text{ nF}$  |

Explosion protection for USA  
(to FM)

Certificate of Compliance

No. 3033013

## • Identification (XP/DIP) or (IS)

XP CL I, DIV 1, GP ABCDEFG T4 / T6  
DIP CL II, III, DIV1, GP EFG T4/T6  
IS CL I, II, III, DIV1, GP ABCDEFG T4  
CL I, Zone 0, AEx ia IIC T4  
CL I, Zone 1, AEx ib IIC T4

- Permissible Ambient Temperature

$T_a = T4: -40 \dots +85 \text{ } ^\circ\text{C}$   
(-40 ... +185 °F)  
 $T_a = T6: -40 \dots +60 \text{ } ^\circ\text{C}$   
(-40 ... +140 °F)

- Entity parameters

According to "control drawing":  
A5E02189134N  
 $U_m = 30 \text{ V}$ ,  $I_m = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $L_i = 400 \text{ } \mu\text{H}$ ,  $C_i = 6 \text{ nF}$

## • Marking (NI/NO)

NI CL I, DIV 2, GP ABCD T4/T6  
NI CL I, Zone 2, GP IIC T4/T6  
S CL II, III, GPFG T4/T6  
NI CL I, DIV 2, GP ABCD T4/T6, NIFW  
NI CL I, Zone 2, GP IIC T4/T6, NIFW  
NI CLII, III, DIV 2, GP FG T4/T6, NIFW

- Permissible Ambient Temperature

$T_a = T4: -40 \dots +85 \text{ } ^\circ\text{C}$   
(-40 ... +185 °F)  
 $T_a = T6: -40 \dots +60 \text{ } ^\circ\text{C}$   
(-40 ... +140 °F)

- (NI/S) parameters

According to "control drawing":  
A5E02189134N  
 $U_m = 45 \text{ V}$ ,  $L_i = 400 \text{ } \mu\text{H}$ ,  $C_i = 6 \text{ nF}$

Explosion protection for  
Canada(to  $C_{CSA_{US}}$ )

Certificate of Compliance

No. 2280963

## • Marking (XP/DIP)

CL I, DIV 1, GP ABCD T4 /T6;  
CL II, DIV 1, GP EFG T4/T6

- Permissible Ambient Temperature

$T_a = T4: -40 \dots +85 \text{ } ^\circ\text{C}$   
(-40 ... +185 °F)  
 $T_a = T6: -40 \dots +60 \text{ } ^\circ\text{C}$   
(-40 ... +140 °F)

- Entity parameters

According to "control drawing":  
A5E02189134N,  $U_m = 45 \text{ V}$

## • Marking (ia/ib)

CL I, Ex ia/Ex ib IIC, T4  
CL II, III, Ex ia/Ex ib, GP EFG, T4  
CL I, AEx ia/AEx ib IIC, T4  
CL II, III, AEx ia/ AEx ib, GP EFG, T4

- Permissible Ambient Temperature

$T_a = T4: -40 \dots +85 \text{ } ^\circ\text{C}$   
(-40 ... +185 °F)

- Entity parameters

$U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ,  
 $R_i = 300 \text{ } \Omega$ ,  $L_i = 400 \text{ } \mu\text{H}$ ,  $C_i = 6 \text{ nF}$

## • Marking (NI/n)

CL I, DIV2, GP ABCD T4/T6  
CL II, III, DIV2, GP FG T4/T6  
Ex nA IIC T4/T6  
AEx nA IIC T4/T6  
Ex nL IIC T4/T6  
AEx nL IIC T4/T6

- Permissible Ambient Temperature

$T_a = T4: -40 \dots +85 \text{ } ^\circ\text{C}$   
(-40 ... +185 °F)  
 $T_a = T6: -40 \dots +60 \text{ } ^\circ\text{C}$   
(-40 ... +140 °F)

- NI/nA parameters

According to "control drawing":  
A5E02189134N,  $U_m = 45 \text{ V}$

- nL parameters

According to "control drawing":  
A5E02189134N,  $U_i = 45 \text{ V}$ ,  
 $I_i = 100 \text{ mA}$ ,  $L_i = 400 \text{ } \mu\text{H}$ ,  
 $C_i = 6 \text{ nF}$

Explosion protection for China  
(acc. to NEPSI)

## • Intrinsic safety "i"

- Marking

- Permissible ambient temperature

- Connection

- Effective internal inductance

- Effective inner capacitance

## • Explosion-proof "d"

- Marking

- Permissible ambient temperature

- Connection

## • Dust explosion protection for zone 21/22

- Marking

- Connection

## • Type of protection "n" (zone 2)

- Marking

- Connection

- Effective internal inductance

- Effective inner capacitance

GYJ111111X

Ex ia/ib IIB/IIC T4

40 ... +85 °C (-40 ... +185 °F)

To certified intrinsically-safe circuits  
with maximum values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$

 $L_i = 400 \text{ mH}$  $C_i = 6 \text{ nF}$ 

GYJ111112

Ex dia IIC T4/T6

-40 ... +85 °C (-40 ... +185 °F)

temperature class T4;  
-40 ... +60 °C (-40 ... +140 °F)  
temperature class T6

To circuits with values:  
 $U_m = \text{DC } 10.5 \dots 45 \text{ V}$

GYJ111112

DIP A21 TA,T120 °C IP68 D21

To circuits with values:  
 $U_m = \text{DC } 10.5 \dots 45 \text{ V}$

GYJ111111X

Ex nL IIB/IIC T4/T6

Ex nA II T4/T6

 $U_i = 45 \text{ V DC}$  $L_i = 400 \text{ mH}$  $C_i = 6 \text{ nF}$ 

- 1) Only relevant for the pressure transmitter. The temperature error of the remote seal must be calculated separately.
- 2) If the Type "D" measuring cell is used, the error should be increased by a factor of 5. This error can be reduced to 0 by a means of a zero adjustment.
- 3) This value may be increased if the process connection is sufficiently insulated.

**HART communication**

Load with connection of

## • HART Communicator

 $R_B = 230 \dots 1100 \text{ } \Omega$ 

## • HART modem

 $R_B = 230 \dots 500 \text{ } \Omega$ 

Cable

2 wire shielded:  
 $\leq 3.0 \text{ km}$  (1.86 miles),  
multiwire shielded:  
 $\leq 1.5 \text{ km}$  (0.93 miles)

Protocol

HART Version 6.0

PC/laptop requirements

IBM compatible, RAM > 32 MByte,  
hard disk > 70 MByte,  
depending on modem type:  
RS 232-interface or  
USB connection,  
VGA graphics

Software for computer

SIMATIC PDM 6.0







Pressure Measurement

Transmitters for applications with highest requirements (Premium)

SITRANS P500

for level

| Selection and Ordering data                              | Article No. | Order code |
|--|-------------|------------|
| Pressure transmitters for level, SITRANS P500 HART       | 7MF56-0     |            |
| Process connection on high-pressure side: Filling liquid |             |            |
| Silicone oil M5  |             | 0          |
| Silicone oil M50   |             | 1          |
| High-temperature oil                                     |             | 2          |
| Halocarbon (for oxygen measurement)                      |             | 3          |
| FDA compliant oil  |             | 4          |
| Other version, add                                       |             | 9          |
| Order code and plain text:                               |             | R1Y        |
| Filling liquid: ...                                      |             |            |

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# Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

for level

1

| Selection and Ordering data   | Order code |
|---|------------|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.   |            |
| <b>Display</b><br>(Standard: no display, cover closed)  |            |
| With display and blanking cover   | <b>A10</b> |
| With display and glass cover  | <b>A11</b> |
| <b>Special version: cover/casing</b>  |            |
| Two coats of lacquer on casing, cover (PU on epoxy)   | <b>A20</b> |
| <b>Electrical connection and cable entry</b><br>(Standard: no cable gland, only dust protection caps)                                 |            |
| Cable gland made of plastic (IP66/68) <sup>4)</sup>   | <b>A50</b> |
| Cable glands made of metal (IP66/68)  | <b>A51</b> |
| Cable glands made of stainless steel (IP66/68)  | <b>A52</b> |
| M12 device plug without cable socket (IP66/67) <sup>4)</sup>  | <b>A60</b> |
| M12 device plug, cable socket (IP66/67) <sup>4)</sup>   | <b>A61</b> |
| Han 7D device plug, plastic, straight (with cable socket) (IP65) <sup>4)</sup>  | <b>A71</b> |
| Han 7D device plug, plastic, angled (with cable socket) (IP65) <sup>4)</sup>  | <b>A72</b> |
| Han 7D device plug, metal enclosure, straight (with cable socket) (IP65) <sup>4)</sup>  | <b>A73</b> |
| Han 7D device plug, metal enclosure, angled (with cable socket) (IP65) <sup>4)</sup>  | <b>A74</b> |
| Han 8D device plug, plastic, straight (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>  | <b>A75</b> |
| Han 8D device plug, plastic, angled (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>  | <b>A76</b> |
| Han 8D device plug, metal enclosure, straight (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>                                  | <b>A77</b> |
| Han 8D device plug, metal enclosure, angled (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>                                    | <b>A78</b> |
| PG 13.5 adapters <sup>4)</sup>  | <b>A82</b> |
| <b>Language for labels, quick-start guide and menu language default<sup>8)</sup></b><br>(instead of English as standard)              |            |
| German  | <b>B10</b> |
| French  | <b>B12</b> |
| Spanish   | <b>B13</b> |
| Italian   | <b>B14</b> |
| Chinese   | <b>B15</b> |
| Russian   | <b>B16</b> |
| Japanese  | <b>B17</b> |
| English with units: psi/inH <sub>2</sub> O  | <b>B21</b> |
| <b>Special version: Supplementary menu languages</b><br>(Standard: English, German, French, Spanish, Italian)                         |            |
| Asia language package (in addition: Chinese, Japanese, Russian)   | <b>B80</b> |
| <b>Certificates (available online for downloading)<sup>1)</sup></b>   |            |
| Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2 <sup>2)</sup>                             | <b>C11</b> |
| Acceptance test certificate according to EN 10204-3.1 <sup>3)</sup>   | <b>C12</b> |
| Acceptance certificate (EN 10204-3.1); PMI test of parts in contact with medium   | <b>C15</b> |
| <b>Functional Safety (SIL2)</b><br>Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | <b>C20</b> |
| <b>Degree of protection approvals: Ex ia/ib (intrinsic safety)</b>  |            |
| Ex ia/ib protection (ATEX) (T4)   | <b>E00</b> |
| Ex IS protection (FM) (T4)  | <b>E01</b> |
| Ex IS protection (C <sub>CSA</sub> US) (T4)   | <b>E02</b> |
| Ex ia/ib protection (NEPSI) (T4)  | <b>E06</b> |

| Selection and Ordering data   | Order code |
|---|------------|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.               |            |
| <b>Degree of protection approvals: Ex d (flameproof)</b>                                |            |
| Ex d explosion-proof (ATEX)(T4/T6)  | <b>E20</b> |
| Ex XP explosion-proof and DIP (FM)(T4/T6)   | <b>E21</b> |
| Ex XP explosion-proof and DIP (C <sub>CSA</sub> US)(T4/T6)                              | <b>E22</b> |
| Ex d explosion-proof (NEPSI)(T4/T6)   | <b>E26</b> |
| <b>Degree of protection approvals: n/NI</b>   |            |
| Zone 2 (nA, nL, ic) (ATEX) (T4/T6)  | <b>E40</b> |
| Div2 NI, Div2 NI-field wiring (FM) (T4/T6)  | <b>E41</b> |
| Zone 2 (nA, nL), Div2 NI (C <sub>CSA</sub> US) (T4/T6)                                  | <b>E42</b> |
| Zone 2 (nA, nL) (NEPSI) (T4/T6)   | <b>E46</b> |
| <b>Degree of protection approvals: Zone 20/21/22</b>                                    |            |
| Use in Zone 21/22 (Ex tD) (ATEX) Ex tb  | <b>E60</b> |
| Use in Zone 20/21/22 (Ex iaD) (ATEX) Ex ta  | <b>E61</b> |
| Use in Zone (Ex DIP) (ATEX) (NEPSI)   | <b>E66</b> |
| <b>Degree of protection approvals: Combinations</b>                                     |            |
| IS protection and XP and DIP (FM)   | <b>E71</b> |
| IS protection and XP and DIP (C <sub>CSA</sub> US)                                      | <b>E72</b> |
| IS protection and XP and DIP (FM/C <sub>CSA</sub> US)                                   | <b>E73</b> |
| <b>Supplementary approvals / degree of protection</b>                                   |            |
| Ex-protection Ex ia according to EAC Ex (Russia)  | <b>E80</b> |
| Ex-protection Ex d according to EAC Ex (Russia)   | <b>E81</b> |
| Dual Seal approval <sup>5)</sup>  | <b>E85</b> |
| Export approval Korea   | <b>E86</b> |
| <b>Special process connection versions (diff. pressure)</b>                             |            |
| Swap process connection: high-pressure side at front                                    | <b>L33</b> |
| <b>Mosquito protection</b>  |            |
| 4 pcs. for 1/4-18 NPT thread  | <b>L36</b> |
| <b>Process flanges, O-rings, special material</b><br><b>Standard: Viton (FKM (FPM))</b> |            |
| Process connection sealing rings made of PTFE (Teflon), virginal                        | <b>L60</b> |
| Process connection sealing rings made of PTFE (Teflon), glass fiber-reinforced          | <b>L61</b> |
| Process connection sealing rings made of FFKM (Kalrez)                                  | <b>L62</b> |
| Process connection sealing rings made of NBR  | <b>L63</b> |
| Process connection sealing rings made of graphite                                       | <b>L64</b> |
| <b>Drain/Vent valve (1 set = 2 units)</b>   |            |
| 2 ventilation valves 1/4- 18 NPT, in material of process flange)                        | <b>L80</b> |
| <b>Vacuum-proof design</b>  |            |
| Vacuum service  | <b>V04</b> |
| Spark arrester  | <b>V05</b> |
| For mounting on zone 0 (including documentation)  |            |

1) Enclosed in print or as DVD: see page 1/347.

2) When also ordering the quality inspection certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

3) When also ordering the acceptance test certificate according to EN 10204-3.1 for transmitters with mounted diaphragm seals: Order this certificate as well in addition to the respective remote seals.

4) Not together with types of protection "Explosion-proof", "Ex nA" and "Intrinsic safety and explosion-proof"

5) Only in conjunction with FM and/or C<sub>CSA</sub>US

6) Not recommended for Measuring span "D"

7) The Han 8D device plug is identical with the former Han 8U version.

8) For option B15, B16 and B17 the menu language default is English. Otherwise the Option B80 (Asia language package) is necessary.

9) Cable glands must be ordered separately from "Further designs" (add "-Z" to Article No. and specify order code).

| Selection and ordering data  | Order code       |
|--|------------------|
| <b>Additional data</b><br>Please add <b>"-Z"</b> to Article No. and specify Order code(s) and plain text.  |                  |
| <b>Measuring range to be set</b><br>Specify in plain text:<br>Linear characteristic curve (max. 5 characters):<br>Y01: ... up to ... mbar, kPa, MPa, psi   | <b>Y01</b>       |
| <b>Measuring point number and measuring point identifier (only standard ASCII character set)</b><br>Specify in plain text:<br>Measuring point number (TAG No.), max. 16 characters<br>Y15: .....   | <b>Y15</b>       |
| Measuring point text (max. 27 char.)<br>Y16: .....   | <b>Y16</b>       |
| Entry of HART address (TAG), max. 32 characters<br>Y17: .....  | <b>Y17</b>       |
| <b>Setting of pressure indication in pressure units</b><br>Specify in plain text (standard setting: mbar)<br>Y21: bar, kPa, MPa, psi, ...<br><br>Note: The following pressure units are selectable:<br>bar, mbar, mm H <sub>2</sub> O*), in H <sub>2</sub> O*), ftH <sub>2</sub> O*), mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM, % or mA<br>*) Reference temperature 20 °C | <b>Y21</b>       |
| <b>Setting of pressure indication in non-pressure units<sup>1)</sup></b><br>Specify in plain text:<br>Y22: ... up to ... l/min, m <sup>3</sup> /h, m, USgpm, ...<br>(specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)   | <b>Y22 + Y01</b> |
| <b>Customer-specific settings</b><br>Damping setting (range: 0 ... 100 s)<br>(Standard setting: 2 s)   | <b>Y30</b>       |

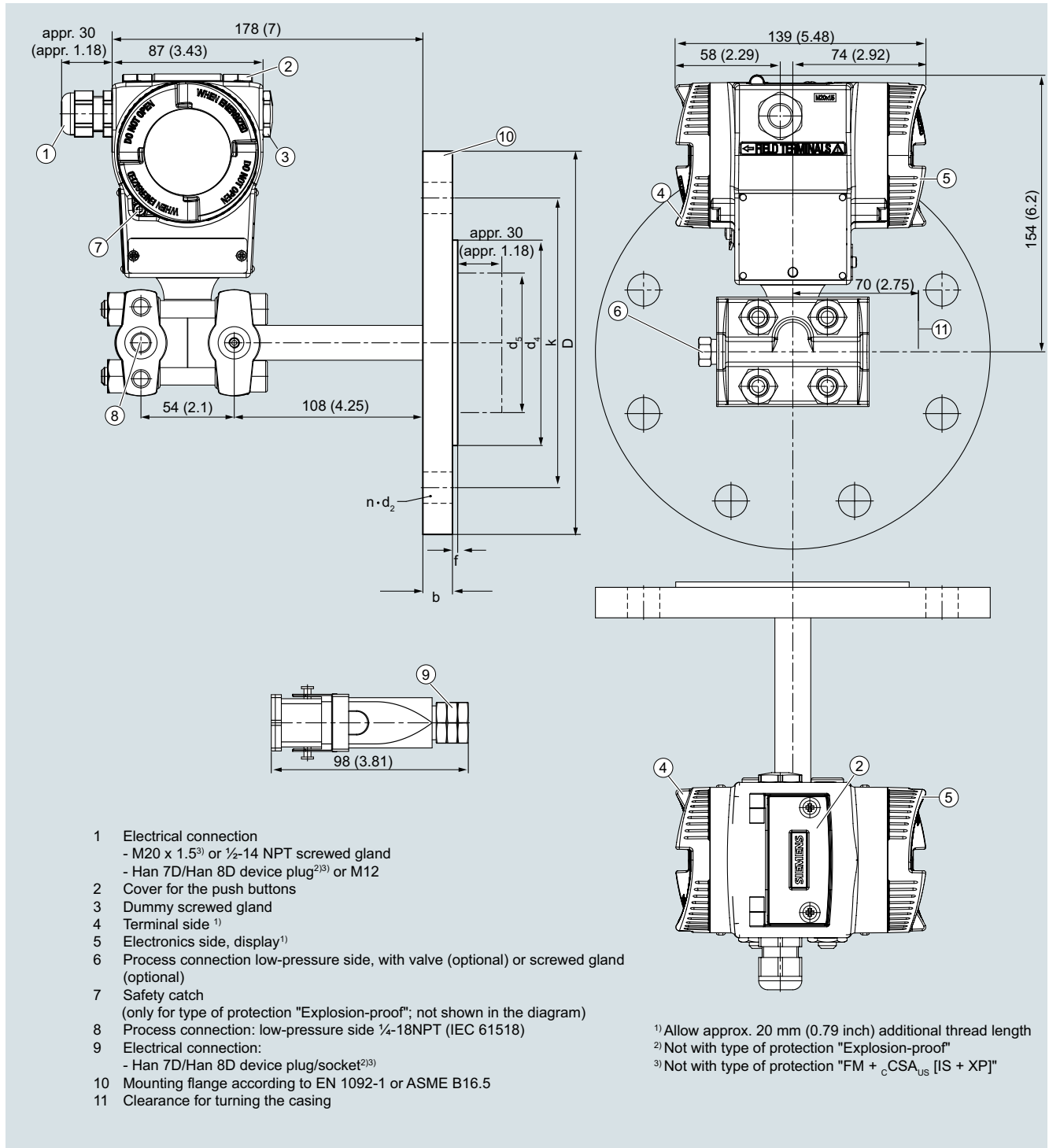
<sup>1)</sup> Preset values can only be changed over SIMATIC PDM.

## Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

for level

### Dimensional drawings



SITRANS P pressure transmitter for filling level, P500 series, measurements in mm (inch)

# Pressure Measurement

## Transmitters for applications with highest requirements (Premium)

### SITRANS P500

for level

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#### Connection to EN 1092-1

| Nominal diameter | Nominal pressure | b<br>mm | D<br>mm | d<br>mm | d <sub>2</sub><br>mm | d <sub>4</sub><br>mm | d <sub>5</sub><br>mm | d <sub>M</sub><br>mm | f<br>mm | k<br>mm | n | L<br>mm                   |
|------------------|------------------|---------|---------|---------|----------------------|----------------------|----------------------|----------------------|---------|---------|---|---------------------------|
| DN50             | PN 40            | 20      | 165     | 61      | 18                   | 102                  | 48.3                 | 45 <sup>1)</sup>     | 2       | 125     | 4 | 0, 50, 100,<br>150 or 200 |
| DN 80            | PN 40            | 24      | 200     | 90      | 18                   | 138                  | 76                   | 72 <sup>2)</sup>     | 2       | 160     | 8 |                           |
| DN 100           | PN 16            | 20      | 220     | 115     | 18                   | 158                  | 94                   | 89                   | 2       | 180     | 8 |                           |
|                  | PN 40            | 24      | 235     | 115     | 22                   | 162                  | 94                   | 89                   | 2       | 190     | 8 |                           |

#### Connection to ASME B16.5

| Nominal diameter | Nominal pressure<br>lb/sq.in. | b<br>inch (mm) | D<br>inch (mm) | d <sub>2</sub><br>inch (mm) | d <sub>4</sub><br>inch (mm) | d <sub>5</sub><br>inch (mm) | d <sub>M</sub><br>inch (mm) | f<br>inch (mm) | k<br>inch (mm) | n | L<br>inch (mm)                 |
|------------------|-------------------------------|----------------|----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|---|--------------------------------|
| 2 inch           | class 150                     | 0.77 (19.5)    | 5.91 (150)     | 0.75 (19.0)                 | 3.62 (92)                   | 1.9 (48.3)                  | 1.77 (45) <sup>1)</sup>     | 0.079 (2.0)    | 4.75 (120.7)   | 4 | 0, 2, 3.94,<br>5.94 or<br>7.87 |
|                  | class 300                     | 0.89 (22.7)    | 6.49 (165)     | 0.75 (19.0)                 | 3.62 (92)                   | 1.9 (48.3)                  | 1.77 (45) <sup>1)</sup>     | 0.079 (2.0)    | 5.0 (127)      | 8 |                                |
| 3 inch           | class 150                     | 0.96 (24.3)    | 7.5 (190.5)    | 0.75 (19.0)                 | 5 (127)                     | 3.0 (76)                    | 2.83 (72) <sup>2)</sup>     | 0.079 (2.0)    | 6 (152.4)      | 4 | (0, 50,<br>100, 150<br>or 200) |
|                  | class 300                     | 1.14 (29.0)    | 8.27 (210)     | 0.87 (22.2)                 | 5 (127)                     | 3.0 (76)                    | 2.83 (72) <sup>2)</sup>     | 0.079 (2.0)    | 6.69 (168.3)   | 8 |                                |
| 4 inch           | class 150                     | 0.96 (24.3)    | 9.06 (230)     | 0.75 (19.0)                 | 6.19 (157.2)                | 3.69 (94)                   | 3.5 (89)                    | 0.079 (2.0)    | 7.5 (190.5)    | 8 |                                |
|                  | class 300                     | 1.27 (32.2)    | 10.04 (255)    | 0.87 (22.2)                 | 6.19 (157.2)                | 3.69 (94)                   | 3.5 (89)                    | 0.079 (2.0)    | 7.88 (200)     | 8 |                                |

Explanations of tables:

d: Internal diameter of gasket to DIN 2690

d<sub>M</sub>: Effective diaphragm diameter

d<sub>5</sub>: Diameter of extension

f: Milling edge

L: Extension length

<sup>1)</sup> 59 mm = 2.32 inch with tube length L=0.

<sup>2)</sup> 89 mm = 3½ inch with tube length L=0.

## Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

### Accessories/Spare parts

| Selection and ordering data   |                                     | Article No.      |
|---|-------------------------------------|------------------|
| <b>Replacement measuring cells for differential pressure</b><br>SITRANS P pressure transmitters for differential pressure and flow, P500 HART PN 160 series (MAWP 2320 psi) |                                     | <b>7MF5994 -</b> |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.   |                                     | <b>1</b>         |
| <b>Measuring cell filling</b>   | <b>Measuring cell cleaning</b>      |                  |
| Silicone oil  | normal                              | <b>1</b>         |
| <b>Measuring span (min. ... max.)</b>   |                                     |                  |
| 1.00 ... 50 mbar  | (0.4 ... 20 inH <sub>2</sub> O)     | <b>C</b>         |
| 1.25 ... 250 mbar   | (0.5 ... 100 inH <sub>2</sub> O)    | <b>D</b>         |
| 6.25 ... 1250 mbar  | (2.5 ... 502 inH <sub>2</sub> O)    | <b>E</b>         |
| 31.25 ... 6250 mbar   | (12.54 ... 2509 inH <sub>2</sub> O) | <b>F</b>         |
| 0.16 ... 32 bar   | (2.33 ... 465 psi)                  | <b>G</b>         |
| <b>Wetted parts materials</b><br>(stainless steel process flanges)  |                                     |                  |
| Seal diaphragm  | Parts of measuring cell             |                  |
| Stainless steel 1.4404/316L   | Stainless steel 1.4404/316L         | <b>A</b>         |
| Hastelloy C276 <sup>1)</sup>  | Stainless steel 1.4404/316L         | <b>B</b>         |
| Monel 400 <sup>1)</sup>   | Stainless steel 1.4404/316L         | <b>C</b>         |
| <b>Process connection</b>   |                                     |                  |
| Female thread 1/4-18 NPT  |                                     |                  |
| • Sealing screw opposite process connection   |                                     |                  |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518   |                                     | <b>0</b>         |
| - Mounting thread M10 to DIN 19213  |                                     | <b>1</b>         |
| • Vent on side of process flange  |                                     |                  |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518   |                                     | <b>4</b>         |
| - Mounting thread M10 to DIN 19213  |                                     | <b>5</b>         |
| <b>Further designs</b>  |                                     | Order code       |
| Add "-Z" to Article No. and specify Order code.   |                                     |                  |
| <b>Acceptance test certificate</b>  |                                     | <b>C12</b>       |
| Acc. to EN 10204-3.1  |                                     |                  |
| Without process flanges   |                                     | <b>K00</b>       |
| Vent on side for gas measurements <sup>2)</sup>   |                                     | <b>L32</b>       |
| <b>Process flanges, O-ring, special material</b><br><b>Standard: Viton (FKM (FPM))</b>  |                                     |                  |
| Process connection sealing rings made of PTFE (Teflon), virginal  |                                     | <b>L60</b>       |
| Process connection sealing rings made of PTFE (Teflon), glass fiber-reinforced  |                                     | <b>L61</b>       |
| Process connection sealing rings made of FPM (Kalrez) <sup>2)</sup>   |                                     | <b>L62</b>       |
| Process flanges, O-rings made of NBR  |                                     | <b>L63</b>       |
| Process flanges, O-rings made of graphite   |                                     | <b>L64</b>       |

<sup>1)</sup> Not together with Measuring span "C".

<sup>2)</sup> Only in conjunction with process connection code 4 or 5.

<sup>2)</sup> Not together with Measuring span "G".

# Pressure Measurement

## Transmitters for applications with highest requirements (Premium)

### SITRANS P500

#### Accessories/Spare parts

1

#### Selection and Ordering data

|   | Article No.  |
|---|--|
| <b>Mounting brackets</b><br>For differential pressure transmitters with flange thread M10 (7MF54...10 and 7MF54...50) <ul style="list-style-type: none"> <li>Made of steel</li> <li>Made of stainless steel</li> <li>Made of stainless steel</li> </ul>   | 7MF5987-1AA<br>7MF5987-1AD<br>7MF5987-1AG                  |
| <b>Mounting brackets</b><br>for differential pressure transmitter with flange thread 7/16-20 UNF (7MF54...00 and 7MF54...40) <ul style="list-style-type: none"> <li>Made of steel</li> <li>Made of stainless steel</li> <li>Made of stainless steel</li> </ul>  | 7MF5987-1AC<br>7MF5987-1AF<br>7MF5987-1AJ                  |
| <b>Cover</b><br>Made of die-cast aluminum, including O-ring <ul style="list-style-type: none"> <li>Without inspection window</li> <li>With inspection window</li> </ul> Made of stainless steel, including seal <ul style="list-style-type: none"> <li>Without inspection window</li> <li>With inspection window</li> </ul> | 7MF5987-1BE<br>7MF5987-1BF<br>7MF5987-1BG<br>7MF5987-1BH   |
| <b>Digital indicator</b><br>Including mounting material   | 7MF5987-1BR  |
| <b>TAG plate (incl. fastening material)</b><br>Without inscription (5 pcs.)<br>Printed (1 pc.)<br>Data according to Y01 or Y02, Y15 and Y16 (see "SITRANS P transmitters")  | 7MF5987-1CA<br>7MF5987-1CB-Z<br>Y...: .....                |
| <b>Mounting screws</b><br>For TAG plate, grounding and connection terminals and securing and locking screws (30 units)  | 7MF5987-1CC  |
| <b>Sealing plugs for process flange</b><br>(1 set = 2 units) <ul style="list-style-type: none"> <li>Made of stainless steel</li> <li>Made of Hastelloy</li> </ul>   | 7MF4997-1CG<br>7MF4997-1CH                                 |
| <b>Vent valve</b><br>Complete (1 set = 2 units) <ul style="list-style-type: none"> <li>Made of stainless steel</li> <li>Made of Hastelloy</li> </ul>  | 7MF4997-1CP<br>7MF4997-1CQ                                 |
| <b>Electronics module</b><br>HART, intrinsically safe Ex ia for installation in transmitter casing (observe warranty conditions)  | 7MF5987-1DC  |
| <b>Connection board (incl. fastening material)</b><br>HART, intrinsically safe Ex ia for installation in transmitter casing (observe warranty conditions)   | 7MF5987-1DM  |
| <b>Push buttons assembly (incl. fastening material)</b><br>For replacement of operating keys for on-site operation of the transmitter   | 7MF5987-2AF  |
| <b>Sealing ring for</b> <ul style="list-style-type: none"> <li>Process connection</li> <li>NBR sealing ring for screw cover (10 pcs.)</li> <li>NBR sealing ring for interface measuring cell/housing (10 pcs.)</li> </ul>   | See catalog FI01, "Fittings"<br>7MF4997-2EA<br>7MF4997-2EB |

#### Selection and Ordering data

|  | Article No.   |
|--|---|
| <b>Documentation</b><br>The entire documentation is available for download free-of-charge in various languages at: <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a><br>Compact operating instructions <ul style="list-style-type: none"> <li>German, Spanish, French, Italian, Dutch</li> <li>Estonian, Latvian, Lithuanian, Polish, Romanian</li> <li>Bulgarian, Czech, Finnish, Slovakian, Slovenian</li> <li>Danish, Greek, Portuguese, Swedish, Hungarian</li> <li>Russian</li> </ul> | A5E02344532<br>A5E02307339<br>A5E02307340<br>A5E02307341<br>A5E02307338 |
| <b>HART modem</b><br>With USB interface  | 7MF4997-1DB   |
| <b>Certificates (order only via SAP) additional to internet download</b> <ul style="list-style-type: none"> <li>Hard copy (to order)</li> <li>On DVD (to order)</li> </ul>   | A5E03252406<br>A5E03252407  |

For power supply units, see catalog FI01 "Supplementary Components".

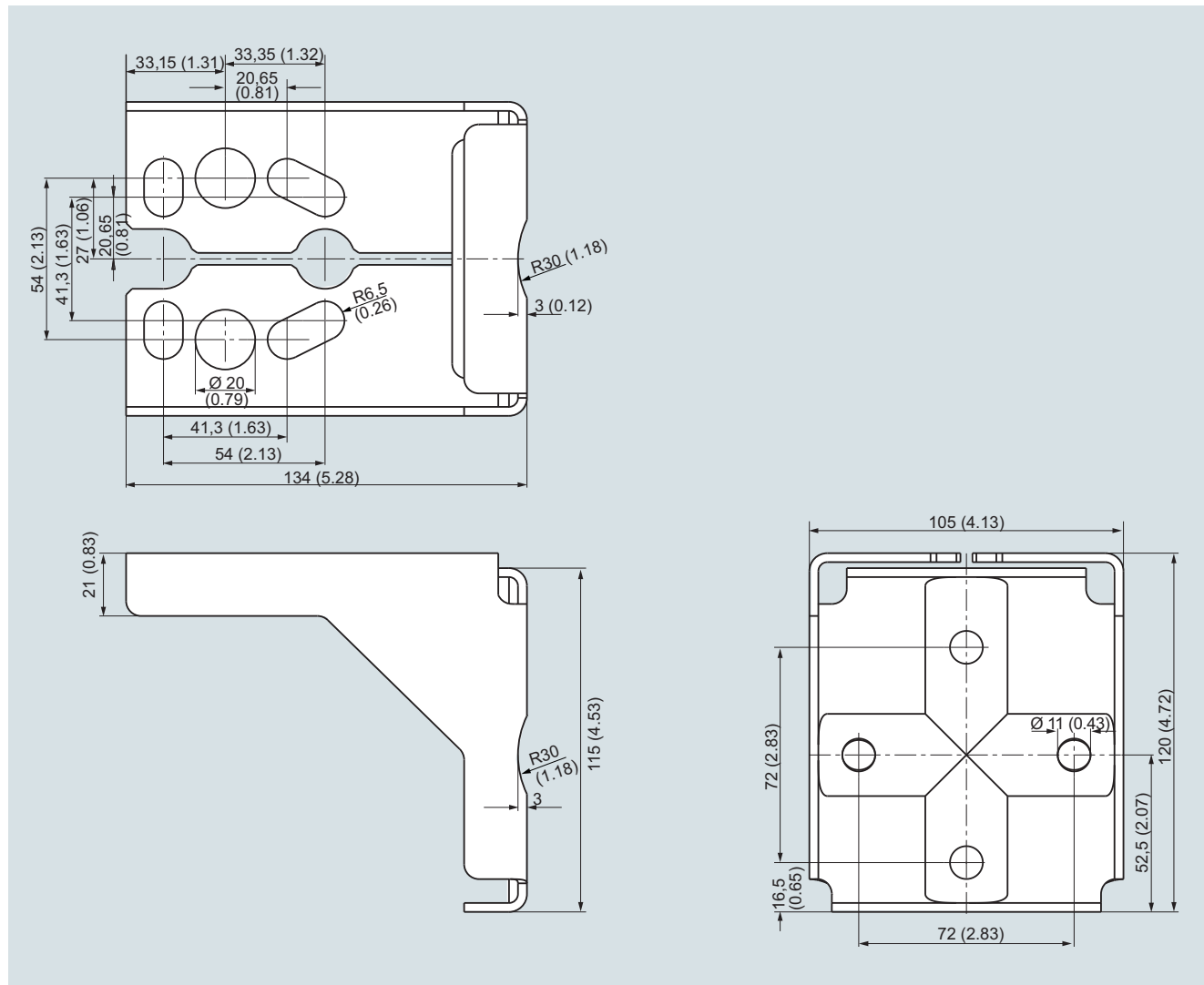
## Pressure Measurement

Transmitters for applications with highest requirements (Premium)

SITRANS P500

### Accessories/Spare parts

### Dimensional drawings



Mounting bracket for SITRANS P pressure transmitter, P500 series, measurements in mm (inch)

Mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



**Overview**

The SITRANS P500 transmitter can be delivered factory-fitted with the following manifolds:

- Valve manifolds 7MF9411-5BA: Three valve manifold for differential pressure transmitter
- Valve manifolds 7MF9411-5CA: Three valve manifold for differential pressure transmitter

**Design**

The 7MF9411-5BA and 7MF9411-5CA manifolds are sealed with PTFE sealing rings between the transmitter and the manifold.

Once installed, the complete unit is checked under pressure for leaks (compressed air 6 bar (2411 inH<sub>2</sub>O)) and is certified leak-proof with a test report to EN 10204 - 2.2.

All manifolds should preferably be secured with the respective mounting brackets. The transmitters are mounted on the manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of manifolds", you will receive a mounting bracket for the manifold instead of a bracket for mounting the transmitter.

If you order an acceptance test certificate 3.1 to EN 10204 when choosing the option "Factory mounting of manifolds", a separate certificate is provided for the transmitters and the manifolds respectively.

**Selection and ordering Data****Manifold 7MF9411-5BA on SITRANS P pressure transmitter P500 for differential pressure and flow**

Add -Z to the Article No. of the transmitter and add Order codes

SITRANS P500 7MF54...-...

mounted with gaskets made of PTFE and screws made of

- Chromized steel
- Stainless steel

Delivery incl. high-pressure test certified by factory certificate to EN 10204-2.2

**Further designs:**

Delivery includes mounting bracket and mounting clips made of

- Steel
- Stainless steel

(instead of the mounting bracket supplied with the transmitter)

Supplied acceptance test certificate to EN 10204-3.1 for transmitters and mounted valve manifold

Order code

**U01**

**U02**

**A01**

**A02**

**C12**

**Manifold 7MF9411-5CA on SITRANS P500 pressure transmitter for differential pressure and flow**

Add -Z to the Article No. of the transmitter and add Order codes

SITRANS P500 7MF54...-...

mounted with gaskets made of PTFE and screws made of

- Chromized steel
- Stainless steel

Delivery incl. high-pressure test certified by factory certificate to EN 10204-2.2

**Further designs:**

Delivery includes mounting bracket and mounting clips made of

- Steel
- Stainless steel

(instead of the mounting bracket supplied with the transmitter)

Supplied acceptance test certificate to EN 10204-3.1 for transmitters and mounted valve manifold

Order code

**U03**

**U04**

**A01**

**A02**

**C12**

## Pressure Measurement

Transmitters for applications with highest requirements (Premium)  
SITRANS P500

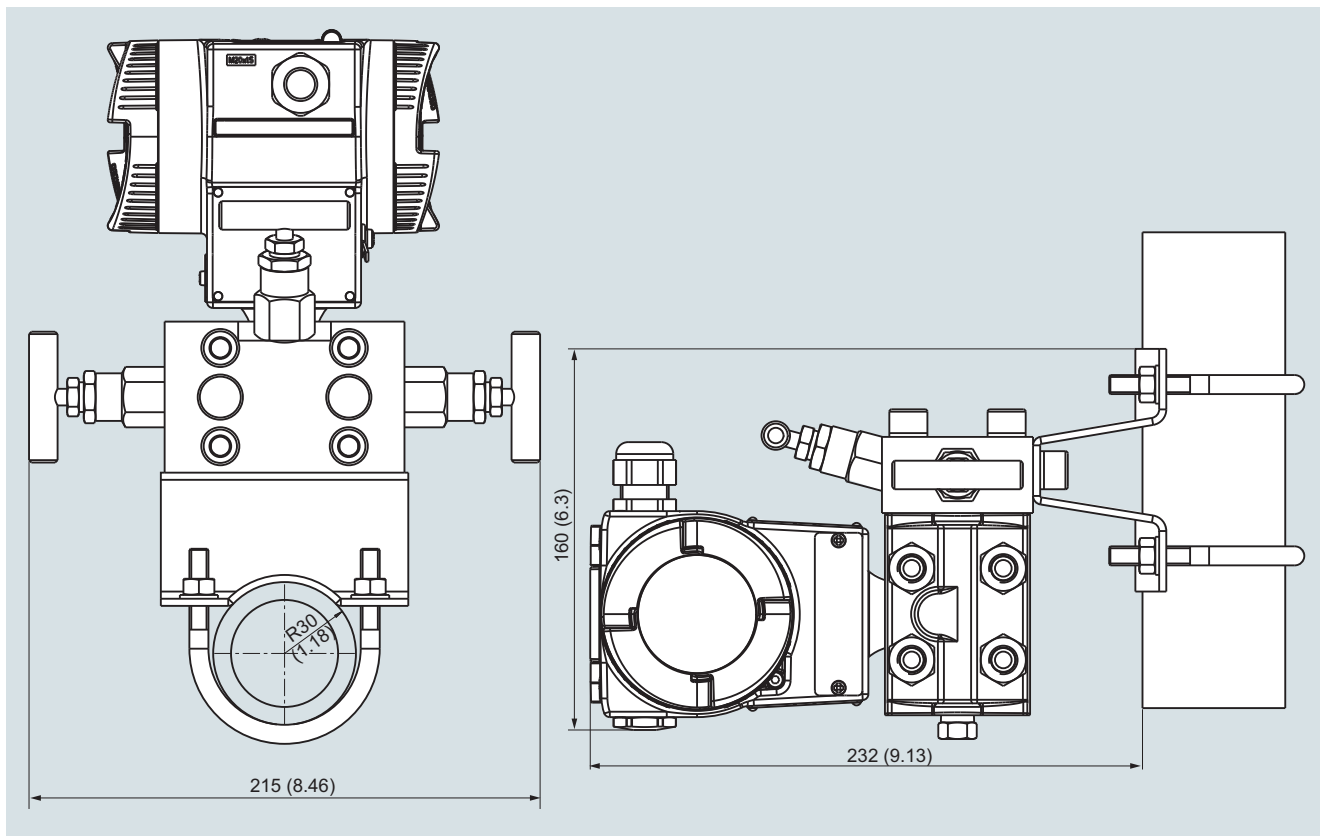
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### Factory-mounting of valve manifolds on transmitters

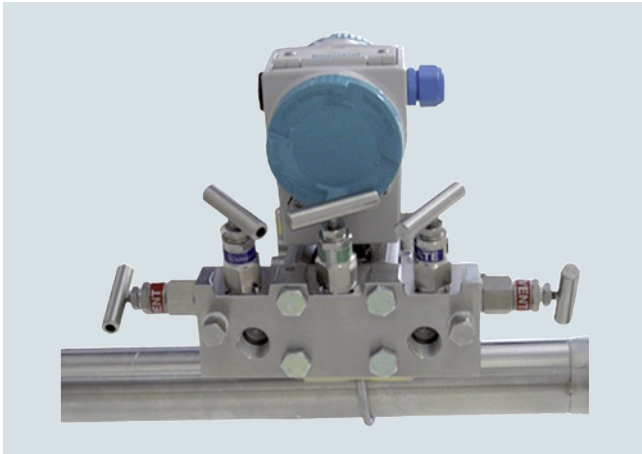
#### Dimensional drawings



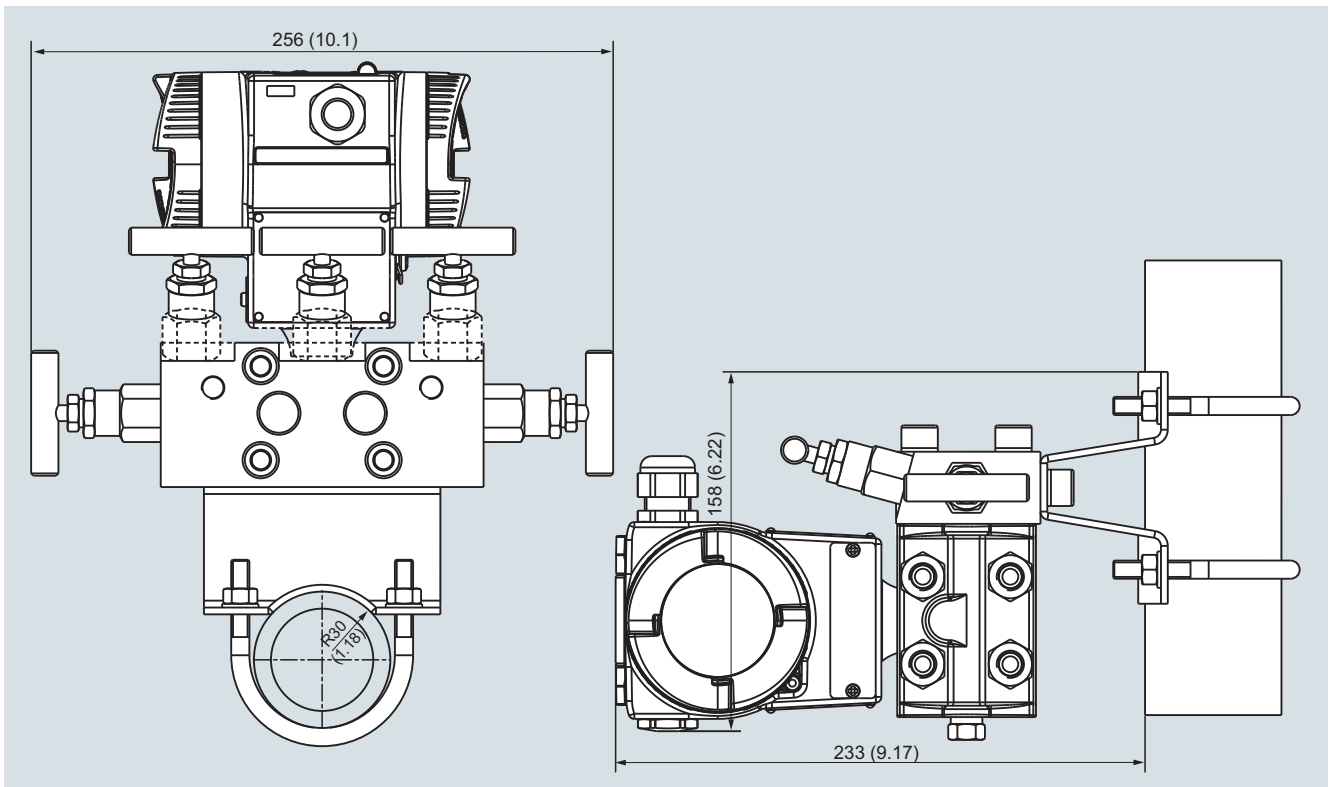
Manifold 7MF9411-5BA with attached SITRANS P500 pressure transmitter for differential pressure and flow (incl. mounting bracket)



Manifold 7MF9411-5BA with attached SITRANS P500 pressure transmitter for differential pressure and flow, measurements in mm (inch)



Manifold 7MF9411-5CA with attached SITRANS P500 pressure transmitter for differential pressure and flow (incl. mounting bracket)



Manifold 7MF9411-5CA with attached SITRANS P500 pressure transmitter for differential pressure and flow, measurements in mm (inch)

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

### Technical description

1

#### Overview

In many cases the pressure transmitter and the measured medium have to be physically separated. It is then necessary to use a remote seal.

The remote seals can be used with the SITRANS P320/420 pressure transmitter series:

- Pressure
- Absolute pressure
- Differential pressure and flow

#### Note

When configuring your remote seal, be sure to read the information about transmission response, temperature error and response time to be found in the sections "Function" and "Technical data". Only then will the remote seal work to optimum effect.

#### Benefits

- No direct contact between the pressure transmitter and the medium
- Individual configuration of the pressure transmitter for perfect adaptation to the operating conditions
- Available in many versions
- Specially designed for difficult operating conditions
- Quick-release versions available for the food industry

#### Application

Remote seal systems should be used if a separation between the measured medium and the measuring instrument is essential or appropriate.

Examples of such cases:

- The temperature of the medium is outside the limits specified for the pressure transmitter.
- The medium is corrosive and requires diaphragm materials which are not available for the pressure transmitter.
- The medium is highly viscous or contains solids which would block the measuring chambers of the pressure transmitter.
- The medium may freeze in the measuring chambers or pulse line.
- The medium is heterogeneous or fibrous.
- The medium tends towards polymerization or crystallization.
- The process requires quick-release remote seals, as necessary e.g. in the food industry for fast cleaning.
- The process requires cleaning of the measuring point, e.g. in a batch process.

#### Design

A remote seal system consists of the following components.

- Pressure transmitter
- One or two remote seals
- Filling liquid
- Connection between pressure transmitter and remote seal (direct mounting or by means of capillary)

The volume in contact with the measured medium is terminated by a flat elastic diaphragm lying in a bed. Between the diaphragm and the pressure transmitter is the filling liquid.

In many cases, a capillary has to be connected between the remote seal and the pressure transmitter in order e.g. to minimize temperature effects on the latter when hot media are involved.

However, the capillary influences the response time and the temperature response of the complete remote seal system. Two capillaries of equal length must always be used to connect a remote seal to a pressure transmitter for differential pressure.

The remote seal can be optionally equipped with a projecting diaphragm (tube).

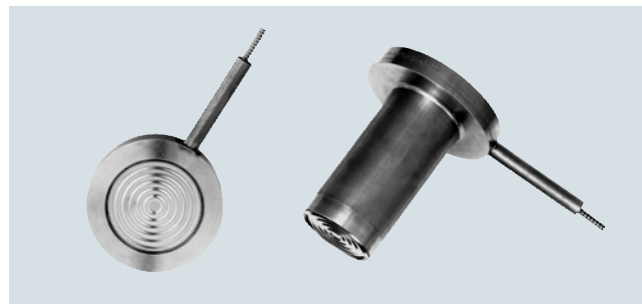
Remote seals of sandwich design are fitted with a dummy flange.

#### Designs

##### Diaphragm seal

With diaphragm seals, the pressure is measured by means of a flat diaphragm which rests in a bed.

The following types of diaphragm seals exist:



Diaphragm seal of sandwich design without (left) and with a projecting diaphragm (tube)

- Sandwich design
- Sandwich design with projecting diaphragm (tube) to DIN or ASME which are secured using a dummy flange.



Diaphragm seal of flange design without (left) and with a projecting diaphragm (tube)

- Flange design
- Flange design with projecting diaphragm (tube) to DIN or ASME, secured using holes in the flange.



Quick-release diaphragm seal

- Quick-release remote seals, e.g. to DIN 11851, SMS standard, IDF standard, APV RJF standard, clamp connection, etc.
- Miniature diaphragm seal with male thread for screwing into tapped holes
- Remote seals with customer-specific process connections



Miniature diaphragm seal with diaphragm flush with front

- Miniature diaphragm seals

The quick-release remote seals are used above all in the food industry. Their design means that the measured medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismounting is possible for cleaning.

#### Clamp-on seal



Clamp-on seal with quick-release design (left) and for flange mounting

With clamp-on seals, the pressure is first measured using a cylindrical diaphragm positioned in a pipe, and then transmitted to the pressure transmitter by means of the filling liquid.

The clamp-on seal is a special design for flowing media. It consists of a cylindrical pipe in which a cylindrical diaphragm is embedded. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. Furthermore, the clamp-on seal can be cleaned by a pig.

The following types of clamp-on seals exist:

- Quick-release clamp-on seals, e.g. to DIN 11851, SMS standard, IDF standard, APV/RJF standard, clamp connection etc. The quick-release facility attached to the remote seal enables the seal to be removed quickly for cleaning purposes.
- Clamp-on seals for flanging to EN or ASME.
- Clamp-on seals with customer-specific process connections.

#### **Note:**

The pressure data on the transmitter and the remote seal must be observed with regard to pressure/temperature behavior.

#### **Function**

The measured pressure is transferred from the diaphragm to the filling liquid and passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the transmitter, are filled gas-free by the filling liquid.

#### **Transmission response**

The transmission response of a remote seal is characterized by the following variables:

- Temperature error
- Adjustment time

#### Temperature error

Temperature errors are caused by the change of volume of the filling liquid due to temperature variations. To select the right remote seal you must calculate the temperature error.

Below you will find an overview of the factors which influence the size of the temperature error, as well as information on how to calculate the temperature error.

The temperature error is dependent on the following variables:

- Rigidity of the diaphragm used
- Filling liquid used
- Influence of the filling liquid underneath the process flanges or in the connection shank of the pressure transmitter
- Internal diameter of the capillary: The bigger the internal diameter, the bigger the temperature error
- Length of the capillary: The longer the capillary, the bigger the temperature error

#### Diaphragm rigidity

The rigidity of the diaphragm is of decisive importance. The bigger the diameter of the diaphragm, the softer the diaphragm and the more sensitively it reacts to temperature-induced changes in volume of the filling liquid.

The result is that small measuring ranges are only possible with large diaphragm diameters.

Other factors apart from diaphragm rigidity which also play a role:

- Diaphragm thickness
- Diaphragm material
- Coatings if present

#### Filling liquid

Every filling liquid reacts to temperature variations with a change of volume. Temperature errors can be minimized by selecting a suitable filling liquid, but the filling liquid must also be appropriate for the temperature limits and operating pressure. Furthermore, the filling liquid must also be physiologically harmless.

Since the filling liquid is present under the diaphragm, in the capillary and under the process flange of the pressure transmitter (or in the connection shank), the temperature error must be calculated separately for each combination.

#### **Note:**

A vacuum-resistant remote seal is recommended for continuous low-pressure operation at 500 mbar or below, including during commissioning (see ordering data).

An example of a temperature error calculation can be found in the section "Technical Specifications".

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

1

### Technical description

#### Response time

The response time is dependent on the following factors:

- Internal diameter of the capillary: The bigger the internal diameter, the shorter the response time
- Viscosity of the filling liquid: The greater the viscosity, the longer the response time
- Length of the capillary: The longer the capillary, the longer the response time
- Pressure in the pressure measuring system: The higher the pressure, the shorter the response time

#### Recommendations

The following should be observed to obtain an optimum combination of transmitter and remote seal:

- Choose the biggest possible diameter for the remote seal. The effective diameter of the seal diaphragm is then bigger and the temperature error smaller.
- Choose the shortest possible capillary. The response time is then shorter and the temperature error smaller
- Choose the filling liquid with the least viscosity and the smallest coefficient of expansion. Make sure, however, that the filling liquid meets the process requirements with regard to pressure, vacuum and temperature. And ensure that the filling liquid and the medium are compatible with one another.
- Note the following points for use in the vacuum range:
  - The pressure transmitter must always be positioned below the lowest spigot.
  - The operating range of some filling liquids is very limited with regard to the permissible temperature of the medium.
  - A vacuum-proof seal is necessary for continuous operation in the low-pressure range.
- Recommendations for the minimum span can be found in the section "Technical data".

#### Note

The remote seals listed here are a selection of the most common designs. On account of the large variety of process connections, certain remote seals which are not listed here may be available nevertheless.

Other versions can be:

- Other process connections, standards
- Aseptic or sterile connections
- Other dimensions
- Other nominal pressures
- Special diaphragm materials, including coatings
- Other sealing faces
- Other filling liquids
- Other capillary lengths
- Sheathing of capillaries with protective hose
- Calibration at higher/lower temperatures etc.

**Please contact your local Siemens office for further information.**

#### Negative pressure service

Liquids, such as silicone oils, inert or those suitable for food, are used in remote seal systems for transmission of the process pressure to the pressure transmitter.

In each liquid, particles have the tendency to leave the liquid compound with increasing temperature (transition from liquid to gaseous aggregate state). This means the vapor pressure increases with increasing temperature and is dependent on the substance or mixture being present.

The higher the temperature and the lower the associated process pressure in the liquid, the more difficult it gets to guarantee the desired transmission properties of the fill fluid and therefore the measuring arrangement.

Plus the sealing elements at the transmitter must be designed so that a diffusion of molecules from the atmosphere into the remote seal system is prevented due to the constantly occurring negative pressure.

In addition to the influencing variables process pressure and process temperature, the vapor pressure curve of the fill fluid at the remote seal end and the stiffness of the remote seal membrane impact the functionality of the remote seal in the negative pressure range.

This means you have to pay special attention to the physical properties of fill fluids with applications in the negative pressure range.

There are three stages for the negative pressure resistance:

- **Standard design** of the remote seal without additional protective measures, suitable for the overpressure range and low negative pressure range. This design is identified with (1) in the diagrams below in section 3.
- **Negative pressure service** with suitable seals and treated fill fluid, identified with (2) in the diagrams below in section 3. Here you select the order codes D81 or D83, depending on the mounting type.
- **Extended negative pressure service** with more extended treatment of the fill fluid and the remote seals, identified in the diagrams below. Here you select the order codes D85 or D88, depending on the mounting type.

There are two more areas in the diagrams. The area (4) identifies an area that has to be clarified with Technical Support prior to placing the order. The area (5) describes the area in which the remote seal fill fluid is permanently destroyed and the entire remote seal is therefore without function.

## Technical specifications of the remote seal filling liquids

| Filling liquid        | Number in the Article No. | Density at 20°C [kg/dm <sup>3</sup> ] | Viscosity at 20°C [mm <sup>2</sup> /s] | Suitable for negative pressure service | Suitable for extended negative pressure service |
|-----------------------|---------------------------|---------------------------------------|--|--|---|
| Silicone oil M5       | 1                         | 0.914                                 | 4                                      | x                                      | -   |
| Silicone oil M50      | 2                         | 0.966                                 | 50                                     | x                                      | x   |
| High-temperature oil  | 3                         | 1.070                                 | 57                                     | x                                      | x   |
| Halocarbon oil        | 4                         | 1.968                                 | 14                                     | x                                      | -   |
| Food oil (FDA-listed) | 7                         | 0.920                                 | 10                                     | x                                      | x   |

The suitable negative pressure service is specified with the pressure/temperature curves of the respective liquids described below.

**Note:** For reasons of operational safety, the transmitter must not exceed the height of the remote seal - with differential pressure applications, the height of the bottom remote seal - for measurements in the negative pressure range. The associated installation types B, C1, C2 or H are described at the end of this section under the topic "Measuring arrangements".

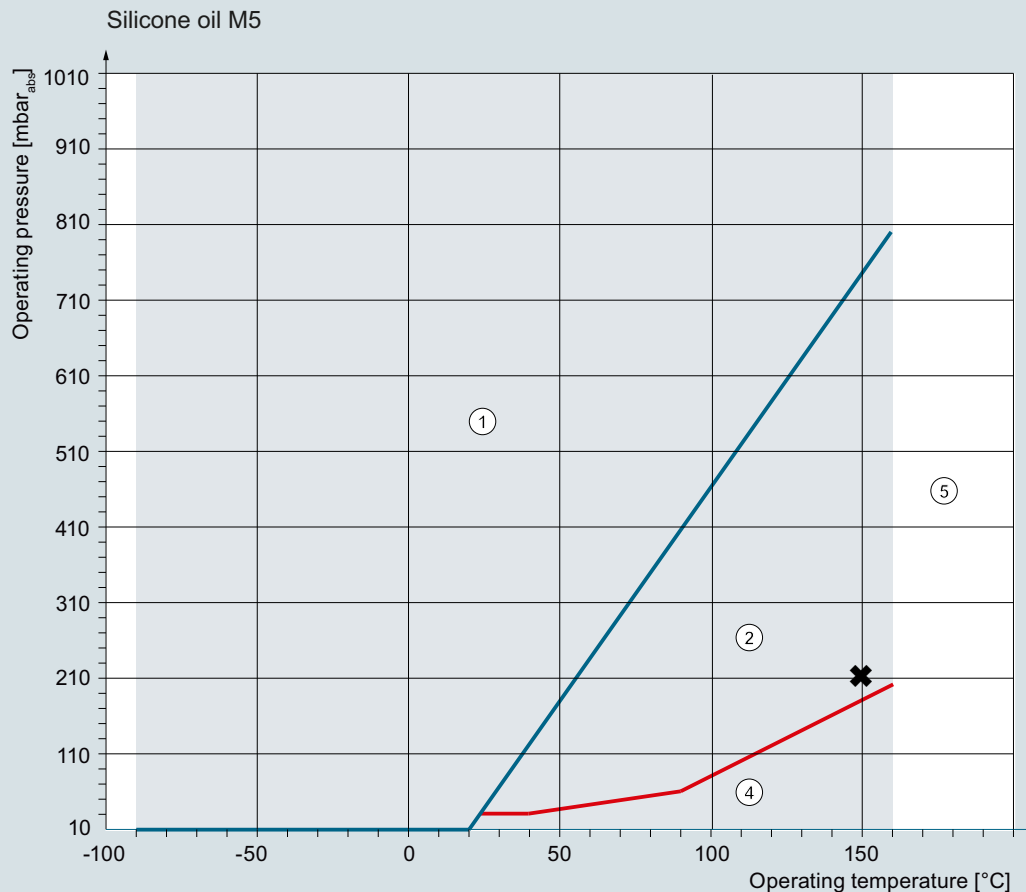
## Selection of the required negative pressure service

The procedure for determining the required negative pressure service is described below using the silicone oil M5 as fill fluid. The minimum existing process pressure of a fictitious process is 200 mbar<sub>abs</sub> (2.9 psi) (at a maximum process temperature of 150 °C (302 °F)). This intersection is identified by an "x" in the diagram below. This means the negative pressure service D81 or D83 (depending on the application) is sufficient in this example.

The suitable negative pressure resistance is determined this way for all other fill fluids.

**Note:**

Note the response times according to the table on page 1/364.



- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service D81 or D83** is required.  
Note: An extended negative pressure service is **not** possible for this fill fluid.
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

Permissible operating range:  
Max. temperature limit: 160 °C  
Min. temperature limit: -90 °C



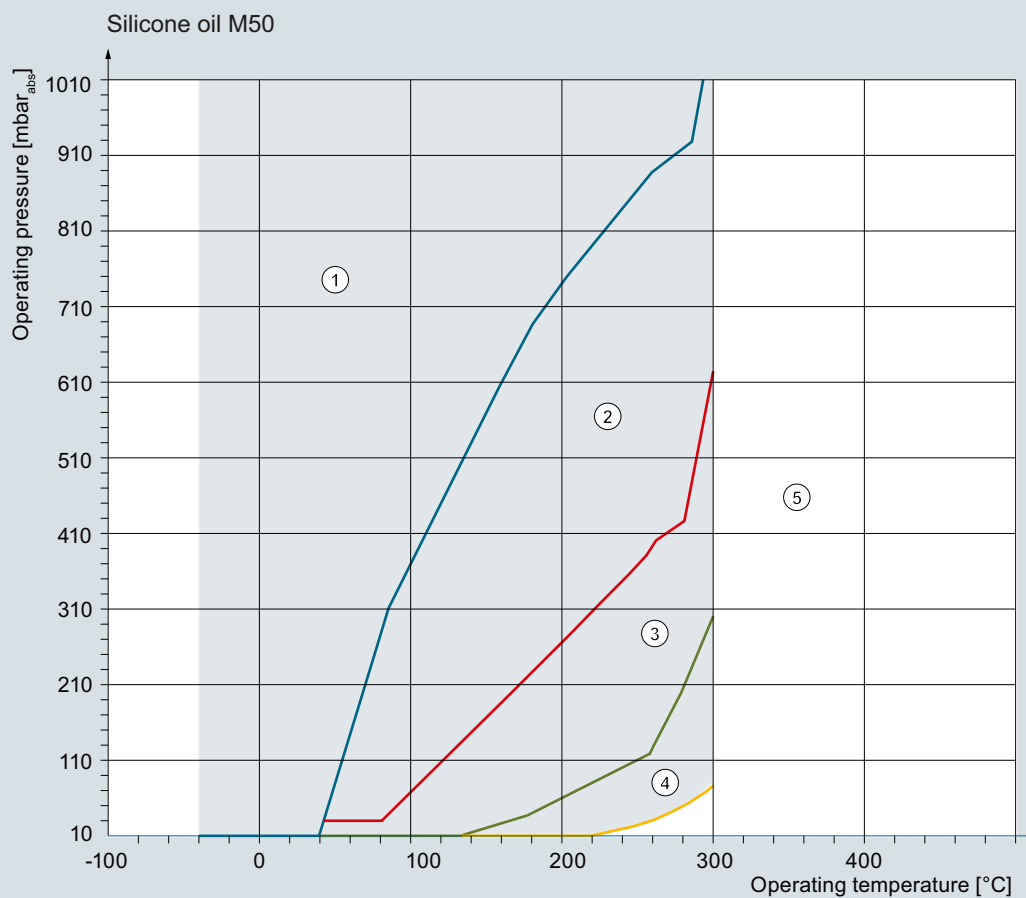
## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

1

### Technical description

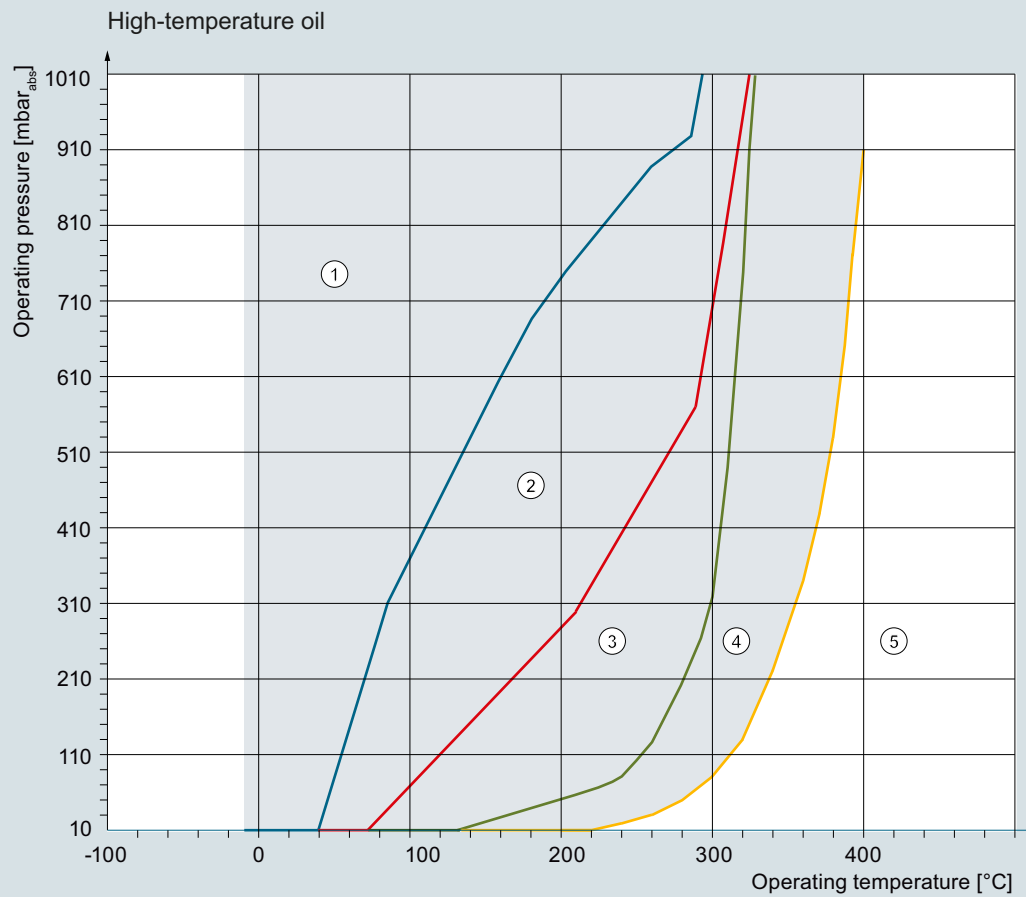


- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service D81 or D83** is required.
- ③ Operating range for which the **extended negative pressure service D85 or D88** is required
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

Permissible operating range:  
Max. temperature limit: 300 °C  
Min. temperature limit: -40 °C

Negative pressure applications with silicone oil M50





- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service D81 or D83** is required.
- ③ Operating range for which the **extended negative pressure service D85 or D88** is required
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

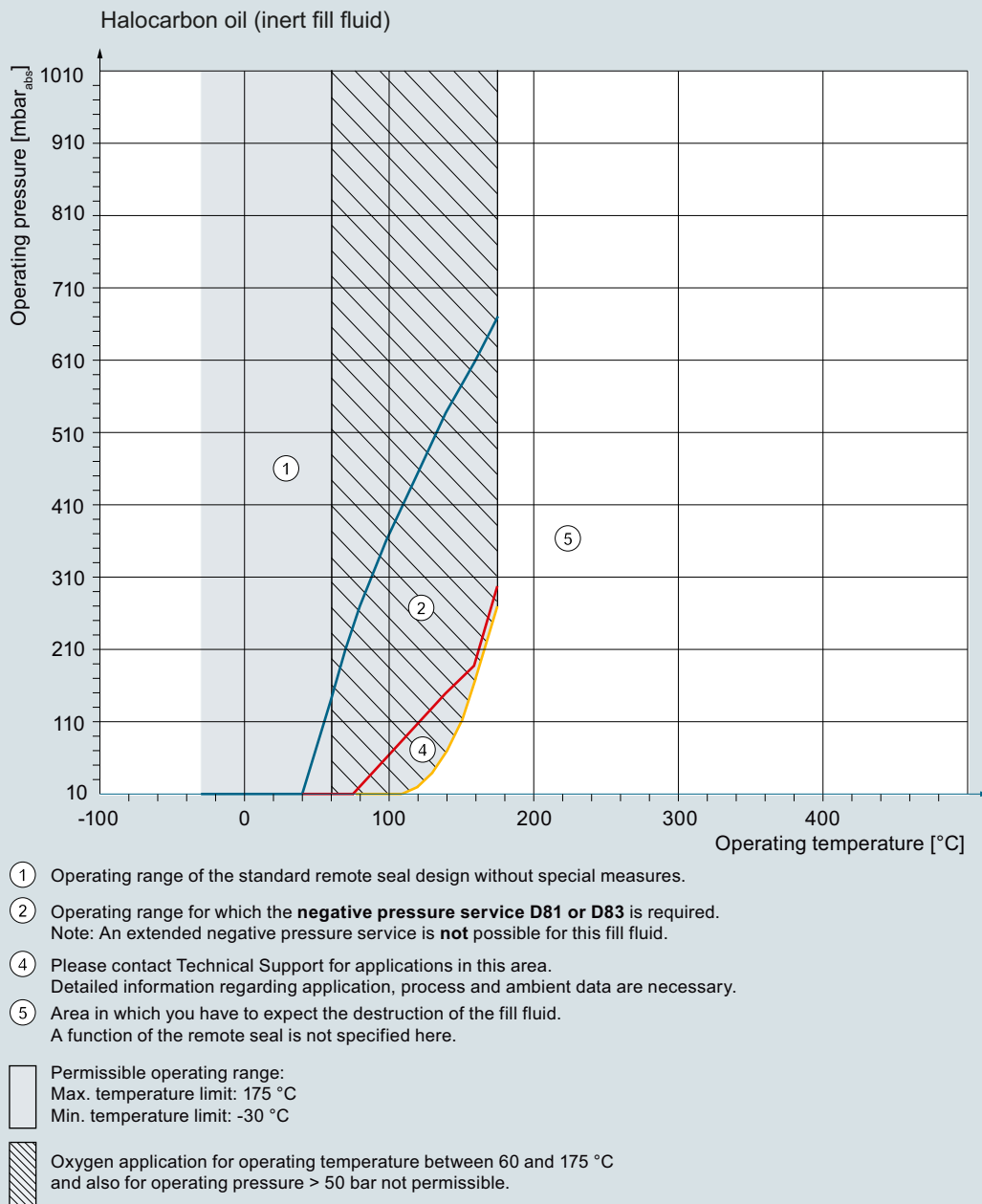
Permissible operating range:  
Max. temperature limit: 400 °C  
Min. temperature limit: -10 °C

Negative pressure applications with high-temperature oil

## Pressure Measurement

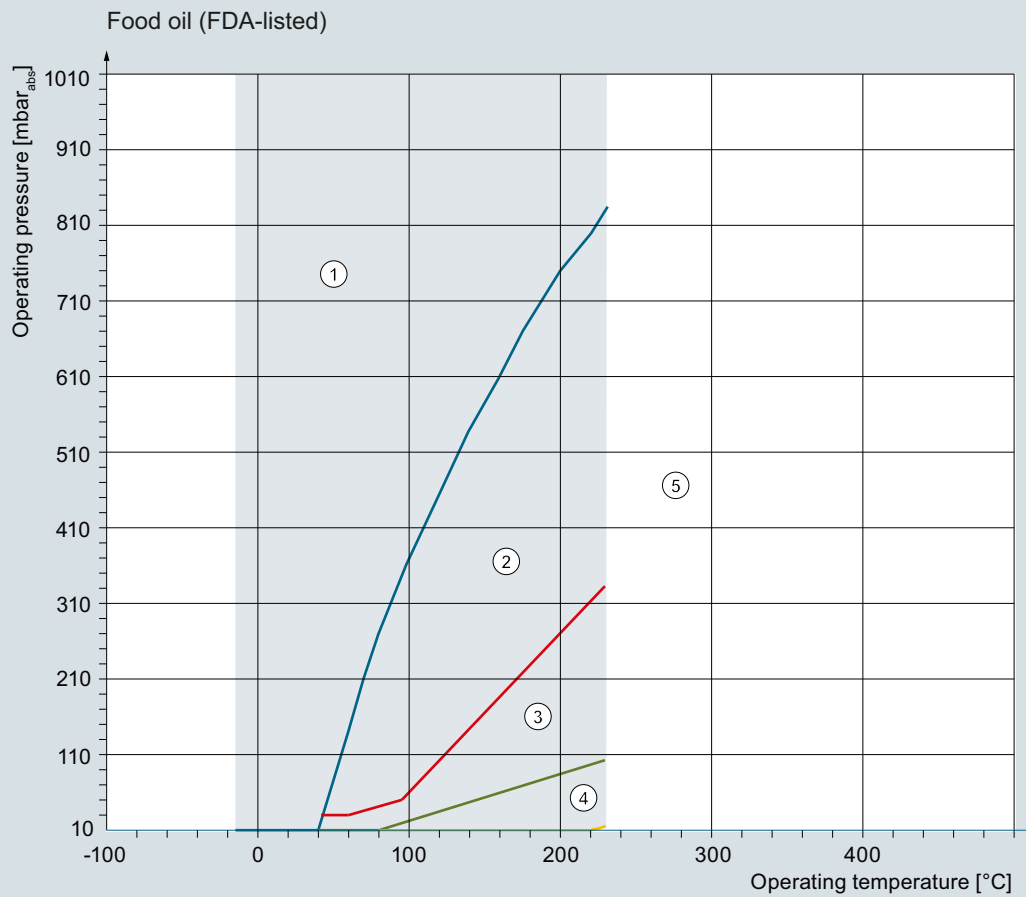
Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

### Technical description



Negative pressure applications with halocarbon oil (inert filling liquid)

A BAM approval for process temperatures up to 60 °C (140 °F) and system pressures up to 50 bar (725 psi) is available for the oxygen application.



- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service D81 or D83** is required.
- ③ Operating range for which the **extended negative pressure service D85 or D88** is required
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

Permissible operating range:  
Max. temperature limit: 230 °C  
Min. temperature limit: -15 °C

Negative pressure applications with food oil (FDA listed)

## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

### Technical description

#### Technical specifications

##### Temperature error Diaphragm seals

Temperature errors of diaphragm seals when connected to pressure transmitters for pressure, absolute pressure, differential pressure (single-sided) and level

|  | Nominal diameter/<br>design | Diaphragm<br>diameter |        | Temperature<br>error of remote<br>seal $f_{RS}$ |                | Temperature error of<br>capillary $f_{Cap}$ |                               | Temperature<br>error of process<br>flange/connec-<br>tion spigot $f_{PF}$ |                | Recommended<br>min. spans (guid-<br>ance values,<br>observe temp.<br>error) |        |
|--|-----------------------------|-----------------------|--------|---|----------------|---|-------------------------------|---|----------------|---|--------|
|  |                             | mm                    | (inch) | mbar/<br>10 K                                   | (psi/<br>10 K) | mbar/<br>(10 K · $m_{Cap}$ )                | (psi/<br>(10 K · $m_{Cap}$ )) | mbar/<br>10 K   | (psi/<br>10 K) | mbar  | (psi)  |
| Sandwich<br>design or with<br>flange to<br>EN 1092-1   | DN 50 without tube          | 59                    | (2.32) | 1.5   | (0.022)        | 2   | (0.029)                       | 2   | (0.029)        | 200   | (2.90) |
|  | DN 50 with tube             | 45                    | (1.89) | 5   | (0.073)        | 10  | (0.145)                       | 10  | (0.145)        | 500   | (7.25) |
|  | DN 80 without tube          | 89                    | (3.50) | 0.2   | (0.003)        | 0.2   | (0.003)                       | 0.2   | (0.003)        | 100   | (1.45) |
|  | DN 80 with tube             | 72                    | (2.83) | 1   | (0.015)        | 1   | (1.015)                       | 1   | (1.015)        | 250   | (3.63) |
|  | DN 100 without tube         | 89                    | (3.50) | 0.2   | (0.003)        | 0.4   | (0.006)                       | 0.4   | (0.006)        | 100   | (1.45) |
|  | DN 100 with tube            | 89                    | (3.50) | 0.4   | (0.006)        | 0.4   | (0.006)                       | 0.4   | (0.006)        | 100   | (1.45) |
|  | DN 125 without tube         | 124                   | (4.88) | 0.2   | (0.003)        | 0.1   | (0.002)                       | 0.1   | (0.002)        | 20  | (0.29) |
|  | DN 125 with tube            | 124                   | (4.88) | 0.2   | (0.003)        | 0.1   | (0.002)                       | 0.1   | (0.002)        | 20  | (0.29) |
| Sandwich<br>design or with<br>flange to<br>ASME B16.5  | 2 inch without tube         | 59                    | (2.32) | 1.5   | (0.022)        | 2   | (0.029)                       | 2   | (0.029)        | 200   | (2.90) |
|  | 2 inch with tube            | 45                    | (1.89) | 5   | (0.073)        | 10  | (0.145)                       | 10  | (0.145)        | 500   | (7.25) |
|  | 3 inch without tube         | 89                    | (3.50) | 0.2   | (0.003)        | 0.2   | (0.003)                       | 0.2   | (0.003)        | 100   | (1.45) |
|  | 3 inch with tube            | 72                    | (2.83) | 1   | (0.015)        | 1   | (1.015)                       | 1   | (1.015)        | 250   | (3.63) |
|  | 4 inch without tube         | 89                    | (3.50) | 0.2   | (0.003)        | 0.4   | (0.006)                       | 0.4   | (0.006)        | 100   | (1.45) |
|  | 4 inch with tube            | 89                    | (3.50) | 0.4   | (0.006)        | 0.4   | (0.006)                       | 0.4   | (0.006)        | 100   | (1.45) |
|  | 5 inch without tube         | 124                   | (4.88) | 0.2   | (0.003)        | 0.1   | (0.002)                       | 0.1   | (0.002)        | 20  | (0.29) |
|  | 5 inch with tube            | 124                   | (4.88) | 0.2   | (0.003)        | 0.1   | (0.002)                       | 0.1   | (0.002)        | 20  | (0.29) |
| Remote seal<br>with union nut to<br>DIN 11851          | DN 25                       | 25                    | (0.98) | 20  | (0.290)        | 60  | (0.870)                       | 60  | (0.870)        | 6000  | (87)   |
|  | DN 32                       | 32                    | (1.26) | 8   | (0.116)        | 25  | (0.363)                       | 25  | (0.363)        | 4000  | (58)   |
|  | DN 40                       | 40                    | (1.57) | 4   | (0.058)        | 10  | (0.145)                       | 10  | (0.145)        | 2000  | (29)   |
|  | DN 50                       | 52                    | (2.05) | 4   | (0.058)        | 5   | (0.073)                       | 5   | (0.073)        | 500   | (7.25) |
|  | DN 65                       | 59                    | (2.32) | 3   | (0.044)        | 4   | (0.058)                       | 4   | (0.058)        | 500   | (7.25) |
|  | DN 80                       | 72                    | (2.83) | 1   | (0.015)        | 1   | (0.015)                       | 1   | (0.015)        | 250   | (3.63) |
| Remote seal,<br>screwed gland<br>design                | DN 50                       | 52                    | (2.05) | 4   | (0.058)        | 5   | (0.073)                       | 5   | (0.073)        | 500   | (7.25) |
| Remote seal<br>with threaded<br>socket to<br>DIN 11851 | DN 25                       | 25                    | (0.98) | 20  | (0.290)        | 60  | (0.870)                       | 60  | (0.870)        | 6000  | (87)   |
|  | DN 32                       | 32                    | (1.26) | 8   | (0.116)        | 25  | (0.363)                       | 25  | (0.363)        | 4000  | (58)   |
|  | DN 40                       | 40                    | (1.57) | 4   | (0.058)        | 10  | (0.145)                       | 10  | (0.145)        | 2000  | (29)   |
|  | DN 50                       | 52                    | (2.05) | 4   | (0.058)        | 5   | (0.073)                       | 5   | (0.073)        | 500   | (7.25) |
|  | DN 65                       | 59                    | (2.32) | 3   | (0.044)        | 4   | (0.058)                       | 4   | (0.058)        | 500   | (7.25) |
|  | DN 80                       | 72                    | (2.83) | 1   | (0.015)        | 1   | (0.015)                       | 1   | (0.015)        | 250   | (3.63) |
| Clamp connec-<br>tion                                  | 1½ inch                     | 32                    | (1.26) | 8   | (0.116)        | 25  | (0.363)                       | 25  | (0.363)        | 4000  | (58)   |
|  | 2 inch                      | 40                    | (1.57) | 4   | (0.058)        | 10  | (0.145)                       | 10  | (0.145)        | 2000  | (29)   |
|  | 2½ inch                     | 59                    | (2.32) | 3   | (0.044)        | 5   | (0.073)                       | 5   | (0.073)        | 500   | (7.25) |
|  | 3 inch                      | 72                    | (2.83) | 1   | (0.015)        | 1   | (0.015)                       | 1   | (0.015)        | 250   | (3.63) |
| Miniature dia-<br>phragm seal                          | G1B                         | 25                    | (0.98) | 20  | (0.290)        | 60  | (0.870)                       | 60  | (0.870)        | 6000  | (87)   |
|  | G1½B                        | 40                    | (1.57) | 4   | (0.058)        | 10  | (0.145)                       | 10  | (0.145)        | 2000  | (29)   |
|  | G2B                         | 52                    | (2.05) | 4   | (0.058)        | 5   | (0.073)                       | 5   | (0.073)        | 500   | (7.25) |

#### Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Values apply to stainless steel as the diaphragm material.

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

## Technical description

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Temperature errors of diaphragm seals with connection to differential pressure transmitters (double-sided)

|  | Nominal diameter/<br>design | Diaphragm<br>diameter |        | Temperature error<br>of remote seal $f_{RS}$ |                | Temperature error of<br>capillary $f_{Cap}$ |                               | Temperature error<br>of process<br>flange/connec-<br>tion spigot $f_{PF}$ |                | Recommended<br>min. spans<br>(guidance val-<br>ues, observe<br>temperature<br>error) |         |
|--|-----------------------------|-----------------------|--------|--|----------------|---|-------------------------------|---|----------------|--|---------|
|  |                             | mm                    | (inch) | mbar/<br>10 K                                | (psi/<br>10 K) | mbar/<br>(10 K · $m_{Cap}$ )                | (psi/<br>(10 K · $m_{Cap}$ )) | mbar/<br>10 K   | (psi/<br>10 K) | mbar   | (psi)   |
| Sandwich<br>design or with<br>flange to<br>EN 1092-1   | DN 50 without tube          | 59                    | (2.32) | 0.3  | (0.0043)       | 0.3   | (0.0045)                      | 0.3   | (0.0045)       | 250  | (3.626) |
|  | DN 50 with tube             | 45                    | (1.89) | 1.26   | (0.018)        | 1.7   | (0.025)                       | 1.7   | (0.025)        | 250  | (3.626) |
|  | DN 80 without tube          | 89                    | (3.50) | 0.05   | (0.001)        | 0.05  | (0.001)                       | 0.05  | (0.0007)       | 50   | (0.725) |
|  | DN 80 with tube             | 72                    | (2.83) | 0.24   | (0.004)        | 0.17  | (0.003)                       | 0.17  | (0.003)        | 100  | (1.45)  |
|  | DN 100 without tube         | 89                    | (3.50) | 0.05   | (0.001)        | 0.07  | (0.001)                       | 0.07  | (0.001)        | 50   | (0.725) |
|  | DN 100 with tube            | 89                    | (3.50) | 0.1  | (0.002)        | 0.07  | (0.001)                       | 0.07  | (0.001)        | 50   | (0.725) |
|  | DN 125 without tube         | 124                   | (4.88) | 0.05   | (0.001)        | 0.03  | (0.0004)                      | 0.03  | (0.0004)       | 20   | (0.29)  |
|  | DN 125 with tube            | 124                   | (4.88) | 0.05   | (0.001)        | 0.03  | (0.0004)                      | 0.03  | (0.0004)       | 20   | (0.29)  |
| Sandwich<br>design with<br>flange to<br>ASME B16.5     | 2 inch without tube         | 59                    | (2.32) | 0.3  | (0.0043)       | 0.3   | (0.0043)                      | 0.3   | (0.0045)       | 250  | (3.626) |
|  | 2 inch with tube            | 45                    | (1.89) | 1.26   | (0.018)        | 1.7   | (0.025)                       | 1.7   | (0.025)        | 250  | (3.626) |
|  | 3 inch without tube         | 89                    | (3.50) | 0.05   | (0.001)        | 0.05  | (0.0007)                      | 0.05  | (0.0007)       | 50   | (0.725) |
|  | 3 inch with tube            | 72                    | (2.83) | 0.24   | (0.004)        | 0.17  | (0.003)                       | 0.17  | (0.003)        | 100  | (1.45)  |
|  | 4 inch without tube         | 89                    | (3.50) | 0.05   | (0.001)        | 0.07  | (0.001)                       | 0.07  | (0.001)        | 50   | (0.725) |
|  | 4 inch with tube            | 89                    | (3.50) | 0.1  | (0.002)        | 0.07  | (0.001)                       | 0.07  | (0.001)        | 50   | (0.725) |
|  | 5 inch without tube         | 124                   | (4.88) | 0.05   | (0.001)        | 0.03  | (0.0004)                      | 0.03  | (0.0004)       | 20   | (0.29)  |
|  | 5 inch with tube            | 124                   | (4.88) | 0.05   | (0.001)        | 0.03  | (0.0004)                      | 0.03  | (0.0004)       | 20   | (0.29)  |
| Remote seal,<br>screwed gland<br>design                | DN 50                       | 52                    | (2.05) | 1  | (0.015)        | 0.83  | (0.012)                       | 0.83  | (0.012)        | 250  | (3.626) |
| Remote seal<br>with union nut to<br>DIN 11851          | DN 50                       | 52                    | (2.05) | 1  | (0.015)        | 0.83  | (0.012)                       | 0.83  | (0.012)        | 250  | (3.626) |
|  | DN 65                       | 59                    | (2.32) | 0.7  | (0.010)        | 0.67  | (0.010)                       | 0.67  | (0.010)        | 250  | (3.626) |
|  | DN 80                       | 72                    | (2.83) | 0.24   | (0.004)        | 0.17  | (0.003)                       | 0.17  | (0.003)        | 100  | (1.450) |
| Remote seal<br>with threaded<br>socket to<br>DIN 11851 | DN 50                       | 52                    | (2.05) | 1  | (0.015)        | 0.83  | (0.012)                       | 0.83  | (0.012)        | 250  | (3.626) |
|  | DN 65                       | 59                    | (2.32) | 0.7  | (0.010)        | 0.67  | (0.010)                       | 0.67  | (0.010)        | 250  | (3.626) |
|  | DN 80                       | 72                    | (2.83) | 0.24   | (0.004)        | 0.17  | (0.003)                       | 0.17  | (0.003)        | 100  | (1.450) |
| Clamp connec-<br>tion                                  | 2 inch                      | 40                    | (1.57) | 1  | (0.015)        | 2.5   | (0.036)                       | 2.5   | (0.036)        | 2000   | (29.01) |
|  | 2½ inch                     | 59                    | (2.32) | 0.7  | (0.010)        | 0.67  | (0.010)                       | 0.67  | (0.010)        | 250  | (3.626) |
|  | 3 inch                      | 72                    | (2.83) | 0.24   | (0.004)        | 0.17  | (0.003)                       | 0.17  | (0.003)        | 100  | (1.450) |

## Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Values apply to stainless steel as the diaphragm material.

## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

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### Technical description

#### Temperature error Clamp-on seals

Temperature errors of clamp-on seals when connected to pressure transmitters for gauge pressure and absolute pressure, and with single-sided connection to pressure transmitters for differential pressure

| Nominal diameter/<br>design | Temperature error of remote<br>seal $f_{RS}$ |            | Temperature error of<br>capillary $f_{Cap}$ |            | Temperature error of pro-<br>cess flange/connection<br>spigot $f_{PF}$ |            | Recommended min. spans<br>(guidance values, observe<br>temperature error) |        |
|-----------------------------|--|------------|---|------------|--|------------|---|--------|
|                             | mbar/10 K                                    | (psi/10 K) | mbar/10 K                                   | (psi/10 K) | mbar/10 K  | (psi/10 K) | mbar  | (psi)  |
| DN 25 (1 inch)              | 6.0  | (0.0870)   | 8.5   | (0.123)    | 8.5  | (0.123)    | 1000  | (14.5) |
| DN 40 (1½ inch)             | 4.5  | (0.065)    | 4.5   | (0.065)    | 4.5  | (0.065)    | 250   | (3.63) |
| DN 50 (2 inch)              | 4.0  | (0.058)    | 3.0   | (0.044)    | 3.0  | (0.044)    | 100   | (1.45) |
| DN 80 (3 inch)              | 9.5  | (0.138)    | 5.0   | (0.073)    | 5.0  | (0.073)    | 100   | (1.45) |
| DN 100 (4 inch)             | 8.0  | (0.012)    | 3.0   | (0.044)    | 3.0  | (0.044)    | 100   | (1.45) |

Temperature errors of clamp-on seals with double-sided connection to pressure transmitters for differential pressure

| Nominal diameter/<br>design | Temperature error of remote<br>seal $f_{RS}$ |            | Temperature error of<br>capillary $f_{Cap}$ |            | Temperature error of pro-<br>cess flange/connection<br>spigot $f_{PF}$ |            | Recommended min. spans<br>(guidance values, observe<br>temperature error) |        |
|-----------------------------|--|------------|---|------------|--|------------|---|--------|
|                             | mbar/10 K                                    | (psi/10 K) | mbar/10 K                                   | (psi/10 K) | mbar/10 K  | (psi/10 K) | mbar  | (psi)  |
| DN 25 (1 inch)              | 2.3  | (0.033)    | 1.8   | (0.026)    | 1.8  | (0.026)    | 1000  | (14.5) |
| DN 40 (1½ inch)             | 0.8  | (0.012)    | 0.3   | (0.004)    | 0.3  | (0.004)    | 250   | (3.63) |
| DN 50 (2 inch)              | 0.3  | (0.004)    | 0.1   | (0.002)    | 0.1  | (0.002)    | 100   | (1.45) |
| DN 80 (3 inch)              | 3.0  | (0.044)    | 0.5   | (0.007)    | 0.5  | (0.007)    | 100   | (1.45) |
| DN 100 (4 inch)             | 1.0  | (0.015)    | 0.1   | (0.002)    | 0.1  | (0.002)    | 100   | (1.45) |

#### Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Half the values apply to glycerin/water mixture as the filling liquid.
- Values apply to stainless steel as the diaphragm material.
- Diaphragm thickness 0.05 mm (0.002 inch) for DN 25/DN 40/DN 50 and 0.1 mm (0.004 inch) for DN 80/DN 100

**Calculation of the temperature error**

The following equation is used to calculate the temperature error:

$$dp = (\vartheta_{RS} - \vartheta_{Cal}) \cdot f_{RS} + (\vartheta_{Cap} - \vartheta_{Cal}) \cdot l_{Cap} \cdot f_{Cap} + (\vartheta_{TR} - \vartheta_{Cal}) \cdot f_{PF}$$

|                   |   |
|-------------------|---|
| dp                | Additional temperature error (mbar)   |
| $\vartheta_{RS}$  | Temperature on remote seal diaphragm (generally corresponds to temperature of medium)   |
| $\vartheta_{Cal}$ | Calibration (reference) temperature (20 °C (68 °F))                                     |
| $f_{RS}$          | Temperature error of remote seal  |
| $\vartheta_{Cap}$ | Ambient temperature on the capillaries  |
| $l_{Cap}$         | Capillary length  |
| $f_{Cap}$         | Temperature error of capillaries  |
| $\vartheta_{TR}$  | Ambient temperature on pressure transmitter   |
| $f_{PF}$          | Temperature error of the oil filling in the process flanges of the pressure transmitter |

**Example of temperature error calculation****Existing conditions:**

|   |   |
|---|---|
| SITRANS P pressure transmitter for differential pressure, 250 mbar, set to 0 ... 100 mbar, with DN 100 remote seal diaphragms without tube, diaphragm made of stainless steel, mat. No. 1.4404/316L | $f_{RS} = 0.05 \text{ mbar}/10 \text{ K}$<br>(0.039 inH <sub>2</sub> O/10 K)  |
| Capillary length  | $l_{Cap} = 6 \text{ m (19.7 ft)}$   |
| Capillaries fitted on both sides  | $f_{Cap} = 0.07 \text{ mbar}/(10 \text{ K} \cdot m_{Cap})$<br>(0.028 inH <sub>2</sub> O/(10 K · m <sub>Cap</sub> )) |
| Filling liquid silicone oil M5  | $f_{PF} = 0.07 \text{ mbar}/10 \text{ K}$<br>(0.028 inH <sub>2</sub> O/10 K)  |
| Process temperature   | $\vartheta_{RS} = 100 \text{ °C (212 °F)}$  |
| Temperature on the capillaries  | $\vartheta_{Cap} = 50 \text{ °C (122 °F)}$  |
| Temperature on pressure transmitter   | $\vartheta_{TR} = 50 \text{ °C (122 °F)}$   |
| Calibration temperature   | $\vartheta_{Cal} = 20 \text{ °C (68 °F)}$   |

**Required:**

Additional temperature error of remote seals: dp

**Calculation:****in mbar**

$$dp = (100 \text{ °C} - 20 \text{ °C}) \cdot 0.05 \text{ mbar}/10 \text{ K} + (50 \text{ °C} - 20 \text{ °C}) \cdot 6 \text{ m} \cdot 0.07 \text{ mbar}/(10 \text{ K} \cdot \text{m}) + (50 \text{ °C} - 20 \text{ °C}) \cdot 0.07 \text{ mbar}/10 \text{ K}$$

$$dp = 0.4 \text{ mbar} + 1.26 \text{ mbar} + 0.21 \text{ mbar}$$

**in inH<sub>2</sub>O**

$$dp = (212 \text{ °F} - 68 \text{ °F}) \cdot 0.039 \text{ inH}_2\text{O}/10 \text{ K} + (112 \text{ °F} - 68 \text{ °F}) \cdot 19.7 \text{ ft} \cdot 0.028 \text{ inH}_2\text{O}/(10 \text{ K} \cdot 3.28 \text{ ft}) + (112 \text{ °F} - 68 \text{ °F}) \cdot (0.028 \text{ inH}_2\text{O}/10 \text{ K})$$

$$dp = 0.16 \text{ inH}_2\text{O} + 0.51 \text{ inH}_2\text{O} + 0.08 \text{ inH}_2\text{O}$$

**Result:**

$$dp = 1.87 \text{ mbar (0.75 inH}_2\text{O)}$$

(corresponds to 2.27% of set span)

**Note**

The determined temperature error only applies to the error resulting from connection of the remote seal.

The transmission response of the respective transmitter is not included in this consideration.

It must be calculated separately, and the resulting error added to the error determined above from connection of the remote seal.

**Dependence of temperature error on diaphragm material**

The temperature errors listed in the previous table are based on the use of stainless steel as the diaphragm material. If other diaphragm materials are used, the temperature errors change as follows:

| Diaphragm material  | Change in temperature error of remote seal |
|---|--|
|   | Increase in values by                      |
| Stainless steel, Duplex, ...                              | See previous tables                        |
| Hastelloy C4, mat. No. 2.4602                             | 50 %                                       |
| Hastelloy C276, mat. No. 2.4819                           | 50 %                                       |
| Monel 400, mat. No. 2.4360                                | 60 %                                       |
| Tantalum  | 50 %                                       |
| Titanium  | 50 %                                       |
| PTFE coating on stainless steel diaphragm                 | 80 %                                       |
| ECTFE coating or PFA coating on stainless steel diaphragm | 100 %                                      |
| Gold coating on stainless steel diaphragm                 | 40 %                                       |
| Inconel   | 50 %                                       |
| Incoloy   | 50 %                                       |

**Maximum temperature of medium**

Note:

When taking into account the maximum medium temperature, the application limits of the fill fluids and gaskets used as well as the pressure/temperature limits of the respective process connections must also be taken into consideration.

The following maximum temperatures of the medium apply depending on the material of the wetted parts.

| Material                        | Max. temperature of medium | Min./max. pressure                                |
|---------------------------------|----------------------------|---|
| Stainless steel, 316L           | 400 °C (752 °F)            | No restriction                                    |
| PTFE coating                    | 200 °C (392 °F)            | < 0 bar (0 psi); gauge pressure                   |
|                                 | 260 °C (500 °F)            | 0 bar (0 psi)/25 bar (363 psi); gauge pressure    |
|                                 | 150 °C (302 °F)            | 25 bar (363 psi)/40 bar (580 psi); gauge pressure |
|                                 | 50 °C (302 °F)             | 40 bar (580 psi)/60 bar (870 psi); gauge pressure |
| ECTFE coating                   | 150 °C (302 °F)            | For pressures < 1 bar (14.5 psi) on request       |
| PFA coating                     | 200 °C (392 °F)            | < 0 bar (0 psi); gauge pressure                   |
|                                 | 260 °C (500 °F)            | 25 bar (363 psi)/40 bar (580 psi); gauge pressure |
|                                 | 150 °C (302 °F)            | 40 bar (580 psi)/60 bar (870 psi); gauge pressure |
|                                 | 50 °C (302 °F)             | For pressures < 1 bar (14.5 psi) on request       |
| Hastelloy C4, mat. No. 2.4602   | 400 °C (752 °F)            | No restriction                                    |
| Hastelloy C276, mat. No. 2.4819 | 400 °C (752 °F)            | No restriction                                    |
| Hastelloy C22, mat. No. 2.4602  | 400 °C (752 °F)            | No restriction                                    |
| Monel 400, mat. No. 2.4360      | 400 °C (752 °F)            | No restriction                                    |
| Tantalum                        | 300 °C (572 °F)            | No restriction                                    |
| Duplex, mat. No. 1.4462         | 250 °C (482 °F)            | No restriction                                    |
| Titanium                        | 150 °C (302 °F)            | No restriction                                    |
| Inconel                         | 400 °C (752 °F)            | No restriction                                    |
| Incoloy                         | 400 °C (752 °F)            | No restriction                                    |
| Gold coating                    | 400 °C (752 °F)            | No restriction                                    |

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

### Technical description

#### Maximum capillary length for diaphragm seals (guidance values)

| Nom. diam. |           | Max. length of capillary |        |               |        |
|------------|-----------|--------------------------|--------|---------------|--------|
|            |           | Diaphragm seal           |        | Clamp-on seal |        |
|            |           | m                        | (ft)   | m             | (ft)   |
| DN 25      | (1 inch)  | 2.5                      | (8.2)  | 2.5           | (8.2)  |
| DN 32      | (1¼ inch) | 2.5                      | (8.2)  | 2.5           | (8.2)  |
| DN 40      | (1½ inch) | 4                        | (13.1) | 6             | (19.7) |
| DN 50      | (2 inch)  | 6                        | (19.7) | 10            | (32.8) |
| DN 65      | (2½ inch) | 8                        | (26.2) | 10            | (32.8) |
| DN 80      | (3 inch)  | 15                       | (49.1) | 10            | (32.8) |
| DN 100     | (4 inch)  | 15                       | (49.1) | 10            | (32.8) |
| DN 125     | (5 inch)  | 15                       | (49.1) | -             | -      |

#### Response times

The values listed in the following table are the response times (in seconds per meter of capillary) for a change in pressure which corresponds to the set span.

The listed values must be multiplied by the respective length of the capillary, or with transmitters for differential pressure and flow by the total length of both capillaries.

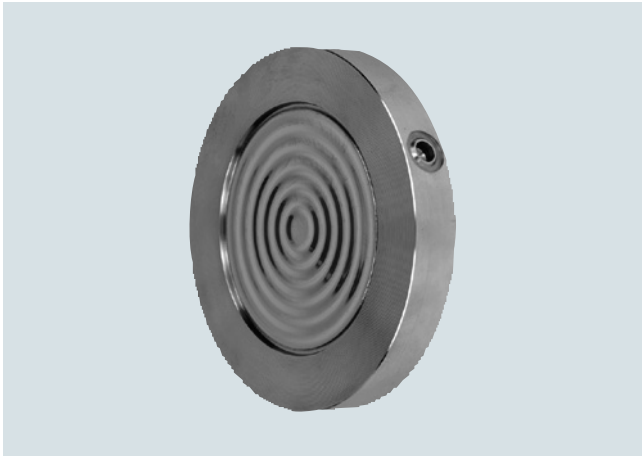
The response times are independent of the set span within the range of the respective transmitter. The response times are of insignificant importance for spans above 10 bar (145 psi). The response times of the pressure transmitters are not considered in the table.

| Filling liquid        | Density |          | Temperature on capillary |       | Response time in s/m (s/ft) with max. span of pressure transmitter |             |          |             |           |             |
|-----------------------|---------|----------|--------------------------|-------|--|-------------|----------|-------------|-----------|-------------|
|                       | kg/dm³  | (lb/in³) | °C                       | (°F)  | 250 mbar   | (101 inH₂O) | 600 mbar | (241 inH₂O) | 1600 mbar | (643 inH₂O) |
| Silicone oil M5       | 0.914   | (0.033)  | +60                      | (140) | 0.06   | (0.018)     | 0.02     | (0.006)     | 0.01      | (0.003)     |
|                       |         |          | +20                      | (68)  | 0.11   | (0.034)     | 0.02     | (0.006)     | 0.02      | (0.006)     |
|                       |         |          | -20                      | (-4)  | 0.3  | (0.091)     | 0.12     | (0.037)     | 0.05      | (0.015)     |
| Silicone oil M50      | 0.966   | (0.035)  | +60                      | (140) | 0.6  | (0.183)     | 0.25     | (0.076)     | 0.09      | (0.027)     |
|                       |         |          | +20                      | (68)  | 0.61   | (0.186)     | 0.26     | (0.079)     | 0.1       | (0.030)     |
|                       |         |          | -20                      | (-4)  | 1.69   | (0.515)     | 0.71     | (0.216)     | 0.27      | (0.082)     |
| High-temperature oil  | 1.070   | (0.039)  | +60                      | (140) | 0.14   | (0.043)     | 0.06     | (0.018)     | 0.02      | (0.006)     |
|                       |         |          | +20                      | (68)  | 0.65   | (0.198)     | 0.27     | (0.082)     | 0.1       | (0.030)     |
|                       |         |          | -10                      | (14)  | 3.96   | (1.207)     | 1.65     | (0.503)     | 0.62      | (0.189)     |
| Halocarbon oil        | 1.968   | (0.071)  | +60                      | (140) | 0.07   | (0.021)     | 0.03     | (0.009)     | 0.01      | (0.003)     |
|                       |         |          | +20                      | (68)  | 0.29   | (0.088)     | 0.12     | (0.037)     | 0.05      | (0.015)     |
|                       |         |          | -20                      | (-4)  | 2.88   | (0.878)     | 1.2      | (0.366)     | 0.45      | (0.137)     |
| Food oil (FDA listed) | 0.920   | (0.033)  | +60                      | (140) | 0.75   | (0.229)     | 0.33     | (0.101)     | 0.17      | (0.052)     |
|                       |         |          | +20                      | (68)  | 4  | (1.220)     | 1.75     | (0.534)     | 0.67      | (0.204)     |
|                       |         |          | -20                      | (-4)  | 20   | (6.100)     | 8.5      | (2.593)     | 3.25      | (0.991)     |

Permissible data of filling liquids for pressure and temperature see diagrams on page 1/355 ff.



## Overview



Diaphragm seals of sandwich design

## Technical specifications

## Diaphragm seals of sandwich design

|  |   |
|--|---|
| Nominal diameter   | Nominal pressure  |
| Connecting standard EN 1092-1                              |   |
| • DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125        | PN 16 ... PN 400  |
| Connecting standard ASME B16.5                             |   |
| • 1 inch, 1½ inch, 2 inch, 2½ inch, 3 inch, 4 inch, 5 inch | Class 150 ... class 2500  |
| Connecting standard J.I.S.                                 |   |
| • DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125        | 10K ... 63K   |
| Sealing face   |   |
| • For stainless steel, mat. No. 1.4404/316L                | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA               |
| • For the other materials                                  | To EN 1092-1, form B2 or ASME B16.5 RFSF                            |
| Materials  |   |
| • Main body  | Stainless steel mat. no. 1.4404/316L                                |
| • Wetted parts   | Stainless steel mat. no. 1.4404/316L                                |
|  | • Without coating   |
|  | • PTFE coating  |
|  | • ECTFE coating (for vacuum on request)                             |
|  | • PFA coating   |
|  | Monel 400, mat. No. 2.4360  |
|  | Hastelloy C276, mat. No. 2.4819                                     |
|  | Hastelloy C4, mat. No. 2.4602                                       |
|  | Hastelloy C22, mat. no. 2.4602                                      |
|  | Tantalum  |
|  | Titanium, mat. no. 3.7035   |
|  | Nickel 201  |
|  | Duplex 2205, mat. no. 1.4462  |
|  | Stainless steel 316L, gold plated, thickness approx. 25 µm          |
| • Capillary  | Stainless steel, mat. No. 1.4571/316Ti                              |
| • Sheath   | Spiral protective tube made of stainless steel, mat. No. 1.4301/304 |

|   |   |
|---|---|
| Sealing material in the process flanges   |   |
| • For pressure transmitters, absolute pressure transmitters and low-pressure applications | Copper  |
| • For other applications  | Viton   |
| Maximum pressure  | See above and the technical data of the pressure transmitters   |
| Tube length   | Without tube as standard (tube available on request)  |
| Capillary   |   |
| • Length  | Max. 10 m (32.8 ft), longer lengths on request  |
| • Internal diameter   | max. 2 mm (0.079 inch)  |
| • Minimum bending radius  | 150 mm (5.9 inch)   |
| Filling liquid  | Silicone oil M5   |
|   | Silicone oil M50  |
|   | High-temperature oil  |
|   | Halocarbon oil (for measuring O <sub>2</sub> )  |
|   | Food grade oil (FDA listed)   |
| Permissible ambient temperature   | Dependent on the pressure transmitter and the filling liquid of the remote seal   |
|   | More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals |
| Weight  | Approx. 4 kg (8.82 lb)  |

## Certificate and approvals

|  |  |
|--|--|
| Classification according to pressure equipment directive (DGRL 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) |
|--|--|

# Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

## Diaphragm seals of sandwich design with flexible capillary

### Selection and Ordering data

Article No.

Order  
code

#### Diaphragm seal

Sandwich type design, with flexible capillary tube, connected with flexible capillary tube to a

- SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off

7MF0800 -

7MF0801 -

7MF0802 -

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Nominal diameter Nominal pressure

Connecting standard EN 1092-1

(DN 25, DN 40 and DN 50 recommended only for pressure transmitters)

|        |               |     |
|--------|---------------|-----|
| DN 25  | PN 16 ... 400 | 0BQ |
| DN 40  | PN 16 ... 400 | 0DQ |
| DN 50  | PN 16 ... 400 | 0EQ |
| DN 65  | PN 16 ... 400 | 0FQ |
| DN 80  | PN 16 ... 400 | 0GQ |
| DN 100 | PN 16 ... 400 | 0HQ |
| DN 125 | PN 16 ... 400 | 0JQ |

Connecting standard ASME B16.5

(1 inch, 1½ inch and 2 inch recommended only for pressure transmitters)

|         |                    |     |
|---------|--------------------|-----|
| 1 inch  | class 150 ... 2500 | 1KX |
| 1½ inch | class 150 ... 2500 | 1LX |
| 2 inch  | class 150 ... 2500 | 1MX |
| 2½ inch | class 150 ... 2500 | 1NX |
| 3 inch  | class 150 ... 2500 | 1PX |
| 4 inch  | class 150 ... 2500 | 1QX |
| 5 inch  | class 150 ... 2500 | 1RX |

Connecting standard J.I.S.

(DN 25, DN 40 and DN 50 recommended only for pressure transmitters)

|        |             |     |
|--------|-------------|-----|
| DN 25  | 10K ... 63K | 2BW |
| DN 40  | 10K ... 63K | 2DW |
| DN 50  | 10K ... 63K | 2EW |
| DN 65  | 10K ... 63K | 2FW |
| DN 80  | 10K ... 63K | 2GW |
| DN 100 | 10K ... 63K | 2HW |
| DN 125 | 10K ... 63K | 2JW |

Other version  
Add Order code and plain text

9AA H1Y

#### Length of capillary

|       |    |
|-------|----|
| 1 m   | 10 |
| 1,6 m | 11 |
| 2 m   | 12 |
| 2,5 m | 13 |
| 3 m   | 14 |
| 4 m   | 15 |
| 5 m   | 16 |
| 6 m   | 17 |
| 7 m   | 18 |
| 8 m   | 20 |
| 9 m   | 21 |
| 10 m  | 22 |

### Selection and Ordering data

Article No.

Order  
code

#### Diaphragm seal

Sandwich type design, with flexible capillary tube, connected with flexible capillary tube to a

- SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off

7MF0800 -

7MF0801 -

7MF0802 -

11 m (only for 7MF0802)

23

12 m (only for 7MF0802)

24

13 m (only for 7MF0802)

25

14 m (only for 7MF0802)

26

15 m (only for 7MF0802)

27

Other version

98

Add Order code and plain text

L1Y

#### Filling liquid

Silicone oil M5  
Silicone oil M50  
High-temperature oil  
Halocarbon oil  
Food-grade oil (FDA listed)  
Other version  
Add Order code and plain text

A

B

C

D

E

Z

P1Y

#### Wetted parts materials

Stainless steel 316L  
• Without coating  
• With PFA coating  
• With PTFE coating  
• With ECTFE coating  
Monel 400, 2.4360  
Hastelloy C276, 2.4819  
Tantalum  
Titanium, 3.7035  
Nickel 201  
Diaphragm Duplex, 1.4462  
Diaphragm plus flange Duplex, 1.4462  
Stainless steel 316L with gold coating  
Hastelloy C4, 2.4610  
Hastelloy C22, 2.4602  
Other version  
Add Order code and plain text

A

D

E0

F

G

J

K

L0

M0

Q

R

S0

U0

V0

Z8

Q1Y

#### Extension length

- without
- 50 mm (2")
- 100 mm (4")
- 150 mm (6")
- 200 mm (8")
- 250 mm (10")

0

1

2

3

4

5




Z8

Q1Y

Other version  
Add Order code and plain text

## Diaphragm seals of sandwich design with flexible capillary

1

| Selection and Ordering data   |                 | Article No.   | Order code |
|---|-----------------|---|------------|
| <b>Diaphragm seal</b>   |                 |   |            |
| Sandwich type design, with flexible capillary tube, connected with flexible capillary tube to a   |                 |   |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off</li> </ul> |                 | <b>7MF0800 -</b>  |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off</li> </ul>   |                 | <b>7MF0801 -</b>  |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off</li> </ul>  |                 | <b>7MF0802 -</b>  |            |
|   |                 |    | <b>- 0</b> |
| <b>Customer-specific extension length</b>   |                 |   |            |
| <ul style="list-style-type: none"> <li>Wetted parts stainless steel without coating</li> </ul>  |                 |   |            |
| Range   | Standard length |   |            |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>A 1</b>  |            |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>A 2</b>  |            |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>A 3</b>  |            |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>A 4</b>  |            |
| 201 ... 250 mm (7.91 ... 9.84")   | 250 mm (9.84")  | <b>A 5</b>  |            |
| <ul style="list-style-type: none"> <li>Wetted parts stainless steel with ECTFE coating</li> </ul>   |                 |   |            |
| Range   | Standard length |   |            |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>F 1</b>  |            |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>F 2</b>  |            |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>F 3</b>  |            |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>F 4</b>  |            |
| 201 ... 250 mm (7.91 ... 9.84")   | 250 mm (9.84")  | <b>F 5</b>  |            |
| <ul style="list-style-type: none"> <li>Wetted parts stainless steel with PFA coating</li> </ul>   |                 |   |            |
| Range   | Standard length |   |            |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>D 1</b>  |            |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>D 2</b>  |            |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>D 3</b>  |            |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>D 4</b>  |            |
| 201 ... 250 mm (7.91 ... 9.84")   | 250 mm (9.84")  | <b>D 5</b>  |            |
| <ul style="list-style-type: none"> <li>Wetted parts Monel 400</li> </ul>  |                 |   |            |
| Range   | Standard length |   |            |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>G 1</b>  |            |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>G 2</b>  |            |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>G 3</b>  |            |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>G 4</b>  |            |
|   |                 |  | <b>- 0</b> |
| <b>Diaphragm seal</b>   |                 |   |            |
| Sandwich type design, with flexible capillary tube, connected with flexible capillary tube to a   |                 |   |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off</li> </ul> |                 | <b>7MF0800 -</b>  |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off</li> </ul>   |                 | <b>7MF0801 -</b>  |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off</li> </ul>  |                 | <b>7MF0802 -</b>  |            |
|   |                 |  | <b>- 0</b> |
| <ul style="list-style-type: none"> <li>Wetted parts Hastelloy C276</li> </ul>   |                 |   |            |
| Range   | Standard length |   |            |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>J 1</b>  |            |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>J 2</b>  |            |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>J 3</b>  |            |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>J 4</b>  |            |
| <ul style="list-style-type: none"> <li>Wetted parts Tantalum</li> </ul>   |                 |   |            |
| Range   | Standard length |   |            |
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")   | <b>K 1</b>  |            |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94")  | <b>K 2</b>  |            |
| 101 ... 150 mm (3.98 ... 5.91")   | 150 mm (5.91")  | <b>K 3</b>  |            |
| 151 ... 200 mm (5.94 ... 7.87")   | 200 mm (7.87")  | <b>K 4</b>  |            |

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

### Diaphragm seals of sandwich design with flexible capillary

1

| Selection and Ordering data  | Order code | Selection and Ordering data   | Order code |
|--|------------|---|------------|
| <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code.  |            | <b>Further designs</b><br>Add "-Z" to Article No. and specify Order code. |            |
| <b>Factory certificates</b><br>Quality inspection certificate (Five-step factory calibration) to IEC 60770-2   | <b>C11</b> | Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)  | <b>M82</b> |
| Inspection certificate to EN 10204-3.1 - material of body and wetted parts   | <b>C12</b> | • DN 25   | <b>M83</b> |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)  | <b>C13</b> | • DN 40   | <b>M84</b> |
| Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts   | <b>C15</b> | • DN 50   | <b>M85</b> |
| Certificate of FDA-approved fill oil (to EN10204-2.2)  | <b>C17</b> | • DN 80   | <b>M86</b> |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)   | <b>C20</b> | • DN 100  | <b>M87</b> |
|  |            | • DN 125  |            |
| <b>Accessories</b><br>Spark arrestor (for gauge and absolute pressure transmitters)  | <b>D61</b> | <b>Capillary connection</b><br>(only for 7MF0800)                         |            |
| Spark arrestor (for differential pressure and level transmitters)  | <b>D62</b> | Single-side mounted at differential pressure transmitters at high-side    | <b>S03</b> |
| Low-temperature version (for Silicon Oil M50 only)   | <b>D67</b> | Single-side mounted at differential pressure transmitters at low-side     | <b>S04</b> |
| <b>Negative pressure services</b><br>Negative pressure service (for gauge and absolute pressure transmitters)  | <b>D81</b> | <b>Capillary coating</b><br>PE protective tube                            |            |
| Negative pressure service (for differential pressure transmitters)   | <b>D83</b> | 1 m   | <b>S10</b> |
| Extended negative pressure service (for gauge and absolute pressure transmitters) (only 7MF0800)   | <b>D85</b> | 1,6 m   | <b>S11</b> |
| Extended negative pressure service (for differential pressure transmitters)  | <b>D88</b> | 2 m   | <b>S12</b> |
|  |            | 2,5 m   | <b>S13</b> |
| <b>General product approvals without explosion proof approvals</b><br>Oil-and grease-free cleaned version (for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar) | <b>E80</b> | 3 m   | <b>S14</b> |
| Oil-and grease-free cleaned version (not for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)   | <b>E87</b> | 4 m   | <b>S15</b> |
|  |            | 5 m   | <b>S16</b> |
| <b>Sealing surface</b><br>Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)  | <b>M50</b> | 6 m   | <b>S17</b> |
| Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)   | <b>M54</b> | 7 m   | <b>S18</b> |
| Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)   | <b>M64</b> | 8 m   | <b>S19</b> |
| Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)   |            | 9 m   | <b>S20</b> |
| • DN 25  | <b>M70</b> | 10 m  | <b>S21</b> |
| • DN 40  | <b>M71</b> | 11 m (only for 7MF0802)   | <b>S22</b> |
| • DN 50  | <b>M72</b> | 12 m (only for 7MF0802)   | <b>S23</b> |
| • DN 80  | <b>M73</b> | 13 m (only for 7MF0802)   | <b>S24</b> |
| • DN 100   | <b>M74</b> | 14 m (only for 7MF0802)   | <b>S25</b> |
| • DN 125   | <b>M75</b> | 15 m (only for 7MF0802)   | <b>S26</b> |
| Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)   |            | <b>PTFE protective tube</b>   |            |
| • DN 25  | <b>M76</b> | 1 m   | <b>S40</b> |
| • DN 40  | <b>M77</b> | 1,6 m   | <b>S41</b> |
| • DN 50  | <b>M78</b> | 2 m   | <b>S42</b> |
| • DN 80  | <b>M79</b> | 2,5 m   | <b>S43</b> |
| • DN 100   | <b>M80</b> | 3 m   | <b>S44</b> |
| • DN 125   | <b>M81</b> | 4 m   | <b>S45</b> |
|  |            | 5 m   | <b>S46</b> |
|  |            | 6 m   | <b>S47</b> |
|  |            | 7 m   | <b>S48</b> |
|  |            | 8 m   | <b>S49</b> |
|  |            | 9 m   | <b>S50</b> |
|  |            | 10 m  | <b>S51</b> |
|  |            | 11 m (only for 7MF0802)   | <b>S52</b> |
|  |            | 12 m (only for 7MF0802)   | <b>S53</b> |
|  |            | 13 m (only for 7MF0802)   | <b>S54</b> |
|  |            | 14 m (only for 7MF0802)   | <b>S55</b> |
|  |            | 15 m (only for 7MF0802)   | <b>S56</b> |

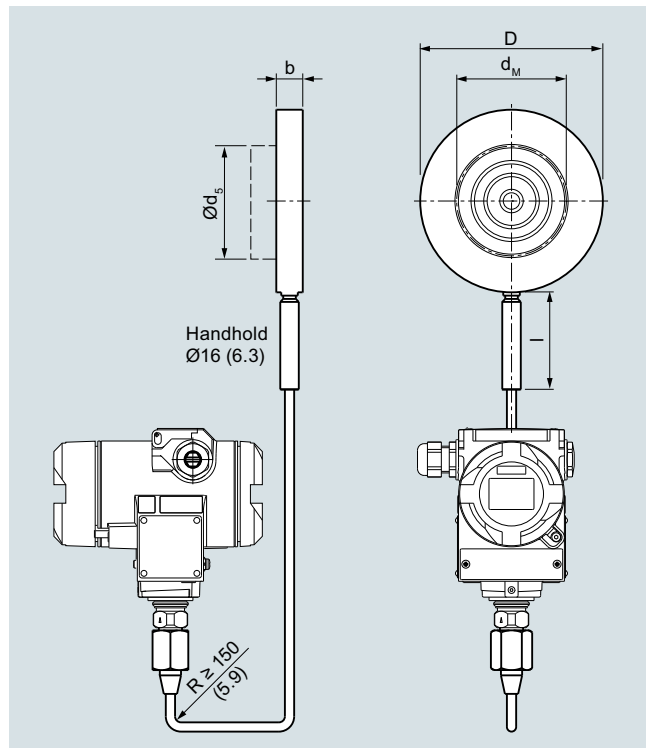
| Selection and Ordering data  | Order code |
|--|------------|
| <b>Further designs</b>   |            |
| Add "-Z" to Article No. and specify Order code.  |            |
| <u>PVC protective tube</u>   |            |
| 1 m  | <b>S70</b> |
| 1,6 m  | <b>S71</b> |
| 2 m  | <b>S72</b> |
| 2,5 m  | <b>S73</b> |
| 3 m  | <b>S74</b> |
| 4 m  | <b>S75</b> |
| 5 m  | <b>S76</b> |
| 6 m  | <b>S77</b> |
| 7 m  | <b>S78</b> |
| 8 m  | <b>S79</b> |
| 9 m  | <b>S80</b> |
| 10 m   | <b>S81</b> |
| 11 m (only for 7MF0802)  | <b>S82</b> |
| 12 m (only for 7MF0802)  | <b>S83</b> |
| 13 m (only for 7MF0802)  | <b>S84</b> |
| 14 m (only for 7MF0802)  | <b>S85</b> |
| 15 m (only for 7MF0802)  | <b>S86</b> |
| <b>Device settings</b>   |            |
| Operating Temperature; Lower range value ... °C (°F),<br>upper range value ... °C (°F) | <b>Y10</b> |
| Static pressure: ... bar (psi)   | <b>Y11</b> |
| Customer specific extension length (enter required<br>length in plain text)            | <b>Y44</b> |

## Pressure Measurement

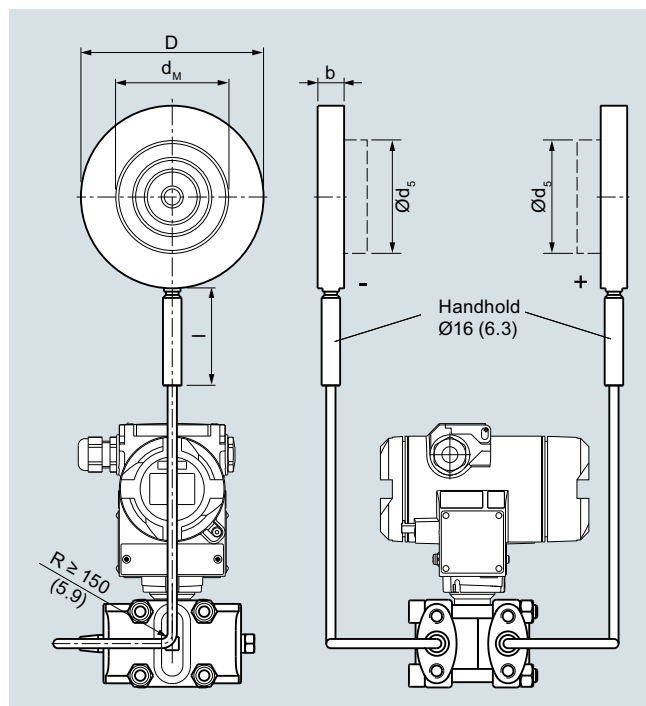
Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

### Diaphragm seals of sandwich design with flexible capillary

#### Dimensional drawings



Diaphragm seals of sandwich design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)



Diaphragm seals of sandwich design (without flange) with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or differential pressure and flow, dimensions in mm (inch)

#### Connection to EN 1092-1

| Nom. diameter | Nom. pressure | b  | D   | d <sub>5</sub> | d <sub>M</sub> with tube | d <sub>M</sub> w/o tube | l   |
|---------------|---------------|----|-----|----------------|--------------------------|-------------------------|-----|
|               |               | mm | mm  | mm             | mm                       | mm                      | mm  |
| DN 25         | PN 16 ...     | 20 | 68  | 24,5           | 22.6                     | 27                      | 100 |
| DN 40         | PN 400        | 20 | 88  | 38             | 30                       | 40                      | 100 |
| DN 50         |               | 20 | 102 | 48.3           | 40                       | 51                      | 100 |
| DN 65         |               | 20 | 122 | 48,3           | 40                       | 65                      | 100 |
| DN 80         |               | 20 | 138 | 76             | 65                       | 85                      | 100 |
| DN 100        |               | 20 | 158 | 94             | 85                       | 85                      | 100 |
| DN 125        |               | 22 | 188 | 125            | 116                      | 116                     | 100 |

#### Connection to ASME B16.5

| Nom. diameter | Nom. pressure | b         | D          | d <sub>5</sub> | d <sub>M</sub> with tube | d <sub>M</sub> w/o tube | l          |
|---------------|---------------|-----------|------------|----------------|--------------------------|-------------------------|------------|
|               | lb/sq.in.     | mm (inch) | mm (inch)  | mm (inch)      | mm (inch)                | mm (inch)               | mm (inch)  |
| 1 inch        | 150 ... 2500  | 20 (0.79) | 51 (2.01)  | 24.5 (0.96)    | 22.6 (0.89)              | 30 (1.18)               | 100 (3.94) |
| 1½ inch       |               | 20 (0.79) | 73 ( )     | 38 (1.5)       | 30 (1.18)                | 40 (1.57)               | 100 (3.94) |
| 2 inch        |               | 20 (0.79) | 100 (3.94) | 48.3 (1.9)     | 40 (1.57)                | 51 (2.01)               | 100 (3.94) |
| 2½ inch       |               | 20 (0.79) | 105 (4.13) | 48.3 (1.9)     | 40 (1.57)                | 65 (2.56)               | 100 (3.94) |
| 3 inch        |               | 20 (0.79) | 134 (5.28) | 72 (3)         | 65 (2.56)                | 85 (3.35)               | 100 (3.94) |
| 4 inch        |               | 20 (0.79) | 158 (6.22) | 94 (3.69)      | 85 (3.35)                | 85 (3.35)               | 100 (3.94) |
| 5 inch        |               | 22 (0.87) | 186 (7.32) | 125 (4.92)     | 116 (4.57)               | 116 (4.57)              | 100 (3.94) |

#### Connection to J.I.S.

| Nom. diameter | Nom. pressure | b         | D 10K, 20K | D 30K... 63K | d <sub>5</sub> | d <sub>M</sub> with tube | d <sub>M</sub> w/o tube | l          |
|---------------|---------------|-----------|------------|--------------|----------------|--------------------------|-------------------------|------------|
|               |               | mm (inch) | mm (inch)  | mm (inch)    | mm (inch)      | mm (inch)                | mm (inch)               | mm (inch)  |
| DN 25         | 10K ... 63K   | 20 (0.79) | 67 (2.64)  | 70 (2.76)    | 24.5 (0.96)    | 22.6 (0.89)              | 30 (1.18)               | 100 (3.94) |
| DN 40         |               | 20 (0.79) | 81 (3.19)  | 90 (3.54)    | 38 (1.5)       | 30 (1.18)                | 36 (1.42)               | 100 (3.94) |
| DN 50         |               | 20 (0.79) | 96 (3.78)  | 105 (4.13)   | 48.3 (1.9)     | 40 (1.57)                | 51 (2.01)               | 100 (3.94) |
| DN 65         |               | 20 (0.79) | 116 (4.57) | 130 (5.12)   | 48.3 (1.9)     | 40 (1.57)                | 65 (2.56)               | 100 (3.94) |
| DN 80         |               | 20 (0.79) | 132 (5.2)  | 140 (5.51)   | 76 (2.99)      | 65 (2.56)                | 85 (3.35)               | 100 (3.94) |
| DN 100        |               | 20 (0.79) | 160 (6.3)  | 160 (6.3)    | 94 (3.69)      | 85 (3.35)                | 85 (3.35)               | 100 (3.94) |
| DN 125        |               | 20 (0.79) | 195 (7.68) | 195 (7.68)   | 125 (4.92)     | 116 (4.57)               | 116 (4.57)              | 100 (3.94) |

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

## Diaphragm seals of flange design with flexible capillary

1

## Overview



Diaphragm seals of flange design

## Technical specifications

## Diaphragm seals of flange design with flexible capillary

| Nominal diameter                            | Nominal pressure                                      |
|---|---|
| Connecting standard EN 1092-1               |   |
| • DN 25                                     | PN 10/16/25/40/63/100/160/250                         |
| • DN 40                                     | PN 10/16/25/40/63/100/160                             |
| • DN 50                                     | PN 10/16/25/40/63/100                                 |
| • DN 80                                     | PN 10/16/25/40/100                                    |
| • DN 100                                    | PN 10/16/25/40  |
| • DN 125                                    | PN 16/40  |
| Connecting standard ASME B16.5              |   |
| • 1 inch                                    | Class 150/300/600/1500                                |
| • 1½ inch                                   | Class 150/300/400/600/900/1500                        |
| • 2 inch                                    | Class 150/300/400/600/900/1500                        |
| • 3 inch                                    | Class 150/300/600/1500                                |
| • 4 inch                                    | Class 150/300/400/1500                                |
| • 5 inch                                    | Class 150/300/400                                     |
| Connecting standard J.I.S.                  |   |
| • DN 50                                     | 10K   |
| • DN 80                                     | 20K   |
| • DN 100                                    | 40K   |
| Sealing face                                |   |
| • For stainless steel, mat. No. 1.4404/316L | To EN 1092-1, form B1 or ASMR B16.5 RF 125 ... 250 AA |
| • For the other materials                   | To EN 1092-1, form B2 or ASME B16.5 RFSF              |

## Materials

- Main body
- Wetted parts

Stainless steel  
mat. no. 1.4404/316L  
Stainless steel  
mat. no. 1.4404/316L

- Without coating
- PTFE coating
- ECTFE coating (for vacuum on request)
- PFA coating

Monel 400, mat. No. 2.4360  
Hastelloy C276, mat. No. 2.4819  
Hastelloy C4, mat. No. 2.4602  
Hastelloy C22, W.-Nr. 2.4602  
Tantalum  
Titanium, W.-Nr. 3.7035  
Nickel 201  
Duplex 2205, mat. no. 1.4462  
Stainless steel 316L, gold plated, thickness approx. 25 µm

## • Capillary

Stainless steel, mat. No. 1.4571/316Ti

## • Sheath

Spiral protective tube made of stainless steel, mat. no. 1.4301/304

## Sealing material in the process flanges

- For pressure transmitters, absolute pressure transmitters and low-pressure applications
- For other applications

Copper

Viton

## Maximum pressure

See above and the technical data of the pressure transmitter

## Tube length

Without tube as standard (tube available on request)

## Capillary

## • Length

Max. 10 m (32.8 ft), longer lengths on request

## • Internal diameter

2 mm (0.079 inch)

## • Minimum bending radius

150 mm (5.9 inch)

## Filling liquid

(for remote seals of sandwich and flange design)

Silicone oil M5

Silicone oil M50

High-temperature oil

Halocarbon oil (for measuring O<sub>2</sub>)

Food oil (FDA listed)

## Permissible ambient temperature

Dependent on the pressure transmitter and the filling liquid of the remote seal

More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals

## Weight

Approx. 4 kg (8.82 lb)

## Certificate and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)



# Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

## Diaphragm seals of flange design with flexible capillary

### Selection and Ordering data

Article No.

Order  
code

#### Diaphragm seal

Flange type design, with flexible capillary tube, connected with flexible capillary tube to a

- SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off

7MF0810 -

7MF0811 -

7MF0812 -

- 0

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Nominal diameter Nominal pressure

Connecting standard EN 1092-1

(DN 25, DN 40 and DN 50 recommended only for pressure transmitters)

|        |                |     |
|--------|----------------|-----|
| DN 25  | PN 10/16/25/40 | 0BD |
|        | PN 63/100      | 0BF |
|        | PN 160         | 0BG |
| DN 40  | PN 250         | 0BH |
|        | PN 10/16/25/40 | 0DD |
|        | PN 63/100      | 0DF |
| DN 50  | PN 160         | 0DG |
|        | PN 10/16/25/40 | 0ED |
|        | PN 63          | 0EE |
| DN 80  | PN 100         | 0EF |
|        | PN 10/16/25/40 | 0GD |
|        | PN 100         | 0GF |
| DN 100 | PN 10/16       | 0HB |
|        | PN 25/40       | 0HD |
| DN 125 | PN 16          | 0JB |
|        | PN 40          | 0JD |

Connecting standard ASME B16.5

(1 inch, 1½ inch and 2 inch recommended only for pressure transmitters)

|         |                |     |
|---------|----------------|-----|
| 1 inch  | class 150      | 1KL |
|         | class 300      | 1KM |
|         | class 600      | 1KN |
|         | class 1500     | 1KP |
| 1½ inch | class 150      | 1LA |
|         | class 300      | 1LB |
|         | class 400/600  | 1LD |
|         | class 900/1500 | 1LF |
| 2 inch  | class 150      | 1MA |
|         | class 300      | 1MB |
|         | class 400/600  | 1MD |
|         | class 900/1500 | 1MF |
| 3 inch  | class 150      | 1PA |
|         | class 300      | 1PB |
|         | class 600      | 1PD |
|         | class 1500     | 1PF |
| 4 inch  | class 150      | 1QA |
|         | class 300      | 1QB |
|         | class 400      | 1QC |
|         | class 1500     | 1QF |
| 5 inch  | class 150      | 1RA |
|         | class 300      | 1RB |
|         | class 400      | 1RC |

### Selection and Ordering data

Article No.

Order  
code

#### Diaphragm seal

Flange type design, with flexible capillary tube, connected with flexible capillary tube to a

- SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off

7MF0810 -

7MF0811 -

7MF0812 -

- 0

Connecting standard J.I.S.

(DN 50 recommended only for pressure transmitters)

|        |      |
|--------|------|
| DN 50  | 10 K |
|        | 20 K |
|        | 40 K |
| DN 80  | 10 K |
|        | 20 K |
|        | 40 K |
| DN 100 | 10 K |
|        | 20 K |
|        | 40 K |

Other version

Add Order code and plain text

#### Transmitter connection

Connection via capillary tube

Length of capillary

|                         |    |
|-------------------------|----|
| 1 m                     | 10 |
| 1,6 m                   | 11 |
| 2 m                     | 12 |
| 2,5 m                   | 13 |
| 3 m                     | 14 |
| 4 m                     | 15 |
| 5 m                     | 16 |
| 6 m                     | 17 |
| 7 m                     | 18 |
| 8 m                     | 20 |
| 9 m                     | 21 |
| 10 m                    | 22 |
| 11 m (only for 7MF0812) | 23 |
| 12 m (only for 7MF0812) | 24 |
| 13 m (only for 7MF0812) | 25 |
| 14 m (only for 7MF0812) | 26 |
| 15 m (only for 7MF0812) | 27 |
| Other version           | 98 |

Add Order code and plain text

#### Filling liquid

Silicone oil M5  
Silicone oil M50  
High-temperature oil  
Halocarbon oil  
Food-grade oil (FDA grade)  
Other version  
Add Order code and plain text

2ES  
2ET  
2EU  
2GS  
2GT  
2GU  
2HS  
2HT  
2HU  
9AA

H1Y

L1Y

A  
B  
C  
D  
E  
Z

P1Y



## Diaphragm seals of flange design with flexible capillary

1

| Selection and Ordering data  | Article No.   | Order code | Selection and Ordering data | Article No. | Order code |
|--|---|------------|-----------------------------|-------------|------------|
| <div>Diaphragm seal</div> <div>Flange type design, with flexible capillary tube, connected with flexible capillary tube to a</div> <div><div><div>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately</div><div>Scope of delivery: 1 off</div></div><div><div>SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately,</div><div>Scope of delivery: 1 off</div></div><div><div>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately,</div><div>Scope of delivery: 2 off</div></div></div> | <div>7MF0810 -</div> <div>7MF0811 -</div> <div>7MF0812 -</div> <div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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# Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

1

## Diaphragm seals of flange design with flexible capillary

| Selection and Ordering data   |                 | Article No.      | Order code | Selection and Ordering data  | Order code |
|---|-----------------|------------------|------------|--|------------|
| <b>Diaphragm seal</b>   |                 |                  |            | <b>Further designs</b>   |            |
| Flange type design, with flexible capillary tube, connected with flexible capillary tube to a   |                 |                  |            | Add <b>"-Z"</b> to Article No. and specify Order code.   |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off</li> </ul> |                 | <b>7MF0810 -</b> |            | <b>Factory certificates</b>  |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off</li> </ul>   |                 | <b>7MF0811 -</b> |            | Quality inspection certificate (Five-step factory calibration) to IEC 60770-2  | <b>C11</b> |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off</li> </ul>  |                 | <b>7MF0812 -</b> |            | Inspection certificate to EN 10204-3.1 - material of body and wetted parts   | <b>C12</b> |
|   |                 |                  |            | Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)                                      | <b>C13</b> |
|   |                 |                  |            | Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts   | <b>C15</b> |
|   |                 |                  |            | Certificate of FDA-approved fill oil (to EN10204-2.2)  | <b>C17</b> |
|   |                 |                  |            | Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)   | <b>C20</b> |
| <ul style="list-style-type: none"> <li>Wetted parts Tantalum</li> </ul>   |                 |                  |            | <b>Accessories</b>   |            |
| Range   | Standard length |                  |            | Spark arrestor (for gauge and absolute pressure transmitters)  | <b>D61</b> |
| 20 ... 50 mm<br>(0.79 ... 1.97")  | 50 mm (1.97")   |                  | <b>K1</b>  | Spark arrestor (for differential pressure and flow transmitters)   | <b>D62</b> |
| 51 ... 100 mm<br>(2.01 ... 3.94")   | 100 mm (3.94")  |                  | <b>K2</b>  | Low-temperature version (for Silicon Oil M50 only)   | <b>D67</b> |
| 101 ... 150 mm<br>(3.98 ... 5.91")  | 150 mm (5.91")  |                  | <b>K3</b>  |  |            |
| 151 ... 200 mm<br>(5.94 ... 7.87")  | 200 mm (7.87")  |                  | <b>K4</b>  |  |            |
|   |                 |                  |            | <b>Negative pressure services</b>  |            |
|   |                 |                  |            | Negative pressure service (for gauge and absolute pressure transmitters) (only for 7MF0810)  | <b>D81</b> |
|   |                 |                  |            | Negative pressure service (for differential pressure transmitters)   | <b>D83</b> |
|   |                 |                  |            | Extended negative pressure service (for gauge and absolute pressure transmitters) (only for 7MF0810)   | <b>D85</b> |
|   |                 |                  |            | Extended negative pressure service (for differential pressure transmitters)  | <b>D88</b> |
|   |                 |                  |            | <b>General product approvals without explosion proof approvals</b>   |            |
|   |                 |                  |            | Oil-and grease-free cleaned version (for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar) | <b>E80</b> |
|   |                 |                  |            | Oil-and grease-free cleaned version (not for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)   | <b>E87</b> |
|   |                 |                  |            | <b>Sealing surface</b>   |            |
|   |                 |                  |            | Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)  | <b>M50</b> |
|   |                 |                  |            | Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)   | <b>M54</b> |
|   |                 |                  |            | Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)   | <b>M64</b> |
|   |                 |                  |            | Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)   |            |
|   |                 |                  |            | • DN 25  | <b>M70</b> |
|   |                 |                  |            | • DN 40  | <b>M71</b> |
|   |                 |                  |            | • DN 50  | <b>M72</b> |
|   |                 |                  |            | • DN 80  | <b>M73</b> |
|   |                 |                  |            | • DN 100   | <b>M74</b> |
|   |                 |                  |            | • DN 125   | <b>M75</b> |
|   |                 |                  |            | Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)   |            |
|   |                 |                  |            | • DN 25  | <b>M76</b> |
|   |                 |                  |            | • DN 40  | <b>M77</b> |
|   |                 |                  |            | • DN 50  | <b>M78</b> |
|   |                 |                  |            | • DN 80  | <b>M79</b> |
|   |                 |                  |            | • DN 100   | <b>M80</b> |
|   |                 |                  |            | • DN 125   | <b>M81</b> |

# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

## Diaphragm seals of flange design with flexible capillary

1

| Selection and Ordering data   | Order code | Selection and Ordering data  | Order code |
|---|------------|--|------------|
| <b>Further designs</b>  |            | <b>Further designs</b>   |            |
| Add "-Z" to Article No. and specify Order code.                                       |            | Add "-Z" to Article No. and specify Order code.                          |            |
| Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)              |            | <u>PVC protective tube</u>   |            |
| • DN 25   | <b>M82</b> | 1 m  | <b>S70</b> |
| • DN 40   | <b>M83</b> | 1,6 m  | <b>S71</b> |
| • DN 50   | <b>M84</b> | 2 m  | <b>S72</b> |
| • DN 80   | <b>M85</b> | 2,5 m  | <b>S73</b> |
| • DN 100  | <b>M86</b> | 3 m  | <b>S74</b> |
| • DN 125  | <b>M87</b> | 4 m  | <b>S75</b> |
|   |            | 5 m  | <b>S76</b> |
|   |            | 6 m  | <b>S77</b> |
|   |            | 7 m  | <b>S78</b> |
|   |            | 8 m  | <b>S79</b> |
|   |            | 9 m  | <b>S80</b> |
|   |            | 10 m   | <b>S81</b> |
|   |            | 11 m (only for 7MF0802)  | <b>S82</b> |
|   |            | 12 m (only for 7MF0802)  | <b>S83</b> |
|   |            | 13 m (only for 7MF0802)  | <b>S84</b> |
|   |            | 14 m (only for 7MF0802)  | <b>S85</b> |
|   |            | 15 m (only for 7MF0802)  | <b>S86</b> |
| <b>Capillary connection</b>   |            | <b>Device settings</b>   |            |
| <u>For 7MF0810</u>  |            | Operating Temperature; Lower range value ... °C (°F),                    | <b>Y10</b> |
| Radial capillary pipe outlet (for single-side mounting and capillary connection only) | <b>S01</b> | upper range value ... °C (°F)  | <b>Y11</b> |
| Single-side mounted at differential pressure transmitters at high-side                | <b>S03</b> | Static pressure: ... bar (psi)   | <b>Y44</b> |
| Single-side mounted at differential pressure transmitters at low-side                 | <b>S04</b> | Customer specific extension length (enter required length in plain text) |            |
| Elongated pipe, 150 mm instead of 100 mm  | <b>S05</b> |  |            |
| Elongated pipe, 200 mm instead of 100 mm  | <b>S06</b> |  |            |
| Elongated pipe elbow, 200 mm instead of 130 mm cooling element                        | <b>S07</b> |  |            |
|   | <b>S08</b> |  |            |
| <u>For 7MF0811</u>  |            |  |            |
| Radial capillary pipe outlet (for single-side mounting and capillary connection only) | <b>S01</b> |  |            |
| <u>For 7MF0812</u>  |            |  |            |
| Radial capillary pipe outlet (for double-side mounting)                               | <b>S02</b> |  |            |
| <b>Capillary coating</b>  |            |  |            |
| <u>PE protective tube</u>   |            |  |            |
| 1 m   | <b>S10</b> |  |            |
| 1,6 m   | <b>S11</b> |  |            |
| 2 m   | <b>S12</b> |  |            |
| 2,5 m   | <b>S13</b> |  |            |
| 3 m   | <b>S14</b> |  |            |
| 4 m   | <b>S15</b> |  |            |
| 5 m   | <b>S16</b> |  |            |
| 6 m   | <b>S17</b> |  |            |
| 7 m   | <b>S18</b> |  |            |
| 8 m   | <b>S19</b> |  |            |
| 9 m   | <b>S20</b> |  |            |
| 10 m  | <b>S21</b> |  |            |
| 11 m (only for 7MF0802)   | <b>S22</b> |  |            |
| 12 m (only for 7MF0802)   | <b>S23</b> |  |            |
| 13 m (only for 7MF0802)   | <b>S24</b> |  |            |
| 14 m (only for 7MF0802)   | <b>S25</b> |  |            |
| 15 m (only for 7MF0802)   | <b>S26</b> |  |            |
| <u>PTFE protective tube</u>   |            |  |            |
| 1 m   | <b>S40</b> |  |            |
| 1,6 m   | <b>S41</b> |  |            |
| 2 m   | <b>S42</b> |  |            |
| 2,5 m   | <b>S43</b> |  |            |
| 3 m   | <b>S44</b> |  |            |
| 4 m   | <b>S45</b> |  |            |
| 5 m   | <b>S46</b> |  |            |
| 6 m   | <b>S47</b> |  |            |
| 7 m   | <b>S48</b> |  |            |
| 8 m   | <b>S49</b> |  |            |
| 9 m   | <b>S50</b> |  |            |
| 10 m  | <b>S51</b> |  |            |
| 11 m (only for 7MF0802)   | <b>S52</b> |  |            |
| 12 m (only for 7MF0802)   | <b>S53</b> |  |            |
| 13 m (only for 7MF0802)   | <b>S54</b> |  |            |
| 14 m (only for 7MF0802)   | <b>S55</b> |  |            |
| 15 m (only for 7MF0802)   | <b>S56</b> |  |            |

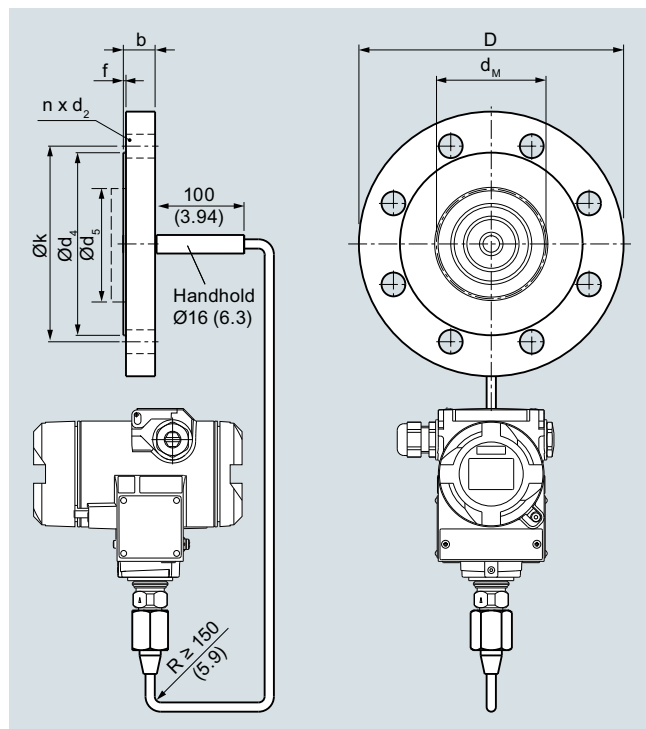
## Pressure Measurement

Remote seals for transmitters and pressure gauges

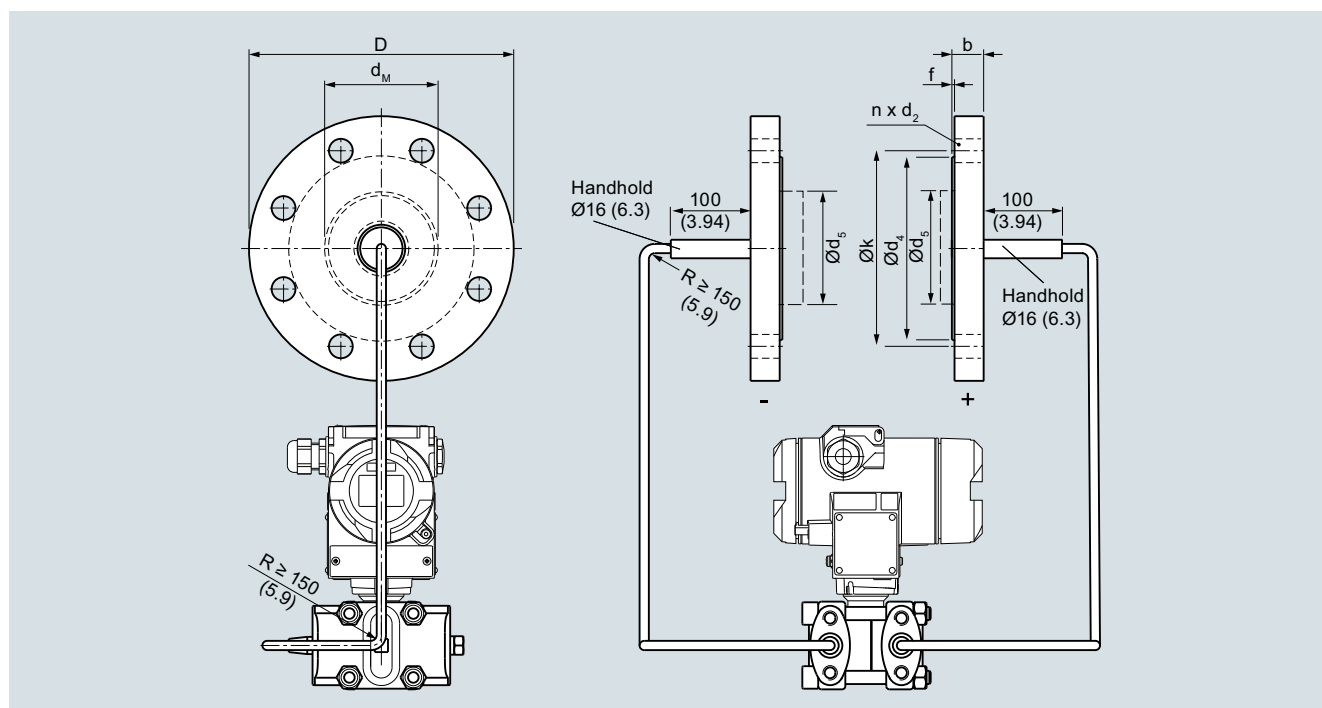
SITRANS P320/P420

### Diaphragm seals of flange design with flexible capillary

#### Dimensional drawings



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or for differential pressure and flow, dimensions in mm (inch)

**Pressure Measurement**

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

**Diaphragm seals of flange design with flexible capillary****1**Connection to EN 1092-1

| Nominal diameter | Nominal pressure | b  | D   | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub><br>with exten-<br>sion | d <sub>M</sub><br>without exten-<br>sion | f  | k   | n  | L                              |
|------------------|------------------|----|-----|----------------|----------------|----------------|---------------------------------------|--|----|-----|----|--------------------------------|
|                  |                  | mm | mm  | mm             | mm             | mm             | mm                                    | mm                                       | mm | mm  | mm | mm                             |
| DN 25            | PN 10/16/25/40   | 18 | 115 | 14             | 68             | 24.5           | 22.6                                  | 27                                       | 2  | 85  | 4  | 0, 50, 100,<br>150 oder<br>200 |
|                  | PN 63/100        | 24 | 140 | 18             | 68             | 24.5           | 22.6                                  | 27                                       | 2  | 100 | 4  |                                |
|                  | PN 160           | 24 | 140 | 18             | 68             | 24.5           | 22.6                                  | 27                                       | 2  | 100 | 4  |                                |
|                  | PN 250           | 28 | 150 | 22             | 68             | 24.5           | 22.6                                  | 27                                       | 2  | 105 | 4  |                                |
| DN 40            | PN 10/16/25/40   | 16 | 150 | 18             | 88             | 38             | 30                                    | 42                                       | 2  | 110 | 4  |                                |
|                  | PN 63/100        | 24 | 170 | 22             | 88             | 38             | 30                                    | 42                                       | 2  | 125 | 4  |                                |
|                  | PN 160           | 26 | 170 | 22             | 88             | 38             | 30                                    | 42                                       | 2  | 125 | 4  |                                |
| DN 50            | PN 10/16/25/40   | 18 | 165 | 18             | 102            | 48.3           | 40                                    | 51                                       | 2  | 125 | 4  |                                |
|                  | PN 63/100        | 26 | 195 | 26             | 102            | 48.3           | 40                                    | 51                                       | 2  | 145 | 4  |                                |
|                  | PN 160           | 28 | 195 | 26             | 102            | 48.3           | 40                                    | 51                                       | 2  | 145 | 4  |                                |
| DN 80            | PN 10/16/25/40   | 22 | 200 | 18             | 138            | 76             | 65                                    | 85                                       | 2  | 160 | 8  |                                |
|                  | PN 100           | 30 | 230 | 26             | 138            | 76             | 65                                    | 85                                       | 2  | 180 | 8  |                                |
| DN 100           | PN 10/16         | 18 | 220 | 18             | 158            | 94             | 85                                    | 85                                       | 2  | 180 | 8  |                                |
|                  | PN 25/40         | 22 | 235 | 22             | 162            | 94             | 85                                    | 85                                       | 2  | 190 | 8  |                                |
| DN 125           | PN 16            | 20 | 250 | 18             | 188            | 127            | 85                                    | 116                                      | 2  | 210 | 8  |                                |
|                  | PN 40            | 24 | 270 | 26             | 188            | 127            | 85                                    | 116                                      | 2  | 220 | 8  |                                |

Connection to ASME B16.5

| Nominal diameter | Nominal pressure | b            | D            | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub><br>with exten-<br>sion | d <sub>M</sub><br>without exten-<br>sion | f            | k            | n            | L   |
|------------------|------------------|--------------|--------------|----------------|----------------|----------------|---------------------------------------|--|--------------|--------------|--------------|---|
|                  | lb./sq.in        | inch<br>(mm) | inch<br>(mm) | inch<br>(mm)   | inch<br>(mm)   | inch<br>(mm)   | inch<br>(mm)                          | inch<br>(mm)                             | inch<br>(mm) | inch<br>(mm) | inch<br>(mm) | inch<br>(mm)  |
| 1 inch           | 150              | 0.71 (18)    | 4.33 (110)   | 0.61 (15.6)    | 2 (50.8)       | 0.96 (24.5)    | 0.89 (22.6)                           | 1.18 (30)                                | 0.08 (2)     | 3.13 (79.4)  | 4            | 0, 2,<br>3.94,<br>5.94<br>oder<br>7.87<br>(0,<br>50,<br>100,<br>150<br>oder<br>200) |
|                  | 300              | 0.77 (19.5)  | 4.92 (125)   | 0.75 (19.1)    | 2 (50.8)       | 0.96 (24.5)    | 0.89 (22.6)                           | 1.18 (30)                                | 0.08 (2)     | 3.5 (88.9)   | 4            |   |
|                  | 600              | 0.96 (24.5)  | 4.92 (125)   | 0.75 (19.1)    | 2 (50.8)       | 0.96 (24.5)    | 0.89 (22.6)                           | 1.18 (30)                                | 0.28 (7)     | 3.5 (88.9)   | 4            |   |
|                  | 1500             | 1.4 (35.6)   | 5.91 (150)   | 1 (25.4)       | 2 (50.8)       | 0.96 (24.5)    | 0.89 (22.6)                           | 1.18 (30)                                | 0.28 (7)     | 4 (101.6)    | 4            |   |
| 1½ inch          | 150              | 0.63 (15.9)  | 4.92 (125)   | 0.63 (15.9)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                             | 1.42 (36)                                | 0.08 (2)     | 3.87 (98.4)  | 4            |   |
|                  | 300              | 0.75 (19.1)  | 6.10 (155)   | 0.87 (22.2)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                             | 1.42 (36)                                | 0.08 (2)     | 4.5 (114.3)  | 4            |   |
|                  | 400/600          | 0.88 (22.3)  | 6.10 (155)   | 0.87 (22.2)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                             | 1.42 (36)                                | 0.28 (7)     | 4.5 (114.3)  | 4            |   |
|                  | 900/1500         | 1.25 (31.8)  | 7.09 (180)   | 1.13 (28.6)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                             | 1.42 (36)                                | 0.28 (7)     | 4.87 (123.8) | 4            |   |
| 2 inch           | 150              | 0.69 (17.5)  | 5.91 (150)   | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                             | 2.01 (51)                                | 0.08 (2)     | 4.75 (120.7) | 4            |   |
|                  | 300              | 0.81 (20.7)  | 6.5 (165)    | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                             | 2.01 (51)                                | 0.08 (2)     | 5 (127)      | 8            |   |
|                  | 400/600          | 1.00 (25.4)  | 6.5 (165)    | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                             | 2.01 (51)                                | 0.28 (7)     | 5 (127)      | 8            |   |
|                  | 900/1500         | 1.5 (38.1)   | 8.46 (215)   | 1.00 (25.4)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                             | 2.01 (51)                                | 0.28 (7)     | 6.5 (165.1)  | 8            |   |
| 3 inch           | 150              | 0.88 (22.3)  | 7.48 (190)   | 0.75 (19.1)    | 5 (127)        | 3 (76)         | 2.65 (65)                             | 3.35 (85)                                | 0.08 (2)     | 6 (152.4)    | 4            |   |
|                  | 300              | 1.06 (27)    | 8.27 (210)   | 0.87 (22.2)    | 5 (127)        | 3 (76)         | 2.65 (65)                             | 3.35 (85)                                | 0.08 (2)     | 6.63 (168.3) | 8            |   |
|                  | 600              | 1.23 (31.8)  | 8.27 (210)   | 0.87 (22.2)    | 5 (127)        | 3 (76)         | 2.65 (65)                             | 3.35 (85)                                | 0.28 (7)     | 6.63 (168.3) | 8            |   |
|                  | 1500             | 1.88 (47.7)  | 10.43 (265)  | 1.25 (31.8)    | 5 (127)        | 3 (76)         | 2.65 (65)                             | 3.35 (85)                                | 0.28 (7)     | 8 (203.2)    | 8            |   |
| 4 inch           | 150              | 0.88 (22.3)  | 9.06 (230)   | 0.75 (19.1)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                             | 3.35 (85)                                | 0.08 (2)     | 7.5 (190.5)  | 8            |   |
|                  | 300              | 1.19 (30.2)  | 10.04 (255)  | 0.87 (22.2)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                             | 3.35 (85)                                | 0.08 (2)     | 7.87 (200)   | 8            |   |
|                  | 400              | 1.38 (35)    | 10.04 (255)  | 0.87 (22.2)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                             | 3.35 (85)                                | 0.28 (7)     | 7.87 (200)   | 8            |   |
|                  | 1500             | 2.13 (54)    | 12.20 (310)  | 1.37 (34.9)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                             | 3.35 (85)                                | 0.28 (7)     | 9.5 (241.3)  | 8            |   |
| 5 inch           | 150              | 0.88 (22.3)  | 10.04 (255)  | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)                            | 4.57 (116)                               | 0.08 (2)     | 8.5 (215.9)  | 8            |   |
|                  | 300              | 1.31 (33.4)  | 11.02 (280)  | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)                            | 4.57 (116)                               | 0.08 (2)     | 9.25 (235)   | 8            |   |
|                  | 400              | 1.50 (38.1)  | 11.02 (280)  | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)                            | 4.57 (116)                               | 0.28 (7)     | 9.25 (235)   | 8            |   |

## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

1

### Diaphragm seals of flange design with flexible capillary

Connection to J.I.S

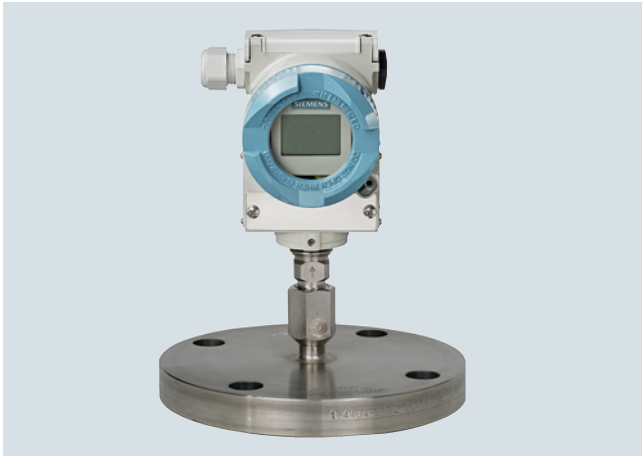
| Nominal diameter | Nominal pressure | b            | D            | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub><br>with<br>extension | d <sub>M</sub><br>without<br>extension | f            | k            | n | L  |
|------------------|------------------|--------------|--------------|----------------|----------------|----------------|-------------------------------------|--|--------------|--------------|---|--|
|                  |                  | mm<br>(inch) | mm<br>(inch) | mm<br>(inch)   | mm<br>(inch)   | mm<br>(inch)   | mm<br>(inch)                        | mm<br>(inch)                           | mm<br>(inch) | mm<br>(inch) |   | mm<br>(inch)   |
| DN 50            | 10K              | 14 (0.55)    | 155 (6.10)   | 19 (0.75)      | 96 (3.78)      | 48.3 (1.9)     | 40 (1.57)                           | 51 (2.01)                              | 2            | 120 (4.72)   | 4 | 0, 50,<br>100,<br>150<br>oder<br>200<br>(0, 2,<br>3.94,<br>5.94<br>oder<br>7.87) |
|                  | 20K              | 16 (0.63)    | 165 (6.50)   | 19 (0.75)      | 96 (3.78)      | 48.3 (1.9)     | 40 (1.57)                           | 51 (2.01)                              | 2            | 120 (4.72)   | 8 |  |
|                  | 40K              | 26 (1.02)    | 165 (6.50)   | 19 (0.75)      | 105 (4.13)     | 48.3 (1.9)     | 40 (1.57)                           | 51 (2.01)                              | 2            | 130 (5.12)   | 8 |  |
| DN 80            | 10K              | 16 (0.63)    | 185 (7.28)   | 19 (0.75)      | 126 (4.96)     | 76 (2.99)      | 65 (2.56)                           | 85 (3.35)                              | 2            | 150 (5.91)   | 8 |  |
|                  | 20K              | 20 (0.79)    | 200 (7.87)   | 23 (0.91)      | 132 (5.20)     | 76 (2.99)      | 65 (2.56)                           | 85 (3.35)                              | 2            | 160 (6.30)   | 8 |  |
|                  | 40K              | 32 (1.26)    | 210 (8.27)   | 23 (0.91)      | 140 (5.51)     | 76 (2.99)      | 65 (2.56)                           | 85 (3.35)                              | 2            | 170 (6.30)   | 8 |  |
| DN 100           | 10K              | 16 (0.63)    | 210 (8.27)   | 19 (0.75)      | 151 (5.94)     | 94 (3.7)       | 85 (3.35)                           | 85 (3.35)                              | 2            | 175 (6.89)   | 8 |  |
|                  | 20K              | 22 (0.87)    | 225 (8.86)   | 23 (0.91)      | 160 (6.30)     | 94 (3.7)       | 85 (3.35)                           | 85 (3.35)                              | 2            | 185 (7.28)   | 8 |  |
|                  | 40K              | 36 (1.42)    | 250 (9.84)   | 25 (0.98)      | 165 (6.50)     | 94 (3.7)       | 85 (3.35)                           | 85 (3.35)                              | 2            | 205 (8.07)   | 8 |  |

d: Internal diameter of gasket to DIN 2690

d<sub>M</sub>: Effective diaphragm diameter

## Diaphragm seals of flange design directly fitted on transmitter

## Overview



Diaphragm seals of flange design, directly fitted on a pressure transmitter for pressure

## Technical specifications

**Diaphragm seals (flange design) for pressure and absolute pressure, directly fitted on a transmitter**

|   |   |
|---|---|
| Nominal diameter                            | Nominal pressure                                      |
| Connecting standard EN 1092-1               |   |
| • DN 25                                     | PN 10/16/25/40/63/100/160/250                         |
| • DN 40                                     | PN 10/16/25/40/63/100/160                             |
| • DN 50                                     | PN 10/16/25/40/63/100                                 |
| • DN 80                                     | PN 10/16/25/40/100                                    |
| • DN 100                                    | PN 10/16/25/40  |
| • DN 125                                    | PN 16/40  |
| Connecting standard ASME B16.5              |   |
| • 1 inch                                    | Class 150/300/600/1500                                |
| • 1½ inch                                   | Class 150/300/400/600/900/1500                        |
| • 2 inch                                    | Class 150/300/400/600/900/1500                        |
| • 3 inch                                    | Class 150/300/600/1500                                |
| • 4 inch                                    | Class 150/300/400/1500                                |
| • 5 inch                                    | Class 150/300/400                                     |
| Connecting standard J.I.S.                  |   |
| • DN 50                                     | 10K   |
| • DN 80                                     | 20K   |
| • DN 100                                    | 40K   |
| Sealing face                                |   |
| • For stainless steel, mat. No. 1.4404/316L | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA |
| • For the other materials                   | Smooth to EN 1092-1, form B2 or ASME B16.5 RFSF       |

## Materials

- Main body
- Wetted parts

Stainless steel, 1.4404/316L  
 Stainless steel, 1.4404/316L  
 • Without coating  
 • PTFE coating  
 • ECTFE coating (for vacuum on request)  
 • PFA coating  
 Monel 400, mat. No. 2.4360  
 Hastelloy C276, mat. No. 2.4819  
 Hastelloy C4, mat. No. 2.4602  
 Hastelloy C22, mat. No. 2.4602  
 Tantalum  
 Titanium, mat. No. 3.7035  
 Nickel 201  
 Duplex 2205, mat. no. 1.4462  
 Stainless steel 316L, gold plated, thickness approx. 25 µm

- Capillary
- Sealing material at the transmitter connection

Stainless steel, 1.4571/316Ti  
 Copper

## Maximum pressure

See above and the technical data of the transmitter

## Tube length

- Without tube
- 50 mm (1.97 inch)
- 100 mm (3.94 inch)
- 150 mm (5.91 inch)
- 200 mm (7.87 inch)

## Capillary

- Length

Max. 10 m (32.8 ft), longer lengths on request

- Internal diameter

2 mm (0.079 inch)

- Minimum bending radius

150 mm (5.9 inch)

## Filling liquid

- Silicone oil M5
- Silicone oil M50
- High-temperature oil
- Halocarbon oil (for measuring O<sub>2</sub>)
- Food oil (FDA listed)

## Max. recommended process temperature

170 °C (338 °F)

## Permissible ambient temperature

Dependent on the pressure transmitter and the filling liquid of the remote seal.

More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals.

## Weight

Approx. 4 kg (8.82 lb)

## Certificate and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

# Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

1

## Diaphragm seals of flange design directly fitted on transmitter

### Selection and Ordering data

Article No.

Order  
code

#### Diaphragm seal

Flange type design, directly mounted to a

- SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately
- Scope of delivery: 1 off

7MF0810 -

- 0

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Nominal diameter Nominal pressure

Connecting standard EN 1092-1

|        |                |     |
|--------|----------------|-----|
| DN 25  | PN 10/16/25/40 | 0BD |
|        | PN 63/100      | 0BF |
|        | PN 160         | 0BG |
|        | PN 250         | 0BH |
| DN 40  | PN 10/16/25/40 | 0DD |
|        | PN 63/100      | 0DF |
|        | PN 160         | 0DG |
| DN 50  | PN 10/16/25/40 | 0ED |
|        | PN 63          | 0EE |
|        | PN 100         | 0EF |
| DN 80  | PN 10/16/25/40 | 0GD |
|        | PN 100         | 0GF |
| DN 100 | PN 10/16       | 0HB |
|        | PN 25/40       | 0HD |
| DN 125 | PN 16          | 0JB |
|        | PN 40          | 0JD |

Connecting standard ASME B16.5

|         |                |     |
|---------|----------------|-----|
| 1 inch  | class 150      | 1KL |
|         | class 300      | 1KM |
|         | class 600      | 1KN |
|         | class 1500     | 1KP |
| 1½ inch | class 150      | 1LA |
|         | class 300      | 1LB |
|         | class 400/600  | 1LD |
|         | class 900/1500 | 1LF |
| 2 inch  | class 150      | 1MA |
|         | class 300      | 1MB |
|         | class 400/600  | 1MD |
|         | class 900/1500 | 1MF |
| 3 inch  | class 150      | 1PA |
|         | class 300      | 1PB |
|         | class 600      | 1PD |
|         | class 1500     | 1PF |
| 4 inch  | class 150      | 1QA |
|         | class 300      | 1QB |
|         | class 400      | 1QC |
|         | class 1500     | 1QF |
| 5 inch  | class 150      | 1RA |
|         | class 300      | 1RB |
|         | class 400      | 1RC |

Connecting standard J.I.S.

|        |     |     |
|--------|-----|-----|
| DN 50  | 10K | 2ES |
|        | 20K | 2ET |
|        | 40K | 2EU |
| DN 80  | 10K | 2GS |
|        | 20K | 2GT |
|        | 40K | 2GU |
| DN 100 | 10K | 2HS |
|        | 20K | 2HT |
|        | 40K | 2HU |

Other version  
Add Order code and plain text

9AA H1Y

### Selection and Ordering data

Article No.

Order  
code

#### Diaphragm seal

Flange type design, directly mounted to a

- SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately
- Scope of delivery: 1 off

7MF0810 -

- 0

#### Transmitter connection

Without capillary tube, direct mount straight connection (for gauge pressure)

00

Without capillary tube, direct mount connection via 90°-bow (for gauge pressure)

01

#### Filling liquid

- Silicone oil M5
  - Silicone oil M50
  - High-temperature oil
  - Halocarbon oil
  - Food-grade oil (FDA listed)
  - Other version
- Add Order code and plain text

A  
B  
C  
D  
E  
Z P1Y

#### Wetted parts materials

- Stainless steel 316L
- Without coating
- With PFA coating
- With PTFE coating
- With ECTFE coating
- Monel 400, 2.4360
- Hastelloy C276, 2.4819
- Tantalum
- Titanium, 3.7035
- Nickel 201
- Diaphragm Duplex, 1.4462
- Diaphragm plus flange Duplex, 1.4462
- Stainless steel 316L with gold coating
- Hastelloy C4, 2.4610
- Hastelloy C22, 2.4602

A  
D  
E0  
F  
G  
J  
K  
L0  
M0  
Q  
R  
S0  
U0  
V0  
Z8 Q1Y

Other version  
Add Order code and plain text

#### Extension length

- without
- 50 mm (2")
- 100 mm (4")
- 150 mm (6")
- 200 mm (8")
- 250 mm (10")

0  
1  
2  
3  
4  
5  
Z8 Q1Y

Other version  
Add Order code and plain text



# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

## Diaphragm seals of flange design directly fitted on transmitter

1

| Selection and Ordering data  |                 | Article No. | Order code |
|--|-----------------|-------------|------------|
| <b>Diaphragm seal</b>  |                 |             |            |
| Flange type design, directly mounted to a  |                 |             |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately</li> </ul> |                 | 7MF0810 -   |            |
| Scope of delivery: 1 off   |                 |             |            |
| <b>Customer-specific extension length</b>  |                 |             |            |
| <ul style="list-style-type: none"> <li>Wetted parts stainless steel without coating</li> </ul>   |                 |             |            |
| Range  | Standard length |             |            |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | A 1         |            |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | A 2         |            |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | A 3         |            |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | A 4         |            |
| 201 ... 250 mm (7.91 ... 9.84")  | 250 mm (9.84")  | A 5         |            |
| <ul style="list-style-type: none"> <li>Wetted parts stainless steel with ECTFE coating</li> </ul>  |                 |             |            |
| Range  | Standard length |             |            |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | F 1         |            |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | F 2         |            |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | F 3         |            |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | F 4         |            |
| 201 ... 250 mm (7.91 ... 9.84")  | 250 mm (9.84")  | F 5         |            |
| <ul style="list-style-type: none"> <li>Wetted parts stainless steel with PFA coating</li> </ul>  |                 |             |            |
| Range  | Standard length |             |            |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | D 1         |            |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | D 2         |            |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | D 3         |            |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | D 4         |            |
| 201 ... 250 mm (7.91 ... 9.84")  | 250 mm (9.84")  | D 5         |            |
| <ul style="list-style-type: none"> <li>Wetted parts Monel 400</li> </ul>   |                 |             |            |
| Range  | Standard length |             |            |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | G 1         |            |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | G 2         |            |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | G 3         |            |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | G 4         |            |

| Selection and Ordering data  |                 | Article No. | Order code |
|--|-----------------|-------------|------------|
| <b>Diaphragm seal</b>  |                 |             |            |
| Flange type design, directly mounted to a  |                 |             |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately</li> </ul> |                 | 7MF0810 -   |            |
| Scope of delivery: 1 off   |                 |             |            |
| <ul style="list-style-type: none"> <li>Wetted parts Hastelloy C276</li> </ul>  |                 |             |            |
| Range  | Standard length |             |            |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | J 1         |            |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | J 2         |            |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | J 3         |            |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | J 4         |            |
| <ul style="list-style-type: none"> <li>Wetted parts Tantalum</li> </ul>  |                 |             |            |
| Range  | Standard length |             |            |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | K 1         |            |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | K 2         |            |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | K 3         |            |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | K 4         |            |

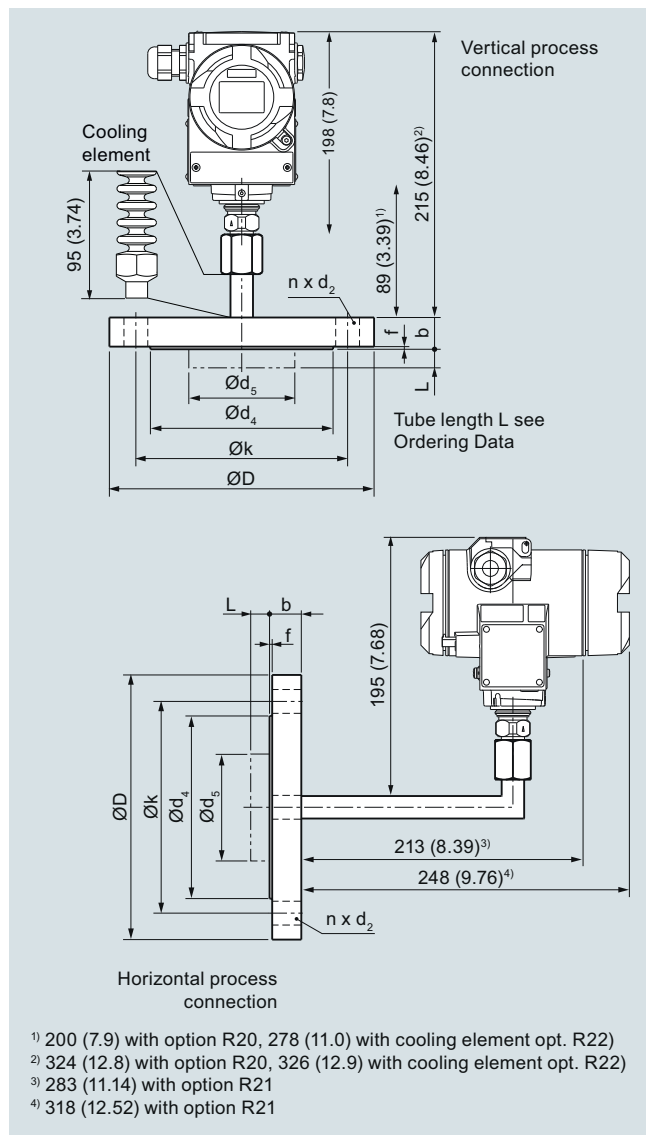
## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

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### Diaphragm seals of flange design directly fitted on transmitter

| Selection and Ordering data  | Order code | Selection and Ordering data   | Order code |
|--|------------|---|------------|
| <b>Further designs</b>   |            | <b>Further designs</b>  |            |
| Add <b>"-Z"</b> to Article No. and specify Order code.   |            | Add <b>"-Z"</b> to Article No. and specify Order code.                              |            |
| <b>Factory certificates</b>  |            | Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)            |            |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2  | <b>C11</b> | • DN 25   | <b>M82</b> |
| Inspection certificate to EN 10204-3.1 - material of body and wetted parts   | <b>C12</b> | • DN 40   | <b>M83</b> |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)                                      | <b>C13</b> | • DN 50   | <b>M84</b> |
| Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts   | <b>C15</b> | • DN 80   | <b>M85</b> |
| Certificate of FDA-approved fill oil (to EN10204-2.2)  | <b>C17</b> | • DN 100  | <b>M86</b> |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)   | <b>C20</b> | • DN 125  | <b>M87</b> |
| <b>Accessories</b>   |            | <b>Device settings</b>  |            |
| Spark arrestor (for gauge and absolute pressure transmitters)  | <b>D61</b> | Operating Temperature; Lower range value ... °C (°F), upper range value ... °C (°F) | <b>Y10</b> |
| Low-temperature version (for Silicon Oil M50 only)   | <b>D67</b> | Static pressure: ... bar (psi)  | <b>Y11</b> |
| <b>Negative pressure services</b>  |            | Customer specific extension length (enter required length in plain text)            | <b>Y44</b> |
| Negative pressure service (for gauge and absolute pressure transmitters)   | <b>D81</b> |   |            |
| Extended negative pressure service (for gauge and absolute pressure transmitters) (only for 7MF0810)   | <b>D85</b> |   |            |
| <b>General product approvals without explosion proof approvals</b>   |            |   |            |
| Oil-and grease-free cleaned version (for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar) | <b>E80</b> |   |            |
| Oil-and grease-free cleaned version (not for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)   | <b>E87</b> |   |            |
| <b>Sealing surface</b>   |            |   |            |
| Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)  | <b>M50</b> |   |            |
| Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)   | <b>M54</b> |   |            |
| Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)   | <b>M64</b> |   |            |
| Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)   |            |   |            |
| • DN 25  | <b>M70</b> |   |            |
| • DN 40  | <b>M71</b> |   |            |
| • DN 50  | <b>M72</b> |   |            |
| • DN 80  | <b>M73</b> |   |            |
| • DN 100   | <b>M74</b> |   |            |
| • DN 125   | <b>M75</b> |   |            |
| Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)   |            |   |            |
| • DN 25  | <b>M76</b> |   |            |
| • DN 40  | <b>M77</b> |   |            |
| • DN 50  | <b>M78</b> |   |            |
| • DN 80  | <b>M79</b> |   |            |
| • DN 100   | <b>M80</b> |   |            |
| • DN 125   | <b>M81</b> |   |            |

**Dimensional drawings**

Diaphragm seals of flange design, direct connection to a SITRANS P pressure transmitter (process connection vertical (top) and horizontal (bottom)), dimensions in mm (inch)

## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

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### Diaphragm seals of flange design directly fitted on transmitter

Connection to EN 1092-1

| Nominal diameter | Nominal pressure | b  | D   | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub> with extension | d <sub>M</sub> without extension | f  | k   | n  | L                        |
|------------------|------------------|----|-----|----------------|----------------|----------------|-------------------------------|----------------------------------|----|-----|----|--------------------------|
|                  |                  | mm | mm  | mm             | mm             | mm             | mm                            | mm                               | mm | mm  | mm | mm                       |
| DN 25            | PN 10/16/25/40   | 18 | 115 | 14             | 68             | 24.5           | 22.6                          | 27                               | 2  | 85  | 4  | 0, 50, 100, 150 oder 200 |
|                  | PN 63/100        | 24 | 140 | 18             | 68             | 24.5           | 22.6                          | 27                               | 2  | 100 | 4  |                          |
|                  | PN 160           | 24 | 140 | 18             | 68             | 24.5           | 22.6                          | 27                               | 2  | 100 | 4  |                          |
|                  | PN 250           | 28 | 150 | 22             | 68             | 24.5           | 22.6                          | 27                               | 2  | 105 | 4  |                          |
| DN 40            | PN 10/16/25/40   | 16 | 150 | 18             | 88             | 38             | 30                            | 42                               | 2  | 110 | 4  |                          |
|                  | PN 63/100        | 24 | 170 | 22             | 88             | 38             | 30                            | 42                               | 2  | 125 | 4  |                          |
|                  | PN 160           | 26 | 170 | 22             | 88             | 38             | 30                            | 42                               | 2  | 125 | 4  |                          |
| DN 50            | PN 10/16/25/40   | 18 | 165 | 18             | 102            | 48.3           | 40                            | 51                               | 2  | 125 | 4  |                          |
|                  | PN 63/100        | 26 | 195 | 26             | 102            | 48.3           | 40                            | 51                               | 2  | 145 | 4  |                          |
|                  | PN 160           | 28 | 195 | 26             | 102            | 48.3           | 40                            | 51                               | 2  | 145 | 4  |                          |
| DN 80            | PN 10/16/25/40   | 22 | 200 | 18             | 138            | 76             | 65                            | 85                               | 2  | 160 | 8  |                          |
|                  | PN 100           | 30 | 230 | 26             | 138            | 76             | 65                            | 85                               | 2  | 180 | 8  |                          |
| DN 100           | PN 10/16         | 18 | 220 | 18             | 158            | 94             | 85                            | 85                               | 2  | 180 | 8  |                          |
|                  | PN 25/40         | 22 | 235 | 22             | 162            | 94             | 85                            | 85                               | 2  | 190 | 8  |                          |
| DN 125           | PN 16            | 20 | 250 | 18             | 188            | 127            | 85                            | 116                              | 2  | 210 | 8  |                          |
|                  | PN 40            | 24 | 270 | 26             | 188            | 127            | 85                            | 116                              | 2  | 220 | 8  |                          |

Connection to ASME B16.5

| Nominal diameter | Nominal pressure | b           | D           | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub> with extension | d <sub>M</sub> without extension | f         | k            | n         | L   |
|------------------|------------------|-------------|-------------|----------------|----------------|----------------|-------------------------------|----------------------------------|-----------|--------------|-----------|---|
|                  | lb./sq.in        | inch (mm)   | inch (mm)   | inch (mm)      | inch (mm)      | inch (mm)      | inch (mm)                     | inch (mm)                        | inch (mm) | inch (mm)    | inch (mm) | inch (mm)   |
| 1 inch           | 150              | 0.71 (18)   | 4.33 (110)  | 0.61 (15.6)    | 2 (50.8)       | 0.96 (24.5)    | 0.89 (22.6)                   | 1.18 (30)                        | 0.08 (2)  | 3.13 (79.4)  | 4         | 0, 2, 3.94, 5.94 oder 7.87 (0, 50, 100, 150 oder 200) |
|                  | 300              | 0.77 (19.5) | 4.92 (125)  | 0.75 (19.1)    | 2 (50.8)       | 0.96 (24.5)    | 0.89 (22.6)                   | 1.18 (30)                        | 0.08 (2)  | 3.5 (88.9)   | 4         |   |
|                  | 600              | 0.96 (24.5) | 4.92 (125)  | 0.75 (19.1)    | 2 (50.8)       | 0.96 (24.5)    | 0.89 (22.6)                   | 1.18 (30)                        | 0.28 (7)  | 3.5 (88.9)   | 4         |   |
|                  | 1500             | 1.4 (35.6)  | 5.91 (150)  | 1 (25.4)       | 2 (50.8)       | 0.96 (24.5)    | 0.89 (22.6)                   | 1.18 (30)                        | 0.28 (7)  | 4 (101.6)    | 4         |   |
| 1½ inch          | 150              | 0.63 (15.9) | 4.92 (125)  | 0.63 (15.9)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                     | 1.42 (36)                        | 0.08 (2)  | 3.87 (98.4)  | 4         |   |
|                  | 300              | 0.75 (19.1) | 6.10 (155)  | 0.87 (22.2)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                     | 1.42 (36)                        | 0.08 (2)  | 4.5 (114.3)  | 4         |   |
|                  | 400/600          | 0.88 (22.3) | 6.10 (155)  | 0.87 (22.2)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                     | 1.42 (36)                        | 0.28 (7)  | 4.5 (114.3)  | 4         |   |
|                  | 900/1500         | 1.25 (31.8) | 7.09 (180)  | 1.13 (28.6)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                     | 1.42 (36)                        | 0.28 (7)  | 4.87 (123.8) | 4         |   |
| 2 inch           | 150              | 0.69 (17.5) | 5.91 (150)  | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                     | 2.01 (51)                        | 0.08 (2)  | 4.75 (120.7) | 4         |   |
|                  | 300              | 0.81 (20.7) | 6.5 (165)   | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                     | 2.01 (51)                        | 0.08 (2)  | 5 (127)      | 8         |   |
|                  | 400/600          | 1.00 (25.4) | 6.5 (165)   | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                     | 2.01 (51)                        | 0.28 (7)  | 5 (127)      | 8         |   |
|                  | 900/1500         | 1.5 (38.1)  | 8.46 (215)  | 1.00 (25.4)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                     | 2.01 (51)                        | 0.28 (7)  | 6.5 (165.1)  | 8         |   |
| 3 inch           | 150              | 0.88 (22.3) | 7.48 (190)  | 0.75 (19.1)    | 5 (127)        | 3 (76)         | 2.65 (65)                     | 3.35 (85)                        | 0.08 (2)  | 6 (152.4)    | 4         |   |
|                  | 300              | 1.06 (27)   | 8.27 (210)  | 0.87 (22.2)    | 5 (127)        | 3 (76)         | 2.65 (65)                     | 3.35 (85)                        | 0.08 (2)  | 6.63 (168.3) | 8         |   |
|                  | 600              | 1.23 (31.8) | 8.27 (210)  | 0.87 (22.2)    | 5 (127)        | 3 (76)         | 2.65 (65)                     | 3.35 (85)                        | 0.28 (7)  | 6.63 (168.3) | 8         |   |
|                  | 1500             | 1.88 (47.7) | 10.43 (265) | 1.25 (31.8)    | 5 (127)        | 3 (76)         | 2.65 (65)                     | 3.35 (85)                        | 0.28 (7)  | 8 (203.2)    | 8         |   |
| 4 inch           | 150              | 0.88 (22.3) | 9.06 (230)  | 0.75 (19.1)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                     | 3.35 (85)                        | 0.08 (2)  | 7.5 (190.5)  | 8         |   |
|                  | 300              | 1.19 (30.2) | 10.04 (255) | 0.87 (22.2)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                     | 3.35 (85)                        | 0.08 (2)  | 7.87 (200)   | 8         |   |
|                  | 400              | 1.38 (35)   | 10.04 (255) | 0.87 (22.2)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                     | 3.35 (85)                        | 0.28 (7)  | 7.87 (200)   | 8         |   |
|                  | 1500             | 2.13 (54)   | 12.20 (310) | 1.37 (34.9)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                     | 3.35 (85)                        | 0.28 (7)  | 9.5 (241.3)  | 8         |   |
| 5 inch           | 150              | 0.88 (22.3) | 10.04 (255) | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)                    | 4.57 (116)                       | 0.08 (2)  | 8.5 (215.9)  | 8         |   |
|                  | 300              | 1.31 (33.4) | 11.02 (280) | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)                    | 4.57 (116)                       | 0.08 (2)  | 9.25 (235)   | 8         |   |
|                  | 400              | 1.50 (38.1) | 11.02 (280) | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)                    | 4.57 (116)                       | 0.28 (7)  | 9.25 (235)   | 8         |   |

**Pressure Measurement**

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

**Diaphragm seals of flange design directly fitted on transmitter**

Connection to J.I.S

| Nominal diameter | Nominal pressure | b            | D            | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub><br>with<br>exten-<br>sion | d <sub>M</sub><br>without<br>exten-<br>sion | f            | k            | n | L  |
|------------------|------------------|--------------|--------------|----------------|----------------|----------------|--|---|--------------|--------------|---|--|
|                  |                  | mm<br>(inch) | mm<br>(inch) | mm<br>(inch)   | mm<br>(inch)   | mm<br>(inch)   | mm<br>(inch)                             | mm<br>(inch)                                | mm<br>(inch) | mm<br>(inch) |   | mm<br>(inch)   |
| DN 50            | 10K              | 14 (0.55)    | 155 (6.10)   | 19 (0.75)      | 96 (3.78)      | 48.3 (1.9)     | 40 (1.57)                                | 51 (2.01)                                   | 2            | 120 (4.72)   | 4 | 0, 50,<br>100,<br>150<br>oder<br>200<br>(0, 2,<br>3.94,<br>5.94<br>oder<br>7.87) |
|                  | 20K              | 16 (0.63)    | 165 (6.50)   | 19 (0.75)      | 96 (3.78)      | 48.3 (1.9)     | 40 (1.57)                                | 51 (2.01)                                   | 2            | 120 (4.72)   | 8 |  |
|                  | 40K              | 26 (1.02)    | 165 (6.50)   | 19 (0.75)      | 105 (4.13)     | 48.3 (1.9)     | 40 (1.57)                                | 51 (2.01)                                   | 2            | 130 (5.12)   | 8 |  |
| DN 80            | 10K              | 16 (0.63)    | 185 (7.28)   | 19 (0.75)      | 126 (4.96)     | 76 (2.99)      | 65 (2.56)                                | 85 (3.35)                                   | 2            | 150 (5.91)   | 8 |  |
|                  | 20K              | 20 (0.79)    | 200 (7.87)   | 23 (0.91)      | 132 (5.20)     | 76 (2.99)      | 65 (2.56)                                | 85 (3.35)                                   | 2            | 160 (6.30)   | 8 |  |
|                  | 40K              | 32 (1.26)    | 210 (8.27)   | 23 (0.91)      | 140 (5.51)     | 76 (2.99)      | 65 (2.56)                                | 85 (3.35)                                   | 2            | 170 (6.30)   | 8 |  |
| DN 100           | 10K              | 16 (0.63)    | 210 (8.27)   | 19 (0.75)      | 151 (5.94)     | 94 (3.7)       | 85 (3.35)                                | 85 (3.35)                                   | 2            | 175 (6.89)   | 8 |  |
|                  | 20K              | 22 (0.87)    | 225 (8.86)   | 23 (0.91)      | 160 (6.30)     | 94 (3.7)       | 85 (3.35)                                | 85 (3.35)                                   | 2            | 185 (7.28)   | 8 |  |
|                  | 40K              | 36 (1.42)    | 250 (9.84)   | 25 (0.98)      | 165 (6.50)     | 94 (3.7)       | 85 (3.35)                                | 85 (3.35)                                   | 2            | 205 (8.07)   | 8 |  |

d: Internal diameter of gasket to DIN 2690

d<sub>M</sub>: Effective diaphragm diameter

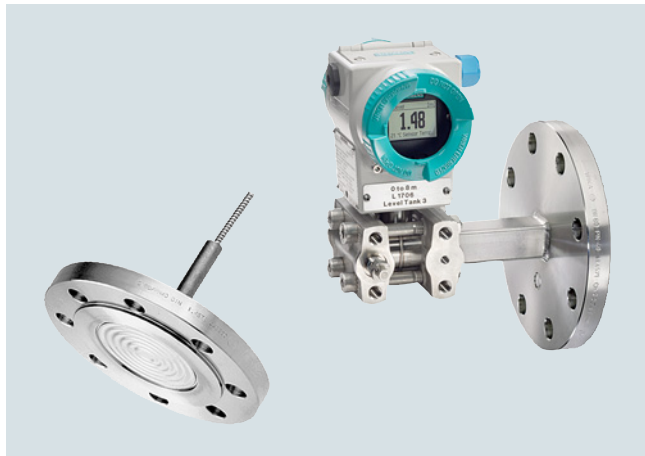
## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

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### Diaphragm seals of flange design fixed connection and with capillary

#### Overview



Diaphragm seals of screwed design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

#### Technical specifications

##### Diaphragm seals of screwed design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

|   |   |
|---|---|
| Nominal diameter                            | Nominal pressure                                      |
| Connecting standard EN 1092-1               |   |
| • DN 40                                     | PN 10/16/25/40/63/100/160                             |
| • DN 50                                     | PN 10/16/25/40/63/100                                 |
| • DN 80                                     | PN 10/16/25/40/100                                    |
| • DN 100                                    | PN 10/16/25/40  |
| • DN 125                                    | PN 16/40  |
| Connecting standard ASME B16.5              |   |
| • 1½ inch                                   | Class 150/300/400/600/900/1500                        |
| • 2 inch                                    | Class 150/300/400/600/900/1500                        |
| • 3 inch                                    | Class 150/300/600/1500                                |
| • 4 inch                                    | Class 150/300/400/1500                                |
| • 5 inch                                    | Class 150/300/400                                     |
| Connecting standard J.I.S.                  |   |
| • DN 50                                     | 10K   |
| • DN 80                                     | 20K   |
| • DN 100                                    | 40K   |
| Sealing face                                |   |
| • For stainless steel, mat. No. 1.4404/316L | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA |
| • For the other materials                   | To EN 1092-1, form B2 or ASME B16.5 RFSF              |

#### Materials

- Main body
- Wetted parts

Stainless steel, 1.4404/316L  
Stainless steel, 1.4404/316L

- Without coating
- PTFE coating
- ECTFE coating (for vacuum on request)
- PFA coating

Monel 400, mat. No. 2.4360  
Hastelloy C276, mat. No. 2.4819  
Hastelloy C4, mat. No. 2.4602  
Hastelloy C22, W.-Nr. 2.4602  
Tantalum  
Titanium, W.-Nr. 3.7035  
Nickel 201  
Duplex 2205, mat. no. 1.4462  
Stainless steel 316L, gold plated, thickness approx. 25 µm  
Stainless steel, mat. No. 1.4571/316Ti  
Spiral protective tube made of stainless steel, mat. No. 1.4301/304

- Capillary

- Sheath

#### Sealing material in the process flanges

- For pressure transmitters, absolute pressure transmitters and low-pressure applications
- For other applications

Copper

#### Maximum pressure

Viton

See above and the technical data of the pressure transmitter

#### Tube length

Without tube  
50 mm (1.97 inch)  
100 mm (3.94 inch)  
150 mm (5.91 inch)  
200 mm (7.87 inch)

#### Capillary

- Length

Max. 10 m (32.8 ft), longer lengths on request

- Internal diameter

2 mm (0.079 inch)

- Minimum bending radius

150 mm (5.9 inch)

#### Filling liquid

Silicone oil M5

Silicone oil M50

High-temperature oil

Halocarbon oil (for measuring O<sub>2</sub>)

Food oil (FDA listed)

170 °C (338 °F)

#### Max. recommended process temperature

#### Permissible ambient temperature

Dependent on the pressure transmitter and the filling liquid of the remote seal

More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals

#### Weight

Approx. 4 kg (8.82 lb)

#### Certificate and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

## Diaphragm seals of flange design fixed connection and with capillary

1

| Selection and Ordering data  |                  | Article No. | Order code |
|--|------------------|-------------|------------|
| <b>Diaphragm seal</b>  |                  |             |            |
| Flange type design, direct connected at high-side and with flexible capillary tube at low-side to  |                  |             |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately</li> </ul> |                  | 7MF0813 -   |            |
| Scope of delivery: 2 off   |                  |             |            |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |                  |             |            |
| Nominal diameter   | Nominal pressure |             |            |
| Connecting standard EN 1092-1  |                  |             |            |
| DN 40  | PN 10/16/25/40   | 0DD         |            |
|  | PN 63/100        | 0DF         |            |
|  | PN 160           | 0DG         |            |
| DN 50  | PN 10/16/25/40   | 0ED         |            |
|  | PN 63            | 0EE         |            |
|  | PN 100           | 0EF         |            |
| DN 80  | PN 10/16/25/40   | 0GD         |            |
|  | PN 100           | 0GF         |            |
| DN 100   | PN 10/16         | 0HB         |            |
|  | PN 25/40         | 0HD         |            |
| DN 125   | PN 16            | 0JB         |            |
|  | PN 40            | 0JD         |            |
| Connecting standard ASME B16.5   |                  |             |            |
| 1½ inch  | class 150        | 1LA         |            |
|  | class 300        | 1LB         |            |
|  | class 400/600    | 1LD         |            |
|  | class 900/1500   | 1LF         |            |
| 2 inch   | class 150        | 1MA         |            |
|  | class 300        | 1MB         |            |
|  | class 400/600    | 1MD         |            |
|  | class 900/1500   | 1MF         |            |
| 3 inch   | class 150        | 1PA         |            |
|  | class 300        | 1PB         |            |
|  | class 600        | 1PD         |            |
|  | class 1500       | 1PF         |            |
| 4 inch   | class 150        | 1QA         |            |
|  | class 300        | 1QB         |            |
|  | class 400        | 1QC         |            |
|  | class 1500       | 1QF         |            |
| 5 inch   | class 150        | 1RA         |            |
|  | class 300        | 1RB         |            |
|  | class 400        | 1RC         |            |
| Connecting standard J.I.S.   |                  |             |            |
| DN 50  | 10K              | 2ES         |            |
|  | 20K              | 2ET         |            |
|  | 40K              | 2EU         |            |
| DN 80  | 10K              | 2GS         |            |
|  | 20K              | 2GT         |            |
|  | 40K              | 2GU         |            |
| DN 100   | 10K              | 2HS         |            |
|  | 20K              | 2HT         |            |
|  | 40K              | 2HU         |            |
| Other version  |                  | 9AA         | H1Y        |
| Add Order code and plain text  |                  |             |            |
| Selection and Ordering data  |                  | Article No. | Order code |
| <b>Diaphragm seal</b>  |                  |             |            |
| Flange type design, direct connected at high-side and with flexible capillary tube at low-side to  |                  |             |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately</li> </ul> |                  | 7MF0813 -   |            |
| Scope of delivery: 2 off   |                  |             |            |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |                  |             |            |
| Length of capillary tube at low-side   |                  |             |            |
| 1 m  |                  | 10          |            |
| 1,6 m  |                  | 11          |            |
| 2 m  |                  | 12          |            |
| 2,5 m  |                  | 13          |            |
| 3 m  |                  | 14          |            |
| 4 m  |                  | 15          |            |
| 5 m  |                  | 16          |            |
| 6 m  |                  | 17          |            |
| 7 m  |                  | 18          |            |
| 8 m  |                  | 20          |            |
| 9 m  |                  | 21          |            |
| 10 m   |                  | 22          |            |
| Other version  |                  | 98          | L1Y        |
| Add Order code and plain text  |                  |             |            |
| Filling liquid   |                  |             |            |
| Silicone oil M5  |                  | A           |            |
| Silicone oil M50   |                  | B           |            |
| High-temperature oil   |                  | C           |            |
| Halocarbon oil   |                  | D           |            |
| Food-grade oil (FDA listed)  |                  | E           |            |
| Other version  |                  | Z           | P1Y        |
| Add Order code and plain text  |                  |             |            |

# Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

## Diaphragm seals of flange design fixed connection and with capillary

1

### Selection and Ordering data

Article No.

Order  
code

#### Diaphragm seal

Flange type design, direct connected at high-side and with flexible capillary tube at low-side to

- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately
- Scope of delivery: 2 off

7MF0813 -

- 0

#### Wetted parts materials

Stainless steel 316L

- Without coating
- With PFA coating
- With PTFE coating
- With ECTFE coating

Monel 400, 2.4360

Hastelloy C276, 2.4819

Tantalum

Titanium, 3.7035

Nickel 201

Diaphragm Duplex, 1.4462

Diaphragm plus flange Duplex, 1.4462

Stainless steel 316L with gold coating

Hastelloy C4, 2.4610

Hastelloy C22, 2.4602

Other version

Add Order code and plain text

A  
D  
E 0  
F  
G  
J  
K  
L 0  
M 0  
Q  
R  
S 0  
U 0  
V 0  
Z 8 Q 1 Y

#### Extension length

- without
- 50 mm (2")
- 100 mm (4")
- 150 mm (6")
- 200 mm (8")
- 250 mm (10")

0  
1  
2  
3  
4  
5  
Z 8 Q 1 Y

Other version

Add Order code and plain text

#### Customer-specific extension length

- Wetted parts stainless steel without coating

| Range                              | Standard length |     |
|------------------------------------|-----------------|-----|
| 20 ... 50 mm<br>(0.79 ... 1.97")   | 50 mm (1.97")   | A 1 |
| 51 ... 100 mm<br>(2.01 ... 3.94")  | 100 mm (3.94")  | A 2 |
| 101 ... 150 mm<br>(3.98 ... 5.91") | 150 mm (5.91")  | A 3 |
| 151 ... 200 mm<br>(5.94 ... 7.87") | 200 mm (7.87")  | A 4 |
| 201 ... 250 mm<br>(7.91 ... 9.84") | 250 mm (9.84")  | A 5 |

- Wetted parts stainless steel with ECTFE coating

| Range                              | Standard length |     |
|------------------------------------|-----------------|-----|
| 20 ... 50 mm<br>(0.79 ... 1.97")   | 50 mm (1.97")   | F 1 |
| 51 ... 100 mm<br>(2.01 ... 3.94")  | 100 mm (3.94")  | F 2 |
| 101 ... 150 mm<br>(3.98 ... 5.91") | 150 mm (5.91")  | F 3 |
| 151 ... 200 mm<br>(5.94 ... 7.87") | 200 mm (7.87")  | F 4 |
| 201 ... 250 mm<br>(7.91 ... 9.84") | 250 mm (9.84")  | F 5 |

### Selection and Ordering data

Article No.

Order  
code

#### Diaphragm seal

Flange type design, direct connected at high-side and with flexible capillary tube at low-side to

- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately
- Scope of delivery: 2 off

7MF0813 -

- 0

- Wetted parts stainless steel with PFA coating

| Range                              | Standard length |     |
|------------------------------------|-----------------|-----|
| 20 ... 50 mm<br>(0.79 ... 1.97")   | 50 mm (1.97")   | D 1 |
| 51 ... 100 mm<br>(2.01 ... 3.94")  | 100 mm (3.94")  | D 2 |
| 101 ... 150 mm<br>(3.98 ... 5.91") | 150 mm (5.91")  | D 3 |
| 151 ... 200 mm<br>(5.94 ... 7.87") | 200 mm (7.87")  | D 4 |
| 201 ... 250 mm<br>(7.91 ... 9.84") | 250 mm (9.84")  | D 5 |

- Wetted parts Monel 400

| Range                              | Standard length |     |
|------------------------------------|-----------------|-----|
| 20 ... 50 mm<br>(0.79 ... 1.97")   | 50 mm (1.97")   | G 1 |
| 51 ... 100 mm<br>(2.01 ... 3.94")  | 100 mm (3.94")  | G 2 |
| 101 ... 150 mm<br>(3.98 ... 5.91") | 150 mm (5.91")  | G 3 |
| 151 ... 200 mm<br>(5.94 ... 7.87") | 200 mm (7.87")  | G 4 |

- Wetted parts Hastelloy C276

| Range                              | Standard length |     |
|------------------------------------|-----------------|-----|
| 20 ... 50 mm<br>(0.79 ... 1.97")   | 50 mm (1.97")   | J 1 |
| 51 ... 100 mm<br>(2.01 ... 3.94")  | 100 mm (3.94")  | J 2 |
| 101 ... 150 mm<br>(3.98 ... 5.91") | 150 mm (5.91")  | J 3 |
| 151 ... 200 mm<br>(5.94 ... 7.87") | 200 mm (7.87")  | J 4 |

- Wetted parts Tantalum

| Range                              | Standard length |     |
|------------------------------------|-----------------|-----|
| 20 ... 50 mm<br>(0.79 ... 1.97")   | 50 mm (1.97")   | K 1 |
| 51 ... 100 mm<br>(2.01 ... 3.94")  | 100 mm (3.94")  | K 2 |
| 101 ... 150 mm<br>(3.98 ... 5.91") | 150 mm (5.91")  | K 3 |
| 151 ... 200 mm<br>(5.94 ... 7.87") | 200 mm (7.87")  | K 4 |



## Diaphragm seals of flange design fixed connection and with capillary

| Selection and Ordering data  | Order code | Selection and Ordering data   | Order code |
|--|------------|---|------------|
| <b>Further designs</b>   |            | <b>Further designs</b>  |            |
| Add "-Z" to Article No. and specify Order code.  |            | Add "-Z" to Article No. and specify Order code.                                     |            |
| <b>Factory certificates</b>  |            | <b>Capillary coating</b>  |            |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2  | <b>C11</b> | <u>PE protective tube</u>   |            |
| Inspection certificate to EN 10204-3.1 - material of body and wetted parts   | <b>C12</b> | 1 m   | <b>S10</b> |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)                                      | <b>C13</b> | 1,6 m   | <b>S11</b> |
| Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts   | <b>C15</b> | 2 m   | <b>S12</b> |
| Certificate of FDA-approved fill oil (to EN10204-2.2)  | <b>C17</b> | 2,5 m   | <b>S13</b> |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)   | <b>C20</b> | 3 m   | <b>S14</b> |
|  |            | 4 m   | <b>S15</b> |
|  |            | 5 m   | <b>S16</b> |
|  |            | 6 m   | <b>S17</b> |
|  |            | 7 m   | <b>S18</b> |
|  |            | 8 m   | <b>S19</b> |
|  |            | 9 m   | <b>S20</b> |
|  |            | 10 m  | <b>S21</b> |
|  |            | <u>PTFE protective tube</u>   |            |
|  |            | 1 m   | <b>S40</b> |
|  |            | 1,6 m   | <b>S41</b> |
|  |            | 2 m   | <b>S42</b> |
|  |            | 2,5 m   | <b>S43</b> |
|  |            | 3 m   | <b>S44</b> |
|  |            | 4 m   | <b>S45</b> |
|  |            | 5 m   | <b>S46</b> |
|  |            | 6 m   | <b>S47</b> |
|  |            | 7 m   | <b>S48</b> |
|  |            | 8 m   | <b>S49</b> |
|  |            | 9 m   | <b>S50</b> |
|  |            | 10 m  | <b>S51</b> |
|  |            | <u>PVC protective tube</u>  |            |
|  |            | 1 m   | <b>S70</b> |
|  |            | 1,6 m   | <b>S71</b> |
|  |            | 2 m   | <b>S72</b> |
|  |            | 2,5 m   | <b>S73</b> |
|  |            | 3 m   | <b>S74</b> |
|  |            | 4 m   | <b>S75</b> |
|  |            | 5 m   | <b>S76</b> |
|  |            | 6 m   | <b>S77</b> |
|  |            | 7 m   | <b>S78</b> |
|  |            | 8 m   | <b>S79</b> |
|  |            | 9 m   | <b>S80</b> |
|  |            | 10 m  | <b>S81</b> |
|  |            | <b>Device settings</b>  |            |
|  |            | Operating Temperature; Lower range value ... °C (°F), upper range value ... °C (°F) | <b>Y10</b> |
|  |            | Static pressure: ... bar (psi)  | <b>Y11</b> |
|  |            | Customer specific extension length (enter required length in plain text)            | <b>Y44</b> |
| <b>Accessories</b>   |            |   |            |
| Spark arrestor (for differential pressure and level transmitters)  | <b>D62</b> |   |            |
| Low-temperature version (for Silicon Oil M50 only)   | <b>D67</b> |   |            |
| <b>Negative pressure services</b>  |            |   |            |
| Negative pressure service (for differential pressure transmitters)   | <b>D83</b> |   |            |
| Extended negative pressure service (for differential pressure transmitters)  | <b>D88</b> |   |            |
| <b>General product approvals without explosion proof approvals</b>   |            |   |            |
| Oil-and grease-free cleaned version (for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar) | <b>E80</b> |   |            |
| Oil-and grease-free cleaned version (not for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)   | <b>E87</b> |   |            |
| <b>Sealing surface</b>   |            |   |            |
| Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)  | <b>M50</b> |   |            |
| Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)   | <b>M54</b> |   |            |
| Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)   | <b>M64</b> |   |            |
| Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)   |            |   |            |
| • DN 25  | <b>M70</b> |   |            |
| • DN 40  | <b>M71</b> |   |            |
| • DN 50  | <b>M72</b> |   |            |
| • DN 80  | <b>M73</b> |   |            |
| • DN 100   | <b>M74</b> |   |            |
| • DN 125   | <b>M75</b> |   |            |
| Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)   |            |   |            |
| • DN 25  | <b>M76</b> |   |            |
| • DN 40  | <b>M77</b> |   |            |
| • DN 50  | <b>M78</b> |   |            |
| • DN 80  | <b>M79</b> |   |            |
| • DN 100   | <b>M80</b> |   |            |
| • DN 125   | <b>M81</b> |   |            |
| Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)   |            |   |            |
| • DN 25  | <b>M82</b> |   |            |
| • DN 40  | <b>M83</b> |   |            |
| • DN 50  | <b>M84</b> |   |            |
| • DN 80  | <b>M85</b> |   |            |
| • DN 100   | <b>M86</b> |   |            |
| • DN 125   | <b>M87</b> |   |            |

## Pressure Measurement

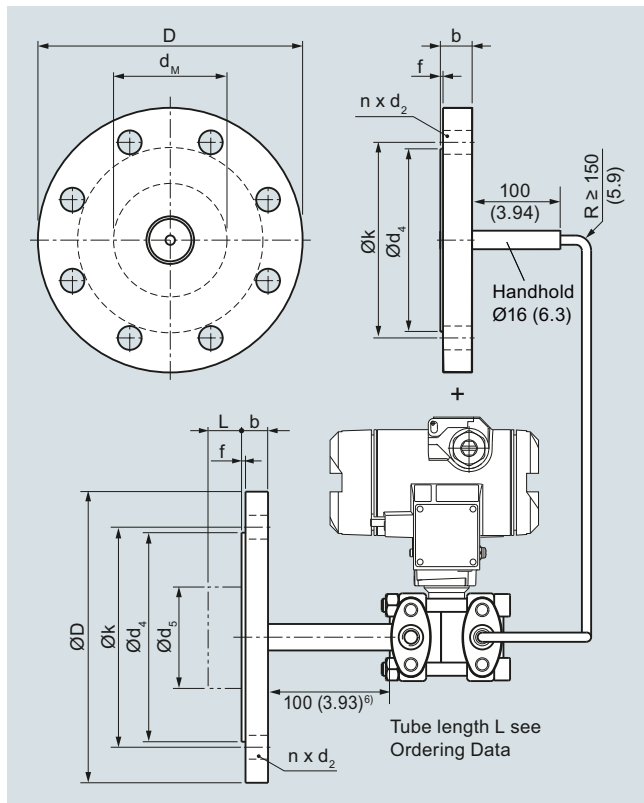
Remote seals for transmitters and pressure gauges

SITRANS P320/P420

1

### Diaphragm seals of flange design fixed connection and with capillary

#### Dimensional drawings



Diaphragm seals of screwed design with flexible capillary, fixed connection, for connection to a SITRANS P pressure transmitter for differential pressure, dimensions in mm (inch)

# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

## Diaphragm seals of flange design fixed connection and with capillary

### Connection to EN 1092-1

| Nominal diameter | Nominal pressure | b  | D   | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub> with extension | d <sub>M</sub> without extension | f  | k   | n  | L                        |
|------------------|------------------|----|-----|----------------|----------------|----------------|-------------------------------|----------------------------------|----|-----|----|--------------------------|
|                  |                  | mm | mm  | mm             | mm             | mm             | mm                            | mm                               | mm | mm  | mm | mm                       |
| DN 40            | PN 10/16/25/40   | 16 | 150 | 18             | 88             | 38             | 30                            | 42                               | 2  | 110 | 4  | 0, 50, 100, 150 oder 200 |
|                  | PN 63/100        | 24 | 170 | 22             | 88             | 38             | 30                            | 42                               | 2  | 125 | 4  |                          |
|                  | PN 160           | 26 | 170 | 22             | 88             | 38             | 30                            | 42                               | 2  | 125 | 4  |                          |
| DN 50            | PN 10/16/25/40   | 18 | 165 | 18             | 102            | 48.3           | 40                            | 51                               | 2  | 125 | 4  |                          |
|                  | PN 63/100        | 26 | 195 | 26             | 102            | 48.3           | 40                            | 51                               | 2  | 145 | 4  |                          |
|                  | PN 160           | 28 | 195 | 26             | 102            | 48.3           | 40                            | 51                               | 2  | 145 | 4  |                          |
| DN 80            | PN 10/16/25/40   | 22 | 200 | 18             | 138            | 76             | 65                            | 85                               | 2  | 160 | 8  |                          |
|                  | PN 100           | 30 | 230 | 26             | 138            | 76             | 65                            | 85                               | 2  | 180 | 8  |                          |
| DN 100           | PN 10/16         | 18 | 220 | 18             | 158            | 94             | 85                            | 85                               | 2  | 180 | 8  |                          |
|                  | PN 25/40         | 22 | 235 | 22             | 162            | 94             | 85                            | 85                               | 2  | 190 | 8  |                          |
| DN 125           | PN 16            | 20 | 250 | 18             | 188            | 127            | 85                            | 116                              | 2  | 210 | 8  |                          |
|                  | PN 40            | 24 | 270 | 26             | 188            | 127            | 85                            | 116                              | 2  | 220 | 8  |                          |

### Connection to ASME B16.5

| Nominal diameter | Nominal pressure | b           | D           | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub> with extension | d <sub>M</sub> without extension | f         | k            | n | L   |
|------------------|------------------|-------------|-------------|----------------|----------------|----------------|-------------------------------|----------------------------------|-----------|--------------|---|---|
|                  | lb./sq.in        | inch (mm)   | inch (mm)   | inch (mm)      | inch (mm)      | inch (mm)      | inch (mm)                     | inch (mm)                        | inch (mm) | inch (mm)    |   | inch (mm)   |
| 1½ inch          | 150              | 0.63 (15.9) | 4.92 (125)  | 0.63 (15.9)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                     | 1.42 (36)                        | 0.08 (2)  | 3.87 (98.4)  | 4 | 0, 2, 3.94, 5.94 oder 7.87 (0, 50, 100, 150 oder 200) |
|                  | 300              | 0.75 (19.1) | 6.10 (155)  | 0.87 (22.2)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                     | 1.42 (36)                        | 0.08 (2)  | 4.5 (114.3)  | 4 |   |
|                  | 400/600          | 0.88 (22.3) | 6.10 (155)  | 0.87 (22.2)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                     | 1.42 (36)                        | 0.28 (7)  | 4.5 (114.3)  | 4 |   |
|                  | 900/1500         | 1.25 (31.8) | 7.09 (180)  | 1.13 (28.6)    | 2.87 (73)      | 1.5 (38)       | 1.18 (30)                     | 1.42 (36)                        | 0.28 (7)  | 4.87 (123.8) | 4 |   |
| 2 inch           | 150              | 0.69 (17.5) | 5.91 (150)  | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                     | 2.01 (51)                        | 0.08 (2)  | 4.75 (120.7) | 4 |   |
|                  | 300              | 0.81 (20.7) | 6.5 (165)   | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                     | 2.01 (51)                        | 0.08 (2)  | 5 (127)      | 8 |   |
|                  | 400/600          | 1.00 (25.4) | 6.5 (165)   | 0.75 (19.1)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                     | 2.01 (51)                        | 0.28 (7)  | 5 (127)      | 8 |   |
|                  | 900/1500         | 1.5 (38.1)  | 8.46 (215)  | 1.00 (25.4)    | 3.63 (92.1)    | 1.9 (48.3)     | 1.57 (40)                     | 2.01 (51)                        | 0.28 (7)  | 6.5 (165.1)  | 8 |   |
| 3 inch           | 150              | 0.88 (22.3) | 7.48 (190)  | 0.75 (19.1)    | 5 (127)        | 3 (76)         | 2.65 (65)                     | 3.35 (85)                        | 0.08 (2)  | 6 (152.4)    | 4 |   |
|                  | 300              | 1.06 (27)   | 8.27 (210)  | 0.87 (22.2)    | 5 (127)        | 3 (76)         | 2.65 (65)                     | 3.35 (85)                        | 0.08 (2)  | 6.63 (168.3) | 8 |   |
|                  | 600              | 1.23 (31.8) | 8.27 (210)  | 0.87 (22.2)    | 5 (127)        | 3 (76)         | 2.65 (65)                     | 3.35 (85)                        | 0.28 (7)  | 6.63 (168.3) | 8 |   |
|                  | 1500             | 1.88 (47.7) | 10.43 (265) | 1.25 (31.8)    | 5 (127)        | 3 (76)         | 2.65 (65)                     | 3.35 (85)                        | 0.28 (7)  | 8 (203.2)    | 8 |   |
| 4 inch           | 150              | 0.88 (22.3) | 9.06 (230)  | 0.75 (19.1)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                     | 3.35 (85)                        | 0.08 (2)  | 7.5 (190.5)  | 8 |   |
|                  | 300              | 1.19 (30.2) | 10.04 (255) | 0.87 (22.2)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                     | 3.35 (85)                        | 0.08 (2)  | 7.87 (200)   | 8 |   |
|                  | 400              | 1.38 (35)   | 10.04 (255) | 0.87 (22.2)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                     | 3.35 (85)                        | 0.28 (7)  | 7.87 (200)   | 8 |   |
|                  | 1500             | 2.13 (54)   | 12.20 (310) | 1.37 (34.9)    | 6.19 (157.2)   | 3.69 (94)      | 3.35 (85)                     | 3.35 (85)                        | 0.28 (7)  | 9.5 (241.3)  | 8 |   |
| 5 inch           | 150              | 0.88 (22.3) | 10.04 (255) | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)                    | 4.57 (116)                       | 0.08 (2)  | 8.5 (215.9)  | 8 |   |
|                  | 300              | 1.31 (33.4) | 11.02 (280) | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)                    | 4.57 (116)                       | 0.08 (2)  | 9.25 (235)   | 8 |   |
|                  | 400              | 1.50 (38.1) | 11.02 (280) | 0.87 (22.2)    | 7.31 (185.7)   | 5 (127)        | 4.57 (116)                    | 4.57 (116)                       | 0.28 (7)  | 9.25 (235)   | 8 |   |

## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

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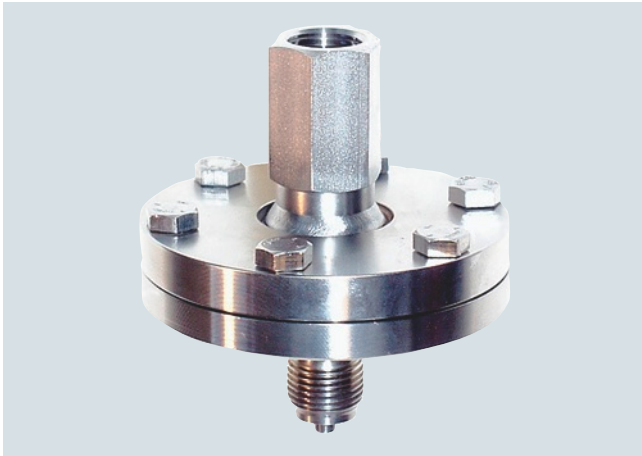
### Diaphragm seals of flange design fixed connection and with capillary

Connection to J.I.S

| Nominal diameter | Nominal pressure | b            | D            | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub><br>with<br>extension | d <sub>M</sub><br>without<br>extension | f            | k            | n | L  |
|------------------|------------------|--------------|--------------|----------------|----------------|----------------|-------------------------------------|--|--------------|--------------|---|--|
|                  |                  | mm<br>(inch) | mm<br>(inch) | mm<br>(inch)   | mm<br>(inch)   | mm<br>(inch)   | mm<br>(inch)                        | mm<br>(inch)                           | mm<br>(inch) | mm<br>(inch) |   | mm<br>(inch)   |
| DN 50            | 10K              | 14 (0.55)    | 155 (6.10)   | 19 (0.75)      | 96 (3.78)      | 48.3 (1.9)     | 40 (1.57)                           | 51 (2.01)                              | 2            | 120 (4.72)   | 4 | 0, 50,<br>100,<br>150<br>oder<br>200<br>(0, 2,<br>3.94,<br>5.94<br>oder<br>7.87) |
|                  | 20K              | 16 (0.63)    | 165 (6.50)   | 19 (0.75)      | 96 (3.78)      | 48.3 (1.9)     | 40 (1.57)                           | 51 (2.01)                              | 2            | 120 (4.72)   | 8 |  |
|                  | 40K              | 26 (1.02)    | 165 (6.50)   | 19 (0.75)      | 105 (4.13)     | 48.3 (1.9)     | 40 (1.57)                           | 51 (2.01)                              | 2            | 130 (5.12)   | 8 |  |
| DN 80            | 10K              | 16 (0.63)    | 185 (7.28)   | 19 (0.75)      | 126 (4.96)     | 76 (2.99)      | 65 (2.56)                           | 85 (3.35)                              | 2            | 150 (5.91)   | 8 |  |
|                  | 20K              | 20 (0.79)    | 200 (7.87)   | 23 (0.91)      | 132 (5.20)     | 76 (2.99)      | 65 (2.56)                           | 85 (3.35)                              | 2            | 160 (6.30)   | 8 |  |
|                  | 40K              | 32 (1.26)    | 210 (8.27)   | 23 (0.91)      | 140 (5.51)     | 76 (2.99)      | 65 (2.56)                           | 85 (3.35)                              | 2            | 170 (6.30)   | 8 |  |
| DN 100           | 10K              | 16 (0.63)    | 210 (8.27)   | 19 (0.75)      | 151 (5.94)     | 94 (3.7)       | 85 (3.35)                           | 85 (3.35)                              | 2            | 175 (6.89)   | 8 |  |
|                  | 20K              | 22 (0.87)    | 225 (8.86)   | 23 (0.91)      | 160 (6.30)     | 94 (3.7)       | 85 (3.35)                           | 85 (3.35)                              | 2            | 185 (7.28)   | 8 |  |
|                  | 40K              | 36 (1.42)    | 250 (9.84)   | 25 (0.98)      | 165 (6.50)     | 94 (3.7)       | 85 (3.35)                           | 85 (3.35)                              | 2            | 205 (8.07)   | 8 |  |

d: Internal diameter of gasket to DIN 2690

d<sub>M</sub>: Effective diaphragm diameter

**Overview**

Diaphragm seal, screwed gland design with inside diaphragm for gauge, absolute and differential pressure for direct mounting



Process connection, open measuring flange

**Technical specifications****Diaphragm seal, screwed gland with inside diaphragm**

|  |  |
|--|--|
| Process connection   | Nominal pressure   |
| <ul style="list-style-type: none"> <li>Open flange EN1092-1 <ul style="list-style-type: none"> <li>- DN 15</li> <li>- DN 20</li> <li>- DN 25</li> </ul> </li> <li>Open flange ASME B16.5 <ul style="list-style-type: none"> <li>- ½ inch, ¾ inch, 1 inch</li> </ul> </li> <li>Thread to EN 837-1 <ul style="list-style-type: none"> <li>- G¼"B, G½"B, G¾"B, G1"B</li> </ul> </li> <li>Thread ASME B1.20.1 <ul style="list-style-type: none"> <li>- ¼" NPT-M, ¼" NPT-F</li> <li>- ½" NPT-M, ½" NPT-F</li> <li>- ¾" NPT-M, ¾" NPT-F</li> <li>- 1" NPT-M, 1" NPT-F</li> </ul> </li> </ul> | PN 10/16/25/40/63/100/160/250<br>PN 10/16/25/40<br>PN 10/16/25/40/63/100/160/250   |
|  | Class 150/300/600/1500   |
|  | PN 100/250   |
|  | Class 1500/3675<br>Class 1500/3675<br>Class 1500/3675<br>Class 1500/3675   |
| Sealing face for open measurement flange   |  |
| <ul style="list-style-type: none"> <li>For stainless steel, mat. no. 1.4404/316L</li> </ul>  | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA  |
| Materials  |  |
| <ul style="list-style-type: none"> <li>Lower section (in the case of process connection thread)</li> <li>Diaphragm</li> </ul>  | Stainless steel, Mat. no. 1.4404/316L<br>Stainless steel, Mat. no. 1.4404/316L <ul style="list-style-type: none"> <li>• No coating</li> <li>• With PTFE coating</li> </ul> Monel 400, mat. no. 2.4360<br>Hastelloy C276, mat. no. 2.4819<br>Hastelloy C4, mat. no. 2.4602<br>Tantal<br>Stainless steel 316L, gold plated, thickness approx. 25 µm<br>Stainless steel, mat. no. 1.4404/316L |
| <ul style="list-style-type: none"> <li>Top section (process connection in the case of an open measurement flange)</li> <li>Capillary</li> <li>Sealing material on the process connection</li> <li>Sealing material between top and bottom section</li> </ul>   | Stainless steel 1.4571/316Ti<br>Viton or copper (in the case of vacuum-free version)<br>Viton (FKM) (standard)<br>Teflon (PTFE)<br>metal spring ring (silver-coated)   |

|   |   |
|---|---|
| Capillary   |   |
| <ul style="list-style-type: none"> <li>Length</li> <li>Internal diameter</li> <li>Minimum bending radius</li> <li>Sheath</li> </ul> | Max. 10 m (32.8 ft)<br>2 mm (0.079 inch)<br>150 mm (5.9 inch)<br>Stainless steel protective tube, mat. No. 1.4301/304   |
| Filling liquid  | <ul style="list-style-type: none"> <li>Silicone oil M5</li> <li>Silicone oil M50</li> <li>High-temperature oil</li> <li>Halocarbon oil (for measuring O<sub>2</sub>)</li> <li>Food oil (FDA listed)</li> </ul>  |
| Max. recommended process temperature  | 170 °C (338 °F)   |
| Permissible ambient temperature   | Dependent on the pressure transmitter and the filling liquid of the remote seal<br><br>More information can be found in the technical specifications of the pressure transmitters and in the section "Technical data of filling liquid" in the introduction to the remote seals |
| Weight  | Approx. 1.5 kg (3.3 lb)   |
| <b>Certificates and approvals</b>   |   |
| Classification according to pressure equipment directive (PED 2014/68/EU)   | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)  |

# Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

## Diaphragm seal, screwed design directly mounted or/and with capillary

| Selection and Ordering data   |                         | Article No. | Order code |
|---|-------------------------|-------------|------------|
| <b>Diaphragm seal threaded design</b>   |                         |             |            |
| With inside diaphragm, directly connected or connected via flexible capillary tube to a   |                         |             |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately<br/>Scope of delivery: 1 off</li> </ul> |                         | 7MF0840 -   |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately,<br/>Scope of delivery: 2 off</li> </ul>  |                         | 7MF0842 -   |            |
|   |                         |             | - 0 0      |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |                         |             |            |
| <b>Nominal diameter</b>   | <b>Nominal pressure</b> |             |            |
| Open flange, connecting standard EN 1092-1  |                         |             |            |
| DN 15   | PN 10/16/25/40          | 0AD         |            |
|   | PN 63/100               | 0AF         |            |
|   | PN 160                  | 0AG         |            |
|   | PN 250                  | 0AH         |            |
| DN 20   | PN 10/16/25/40          | 0AM         |            |
| DN 25   | PN 10/16/25/40          | 0BD         |            |
|   | PN 63/100               | 0BF         |            |
|   | PN 160                  | 0BG         |            |
|   | PN 250                  | 0BH         |            |
| Open flange, connecting standard ASME B16.5   |                         |             |            |
| ½ inch  | class 150               | 1KA         |            |
|   | class 300               | 1KB         |            |
|   | class 600               | 1KC         |            |
|   | class 1500              | 1KD         |            |
| ¾ inch  | class 150               | 1KF         |            |
|   | class 300               | 1KG         |            |
|   | class 600               | 1KH         |            |
|   | class 1500              | 1KJ         |            |
| 1 inch  | class 150               | 1KL         |            |
|   | class 300               | 1KM         |            |
|   | class 600               | 1KN         |            |
|   | class 1500              | 1KP         |            |
| Process connection thread EN 837-1  |                         |             |            |
| G¼"B  | PN 100                  | 3SB         |            |
| G¼"B  | PN 250                  | 3SC         |            |
| G½"B  | PN 100                  | 3SF         |            |
| G½"B  | PN 250                  | 3SG         |            |
| G¾"B  | PN 100                  | 3SK         |            |
| G¾"B  | PN 250                  | 3SL         |            |
| G1"B  | PN 100                  | 3SP         |            |
| G1"B  | PN 250                  | 3SQ         |            |
| Process connection thread ASME B1.20.1  |                         |             |            |
| ¼"-NPT-M  | Class 1500              | 5TA         |            |
| ¼"-NPT-M  | Class 3675              | 5TB         |            |
| ¼"-NPT-F  | Class 1500              | 5TC         |            |
| ¼"-NPT-F  | Class 3675              | 5TD         |            |
| ½"-NPT-M  | Class 1500              | 5TE         |            |
| ½"-NPT-M  | Class 3675              | 5TF         |            |
| ½"-NPT-F  | Class 1500              | 5TG         |            |
| ½"-NPT-F  | Class 3675              | 5TH         |            |
| ¾"-NPT-M  | Class 1500              | 5TJ         |            |
| ¾"-NPT-M  | Class 3675              | 5TK         |            |
| ¾"-NPT-F  | Class 1500              | 5TL         |            |
| ¾"-NPT-F  | Class 3675              | 5TM         |            |
| 1"-NPT-M  | Class 1500              | 5TN         |            |
| 1"-NPT-M  | Class 3675              | 5TP         |            |
| 1"-NPT-F  | Class 1500              | 5TQ         |            |
| 1"-NPT-F  | Class 3675              | 5TR         |            |
| Other version   |                         | 9AA         | H1Y        |
| Add Order code and plain text   |                         |             |            |

| Selection and Ordering data   |  | Article No. | Order code |
|---|--|-------------|------------|
| <b>Diaphragm seal threaded design</b>   |  |             |            |
| With inside diaphragm, directly connected or connected via flexible capillary tube to a   |  |             |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately<br/>Scope of delivery: 1 off</li> </ul> |  | 7MF0840 -   |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately,<br/>Scope of delivery: 2 off</li> </ul>  |  | 7MF0842 -   |            |
|   |  |             | - 0 0      |
| <b>Transmitter connection</b>   |  |             |            |
| Without capillary tube, direct mount straight connection (for gauge pressure)   |  | 00          |            |
| Connection via capillary tube   |  |             |            |
| Length of capillary   |  |             |            |
| 1 m   |  | 10          |            |
| 1,6 m   |  | 11          |            |
| 2 m   |  | 12          |            |
| 2,5 m   |  | 13          |            |
| 3 m   |  | 14          |            |
| 4 m   |  | 15          |            |
| 5 m   |  | 16          |            |
| 6 m   |  | 17          |            |
| 7 m   |  | 18          |            |
| 8 m   |  | 20          |            |
| 9 m   |  | 21          |            |
| 10 m  |  | 22          |            |
| Other version   |  | 98          | L1Y        |
| Add Order code and plain text   |  |             |            |
| <b>Filling liquid</b>   |  |             |            |
| Silicone oil M5   |  | A           |            |
| Silicone oil M50  |  | B           |            |
| High-temperature oil  |  | C           |            |
| Halocarbon oil  |  | D           |            |
| Food-grade oil (FDA listed)   |  | E           |            |
| Other version   |  | Z           | P1Y        |
| Add Order code and plain text   |  |             |            |
| <b>Wetted parts materials</b>   |  |             |            |
| Stainless steel 316L without coating  |  | A           |            |
| Stainless steel 316L with PTFE-coating  |  | E           |            |
| Monel 400, 2.4360   |  | G           |            |
| Hastelloy C276, 2.4819  |  | J           |            |
| Tantalum  |  | K           |            |
| Stainless steel 316L with gold coating  |  | S           |            |
| Hastelloy C4, 2.4610  |  | U           |            |
| Other version   |  | Z           | Q1Y        |
| Add Order code and plain text   |  |             |            |

# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

## Diaphragm seal, screwed design directly mounted or/and with capillary

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| Selection and Ordering data  | Order code | Selection and Ordering data   | Order code |
|--|------------|---|------------|
| <b>Further designs</b>   |            | <b>Further designs</b>  |            |
| Add "-Z" to Article No. and specify Order code.  |            | Add "-Z" to Article No. and specify Order code.                                     |            |
| <b>Factory certificates</b>  |            | <b>Capillary coating</b>  |            |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2  | <b>C11</b> | <u>PE protective tube</u>   |            |
| Inspection certificate to EN 10204-3.1 - material of body and wetted parts   | <b>C12</b> | 1 m   | <b>S10</b> |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)                                      | <b>C13</b> | 1,6 m   | <b>S11</b> |
| Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts   | <b>C15</b> | 2 m   | <b>S12</b> |
| Certificate of FDA-approved fill oil (to EN10204-2.2)  | <b>C17</b> | 2,5 m   | <b>S13</b> |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)   | <b>C20</b> | 3 m   | <b>S14</b> |
|  |            | 4 m   | <b>S15</b> |
|  |            | 5 m   | <b>S16</b> |
|  |            | 6 m   | <b>S17</b> |
|  |            | 7 m   | <b>S18</b> |
|  |            | 8 m   | <b>S19</b> |
|  |            | 9 m   | <b>S20</b> |
|  |            | 10 m  | <b>S21</b> |
|  |            | <u>PTFE protective tube</u>   |            |
|  |            | 1 m   | <b>S40</b> |
|  |            | 1,6 m   | <b>S41</b> |
|  |            | 2 m   | <b>S42</b> |
|  |            | 2,5 m   | <b>S43</b> |
|  |            | 3 m   | <b>S44</b> |
|  |            | 4 m   | <b>S45</b> |
|  |            | 5 m   | <b>S46</b> |
|  |            | 6 m   | <b>S47</b> |
|  |            | 7 m   | <b>S48</b> |
|  |            | 8 m   | <b>S49</b> |
|  |            | 9 m   | <b>S50</b> |
|  |            | 10 m  | <b>S51</b> |
|  |            | <u>PVC protective tube</u>  |            |
|  |            | 1 m   | <b>S70</b> |
|  |            | 1,6 m   | <b>S71</b> |
|  |            | 2 m   | <b>S72</b> |
|  |            | 2,5 m   | <b>S73</b> |
|  |            | 3 m   | <b>S74</b> |
|  |            | 4 m   | <b>S75</b> |
|  |            | 5 m   | <b>S76</b> |
|  |            | 6 m   | <b>S77</b> |
|  |            | 7 m   | <b>S78</b> |
|  |            | 8 m   | <b>S79</b> |
|  |            | 9 m   | <b>S80</b> |
|  |            | 10 m  | <b>S81</b> |
|  |            | <b>Device settings</b>  |            |
|  |            | Operating Temperature; Lower range value ... °C (°F), upper range value ... °C (°F) | <b>Y10</b> |
|  |            | Static pressure: ... bar (psi) (only for 7MF0842)                                   | <b>Y11</b> |
| <b>Accessories</b>   |            |   |            |
| Low-temperature version (for Silicon Oil M50 only)   | <b>D67</b> |   |            |
| Flushing port ¼"-18 NPT unsealed   | <b>D70</b> |   |            |
| Flushing port ¼"-18 NPT sealed with stainless steel plug   | <b>D71</b> |   |            |
| Sealing material between upper and lower housing PTFE (instead of FKM viton)   | <b>D75</b> |   |            |
| Sealing material between upper and lower housing metal C-circlip (instead of FKM viton)  | <b>D76</b> |   |            |
| PTFE coating for lower housing (only for G½B PN 100, DN 25 PN 10 ... 40, 1 inch Class 150/300)   | <b>D77</b> |   |            |
| <b>Negative pressure services</b>  |            |   |            |
| Negative pressure service (for gauge and absolute pressure transmitters)   | <b>D81</b> |   |            |
| Negative pressure service (for differential pressure transmitters)   | <b>D83</b> |   |            |
| Extended negative pressure service (for gauge and absolute pressure transmitters)  | <b>D85</b> |   |            |
| Extended negative pressure service (for differential pressure transmitters)  | <b>D88</b> |   |            |
| <b>General product approvals without explosion proof approvals</b>   |            |   |            |
| Oil-and grease-free cleaned version (for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar) | <b>E80</b> |   |            |
| Oil-and grease-free cleaned version (not for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)   | <b>E87</b> |   |            |
| <b>Capillary connection (only for 7MF0840)</b>   |            |   |            |
| Single-side mounted at differential pressure transmitters at high-side   | <b>S03</b> |   |            |
| Single-side mounted at differential pressure transmitters at low-side  | <b>S04</b> |   |            |
| Cooling element  | <b>S08</b> |   |            |

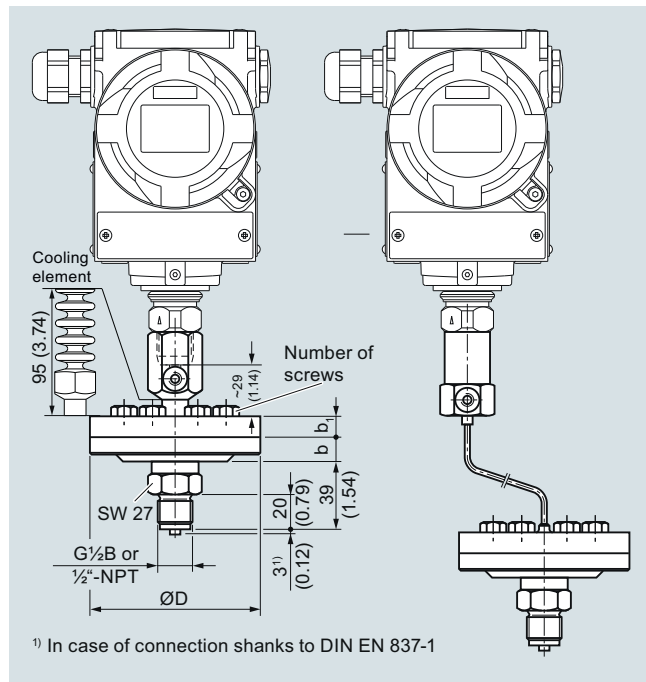
## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

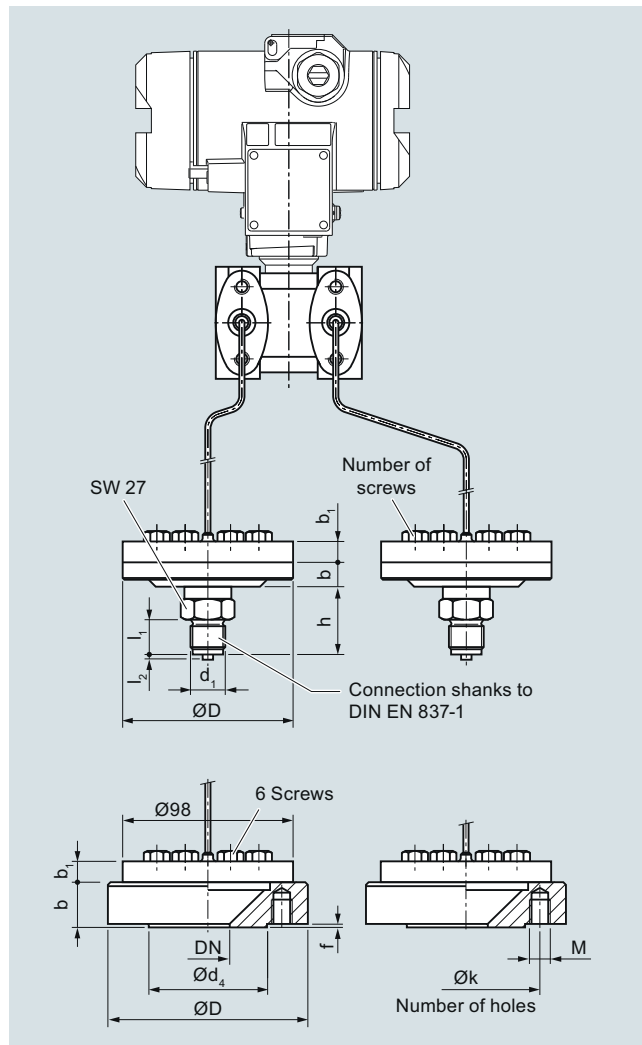
Diaphragm seal, screwed design directly mounted or/and with capillary

### Dimensional drawings



Diaphragm seal, screwed gland with inside diaphragm, for gauge and absolute pressure, direct and attached directly to the transmitter with with capillaries, dimensions in mm (inch)

| Range         | D<br>mm | b<br>mm | b <sub>1</sub><br>mm | Number of<br>screws |
|---------------|---------|---------|----------------------|---------------------|
| up to 100 bar | 98      | 14      | 16                   | 6                   |
| up to 250 bar | 98      | 14      | 20                   | 12                  |

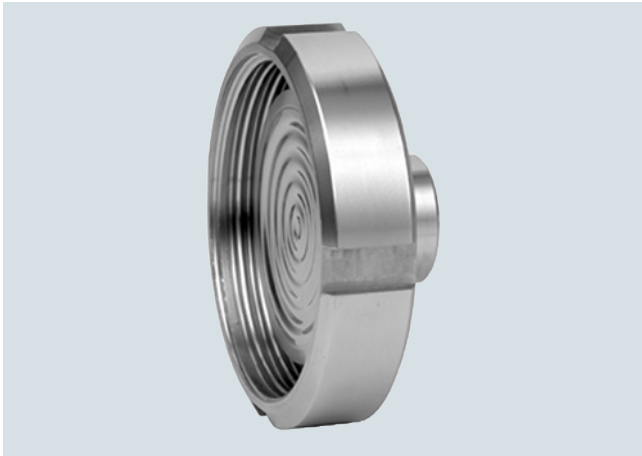


Diaphragm seal, screwed gland with inside diaphragm, for differential pressure, direct and attached directly to the transmitter with with capillaries, dimensions in mm (inch)

| Nomi-<br>nal<br>diam-<br>eter | Nominal<br>pressure | D<br>mm | d <sub>4</sub><br>mm | k<br>mm | M   | Number<br>of holes | b<br>mm | b <sub>1</sub><br>mm | f<br>mm |
|-------------------------------|---------------------|---------|----------------------|---------|-----|--------------------|---------|----------------------|---------|
| DN 25                         | PN 10/16/<br>25/40  | 115     | 68                   | 85      | M12 | 4                  | 26      | 12                   | 2       |
| 1 inch                        | 150<br>lb/sq.in     | 110     | 50.8                 | 79.4    | M12 | 4                  | 32      | 12                   | 2       |
| 1 inch                        | 300<br>lb/sq.in     | 125     | 50.8                 | 88.9    | M16 | 4                  | 32      | 12                   | 2       |



## Overview



Quick-release diaphragm seals, to DIN 11851 with slotted union nut



Quick-release diaphragm seals, with clamp connection

Quick-release diaphragm seals are available for the following SITRANS P pressure transmitter series:

- For pressure: P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
- For differential pressure and flow: P500, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
- The quick-release remote seals are common designs in the food industry. Their design means that the measured medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismantling is possible for cleaning.

## Technical specifications

## Quick-release diaphragm seal

| Connection, nominal diameter  | Nominal pressure   |
|---|--|
| <ul style="list-style-type: none"> <li>• Standard to DIN 11851 with nut               <ul style="list-style-type: none"> <li>- DN 25/32/40</li> <li>- DN 50/65/80</li> </ul> </li> <li>• Standard to DIN 11851 with thread               <ul style="list-style-type: none"> <li>- DN 25/32/40</li> <li>- DN 50/65/80</li> </ul> </li> <li>• Standard clamp ISO 2852               <ul style="list-style-type: none"> <li>- DN 25/38/51</li> <li>- DN 63.5/76.1</li> </ul> </li> </ul> | PN 40<br>PN 25<br><br>PN 40<br>PN 25<br><br>PN 16<br>PN 10 |







- Standard clamp DIN 32676, row C Tri-clamp
  - 1 inch, 1½ inch
  - 2 inch, 2½ inch
  - 3 inch

PN 25  
PN 16  
PN 10

- Standard clamp DIN 32676, row A metric
  - DN 25/32/40
  - DN 50
  - DN 65

PN 25  
PN 16  
PN 10

- Varivent
  - DN 25/32/40/50

PN 25

- DRD-flange
  - DN 50

PN 40

## Sealing face

- For stainless steel, mat. No. 1.4404/316L

To EN 1092-1, form B1 or  
ASME B 16.5RF 125 ... 250 AA

- For the other materials

To EN 1092-1, form B2 or  
ASME B16.5 RFSF

## Materials

- Main body
- Wetted parts
- Capillary

Stainless steel 316L

Stainless steel 316L

Stainless steel, mat. No. 1.4571/316Ti

- Sheath

Spiral protective tube made of stainless steel, mat. No. 1.4301/316

## Maximum pressure

See above and the technical data of the pressure transmitter

## Tube length

Without tube

## Capillary

- Length

Max. 10 m (32.8 ft), longer lengths on request

- Internal diameter

2 mm (0.079 inch)

- Minimum bending radius

150 mm (5.9 inch)

- Sheath

Spiral protective tube made of stainless steel, mat. No. 1.4301/316

## Filling liquid

Food oil (FDA listed)

## Permissible ambient temperature

Dependent on the pressure transmitter and the filling liquid of the remote seal

More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals

## Weight

Approx. 4 kg (8.82 lb)

## Certificates and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

## EHEDG

Complies with EHEDG recommendations

# Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

## Quick-release diaphragm seals

1

### Selection and Ordering data

Article No.

Order  
code

#### Quick release diaphragm seal

Flange type design, with flexible capillary tube or directly connected to a

- SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately  
Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately  
Scope of delivery: 1 off

7MF0830 -

7MF0832 -

- 0 A 0

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Nominal diameter Nominal pressure

Connection standard DIN 11851 with nut

|       |       |     |
|-------|-------|-----|
| DN 25 | PN 40 | 0BM |
| DN 32 | PN 40 | 0CD |
| DN 40 | PN 40 | 0DM |
| DN 50 | PN 25 | 0EK |
| DN 65 | PN 25 | 0FL |
| DN 80 | PN 25 | 0GK |

Connection standard DIN 11851 with thread

|       |       |     |
|-------|-------|-----|
| DN 25 | PN 40 | 1BM |
| DN 32 | PN 40 | 1CD |
| DN 40 | PN 40 | 1DM |
| DN 50 | PN 25 | 1EK |
| DN 65 | PN 25 | 1FL |
| DN 80 | PN 25 | 1GK |

Connection standard Clamp ISO 2852

|         |       |     |
|---------|-------|-----|
| DN 25   | PN 16 | 2BK |
| DN 38   | PN 16 | 2CQ |
| DN 51   | PN 16 | 2FH |
| DN 63.5 | PN 10 | 2FJ |
| DN 76.1 | PN 10 | 2GJ |

Connection standard Clamp DIN 32676, row C Tri-clamp

|        |       |     |
|--------|-------|-----|
| DN 1"  | PN 25 | 3KV |
| DN 1½" | PN 25 | 3LV |
| DN 2"  | PN 16 | 3MV |
| DN 2½" | PN 16 | 3NV |
| DN 3"  | PN 10 | 3PV |

Connection standard Clamp DIN 32676, row A metric

|       |       |     |
|-------|-------|-----|
| DN 25 | PN 25 | 4BL |
| DN 32 | PN 25 | 4CC |
| DN 40 | PN 25 | 4DL |
| DN 50 | PN 16 | 4EJ |
| DN 65 | PN 10 | 4FK |

Varivent

|          |       |     |
|----------|-------|-----|
| DN 25/32 | PN 25 | 5CL |
| DN 40/50 | PN 25 | 5DK |

DRD-flange

|       |       |     |
|-------|-------|-----|
| DN 50 | PN 40 | 6EM |
|-------|-------|-----|

Other version  
Add Order code and plain text

9AA H1Y

### Selection and Ordering data

Article No.

Order  
code

#### Quick release diaphragm seal

Flange type design, with flexible capillary tube or directly connected to a

- SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately  
Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately  
Scope of delivery: 1 off

7MF0830 -

7MF0832 -

- 0 A 0

#### Transmitter connection

Without capillary tube, direct mount straight connection (for gauge pressure)

Connection via capillary tube

Length of capillary

1 m  
1,6 m  
2 m  
2,5 m  
3 m  
4 m  
5 m  
6 m  
7 m  
8 m  
9 m  
10 m

00

10

11

12

13

14

15

16

17

18

20

21

22

Other version

Add Order code and plain text

98

L1Y

#### Filling liquid

Food-grade oil (FDA listed)

Other version

Add Order code and plain text

E

Z

P1Y

**Pressure Measurement**Remote seals for transmitters and pressure gauges  
SITRANS P320/P420**Quick-release diaphragm seals**

1

| Selection and Ordering data  | Order code | Selection and Ordering data   | Order code |
|--|------------|---|------------|
| <b>Further designs</b>   |            | <b>Further designs</b>  |            |
| Add "-Z" to Article No. and specify Order code.  |            | Add "-Z" to Article No. and specify Order code.                                     |            |
| <b>Factory certificates</b>  |            | <u>PVC protective tube</u>  |            |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2  | <b>C11</b> | 1 m   | <b>S70</b> |
| Inspection certificate to EN 10204-3.1 - material of body and wetted parts   | <b>C12</b> | 1,6 m   | <b>S71</b> |
| Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts                                       | <b>C15</b> | 2 m   | <b>S72</b> |
| Certificate of FDA-approved fill oil (to EN10204-2.2)  | <b>C17</b> | 2,5 m   | <b>S73</b> |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration) | <b>C20</b> | 3 m   | <b>S74</b> |
|  |            | 4 m   | <b>S75</b> |
|  |            | 5 m   | <b>S76</b> |
|  |            | 6 m   | <b>S77</b> |
|  |            | 7 m   | <b>S78</b> |
|  |            | 8 m   | <b>S79</b> |
|  |            | 9 m   | <b>S80</b> |
|  |            | 10 m  | <b>S81</b> |
| <b>Negative pressure services</b>  |            | <b>Device settings</b>  |            |
| Negative pressure service (for gauge and absolute pressure transmitters)   | <b>D81</b> | Operating Temperature; Lower range value ... °C (°F), upper range value ... °C (°F) | <b>Y10</b> |
| Negative pressure service (for differential pressure transmitters)   | <b>D83</b> |   |            |
| Extended negative pressure service (for gauge and absolute pressure transmitters)  | <b>D85</b> |   |            |
| Extended negative pressure service (for differential pressure transmitters)  | <b>D88</b> |   |            |
| <b>Capillary connection (only for 7MF0830)</b>   |            |   |            |
| Single-side mounted at differential pressure transmitters at high-side   | <b>S03</b> |   |            |
| Single-side mounted at differential pressure transmitters at low-side  | <b>S04</b> |   |            |
| Cooling element  | <b>S08</b> |   |            |
| <b>Capillary coating</b>   |            |   |            |
| <u>PE protective tube</u>  |            |   |            |
| 1 m  | <b>S10</b> |   |            |
| 1,6 m  | <b>S11</b> |   |            |
| 2 m  | <b>S12</b> |   |            |
| 2,5 m  | <b>S13</b> |   |            |
| 3 m  | <b>S14</b> |   |            |
| 4 m  | <b>S15</b> |   |            |
| 5 m  | <b>S16</b> |   |            |
| 6 m  | <b>S17</b> |   |            |
| 7 m  | <b>S18</b> |   |            |
| 8 m  | <b>S19</b> |   |            |
| 9 m  | <b>S20</b> |   |            |
| 10 m   | <b>S21</b> |   |            |
| <u>PTFE protective tube</u>  |            |   |            |
| 1 m  | <b>S40</b> |   |            |
| 1,6 m  | <b>S41</b> |   |            |
| 2 m  | <b>S42</b> |   |            |
| 2,5 m  | <b>S43</b> |   |            |
| 3 m  | <b>S44</b> |   |            |
| 4 m  | <b>S45</b> |   |            |
| 5 m  | <b>S46</b> |   |            |
| 6 m  | <b>S47</b> |   |            |
| 7 m  | <b>S48</b> |   |            |
| 8 m  | <b>S49</b> |   |            |
| 9 m  | <b>S50</b> |   |            |
| 10 m   | <b>S51</b> |   |            |

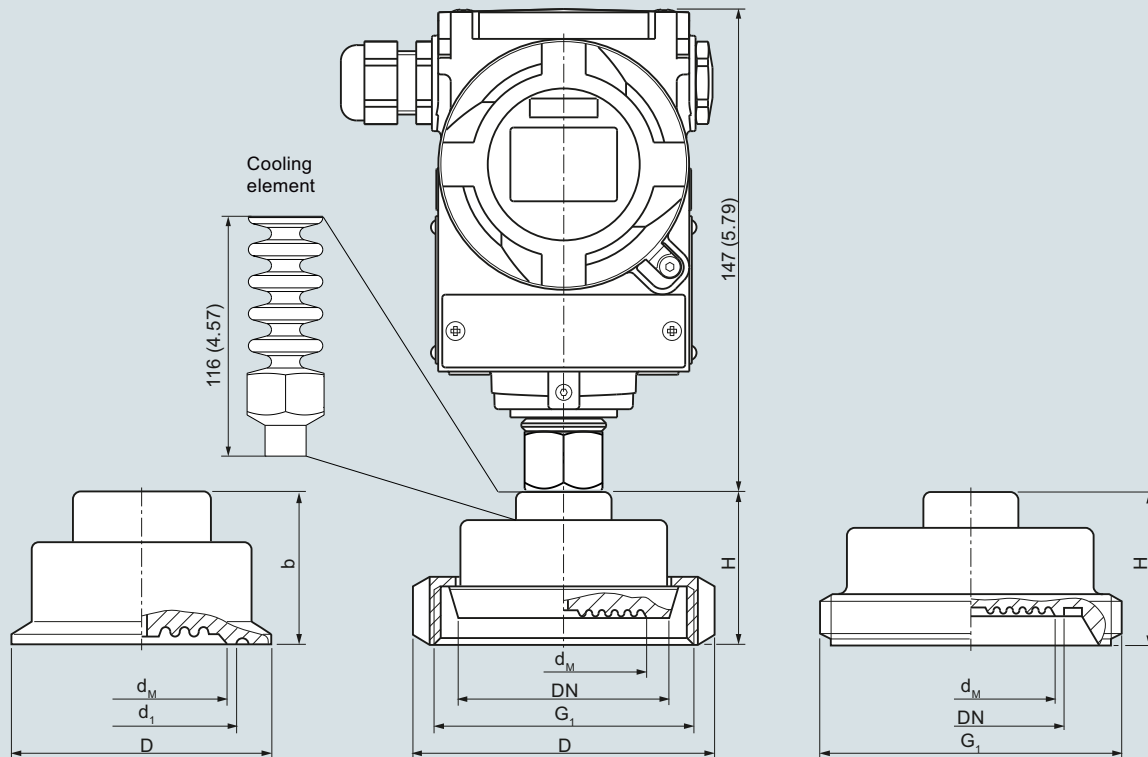
## Pressure Measurement

Remote seals for transmitters and pressure gauges

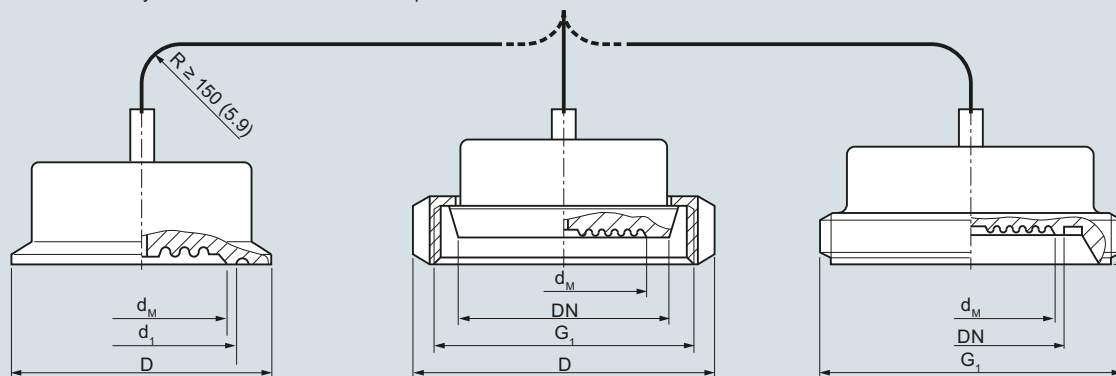
SITRANS P320/P420

### Quick-release diaphragm seals

#### Dimensional drawings



Mounted directly on SITRANS P transmitter for pressure



Mounted on SITRANS P transmitter for pressure or differential pressure and flow



Quick-release diaphragm seal, dimensions in mm (inch)

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

### Quick-release diaphragm seals

1

Connection to DIN 11851 with slotted union nut

| Nominal diameter | Ø d <sub>M</sub><br>mm | Ø D<br>mm | H<br>mm | G <sub>1</sub><br>mm |
|------------------|------------------------|-----------|---------|----------------------|
| DN 25            | 25                     | 63        | 36      | Rd 52x1/6            |
| DN 32            | 32                     | 70        | 36      | Rd 52x1/6            |
| DN 40            | 40                     | 78        | 36      | Rd 65x1/6            |
| DN 50            | 52                     | 112       | 36      | Rd 78x1/6            |
| DN 65            | 65                     | 112       | 36      | Rd 95x1/6            |
| DN 80            | 72                     | 127       | 36      | Rd 110x1/6           |

Connection to DIN 11851 with threaded socket

| Nominal diameter | Ø d <sub>M</sub><br>mm | H<br>mm | G <sub>1</sub><br>mm |
|------------------|------------------------|---------|----------------------|
| DN 25            | 25                     | 36      | Rd 52x1/6            |
| DN 32            | 32                     | 36      | Rd 52x1/6            |
| DN 40            | 40                     | 36      | Rd 65x1/6            |
| DN 50            | 52                     | 36      | Rd 78x1/6            |
| DN 65            | 65                     | 36      | Rd 95x1/6            |
| DN 80            | 72                     | 36      | Rd 110x1/6           |

Clamp connection to ISO 2852 for pipes to ISO 2037

| Nominal diameter | Nominal pressure | d <sub>M</sub><br>mm | d <sub>1</sub><br>mm | b<br>mm | D<br>mm |
|------------------|------------------|----------------------|----------------------|---------|---------|
| DN 25            | PN 16            | 22.6                 | 43.5                 | 14      | 50.5    |
| DN 38            | PN 16            | 34                   | 43.5                 | 12      | 50.5    |
| DN 51            | PN 16            | 46                   | 56.5                 | 14      | 64      |
| DN 63.5          | PN 10            | 51                   | 70.5                 | 14      | 77.5    |
| DN 76.1          | PN 10            | 65                   | 83.5                 | 14      | 91      |

Clamp connection to DIN 32676 row C (Tri-Clamp) for pipes to ASME BPE

| Nominal diameter | Nominal pressure | d <sub>M</sub><br>mm<br>(inch) | d <sub>1</sub><br>mm<br>(inch) | b<br>mm<br>(inch) | D<br>mm<br>(inch) |
|------------------|------------------|--------------------------------|--------------------------------|-------------------|-------------------|
| 1"               | PN 25            | 22.6<br>(0.89)                 | 43.5<br>(1.71)                 | 14<br>(0.55)      | 50.5<br>(1.99)    |
| 1½"              | PN 25            | 34<br>(1.34)                   | 43.5<br>(1.71)                 | 12<br>(0.47)      | 50.5<br>(1.99)    |
| 2"               | PN 16            | 46<br>(1.81)                   | 56.5<br>(2.22)                 | 14<br>(0.55)      | 64<br>(2.52)      |
| 2½"              | PN 16            | 51<br>(2.01)                   | 70.5<br>(2.78)                 | 14<br>(0.55)      | 77.5<br>(3.05)    |
| 3"               | PN 16            | 65<br>(2.56)                   | 83.5<br>(3.29)                 | 14<br>(0.55)      | 91<br>(3.58)      |

Clamp connection to DIN 32676 row A (metric) for pipes to EN 10357 (DIN 11850)

| Nominal diameter | Nominal pressure | Ø d <sub>M</sub><br>mm | d <sub>1</sub><br>mm | b<br>mm | D<br>mm |
|------------------|------------------|------------------------|----------------------|---------|---------|
| DN 25            | PN 25            | 22.6                   | 43.5                 | 14      | 50.5    |
| DN 32            | PN 25            | 27                     | 43.5                 | 12      | 50.5    |
| DN 40            | PN 25            | 34                     | 43.5                 | 12      | 50.5    |
| DN 50            | PN 16            | 46                     | 56.5                 | 14      | 64      |
| DN 65            | PN 16            | 65                     | 83.5                 | 14      | 91      |

Varivent

| Nominal diameter          | d <sub>M</sub><br>mm<br>(inch) | A<br>mm<br>(inch) | D<br>mm<br>(inch) | h<br>mm<br>(inch) |
|---------------------------|--------------------------------|-------------------|-------------------|-------------------|
| DN 25, DN 32, 1", 1¼"     | 40<br>(1.57)                   | 66<br>(2.6)       | 50<br>(1.97)      | 19<br>(0.75)      |
| DN 40 ... 125, 1½" ... 6" | 58<br>(2.28)                   | 84<br>(3.331)     | 68<br>(2.68)      | 19<br>(0.75)      |

d<sub>M</sub> Effective diaphragm diameter

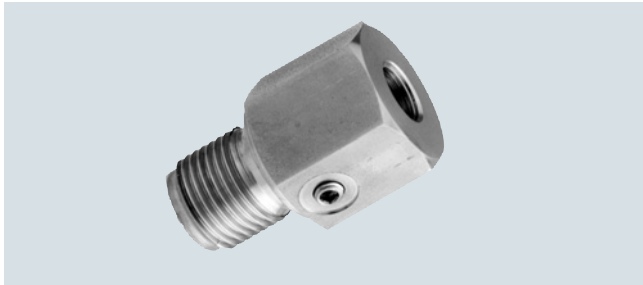
## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

1

### Miniature diaphragm seals

#### Overview



Miniature diaphragm seals

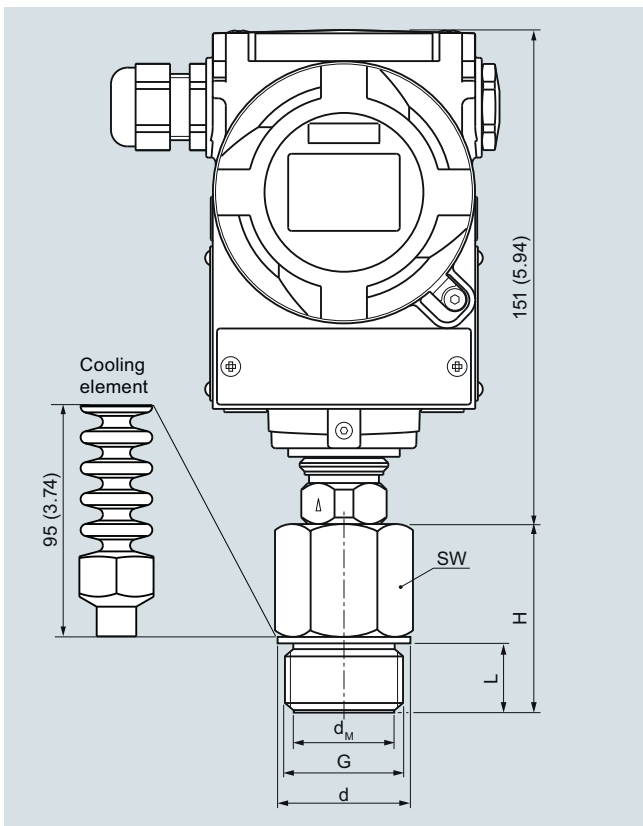
The miniature diaphragm seals are available for the SITRANS P320/420 pressure transmitter series.

Suitable for high pressures, contaminated, fibrous and viscous media in the chemical, paper, food and drink industries.

#### Design

- Flush-mounted diaphragm
- No dead spaces
- Fixed threaded stems

#### Dimensional drawings



Miniature diaphragm seal, dimensions in mm (inch)

| G    | Ø d <sub>M</sub> |        | SW |        | Ø d |        | L  |        | H  |        |
|------|------------------|--------|----|--------|-----|--------|----|--------|----|--------|
|      | mm               | (inch) | mm | (inch) | mm  | (inch) | mm | (inch) | mm | (inch) |
| G1B  | 25               | (0.98) | 41 | (1.61) | 39  | (1.53) | 28 | (1.1)  | 56 | (2.21) |
| G1½B | 40               | (1.57) | 55 | (2.17) | 60  | (2.36) | 30 | (1.18) | 50 | (1.97) |
| G2B  | 50               | (1.97) | 60 | (2.36) | 70  | (2.76) | 30 | (1.18) | 63 | (2.48) |

| G       | Ø d <sub>M</sub> |        | SW |        | L  |        | H  |        |
|---------|------------------|--------|----|--------|----|--------|----|--------|
|         | mm               | (inch) | mm | (inch) | mm | (inch) | mm | (inch) |
| 1"-NPT  | 27               | (1.06) | 41 | (1.61) | 25 | (0.98) | 40 | (1.57) |
| 1½"-NPT | 34               | (1.34) | 55 | (2.17) | 26 | (1.02) | 45 | (1.77) |
| 2"-NPT  | 46               | (1.81) | 65 | (2.56) | 26 | (1.02) | 45 | (1.77) |

d<sub>M</sub>: Effective diaphragm diameter

#### Technical specifications

##### Miniature diaphragm seals

|  |  |
|--|--|
| Span with  |  |
| • G1B and 1"-NPT   | > 6 bar (> 87 psi)   |
| • G1½B and 1½"-NPT   | > 2 bar (> 29 psi)   |
| • G2B and 2"-NPT   | > 600 mbar (> 8.7 psi)   |
| Filling liquid   | Silicone oil M5 or food oil (FDA listed)   |
| Material   |  |
| • Main body  | Stainl. steel mat No. 1.4404/ 316L or Hastelloy C276, mat No. 2.4819   |
| • Diaphragm  | Stainl. steel mat No. 1.4404 / 316L or Hastelloy C276, mat. No. 2.4819   |
| Maximum pressure   | 100% of nominal pressure of pressure transmitter, up to maximum of PN 400 (5802 psi) (depending on the seal used)                          |
| Temperature of use   | Same as pressure transmitter   |
| Temperature range of medium  | Same as pressure transmitter   |
| Max. recommended process temperature                                       | 150 °C (302 °F)  |
| Weight   |  |
| • G1B and 1"-NPT   | Approx. 0.3 kg (approx. 0.66 lb)   |
| • G1½B and 1½"-NPT   | Approx. 0.5 kg (approx. 1.10 lb)   |
| • G2B and 2"-NPT   | Approx. 0.8 kg (approx. 1.76 lb)   |
| <b>Certificate and approvals</b>   |  |
| Classification according to pressure equipment directive (DGRL 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) |

# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

## Miniature diaphragm seals

1

| Selection and Ordering data  |            | Article No. | Order code | Selection and Ordering data   |  | Order code |
|--|------------|-------------|------------|---|--|------------|
| <b>Miniature diaphragm seal</b>  |            |             |            | <b>Further designs</b>  |  |            |
| directly connected to a  |            |             |            | Add <b>"-Z"</b> to Article No. and specify Order code.  |  |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately</li> <li>Scope of delivery: 1 off</li> </ul> |            | 7MF0850 -   |            | <b>Factory certificates</b>   |  |            |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |            | 00 - 00     |            | Quality inspection certificate (Five-step factory calibration) to IEC 60770-2   |  | C11        |
|  |            |             |            | Inspection certificate to EN 10204-3.1 - material of body and wetted parts  |  | C12        |
|  |            |             |            | Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel) |  | C13        |
|  |            |             |            | Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts  |  | C15        |
|  |            |             |            | Certificate of FDA-approved fill oil (to EN10204-2.2)   |  | C17        |
|  |            |             |            | Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)                    |  | C20        |
|  |            |             |            | <b>Negative pressure services</b>   |  |            |
|  |            |             |            | Negative pressure service   |  | D81        |
|  |            |             |            | Extended negative pressure service (for gauge and absolute pressure transmitters)   |  | D85        |
|  |            |             |            | <b>Capillary connection</b>   |  |            |
|  |            |             |            | Cooling element between transmitter and remote seal   |  | S08        |
|  |            |             |            | <b>Device settings</b>  |  |            |
|  |            |             |            | Operating Temperature; Lower range value ... °C (°F), upper range value ... °C (°F)   |  | Y10        |
| <b>Process connection</b>  |            |             |            |   |  |            |
| Connection standard DIN 3852   |            |             |            |   |  |            |
| G 1/2"   | PN 400     | 4ST         |            |   |  |            |
| G 3/4"   | PN 400     | 4SU         |            |   |  |            |
| G 1"   | PN 400     | 4SV         |            |   |  |            |
| G 1 1/2"   | PN 400     | 4SW         |            |   |  |            |
| G 2"   | PN 400     | 4SX         |            |   |  |            |
| Connection standard ASME B1.20.1   |            |             |            |   |  |            |
| 1/2"-NPT-M   | class 5800 | 5TS         |            |   |  |            |
| 3/4"-NPT-M   | class 5800 | 5TT         |            |   |  |            |
| 1"-NPT-M   | class 5800 | 5TU         |            |   |  |            |
| 1 1/2"-NPT-M   | class 5800 | 5TV         |            |   |  |            |
| 2"-NPT-M   | class 5800 | 5TW         |            |   |  |            |
| Other version  |            | 9AA         | H1Y        |   |  |            |
| Add Order code and plain text  |            |             |            |   |  |            |
| <b>Filling liquid</b>  |            |             |            |   |  |            |
| Silicone oil M5  |            | A           |            |   |  |            |
| Food-grade oil (FDA listed)  |            | E           |            |   |  |            |
| Other version  |            | Z           | P1Y        |   |  |            |
| Add Order code and plain text  |            |             |            |   |  |            |
| <b>Wetted parts material</b>   |            |             |            |   |  |            |
| Stainless steel 316L without coating   |            | A           |            |   |  |            |
| Hastelloy C276, 2.4819   |            | J           |            |   |  |            |

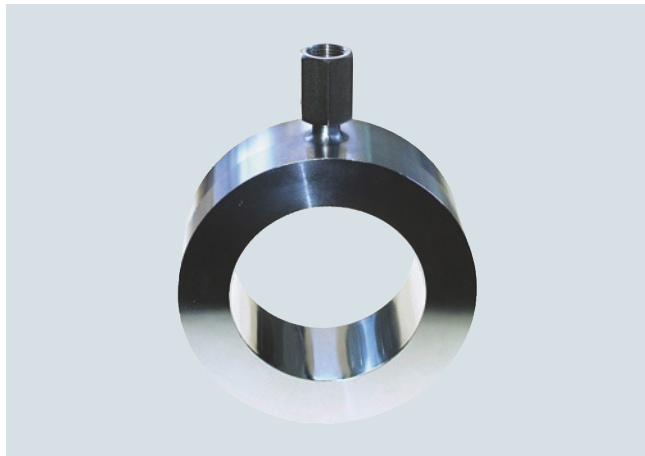
## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

### Clamp-on seals of flange design

1

#### Overview



Inline seals for flange-mounting

The inline seal is completely integrated in the process line. It is particularly suitable for flowing and highly viscous media.

The inline remote seal consists of a cylindrical jacket into which a thin-walled pipe is welded. It is clamped directly between two flanges in the pipeline.

#### Design

- Inline seals for flange-mounting (flange design) to EN/ASME for SITRANS P pressure transmitters
  - For pressure: P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
  - For differential pressure and flow: DS III with HART, DS III with PROFIBUS PA, DS III with FOUNDATION Fieldbus and P500
- Sealing face to EN 1092-1 or ASME B16.5
- Connection to the transmitter directly or by means of a flexible capillary (max. 10 m long)
- See Technical data for details of materials used for the wetted parts
- Material used for the capillary, the guard sleeve, the seal's main body and the measuring cell: Stainless steel, mat.-No. 1.4571
- Filling liquid: Silicone oil, high-temperature oil, halocarbon oil, food oil (FDA listed) or glycerin/water (not suitable for uses in low-pressure range)

#### Function

The measured pressure is transferred from the diaphragm to the filling liquid and passes either directly or through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

#### Note:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof remote seal (see Selection and Ordering data).

#### Technical specifications

##### Inline seals for flange-mounting

|                                 |  |
|---------------------------------|--|
| Nominal diameter                | Nominal pressure   |
| Connecting standard EN 1092-1   |  |
| • DN 25/40/50/65/80/100/125     | PN 6 ... PN 100  |
| Connecting standard ASME B16.5  |  |
| • 1, 1½, 2, 2½, 3, 4, 5 inch    | Class 150 ... class 2500   |
| Process connection              | Flange to EN 1092-1 or ASME B 16.5   |
| Sealing face                    | <ul style="list-style-type: none"> <li>• for stainless steel mat. no. 1.4404/316L according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA</li> <li>• for all other materials according to EN 1092-1, form B2 or ASME B16.5 RFSF</li> </ul> |
| Materials                       |  |
| • Main body                     | Stainless steel 1.4404/316L  |
| • Diaphragm                     | Stainless steel 1.4404/316L  |
| • Wetted parts                  | Stainless steel 1.4404/316L  |
|                                 | <ul style="list-style-type: none"> <li>• Without coating</li> <li>• ECTFE coating (for vacuum on request)</li> <li>• PFA coating</li> </ul>  |
|                                 | Monel 400, mat. No. 2.4360   |
|                                 | Hastelloy C276, mat. No. 2.4819  |
|                                 | Hastelloy C4, mat. No. 2.4602  |
|                                 | Tantalum   |
| • Capillary                     | Stainless steel, mat. No. 1.4571/316Ti   |
| • Sheath                        | Spiral protective tube made of stainless steel, mat. No. 1.4301/316  |
| Capillary                       |  |
| • Length                        | Max. 10 m (32.8 ft)  |
| • Internal diameter             | 2 mm (0.079 inch)  |
| • Minimum bending radius        | 150 mm (5.9 inch)  |
| Filling liquid                  | Silicone oil M5  |
|                                 | Silicone oil M50   |
|                                 | High-temperature oil   |
|                                 | Halocarbon oil   |
|                                 | Food oil (FDA listed)  |
| Permissible ambient temperature | See pressure transmitters, see filling liquid  |
| Weight                          | Approx. 4 kg (8.82 lb)   |

##### Certificates and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord





## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

## Clamp-on seals of flange design

1

| Selection and Ordering data   |                         | Article No. | Order code |
|---|-------------------------|-------------|------------|
| <b>Inline-diaphragm seal</b>  |                         |             |            |
| Sandwich type design, directly connected or connected with flexible capillary tube to a   |                         |             |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately<br/>Scope of delivery: 1 off</li> </ul> |                         | 7MF0900 -   |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off</li> </ul>  |                         | 7MF0902 -   |            |
|    |                         | - 0 0       |            |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |                         |             |            |
| <b>Nominal diameter</b>   | <b>Nominal pressure</b> |             |            |
| Connecting standard EN 1092-1   |                         |             |            |
| DN 25   | PN 6 ... 100            | 0BP         |            |
| DN 40   | PN 6 ... 100            | 0DP         |            |
| DN 50   | PN 6 ... 100            | 0EP         |            |
| DN 65   | PN 6 ... 100            | 0FP         |            |
| DN 80   | PN 6 ... 100            | 0GP         |            |
| DN 100  | PN 6 ... 100            | 0HP         |            |
| DN 125  | PN 6 ... 100            | 0JP         |            |
| Connecting standard ASME B16.5  |                         |             |            |
| 1 inch  | class 150 ... 2500      | 1KX         |            |
| 1½ inch   | class 150 ... 2500      | 1LX         |            |
| 2 inch  | class 150 ... 2500      | 1MX         |            |
| 2½ inch   | class 150 ... 2500      | 1NX         |            |
| 3 inch  | class 150 ... 2500      | 1PX         |            |
| 4 inch  | class 150 ... 2500      | 1QX         |            |
| 5 inch  | class 150 ... 2500      | 1RX         |            |
| Other version<br>Add Order code and plain text  |                         | 9AA         | H1Y        |
| <b>Transmitter connection</b>   |                         |             |            |
| Without capillary tube, direct mount straight connection (for gauge pressure)   |                         | 00          |            |
| Without capillary tube, direct mount connection via 90°-bow (for gauge pressure)  |                         | 01          |            |
| Connection via capillary tube   |                         |             |            |
| Length of capillary   |                         |             |            |
| 1 m   |                         | 10          |            |
| 1,6 m   |                         | 11          |            |
| 2 m   |                         | 12          |            |
| 2,5 m   |                         | 13          |            |
| 3 m   |                         | 14          |            |
| 4 m   |                         | 15          |            |
| 5 m   |                         | 16          |            |
| 6 m   |                         | 17          |            |
| 7 m   |                         | 18          |            |
| 8 m   |                         | 20          |            |
| 9 m   |                         | 21          |            |
| 10 m  |                         | 22          |            |
| 11 m (only for 7MF0900)   |                         | 23          |            |
| 12 m (only for 7MF0900)   |                         | 24          |            |
| 13 m (only for 7MF0900)   |                         | 25          |            |
| 14 m (only for 7MF0900)   |                         | 26          |            |
| 15 m (only for 7MF0900)   |                         | 27          |            |
| Other version<br>Add Order code and plain text  |                         | 98          | L1Y        |

| Selection and Ordering data   |  | Article No. | Order code |
|---|--|-------------|------------|
| <b>Inline-diaphragm seal</b>  |  |             |            |
| Sandwich type design, directly connected or connected with flexible capillary tube to a   |  |             |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately<br/>Scope of delivery: 1 off</li> </ul> |  | 7MF0900 -   |            |
| <ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off</li> </ul>  |  | 7MF0902 -   |            |
|    |  | - 0 0       |            |
| <b>Filling liquid</b>   |  |             |            |
| Silicone oil M5   |  | A           |            |
| Silicone oil M50  |  | B           |            |
| High-temperature oil  |  | C           |            |
| Halocarbon oil  |  | D           |            |
| Food-grade oil (FDA listed)   |  | E           |            |
| Other version<br>Add Order code and plain text  |  | Z           | P1Y        |
| <b>Wetted parts materials</b>   |  |             |            |
| Stainless steel 316L  |  | A           |            |
| <ul style="list-style-type: none"> <li>Without coating</li> </ul>   |  | D           |            |
| <ul style="list-style-type: none"> <li>With PFA coating</li> </ul>  |  | F           |            |
| <ul style="list-style-type: none"> <li>With ECTFFE coating</li> </ul>   |  | G           |            |
| Monel 400, 2.4360   |  | J           |            |
| Hastelloy C276, 2.4819  |  | K           |            |
| Tantalum  |  | U           |            |
| Hastelloy C4, 2.4610  |  | Z           | Q1Y        |
| Other version<br>Add Order code and plain text  |  |             |            |

## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

1

### Clamp-on seals of flange design

| Selection and Ordering data  | Order code | Selection and Ordering data  | Order code |
|--|------------|--|------------|
| <b>Further designs</b>   |            | <b>Further designs</b>   |            |
| Add "-Z" to Article No. and specify Order code.  |            | Add "-Z" to Article No. and specify Order code.                          |            |
| <b>Factory certificates</b>  |            | Sealing surface with recess to EN1092-1, form F (wetted parts 316L only) |            |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2  | <b>C11</b> | • DN 25  | <b>M82</b> |
| Inspection certificate to EN 10204-3.1 - material of body and wetted parts   | <b>C12</b> | • DN 40  | <b>M83</b> |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)                                      | <b>C13</b> | • DN 50  | <b>M84</b> |
| Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts   | <b>C15</b> | • DN 80  | <b>M85</b> |
| Certificate of FDA-approved fill oil (to EN10204-2.2)  | <b>C17</b> | • DN 100   | <b>M86</b> |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)   | <b>C20</b> | • DN 125   | <b>M87</b> |
| <b>Accessories</b>   |            | <b>Capillary connection</b>  |            |
| Spark arrestor (for gauge and absolute pressure transmitters)  | <b>D61</b> | For 7MF0900  |            |
| Spark arrestor (for differential pressure and level transmitters)  | <b>D62</b> | Single-side mounted at differential pressure transmitters at high-side   | <b>S03</b> |
| Low-temperature version (for Silicon Oil M50 only)   | <b>D67</b> | Single-side mounted at differential pressure transmitters at low-side    | <b>S04</b> |
| <b>Negative pressure services</b>  |            | cooling element  | <b>S08</b> |
| Negative pressure service (for gauge and absolute pressure transmitters)   | <b>D81</b> | <b>Capillary coating</b>   |            |
| Negative pressure service (for differential pressure transmitters)   | <b>D83</b> | <u>PE protective tube</u>  |            |
| Extended negative pressure service (for gauge and absolute pressure transmitters)  | <b>D85</b> | 1 m  | <b>S10</b> |
| Extended negative pressure service (for differential pressure transmitters)  | <b>D88</b> | 1,6 m  | <b>S11</b> |
| <b>General product approvals without explosion proof approvals</b>   |            | 2 m  | <b>S12</b> |
| Oil-and grease-free cleaned version (for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar) | <b>E80</b> | 2,5 m  | <b>S13</b> |
| Oil-and grease-free cleaned version (not for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)   | <b>E87</b> | 3 m  | <b>S14</b> |
| <b>Sealing surface</b>   |            | 4 m  | <b>S15</b> |
| Sealing surface smooth, form B2/EN1092-1 resp. RF5F/ANSI B16.5 (wetted parts 316L only)  | <b>M50</b> | 5 m  | <b>S16</b> |
| Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)   | <b>M54</b> | 6 m  | <b>S17</b> |
| Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)   | <b>M64</b> | 7 m  | <b>S18</b> |
| Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)   |            | 8 m  | <b>S19</b> |
| • DN 25  | <b>M70</b> | 9 m  | <b>S20</b> |
| • DN 40  | <b>M71</b> | 10 m   | <b>S21</b> |
| • DN 50  | <b>M72</b> | 11 m (only for 7MF0902)  | <b>S22</b> |
| • DN 80  | <b>M73</b> | 12 m (only for 7MF0902)  | <b>S23</b> |
| • DN 100   | <b>M74</b> | 13 m (only for 7MF0902)  | <b>S24</b> |
| • DN 125   | <b>M75</b> | 14 m (only for 7MF0902)  | <b>S25</b> |
| Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)   |            | 15 m (only for 7MF0902)  | <b>S26</b> |
| • DN 25  | <b>M76</b> | <u>PTFE protective tube</u>  |            |
| • DN 40  | <b>M77</b> | 1 m  | <b>S40</b> |
| • DN 50  | <b>M78</b> | 1,6 m  | <b>S41</b> |
| • DN 80  | <b>M79</b> | 2 m  | <b>S42</b> |
| • DN 100   | <b>M80</b> | 2,5 m  | <b>S43</b> |
| • DN 125   | <b>M81</b> | 3 m  | <b>S44</b> |
|  |            | 4 m  | <b>S45</b> |
|  |            | 5 m  | <b>S46</b> |
|  |            | 6 m  | <b>S47</b> |
|  |            | 7 m  | <b>S48</b> |
|  |            | 8 m  | <b>S49</b> |
|  |            | 9 m  | <b>S50</b> |
|  |            | 10 m   | <b>S51</b> |
|  |            | 11 m (only for 7MF0902)  | <b>S52</b> |
|  |            | 12 m (only for 7MF0902)  | <b>S53</b> |
|  |            | 13 m (only for 7MF0902)  | <b>S54</b> |
|  |            | 14 m (only for 7MF0902)  | <b>S55</b> |
|  |            | 15 m (only for 7MF0902)  | <b>S56</b> |

| Selection and Ordering data                           | Order code |
|---|------------|
| <b>Further designs</b>                                |            |
| Add "-Z" to Article No. and specify Order code.       |            |
| <u>PVC protective tube</u>                            |            |
| 1 m   | <b>S70</b> |
| 1,6 m   | <b>S71</b> |
| 2 m   | <b>S72</b> |
| 2,5 m   | <b>S73</b> |
| 3 m   | <b>S74</b> |
| 4 m   | <b>S75</b> |
| 5 m   | <b>S76</b> |
| 6 m   | <b>S77</b> |
| 7 m   | <b>S78</b> |
| 8 m   | <b>S79</b> |
| 9 m   | <b>S80</b> |
| 10 m  | <b>S81</b> |
| 11 m (only for 7MF0902)                               | <b>S82</b> |
| 12 m (only for 7MF0902)                               | <b>S83</b> |
| 13 m (only for 7MF0902)                               | <b>S84</b> |
| 14 m (only for 7MF0902)                               | <b>S85</b> |
| 15 m (only for 7MF0902)                               | <b>S86</b> |
| <b>Device settings</b>                                |            |
| Operating Temperature; Lower range value ... °C (°F), | <b>Y10</b> |
| upper range value ... °C (°F)                         |            |
| Static pressure: ... bar (psi) (only for 7MF0902)     | <b>Y11</b> |

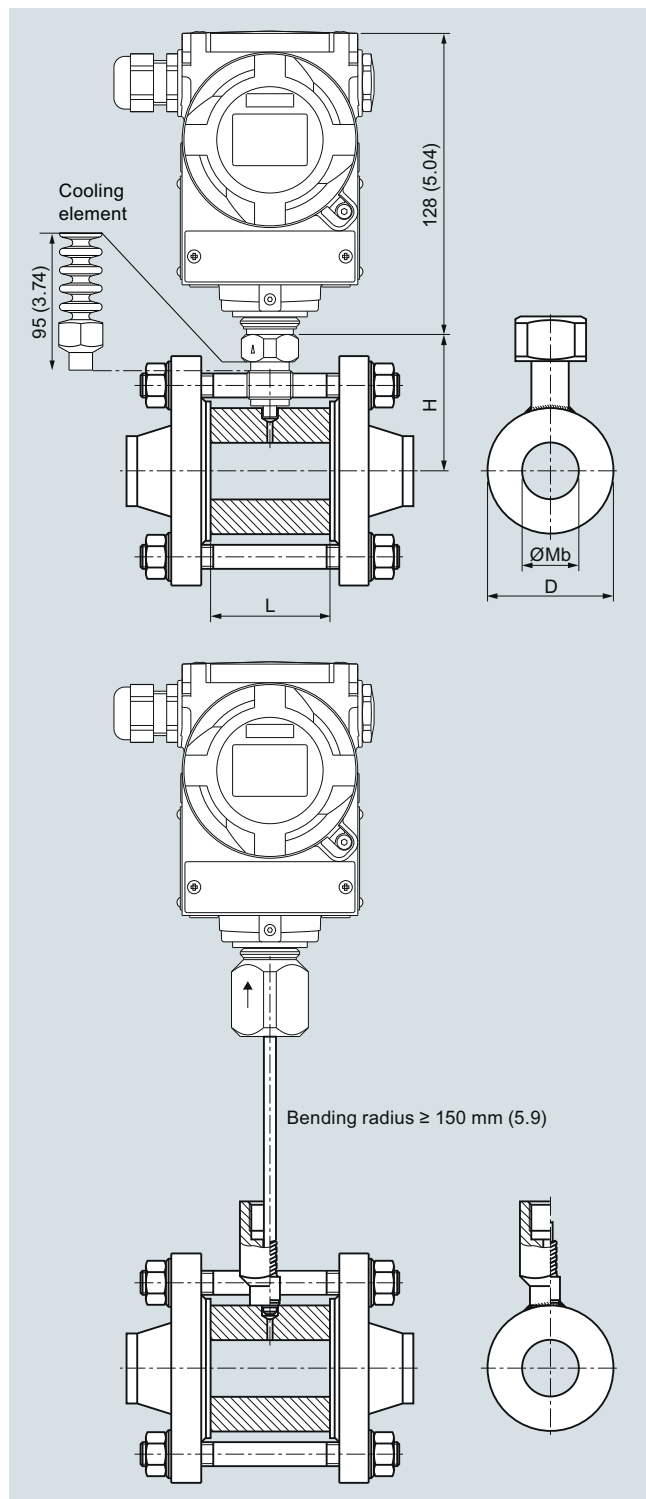
## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

### Clamp-on seals of flange design

#### Dimensional drawings



Inline seal for flange-mounting, connected to SITRANS P pressure transmitter, dimensions in mm (inch)

#### Connection to EN 1092-1

| DN<br>mm | PN<br>bar | D<br>mm | Mb<br>mm | L<br>mm | H<br>mm |
|----------|-----------|---------|----------|---------|---------|
| 25       | 6 ... 100 | 68      | 28.5     | 60      | 81      |
| 40       |           | 88      | 43.1     | 60      | 91      |
| 50       |           | 100     | 54.5     | 60      | 93      |
| 65       |           | 120     | 70.3     | 60      | 107     |
| 80       |           | 138     | 82.5     | 60      | 116     |
| 100      |           | 160     | 107.1    | 60      | 127     |
| 125      |           | 188     | 127      | 60      | 141     |

#### Connection to ASME B16.5

| DN<br>(inch) | Class        | D<br>mm<br>(inch) | Mb<br>mm<br>(inch) | L<br>mm<br>(inch) | H<br>mm<br>(inch) |
|--------------|--------------|-------------------|--------------------|-------------------|-------------------|
| 1            | 150 ... 2500 | 50<br>(1.97)      | 28.5<br>(1.12)     | 60<br>(2.36)      | 72<br>(2.83)      |
| 1½           | 150 ... 2500 | 73.5<br>(2.89)    | 43.1<br>(1.70)     | 60<br>(2.36)      | 84<br>(3.31)      |
| 2            | 150 ... 2500 | 91.9<br>(3.62)    | 54.5<br>(2.15)     | 60<br>(2.36)      | 93<br>(3.66)      |
| 2½           | 150 ... 2500 | 104.6<br>(4.12)   | 70.3<br>(2.77)     | 60<br>(2.36)      | 99<br>(3.9)       |
| 3            | 150 ... 2500 | 127<br>(5)        | 82.5<br>(3.25)     | 60<br>(2.36)      | 110<br>(4.33)     |
| 4            | 150 ... 2500 | 157.2<br>(6.19)   | 107.1<br>(4.22)    | 60<br>(2.36)      | 125<br>(4.92)     |
| 5            | 150 ... 2500 | 188<br>(7.4)      | 127<br>(5)         | 60<br>(2.36)      | 141<br>(5.55)     |

## Overview



Quick-release inline seals, to DIN 11851 with threaded socket



Quick-release inline seals, with clamp connection

Quick-release inline seals for pressure are available for the following SITRANS P pressure transmitter series:

- P300
- DS III with HART
- DS III with PROFIBUS PA
- DS III with FOUNDATION Fieldbus

## Application

The quick-release inline seal is a special design for flowing media and high-viscosity media. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. The measured medium flows unhindered through the inline seal and results in self-cleaning of the measuring chamber. Furthermore, the inline seal can be cleaned by a pig.

## Design

The quick-release clamp is available in two versions:

- DIN 11851 with threaded socket
- Clamp connection

The inline seal is connected to the pressure transmitter either directly or by way of a capillary.

## Function

The measured pressure is transferred from the diaphragm, mounted on the inner circumference of the inline seal, to the filling liquid and then passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the inline seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

### Note:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof pressure transmitter (see Selection and Ordering data).

## Technical specifications

| Inline seals of quick-release design for pressure  |  |                  |
|--|--|------------------|
| Connection   | Nominal diameter   | Nominal pressure |
| <ul style="list-style-type: none"><li>• Standard to DIN 11851 with thread</li><li>• Standard Clamp ISO 2852</li><li>• Standard Clamp DIN 32676, row C Tri-clamp</li><li>• Standard Clamp DIN 32676, row A metric</li></ul> | DN 25/32/40  | PN 40            |
|  | DN 50/65/80  | PN 25            |
|  | DN 25/38/51  | PN 16            |
|  | DN 63.5/76.1   | PN 10            |
|  | 1, 1½ inch   | PN 25            |
|  | 2, 2½ inch   | PN 16            |
|  | 3 inch   | PN 10            |
|  | DN 25/32/40  | PN 25            |
|  | DN 50  | PN 16            |
|  | DN 65  | PN 10            |
| Material   |  |                  |
| • Main body  | Stainless steel 1.4404/316L  |                  |
| • Diaphragm  | Stainless steel 1.4404/316L  |                  |
| Capillary  |  |                  |
| • Length   | Max. 10 m (32.8 ft)  |                  |
| • Internal diameter  | 2 mm (0.079 inch)  |                  |
| • Minimum bending radius   | 150 mm (5.9 inch)  |                  |
| • Sheath   | Spiral protective tube made of stainless steel, mat. No. 1.4301/316  |                  |
| Filling liquid   | • Food oil (FDA listed)  |                  |
| Permissible ambient temperature  | Dependent on the pressure transmitter and the filling liquid of the remote seal<br>More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals |                  |
| Weight   | Approx. 4 kg (approx. 8.82 lb)   |                  |
| Certificate and approvals  |  |                  |
| Classification according to pressure equipment directive (DGRL 2014/68/EU)   | For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord   |                  |
| EHEDG  | Complies with EHEDG recommendations  |                  |

# Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

## Quick-release inline seals

1

### Selection and Ordering data

Article No.

Order  
code

#### Quick release inline-seal

Flange type design, with flexible capillary tube or directly connected to a

- SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately  
Scope of delivery: 1 off

7MF0930 -

- 0 A 0

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Nominal diameter Nominal pressure

Connection standard DIN 11851 with thread

|       |       |      |
|-------|-------|------|
| DN 25 | PN 40 | 1 BM |
| DN 32 | PN 40 | 1 CD |
| DN 40 | PN 40 | 1 DM |
| DN 50 | PN 25 | 1 EK |
| DN 65 | PN 25 | 1 FL |
| DN 80 | PN 25 | 1 GK |

Connection standard Clamp ISO 2852

|         |       |      |
|---------|-------|------|
| DN 25   | PN 16 | 2 BK |
| DN 38   | PN 16 | 2 CQ |
| DN 51   | PN 16 | 2 FH |
| DN 63,5 | PN 10 | 2 FJ |
| DN 76,1 | PN 10 | 2 GJ |

Connection standard Clamp DIN 32676, row C Tri-clamp

|        |       |      |
|--------|-------|------|
| DN 1"  | PN 25 | 3 KV |
| DN 1½" | PN 25 | 3 LV |
| DN 2"  | PN 16 | 3 MV |
| DN 2½" | PN 16 | 3 NV |
| DN 3"  | PN 10 | 3 PV |

Connection standard Clamp DIN 32676, row A metric

|       |       |      |
|-------|-------|------|
| DN 25 | PN 25 | 4 BL |
| DN 32 | PN 25 | 4 CC |
| DN 40 | PN 25 | 4 DL |
| DN 50 | PN 16 | 4 EJ |
| DN 65 | PN 10 | 4 FK |

Other version  
Add Order code and plain text

9 AA H 1 Y

### Selection and Ordering data

Article No.

Order  
code

#### Quick release inline-seal

Flange type design, with flexible capillary tube or directly connected to a

- SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately  
Scope of delivery: 1 off

7MF0930 -

- 0 A 0

#### Transmitter connection

Without capillary tube, direct mount straight connection (for gauge pressure)

Connection via capillary tube

Length of capillary

|       |
|-------|
| 1 m   |
| 1,6 m |
| 2 m   |
| 2,5 m |
| 3 m   |
| 4 m   |
| 5 m   |
| 6 m   |
| 7 m   |
| 8 m   |
| 9 m   |
| 10 m  |

Other version  
Add Order code and plain text

#### Filling liquid

Food-grade oil (FDA listed)

Other version

Add Order code and plain text

0 0

|     |
|-----|
| 1 0 |
| 1 1 |
| 1 2 |
| 1 3 |
| 1 4 |
| 1 5 |
| 1 6 |
| 1 7 |
| 1 8 |
| 2 0 |
| 2 1 |
| 2 2 |

9 8

L 1 Y

E  
Z

P 1 Y

**Pressure Measurement**Remote seals for transmitters and pressure gauges  
SITRANS P320/P420**Quick-release inline seals**

1

| Selection and Ordering data  | Order code | Selection and Ordering data   | Order code |
|--|------------|---|------------|
| <b>Further designs</b>   |            | <b>Further designs</b>  |            |
| Add "-Z" to Article No. and specify Order code.  |            | Add "-Z" to Article No. and specify Order code.                                     |            |
| <b>Factory certificates</b>  |            | <b>Device settings</b>  |            |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2  | <b>C11</b> | Operating Temperature; Lower range value ... °C (°F), upper range value ... °C (°F) | <b>Y10</b> |
| Inspection certificate to EN 10204-3.1 - material of body and wetted parts   | <b>C12</b> |   |            |
| Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts                                       | <b>C15</b> |   |            |
| Certificate of FDA-approved fill oil (to EN10204-2.2)  | <b>C17</b> |   |            |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration) | <b>C20</b> |   |            |
| <b>Negative pressure services</b>  |            |   |            |
| Negative pressure service (for gauge and absolute pressure transmitters)   | <b>D81</b> |   |            |
| Extended negative pressure service (for gauge and absolute pressure transmitters)  | <b>D85</b> |   |            |
| <b>Capillary connection</b>  |            |   |            |
| Single-side mounted at differential pressure transmitters at high-side   | <b>S03</b> |   |            |
| Single-side mounted at differential pressure transmitters at low-side  | <b>S04</b> |   |            |
| cooling element  | <b>S08</b> |   |            |
| <b>Capillary coating</b>   |            |   |            |
| <u>PE protective tube</u>  |            |   |            |
| 1 m  | <b>S10</b> |   |            |
| 1,6 m  | <b>S11</b> |   |            |
| 2 m  | <b>S12</b> |   |            |
| 2,5 m  | <b>S13</b> |   |            |
| 3 m  | <b>S14</b> |   |            |
| 4 m  | <b>S15</b> |   |            |
| 5 m  | <b>S16</b> |   |            |
| 6 m  | <b>S17</b> |   |            |
| 7 m  | <b>S18</b> |   |            |
| 8 m  | <b>S19</b> |   |            |
| 9 m  | <b>S20</b> |   |            |
| 10 m   | <b>S21</b> |   |            |
| <u>PTFE protective tube</u>  |            |   |            |
| 1 m  | <b>S40</b> |   |            |
| 1,6 m  | <b>S41</b> |   |            |
| 2 m  | <b>S42</b> |   |            |
| 2,5 m  | <b>S43</b> |   |            |
| 3 m  | <b>S44</b> |   |            |
| 4 m  | <b>S45</b> |   |            |
| 5 m  | <b>S46</b> |   |            |
| 6 m  | <b>S47</b> |   |            |
| 7 m  | <b>S48</b> |   |            |
| 8 m  | <b>S49</b> |   |            |
| 9 m  | <b>S50</b> |   |            |
| 10 m   | <b>S51</b> |   |            |
| <u>PVC protective tube</u>   |            |   |            |
| 1 m  | <b>S70</b> |   |            |
| 1,6 m  | <b>S71</b> |   |            |
| 2 m  | <b>S72</b> |   |            |
| 2,5 m  | <b>S73</b> |   |            |
| 3 m  | <b>S74</b> |   |            |
| 4 m  | <b>S75</b> |   |            |
| 5 m  | <b>S76</b> |   |            |
| 6 m  | <b>S77</b> |   |            |
| 7 m  | <b>S78</b> |   |            |
| 8 m  | <b>S79</b> |   |            |
| 9 m  | <b>S80</b> |   |            |
| 10 m   | <b>S81</b> |   |            |

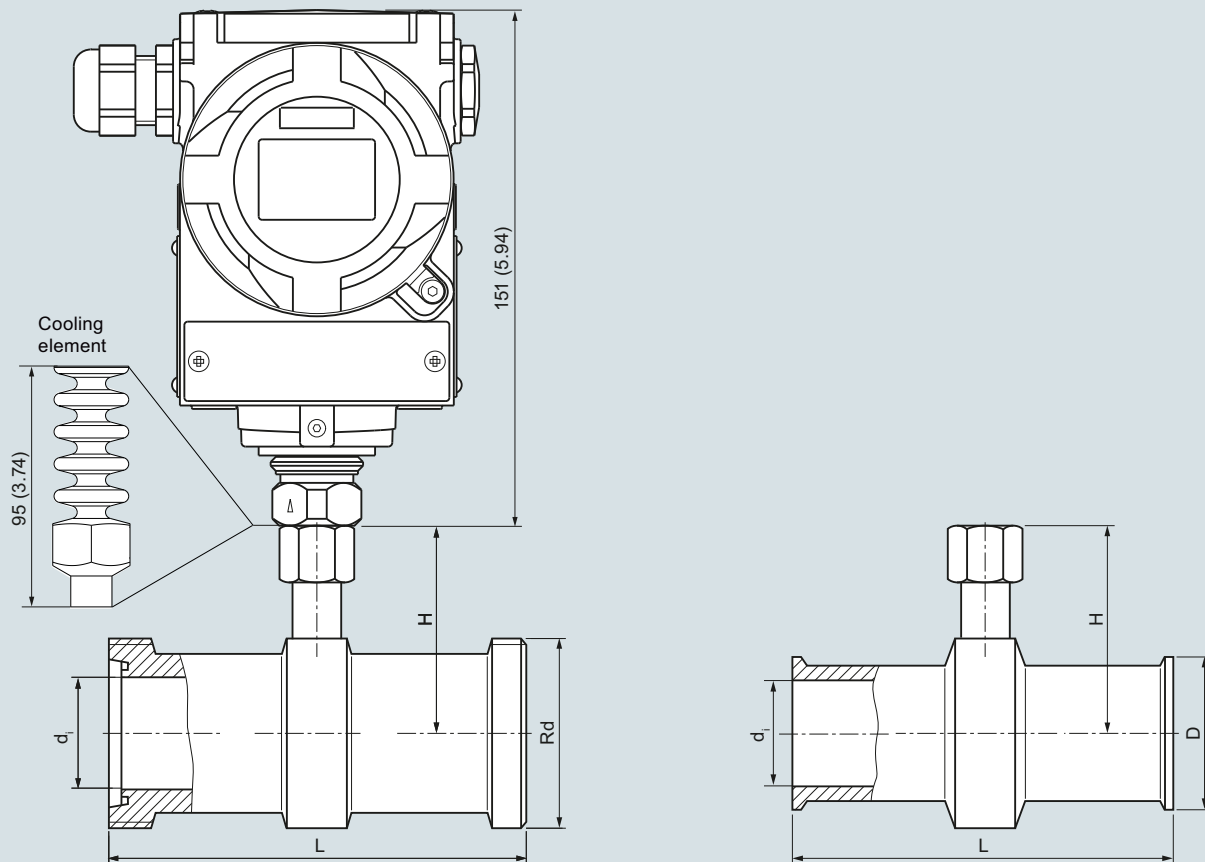
## Pressure Measurement

Remote seals for transmitters and pressure gauges

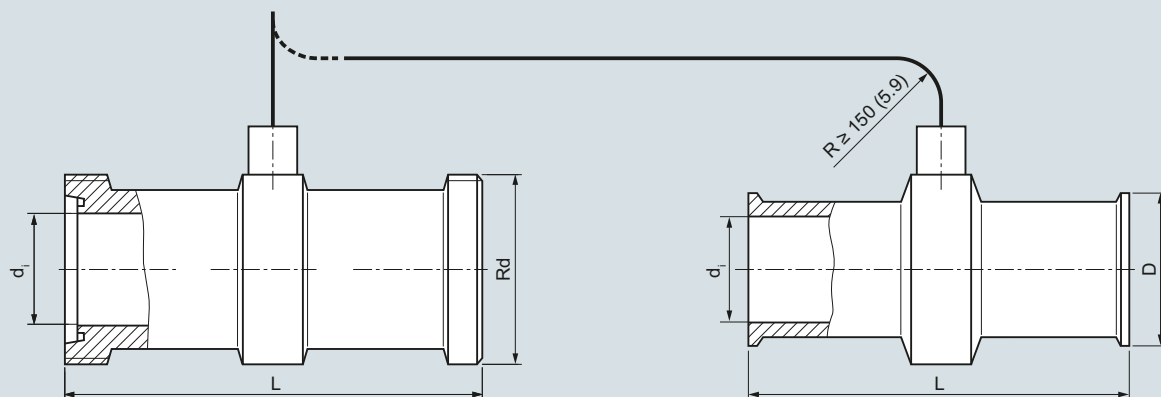
SITRANS P320/P420

### Quick-release inline seals

#### Dimensional drawings



Mounted directly on SITRANS P transmitter for pressure



Mounted on SITRANS P transmitter for pressure or differential pressure and flow

Quick-release inline seal, dimensions in mm (inch)



## Clamp-on seals for pipes to EN 10357 (DIN 11851)

| Food connections |                |                   |                  |                                      |                  |                               |      |
|------------------|----------------|-------------------|------------------|--------------------------------------|------------------|-------------------------------|------|
| DIN 11851        |                |                   |                  | DIN 32676                            |                  |                               |      |
| Length           | Inner diameter | Connection height | Nominal pressure | Round thread connection to DIN 11851 | Nominal pressure | Clamp connection to DIN 32676 |      |
| Nominal diameter | L (mm)         | di (mm)           | h (mm)           | Thread Rd                            |                  | D (mm)                        |      |
| DN 10            | 96             | 10                | 27.5             | PN 40                                | 28 x 1/8"        | PN 16                         | 34   |
| DN 15            | 150            | 16                | 12               | PN 40                                | 34 x 1/8"        | PN 16                         | 34   |
| DN 25            | 110            | 26                | 21               | PN 40                                | 52 x 1/6"        | PN 16                         | 50.5 |
| DN 32            | 110            | 32                | 26               | PN 40                                | 58 x 1/6"        | PN 16                         | 50.5 |
| DN 40            | 110            | 38                | 28.5             | PN 40                                | 65 x 1/6"        | PN 16                         | 50.5 |
| DN 50            | 110            | 50                | 34               | PN 25                                | 78 x 1/6"        | PN 16                         | 64   |
| DN 65            | 110            | 66                | 42               | PN 25                                | 95 x 1/6"        | PN 10                         | 91   |
| DN 80            | 60             | 81                | 47.5             | PN 25                                | 110 x 1/4"       | PN 10                         | 106  |
| DN 100           | 60             | 100               | 60               | PN 25                                | 130 x 1/4"       | PN 10                         | 119  |

## Clamp-on seals for pipes to BS 4825 Part 3 and O.D. Tube (suited for pipes to ASME-BPE)

|                  |          |         |                |                   | Food connection  |                        |                              |                              |
|------------------|----------|---------|----------------|-------------------|------------------|------------------------|------------------------------|------------------------------|
|                  |          |         |                |                   | IDF to ISO 2853  |                        | Clamp connection to ISO 2852 |                              |
| Length           |          |         | Inner diameter | Connection height | Nominal pressure | IDF-Thread to ISO 2853 | Nominal pressure             | Clamp connection to ISO 2852 |
| Nominal diameter | L (mm)   | di (mm) | h (mm)         | IDF-thread (Tr)   |                  | D (mm)                 |                              |                              |
| 1 inch           | 25.4 mm  | 110     | 22.2           | 21                | PN 40            | 37 x 3.175             | PN 16                        | 50.5                         |
| 1½ inch          | 38 mm    | 110     | 34.8           | 28.5              | PN 40            | 50 x 3.175             | PN 16                        | 50.5                         |
| 2 inch           | 51 mm    | 110     | 47.8           | 34                | PN 25            | 64 x 3.175             | PN 16                        | 64                           |
| 1½ inch          | 63.5 mm  | 110     | 60.3           | 38                | PN 25            | 77.5 x 3.175           | PN 16                        | 77.5                         |
| 3 inch           | 76.1 mm  | 60      | 72.9           | 44.5              | PN 25            | 91 x 3.175             | PN 10                        | 91                           |
| 4 inch           | 101.6 mm | 60      | 97.6           | 59.5              | PN 25            | 118 x 3175             | PN 10                        | 119                          |

## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P320/P420

1

### Flushing rings for diaphragm seals

#### Overview



Flushing ring

Flushing rings are required for flange-mounted and sandwich-type remote seals (Article No. 7MF0800 ... 7MF0814) if the danger exists that the process conditions and the geometry of the connection could cause the medium to form deposits or blockages.

The flushing ring is clamped between the process flange and the remote seal.

Deposits can be flushed away from the diaphragm through the holes in the side, or the pressure volume can be vented. Different nominal diameters and forms permit adaptation to the respective process flange.

#### Process connection

For flanges to EN and ASME:  
DN 50, 80, 100, 125; PN 16 ... 100 or  
DN 2 inch, 3 inch, 4 inch, 5 inch; Class 150 ... 600

#### Standard design

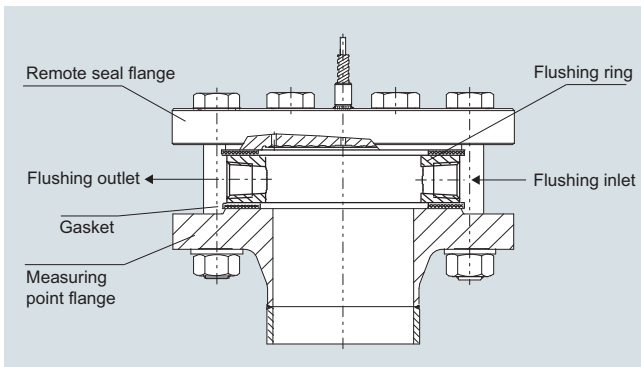
Material: CrNi-Stahl, mat. No. 1.4404/316L  
Sealing faces and flushing holes: See Selection and Ordering data

#### Technical specifications

##### Flushing ring for remote seals of sandwich and flange design

|                                       |                             |
|---------------------------------------|-----------------------------|
| Nominal diameter                      | Nominal pressure            |
| • DN 50                               | PN 16 ... PN 100            |
| • DN 80                               | PN 16 ... PN 100            |
| • DN 100                              | PN 16 ... PN 100            |
| • DN 125                              | PN 16 ... PN 100            |
| • 2 inch                              | Class 150 ... class 600     |
| • 3 inch                              | Class 150 ... class 600     |
| • 4 inch                              | Class 150 ... class 600     |
| • 5 inch                              | Class 150 ... class 600     |
| Sealing face                          |                             |
| • To EN 1092-1                        | Form B1                     |
|                                       | Form B2                     |
|                                       | Form D/Form D               |
|                                       | Form C/Form C               |
|                                       | Form C/Form C               |
|                                       | Form E                      |
|                                       | Form F                      |
| • To ASME B16.5                       | RF 125 ... 250 AA           |
|                                       | RFSF                        |
|                                       | RJF ring groove             |
| Flushing holes (2 off), female thread | • G $\frac{1}{4}$           |
|                                       | • G $\frac{1}{2}$           |
|                                       | • $\frac{1}{4}$ -18 NPT     |
|                                       | • $\frac{1}{2}$ -14 NPT     |
| Material                              | Stainless steel 1.4404/316L |

#### Design



Installation example

## Selection and Ordering data

Article No.Ord. code

## Flushing ring

7MF4925 -

for remote seals 7MF0800 to 7MF0814

1

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

## Nom. diam.

## Nom. press.

- DN 50 PN 16 ... PN 100
- DN 80 PN 16 ... PN 100
- DN 100 PN 16 ... PN 100
- DN 125 PN 16 ... PN 100

A  
B  
C  
D

- 2 inch Class 150 ... 600
- 3 inch Class 150 ... 600
- 4 inch Class 150 ... 600
- 5 inch Class 150 ... 600

G  
H  
J  
K

Other version

Add Order code and plain text:

Nominal pressure: ...; Nominal pressure: ...

Z

J 1 Y

## Sealing face

- EN 1092-1
  - Form B1
  - Form B2
  - Form C/Form C
  - Form D/Form C
  - Form D/Form D
- Form E
- Form F
- ASME B16.5
  - RF 125 ... 250 AA
  - RFSF
  - RJF ring groove

A  
C  
D  
E  
FG  
HM  
Q  
R

Other version

Add Order code and plain text:

Sealing face: ...

Z

K 1 Y

## Flushing holes (2 off)

- Female thread G $\frac{1}{4}$
- Female thread G $\frac{1}{2}$
- Female thread  $\frac{1}{4}$ -18 NPT
- Female thread  $\frac{1}{2}$ -14 NPT

1  
2  
3  
4

## Material

- Stainless steel 316L

Other version

Add Order code and plain text:

Material: ...

0  
9

M 1 Y

## Further designs

Please add "-Z" to Article No. and specify Order code.

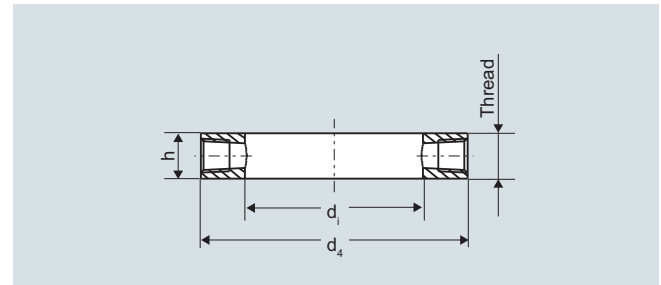
Order code

## Inspection certificate

to EN 10204, section 3.1

C12

## Dimensional drawings



Flushing ring, dimension drawing

## Connection to EN 1092-1

| DN<br>(mm) | PN<br>(bar) | d <sub>4</sub><br>(mm) | d <sub>i</sub><br>(mm) | h<br>(mm) | Weight<br>(kg) |
|------------|-------------|------------------------|------------------------|-----------|----------------|
| 50         | 16 ... 100  | 102                    | 62                     | 30        | 1.10           |
| 80         | 16 ... 100  | 138                    | 92                     | 30        | 1.90           |
| 100        | 16 ... 100  | 162                    | 92                     | 30        | 3.15           |
| 125        | 16 ... 100  | 188                    | 126                    | 30        | 3.50           |

## Connection to ASME B 16.5

| DN<br>inch | Class       | d <sub>4</sub><br>mm<br>(in.) | d <sub>i</sub><br>mm<br>(in.) | h<br>mm<br>(in.) | Weight<br>kg<br>(lb) |
|------------|-------------|-------------------------------|-------------------------------|------------------|----------------------|
| 2          | 150 ... 600 | 92<br>(3.62)                  | 62<br>(2.44)                  | 30<br>(1.18)     | 0.60<br>(1.32)       |
| 3          | 150 ... 600 | 127<br>(5)                    | 92<br>(3.62)                  | 30<br>(1.18)     | 1.05<br>(2.31)       |
| 4          | 150 ... 600 | 157<br>(6.18)                 | 92<br>(3.62)                  | 30<br>(1.18)     | 2.85<br>(6.28)       |
| 5          | 150 ... 600 | 185.5<br>(7.3)                | 126<br>(4.96)                 | 30<br>(1.18)     | 3.30<br>(7.28)       |

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

### Measuring setups

1

#### Overview

This section shows examples of typical measuring setups for using SITRANS P pressure transmitters with and without remote seals.

Equations for calculating start of scale and full scale are provided for each example.

Questionnaires are included to help you select the right combination of remote seal and pressure transmitter.

#### Installation

Remote seals of sandwich design are fitted between the connection flange of the measuring point and a dummy flange. Remote seals of flange design are fitted directly on the connection flange of the measuring point. The respective pressure rating of the dummy flange or the flanged remote seal must be observed.

The pressure transmitter should be installed below the connection flange (and below the lower connection flange in the case of differential pressure transmitters). This arrangement must be used in the low-pressure range.

When measuring at pressures above atmospheric, the pressure transmitter can also be installed above the connection flange.

The capillaries between the remote seal and the pressure transmitter should be as short as possible to obtain a good transmission response.

#### Offset of measuring range

If there is a difference in height between the two connection flanges when measuring with two remote seals, an additional differential pressure will result from the oil filling of the remote seal capillaries. This results in a measuring range offset which has to be taken into account when you set the pressure transmitter.

An offset in the measuring range also occurs when combining a remote seal with a transmitter if the remote seal is not installed at the same height as the transmitter.

#### Pressure transmitter output

If the level, separation layer or density increase in closed vessels, the differential pressure and hence the output signal of the pressure transmitter also increase.

For an inverted relationship between the differential pressure and the output signal, the start-of-scale and full-scale values of the SITRANS P must be interchanged.

With open vessels, a rising pressure is usually assigned to an increasing level, separation layer or density.

#### Influence of ambient temperature

Temperature differences between the individual capillaries and between the individual remote seals should be avoided.

Temperature variations in the area of the measuring setup cause a change in volume of the filling liquid and hence measuring errors.

#### Notes

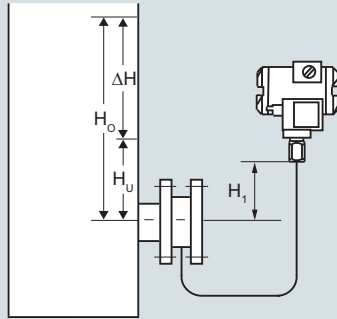
- For the separation layer measurement, the separation layer has to be positioned between the two spigots. Also you must make sure that the level in the container is always above the top spigot.
- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot.

#### Possible combinations of pressure transmitters and remote seals

| Type of installation              | Pressure transmitters                                | Remote seals   |
|-----------------------------------|--|--|
| A/B                               | 7MF030-...<br>7MF031-...<br>7MF040-...<br>7MF041-... | 7MF0800-...<br>7MF0810-...   |
| C <sub>1</sub> and C <sub>2</sub> | 7MF032-...<br>7MF042-...                             | 7MF0800-...<br>7MF0810-...<br>(negative pressure service in each case) |
|                                   | 7MF033-...<br>7MF043-...                             | 7MF0801-...<br>7MF0811-...   |
| D                                 | 7MF034-...<br>7MF035-...<br>7MF044-...<br>7MF045-... | 7MF0802-...<br>7MF0812-...   |
| E                                 | 7MF034-...<br>7MF035-...<br>7MF044-...<br>7MF045-... | 7MF0813-...  |
| G, H and J                        | 7MF034-...<br>7MF035-...<br>7MF044-...<br>7MF045-... | 7MF0802-...<br>7MF0812-...   |

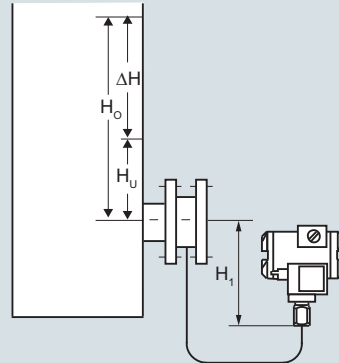
**Dimensional drawings****Types of installation for pressure and level measurements (open vessels)**

Installation type A



Pressure transmitter  
above the measuring point

Installation type B



Pressure transmitter  
below the measuring point

$H_1 \leq 7 \text{ m (23 ft)}$ , with halocarbon oil as filling liquid only  $H_1 \leq 4 \text{ m (13.1 ft)}$

Installation type A

$$\text{Start-of-scale: } p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{OIL} \cdot g \cdot H_1$$

$$\text{Full-scale: } p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{OIL} \cdot g \cdot H_1$$

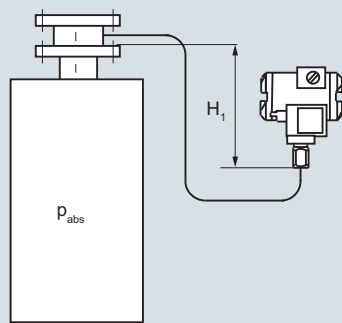
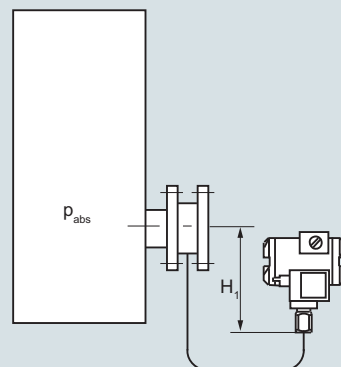
Installation type B

$$\text{Start-of-scale: } p_{MA} = \rho_{FL} \cdot g \cdot H_U + \rho_{OIL} \cdot g \cdot H_1$$

$$\text{Full-scale: } p_{ME} = \rho_{FL} \cdot g \cdot H_O + \rho_{OIL} \cdot g \cdot H_1$$

Legend

|              |  |
|--------------|--|
| $p_{MA}$     | Start-of-scale value to be set                             |
| $p_{ME}$     | Full-scale value to be set                                 |
| $\rho_{FL}$  | Density of medium in vessel                                |
| $\rho_{OIL}$ | Density of filling oil in the capillary to the remote seal |
| $g$          | Local acceleration due to gravity                          |
| $H_U$        | Start-of-scale value                                       |
| $H_O$        | Full-scale value   |
| $H_1$        | Distance between vessel flange and pressure trans.         |

**Types of installation for absolute level measurements (closed vessels)**Installation type C<sub>1</sub>Installation type C<sub>2</sub>

Pressure transmitter for absolute pressure always below the measuring point:  $H_1 \geq 200 \text{ mm (7.9 inch)}$

Installation type C<sub>1</sub> and C<sub>2</sub>

$$\text{Start-of-scale: } p_{MA} = p_{START} + \rho_{OIL} \cdot g \cdot H_1$$

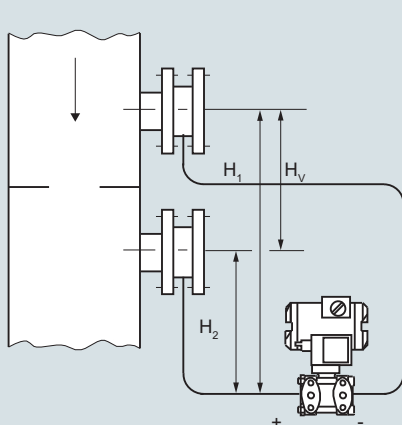
$$\text{Full-scale: } p_{ME} = p_{END} + \rho_{OIL} \cdot g \cdot H_1$$

Legend

|              |  |
|--------------|--|
| $p_{MA}$     | Start-of-scale value to be set                             |
| $p_{ME}$     | Full-scale value to be set                                 |
| $p_{START}$  | Start-of-scale value                                       |
| $p_{END}$    | Full-scale value   |
| $\rho_{OIL}$ | Density of filling oil in the capillary to the remote seal |
| $g$          | Local acceleration due to gravity                          |
| $H_1$        | Distance between vessel flange and pressure trans.         |

**Type of installation for differential pressure and flow measurements**

Installation type D Filter monitoring



Installation type D

$$\text{Start-of-scale: } p_{MA} = p_{START} - \rho_{OIL} \cdot g \cdot H_V$$

$$\text{Full-scale: } p_{ME} = p_{END} - \rho_{OIL} \cdot g \cdot H_V$$

Legend

|              |  |
|--------------|--|
| $p_{MA}$     | Start-of-scale value to be set                             |
| $p_{ME}$     | Full-scale value to be set                                 |
| $p_{START}$  | Start-of-scale value                                       |
| $p_{END}$    | Full-scale value   |
| $\rho_{OIL}$ | Density of filling oil in the capillary to the remote seal |
| $g$          | Local acceleration due to gravity                          |
| $H_V$        | Distance between the measuring points (spigots)            |

## Pressure Measurement

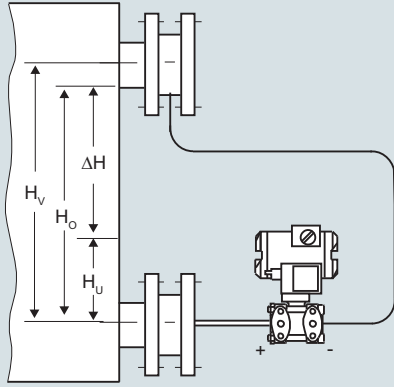
Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

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### Measuring setups with remote seals

#### Types of installation for level measurements (closed vessels)

Installation type E



Installation type E

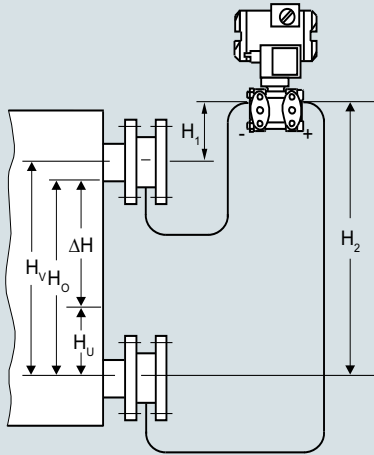
$$\text{Start-of-scale: } p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$$

$$\text{Full-scale: } p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$$

#### Legend

|              |  |
|--------------|--|
| $p_{MA}$     | Start-of-scale value to be set                             |
| $p_{ME}$     | Full-scale value to be set                                 |
| $\rho_{FL}$  | Density of medium in vessel                                |
| $\rho_{Oil}$ | Density of filling oil in the capillary to the remote seal |
| $g$          | Local acceleration due to gravity                          |
| $H_U$        | Start-of-scale value                                       |
| $H_O$        | Full-scale value   |
| $H_V$        | Distance between the measuring points (spigots)            |

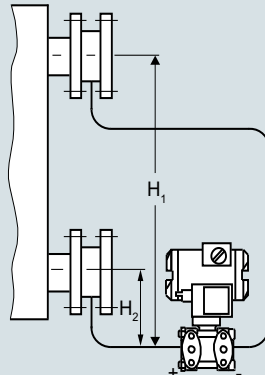
Installation type G



Pressure transmitter for differential pressure  
above the upper measuring point, no vacuum

$H_2 \leq 7 \text{ m (23 ft)}$ , with halocarbon oil as filling  
liquid only  $H_1 \leq 4 \text{ m (13.1 ft)}$

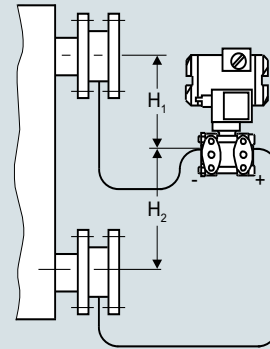
Installation type H



below the lower measuring point

Installation type for vacuum applications

Installation type J



between the measuring points, no vacuum

$H_2 \leq 7 \text{ m (23 ft)}$ , with halocarbon oil as filling  
liquid only  $H_2 \leq 4 \text{ m (13.1 ft)}$

Installation type G, H and J

$$\text{Start-of-scale: } p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$$

$$\text{Full-scale: } p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$$

#### Legend

|              |  |
|--------------|--|
| $p_{MA}$     | Start-of-scale value to be set                             |
| $p_{ME}$     | Full-scale value to be set                                 |
| $\rho_{FL}$  | Density of medium in vessel                                |
| $\rho_{Oil}$ | Density of filling oil in the capillary to the remote seal |

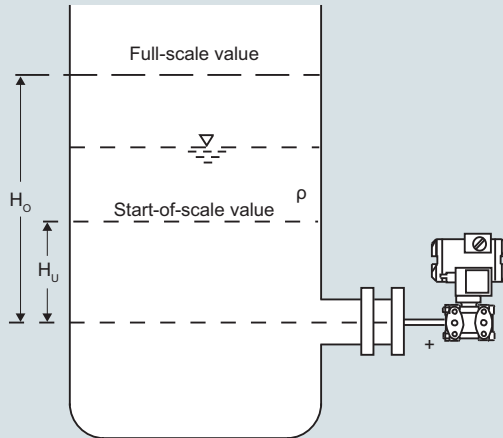
|       |   |
|-------|---|
| $g$   | Local acceleration due to gravity               |
| $H_U$ | Start-of-scale value                            |
| $H_O$ | Full-scale value                                |
| $H_V$ | Distance between the measuring points (spigots) |

**Overview****Notes**

- For the separation layer measurement, the separation layer has to be positioned between the two spigots.

Also you must make sure that the level in the container is always above the top spigot.

- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot

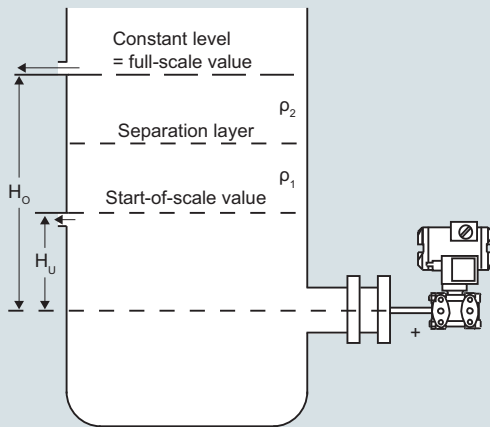
**Dimensional drawings****Pressure transmitters for differential pressure, for flanging**Measuring setups for open containers**Level measurement**

$$\text{Start-of-scale: } p_{MA} = \rho \cdot g \cdot H_U$$

$$\text{Full-scale: } p_{ME} = \rho \cdot g \cdot H_O$$

**Legend**

|          |                                   |
|----------|-----------------------------------|
| $p_{MA}$ | Start-of-scale value to be set    |
| $p_{ME}$ | Full-scale value to be set        |
| $\rho$   | Density of medium in vessel       |
| $g$      | Local acceleration due to gravity |
| $H_U$    | Start-of-scale value              |
| $H_O$    | Full-scale value                  |

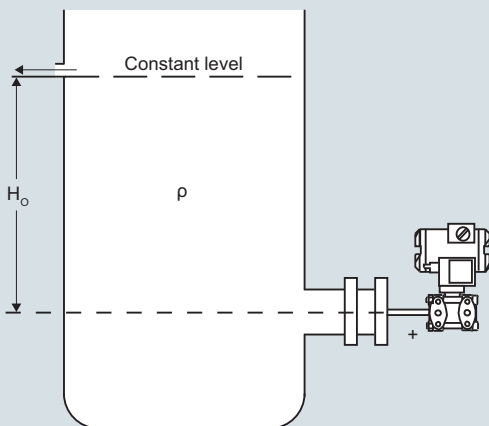
**Separation layer measurement**

$$\text{Start-of-scale: } p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2)$$

$$\text{Full-scale: } p_{ME} = \rho_1 \cdot g \cdot H_O$$

**Legend**

|          |                                   |
|----------|-----------------------------------|
| $p_{MA}$ | Start-of-scale value to be set    |
| $p_{ME}$ | Full-scale value to be set        |
| $\rho_1$ | Density of heavier liquid         |
| $\rho_2$ | Density of lighter liquid         |
| $g$      | Local acceleration due to gravity |
| $H_U$    | Start-of-scale value              |
| $H_O$    | Full-scale value                  |

**Density measurement**

$$\text{Start-of-scale: } p_{MA} = \rho_{MIN} \cdot g \cdot H_O$$

$$\text{Full-scale: } p_{ME} = \rho_{MAX} \cdot g \cdot H_O$$

**Legende**

|              |                                     |
|--------------|-------------------------------------|
| $p_{MA}$     | Start-of-scale value to be set      |
| $p_{ME}$     | Full-scale value to be set          |
| $\rho_{MIN}$ | Minimum density of medium in vessel |
| $\rho_{MAX}$ | Maximum density of medium in vessel |
| $g$          | Local acceleration due to gravity   |
| $H_O$        | Full-scale value in m               |

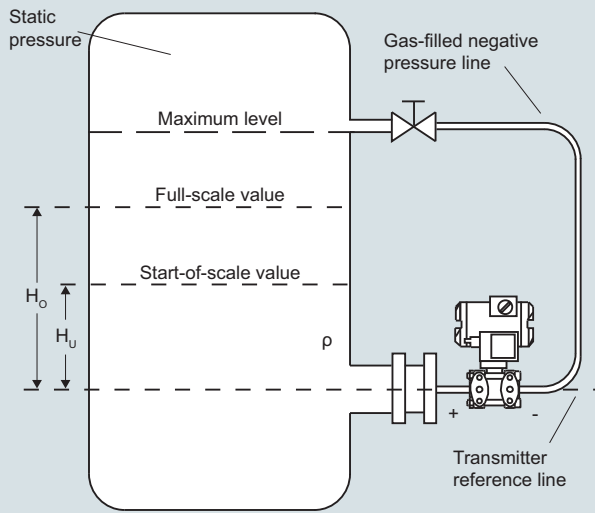
## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

1

### Measuring setups without remote seals

#### Measuring setups for closed containers



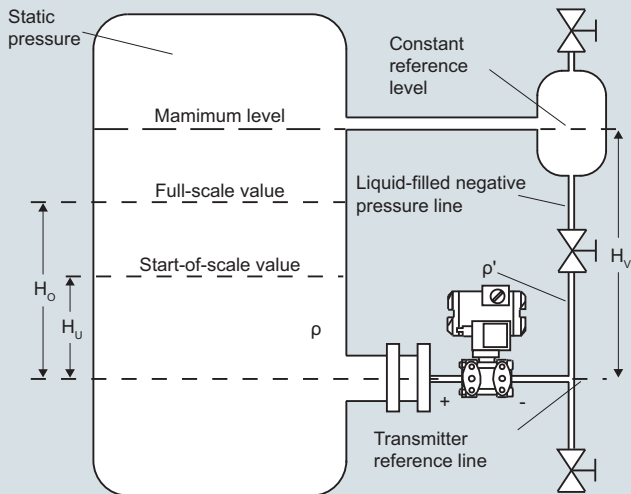
#### Level measurement, Version 1

$$\text{Start-of-scale: } \Delta p_{MA} = \rho \cdot g \cdot H_U$$

$$\text{Full-scale: } \Delta p_{ME} = \rho \cdot g \cdot H_O$$

#### Legend

|                 |                                   |
|-----------------|-----------------------------------|
| $\Delta p_{MA}$ | Start-of-scale value to be set    |
| $\Delta p_{ME}$ | Full-scale value to be set        |
| $\rho$          | Density of medium in vessel       |
| $g$             | Local acceleration due to gravity |
| $H_U$           | Start-of-scale value              |
| $H_O$           | Full-scale value                  |



#### Level measurement, Version 2

$$\text{Start-of-scale: } \Delta p_{MA} = g \cdot (H_U \cdot \rho - H_V \cdot \rho')$$

$$\text{Full-scale: } \Delta p_{ME} = g \cdot (H_O \cdot \rho - H_V \cdot \rho')$$

#### Legend

|                 |   |
|-----------------|---|
| $\Delta p_{MA}$ | Start-of-scale value to be set  |
| $\Delta p_{ME}$ | Full-scale value to be set  |
| $\rho$          | Density of medium in vessel   |
| $\rho'$         | Density of liquid in the negative pressure line (corresponding to the temperature existing there) |
| $g$             | Local acceleration due to gravity   |
| $H_U$           | Start-of-scale value  |
| $H_O$           | Full-scale value  |
| $H_V$           | Distance between the measuring points (spigots)   |

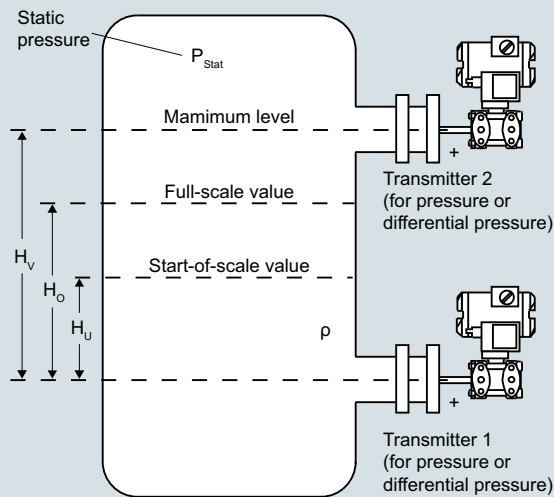


# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P320/P420

## Measuring setups without remote seals

1



### Level measurement, Version 3

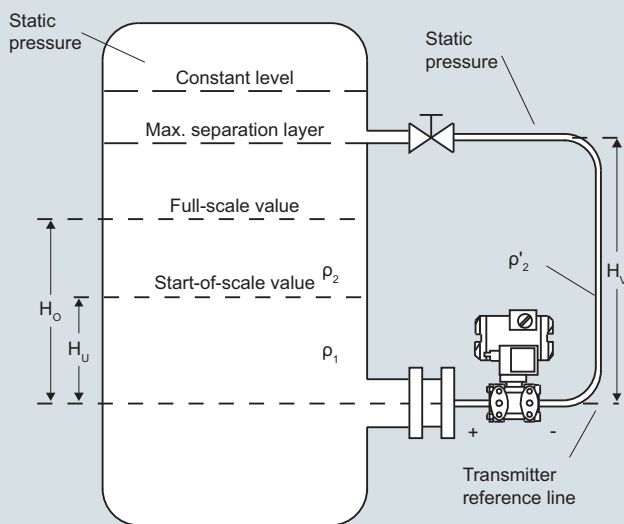
$$\text{Start-of-scale: } \Delta p_{MA} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_U}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$$

$$\text{Full-scale: } \Delta p_{ME} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_O}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$$

### Legend

|                 |   |
|-----------------|---|
| $\Delta p_{MA}$ | Start-of-scale value to be set                  |
| $\Delta p_{ME}$ | Full-scale value to be set                      |
| $\rho$          | Density of medium in vessel                     |
| $g$             | Local acceleration due to gravity               |
| $H_U$           | Start-of-scale value                            |
| $H_O$           | Full-scale value                                |
| $H_V$           | Distance between the measuring points (spigots) |

The pressure measuring range ( $\pm$  level) will be calculated by subtraction of measuring range of transmitter 1 minus measuring range of transmitter 2 in the process control system.



### Separation layer measurement

$$\text{Start-of-scale: } \Delta p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2 - H_V \cdot \rho'_2)$$

$$\text{Full-scale: } \Delta p_{ME} = g \cdot (H_O \cdot \rho_1 - H_V \cdot \rho'_2)$$

### Legend

|                 |   |
|-----------------|---|
| $\Delta p_{MA}$ | Start-of-scale value to be set  |
| $\Delta p_{ME}$ | Full-scale value to be set  |
| $\rho_1$        | Density of heavier liquid with separation layer in vessel   |
| $\rho_2$        | Density of lighter liquid with separation layer   |
| $\rho'_2$       | Density of liquid in the negative pressure line (corresponding to the temperature existing there) |
| $g$             | Local acceleration due to gravity   |
| $H_U$           | Start-of-scale value  |
| $H_O$           | Full-scale value  |
| $H_V$           | Distance between the measuring points (spigots)   |

## Pressure Measurement

### Remote seals for transmitters and pressure gauges SITRANS P DS III

#### Technical description

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##### Overview

In many cases the pressure transmitter and the measured medium have to be physically separated. It is then necessary to use a remote seal.

The remote seals can be used with the following SITRANS P pressure transmitter series:

- Pressure (P300 with HART, PROFIBUS PA, FOUNDATION Fieldbus, P310 with HART, DS III with HART, PROFIBUS PA, FOUNDATION Fieldbus, P410 with HART, PROFIBUS PA, FOUNDATION Fieldbus)
- Absolute pressure (P300, DS III with HART, DS III with PROFIBUS PA, DS III with FOUNDATION Fieldbus)
- Differential pressure and flow ((P310 with HART, DS III with HART, PROFIBUS PA, FOUNDATION Fieldbus, P410 with HART, PROFIBUS PA, FOUNDATION Fieldbus, P500 with HART)

##### Note

When configuring your remote seal, be sure to read the information about transmission response, temperature error and response time to be found in the sections "Function" and "Technical data". Only then will the remote seal work to optimum effect.

##### Benefits

- No direct contact between the pressure transmitter and the medium
- Individual configuration of the pressure transmitter for perfect adaptation to the operating conditions
- Available in many versions
- Specially designed for difficult operating conditions
- Quick-release versions available for the food industry

##### Application

Remote seal systems should be used if a separation between the measured medium and the measuring instrument is essential or appropriate.

Examples of such cases:

- The temperature of the medium is outside the limits specified for the pressure transmitter.
- The medium is corrosive and requires diaphragm materials which are not available for the pressure transmitter.
- The medium is highly viscous or contains solids which would block the measuring chambers of the pressure transmitter.
- The medium may freeze in the measuring chambers or pulse line.
- The medium is heterogeneous or fibrous.
- The medium tends towards polymerization or crystallization.
- The process requires quick-release remote seals, as necessary e.g. in the food industry for fast cleaning.
- The process requires cleaning of the measuring point, e.g. in a batch process.

##### Design

A remote seal system consists of the following components.

- Pressure transmitter
- One or two remote seals
- Filling liquid
- Connection between pressure transmitter and remote seal (direct mounting or by means of capillary)

The volume in contact with the measured medium is terminated by a flat elastic diaphragm lying in a bed. Between the diaphragm and the pressure transmitter is the filling liquid.

In many cases, a capillary has to be connected between the remote seal and the pressure transmitter in order e.g. to minimize temperature effects on the latter when hot media are involved.

However, the capillary influences the response time and the temperature response of the complete remote seal system. Two capillaries of equal length must always be used to connect a remote seal to a pressure transmitter for differential pressure.

The remote seal can be optionally equipped with a projecting diaphragm (tube).

Remote seals of sandwich design are fitted with a dummy flange.

##### Designs

###### Diaphragm seal

With diaphragm seals, the pressure is measured by means of a flat diaphragm which rests in a bed.

The following types of diaphragm seals exist:



Diaphragm seal of sandwich design without (left) and with a projecting diaphragm (tube)

- Sandwich design
- Sandwich design with projecting diaphragm (tube) to DIN or ASME which are secured using a dummy flange.



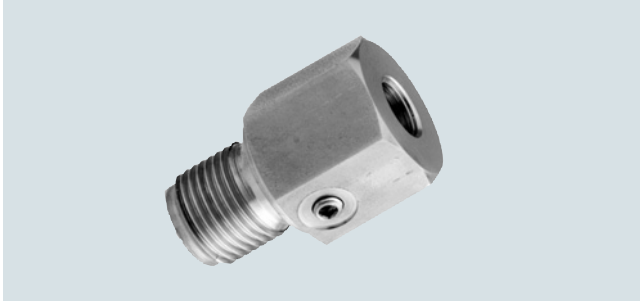
Diaphragm seal of flange design without (left) and with a projecting diaphragm (tube)

- Flange design
- Flange design with projecting diaphragm (tube) to DIN or ASME, secured using holes in the flange.



Quick-release diaphragm seal

- Quick-release remote seals, e.g. to DIN 11851, SMS standard, IDF standard, APV RJF standard, clamp connection, etc.
- Miniature diaphragm seal with male thread for screwing into tapped holes
- Remote seals with customer-specific process connections



Miniature diaphragm seal with diaphragm flush with front

- Miniature diaphragm seals

The quick-release remote seals are used above all in the food industry. Their design means that the measured medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismounting is possible for cleaning.

#### Clamp-on seal



Clamp-on seal with quick-release design (left) and for flange mounting

With clamp-on seals, the pressure is first measured using a cylindrical diaphragm positioned in a pipe, and then transmitted to the pressure transmitter by means of the filling liquid.

The clamp-on seal is a special design for flowing media. It consists of a cylindrical pipe in which a cylindrical diaphragm is embedded. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. Furthermore, the clamp-on seal can be cleaned by a pig.

The following types of clamp-on seals exist:

- Quick-release clamp-on seals, e.g. to DIN 11851, SMS standard, IDF standard, APV/RJF standard, clamp connection etc. The quick-release facility attached to the remote seal enables the seal to be removed quickly for cleaning purposes.
- Clamp-on seals for flanging to EN or ASME.
- Clamp-on seals with customer-specific process connections.

#### **Note:**

The pressure data on the transmitter and the remote seal must be observed with regard to pressure/temperature behavior.

#### **Function**

The measured pressure is transferred from the diaphragm to the filling liquid and passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the transmitter, are filled gas-free by the filling liquid.

#### **Transmission response**

The transmission response of a remote seal is characterized by the following variables:

- Temperature error
- Adjustment time

#### Temperature error

Temperature errors are caused by the change of volume of the filling liquid due to temperature variations. To select the right remote seal you must calculate the temperature error.

Below you will find an overview of the factors which influence the size of the temperature error, as well as information on how to calculate the temperature error.

The temperature error is dependent on the following variables:

- Rigidity of the diaphragm used
- Filling liquid used
- Influence of the filling liquid underneath the process flanges or in the connection shank of the pressure transmitter
- Internal diameter of the capillary: The bigger the internal diameter, the bigger the temperature error
- Length of the capillary: The longer the capillary, the bigger the temperature error

#### Diaphragm rigidity

The rigidity of the diaphragm is of decisive importance. The bigger the diameter of the diaphragm, the softer the diaphragm and the more sensitively it reacts to temperature-induced changes in volume of the filling liquid.

The result is that small measuring ranges are only possible with large diaphragm diameters.

Other factors apart from diaphragm rigidity which also play a role:

- Diaphragm thickness
- Diaphragm material
- Coatings if present

#### Filling liquid

Every filling liquid reacts to temperature variations with a change of volume. Temperature errors can be minimized by selecting a suitable filling liquid, but the filling liquid must also be appropriate for the temperature limits and operating pressure. Furthermore, the filling liquid must also be physiologically harmless.

Since the filling liquid is present under the diaphragm, in the capillary and under the process flange of the pressure transmitter (or in the connection shank), the temperature error must be calculated separately for each combination.

#### **Note:**

A vacuum-resistant remote seal is recommended for continuous low-pressure operation at 500 mbar or below, including during commissioning (see ordering data).

An example of a temperature error calculation can be found in the section "Technical Specifications".

## Pressure Measurement

### Remote seals for transmitters and pressure gauges SITRANS P DS III

1

#### Technical description

##### Response time

The response time is dependent on the following factors:

- Internal diameter of the capillary: The bigger the internal diameter, the shorter the response time
- Viscosity of the filling liquid: The greater the viscosity, the longer the response time
- Length of the capillary: The longer the capillary, the longer the response time
- Pressure in the pressure measuring system: The higher the pressure, the shorter the response time

##### Recommendations

The following should be observed to obtain an optimum combination of transmitter and remote seal:

- Choose the biggest possible diameter for the remote seal. The effective diameter of the seal diaphragm is then bigger and the temperature error smaller.
- Choose the shortest possible capillary. The response time is then shorter and the temperature error smaller
- Choose the filling liquid with the least viscosity and the smallest coefficient of expansion. Make sure, however, that the filling liquid meets the process requirements with regard to pressure, vacuum and temperature. And ensure that the filling liquid and the medium are compatible with one another.
- Note the following points for use in the vacuum range:
  - The pressure transmitter must always be positioned below the lowest spigot.
  - The operating range of some filling liquids is very limited with regard to the permissible temperature of the medium.
  - A vacuum-proof seal is necessary for continuous operation in the low-pressure range.
- Recommendations for the minimum span can be found in the section "Technical data".

##### **Note**

The remote seals listed here are a selection of the most common designs. On account of the large variety of process connections, certain remote seals which are not listed here may be available nevertheless.

Other versions can be:

- Other process connections, standards
- Aseptic or sterile connections
- Other dimensions
- Other nominal pressures
- Special diaphragm materials, including coatings
- Other sealing faces
- Other filling liquids
- Other capillary lengths
- Sheathing of capillaries with protective hose
- Calibration at higher/lower temperatures etc.

**Please contact your local Siemens office for further information.**

##### **Negative pressure service**

Liquids, such as silicone oils, inert or those suitable for food, are used in remote seal systems for transmission of the process pressure to the pressure transmitter.

In each liquid, particles have the tendency to leave the liquid compound with increasing temperature (transition from liquid to gaseous aggregate state). This means the vapor pressure increases with increasing temperature and is dependent on the substance or mixture being present.

The higher the temperature and the lower the associated process pressure in the liquid, the more difficult it gets to guarantee the desired transmission properties of the fill fluid and therefore the measuring arrangement.

Plus the sealing elements at the transmitter must be designed so that a diffusion of molecules from the atmosphere into the remote seal system is prevented due to the constantly occurring negative pressure.

In addition to the influencing variables process pressure and process temperature, the vapor pressure curve of the fill fluid at the remote seal end and the stiffness of the remote seal membrane impact the functionality of the remote seal in the negative pressure range.

This means you have to pay special attention to the physical properties of fill fluids with applications in the negative pressure range.

There are three stages for the negative pressure resistance:

- **Standard design** of the remote seal without additional protective measures, suitable for the overpressure range and low negative pressure range. This design is identified with (1) in the diagrams below.
- **Negative pressure service** with suitable seals and treated fill fluid, identified with (2) in the diagrams below. Here you select the order codes V01, V03 or V04, depending on the mounting type.
- **Extended negative pressure service** with more extended treatment of the fill fluid and the remote seals, identified in the diagrams below. Here you select the order codes V51, V53 or V54, depending on the mounting type.

There are two more areas in the diagrams. The area (4) identifies an area that has to be clarified with Technical Support prior to placing the order. The area (5) describes the area in which the remote seal fill fluid is permanently destroyed and the entire remote seal is therefore without function.

## Technical specifications of the remote seal filling liquids

| Filling liquid        | Number in the Article No. | Density at 20°C [kg/dm <sup>3</sup> ] | Viscosity at 20°C [mm <sup>2</sup> /s] | Suitable for negative pressure service | Suitable for extended negative pressure service |
|-----------------------|---------------------------|---------------------------------------|--|--|---|
| Silicone oil M5       | 1                         | 0,914                                 | 4                                      | x                                      | -   |
| Silicone oil M50      | 2                         | 0,966                                 | 50                                     | x                                      | x   |
| High-temperature oil  | 3                         | 1,070                                 | 57                                     | x                                      | x   |
| Halocarbon oil        | 4                         | 1,968                                 | 14                                     | x                                      | -   |
| Food oil (FDA-listed) | 7                         | 0,920                                 | 10                                     | x                                      | x   |

The suitable negative pressure service is specified with the pressure/temperature curves of the respective liquids described below.

**Note:** For reasons of operational safety, the transmitter must not exceed the height of the remote seal - with differential pressure applications, the height of the bottom remote seal - for measurements in the negative pressure range. The associated installation types B, C1, C2 or H are described at the end of this section under the topic "Measuring arrangements".

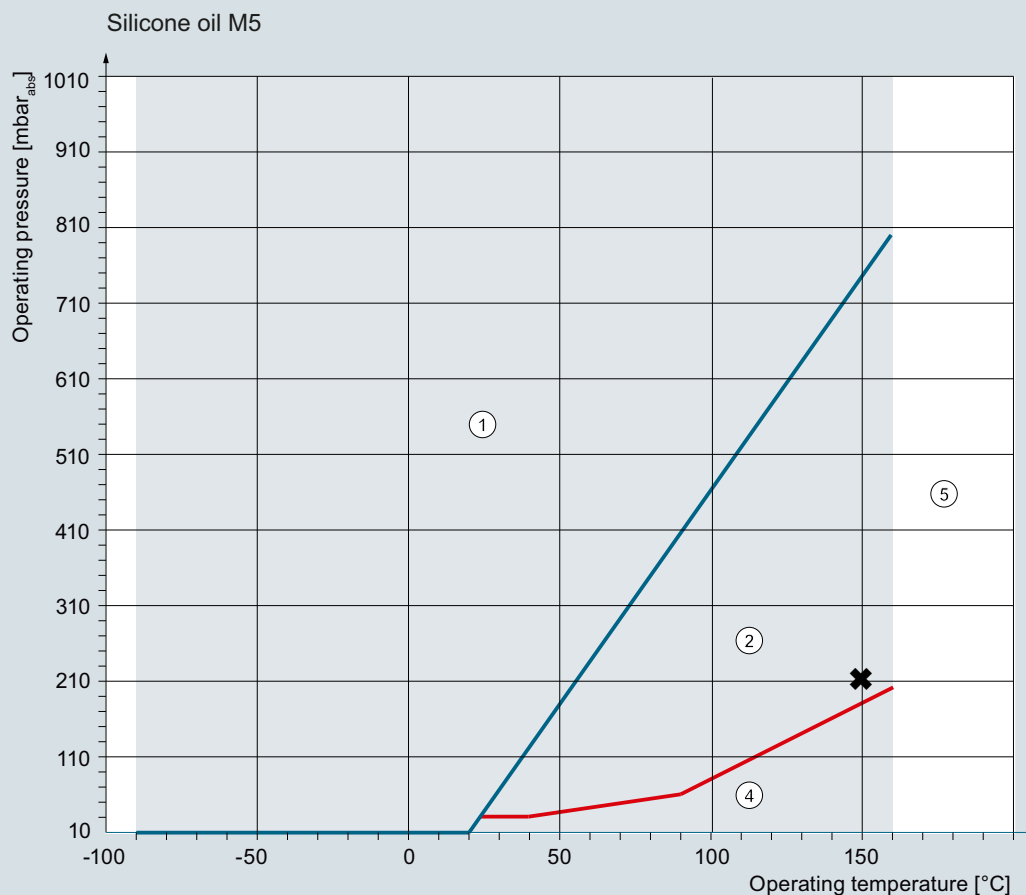
## Selection of the required negative pressure service

The procedure for determining the required negative pressure service is described below using the silicone oil M5 as fill fluid. The minimum existing process pressure of a fictitious process is 200 mbar<sub>abs</sub> (2.9 psi) (at a maximum process temperature of 150 °C (302 °F)). This intersection is identified by an "x" in the diagram below. This means the negative pressure service V01, V03 or V04 (depending on the application) is sufficient in this example.

The suitable negative pressure resistance is determined this way for all other fill fluids.

**Note:**

Note the response times according to the table on page 1/435.



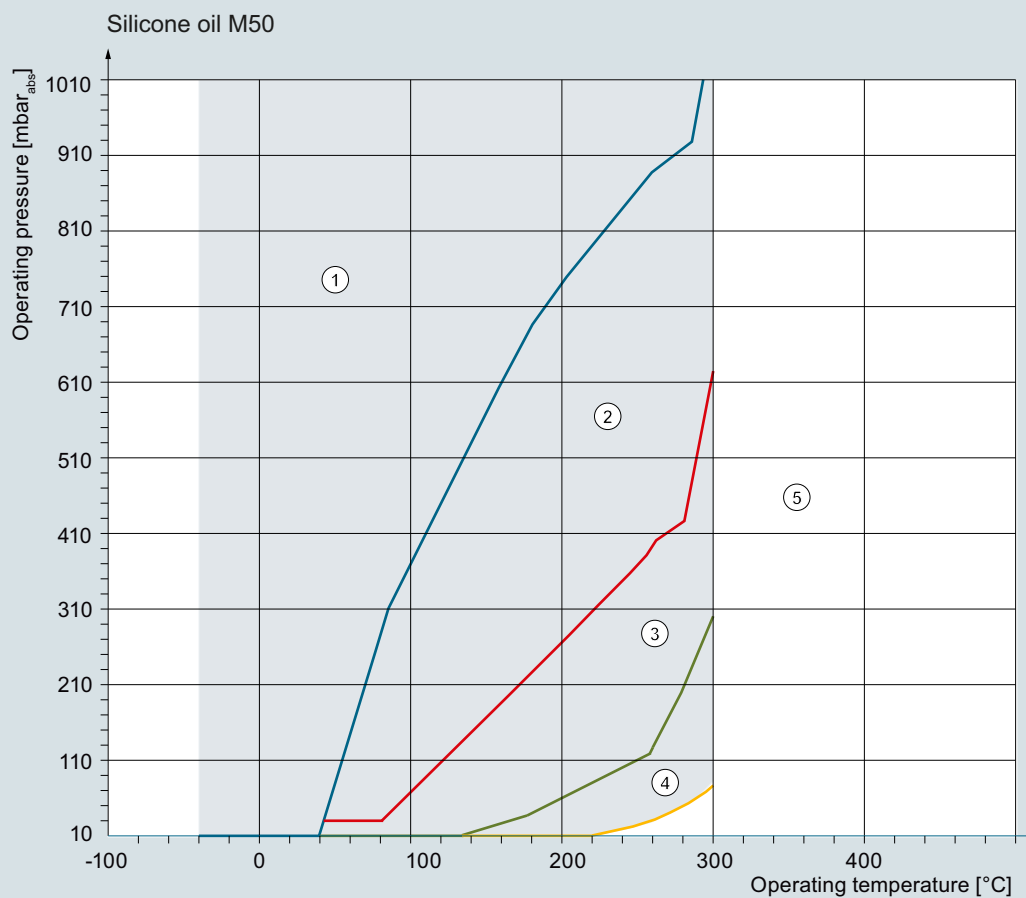
- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.  
Note: An extended negative pressure service is **not** possible for this fill fluid.
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

Permissible operating range:  
Max. temperature limit: 160 °C  
Min. temperature limit: -90 °C

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

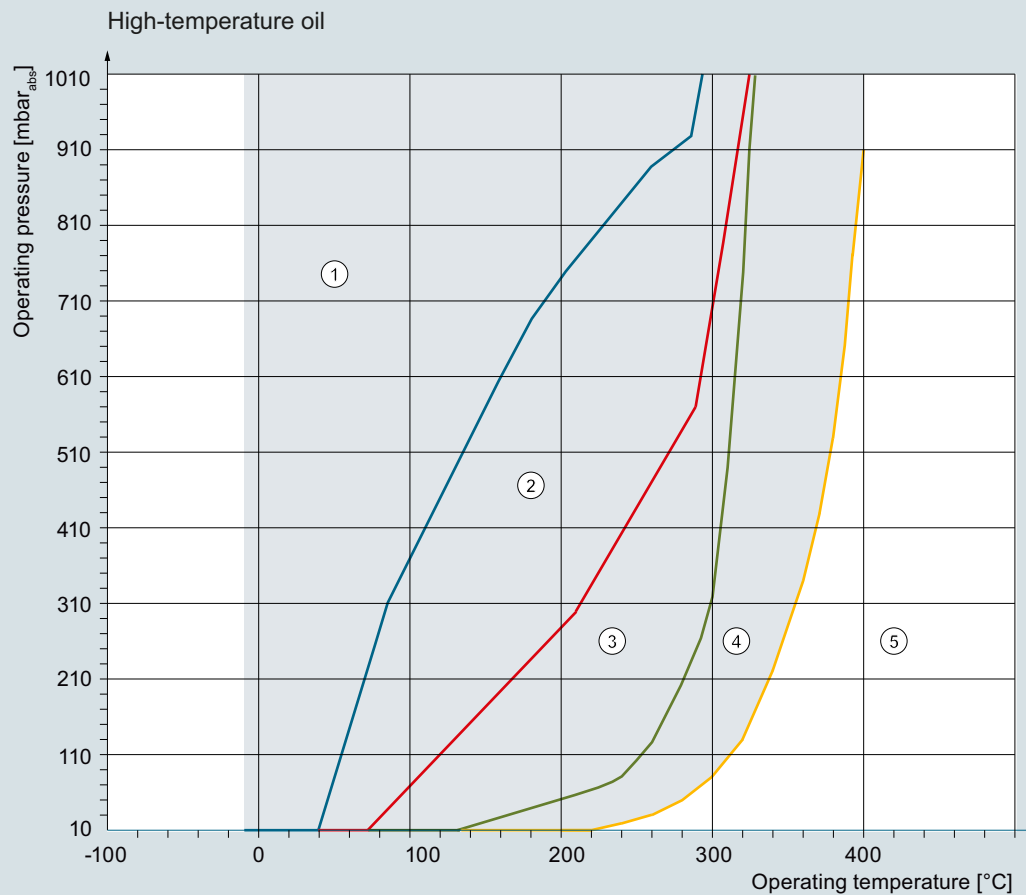
### Technical description



- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.
- ③ Operating range for which the **extended negative pressure service V51, V53 or V54** is required
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

Permissible operating range:  
Max. temperature limit: 300 °C  
Min. temperature limit: -40 °C

Negative pressure applications with silicone oil M50



- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.
- ③ Operating range for which the **extended negative pressure service V51, V53 or V54** is required
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

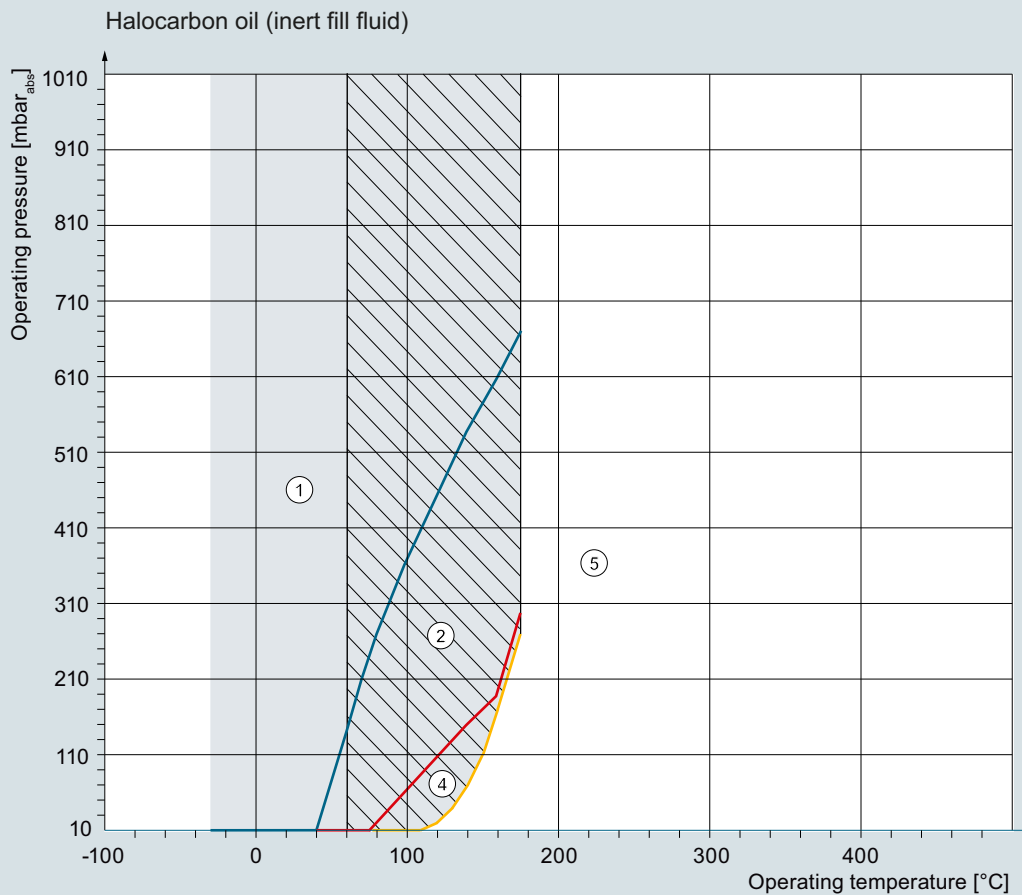
Permissible operating range:  
Max. temperature limit: 400 °C  
Min. temperature limit: -10 °C

Negative pressure applications with high-temperature oil

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Technical description



- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.  
Note: An extended negative pressure service is **not** possible for this fill fluid.
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

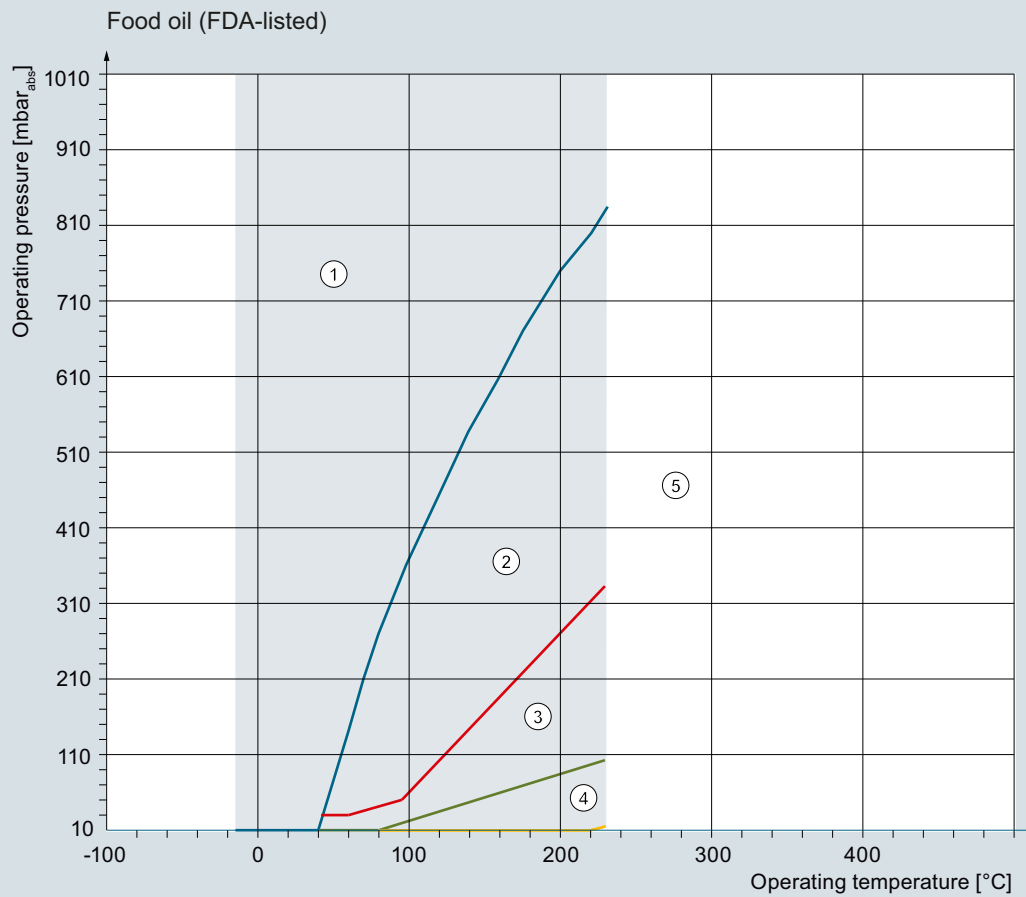
Permissible operating range:  
Max. temperature limit: 175 °C  
Min. temperature limit: -30 °C

Oxygen application for operating temperature between 60 and 175 °C  
and also for operating pressure > 50 bar not permissible.

Negative pressure applications with halocarbon oil (inert filling liquid)

A BAM approval for process temperatures up to 60 °C (140 °F) and system pressures up to 50 bar (725 psi) is available for the oxygen application.





- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.
- ③ Operating range for which the **extended negative pressure service V51, V53 or V54** is required
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

Permissible operating range:  
Max. temperature limit: 230 °C  
Min. temperature limit: -15 °C

Negative pressure applications with food oil (FDA listed)

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Technical description

#### Technical specifications

##### Temperature error Diaphragm seals

Temperature errors of diaphragm seals when connected to pressure transmitters for pressure, absolute pressure, differential pressure (single-sided) and level

|  | Nominal diameter/<br>design | Diaphragm<br>diameter |        | Temperature<br>error of remote<br>seal $f_{RS}$ |                | Temperature error of<br>capillary $f_{Cap}$ |                               | Temperature<br>error of process<br>flange/connec-<br>tion spigot $f_{PF}$ |                | Recommended<br>min. spans (guid-<br>ance values,<br>observe temp.<br>error) |        |
|--|-----------------------------|-----------------------|--------|---|----------------|---|-------------------------------|---|----------------|---|--------|
|  |                             | mm                    | (inch) | mbar/<br>10 K                                   | (psi/<br>10 K) | mbar/<br>(10 K · $m_{Cap}$ )                | (psi/<br>(10 K · $m_{Cap}$ )) | mbar/<br>10 K   | (psi/<br>10 K) | mbar  | (psi)  |
| Sandwich<br>design or with<br>flange to<br>EN 1092-1   | DN 50 without tube          | 59                    | (2.32) | 1.5   | (0.022)        | 2   | (0.029)                       | 2   | (0.029)        | 200   | (2.90) |
|  | DN 50 with tube             | 45                    | (1.89) | 5   | (0.073)        | 10  | (0.145)                       | 10  | (0.145)        | 500   | (7.25) |
|  | DN 80 without tube          | 89                    | (3.50) | 0.2   | (0.003)        | 0.2   | (0.003)                       | 0.2   | (0.003)        | 100   | (1.45) |
|  | DN 80 with tube             | 72                    | (2.83) | 1   | (0.015)        | 1   | (1.015)                       | 1   | (1.015)        | 250   | (3.63) |
|  | DN 100 without tube         | 89                    | (3.50) | 0.2   | (0.003)        | 0.4   | (0.006)                       | 0.4   | (0.006)        | 100   | (1.45) |
|  | DN 100 with tube            | 89                    | (3.50) | 0.4   | (0.006)        | 0.4   | (0.006)                       | 0.4   | (0.006)        | 100   | (1.45) |
|  | DN 125 without tube         | 124                   | (4.88) | 0.2   | (0.003)        | 0.1   | (0.002)                       | 0.1   | (0.002)        | 20  | (0.29) |
|  | DN 125 with tube            | 124                   | (4.88) | 0.2   | (0.003)        | 0.1   | (0.002)                       | 0.1   | (0.002)        | 20  | (0.29) |
| Sandwich<br>design or with<br>flange to<br>ASME B16.5  | 2 inch without tube         | 59                    | (2.32) | 1.5   | (0.022)        | 2   | (0.029)                       | 2   | (0.029)        | 200   | (2.90) |
|  | 2 inch with tube            | 45                    | (1.89) | 5   | (0.073)        | 10  | (0.145)                       | 10  | (0.145)        | 500   | (7.25) |
|  | 3 inch without tube         | 89                    | (3.50) | 0.2   | (0.003)        | 0.2   | (0.003)                       | 0.2   | (0.003)        | 100   | (1.45) |
|  | 3 inch with tube            | 72                    | (2.83) | 1   | (0.015)        | 1   | (1.015)                       | 1   | (1.015)        | 250   | (3.63) |
|  | 4 inch without tube         | 89                    | (3.50) | 0.2   | (0.003)        | 0.4   | (0.006)                       | 0.4   | (0.006)        | 100   | (1.45) |
|  | 4 inch with tube            | 89                    | (3.50) | 0.4   | (0.006)        | 0.4   | (0.006)                       | 0.4   | (0.006)        | 100   | (1.45) |
|  | 5 inch without tube         | 124                   | (4.88) | 0.2   | (0.003)        | 0.1   | (0.002)                       | 0.1   | (0.002)        | 20  | (0.29) |
|  | 5 inch with tube            | 124                   | (4.88) | 0.2   | (0.003)        | 0.1   | (0.002)                       | 0.1   | (0.002)        | 20  | (0.29) |
| Remote seal<br>with union nut to<br>DIN 11851          | DN 25                       | 25                    | (0.98) | 20  | (0.290)        | 60  | (0.870)                       | 60  | (0.870)        | 6000  | (87)   |
|  | DN 32                       | 32                    | (1.26) | 8   | (0.116)        | 25  | (0.363)                       | 25  | (0.363)        | 4000  | (58)   |
|  | DN 40                       | 40                    | (1.57) | 4   | (0.058)        | 10  | (0.145)                       | 10  | (0.145)        | 2000  | (29)   |
|  | DN 50                       | 52                    | (2.05) | 4   | (0.058)        | 5   | (0.073)                       | 5   | (0.073)        | 500   | (7.25) |
|  | DN 65                       | 59                    | (2.32) | 3   | (0.044)        | 4   | (0.058)                       | 4   | (0.058)        | 500   | (7.25) |
|  | DN 80                       | 72                    | (2.83) | 1   | (0.015)        | 1   | (0.015)                       | 1   | (0.015)        | 250   | (3.63) |
| Remote seal,<br>screwed gland<br>design                | DN 50                       | 52                    | (2.05) | 4   | (0.058)        | 5   | (0.073)                       | 5   | (0.073)        | 500   | (7.25) |
| Remote seal<br>with threaded<br>socket to<br>DIN 11851 | DN 25                       | 25                    | (0.98) | 20  | (0.290)        | 60  | (0.870)                       | 60  | (0.870)        | 6000  | (87)   |
|  | DN 32                       | 32                    | (1.26) | 8   | (0.116)        | 25  | (0.363)                       | 25  | (0.363)        | 4000  | (58)   |
|  | DN 40                       | 40                    | (1.57) | 4   | (0.058)        | 10  | (0.145)                       | 10  | (0.145)        | 2000  | (29)   |
|  | DN 50                       | 52                    | (2.05) | 4   | (0.058)        | 5   | (0.073)                       | 5   | (0.073)        | 500   | (7.25) |
|  | DN 65                       | 59                    | (2.32) | 3   | (0.044)        | 4   | (0.058)                       | 4   | (0.058)        | 500   | (7.25) |
|  | DN 80                       | 72                    | (2.83) | 1   | (0.015)        | 1   | (0.015)                       | 1   | (0.015)        | 250   | (3.63) |
| Clamp connec-<br>tion                                  | 1½ inch                     | 32                    | (1.26) | 8   | (0.116)        | 25  | (0.363)                       | 25  | (0.363)        | 4000  | (58)   |
|  | 2 inch                      | 40                    | (1.57) | 4   | (0.058)        | 10  | (0.145)                       | 10  | (0.145)        | 2000  | (29)   |
|  | 2½ inch                     | 59                    | (2.32) | 3   | (0.044)        | 5   | (0.073)                       | 5   | (0.073)        | 500   | (7.25) |
|  | 3 inch                      | 72                    | (2.83) | 1   | (0.015)        | 1   | (0.015)                       | 1   | (0.015)        | 250   | (3.63) |
| Miniature dia-<br>phragm seal                          | G1B                         | 25                    | (0.98) | 20  | (0.290)        | 60  | (0.870)                       | 60  | (0.870)        | 6000  | (87)   |
|  | G1½B                        | 40                    | (1.57) | 4   | (0.058)        | 10  | (0.145)                       | 10  | (0.145)        | 2000  | (29)   |
|  | G2B                         | 52                    | (2.05) | 4   | (0.058)        | 5   | (0.073)                       | 5   | (0.073)        | 500   | (7.25) |

#### Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Values apply to stainless steel as the diaphragm material.

Temperature errors of diaphragm seals with connection to differential pressure transmitters (double-sided)

|  | Nominal diameter/<br>design | Diaphragm<br>diameter |        | Temperature error<br>of remote seal $f_{RS}$ |                | Temperature error of<br>capillary $f_{Cap}$ |                               | Temperature error<br>of process<br>flange/connec-<br>tion spigot $f_{PF}$ |                | Recommended<br>min. spans<br>(guidance val-<br>ues, observe<br>temperature<br>error) |         |
|--|-----------------------------|-----------------------|--------|--|----------------|---|-------------------------------|---|----------------|--|---------|
|  |                             | mm                    | (inch) | mbar/<br>10 K                                | (psi/<br>10 K) | mbar/<br>(10 K · $m_{Cap}$ )                | (psi/<br>(10 K · $m_{Cap}$ )) | mbar/<br>10 K   | (psi/<br>10 K) | mbar   | (psi)   |
| Sandwich<br>design or with<br>flange to<br>EN 1092-1   | DN 50 without tube          | 59                    | (2.32) | 0.3  | (0.0043)       | 0.3   | (0.0045)                      | 0.3   | (0.0045)       | 250  | (3.626) |
|  | DN 50 with tube             | 45                    | (1.89) | 1.26   | (0.018)        | 1.7   | (0.025)                       | 1.7   | (0.025)        | 250  | (3.626) |
|  | DN 80 without tube          | 89                    | (3.50) | 0.05   | (0.001)        | 0.05  | (0.001)                       | 0.05  | (0.0007)       | 50   | (0.725) |
|  | DN 80 with tube             | 72                    | (2.83) | 0.24   | (0.004)        | 0.17  | (0.003)                       | 0.17  | (0.003)        | 100  | (1.45)  |
|  | DN 100 without tube         | 89                    | (3.50) | 0.05   | (0.001)        | 0.07  | (0.001)                       | 0.07  | (0.001)        | 50   | (0.725) |
|  | DN 100 with tube            | 89                    | (3.50) | 0.1  | (0.002)        | 0.07  | (0.001)                       | 0.07  | (0.001)        | 50   | (0.725) |
|  | DN 125 without tube         | 124                   | (4.88) | 0.05   | (0.001)        | 0.03  | (0.0004)                      | 0.03  | (0.0004)       | 20   | (0.29)  |
|  | DN 125 with tube            | 124                   | (4.88) | 0.05   | (0.001)        | 0.03  | (0.0004)                      | 0.03  | (0.0004)       | 20   | (0.29)  |
| Sandwich<br>design with<br>flange to<br>ASME B16.5     | 2 inch without tube         | 59                    | (2.32) | 0.3  | (0.0043)       | 0.3   | (0.0043)                      | 0.3   | (0.0045)       | 250  | (3.626) |
|  | 2 inch with tube            | 45                    | (1.89) | 1.26   | (0.018)        | 1.7   | (0.025)                       | 1.7   | (0.025)        | 250  | (3.626) |
|  | 3 inch without tube         | 89                    | (3.50) | 0.05   | (0.001)        | 0.05  | (0.0007)                      | 0.05  | (0.0007)       | 50   | (0.725) |
|  | 3 inch with tube            | 72                    | (2.83) | 0.24   | (0.004)        | 0.17  | (0.003)                       | 0.17  | (0.003)        | 100  | (1.45)  |
|  | 4 inch without tube         | 89                    | (3.50) | 0.05   | (0.001)        | 0.07  | (0.001)                       | 0.07  | (0.001)        | 50   | (0.725) |
|  | 4 inch with tube            | 89                    | (3.50) | 0.1  | (0.002)        | 0.07  | (0.001)                       | 0.07  | (0.001)        | 50   | (0.725) |
|  | 5 inch without tube         | 124                   | (4.88) | 0.05   | (0.001)        | 0.03  | (0.0004)                      | 0.03  | (0.0004)       | 20   | (0.29)  |
|  | 5 inch with tube            | 124                   | (4.88) | 0.05   | (0.001)        | 0.03  | (0.0004)                      | 0.03  | (0.0004)       | 20   | (0.29)  |
| Remote seal,<br>screwed gland<br>design                | DN 50                       | 52                    | (2.05) | 1  | (0.015)        | 0.83  | (0.012)                       | 0.83  | (0.012)        | 250  | (3.626) |
| Remote seal<br>with union nut to<br>DIN 11851          | DN 50                       | 52                    | (2.05) | 1  | (0.015)        | 0.83  | (0.012)                       | 0.83  | (0.012)        | 250  | (3.626) |
|  | DN 65                       | 59                    | (2.32) | 0.7  | (0.010)        | 0.67  | (0.010)                       | 0.67  | (0.010)        | 250  | (3.626) |
|  | DN 80                       | 72                    | (2.83) | 0.24   | (0.004)        | 0.17  | (0.003)                       | 0.17  | (0.003)        | 100  | (1.450) |
| Remote seal<br>with threaded<br>socket to<br>DIN 11851 | DN 50                       | 52                    | (2.05) | 1  | (0.015)        | 0.83  | (0.012)                       | 0.83  | (0.012)        | 250  | (3.626) |
|  | DN 65                       | 59                    | (2.32) | 0.7  | (0.010)        | 0.67  | (0.010)                       | 0.67  | (0.010)        | 250  | (3.626) |
|  | DN 80                       | 72                    | (2.83) | 0.24   | (0.004)        | 0.17  | (0.003)                       | 0.17  | (0.003)        | 100  | (1.450) |
| Clamp connec-<br>tion                                  | 2 inch                      | 40                    | (1.57) | 1  | (0.015)        | 2.5   | (0.036)                       | 2.5   | (0.036)        | 2000   | (29.01) |
|  | 2½ inch                     | 59                    | (2.32) | 0.7  | (0.010)        | 0.67  | (0.010)                       | 0.67  | (0.010)        | 250  | (3.626) |
|  | 3 inch                      | 72                    | (2.83) | 0.24   | (0.004)        | 0.17  | (0.003)                       | 0.17  | (0.003)        | 100  | (1.450) |

## Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Values apply to stainless steel as the diaphragm material.

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Technical description

#### Temperature error Clamp-on seals

Temperature errors of clamp-on seals when connected to pressure transmitters for gauge pressure and absolute pressure, and with single-sided connection to pressure transmitters for differential pressure

| Nominal diameter/<br>design | Temperature error of remote<br>seal $f_{RS}$ |            | Temperature error of<br>capillary $f_{Cap}$ |            | Temperature error of pro-<br>cess flange/connection<br>spigot $f_{PF}$ |            | Recommended min. spans<br>(guidance values, observe<br>temperature error) |        |
|-----------------------------|--|------------|---|------------|--|------------|---|--------|
|                             | mbar/10 K                                    | (psi/10 K) | mbar/10 K                                   | (psi/10 K) | mbar/10 K  | (psi/10 K) | mbar  | (psi)  |
| DN 25 (1 inch)              | 6.0  | (0.0870)   | 8.5   | (0.123)    | 8.5  | (0.123)    | 1000  | (14.5) |
| DN 40 (1½ inch)             | 4.5  | (0.065)    | 4.5   | (0.065)    | 4.5  | (0.065)    | 250   | (3.63) |
| DN 50 (2 inch)              | 4.0  | (0.058)    | 3.0   | (0.044)    | 3.0  | (0.044)    | 100   | (1.45) |
| DN 80 (3 inch)              | 9.5  | (0.138)    | 5.0   | (0.073)    | 5.0  | (0.073)    | 100   | (1.45) |
| DN 100 (4 inch)             | 8.0  | (0.012)    | 3.0   | (0.044)    | 3.0  | (0.044)    | 100   | (1.45) |

Temperature errors of clamp-on seals with double-sided connection to pressure transmitters for differential pressure

| Nominal diameter/<br>design | Temperature error of remote<br>seal $f_{RS}$ |            | Temperature error of<br>capillary $f_{Cap}$ |            | Temperature error of pro-<br>cess flange/connection<br>spigot $f_{PF}$ |            | Recommended min. spans<br>(guidance values, observe<br>temperature error) |        |
|-----------------------------|--|------------|---|------------|--|------------|---|--------|
|                             | mbar/10 K                                    | (psi/10 K) | mbar/10 K                                   | (psi/10 K) | mbar/10 K  | (psi/10 K) | mbar  | (psi)  |
| DN 25 (1 inch)              | 2.3  | (0.033)    | 1.8   | (0.026)    | 1.8  | (0.026)    | 1000  | (14.5) |
| DN 40 (1½ inch)             | 0.8  | (0.012)    | 0.3   | (0.004)    | 0.3  | (0.004)    | 250   | (3.63) |
| DN 50 (2 inch)              | 0.3  | (0.004)    | 0.1   | (0.002)    | 0.1  | (0.002)    | 100   | (1.45) |
| DN 80 (3 inch)              | 3.0  | (0.044)    | 0.5   | (0.007)    | 0.5  | (0.007)    | 100   | (1.45) |
| DN 100 (4 inch)             | 1.0  | (0.015)    | 0.1   | (0.002)    | 0.1  | (0.002)    | 100   | (1.45) |

#### Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Half the values apply to glycerin/water mixture as the filling liquid.
- Values apply to stainless steel as the diaphragm material.
- Diaphragm thickness 0.05 mm (0.002 inch) for DN 25/DN 40/DN 50 and 0.1 mm (0.004 inch) for DN 80/DN 100

# Pressure Measurement

## Remote seals for transmitters and pressure gauges

### SITRANS P DS III

#### Technical description

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#### Calculation of the temperature error

The following equation is used to calculate the temperature error:

$$dp = (\vartheta_{RS} - \vartheta_{Cal}) \cdot f_{RS} + (\vartheta_{Cap} - \vartheta_{Cal}) \cdot l_{Cap} \cdot f_{Cap} + (\vartheta_{TR} - \vartheta_{Cal}) \cdot f_{PF}$$

|                   |   |
|-------------------|---|
| dp                | Additional temperature error (mbar)   |
| $\vartheta_{RS}$  | Temperature on remote seal diaphragm (generally corresponds to temperature of medium)   |
| $\vartheta_{Cal}$ | Calibration (reference) temperature (20 °C (68 °F))                                     |
| $f_{RS}$          | Temperature error of remote seal  |
| $\vartheta_{Cap}$ | Ambient temperature on the capillaries  |
| $l_{Cap}$         | Capillary length  |
| $f_{Cap}$         | Temperature error of capillaries  |
| $\vartheta_{TR}$  | Ambient temperature on pressure transmitter   |
| $f_{PF}$          | Temperature error of the oil filling in the process flanges of the pressure transmitter |

#### Example of temperature error calculation

##### Existing conditions:

|   |   |
|---|---|
| SITRANS P pressure transmitter for differential pressure, 250 mbar, set to 0 ... 100 mbar, with DN 100 remote seal diaphragms without tube, diaphragm made of stainless steel, mat. No. 1.4404/316L | $f_{RS} = 0.05 \text{ mbar}/10 \text{ K}$<br>(0.039 inH <sub>2</sub> O/10 K)  |
| Capillary length  | $l_{Cap} = 6 \text{ m}$ (19.7 ft)   |
| Capillaries fitted on both sides  | $f_{Cap} = 0.07 \text{ mbar}/(10 \text{ K} \cdot m_{Cap})$<br>(0.028 inH <sub>2</sub> O/(10 K · m <sub>Cap</sub> )) |
| Filling liquid silicone oil M5  | $f_{PF} = 0.07 \text{ mbar}/10 \text{ K}$<br>(0.028 inH <sub>2</sub> O/10 K)  |
| Process temperature   | $\vartheta_{RS} = 100 \text{ °C}$ (212 °F)  |
| Temperature on the capillaries  | $\vartheta_{Cap} = 50 \text{ °C}$ (122 °F)  |
| Temperature on pressure transmitter   | $\vartheta_{TR} = 50 \text{ °C}$ (122 °F)   |
| Calibration temperature   | $\vartheta_{Cal} = 20 \text{ °C}$ (68 °F)   |

##### Required:

Additional temperature error of remote seals: dp

##### Calculation:

##### in mbar

$$dp = (100 \text{ °C} - 20 \text{ °C}) \cdot 0.05 \text{ mbar}/10 \text{ K} + (50 \text{ °C} - 20 \text{ °C}) \cdot 6 \text{ m} \cdot 0.07 \text{ mbar}/(10 \text{ K} \cdot \text{m}) + (50 \text{ °C} - 20 \text{ °C}) \cdot 0.07 \text{ mbar}/10 \text{ K}$$

$$dp = 0.4 \text{ mbar} + 1.26 \text{ mbar} + 0.21 \text{ mbar}$$

##### in inH<sub>2</sub>O

$$dp = (212 \text{ °F} - 68 \text{ °F}) \cdot 0.039 \text{ inH}_2\text{O}/10 \text{ K} + (112 \text{ °F} - 68 \text{ °F}) \cdot 19.7 \text{ ft} \cdot 0.028 \text{ inH}_2\text{O}/(10 \text{ K} \cdot 3.28 \text{ ft}) + (112 \text{ °F} - 68 \text{ °F}) \cdot (0.028 \text{ inH}_2\text{O}/10 \text{ K})$$

$$dp = 0.16 \text{ inH}_2\text{O} + 0.51 \text{ inH}_2\text{O} + 0.08 \text{ inH}_2\text{O}$$

##### Result:

**dp = 1.87 mbar (0.75 inH<sub>2</sub>O)**  
(corresponds to 2.27% of set span)

##### Note

The determined temperature error only applies to the error resulting from connection of the remote seal.

The transmission response of the respective transmitter is not included in this consideration.

It must be calculated separately, and the resulting error added to the error determined above from connection of the remote seal.

#### Dependence of temperature error on diaphragm material

The temperature errors listed in the previous table are based on the use of stainless steel as the diaphragm material. If other diaphragm materials are used, the temperature errors change as follows:

| Diaphragm material  | Change in temperature error of remote seal |
|---|--|
|   | Increase in values by                      |
| Stainless steel, Duplex, ...                              | See previous tables                        |
| Hastelloy C4, mat. No. 2.4602                             | 50 %                                       |
| Hastelloy C276, mat. No. 2.4819                           | 50 %                                       |
| Monel 400, mat. No. 2.4360                                | 60 %                                       |
| Tantalum  | 50 %                                       |
| Titanium  | 50 %                                       |
| PTFE coating on stainless steel diaphragm                 | 80 %                                       |
| ECTFE coating or PFA coating on stainless steel diaphragm | 100 %                                      |
| Gold coating on stainless steel diaphragm                 | 40 %                                       |
| Inconel   | 50 %                                       |
| Incoloy   | 50 %                                       |

#### Maximum temperature of medium

##### Note

When taking into account the maximum medium temperature, the application limits of the fill fluids and gaskets used as well as the pressure/temperature limits of the respective process connections must also be taken into consideration. The following maximum temperatures of the medium apply depending on the material of the wetted parts.

| Material                              | Max. medium temperature            | Min./max. Pressure   |
|---------------------------------------|------------------------------------|--|
| Stainless steel, mat. no. 1.4404/316L | 400 °C (752 °F)                    | No restrictions  |
| PTFE coating                          | 200 °C (392 °F)<br>260 °C (500 °F) | < 0 bar (0 psi); gauge pressure<br>0 bar (0 psi)/25 bar (363 psi); gauge pressure    |
|                                       | 150 °C (302 °F)                    | 25 bar (363 psi)/40 bar (580 psi); gauge pressure                                    |
|                                       | 50 °C (302 °F)                     | 40 bar (580 psi)/60 bar (870 psi); gauge pressure                                    |
| ECTFE coating                         | 150 °C (302 °F)                    | For pressures < 1 bar (14.5 psi) on request  |
| PFA coating                           | 200 °C (392 °F)<br>260 °C (500 °F) | < 0 bar (0 psi); gauge pressure<br>25 bar (363 psi)/40 bar (580 psi); gauge pressure |
|                                       | 150 °C (302 °F)                    | 40 bar (580 psi)/60 bar (870 psi); gauge pressure                                    |
|                                       | 50 °C (302 °F)                     | For pressures < 1 bar (14.5 psi) on request  |
| Hastelloy C4, mat. no. 2.4610         | 400 °C (752 °F)                    | No restrictions  |
| Hastelloy C276, mat. no. 2.4819       | 400 °C (752 °F)                    | No restrictions  |
| Hastelloy C22, mat. no. 2.4602        | 400 °C (752 °F)                    | No restrictions  |
| Monel 400, mat. no. 2.4360            | 400 °C (752 °F)                    | No restrictions  |
| Tantalum                              | 300 °C (572 °F)                    | No restrictions  |
| Duplex, mat. no. 1.4462               | 250 °C (482 °F)                    | No restrictions  |
| Titanium                              | 150 °C (302 °F)                    | No restrictions  |
| Inconel                               | 400 °C (752 °F)                    | No restrictions  |
| Incoloy                               | 400 °C (752 °F)                    | No restrictions  |
| Gold coating                          | 400 °C (752 °F)                    | No restrictions  |

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

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### Technical description

The following maximum temperatures of the medium apply depending on the material of the wetted parts:

#### **Maximum capillary length for diaphragm seals (guidance values)**

| Nom. diam. |           | Max. length of capillary |        |               |        |
|------------|-----------|--------------------------|--------|---------------|--------|
|            |           | Diaphragm seal           |        | Clamp-on seal |        |
|            |           | m                        | (ft)   | m             | (ft)   |
| DN 25      | (1 inch)  | 2.5                      | (8.2)  | 2.5           | (8.2)  |
| DN 32      | (1¼ inch) | 2.5                      | (8.2)  | 2.5           | (8.2)  |
| DN 40      | (1½ inch) | 4                        | (13.1) | 6             | (19.7) |
| DN 50      | (2 inch)  | 6                        | (19.7) | 10            | (32.8) |
| DN 65      | (2½ inch) | 8                        | (26.2) | 10            | (32.8) |
| DN 80      | (3 inch)  | 15                       | (49.1) | 10            | (32.8) |
| DN 100     | (4 inch)  | 15                       | (49.1) | 10            | (32.8) |
| DN 125     | (5 inch)  | 15                       | (49.1) | -             | -      |

**Response times**

The values listed in the following table are the response times (in seconds per meter of capillary) for a change in pressure which corresponds to the set span.

The listed values must be multiplied by the respective length of the capillary, or with transmitters for differential pressure and flow by the total length of both capillaries.

The response times are independent of the set span within the range of the respective transmitter. The response times are of insignificant importance for spans above 10 bar (145 psi). The response times of the pressure transmitters are not considered in the table.

| Filling liquid        | Density            |                       | Temperature on capillary |       | Response time in s/m (s/ft) with max. span of pressure transmitter |                          |          |                          |           |                          |
|-----------------------|--------------------|-----------------------|--------------------------|-------|--|--------------------------|----------|--------------------------|-----------|--------------------------|
|                       | kg/dm <sup>3</sup> | (lb/in <sup>3</sup> ) | °C                       | (°F)  | 250 mbar   | (101 inH <sub>2</sub> O) | 600 mbar | (241 inH <sub>2</sub> O) | 1600 mbar | (643 inH <sub>2</sub> O) |
| Silicone oil M5       | 0.914              | (0.033)               | +60                      | (140) | 0.06   | (0.018)                  | 0.02     | (0.006)                  | 0.01      | (0.003)                  |
|                       |                    |                       | +20                      | (68)  | 0.11   | (0.034)                  | 0.02     | (0.006)                  | 0.02      | (0.006)                  |
|                       |                    |                       | -20                      | (-4)  | 0.3  | (0.091)                  | 0.12     | (0.037)                  | 0.05      | (0.015)                  |
| Silicone oil M50      | 0.966              | (0.035)               | +60                      | (140) | 0.6  | (0.183)                  | 0.25     | (0.076)                  | 0.09      | (0.027)                  |
|                       |                    |                       | +20                      | (68)  | 0.61   | (0.186)                  | 0.26     | (0.079)                  | 0.1       | (0.030)                  |
|                       |                    |                       | -20                      | (-4)  | 1.69   | (0.515)                  | 0.71     | (0.216)                  | 0.27      | (0.082)                  |
| High-temperature oil  | 1.070              | (0.039)               | +60                      | (140) | 0.14   | (0.043)                  | 0.06     | (0.018)                  | 0.02      | (0.006)                  |
|                       |                    |                       | +20                      | (68)  | 0.65   | (0.198)                  | 0.27     | (0.082)                  | 0.1       | (0.030)                  |
|                       |                    |                       | -10                      | (14)  | 3.96   | (1.207)                  | 1.65     | (0.503)                  | 0.62      | (0.189)                  |
| Halocarbon oil        | 1.968              | (0.071)               | +60                      | (140) | 0.07   | (0.021)                  | 0.03     | (0.009)                  | 0.01      | (0.003)                  |
|                       |                    |                       | +20                      | (68)  | 0.29   | (0.088)                  | 0.12     | (0.037)                  | 0.05      | (0.015)                  |
|                       |                    |                       | -20                      | (-4)  | 2.88   | (0.878)                  | 1.2      | (0.366)                  | 0.45      | (0.137)                  |
| Food oil (FDA listed) | 0.920              | (0.033)               | +60                      | (140) | 0.75   | (0.229)                  | 0.33     | (0.101)                  | 0.17      | (0.052)                  |
|                       |                    |                       | +20                      | (68)  | 4  | (1.220)                  | 1.75     | (0.534)                  | 0.67      | (0.204)                  |
|                       |                    |                       | -20                      | (-4)  | 20   | (6.100)                  | 8.5      | (2.593)                  | 3.25      | (0.991)                  |

Permissible data of filling liquids for pressure and temperature see diagrams on page 1/425 ff.

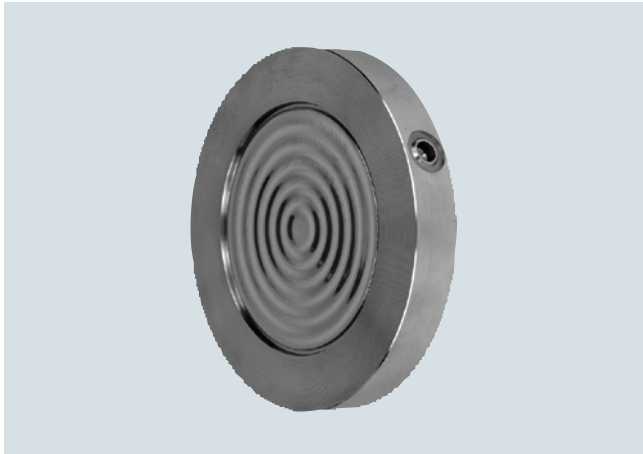
## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

1

### Diaphragm seals of sandwich design with flexible capillary

#### Overview



Diaphragm seals of sandwich design

#### Technical specifications

##### Diaphragm seals of sandwich design

|   |   |
|---|---|
| Nominal diameter                            | Nominal pressure  |
| • DN 50                                     | PN 16 ... PN 400  |
| • DN 80                                     | PN 16 ... PN 400  |
| • DN 100                                    | PN 16 ... PN 400  |
| • DN 125                                    | PN 16 ... PN 400  |
| • 2 inch                                    | Class 150 ... class 2500  |
| • 3 inch                                    | Class 150 ... class 2500  |
| • 4 inch                                    | Class 150 ... class 2500  |
| • 5 inch                                    | Class 150 ... class 2500  |
| Sealing face                                |   |
| • For stainless steel, mat. No. 1.4404/316L | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA   |
| • For the other materials                   | To EN 1092-1, form B2 or ASME B16.5 RFSF  |
| Materials                                   |   |
| • Main body                                 | Stainless steel mat. no. 1.4404/316L  |
| • Wetted parts                              | Stainless steel mat. no. 1.4404/316L  |
|   | <ul style="list-style-type: none"> <li>• Without coating</li> <li>• PTFE coating</li> <li>• ECTFE coating (for vacuum on request)</li> <li>• PFA coating</li> </ul> |
|   | Monel 400, mat. No. 2.4360  |
|   | Hastelloy C276, mat. No. 2.4819   |
|   | Hastelloy C4, mat. No. 2.4602   |
|   | Hastelloy C22, mat. no. 2.4602  |
|   | Tantalum  |
|   | Titanium, mat. no. 3.7035   |
|   | Nickel 201  |
|   | Duplex 2205, mat. no. 1.4462  |
|   | Stainless steel 316L, gold plated, thickness approx. 25 µm  |
| • Capillary                                 | Stainless steel, mat. No. 1.4571/316Ti  |
| • Sheath                                    | Spiral protective tube made of stainless steel, mat. No. 1.4301/304   |

|   |   |
|---|---|
| Sealing material in the process flanges   |   |
| • For pressure transmitters, absolute pressure transmitters and low-pressure applications | Copper  |
| • For other applications  | Viton   |
| Maximum pressure  | See above and the technical data of the pressure transmitters   |
| Tube length   | Without tube as standard (tube available on request)  |
| Capillary   |   |
| • Length  | Max. 10 m (32.8 ft), longer lengths on request  |
| • Internal diameter   | max. 2 mm (0.079 inch)  |
| • Minimum bending radius  | 150 mm (5.9 inch)   |
| Filling liquid  | Silicone oil M5   |
|   | Silicone oil M50  |
|   | High-temperature oil  |
|   | Halocarbon oil (for measuring O <sub>2</sub> )  |
|   | Food oil (FDA listed)   |
| Permissible ambient temperature   | Dependent on the pressure transmitter and the filling liquid of the remote seal   |
|   | More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals |
| Weight  | Approx. 4 kg (8.82 lb)  |

##### Certificate and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)



## Diaphragm seals of sandwich design with flexible capillary

1

| Selection and Ordering data   |  | Article No. |  | Ord.code |  | Selection and Ordering data  |  | Article No.   |  | Ord.code |  |
|---|--|-------------|--|----------|--|--|--|---|--|----------|--|
| <b>Diaphragm seal</b><br><br>Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately):<br><br><b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; Scope of delivery (1 off)<br><br><b>for absolute pressure</b> 7MF433-...; Scope of delivery (1 off)<br><br><b>for differential pressure and flow</b> 7MF243-...;7MF443-... and 7MF54-...; scope of delivery 2 off<br><br>➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.  |  |             |  |          |  | 7MF4900-   |  | 7MF4900-  |  | 7MF4900- |  |
|   |  |             |  |          |  | 7MF4901-   |  | 7MF4901-  |  | 7MF4901- |  |
|   |  |             |  |          |  | 7MF4903-   |  | 7MF4903-  |  | 7MF4903- |  |
|   |  |             |  |          |  | 1  |  | 1   |  | B        |  |
| <b>Nominal diameter and nominal pressure</b><br>• DN 25<br>• DN 40<br>• DN 50                      PN 16 ... 400<br>(recommended only for pressure transmitters for pressure)<br>• DN 80                      PN 16 ... 400<br>• DN 100                    PN 16 ... 400<br>• DN 125                    PN 16 ... 400<br><br>• 2 inch                      Class 150 ... 2500<br>(recommended only for pressure transmitters for pressure)<br>• 3 inch                      Class 150 ... 2500<br>• 4 inch                      Class 150 ... 2500<br>• 5 inch                      Class 150 ... 2500<br><br>Smooth sealing face to EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 AA<br>Other version<br>Add Order code and plain text:<br>Nominal diameter: ...; Nominal pressure: ...<br>Sealing face: see "Technical data" |  |             |  |          |  | Z<br>Z<br>A<br><br>B<br>C<br>D<br>E<br><br>H<br>L<br>N<br><br>Z                    |  | J 0 A<br>J 0 B<br><br><br><br><br><br><br><br>J 1 Y |  |          |  |
| <b>Wetted parts materials</b><br>• Stainless steel 316L<br>- without coating<br>- with PTFE coating <sup>2)</sup><br>- with ECTFE coating <sup>2) 3) 4)</sup><br>- with PFA coating <sup>2) 4)</sup><br>• Monel 400, mat. No. 2.4360<br>• Hastelloy C276, mat. No. 2.4819<br>• Hastelloy C4, mat. No. 2.4602<br>• Hastelloy C22, mat. No. 2.4602<br>• Tantalum<br>• Titanium, mat. No. 3.7035 (max. 150 °C (302 °F))<br>• Nickel 201 (max. 260 °C (500 °F))<br>• Duplex 2205, mat. no. 1.4462<br>• Duplex 2205, mat. no. 1.4462, incl. main body<br>• Stainless steel 316L, gold plated, thickness approx. 25 µm  |  |             |  |          |  | A<br>E 0<br>F<br>D<br>G<br>J<br>U 0<br>V 0<br>K<br>L 0<br><br>M 0<br>Q<br>R<br>S 0 |  |   |  |          |  |
| <b>Tube length</b><br>• without tube<br>Other version:<br>Add Order code and plain text:<br>Wetted parts materials: ...,<br>Tube length: ...  |  |             |  |          |  | 0<br>Z 8   |  | K 1 Y   |  |          |  |

|  |  |  |  |  |  |          |  |          |  |          |  |
|--|--|--|--|--|--|----------|--|----------|--|----------|--|
| <b>Diaphragm seal</b><br><br>Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately):<br><br><b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; Scope of delivery (1 off)<br><br><b>for absolute pressure</b> 7MF433-...; Scope of delivery (1 off)<br><br><b>for differential pressure and flow</b> 7MF243-...;7MF443-... and 7MF54-...; scope of delivery 2 off<br><br>➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. |  |  |  |  |  | 7MF4900- |  | 7MF4900- |  | 7MF4900- |  |
|  |  |  |  |  |  | 7MF4901- |  | 7MF4901- |  | 7MF4901- |  |
|  |  |  |  |  |  | 7MF4903- |  | 7MF4903- |  | 7MF4903- |  |
|  |  |  |  |  |  | 1        |  | 1        |  | B        |  |
| <b>Customer-specific tubus length</b><br>Specify customer-specific length with Y44, see Order Code<br><br>• Wetted parts materials: Stainless steel without foil<br>Range  |  |  |  |  |  |          |  |          |  |          |  |



## Diaphragm seals of sandwich design with flexible capillary

1

| Selection and Ordering data  | Order code | Selection and Ordering data   | Order code |
|--|------------|---|------------|
| <b>Further designs</b>   |            | <b>Further designs</b>  |            |
| Please add <b>"-Z"</b> to Article No. and specify Order code.  |            | Please add <b>"-Z"</b> to Article No. and specify Order code.           |            |
| <b>Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm)</b>   | <b>J11</b> | <b>PE protective tube</b>   |            |
| previously DIN 2501, form E  |            | over the spiral protective tube of the capillaries (color: white)       |            |
| <b>Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA</b>  | <b>J12</b> | 1.0 m (3.28 ft)   | <b>N20</b> |
| instead of sealing surface B2 or RFSF (only for wetted parts made of Hastelloy C276 (2.4819), tantalum and Duplex 2205 (1.4462) and for nominal sizes 2", 3", DN 50 and DN 80) |            | 1.6 m (5.25 ft)   | <b>N21</b> |
| <b>Sealing surface groove, EN 1092-1, form D</b>   | <b>J14</b> | 2.0 m (6.56 ft)   | <b>N22</b> |
| instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)   |            | 2.5 m (8.20 ft)   | <b>N23</b> |
| <b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b>   | <b>J24</b> | 3.0 m (9.84 ft)   | <b>N24</b> |
| instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)   |            | 4.0 m (13.12 ft)  | <b>N25</b> |
| <b>Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L</b>   |            | 5.0 m (16.40 ft)  | <b>N26</b> |
| DN 25  | <b>J30</b> | 6.0 m (19.69 ft)  | <b>N27</b> |
| DN 40  | <b>J31</b> | 7.0 m (22.97 ft)  | <b>N28</b> |
| DN 50  | <b>J32</b> | 8.0 m (26.25 ft)  | <b>N29</b> |
| DN 80  | <b>J33</b> | 9.0 m (29.53 ft)  | <b>N30</b> |
| DN 100   | <b>J34</b> | 10.0 m (32.81 ft)   | <b>N31</b> |
| DN 125   | <b>J35</b> | <u>only for 7MF4903-...</u>   |            |
| <b>Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L</b>   |            | 11.0 m (36.09 ft)   | <b>N32</b> |
| DN 25  | <b>J40</b> | 12.0 m (39.37 ft)   | <b>N33</b> |
| DN 40  | <b>J41</b> | 13.0 m (42.65 ft)   | <b>N34</b> |
| DN 50  | <b>J42</b> | 14.0 m (45.93 ft)   | <b>N35</b> |
| DN 80  | <b>J43</b> | 15.0 m (49.21 ft)   | <b>N36</b> |
| DN 100   | <b>J44</b> |   |            |
| DN 125   | <b>J45</b> | <b>PTFE protective tube</b>   |            |
| <b>Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L</b>   |            | over the spiral protective tube of the capillaries (color: transparent) |            |
| DN 25  | <b>J50</b> | 1.0 m (3.28 ft)   | <b>N40</b> |
| DN 40  | <b>J51</b> | 1.6 m (5.25 ft)   | <b>N41</b> |
| DN 50  | <b>J52</b> | 2.0 m (6.56 ft)   | <b>N42</b> |
| DN 80  | <b>J53</b> | 2.5 m (8.20 ft)   | <b>N43</b> |
| DN 100   | <b>J54</b> | 3.0 m (9.84 ft)   | <b>N44</b> |
| DN 125   | <b>J55</b> | 4.0 m (13.12 ft)  | <b>N45</b> |
|  |            | 5.0 m (16.40 ft)  | <b>N46</b> |
|  |            | 6.0 m (19.69 ft)  | <b>N47</b> |
|  |            | 7.0 m (22.97 ft)  | <b>N48</b> |
|  |            | 8.0 m (26.25 ft)  | <b>N49</b> |
|  |            | 9.0 m (29.53 ft)  | <b>N50</b> |
|  |            | 10.0 m (32.81 ft)   | <b>N51</b> |
|  |            | <u>only for 7MF4903-...</u>   |            |
|  |            | 11.0 m (36.09 ft)   | <b>N52</b> |
|  |            | 12.0 m (39.37 ft)   | <b>N53</b> |
|  |            | 13.0 m (42.65 ft)   | <b>N54</b> |
|  |            | 14.0 m (45.93 ft)   | <b>N55</b> |
|  |            | 15.0 m (49.21 ft)   | <b>N56</b> |

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Diaphragm seals of sandwich design with flexible capillary

#### Selection and Ordering data

#### Order code

##### Further designs

Please add **"-Z"** to Article No. and specify Order code.

##### PVC protective tube

over the spiral protective tube of the capillaries  
(color: black)

|                             |            |
|-----------------------------|------------|
| 1.0 m (3.28 ft)             | <b>N60</b> |
| 1.6 m (5.25 ft)             | <b>N61</b> |
| 2.0 m (6.56 ft)             | <b>N62</b> |
| 2.5 m (8.20 ft)             | <b>N63</b> |
| 3.0 m (9.84 ft)             | <b>N64</b> |
| 4.0 m (13.12 ft)            | <b>N65</b> |
| 5.0 m (16.40 ft)            | <b>N66</b> |
| 6.0 m (19.69 ft)            | <b>N67</b> |
| 7.0 m (22.97 ft)            | <b>N68</b> |
| 8.0 m (26.25 ft)            | <b>N69</b> |
| 9.0 m (29.53 ft)            | <b>N70</b> |
| 10.0 m (32.81 ft)           | <b>N71</b> |
| <u>only for 7MF4903-...</u> |            |
| 11.0 m (36.09 ft)           | <b>N72</b> |
| 12.0 m (39.37 ft)           | <b>N73</b> |
| 13.0 m (42.65 ft)           | <b>N74</b> |
| 14.0 m (45.93 ft)           | <b>N75</b> |
| 15.0 m (49.21 ft)           | <b>N76</b> |

##### Negative pressure service

for use in low-pressure range for transmitters for

- gauge and absolute pressure from the pressure series
- differential pressure

**V01**  
**V03**

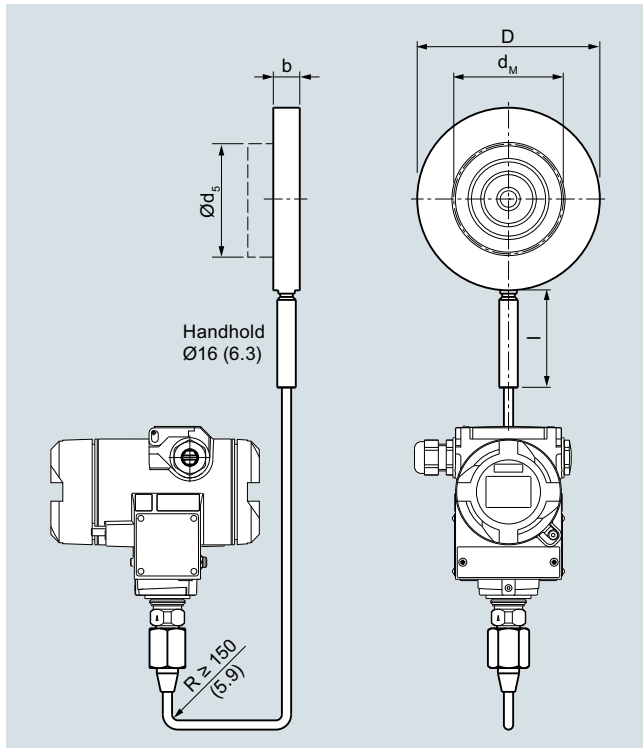
##### Extended negative pressure service

for use in low-pressure range for transmitters for

- gauge and absolute pressure from the pressure series
- differential pressure

**V51**  
**V53**

## Dimensional drawings



Diaphragm seals of sandwich design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)

## Connection to EN 1092-1

| Nom. diam. | Nom. press.      | b  | D   | d <sub>5</sub> | d <sub>M</sub>   | l   |
|------------|------------------|----|-----|----------------|------------------|-----|
|            |                  | mm | mm  | mm             | mm               | mm  |
| DN 50      | PN 16 ... PN 400 | 20 | 102 | 48.3           | 45 <sup>1)</sup> | 100 |
| DN 80      |                  | 20 | 138 | 76             | 72 <sup>2)</sup> | 100 |
| DN 100     |                  | 20 | 158 | 94             | 89               | 100 |
| DN 125     |                  | 22 | 188 | 125            | 124              | 100 |

## Connection to ASME B16.5

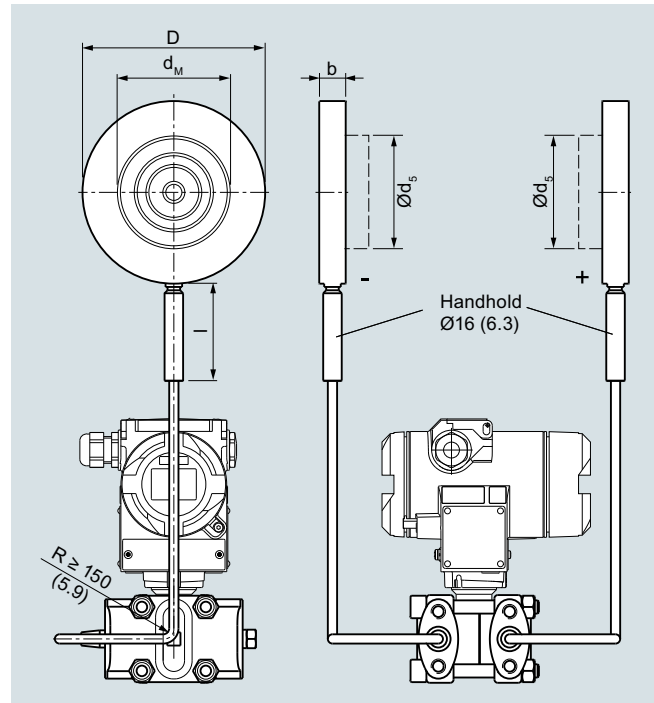
| Nom. diam. | Nom. press.  | b            | D             | d <sub>5</sub> | d <sub>M</sub>             | l             |
|------------|--------------|--------------|---------------|----------------|----------------------------|---------------|
|            | lb/sq.in.    | mm<br>(inch) | mm<br>(inch)  | mm<br>(inch)   | mm<br>(inch)               | mm<br>(inch)  |
| 2 inch     | 150 ... 2500 | 20<br>(0.79) | 100<br>(3.94) | 48.3<br>(1.9)  | 45 <sup>1)</sup><br>(1.77) | 100<br>(3.94) |
| 3 inch     |              | 20<br>(0.79) | 134<br>(5.28) | 72<br>(2.83)   | 72 <sup>2)</sup><br>(2.83) | 100<br>(3.94) |
| 4 inch     |              | 20<br>(0.79) | 158<br>(6.22) | 94<br>(3.69)   | 89<br>(2.32)               | 100<br>(3.94) |
| 5 inch     |              | 22<br>(0.87) | 186<br>(7.32) | 125<br>(4.92)  | 124<br>(4.88)              | 100<br>(3.94) |

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L = 0

<sup>2)</sup> 89 mm = 3½ inch with tube length L = 0



Diaphragm seals of sandwich design (without flange) with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or differential pressure and flow, dimensions in mm (inch)

## Connection to EN 1092-1

| Nom. diam. | Nom. press.      | b  | D   | d <sub>5</sub> | d <sub>M</sub>   | l   |
|------------|------------------|----|-----|----------------|------------------|-----|
|            |                  | mm | mm  | mm             | mm               | mm  |
| DN 50      | PN 16 ... PN 400 | 20 | 102 | 48.3           | 45 <sup>1)</sup> | 100 |
| DN 80      |                  | 20 | 138 | 76             | 72 <sup>2)</sup> | 100 |
| DN 100     |                  | 20 | 158 | 94             | 89               | 100 |
| DN 125     |                  | 22 | 188 | 125            | 124              | 100 |

## Connection to ASME B16.5

| Nom. diam. | Nom. press.  | b            | D             | d <sub>5</sub> | d <sub>M</sub>             | l             |
|------------|--------------|--------------|---------------|----------------|----------------------------|---------------|
|            | lb/sq.in.    | mm<br>(inch) | mm<br>(inch)  | mm<br>(inch)   | mm<br>(inch)               | mm<br>(inch)  |
| 2 inch     | 150 ... 2500 | 20<br>(0.79) | 100<br>(3.94) | 48.3<br>(1.9)  | 45 <sup>1)</sup><br>(1.77) | 100<br>(3.94) |
| 3 inch     |              | 20<br>(0.79) | 134<br>(5.28) | 72<br>(2.83)   | 72 <sup>2)</sup><br>(2.83) | 100<br>(3.94) |
| 4 inch     |              | 20<br>(0.79) | 158<br>(6.22) | 94<br>(3.69)   | 89<br>(2.32)               | 100<br>(3.94) |
| 5 inch     |              | 22<br>(0.87) | 186<br>(7.32) | 125<br>(4.92)  | 124<br>(4.88)              | 100<br>(3.94) |

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L = 0

<sup>2)</sup> 89 mm = 3½ inch with tube length L = 0

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

1

### Diaphragm seals of flange design with flexible capillary

#### Overview



Diaphragm seals of flange design

#### Technical specifications

##### Diaphragm seals of flange design with flexible capillary

|  |  |   |   |
|--|--|---|---|
| Nominal diameter   | Nominal pressure   | • Sheath  | Spiral protective tube made of stainless steel, mat. no. 1.4301/304   |
| • DN 50 (recommendable only for pressure transmitters for pressure)  | PN 10/16/25/40, PN 100                                     | Sealing material in the process flanges   |   |
| • DN 80  | PN 10/16/25/40, PN 100                                     | • For pressure transmitters, absolute pressure transmitters and low-pressure applications | Copper  |
| • DN 100   | PN 10/16, PN 25/40   | • For other applications  | Viton   |
| • DN 125   | PN 16, PN 40   | Maximum pressure  | See above and the technical data of the pressure transmitter  |
| • 2 inch (recommendable only for pressure transmitters for pressure) | Class 150, class 300, class 400/600, class 900/1500        | Tube length   | Without tube as standard (tube available on request)  |
| • 3 inch   | Class 150, class 300, class 600                            | Capillary   |   |
| • 4 inch   | Class 150, class 300, class 400                            | • Length  | Max. 10 m (32.8 ft), longer lengths on request  |
| • 5 inch   | Class 150, class 300, class 400                            | • Internal diameter   | 2 mm (0.079 inch)   |
| Sealing face   |  | • Minimum bending radius  | 150 mm (5.9 inch)   |
| • For stainless steel, mat. No. 1.4404/316L                          | To EN 1092-1, form B1 or ASMR B16.5 RF 125 ... 250 AA      | Filling liquid  | Silicone oil M5   |
| • For the other materials  | To EN 1092-1, form B2 or ASME B16.5 RFSF                   | (for remote seals of sandwich and flange design)  | Silicone oil M50  |
| Materials  |  | Permissible ambient temperature   | High-temperature oil  |
| • Main body  | Stainless steel mat. no. 1.4404/316L                       |   | Halocarbon oil (for measuring O <sub>2</sub> )  |
| • Wetted parts   | Stainless steel mat. no. 1.4404/316L                       |   | Food oil (FDA listed)   |
|  | • Without coating  |   | Dependent on the pressure transmitter and the filling liquid of the remote seal   |
|  | • PTFE coating   |   | More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals |
|  | • ECTFE coating (for vacuum on request)                    |   |   |
|  | • PFA coating  |   |   |
|  | Monel 400, mat. No. 2.4360                                 | Weight  | Approx. 4 kg (8.82 lb)  |
|  | Hastelloy C276, mat. No. 2.4819                            |   |   |
|  | Hastelloy C4, mat. No. 2.4602                              |   |   |
|  | Hastelloy C22, W.-Nr. 2.4602                               |   |   |
|  | Tantalum   |   |   |
|  | Titanium, W.-Nr. 3.7035                                    |   |   |
|  | Nickel 201   |   |   |
|  | Duplex 2205, mat. no. 1.4462                               |   |   |
|  | Stainless steel 316L, gold plated, thickness approx. 25 µm |   |   |
|  | Stainless steel, mat. No. 1.4571/316Ti                     |   |   |
| • Capillary  |  |   |   |
|  |  | <b>Certificate and approvals</b>  |   |
|  |  | Classification according to pressure equipment directive (DGRL 2014/68/EU)                | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)  |

## Diaphragm seals of flange design with flexible capillary

1

| Selection and Ordering data  |                | Article No. Ord. code   |       |
|--|----------------|---|-------|
| <b>Diaphragm seal</b>  |                | <b>Diaphragm seal</b>   |       |
| Flange design, with flexible capillary, connected to a pressure transmitter SITRANS P (order separately):  |                | Flange design, with flexible capillary, connected to a pressure transmitter SITRANS P (order separately):   |       |
| <b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; scope of delivery: 1 off |                | <b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; scope of delivery: 1 off  |       |
| <b>for absolute pressure (differential pressure series</b> 7MF433-...; scope of delivery: 1 off  |                | <b>for absolute pressure (differential pressure series</b> 7MF433-...; scope of delivery: 1 off   |       |
| <b>for differential pressure and flow</b> 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off   |                | <b>for differential pressure and flow</b> 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off  |       |
| ➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.  |                | <b>Wetted parts materials</b>   |       |
| <b>Nominal diameter and nominal pressure</b>   |                | <ul style="list-style-type: none"> <li>Stainless steel 316L <ul style="list-style-type: none"> <li>- without coating</li> <li>- with PTFE coating</li> <li>- with ECTFE coating<sup>2) 3)</sup></li> <li>- with PFA coating<sup>3)</sup></li> </ul> </li> <li>Monel 400, mat. No. 2.4360</li> <li>Hastelloy C276, mat. No. 2.4819</li> <li>Hastelloy C4, mat. No. 2.4602</li> <li>Hastelloy C22, mat. No. 2.4602</li> <li>Tantalum</li> <li>Titanium, mat. No. 3.7035 (max. 150 °C (302 °F))</li> <li>Nickel 201 (max. 260 °C (500 °F))</li> <li>Duplex 2205, mat. no. 1.4462</li> <li>Duplex 2205, mat. no. 1.4462, incl. main body</li> <li>Stainless steel 316L, gold plated, thickness approx. 25 µm</li> </ul> |       |
| • DN 25  | PN 10/16/25/40 | Z   | J 0 A |
|  | PN 63/100/160  | Z   | J 0 B |
| • DN 40  | PN 10/16/25/40 | Z   | J 0 C |
|  | PN 63/100      | Z   | J 0 D |
|  | PN 160         | Z   | J 0 E |
| • DN 50  | PN 10/16/25/40 | A   |       |
|  | PN 100         | B   |       |
| (DN 50 recommended only for pressure transmitters for pressure)  |                |   |       |
| • DN 80  | PN 10/16/25/40 | D   |       |
|  | PN 100         | E   |       |
| • DN 100   | PN 10/16       | G   |       |
| • DN 125   | PN 25/40       | H   |       |
|  | PN 10/16       | J   |       |
|  | PN 25/40       | K   |       |
| • 1 inch   | Class 150      | Z   | J 6 A |
|  | Class 300      | Z   | J 6 B |
|  | Class 400/600  | Z   | J 6 C |
|  | Class 900/1500 | Z   | J 6 D |
| • 1½ inch  | Class 150      | Z   | J 6 E |
|  | Class 300      | Z   | J 6 F |
|  | Class 400/600  | Z   | J 6 G |
|  | Class 900/1500 | Z   | J 6 H |
| • 2 inch   | Class 150      | L   |       |
|  | Class 300      | M   |       |
|  | Class 400/600  | N   |       |
|  | Class 900/1500 | P   |       |
| (2 inch recommended only for pressure transmitters for pressure)   |                |   |       |
| • 3 inch   | Class 150      | Q   |       |
|  | Class 300      | R   |       |
|  | Class 600      | S   |       |
| • 4 inch   | Class 150      | T   |       |
|  | Class 300      | U   |       |
|  | Class 400      | V   |       |
| • 5 inch   | Class 150      | W   |       |
|  | Class 300      | X   |       |
|  | Class 400      | Y   |       |
| • JIS DN 50  | 10 K 316L      | Z   | J 7 A |
|  | 20 K 316L      | Z   | J 7 B |
| • JIS DN 80  | 10 K 316L      | Z   | J 7 C |
|  | 20 K 316L      | Z   | J 7 D |
| Smooth sealing face to EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 AA   |                |   |       |
| Other version  |                | Z   | J 1 Y |
| Add Order code and plain text:<br>Nominal diameter: ...; Nominal pressure: ...<br>Sealing face: See "Technical data"   |                |   |       |



## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Diaphragm seals of flange design with flexible capillary

| Selection and Ordering data  | Article No.                 | Ord. code    |
|--|-----------------------------|--------------|
| <b>Diaphragm seal</b>  |                             |              |
| Flange design, with flexible capillary, connected to a pressure transmitter<br>SITRANS P (order separately):   |                             |              |
| <b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; scope of delivery: 1 off | <b>7MF4920-</b>             |              |
| <b>for absolute pressure (differential pressure series</b> 7MF433-...; scope of delivery: 1 off  | <b>7MF4921-</b>             |              |
| <b>for differential pressure and flow</b> 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off   | <b>7MF4923-</b>             |              |
|  | 1 ■ ■ ■ ■ ■ - ■ B ■ ■ ■ ■ ■ |              |
| <b>Tube length</b>   |                             |              |
| • without tube   | <b>0</b>                    |              |
| Other version:   | <b>Z 8</b>                  | <b>K 1 Y</b> |
| Add Order code and plain text:   |                             |              |
| Wetted parts materials: ...  |                             |              |
| Tube length: ...   |                             |              |
| <b>Customer-specific tubus length</b>  |                             |              |
| Specify customer-specific length with Y44, see Order Code  |                             |              |
| • Wetted parts materials: Stainless steel without foil   |                             |              |
| Range  | Standard length             |              |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")               | <b>A 1</b>   |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")              | <b>A 2</b>   |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")              | <b>A 3</b>   |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")              | <b>A 4</b>   |
| 201 ... 250 mm (7.91 ... 9.84")  | 250 mm (9.84")              | <b>A 5</b>   |
| • Wetted parts materials: Stainless steel coated with ECTFE  |                             |              |
| Range  | Standard length             |              |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")               | <b>F 1</b>   |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")              | <b>F 2</b>   |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")              | <b>F 3</b>   |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")              | <b>F 4</b>   |
| 201 ... 250 mm (7.91 ... 9.84")  | 250 mm (9.84")              | <b>F 5</b>   |
| • Wetted parts materials: Stainless steel coated with PFA  |                             |              |
| Range  | Standard length             |              |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")               | <b>D 1</b>   |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")              | <b>D 2</b>   |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")              | <b>D 3</b>   |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")              | <b>D 4</b>   |
| 201 ... 250 mm (7.91 ... 9.84")  | 250 mm (9.84")              | <b>D 5</b>   |
| • Wetted parts materials: Monel 400  |                             |              |
| Range  | Standard length             |              |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")               | <b>G 1</b>   |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")              | <b>G 2</b>   |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")              | <b>G 3</b>   |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")              | <b>G 4</b>   |
| • Wetted parts materials: Hastelloy C276   |                             |              |
| Range  | Standard length             |              |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")               | <b>J 1</b>   |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")              | <b>J 2</b>   |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")              | <b>J 3</b>   |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")              | <b>J 4</b>   |
| • Wetted parts materials: Tantalum   |                             |              |
| Range  | Standard length             |              |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")               | <b>K 1</b>   |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")              | <b>K 2</b>   |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")              | <b>K 3</b>   |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")              | <b>K 4</b>   |

| Selection and Ordering data  | Article No.                 | Ord. code    |
|--|-----------------------------|--------------|
| <b>Diaphragm seal</b>  |                             |              |
| Flange design, with flexible capillary, connected to a pressure transmitter<br>SITRANS P (order separately):   |                             |              |
| <b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; scope of delivery: 1 off | <b>7MF4920-</b>             |              |
| <b>for absolute pressure (differential pressure series</b> 7MF433-...; scope of delivery: 1 off  | <b>7MF4921-</b>             |              |
| <b>for differential pressure and flow</b> 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off   | <b>7MF4923-</b>             |              |
|  | 1 ■ ■ ■ ■ ■ - ■ B ■ ■ ■ ■ ■ |              |
| <b>Filling liquid</b>  |                             |              |
| • Silicone oil M5  | <b>1</b>                    |              |
| • Silicone oil M50   | <b>2</b>                    |              |
| • High-temperature oil   | <b>3</b>                    |              |
| • Halocarbon oil (for measuring O <sub>2</sub> ) <sup>4)</sup>   | <b>4</b>                    |              |
| • Food oil (FDA listed)  | <b>7</b>                    |              |
| Other version  | <b>9</b>                    | <b>M 1 Y</b> |
| Add Order code and plain text:   |                             |              |
| Filling liquid: ...  |                             |              |
| <b>Length of capillary<sup>5)</sup></b>  |                             |              |
| • 1.0 m (3.28 ft)  | <b>2</b>                    |              |
| • 1.6 m (5.25 ft)  | <b>3</b>                    |              |
| • 2.5 m (8.20 ft)  | <b>4</b>                    |              |
| • 4.0 m (13.1 ft)  | <b>5</b>                    |              |
| • 6.0 m (19.7 ft)  | <b>6</b>                    |              |
| • 8.0 m (26.25 ft)   | <b>7</b>                    |              |
| • 10.0 m (32.8 ft)   | <b>8</b>                    |              |
| <b>Special lengths for capillaries</b>   |                             |              |
| • 2.0 m (6.56 ft)  | <b>9</b>                    | <b>N 1 C</b> |
| • 3.0 m (9.84 ft)  | <b>9</b>                    | <b>N 1 E</b> |
| • 5.0 m (16.40 ft)   | <b>9</b>                    | <b>N 1 G</b> |
| • 7.0 m (23.97 ft)   | <b>9</b>                    | <b>N 1 J</b> |
| • 9.0 m (29.53 ft)   | <b>9</b>                    | <b>N 1 L</b> |
| <u>only for 7MF4923-...</u>  |                             |              |
| • 11.0 m (36.09 ft)  | <b>9</b>                    | <b>N 1 N</b> |
| • 12.0 m (39.37 ft)  | <b>9</b>                    | <b>N 1 P</b> |
| • 13.0 m (42.65 ft)  | <b>9</b>                    | <b>N 1 Q</b> |
| • 14.0 m (45.93 ft)  | <b>9</b>                    | <b>N 1 R</b> |
| • 15.0 m (49.21 ft)  | <b>9</b>                    | <b>N 1 S</b> |

- 1) With 7MF802-... and the measuring cells Q, S, T and U also order the negative pressure service.
- 2) For vacuum on request.
- 3) Only for use in non-hazardous atmospheres.
- 4) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.
- 5) Max. capillary length, see section "Technical description".



# Pressure Measurement

## Remote seals for transmitters and pressure gauges

### SITRANS P DS III

#### Diaphragm seals of flange design with flexible capillary

1

| Selection and Ordering data   | Order code               |
|---|--------------------------|
| <b>Further designs</b><br>Please add "-Z" to Article No. and specify Order code.  |                          |
| <b>Customer-specific tubus length</b><br>Select range,<br>enter desired length in plain text<br>(No entry = standard length)  | <b>Y44</b>               |
| <b>Spark arrestor</b><br>With spark arrestor for mounting on zone 0<br>(including documentation) for transmitters for   |                          |
| • pressure and absolute pressure  | <b>A01</b>               |
| • differential pressure   | <b>A02</b>               |
| <b>Remote seal nameplate</b><br>Attached out of stainless steel, contains MLFB<br>and order number of the remote seal   | <b>B20</b>               |
| <b>Oil- and grease-free cleaned version</b><br>Oil- and grease-free cleaned and packed ver-<br>sion, <u>not for oxygen application</u> , only in conjunc-<br>tion with halocarbon oil fill fluid, certified by<br>certificate acc. to EN 10204-2.2  | <b>C10</b>               |
| <b>Quality Inspection Certificate (5-point charac-<br/>teristic curve test) according to IEC 60770-2</b>  | <b>C11</b>               |
| <b>Inspection certificate</b><br>to EN 10204, section 3.1   | <b>C12</b>               |
| <b>2.2 Certificate of FDA approval of fill oil</b><br>Only in conjunction with "Food-grade oil" fill liq-<br>uid (FDA listed)"  | <b>C17</b>               |
| <b>Functional safety certificate ("SIL 2") to<br/>IEC 61508</b><br>(Only in conjunction with the Order code "C20"<br>in the case of SITRANS P DSIII transmitter)  | <b>C20</b>               |
| <b>Functional safety certificate ("SIL 2/3") to<br/>IEC 61508</b><br>(Only in conjunction with the Order code "C23"<br>in the case of SITRANS P DSIII transmitter)  | <b>C23</b>               |
| <b>Certification acc. to NACE MR-0175</b><br>Includes acceptance test certificate 3.1 accord-<br>ing to EN 10204 (only for wetted parts made of<br>stainless steel 1.4404/316L and Hastelloy C276)  | <b>D07</b>               |
| <b>Certification acc. to NACE MR-0103</b><br>Includes acceptance test certificate 3.1 accord-<br>ing to EN 10204 (only for wetted parts made of<br>stainless steel 1.4404/316L and Hastelloy C276)  | <b>D08</b>               |
| <b>Oil- and grease-free cleaned version</b><br>Oil- and grease-free cleaned and packed ver-<br>sion, <u>only for oxygen application</u> , only inert fill<br>fluid may be used. Max. temperature: 60 °C<br>(140 °F), max. pressure 50 bar (725 psi), only in<br>connection with halocarbon oil, certified by certi-<br>ficate acc. to EN 10204-2.2                        | <b>E10</b>               |
| <b>Epoxy painting</b><br>(not possible with negative pressure service<br>and not for 7MF4921-...)<br>Color: transparent, coverage: front and rear of<br>the remote seal, capillary(ies) or connecting<br>tube, process connection of the transmitter.<br>With transmitters 7MF40.. and 7MF42..., only<br>possible with process connection G½B accord-<br>ing to EN 837-1. | <b>E15</b>               |
| <b>One-sided mounting on differential pressure<br/>transmitters</b><br>(only for 7MF4920-...)<br>on high-pressure side<br>on low-pressure side  | <b>H10</b><br><b>H11</b> |

| Selection and Ordering data  | Order code   |
|--|--|
| <b>Further designs</b><br>Please add "-Z" to Article No. and specify Order code.   |  |
| <b>Sealing surface smooth, form B2 or RFSF<br/>(Stainless steel diaphragm)</b><br>previously DIN 2501, form E  | <b>J11</b>   |
| <b>Sealing surface groove, EN 1092-1, form D</b><br>instead of sealing surface B1 (only for wetted<br>parts made of stainless steel 316L)  | <b>J14</b>   |
| <b>Sealing surface with spring according to<br/>EN 1092-1, form C, (previously DIN 2512,<br/>form F) in stainless steel 316L</b><br>DN 25<br>DN 40<br>DN 50<br>DN 80<br>DN 100<br>DN 125   | <b>J30</b><br><b>J31</b><br><b>J32</b><br><b>J33</b><br><b>J34</b><br><b>J35</b> |
| <b>Sealing surface with male face according to<br/>EN 1092-1, form E (previously DIN 2512, form<br/>V13) in stainless steel 316L</b><br>DN 25<br>DN 40<br>DN 50<br>DN 80<br>DN 100<br>DN 125   | <b>J40</b><br><b>J41</b><br><b>J42</b><br><b>J43</b><br><b>J44</b><br><b>J45</b> |
| <b>Sealing surface with female face according to<br/>EN 1092-1, form F (previously DIN 2512, form<br/>R13) in stainless steel 316L</b><br>DN 25<br>DN 40<br>DN 50<br>DN 80<br>DN 100<br>DN 125   | <b>J50</b><br><b>J51</b><br><b>J52</b><br><b>J53</b><br><b>J54</b><br><b>J55</b> |
| <b>Sealing surface B1 or<br/>ASME B16.5 RF 125 ... 250 AA</b><br>instead of sealing surface B2 or RFSF<br>(only for wetted parts made of Hastelloy C276<br>(2.4819), tantalum and Duplex 2205 (1.4462)<br>and for nominal sizes 2", 3", DN 50 and DN 80) | <b>J12</b>   |
| <b>Sealing surface RJF (groove, previously RTJ)<br/>ASME B16.5</b><br>instead of sealing surface<br>ASME B16.5 RF 125 ... 250 AA (only for wetted<br>parts made of stainless steel 316L)   | <b>J24</b>   |

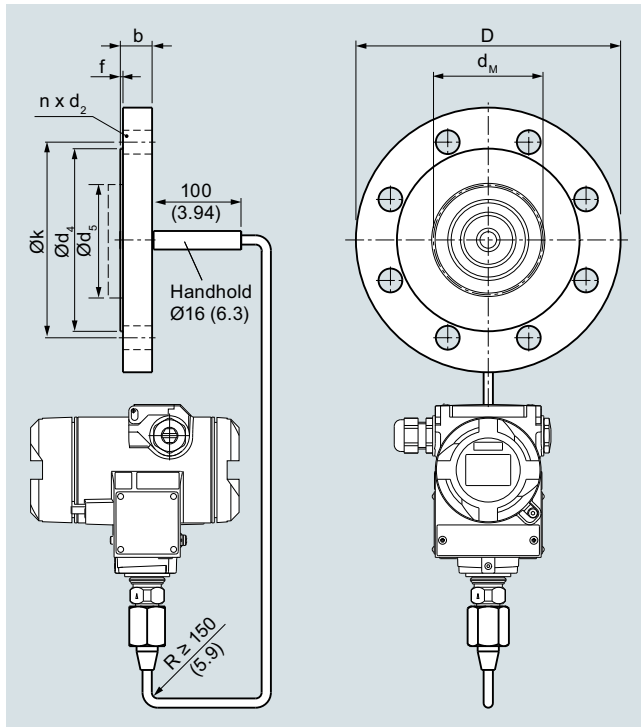
## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Diaphragm seals of flange design with flexible capillary

| Selection and Ordering data  | Order code   | Selection and Ordering data  | Order code   |
|--|--|--|--|
| <b>Further designs</b><br>Please add "-Z" to Article No. and specify Order code.                       |  | <b>PVC protective tube</b><br>over the spiral protective tube of the capillaries (color: black)  |  |
| <b>Radial capillary pipe outlet</b><br>for one-sided mounting<br>for two-sided mounting                | <b>K01</b><br><b>K03</b>   | 1.0 m (3.28 ft)<br>1.6 m (5.25 ft)<br>2.0 m (6.56 ft)<br>2.5 m (8.20 ft)<br>3.0 m (9.84 ft)<br>4.0 m (13.12 ft)<br>5.0 m (16.40 ft)<br>6.0 m (19.69 ft)<br>7.0 m (22.97 ft)<br>8.0 m (26.25 ft)<br>9.0 m (29.53 ft)<br>10.0 m (32.81 ft) | <b>N60</b><br><b>N61</b><br><b>N62</b><br><b>N63</b><br><b>N64</b><br><b>N65</b><br><b>N66</b><br><b>N67</b><br><b>N68</b><br><b>N69</b><br><b>N70</b><br><b>N71</b> |
| <b>PE protective tube</b><br>over the spiral protective tube of the capillaries (color: white)         | <b>N20</b><br><b>N21</b><br><b>N22</b><br><b>N23</b><br><b>N24</b><br><b>N25</b><br><b>N26</b><br><b>N27</b><br><b>N28</b><br><b>N29</b><br><b>N30</b><br><b>N31</b>   | 11.0 m (36.09 ft)<br>12.0 m (39.37 ft)<br>13.0 m (42.65 ft)<br>14.0 m (45.93 ft)<br>15.0 m (49.21 ft)  | <b>N72</b><br><b>N73</b><br><b>N74</b><br><b>N75</b><br><b>N76</b>   |
| only for 7MF4923-...   |  | <b>Negative pressure service</b><br>for use in low-pressure range for transmitters for <ul style="list-style-type: none"> <li>gauge and absolute pressure from the pressure series</li> <li>differential pressure</li> </ul>             | <b>V01</b><br><b>V03</b>   |
| <b>PTFE protective tube</b><br>over the spiral protective tube of the capillaries (color: transparent) | <b>N32</b><br><b>N33</b><br><b>N34</b><br><b>N35</b><br><b>N36</b><br><b>N40</b><br><b>N41</b><br><b>N42</b><br><b>N43</b><br><b>N44</b><br><b>N45</b><br><b>N46</b><br><b>N47</b><br><b>N48</b><br><b>N49</b><br><b>N50</b><br><b>N51</b> | <b>Extended negative pressure service</b><br>for use in low-pressure range for transmitters for <ul style="list-style-type: none"> <li>gauge and absolute pressure from the pressure series</li> <li>differential pressure</li> </ul>    | <b>V51</b><br><b>V53</b>   |
| only for 7MF4923-...   |  |  |  |
| 11.0 m (36.09 ft)<br>12.0 m (39.37 ft)<br>13.0 m (42.65 ft)<br>14.0 m (45.93 ft)<br>15.0 m (49.21 ft)  | <b>N52</b><br><b>N53</b><br><b>N54</b><br><b>N55</b><br><b>N56</b>   |  |  |

## Dimensional drawings



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)

## Connection to EN 1092-1

| Nom. diam. | Nom. press. | b mm | D mm | d <sub>2</sub> mm | d <sub>4</sub> mm | d <sub>5</sub> mm | d <sub>M</sub> mm | f mm | k mm | n |
|------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|------|------|---|
| DN 50      | PN 10/1     | 20   | 165  | 18                | 102               | 48.3              | 45 <sup>1)</sup>  | 2    | 125  | 4 |
|            | PN 100      | 28   | 195  | 26                | 102               | 48.3              | 45 <sup>1)</sup>  | 2    | 145  | 4 |
| DN 80      | PN 10/1     | 24   | 200  | 18                | 138               | 76                | 72 <sup>2)</sup>  | 2    | 160  | 8 |
|            | PN 100      | 32   | 230  | 26                | 138               | 76                | 72 <sup>2)</sup>  | 2    | 180  | 8 |
| DN 100     | PN 10/1     | 20   | 220  | 18                | 158               | 94                | 89                | 2    | 180  | 8 |
|            | PN 25/4     | 24   | 235  | 22                | 162               | 94                | 89                | 2    | 190  | 8 |
| DN 125     | PN 16       | 22   | 250  | 18                | 188               | 125               | 124               | 2    | 210  | 8 |
|            | PN 40       | 26   | 270  | 26                | 188               | 125               | 124               | 2    | 220  | 8 |

## Connection to ASME B16.5

| Nom. diam. | Nom. press. | b mm        | D mm        | d <sub>2</sub> mm | d <sub>4</sub> mm | d <sub>5</sub> mm | d <sub>M</sub> mm       | f mm      | k mm         | n |
|------------|-------------|-------------|-------------|-------------------|-------------------|-------------------|-------------------------|-----------|--------------|---|
|            | lb/sq.in.   | mm (inch)   | mm (inch)   | mm (inch)         | mm (inch)         | mm (inch)         | mm (inch)               | mm (inch) | mm (inch)    |   |
| 2 inch     | 150         | 19.5 (0.77) | 150 (5.80)  | 20 (0.79)         | 92 (3.62)         | 48.3 (1.9)        | 45 <sup>1)</sup> (1.77) | 2 (0.08)  | 120.5 (4.74) | 4 |
|            | 300         | 22.7 (0.89) | 165 (6.50)  | 20 (0.79)         | 92 (3.62)         | 48.3 (1.9)        | 45 <sup>1)</sup> (1.77) | 2 (0.08)  | 127 (5)      | 8 |
|            | 400/600     | 32.4 (1.28) | 165 (6.50)  | 20 (0.79)         | 92 (3.62)         | 48.3 (1.9)        | 45 <sup>1)</sup> (1.77) | 2 (0.08)  | 127 (5)      | 8 |
|            | 900/1500    | 45.1 (1.78) | 215 (8.46)  | 26 (1.02)         | 92 (3.62)         | 48.3 (1.9)        | 45 <sup>1)</sup> (1.77) | 7 (0.28)  | 165 (6.5)    | 8 |
| 3 inch     | 150         | 24.3 (0.96) | 190 (7.48)  | 20 (0.79)         | 127 (5)           | 76 (3)            | 72 <sup>2)</sup> (2.83) | 2 (0.08)  | 152.5 (6)    | 4 |
|            | 300         | 29 (1.14)   | 210 (8.27)  | 22 (0.87)         | 127 (5)           | 76 (3)            | 72 <sup>2)</sup> (2.83) | 2 (0.08)  | 168.5 (6.63) | 8 |
|            | 600         | 38.8 (1.53) | 210 (8.27)  | 22 (0.87)         | 127 (5)           | 76 (3)            | 72 <sup>2)</sup> (2.83) | 7 (0.28)  | 168.5 (6.63) | 8 |
| 4 inch     | 150         | 24.3 (0.96) | 230 (9.06)  | 20 (0.79)         | 158 (6.22)        | 94 (3.69)         | 89 (3.50)               | 2 (0.08)  | 190.5 (7.5)  | 8 |
|            | 300         | 32.2 (1.27) | 255 (10.04) | 22 (0.87)         | 158 (6.22)        | 94 (3.69)         | 89 (3.50)               | 2 (0.08)  | 200 (7.87)   | 8 |
|            | 400         | 42 (1.65)   | 255 (10.04) | 26 (1.02)         | 158 (6.22)        | 94 (3.69)         | 89 (3.50)               | 7 (0.28)  | 200 (7.87)   | 8 |
| 5 inch     | 150         | 24.3 (0.96) | 255 (10.04) | 22 (0.87)         | 186 (7.32)        | 125 (4.92)        | 124 (4.88)              | 2 (0.08)  | 216 (8.50)   | 8 |
|            | 300         | 35.8 (1.41) | 280 (11.02) | 22 (0.87)         | 186 (7.32)        | 125 (4.92)        | 124 (4.88)              | 2 (0.08)  | 235 (9.25)   | 8 |
|            | 400         | 45.1 (1.79) | 280 (11.02) | 26 (1.02)         | 186 (7.32)        | 125 (4.92)        | 124 (4.88)              | 7 (0.28)  | 235 (9.25)   | 8 |

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L = 0

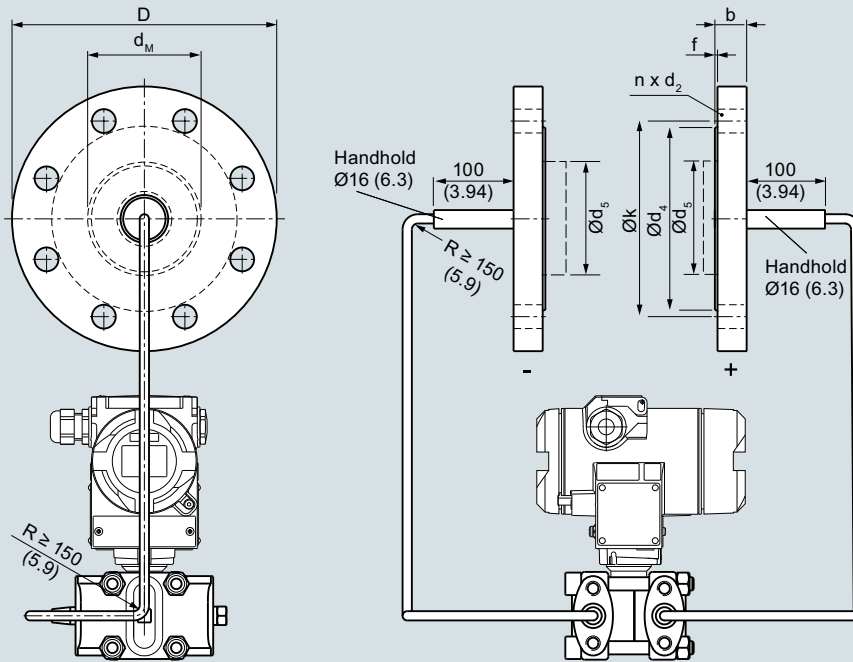
<sup>2)</sup> 89 mm = 3½ inch with tube length L = 0

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

1

### Diaphragm seals of flange design with flexible capillary



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or for differential pressure and flow, dimensions in mm (inch)

#### Connection to EN 1092-1

| Nom. diam. | Nom. press. | b mm | D mm | d <sub>2</sub> mm | d <sub>4</sub> mm | d <sub>5</sub> mm | d <sub>M</sub> mm | f mm | k mm | n |
|------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|------|------|---|
| DN 80      | PN 10/16    | 24   | 200  | 18                | 138               | 76                | 72 <sup>1)</sup>  | 2    | 160  | 8 |
|            | PN 100      | 32   | 230  | 26                | 138               | 76                | 72 <sup>1)</sup>  | 2    | 180  | 8 |
| DN 100     | PN 10/16    | 20   | 220  | 18                | 158               | 94                | 89                | 2    | 180  | 8 |
|            | PN 25/40    | 24   | 235  | 22                | 162               | 94                | 89                | 2    | 190  | 8 |
| DN 125     | PN 16       | 22   | 250  | 18                | 188               | 125               | 124               | 2    | 210  | 8 |
|            | PN 40       | 26   | 270  | 26                | 188               | 125               | 124               | 2    | 220  | 8 |

#### Connection to ASME B16.5

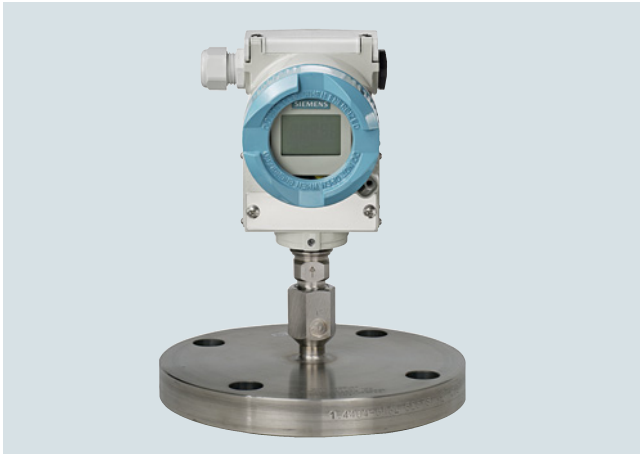
| Nom. diam. | Nom. press. | b mm        | D mm        | d <sub>2</sub> mm | d <sub>4</sub> mm | d <sub>5</sub> mm | d <sub>M</sub> mm       | f mm      | k mm         | n |
|------------|-------------|-------------|-------------|-------------------|-------------------|-------------------|-------------------------|-----------|--------------|---|
| lb/sq.in.  |             | mm (inch)   | mm (inch)   | mm (inch)         | mm (inch)         | mm (inch)         | mm (inch)               | mm (inch) | mm (inch)    |   |
| 3 inch     | 150         | 24.3 (0.96) | 190 (7.48)  | 20 (0.79)         | 127 (5)           | 76 (3)            | 72 <sup>1)</sup> (2.83) | 2 (0.08)  | 152.5 (6)    | 4 |
|            | 300         | 29 (1.14)   | 210 (8.27)  | 22 (0.87)         | 127 (5)           | 76 (3)            | 72 <sup>1)</sup> (2.83) | 2 (0.08)  | 168.5 (6.63) | 8 |
|            | 600         | 38.8 (1.52) | 210 (8.27)  | 22 (0.87)         | 127 (5)           | 76 (3)            | 72 <sup>1)</sup> (2.83) | 7 (0.28)  | 168.5 (6.63) | 8 |
| 4 inch     | 150         | 24.3 (0.96) | 230 (9.06)  | 20 (0.79)         | 158 (6.22)        | 94 (3.69)         | 89 (3.50)               | 2 (0.08)  | 190.5 (7.5)  | 8 |
|            | 300         | 32.2 (1.27) | 255 (10.04) | 22 (0.87)         | 158 (6.22)        | 94 (3.69)         | 89 (3.50)               | 2 (0.08)  | 200 (7.87)   | 8 |
|            | 400         | 42 (1.65)   | 255 (10.04) | 26 (1.02)         | 158 (6.22)        | 94 (3.69)         | 89 (3.50)               | 7 (0.28)  | 200 (7.87)   | 8 |
| 5 inch     | 150         | 24.3 (0.96) | 255 (10.04) | 22 (0.87)         | 186 (7.32)        | 125 (4.92)        | 124 (4.88)              | 2 (0.08)  | 216 (8.50)   | 8 |
|            | 300         | 35.8 (1.41) | 280 (11.02) | 22 (0.87)         | 186 (7.32)        | 125 (4.92)        | 124 (4.88)              | 2 (0.08)  | 235 (9.25)   | 8 |
|            | 400         | 45.1 (1.79) | 280 (11.02) | 26 (1.02)         | 186 (7.32)        | 125 (4.92)        | 124 (4.88)              | 7 (0.28)  | 235 (9.25)   | 8 |

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 89 mm = 3½ inch with tube length L = 0

## Overview



Diaphragm seals of flange design, directly fitted on a pressure transmitter for pressure

## Technical specifications

**Diaphragm seals (flange design) for pressure and absolute pressure, directly fitted on a transmitter**

|  |   |
|--|---|
| Nominal diameter                                 | Nominal pressure  |
| • DN 50  | PN 10/16/25/40, PN 100  |
| • DN 80  | PN 10/16/25/40, PN 100  |
| • DN 100   | PN 10/16, PN 25/40  |
| • 2 inch   | Class 150, class 300, class 400/600, class 900/1500   |
| • 3 inch   | Class 150, class 300, class 600   |
| • 4 inch   | Class 150, class 300, class 400   |
| Sealing face                                     |   |
| • For stainless steel, mat. No. 1.4404/316L      | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA   |
| • For the other materials                        | Smooth to EN 1092-1, form B2 or ASME B16.5 RFSF   |
| Materials  |   |
| • Main body                                      | Stainless steel mat. no. 1.4404/316L  |
| • Wetted parts                                   | Stainless steel mat. no. 1.4404/316L  |
|  | <ul style="list-style-type: none"> <li>• Without coating</li> <li>• PTFE coating</li> <li>• ECTFE coating (for vacuum on request)</li> <li>• PFA coating</li> </ul> |
|  | Monel 400, mat. No. 2.4360  |
|  | Hastelloy C276, mat. No. 2.4819   |
|  | Hastelloy C4, mat. No. 2.4602   |
|  | Hastelloy C22, mat. No. 2.4602  |
|  | Tantalum  |
|  | Titanium, mat. No. 3.7035   |
|  | Nickel 201  |
|  | Duplex 2205, mat. no. 1.4462  |
|  | Stainless steel 316L, gold plated, thickness approx. 25 µm  |
|  | Stainless steel, 1.4571/316Ti   |
| • Capillary                                      |   |
| • Sealing material at the transmitter connection | Copper  |

|  |  |
|--|--|
| Maximum pressure   | See above and the technical data of the transmitter  |
| Tube length  | <ul style="list-style-type: none"> <li>• Without tube</li> <li>• 50 mm (1.97 inch)</li> <li>• 100 mm (3.94 inch)</li> <li>• 150 mm (5.91 inch)</li> <li>• 200 mm (7.87 inch)</li> </ul>  |
| Capillary  |  |
| • Length   | Max. 10 m (32.8 ft), longer lengths on request   |
| • Internal diameter  | 2 mm (0.079 inch)  |
| • Minimum bending radius   | 150 mm (5.9 inch)  |
| Filling liquid   | <ul style="list-style-type: none"> <li>• Silicone oil M5</li> <li>• Silicone oil M50</li> <li>• High-temperature oil</li> <li>• Halocarbon oil (for measuring O<sub>2</sub>)</li> <li>• Food oil (FDA listed)</li> </ul>   |
| Max. recommended process temperature                                       | 170 °C (338 °F)  |
| Permissible ambient temperature  | Dependent on the pressure transmitter and the filling liquid of the remote seal.<br><br>More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals. |
| Weight   | Approx. 4 kg (8.82 lb)   |
| <b>Certificate and approvals</b>   |  |
| Classification according to pressure equipment directive (DGRL 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)   |

# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

## Diaphragm seals of flange design directly fitted on transmitter

1

| Selection and Ordering data  |                | Article No. Ord. code |       |
|--|----------------|-----------------------|-------|
| <b>Diaphragm seal</b>  |                | <b>7MF4910 -</b>      |       |
| Directly fitted to a pressure transmitter SITRANS P for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; must be ordered separately |                |                       |       |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.  |                |                       |       |
| <b>Process connection</b>  |                |                       |       |
| • Vertical (pressure transmitter upright)  |                | 0                     |       |
| • Horizontal   |                | 2                     |       |
| <b>Nominal diameter and nominal pressure</b>   |                |                       |       |
| DN 25  | PN 10/16/25/40 | Z                     | J 0 A |
|  | PN 63/100/160  | Z                     | J 0 B |
| DN 40  | PN 10/16/25/40 | Z                     | J 0 C |
|  | PN 63/100      | Z                     | J 0 D |
|  | PN 160         | Z                     | J 0 E |
| • DN 50  | PN 10/16/25/40 | A                     |       |
|  | PN 100         | B                     |       |
| • DN 80  | PN 10/16/25/40 | D                     |       |
|  | PN 100         | E                     |       |
| • DN 100   | PN 10/16       | G                     |       |
|  | PN 25/40       | H                     |       |
| 1 inch   | class 150      | Z                     | J 6 A |
|  | class 300      | Z                     | J 6 B |
|  | class 400/600  | Z                     | J 6 C |
|  | class 900/1500 | Z                     | J 6 D |
| 1½ inch  | class 150      | Z                     | J 6 E |
|  | class 300      | Z                     | J 6 F |
|  | class 400/600  | Z                     | J 6 G |
|  | class 900/1500 | Z                     | J 6 H |
| • 2 inch   | Class 150      | L                     |       |
|  | Class 300      | M                     |       |
|  | Class 400/600  | N                     |       |
|  | Class 900/1500 | P                     |       |
| • 3 inch   | Class 150      | Q                     |       |
|  | Class 300      | R                     |       |
|  | Class 600      | S                     |       |
| • 4 inch   | Class 150      | T                     |       |
|  | Class 300      | U                     |       |
|  | Class 400      | V                     |       |
| JIS DN 50  | 10 K 316L      | Z                     | J 7 A |
|  | 20 K 316L      | Z                     | J 7 B |
| JIS DN 80  | 10 K 316L      | Z                     | J 7 C |
|  | 20 K 316L      | Z                     | J 7 D |
| Smooth sealing face to DIN 1092-01, form B1 or B2, or to ASME B16.5 125 ... 250 AA or RFSF   |                |                       |       |
| Other version  |                | Z                     |       |
| Add Order code and plain text:   |                | J 1 Y                 |       |
| Nominal diameter: ...; Nominal pressure: ...   |                |                       |       |

| Selection and Ordering data  |  | Article No. Ord. code |  |
|--|--|-----------------------|--|
| <b>Diaphragm seal</b>  |  | <b>7MF4910 -</b>      |  |
| Directly fitted to a pressure transmitter SITRANS P for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; must be ordered separately |  |                       |  |
| <b>Wetted parts materials</b>  |  |                       |  |
| • Stainless steel 316L   |  | A                     |  |
| - without coating  |  | E 0                   |  |
| - with PTFE coating  |  | F                     |  |
| - with ECTFE coating <sup>2) 3)</sup>  |  | D                     |  |
| - with PFA coating <sup>3)</sup>   |  | G                     |  |
| • Monel 400, mat. No. 2.4360   |  | J                     |  |
| • Hastelloy C276, mat. No. 2.4819  |  | U                     |  |
| • Hastelloy C4, mat. No. 2.4602  |  | V 0                   |  |
| • Hastelloy C22, mat. No. 2.4602   |  | K                     |  |
| • Tantalum   |  | L 0                   |  |
| • Titanium, mat. No. (max. 150 °C (302 °F))  |  | M 0                   |  |
| • Nickel 201 (max. 260 °C (500 °F))  |  | Q                     |  |
| • Duplex 2205, W.-Nr. 1.4462   |  | S 0                   |  |
| • Stainless steel 316L, gold plated, thickness approx. 25 µm   |  |                       |  |
| <b>Tube length</b>   |  |                       |  |
| • Without tube   |  | 0                     |  |
| Other version:   |  | Z 8                   |  |
| Add Order code and plain text:   |  | K 1 Y                 |  |
| Wetted parts materials: ...,   |  |                       |  |
| Tube length: ...   |  |                       |  |

| Selection and Ordering data  |                 | Article No. Ord. code | Selection and Ordering data  | Order code  |
|--|-----------------|-----------------------|--|-------------|
| <b>Diaphragm seal</b>  |                 | <b>7MF4910 -</b>      | <b>Further designs</b>   |             |
| Directly fitted to a pressure transmitter SITRANS P for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; must be ordered separately |                 |                       | Please add "-Z" to Article No. and specify Order code.   |             |
| <b>Customer-specific tubus length</b>  |                 |                       | <b>Customer-specific tubus length</b>  | <b>Y44</b>  |
| Specify customer-specific length with Y44, see Order Code  |                 |                       | Select range, enter desired length in plain text (No entry = standard length)  |             |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Stainless steel without foil</li> </ul>   |                 |                       | <b>Spark arrestor</b>  | <b>A01</b>  |
| Range  | Standard length |                       | With spark arrestor for mounting on zone 0 (including documentation) for transmitters for gauge pressure and absolute pressure   |             |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | <b>A 1</b>            | <b>Remote seal nameplate</b>   | <b>B20</b>  |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | <b>A 2</b>            | Attached out of stainless steel, contains MLFB and order number of the remote seal   |             |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | <b>A 3</b>            | <b>Oil- and grease-free cleaned version</b>  | <b>C10</b>  |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | <b>A 4</b>            | Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2   |             |
| 201 ... 250 mm (7.91 ... 9.84")  | 250 mm (9.84")  | <b>A 5</b>            | <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>   | <b>C11</b>  |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Stainless steel coated with ECTFE</li> </ul>  |                 |                       | <b>Inspection certificate</b>  | <b>C12</b>  |
| Range  | Standard length |                       | to EN 10204, section 3.1   |             |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | <b>F 1</b>            | <b>2.2 Certificate of FDA approval of fill oil</b>   | <b>C17</b>  |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | <b>F 2</b>            | Only in conjunction with "Food-grade oil" fill liquid (FDA listed)   |             |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | <b>F 3</b>            | <b>Functional safety certificate ("SIL 2") to IEC 61508</b>  | <b>C20</b>  |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | <b>F 4</b>            | (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)   |             |
| 201 ... 250 mm (7.91 ... 9.84")  | 250 mm (9.84")  | <b>F 5</b>            | <b>Functional safety certificate ("SIL 2/3") to IEC 61508</b>  | <b>C23</b>  |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Stainless steel coated with PFA</li> </ul>  |                 |                       | (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)   |             |
| Range  | Standard length |                       | <b>Certification acc. to NACE MR-0175</b>  | <b>D07</b>  |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | <b>D 1</b>            | Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)  |             |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | <b>D 2</b>            | <b>Certification acc. to NACE MR-0103</b>  | <b>D08</b>  |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | <b>D 3</b>            | Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)  |             |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | <b>D 4</b>            | <b>Oil- and grease-free cleaned version</b>  | <b>E10</b>  |
| 201 ... 250 mm (7.91 ... 9.84")  | 250 mm (9.84")  | <b>D 5</b>            | Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 |             |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Monel 400</li> </ul>  |                 |                       | <b>Epoxy painting</b>  | <b>E15</b>  |
| Range  | Standard length |                       | Not possible with negative pressure service  |             |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | <b>G 1</b>            | Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40... and 7MF42..., only possible with process connection G½B according to EN 837-1.                     |             |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | <b>G 2</b>            |  |             |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | <b>G 3</b>            |  |             |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | <b>G 4</b>            |  |             |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Hastelloy C276</li> </ul>   |                 |                       |  |             |
| Range  | Standard length |                       |  |             |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | <b>J 1</b>            |  |             |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | <b>J 2</b>            |  |             |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | <b>J 3</b>            |  |             |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | <b>J 4</b>            |  |             |
| <ul style="list-style-type: none"> <li>Wetted parts materials: Tantalum</li> </ul>   |                 |                       |  |             |
| Range  | Standard length |                       |  |             |
| 20 ... 50 mm (0.79 ... 1.97")  | 50 mm (1.97")   | <b>K 1</b>            |  |             |
| 51 ... 100 mm (2.01 ... 3.94")   | 100 mm (3.94")  | <b>K 2</b>            |  |             |
| 101 ... 150 mm (3.98 ... 5.91")  | 150 mm (5.91")  | <b>K 3</b>            |  |             |
| 151 ... 200 mm (5.94 ... 7.87")  | 200 mm (7.87")  | <b>K 4</b>            |  |             |
| <b>Filling liquid</b>  |                 |                       |  |             |
| <ul style="list-style-type: none"> <li>Silicone oil M5</li> </ul>  |                 | <b>1</b>              |  |             |
| <ul style="list-style-type: none"> <li>Silicone oil M50</li> </ul>   |                 | <b>2</b>              |  |             |
| <ul style="list-style-type: none"> <li>High-temperature oil</li> </ul>   |                 | <b>3</b>              |  |             |
| <ul style="list-style-type: none"> <li>Halocarbon oil (for measuring O<sub>2</sub>)<sup>4)</sup></li> </ul>  |                 | <b>4</b>              |  |             |
| <ul style="list-style-type: none"> <li>Food oil (FDA listed)</li> </ul>  |                 | <b>7</b>              |  |             |
| Other version  |                 | <b>9</b>              |  |             |
| Add Order code and plain text:   |                 |                       |  | <b>M1 Y</b> |
| Filling liquid: ...  |                 |                       |  |             |

<sup>1)</sup> With 7MF802-... and the measuring cells Q, S, T and U also order negative pressure service.

<sup>2)</sup> For vacuum on request.

<sup>3)</sup> Only for use in non-hazardous atmospheres.

<sup>4)</sup> Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.



## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

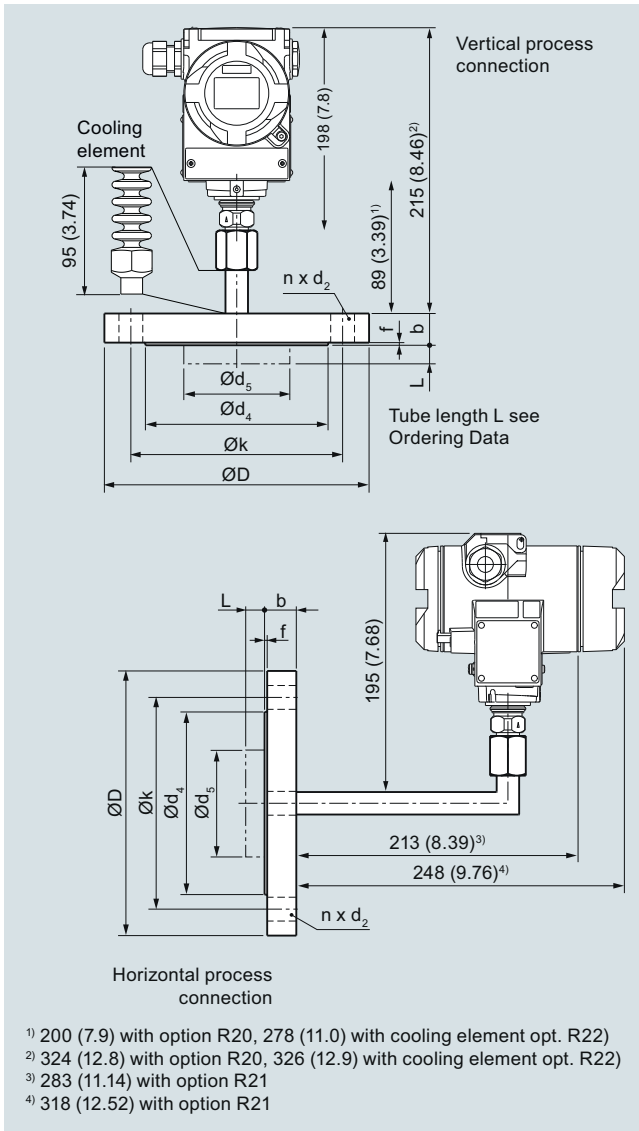
1

### Diaphragm seals of flange design directly fitted on transmitter

| Selection and Ordering data   | Order code   | Selection and Ordering data  | Order code |
|---|--|--|------------|
| <b>Further designs</b>  |  | <b>Further designs</b>   |            |
| Please add <b>"-Z"</b> to Article No. and specify Order code.   |  | Please add <b>"-Z"</b> to Article No. and specify Order code.  |            |
| <b>Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm)</b><br>previously DIN 2501, form E   | <b>J11</b>   | <b>Elongated pipe</b><br>200 mm instead of 89 mm,<br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.        | <b>R20</b> |
| <b>Sealing surface groove, EN 1092-1, form D</b><br>instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)  | <b>J14</b>   | <b>Elongated pipe elbow</b><br>200 mm instead of 130 mm,<br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid. | <b>R21</b> |
| <b>Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L</b><br>DN 25<br>DN 40<br>DN 50<br>DN 80<br>DN 100<br>DN 125  | <b>J30</b><br><b>J31</b><br><b>J32</b><br><b>J33</b><br><b>J34</b><br><b>J35</b> | <b>Cooling element</b><br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.                                   | <b>R22</b> |
| <b>Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L</b><br>DN 25<br>DN 40<br>DN 50<br>DN 80<br>DN 100<br>DN 125  | <b>J40</b><br><b>J41</b><br><b>J42</b><br><b>J43</b><br><b>J44</b><br><b>J45</b> | <b>Negative pressure service</b><br>for use in low-pressure range for transmitters for<br>• gauge and absolute pressure from the pressure series                     | <b>V01</b> |
| <b>Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L</b><br>DN 25<br>DN 40<br>DN 50<br>DN 80<br>DN 100<br>DN 125  | <b>J50</b><br><b>J51</b><br><b>J52</b><br><b>J53</b><br><b>J54</b><br><b>J55</b> | <b>Extended negative pressure service</b><br>for use in low-pressure range for transmitters for<br>• gauge and absolute pressure from the pressure series            | <b>V51</b> |
| <b>Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA</b><br>Instead of sealing surface B2 and RFSF (Only for wetted parts in Hastelloy C276 (2.4819), Tantal and Duplex 2205 (1.4462) and for sizes 2", 3", DN 50 and DN 80) | <b>J12</b>   |  |            |
| <b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b><br>instead of sealing surface<br>ASME B16.5 RF 125 ... 250 AA<br>(only for wetted parts made of stainless steel 316L)  | <b>J24</b>   |  |            |



## Dimensional drawings



Diaphragm seals of flange design, direct connection to a SITRANS P pressure transmitter (process connection vertical (top) and horizontal (bottom)), dimensions in mm (inch)

## Connection to EN 1092-1

| Nom. diam. | Nom. press.    | b  | D   | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub>   | f  | k   | n |
|------------|----------------|----|-----|----------------|----------------|----------------|------------------|----|-----|---|
|            |                | mm | mm  | mm             | mm             | mm             | mm               | mm | mm  |   |
| DN 50      | PN 10/16/25/40 | 20 | 165 | 18             | 102            | 48.3           | 45 <sup>1)</sup> | 2  | 125 | 4 |
|            | PN 100         | 28 | 195 | 26             | 102            | 48.3           | 45 <sup>1)</sup> | 2  | 145 | 4 |
| DN 80      | PN 10/16/25/40 | 24 | 200 | 18             | 138            | 76             | 72 <sup>1)</sup> | 2  | 160 | 8 |
|            | PN 100         | 32 | 230 | 26             | 138            | 76             | 72 <sup>1)</sup> | 2  | 180 | 8 |
| DN 100     | PN 10/16       | 20 | 220 | 18             | 158            | 94             | 89-2             | 2  | 180 | 8 |
|            | PN 25/40       | 24 | 235 | 22             | 162            | 94             | 89               | 2  | 190 | 8 |

## Connection to ASME B16.5

| Nom. diam. | Nom. press. | b         | D       | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub>       | f      | k      | n |
|------------|-------------|-----------|---------|----------------|----------------|----------------|----------------------|--------|--------|---|
|            |             | mm        | mm      | mm             | mm             | mm             | mm                   | mm     | mm     |   |
|            |             | lb/sq.in. | (inch)  | (inch)         | (inch)         | (inch)         | (inch)               | (inch) | (inch) |   |
| 2 inch     | 150         | 19.5      | 150     | 20             | 92             | 48.3           | 45 <sup>1)</sup>     | 2      | 120.5  | 4 |
|            |             | (0.77)    | (5.91)  | (0.79)         | (3.62)         | (1.9)          | (1.77) <sup>1)</sup> | (0.08) | (4.74) |   |
|            | 300         | 22.7      | 165     | 20             | 92             | 48.3           | 45 <sup>1)</sup>     | 2      | 127    | 8 |
|            |             | (0.89)    | (6.5)   | (0.79)         | (3.62)         | (1.9)          | (1.77) <sup>1)</sup> | (0.08) | (5)    |   |
|            | 400/600     | 32.4      | 165     | 20             | 92             | 48.3           | 45 <sup>1)</sup>     | 7      | 127    | 8 |
|            |             | (1.28)    | (6.5)   | (0.79)         | (3.62)         | (1.9)          | (1.77) <sup>1)</sup> | (0.28) | (5)    |   |
|            | 900/1500    | 45.1      | 215     | 26             | 92             | 48.3           | 45 <sup>1)</sup>     | 7      | 165    | 8 |
|            |             | (1.78)    | (8.46)  | (1.02)         | (3.62)         | (1.9)          | (1.77) <sup>1)</sup> | (0.28) | (6.5)  |   |
| 3 inch     | 150         | 24.3      | 190     | 20             | 127            | 76             | 72 <sup>2)</sup>     | 2      | 152.5  | 4 |
|            |             | (0.96)    | (7.48)  | (0.79)         | (5)            | (3)            | (2.83) <sup>2)</sup> | (0.08) | (6)    |   |
|            | 300         | 29        | 210     | 22             | 127            | 76             | 72 <sup>2)</sup>     | 2      | 168.5  | 8 |
|            |             | (1.14)    | (8.27)  | (0.87)         | (5)            | (3)            | (2.83) <sup>2)</sup> | (0.08) | (6.63) |   |
|            | 600         | 38.8      | 210     | 22             | 127            | 76             | 72 <sup>2)</sup>     | 7      | 168.5  | 8 |
|            |             | (1.53)    | (8.27)  | (0.87)         | (5)            | (3)            | (2.83) <sup>2)</sup> | (0.28) | (6.63) |   |
| 4 inch     | 150         | 24.3      | 230     | 20             | 158            | 94             | 89                   | 2      | 190.5  | 8 |
|            |             | (0.96)    | (9.06)  | (0.79)         | (6.22)         | (3.69)         | (3.50)               | (0.08) | (7.5)  |   |
|            | 300         | 32.2      | 255     | 22             | 158            | 94             | 89                   | 2      | 200    | 8 |
|            |             | (1.27)    | (10.04) | (0.79)         | (6.22)         | (3.69)         | (3.50)               | (0.08) | (7.87) |   |
|            | 400         | 42        | 255     | 26             | 158            | 94             | 89                   | 7      | 200    | 8 |
|            |             | (1.65)    | (10.04) | (1.02)         | (6.22)         | (3.69)         | (3.50)               | (0.28) | (7.87) |   |

d: Inside diameter of gasket according to EN 1092-1/  
ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L = 0

<sup>2)</sup> 89 mm = 3½ inch with tube length L = 0

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

1

### Diaphragm seals of flange design fixed connection and with capillary

#### Overview



Diaphragm seals of screwed design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

#### Technical specifications

##### Diaphragm seals of screwed design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

|   |   |
|---|---|
| Nominal diameter                            | Nominal pressure  |
| • DN 50                                     | PN 10/16/25/40, PN 100  |
| • DN 80                                     | PN 10/16/25/40  |
| • DN 100                                    | PN 10/16, PN 25/40  |
| • 2 inch                                    | Class 150, class 300, class 400/600, class 900/1500   |
| • 3 inch                                    | Class 150, class 300  |
| • 4 inch                                    | Class 150, class 300  |
| Sealing face                                |   |
| • For stainless steel, mat. No. 1.4404/316L | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA   |
| • For the other materials                   | To EN 1092-1, form B2 or ASME B16.5 RFSF  |
| Materials                                   |   |
| • Main body                                 | Stainless steel mat. no. 1.4404/316L  |
| • Wetted parts                              | Stainless steel mat. no. 1.4404/316L  |
|   | <ul style="list-style-type: none"> <li>• Without coating</li> <li>• PTFE coating</li> <li>• ECTFE coating (for vacuum on request)</li> <li>• PFA coating</li> </ul> |
|   | Monel 400, mat. No. 2.4360  |
|   | Hastelloy C276, mat. No. 2.4819   |
|   | Hastelloy C4, mat. No. 2.4602   |
|   | Hastelloy C22, W.-Nr. 2.4602  |
|   | Tantalum  |
|   | Titanium, W.-Nr. 3.7035   |
|   | Nickel 201  |
|   | Duplex 2205, mat. no. 1.4462  |
|   | Stainless steel 316L, gold plated, thickness approx. 25 µm  |
| • Capillary                                 | Stainless steel, mat. No. 1.4571/316Ti  |
| • Sheath                                    | Spiral protective tube made of stainless steel, mat. No. 1.4301/304   |



|   |  |
|---|--|
| Sealing material in the process flanges   |  |
| • For pressure transmitters, absolute pressure transmitters and low-pressure applications | Copper   |
| • For other applications  | Viton  |
| Maximum pressure  | See above and the technical data of the pressure transmitter   |
| Tube length   | Without tube<br>50 mm (1.97 inch)<br>100 mm (3.94 inch)<br>150 mm (5.91 inch)<br>200 mm (7.87 inch)  |
| Capillary   |  |
| • Length  | Max. 10 m (32.8 ft), longer lengths on request   |
| • Internal diameter   | 2 mm (0.079 inch)  |
| • Minimum bending radius  | 150 mm (5.9 inch)  |
| Filling liquid  | Silicone oil M5<br>Silicone oil M50<br>High-temperature oil<br>Halocarbon oil (for measuring O <sub>2</sub> )<br>Food oil (FDA listed)   |
| Max. recommended process temperature  | 170 °C (338 °F)  |
| Permissible ambient temperature   | Dependent on the pressure transmitter and the filling liquid of the remote seal<br><br>More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals |
| Weight  | Approx. 4 kg (8.82 lb)   |



#### Certificate and approvals

|  |  |
|--|--|
| Classification according to pressure equipment directive (DGRL 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) |
|--|--|

## Diaphragm seals of flange design fixed connection and with capillary

1

| Selection and Ordering data   |                | Article No. Ord. code   |              |
|---|----------------|---|--------------|
| <b>Diaphragm seal</b>   |                | <b>7MF4913 -</b>  |              |
| <b>Mounting flange (with tube as option)</b> for direct mounting to high-pressure side <b>and flanged remote seal without tube</b> , fitted by means of capillary to low-pressure side of SITRANS P for differential pressure, SITRANS P310 (7MF2433-...); SITRANS P DS III series and P410 (7MF443-...) and SITRANS P500 (7MF54-...) |                | <b>1</b>  <b>- B</b>  |              |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   |                |   |              |
| <b>Flange, connection to EN 1092-1</b>  |                |   |              |
| <b>Nominal diameter and nominal pressure</b>  |                |   |              |
| • DN 25   | PN 10/16/25/40 | <b>Z</b>  | <b>J 0 A</b> |
|   | PN 63/100/160  | <b>Z</b>  | <b>J 0 B</b> |
| • DN 40   | PN 10/16/25/40 | <b>Z</b>  | <b>J 0 C</b> |
|   | PN 63/100      | <b>Z</b>  | <b>J 0 D</b> |
|   | PN 160         | <b>Z</b>  | <b>J 0 E</b> |
| • DN 50   | PN 10/16/25/40 | <b>A</b>  |              |
|   | PN 100         | <b>B</b>  |              |
| • DN 80   | PN 10/16/25/40 | <b>D</b>  |              |
| • DN 100  | PN 10/16       | <b>G</b>  |              |
|   | PN 25/40       | <b>H</b>  |              |
| <b>Flange, connection to ASME B16.5</b>   |                |   |              |
| <b>Nominal diameter and nominal pressure</b>  |                |   |              |
| • 1 inch  | Class 150      | <b>Z</b>  | <b>J 6 A</b> |
|   | Class 300      | <b>Z</b>  | <b>J 6 B</b> |
|   | Class 400/600  | <b>Z</b>  | <b>J 6 C</b> |
|   | Class 900/1500 | <b>Z</b>  | <b>J 6 D</b> |
| • 1½ inch   | Class 150      | <b>Z</b>  | <b>J 6 E</b> |
|   | Class 300      | <b>Z</b>  | <b>J 6 F</b> |
|   | Class 400/600  | <b>Z</b>  | <b>J 6 G</b> |
|   | Class 900/1500 | <b>Z</b>  | <b>J 6 H</b> |
| • 2 inch  | Class 150      | <b>L</b>  |              |
|   | Class 300      | <b>M</b>  |              |
|   | Class 400/600  | <b>N</b>  |              |
|   | Class 900/1500 | <b>P</b>  |              |
| • 3 inch  | Class 150      | <b>Q</b>  |              |
|   | Class 300      | <b>R</b>  |              |
| • 4 inch  | Class 150      | <b>T</b>  |              |
|   | Class 300      | <b>U</b>  |              |
| <b>Flange acc. to JIS</b>   |                |   |              |
| <b>Nominal diameter and nominal pressure</b>  |                |   |              |
| • JIS DN 50   | 10 K 316L      | <b>Z</b>  | <b>J 7 A</b> |
|   | 20 K 316L      | <b>Z</b>  | <b>J 7 B</b> |
| • JIS DN 80   | 10 K 316L      | <b>Z</b>  | <b>J 7 C</b> |
|   | 20 K 316L      | <b>Z</b>  | <b>J 7 D</b> |
| Other version   |                | <b>Z</b>  | <b>J 1 Y</b> |
| Add Order code and plain text:<br>Flange: ...; Nominal diameter: ...; Nominal pressure: ...   |                |   |              |

| Selection and Ordering data   |  | Article No. Ord. code   |  |
|---|--|---|--|
| <b>Diaphragm seal</b>   |  | <b>7MF4913 -</b>  |  |
| <b>Mounting flange (with tube as option)</b> for direct mounting to high-pressure side <b>and flanged remote seal without tube</b> , fitted by means of capillary to low-pressure side of SITRANS P for differential pressure, SITRANS P310 (7MF2433-...); SITRANS P DS III series and P410 (7MF443-...) and SITRANS P500 (7MF54-...) |  | <b>1</b>  <b>- B</b>  |  |
| <b>Wetted parts materials</b>   |  |   |  |
| Smooth sealing face to EN 1092-1, form B1 or B2, or to ASME B16.5 RF 125 ... 250 AA or RFSF   |  |   |  |
| • Stainless steel 316L  |  | <b>A</b>  |  |
| - without coating   |  | <b>E 0</b>  |  |
| - with PTFE coating   |  | <b>F</b>  |  |
| - with ECTFE coating <sup>1) 2)</sup>   |  | <b>D</b>  |  |
| - with PFA coating <sup>2)</sup>  |  | <b>G</b>  |  |
| • Monel 400, mat. No. 2.4360  |  | <b>J</b>  |  |
| • Hastelloy C276, mat. No. 2.4819   |  | <b>U</b>  |  |
| • Hastelloy C4, mat. No. 2.4602   |  | <b>V 0</b>  |  |
| • Hastelloy C22, mat. No. 2.4602  |  | <b>K</b>  |  |
| • Tantalum  |  | <b>L 0</b>  |  |
| • Titanium, mat. No. 3.7035 (max. 150 °C (302 °F))  |  | <b>M 0</b>  |  |
| • Nickel 201 (max. 260 °C (500 °F))   |  | <b>Q</b>  |  |
| • Duplex, mat. no. 1.4462   |  | <b>R</b>  |  |
| • Duplex, mat. no. 1.4462, incl. main body  |  | <b>S 0</b>  |  |
| • Stainless steel 316L, gold plated, thickness approx. 25 µm  |  |   |  |

## Pressure Measurement

Remote seals for transmitters and pressure gauges

SITRANS P DS III

1

### Diaphragm seals of flange design fixed connection and with capillary

#### Selection and Ordering data Article No. Ord. code

##### Diaphragm seal

7MF4913 -

**Mounting flange (with tube as option)** for direct mounting to high-pressure side **and flanged remote seal without tube**, fitted by means of capillary to low-pressure side of SITRANS P for differential pressure, SITRANS P310 (7MF2433-...); SITRANS P DS III series and P410 (7MF443-...) and SITRANS P500 (7MF54-...)

1 ■ ■ ■ ■ - ■ B ■ ■ ■ ■

##### Tube length

(for mounting flange on high-pressure side)

- Without tube

0

Other version:

Add Order code and plain text:

Wetted parts materials: .....,

Tube length: ...

Z 8

K 1 Y

##### Customer-specific tubus length

Specify customer-specific length with Y44, see Order Code

- Wetted parts materials: Stainless steel without foil Range

Standard length

|                                 |                |     |
|---------------------------------|----------------|-----|
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")  | A 1 |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94") | A 2 |
| 101 ... 150 mm (3.98 ... 5.91") | 150 mm (5.91") | A 3 |
| 151 ... 200 mm (5.94 ... 7.87") | 200 mm (7.87") | A 4 |
| 201 ... 250 mm (7.91 ... 9.84") | 250 mm (9.84") | A 5 |

- Wetted parts materials: Stainless steel coated with ECTFE

Range

Standard length

|                                 |                |     |
|---------------------------------|----------------|-----|
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")  | F 1 |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94") | F 2 |
| 101 ... 150 mm (3.98 ... 5.91") | 150 mm (5.91") | F 3 |
| 151 ... 200 mm (5.94 ... 7.87") | 200 mm (7.87") | F 4 |
| 201 ... 250 mm (7.91 ... 9.84") | 250 mm (9.84") | F 5 |

- Wetted parts materials: Stainless steel coated with PFA

Range

Standard length

|                                 |                |     |
|---------------------------------|----------------|-----|
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")  | D 1 |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94") | D 2 |
| 101 ... 150 mm (3.98 ... 5.91") | 150 mm (5.91") | D 3 |
| 151 ... 200 mm (5.94 ... 7.87") | 200 mm (7.87") | D 4 |
| 201 ... 250 mm (7.91 ... 9.84") | 250 mm (9.84") | D 5 |

- Wetted parts materials: Monel 400

Range

Standard length

|                                 |                |     |
|---------------------------------|----------------|-----|
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")  | G 1 |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94") | G 2 |
| 101 ... 150 mm (3.98 ... 5.91") | 150 mm (5.91") | G 3 |
| 151 ... 200 mm (5.94 ... 7.87") | 200 mm (7.87") | G 4 |

- Wetted parts materials: Hastelloy C276

Range

Standard length

|                                 |                |     |
|---------------------------------|----------------|-----|
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")  | J 1 |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94") | J 2 |
| 101 ... 150 mm (3.98 ... 5.91") | 150 mm (5.91") | J 3 |
| 151 ... 200 mm (5.94 ... 7.87") | 200 mm (7.87") | J 4 |

- Wetted parts materials: Tantalum

Range

Standard length

|                                 |                |     |
|---------------------------------|----------------|-----|
| 20 ... 50 mm (0.79 ... 1.97")   | 50 mm (1.97")  | K 1 |
| 51 ... 100 mm (2.01 ... 3.94")  | 100 mm (3.94") | K 2 |
| 101 ... 150 mm (3.98 ... 5.91") | 150 mm (5.91") | K 3 |
| 151 ... 200 mm (5.94 ... 7.87") | 200 mm (7.87") | K 4 |

#### Selection and Ordering data Article No. Ord. code

##### Diaphragm seal

7MF4913 -

**Mounting flange (with tube as option)** for direct mounting to high-pressure side **and flanged remote seal without tube**, fitted by means of capillary to low-pressure side of SITRANS P for differential pressure, SITRANS P310 (7MF2433-...); SITRANS P DS III series and P410 (7MF443-...) and SITRANS P500 (7MF54-...)

1 ■ ■ ■ ■ - ■ B ■ ■ ■ ■

##### Filling liquid

- Silicone oil M5
- Silicone oil M50
- High-temperature oil
- Halocarbon oil (for measuring O<sub>2</sub>)<sup>3)</sup>
- Food oil (FDA listed)

1

2

3

4

7

9

Other version

Add Order code and plain text:

Filling liquid: ...

M 1 Y

##### Length of capillary<sup>4)</sup>

- 1.0 m (3.28 ft)
- 1.6 m (5.25 ft)
- 2.5 m (8.20 ft)
- 4.0 m (13.1 ft)
- 6.0 m (19.7 ft)
- 8.0 m (26.25 ft)
- 10.0 m (32.8 ft)

2

3

4

5

6

7

8

##### Special lengths for capillaries

- 2.0 m (6.56 ft)
- 3.0 m (9.84 ft)
- 5.0 m (16.40 ft)
- 7.0 m (23.97 ft)
- 9.0 m (29.53 ft)

9

N 1 C

9

N 1 E

9

N 1 G

9

N 1 J

9

N 1 L

1) For vacuum on request.

2) Only for use in non-hazardous atmospheres.

3) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.

4) Max. capillary length, see section "Technical description".

## Diaphragm seals of flange design fixed connection and with capillary

1

| Selection and Ordering data   | Order code | Selection and Ordering data   | Order code   |
|---|------------|---|--|
| <b>Further designs</b><br>Please add <b>"-Z"</b> to Article No. and specify Order code.   |            | <b>Further designs</b><br>Please add <b>"-Z"</b> to Article No. and specify Order code.   |  |
| <b>Customer-specific tubus length</b><br>Select range,<br>enter desired length in plain text<br>(No entry = standard length)  | <b>Y44</b> | <b>Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm)</b><br>previously DIN 2501, form E   | <b>J11</b>   |
| <b>Spark arrestor</b><br>With spark arrestor for mounting on zone 0<br>(including documentation)  | <b>A02</b> | <b>Sealing surface groove, EN 1092-1, form D</b><br>instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)  | <b>J14</b>   |
| <b>Remote seal nameplate</b><br>Attached out of stainless steel, contains MLFB and order number of the remote seal  | <b>B20</b> | <b>Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L</b><br>DN 25<br>DN 40<br>DN 50<br>DN 80<br>DN 100<br>DN 125  | <b>J30</b><br><b>J31</b><br><b>J32</b><br><b>J33</b><br><b>J34</b><br><b>J35</b> |
| <b>Oil- and grease-free cleaned version</b><br>Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2   | <b>C10</b> | <b>Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L</b><br>DN 25<br>DN 40<br>DN 50<br>DN 80<br>DN 100<br>DN 125  | <b>J40</b><br><b>J41</b><br><b>J42</b><br><b>J43</b><br><b>J44</b><br><b>J45</b> |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>  | <b>C11</b> |   |  |
| <b>Inspection certificate</b><br>to EN 10204, section 3.1   | <b>C12</b> |   |  |
| <b>2.2 Certificate of FDA approval of fill oil</b><br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"   | <b>C17</b> |   |  |
| <b>Functional safety certificate ("SIL 2") to IEC 61508</b><br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)   | <b>C20</b> | <b>Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L</b><br>DN 25<br>DN 40<br>DN 50<br>DN 80<br>DN 100<br>DN 125  | <b>J50</b><br><b>J51</b><br><b>J52</b><br><b>J53</b><br><b>J54</b><br><b>J55</b> |
| <b>Functional safety certificate ("SIL 2/3") to IEC 61508</b><br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)   | <b>C23</b> |   | <b>J12</b>   |
| <b>Certification acc. to NACE MR-0175</b><br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)  | <b>D07</b> | <b>Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA</b><br>Instead of sealing surface B2 and RFSF (Only for wetted parts in Hastelloy C276 (2.4819), Tantal and Duplex 2205 (1.4462) and for sizes 2", 3", DN 50 and DN 80) |  |
| <b>Certification acc. to NACE MR-0103</b><br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)  | <b>D08</b> | <b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b><br>instead of sealing surface<br>ASME B16.5 RF 125 ... 250 AA<br>(only for wetted parts made of stainless steel 316L)  | <b>J24</b>   |
| <b>Oil- and grease-free cleaned version</b><br>Oil- and grease-free cleaned and packed version, <u>only for oxygen application</u> , only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 | <b>E10</b> |   |  |
| <b>Epoxy painting</b><br>Not possible with negative pressure service.<br>Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter.<br>With transmitters 7MF40.. and 7MF42.., only possible with process connection G½B according to EN 837-1.  | <b>E15</b> |   |  |

## Pressure Measurement

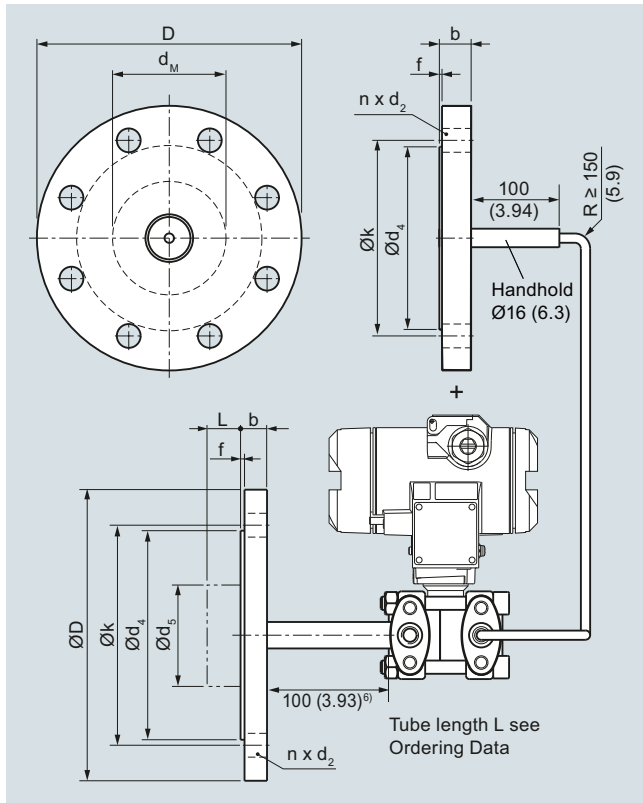
Remote seals for transmitters and pressure gauges  
SITRANS P DS III

1

### Diaphragm seals of flange design fixed connection and with capillary

| Selection and Ordering data   | Order code | Selection and Ordering data  | Order code |
|---|------------|--|------------|
| <b>Further designs</b>  |            | <b>Further designs</b>   |            |
| Please add <b>"-Z"</b> to Article No. and specify Order code.   |            | Please add <b>"-Z"</b> to Article No. and specify Order code.  |            |
| <b>Radial capillary pipe outlet</b><br>for one-sided mounting   | <b>K01</b> | <b>PVC protective tube</b><br>over the spiral protective tube of the capillaries<br>(color: black)   |            |
| <b>PE protective tube</b><br>over the spiral protective tube of the capillaries<br>(color: white)         |            | 1.0 m (3.28 ft)  | <b>N60</b> |
| 1.0 m (3.28 ft)   | <b>N20</b> | 1.6 m (5.25 ft)  | <b>N61</b> |
| 1.6 m (5.25 ft)   | <b>N21</b> | 2.0 m (6.56 ft)  | <b>N62</b> |
| 2.0 m (6.56 ft)   | <b>N22</b> | 2.5 m (8.20 ft)  | <b>N63</b> |
| 2.5 m (8.20 ft)   | <b>N23</b> | 3.0 m (9.84 ft)  | <b>N64</b> |
| 3.0 m (9.84 ft)   | <b>N24</b> | 4.0 m (13.12 ft)   | <b>N65</b> |
| 4.0 m (13.12 ft)  | <b>N25</b> | 5.0 m (16.40 ft)   | <b>N66</b> |
| 5.0 m (16.40 ft)  | <b>N26</b> | 6.0 m (19.69 ft)   | <b>N67</b> |
| 6.0 m (19.69 ft)  | <b>N27</b> | 7.0 m (22.97 ft)   | <b>N68</b> |
| 7.0 m (22.97 ft)  | <b>N28</b> | 8.0 m (26.25 ft)   | <b>N69</b> |
| 8.0 m (26.25 ft)  | <b>N29</b> | 9.0 m (29.53 ft)   | <b>N70</b> |
| 9.0 m (29.53 ft)  | <b>N30</b> | 10.0 m (32.81 ft)  | <b>N71</b> |
| 10.0 m (32.81 ft)   | <b>N31</b> | <b>Elongated pipe, distance from transmitter<br/>process flange to flange is 150 mm instead of<br/>100 mm,</b><br>max. medium temperature 250 °C, observe the<br>maximum permissible media temperature of the<br>filling liquid. | <b>R15</b> |
| <b>PTFE protective tube</b><br>over the spiral protective tube of the capillaries<br>(color: transparent) |            | <b>Elongated pipe, distance from transmitter<br/>process flange to flange is 100 mm instead of<br/>100 mm,</b><br>max. medium temperature 300 °C, observe the<br>maximum permissible media temperature of the<br>filling liquid. | <b>R20</b> |
| 1.0 m (3.28 ft)   | <b>N40</b> | <b>Negative pressure service</b><br>for use in low-pressure range for transmitters for<br>• differential pressure  | <b>V03</b> |
| 1.6 m (5.25 ft)   | <b>N41</b> | <b>Extended negative pressure service</b><br>for use in low-pressure range for transmitters for<br>• differential pressure   | <b>V53</b> |
| 2.0 m (6.56 ft)   | <b>N42</b> |  |            |
| 2.5 m (8.20 ft)   | <b>N43</b> |  |            |
| 3.0 m (9.84 ft)   | <b>N44</b> |  |            |
| 4.0 m (13.12 ft)  | <b>N45</b> |  |            |
| 5.0 m (16.40 ft)  | <b>N46</b> |  |            |
| 6.0 m (19.69 ft)  | <b>N47</b> |  |            |
| 7.0 m (22.97 ft)  | <b>N48</b> |  |            |
| 8.0 m (26.25 ft)  | <b>N49</b> |  |            |
| 9.0 m (29.53 ft)  | <b>N50</b> |  |            |
| 10.0 m (32.81 ft)   | <b>N51</b> |  |            |

## Dimensional drawings



Diaphragm seals of screwed design with flexible capillary, fixed connection, for connection to a SITRANS P pressure transmitter for differential pressure, dimensions in mm (inch)

## Connection to EN 1092-1

| Nom. diam. | Nom. press.    | b  | D   | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub>   | f  | k   | n |
|------------|----------------|----|-----|----------------|----------------|----------------|------------------|----|-----|---|
|            |                | mm | mm  | mm             | mm             | mm             | mm               | mm | mm  |   |
| DN 50      | PN 10/16/25/40 | 20 | 165 | 18             | 102            | 48.3           | 45 <sup>1)</sup> | 2  | 125 | 4 |
|            | PN 100         | 28 | 195 | 26             | 102            | 48.3           | 45 <sup>1)</sup> | 2  | 145 | 4 |
| DN 80      | PN 10/16/25/40 | 24 | 200 | 18             | 138            | 76             | 72 <sup>2)</sup> | 2  | 160 | 8 |
|            | PN 100         | 32 | 230 | 26             | 138            | 76             | 72 <sup>2)</sup> | 2  | 180 | 8 |
| DN 100     | PN 10/16       | 20 | 220 | 18             | 158            | 94             | 89               | 2  | 180 | 8 |
|            | PN 25/40       | 24 | 235 | 22             | 162            | 94             | 89               | 2  | 190 | 8 |

## Connection to ASME B16.5

| Nom. diam. | Nom. press. | b           | D           | d <sub>2</sub> | d <sub>4</sub> | d <sub>5</sub> | d <sub>M</sub>                        | f         | k            | n |
|------------|-------------|-------------|-------------|----------------|----------------|----------------|---------------------------------------|-----------|--------------|---|
| lb/sq.in.  |             | mm (inch)   | mm (inch)   | mm (inch)      | mm (inch)      | mm (inch)      | mm (inch)                             | mm (inch) | mm (inch)    |   |
| 2 inch     | 150         | 19.5 (0.77) | 150 (5.91)  | 20 (0.79)      | 92 (3.62)      | 48.3 (1.9)     | 45 <sup>1)</sup> (1.77) <sup>1)</sup> | 2 (0.08)  | 120.5 (4.74) | 4 |
|            | 300         | 22.7 (0.89) | 165 (6.5)   | 20 (0.79)      | 92 (3.62)      | 48.3 (1.9)     | 45 <sup>1)</sup> (1.77) <sup>1)</sup> | 2 (0.08)  | 127 (5)      | 8 |
|            | 400/600     | 32.4 (1.28) | 165 (6.5)   | 20 (0.79)      | 92 (3.62)      | 48.3 (1.9)     | 45 <sup>1)</sup> (1.77) <sup>1)</sup> | 7 (0.28)  | 127 (5)      | 8 |
|            | 900/1500    | 45.1 (1.78) | 215 (8.46)  | 26 (1.02)      | 92 (3.62)      | 48.3 (1.9)     | 45 <sup>1)</sup> (1.77) <sup>1)</sup> | 7 (0.28)  | 165 (6.5)    | 8 |
| 3 inch     | 150         | 24.3 (0.96) | 190 (7.48)  | 20 (0.79)      | 127 (5)        | 76 (3)         | 72 <sup>2)</sup> (2.83) <sup>2)</sup> | 2 (0.08)  | 152.5 (6)    | 4 |
|            | 300         | 29 (1.14)   | 210 (8.27)  | 22 (0.87)      | 127 (5)        | 76 (3)         | 72 <sup>2)</sup> (2.83) <sup>2)</sup> | 2 (0.08)  | 168.5 (6.63) | 8 |
| 4 inch     | 150         | 24.3 (0.96) | 230 (9.06)  | 20 (0.79)      | 158 (6.22)     | 94 (3.69)      | 89 (3.50)                             | 2 (0.08)  | 190.5 (7.5)  | 8 |
|            | 300         | 32.2 (1.27) | 255 (10.04) | 22 (0.79)      | 158 (6.22)     | 94 (3.69)      | 89 (3.50)                             | 2 (0.08)  | 200 (7.87)   | 8 |

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L = 0

<sup>2)</sup> 89 mm = 3½ inch with tube length L = 0



## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

1

Diaphragm seal, screwed design directly mounted or/and with capillary

### Overview



Diaphragm seal, screwed gland design with inside diaphragm for gauge, absolute and differential pressure for direct mounting



Process connection: open measurement flange

### Technical specifications

#### Diaphragm seal, screwed gland with inside diaphragm

|  |   |
|--|---|
| Process connection   | Nominal pressure  |
| • Male thread G $\frac{1}{2}$ B to EN 837-1                                  | PN 100, PN 250  |
| • External thread $\frac{1}{2}$ -14" NPT-M                                   | PN 100, PN 250  |
| • open measurement flange  |   |
| - DN 25  | PN 10 ... PN 40   |
| - 1 inch   | Class 150, class 300  |
| Sealing face for open measurement flange                                     |   |
| • For stainless steel, mat. no. 1.4404/316L                                  | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA                                       |
| Materials  |   |
| • Lower section (in the case of process connection thread)                   | Stainless steel, Mat. no. 1.4404/316L   |
| • Diaphragm  | Stainless steel, Mat. no. 1.4404/316L   |
|  | <ul style="list-style-type: none"> <li>• No coating</li> <li>• With PTFE coating</li> </ul> |
|  | Monel 400, mat. no. 2.4360  |
|  | Hastelloy C276, mat. no. 2.4819   |
|  | Hastelloy C4, mat. no. 2.4602   |
|  | Tantal  |
|  | Stainless steel 316L, gold plated, thickness approx. 25 $\mu$ m                             |
| • Top section (process connection in the case of an open measurement flange) | Stainless steel, mat. no. 1.4404/316L   |
| • Capillary  | Stainless steel 1.4571/316Ti  |
| • Sealing material on the process connection                                 | Viton or copper (in the case of vacuum-free version)  |
| • Sealing material between top and bottom section                            | Viton (FKM) (standard)<br>Teflon (PTFE)<br>metal spring ring (silver-coated)                |

|   |  |
|---|--|
| Capillary   |  |
| • Length  | Max. 10 m (32.8 ft)  |
| • Internal diameter   | 2 mm (0.079 inch)  |
| • Minimum bending radius  | 150 mm (5.9 inch)  |
| • Sheath  | Stainless steel protective tube, mat. No. 1.4301/304   |
| Filling liquid  | <ul style="list-style-type: none"> <li>• Silicone oil M5</li> <li>• Silicone oil M50</li> <li>• High-temperature oil</li> <li>• Halocarbon oil (for measuring O<sub>2</sub>)</li> <li>• Food oil (FDA listed)</li> </ul> |
| Max. recommended process temperature                                      | 170 °C (338 °F)  |
| Permissible ambient temperature   | Dependent on the pressure transmitter and the filling liquid of the remote seal  |
|   | More information can be found in the technical specifications of the pressure transmitters and in the section "Technical data of filling liquid" in the introduction to the remote seals                                 |
| Weight  | Approx. 1.5 kg (3.3 lb)  |
| <b>Certificates and approvals</b>   |  |
| Classification according to pressure equipment directive (PED 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)   |



## Diaphragm seal, screwed design directly mounted or/and with capillary

1

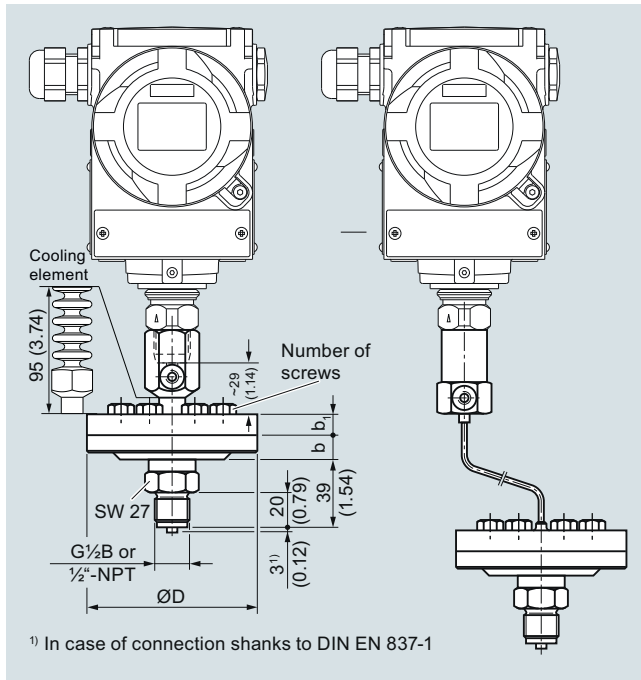
| Selection and Ordering data  |                           |  | Article No. Ord. Code                               |  |
|--|---------------------------|--|---|--|
| <b>Remote seal, screwed gland with inside diaphragm</b>  |                           |  |   |  |
| <b>Mounted on SITRANS P pressure transmitter for</b>   |                           |  | <b>7MF4930 -</b>                                    |  |
| <ul style="list-style-type: none"> <li><b>gauge pressure</b><br/>7MF2033-...; 7MF403-... and SITRANS P300, 7MF802-...</li> <li><b>absolute pressure</b><br/>7MF423-... and SITRANS P300, 7MF802-...</li> </ul> In conjunction with Order code "V01" (vacuum-proof design)  |                           |  |   |  |
| <b>Mounted on either side of SITRANS P pressure transmitter for</b>  |                           |  | <b>7MF4933 -</b>                                    |  |
| <ul style="list-style-type: none"> <li><b>differential pressure</b> 7MF243-...; 7MF443-... and 7MF54-...</li> </ul>  |                           |  |   |  |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.  |                           |  |   |  |
| <b>Type</b>  |                           |  |   |  |
| <ul style="list-style-type: none"> <li>no flushing hole</li> <li>with flushing hole 1x 1/8 NPT unsealed (only with process connection 316L)</li> </ul>   |                           |  | 1<br>2  |  |
| Other version, add<br>Order code and plain text:<br>Version: ...   |                           |  | 9 H 1 Y   |  |
| <b>Process connection version</b>  |                           |  |   |  |
| <b>Lower flange material</b>   | <b>Process connection</b> | <b>Nominal diameter and pressure level</b> |   |  |
| 316L/1.4404  | Thread                    | G½B/PN100                                  | B   |  |
| 316L/1.4404  | Thread                    | G½B/PN250                                  | C   |  |
| 316L/1.4404  | Thread                    | ½NPT-M/PN100                               | E   |  |
| 316L/1.4404  | Thread                    | ½NPT-M/PN250                               | F   |  |
| 316L/1.4404  | Thread                    | ½NPT-F/PN100                               | H   |  |
| 316L/1.4404  | Thread                    | ½NPT-F/PN250                               | J   |  |
| 316L/1.4404  | open measure-ment flange  | DN 25/ PN 10 ... 40                        | N   |  |
| 316L/1.4404  | open measure-ment flange  | 1"/Class 150                               | P   |  |
| 316L/1.4404  | open measure-ment flange  | 1"/Class 300                               | Q   |  |
| PTFE <sup>1)</sup>   | Thread                    | G½B/PN100                                  | T   |  |
| PTFE <sup>1)</sup>   | open measure-ment flange  | DN 25/ PN 10 ... 40                        | U   |  |
| PTFE <sup>1)</sup>   | open measure-ment flange  | 1"/Class 150                               | V   |  |
| PTFE <sup>1)</sup>   | open measure-ment flange  | 1"/Class 300                               | W   |  |
| Other version, add<br>Order code and plain text:<br>Lower flange material: ...;<br>Process connection: ...;<br>Nominal diameter/pressure level: ...  |                           |  | Z J 1 Y   |  |
| <b>Diaphragm material</b>  |                           |  |   |  |
| Stainless steel 316L   |                           |  | A   |  |
| 316L stainless steel with PTFE film  |                           |  | E   |  |
| Monel 400  |                           |  | G   |  |
| Hastelloy C276   |                           |  | J   |  |
| Hastelloy C4   |                           |  | U   |  |
| Tantalum   |                           |  | K   |  |
| Stainless steel 316L, gold plated, thickness approx. 25 µm   |                           |  | S   |  |
| Other version, add<br>Order code and plain text:<br>Diaphragm material: ...  |                           |  | Z K 1 Y   |  |
|  |                           |  |   |  |
| Selection and Ordering data  |                           |  | Article No. Ord. Code                               |  |
| <b>Remote seal, screwed gland with inside diaphragm</b>  |                           |  |   |  |
| <b>Mounted on SITRANS P pressure transmitter for</b>   |                           |  | <b>7MF4930 -</b>                                    |  |
| <ul style="list-style-type: none"> <li><b>gauge pressure</b><br/>7MF2033-...; 7MF403-... and SITRANS P300, 7MF802-...</li> <li><b>absolute pressure</b><br/>7MF423-... and SITRANS P300, 7MF802-...</li> </ul> In conjunction with Order code "V01" (vacuum-proof design)  |                           |  |   |  |
| <b>Mounted on either side of SITRANS P pressure transmitter for</b>  |                           |  | <b>7MF4933 -</b>                                    |  |
| <ul style="list-style-type: none"> <li><b>differential pressure</b> 7MF243-...; 7MF443-... and 7MF54-...</li> </ul>  |                           |  |   |  |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.  |                           |  |   |  |
| <b>Sealing material between top and bottom section</b>   |                           |  |   |  |
| FKM (standard with diaphragm and 316L process connection)  |                           |  | 1   |  |
| PTFE (standard with custom material with max. 260 °C (500 °F))   |                           |  | 2   |  |
| Metal C- circlip, silver coated for > 260 °C (500 °F) incl. high temperature-resistant screwed gland   |                           |  | 3   |  |
| <b>Filling liquid</b>  |                           |  |   |  |
| <ul style="list-style-type: none"> <li>Silicone oil M5</li> <li>Silicone oil M50</li> <li>High-temperature oil</li> <li>Halocarbon oil (for measuring O<sub>2</sub>)<sup>2)</sup></li> <li>Food oil (FDA-listed)</li> </ul>  |                           |  | 1<br>2<br>3<br>4<br>7                               |  |
| Other version, add<br>Order code and plain text:<br>filling liquid: ...  |                           |  | 9 M 1 Y   |  |
| <b>Capillary length<sup>3)</sup></b>   |                           |  |   |  |
| <ul style="list-style-type: none"> <li>none, direct mounting</li> <li>none, direct mounting with cooling element (not in conjunction with transmitter for differential pressure)</li> <li>1.0 m (3.28 ft)</li> <li>1.6 m (5.25 ft)</li> <li>2.5 m (8.20 ft)</li> <li>4.0 m (13.1 ft)</li> <li>6.0 m (19.7 ft)</li> <li>8.0 m (26.25 ft)</li> <li>10.0 m (32.8 ft)</li> </ul> |                           |  | 0<br>1<br>2<br>3<br>4<br>5<br>6<br>7<br>8           |  |
| <b>Special lengths for capillaries</b>   |                           |  |   |  |
| <ul style="list-style-type: none"> <li>2.0 m (6.56 ft)</li> <li>3.0 m (9.84 ft)</li> <li>5.0 m (16.40 ft)</li> <li>7.0 m (23.97 ft)</li> <li>9.0 m (29.53 ft)</li> </ul>   |                           |  | 9 N 1 C<br>9 N 1 E<br>9 N 1 G<br>9 N 1 J<br>9 N 1 L |  |
| 1) Not in combination with flushing holes.<br>Not together with the options for negative pressure service (V01 and V03) and extended negative pressure service (V51 and V53).  |                           |  |   |  |
| 2) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.   |                           |  |   |  |
| 3) Max. capillary length, see section "Technical description".   |                           |  |   |  |

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

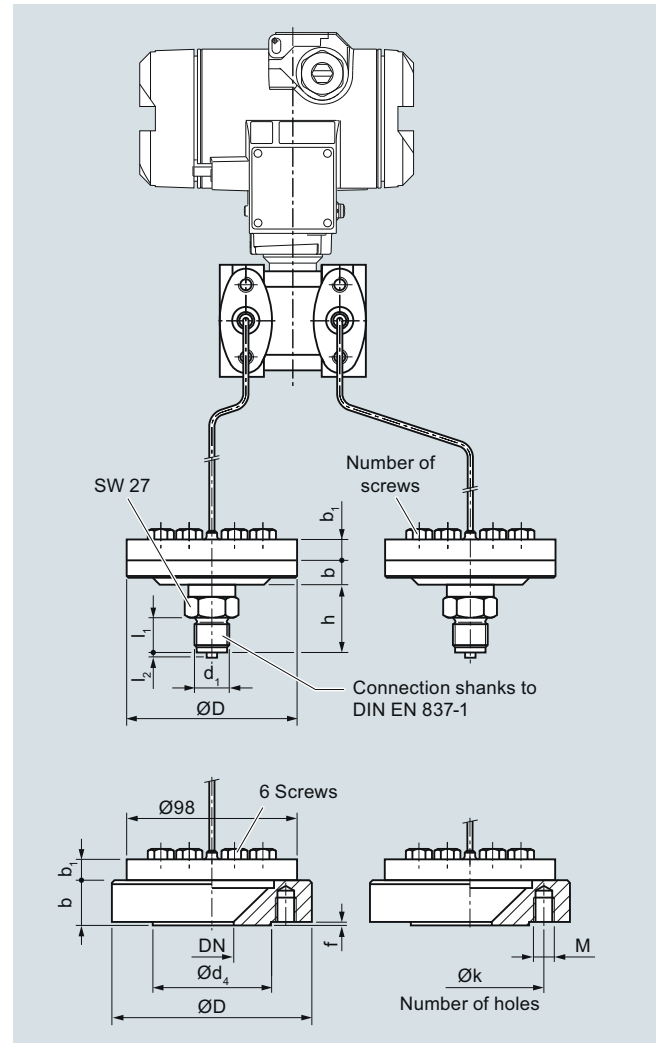
### Diaphragm seal, screwed design directly mounted or/and with capillary

| Selection and Ordering data   | Order code               | Selection and Ordering data  | Order code               |
|---|--------------------------|--|--------------------------|
| <b>Further designs</b>  |                          | <b>Further designs</b>   |                          |
| Add "-Z" to Article No. and specify Order code.   |                          | Add "-Z" to Article No. and specify Order code.  |                          |
| <b>Remote seal nameplate</b><br>Attached out of stainless steel, contains MLFB and order number of the remote seal  | <b>B20</b>               | <b>PE protective tube</b><br>over the spiral protective tube of the capillaries (color: white)   |                          |
| <b>Oil- and grease-free cleaned version</b><br>Oil- and grease-free cleaned and packed version, <u>not for oxygen application</u> , only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2   | <b>C10</b>               | 1.0 m (3.28 ft)  | <b>N20</b>               |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>  | <b>C11</b>               | 1.6 m (5.25 ft)  | <b>N21</b>               |
| <b>Inspection certificate</b><br>to EN 10204, section 3.1   | <b>C12</b>               | 2.0 m (6.56 ft)  | <b>N22</b>               |
| <b>2.2 Certificate of FDA approval of fill oil</b><br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"   | <b>C17</b>               | 2.5 m (8.20 ft)  | <b>N23</b>               |
| <b>Functional safety certificate ("SIL 2") to IEC 61508</b><br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)   | <b>C20</b>               | 3.0 m (9.84 ft)  | <b>N24</b>               |
| <b>Functional safety certificate ("SIL 2/3") to IEC 61508</b><br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)   | <b>C23</b>               | 4.0 m (13.12 ft)   | <b>N25</b>               |
| <b>Certification acc. to NACE MR-0175</b><br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)  | <b>D07</b>               | 5.0 m (16.40 ft)   | <b>N26</b>               |
| <b>Certification acc. to NACE MR-0103</b><br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)  | <b>D08</b>               | 6.0 m (19.69 ft)   | <b>N27</b>               |
| <b>Oil- and grease-free cleaned version</b><br>Oil- and grease-free cleaned and packed version, <u>only for oxygen application</u> , only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 | <b>E10</b>               | 7.0 m (22.97 ft)   | <b>N28</b>               |
| <b>Epoxy painting</b><br>Not possible with negative pressure service.<br>Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter.<br>With transmitters 7MF40.. and 7MF42.., only possible with process connection G½B according to EN 837-1.  | <b>E15</b>               | 8.0 m (26.25 ft)   | <b>N29</b>               |
| <b>One-sided mounting on differential pressure transmitters</b><br>(only for 7MF4930-...)<br>on high-pressure side<br>on low-pressure side  | <b>H10</b><br><b>H11</b> | 9.0 m (29.53 ft)   | <b>N30</b>               |
| <b>Sealing surface groove, EN 1092-1, form D</b><br>instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)  | <b>J14</b>               | 10.0 m (32.81 ft)  | <b>N31</b>               |
| <b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b><br>instead of sealing surface<br>ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)   | <b>J24</b>               | <b>PTFE protective tube</b><br>over the spiral protective tube of the capillaries (color: transparent)   |                          |
| <b>Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L</b><br>DN 25<br>DN 40  | <b>J30</b><br><b>J31</b> | 1.0 m (3.28 ft)  | <b>N40</b>               |
|   |                          | 1.6 m (5.25 ft)  | <b>N41</b>               |
|   |                          | 2.0 m (6.56 ft)  | <b>N42</b>               |
|   |                          | 2.5 m (8.20 ft)  | <b>N43</b>               |
|   |                          | 3.0 m (9.84 ft)  | <b>N44</b>               |
|   |                          | 4.0 m (13.12 ft)   | <b>N45</b>               |
|   |                          | 5.0 m (16.40 ft)   | <b>N46</b>               |
|   |                          | 6.0 m (19.69 ft)   | <b>N47</b>               |
|   |                          | 7.0 m (22.97 ft)   | <b>N48</b>               |
|   |                          | 8.0 m (26.25 ft)   | <b>N49</b>               |
|   |                          | 9.0 m (29.53 ft)   | <b>N50</b>               |
|   |                          | 10.0 m (32.81 ft)  | <b>N51</b>               |
|   |                          | <b>PVC protective tube</b><br>over the spiral protective tube of the capillaries (color: black)  |                          |
|   |                          | 1.0 m (3.28 ft)  | <b>N60</b>               |
|   |                          | 1.6 m (5.25 ft)  | <b>N61</b>               |
|   |                          | 2.0 m (6.56 ft)  | <b>N62</b>               |
|   |                          | 2.5 m (8.20 ft)  | <b>N63</b>               |
|   |                          | 3.0 m (9.84 ft)  | <b>N64</b>               |
|   |                          | 4.0 m (13.12 ft)   | <b>N65</b>               |
|   |                          | 5.0 m (16.40 ft)   | <b>N66</b>               |
|   |                          | 6.0 m (19.69 ft)   | <b>N67</b>               |
|   |                          | 7.0 m (22.97 ft)   | <b>N68</b>               |
|   |                          | 8.0 m (26.25 ft)   | <b>N69</b>               |
|   |                          | 9.0 m (29.53 ft)   | <b>N70</b>               |
|   |                          | 10.0 m (32.81 ft)  | <b>N71</b>               |
|   |                          | <b>Negative pressure service</b><br>for use in low-pressure range for transmitters for<br>• gauge and absolute pressure from the pressure series<br>• differential pressure          | <b>V01</b><br><b>V03</b> |
|   |                          | <b>Extended negative pressure service</b><br>for use in low-pressure range for transmitters for<br>• gauge and absolute pressure from the pressure series<br>• differential pressure | <b>V51</b><br><b>V53</b> |

**Dimensional drawings**

Diaphragm seal, screwed gland with inside diaphragm, for gauge and absolute pressure, direct and attached directly to the transmitter with with capillaries, dimensions in mm (inch)

| Range         | D<br>mm | b<br>mm | b <sub>1</sub><br>mm | Number of<br>screws |
|---------------|---------|---------|----------------------|---------------------|
| up to 100 bar | 98      | 14      | 16                   | 6                   |
| up to 250 bar | 98      | 14      | 20                   | 12                  |



Diaphragm seal, screwed gland with inside diaphragm, for differential pressure, direct and attached directly to the transmitter with with capillaries, dimensions in mm (inch)

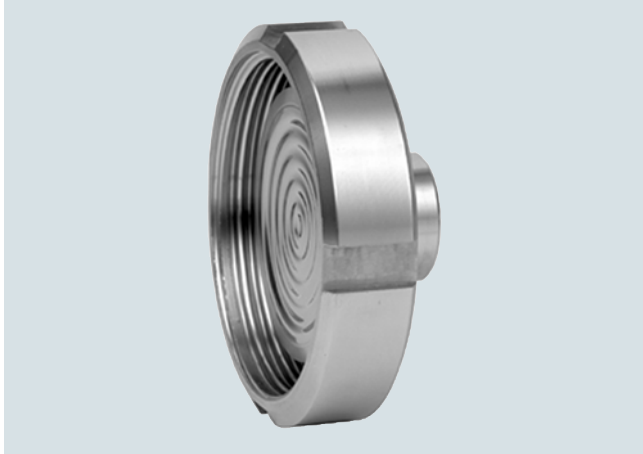
| Nomi-<br>nal<br>diam-<br>eter | Nominal<br>pressure | D<br>mm | d <sub>4</sub><br>mm | k<br>mm | M   | Number<br>of holes | b<br>mm | b <sub>1</sub><br>mm | f<br>mm |
|-------------------------------|---------------------|---------|----------------------|---------|-----|--------------------|---------|----------------------|---------|
| DN 25                         | PN 10/16/<br>25/40  | 115     | 68                   | 85      | M12 | 4                  | 26      | 12                   | 2       |
| 1 inch                        | 150<br>lb/sq.in     | 108     | 50.8                 | 79.2    | M12 | 4                  | 22      | 12                   | 1.6     |
| 1 inch                        | 300<br>lb/sq.in     | 124     | 50.8                 | 88.9    | M16 | 4                  | 22      | 12                   | 1.6     |

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Quick-release diaphragm seals

#### Overview



Quick-release diaphragm seals, to DIN 11851 with slotted union nut



Quick-release diaphragm seals, with clamp connection

Quick-release diaphragm seals are available for the following SITRANS P pressure transmitter series:

- For pressure: P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
- For differential pressure and flow: P500, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
- The quick-release remote seals are common designs in the food industry. Their design means that the measured medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismounting is possible for cleaning.

#### Technical specifications

##### Quick-release diaphragm seal

| Connection, nominal diameter          | Nominal pressure |
|---------------------------------------|------------------|
| <u>For pressure</u>                   |                  |
| • To DIN 11851 with slotted union nut |                  |
| - DN 25                               | PN 40            |
| - DN 32                               | PN 40            |
| - DN 40                               | PN 40            |
| - DN 50                               | PN 25            |
| - DN 65                               | PN 25            |
| - DN 80                               | PN 25            |
| • To DIN 11851 with threaded socket   |                  |
| - DN 25                               | PN 40            |
| - DN 32                               | PN 40            |
| - DN 40                               | PN 40            |
| - DN 50                               | PN 25            |
| - DN 65                               | PN 25            |
| - DN 80                               | PN 25            |

##### For pressure



##### • Clamp connection

- |           |       |
|-----------|-------|
| - 1½ inch | PN 16 |
| - 2 inch  | PN 16 |
| - 2½ inch | PN 16 |
| - 3 inch  | PN 10 |

##### For differential pressure and flow

##### • To DIN 11851 with slotted union nut

- |         |       |
|---------|-------|
| - DN 50 | PN 25 |
| - DN 65 | PN 25 |
| - DN 80 | PN 25 |

##### • To DIN 11851 with threaded socket

- |         |       |
|---------|-------|
| - DN 50 | PN 25 |
| - DN 65 | PN 25 |
| - DN 80 | PN 25 |

##### • Clamp connection

- |           |       |
|-----------|-------|
| - 2 inch  | PN 16 |
| - 2½ inch | PN 16 |
| - 3 inch  | PN 10 |

##### Sealing face

- For stainless steel, mat. No. 1.4404/316L

To EN 1092-1, form B1 or ASME B 16.5RF 125 ... 250 AA

- For the other materials

To EN 1092-1, form B2 or ASME B16.5 RFSF

##### Materials

- Main body
- Wetted parts
- Capillary

Stainless steel 316L

Stainless steel 316L

Stainless steel, mat. No. 1.4571/316Ti

- Sheath

Spiral protective tube made of stainless steel, mat. No. 1.4301/316

##### Maximum pressure

See above and the technical data of the pressure transmitter

##### Tube length

Without tube

##### Capillary

- Length

Max. 10 m (32.8 ft), longer lengths on request

- Internal diameter

2 mm (0.079 inch)

- Minimum bending radius

150 mm (5.9 inch)

- Sheath

Spiral protective tube made of stainless steel, mat. No. 1.4301/316

##### Filling liquid

Food oil (FDA listed)

##### Permissible ambient temperature

Dependent on the pressure transmitter and the filling liquid of the remote seal

More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals

##### Weight

Approx. 4 kg (8.82 lb)

##### Certificates and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

##### EHEDG

Complies with EHEDG recommendations

## Selection and Ordering data Article No. Ord. code

## Quick-release diaphragm seal

for SITRANS P pressure transmitters for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-...<sup>1)</sup>; must be ordered separately  
Filling liquid: Food oil (FDA listed)  
Material: Stainless steel, mat. No. 1.4435

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

## Nom. diam.

## Nom. press.

- Connection to DIN 11851 with slotted union nut
  - DN 25 PN 40
  - DN 32 PN 40
  - DN 40 PN 40
  - DN 50 PN 25
  - DN 65 PN 25
  - DN 80 PN 25
- Connection to DIN 11851 with screw necks
  - DN 25 PN 40
  - DN 32 PN 40
  - DN 40 PN 40
  - DN 50 PN 25
  - DN 65 PN 25
  - DN 80 PN 25
- Tri-Clamp connection to DIN 32676/ISO 2852
  - DN 40/1½ inch PN 16
  - DN 50/2 inch PN 16
  - DN 65/2½ inch PN 16
  - DN 80/3 inch PN 10

Other version

Add Order codes and plain text:

Process connection: ..., Nominal diameter: ...;

Nominal pressure: ...

## Filling liquid

- Food oil (FDA listed)

Other version

Add Order code and plain text:

Filling liquid: ...

## Connection to pressure transmitter

- direct

through capillary, length:<sup>2)</sup>

- 1.0 m (3.28 ft)
- 1.6 m (5.25 ft)
- 2.5 m (8.20 ft)
- 4.0 m (13.1 ft)
- 6.0 m (19.7 ft)
- 8.0 m (26.25 ft)
- 10.0 m (32.8 ft)

## Special lengths for capillaries

- 2.0 m (6.56 ft)
- 3.0 m (9.84 ft)
- 5.0 m (16.40 ft)
- 7.0 m (23.97 ft)
- 9.0 m (29.53 ft)

7MF4940 -

A 0 - B

1 B

1 C

1 D

1 E

1 F

1 G

2 B

2 C

2 D

2 E

2 F

2 G

4 L

4 M

4 N

4 P

9 A

H 1 Y

7

9

M 1 Y

0

2

3

4

5

6

7

8

9

N 1 C

9

N 1 E

9

N 1 G

9

N 1 J

9

N 1 L

## Selection and Ordering data Ord. code

## Further designs

Please add "-Z" to Article No. and specify Order code.

## Remote seal nameplate

Attached out of stainless steel, contains MLFB and order number of the remote seal

## Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2

## Inspection certificate

to EN 10204, section 3.1

## 2.2 Certificate of FDA approval of fill oil

Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"

## Functional safety certificate ("SIL 2") to IEC 61508

(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)

## Functional safety certificate ("SIL 2/3") to IEC 61508

(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)

## One-sided mounting on differential pressure transmitters

(only for 7MF4940-...)

on high-pressure side

on low-pressure side

## PE protective tube

over the spiral protective tube of the capillaries (color: white)

1.0 m (3.28 ft)

1.6 m (5.25 ft)

2.0 m (6.56 ft)

2.5 m (8.20 ft)

3.0 m (9.84 ft)

4.0 m (13.12 ft)

5.0 m (16.40 ft)

6.0 m (19.69 ft)

7.0 m (22.97 ft)

8.0 m (26.25 ft)

9.0 m (29.53 ft)

10.0 m (32.81 ft)

10.0 m (32.81 ft)

10.0 m (32.81 ft)

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10.0 m (32.81 ft)

10.0 m (32.81 ft)

10.0 m (32.81 ft)

Ord. code

B20

C11

C12

C17

C20

C23

H10

H11

N20

N21

N22

N23

N24

N25

N26

N27

N28

N29

N30

N31

## PTFE protective tube

over the spiral protective tube of the capillaries (color: transparent)

1.0 m (3.28 ft)

1.6 m (5.25 ft)

2.0 m (6.56 ft)

2.5 m (8.20 ft)

3.0 m (9.84 ft)

4.0 m (13.12 ft)

5.0 m (16.40 ft)

6.0 m (19.69 ft)

7.0 m (22.97 ft)

8.0 m (26.25 ft)

9.0 m (29.53 ft)

10.0 m (32.81 ft)

N40

N41

N42

N43

N44

N45

N46

N47

N48

N49

N50

N51

<sup>1)</sup> With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.

<sup>2)</sup> Max. capillary length, see section "Technical description"

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Quick-release diaphragm seals

| Selection and Ordering data  | Ord. code  |
|--|------------|
| <b>Further designs</b><br>Please add <b>"-Z"</b> to Article No. and specify Order code.  |            |
| <b>PVC protective tube</b><br>over the spiral protective tube of the capillaries<br>(color: black)   |            |
| 1.0 m (3.28 ft)  | <b>N60</b> |
| 1.6 m (5.25 ft)  | <b>N61</b> |
| 2.0 m (6.56 ft)  | <b>N62</b> |
| 2.5 m (8.20 ft)  | <b>N63</b> |
| 3.0 m (9.84 ft)  | <b>N64</b> |
| 4.0 m (13.12 ft)   | <b>N65</b> |
| 5.0 m (16.40 ft)   | <b>N66</b> |
| 6.0 m (19.69 ft)   | <b>N67</b> |
| 7.0 m (22.97 ft)   | <b>N68</b> |
| 8.0 m (26.25 ft)   | <b>N69</b> |
| 9.0 m (29.53 ft)   | <b>N70</b> |
| 10.0 m (32.81 ft)  | <b>N71</b> |
| <b>Cooling element</b><br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.   | <b>R22</b> |
| <b>Negative pressure service</b><br>for use in low-pressure range for transmitters for <ul style="list-style-type: none"> <li>gauge and absolute pressure from the pressure series</li> </ul>          | <b>V01</b> |
| <b>Extended negative pressure service</b><br>for use in low-pressure range for transmitters for <ul style="list-style-type: none"> <li>gauge and absolute pressure from the pressure series</li> </ul> | <b>V51</b> |

| Selection and Ordering data  |  | Article No.  | Ord. code | Selection and Ordering data   | Order code |
|--|--|--|-----------|---|------------|
| <b>Quick-release diaphragm seal</b>  |  | <b>7 M F 4 9 4 3 -</b>   |           | <b>Further designs</b>  |            |
| for SITRANS P pressure transmitters for pressure for differential pressure and flow, type 7MF243...; 7MF443... and 7MF54...; order separately<br>Filling liquid: Food oil (FDA listed)<br>Material: Stainless steel, mat. No. 1.4435<br>Delivery unit: 2 off   |  | <b>A 0 - B</b>   |           | Please add "-Z" to Article No. and specify Order code.  |            |
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  |  |  |           | <b>Remote seal nameplate</b>  | <b>B20</b> |
|  |  |  |           | Attached out of stainless steel, contains MLFB and order number of the remote seal  |            |
|  |  |  |           | <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>  | <b>C11</b> |
|  |  |  |           | <b>Inspection certificate</b><br>to EN 10204, section 3.1   | <b>C12</b> |
|  |  |  |           | <b>2.2 Certificate of FDA approval of fill oil</b><br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"                                   | <b>C17</b> |
|  |  |  |           | <b>Functional safety certificate ("SIL 2") to IEC 61508</b><br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)   | <b>C20</b> |
|  |  |  |           | <b>Functional safety certificate ("SIL 2/3") to IEC 61508</b><br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) | <b>C23</b> |
|  |  |  |           | <b>PE protective tube</b><br>over the spiral protective tube of the capillaries (color: white)  |            |
|  |  |  |           | 1.0 m (3.28 ft)   | <b>N20</b> |
|  |  |  |           | 1.6 m (5.25 ft)   | <b>N21</b> |
|  |  |  |           | 2.0 m (6.56 ft)   | <b>N22</b> |
|  |  |  |           | 2.5 m (8.20 ft)   | <b>N23</b> |
|  |  |  |           | 3.0 m (9.84 ft)   | <b>N24</b> |
|  |  |  |           | 4.0 m (13.12 ft)  | <b>N25</b> |
|  |  |  |           | 5.0 m (16.40 ft)  | <b>N26</b> |
|  |  |  |           | 6.0 m (19.69 ft)  | <b>N27</b> |
|  |  |  |           | 7.0 m (22.97 ft)  | <b>N28</b> |
|  |  |  |           | 8.0 m (26.25 ft)  | <b>N29</b> |
|  |  |  |           | 9.0 m (29.53 ft)  | <b>N30</b> |
|  |  |  |           | 10.0 m (32.81 ft)   | <b>N31</b> |
|  |  |  |           | <b>PTFE protective tube</b><br>over the spiral protective tube of the capillaries (color: transparent)  |            |
|  |  |  |           | 1.0 m (3.28 ft)   | <b>N40</b> |
|  |  |  |           | 1.6 m (5.25 ft)   | <b>N41</b> |
|  |  |  |           | 2.0 m (6.56 ft)   | <b>N42</b> |
|  |  |  |           | 2.5 m (8.20 ft)   | <b>N43</b> |
|  |  |  |           | 3.0 m (9.84 ft)   | <b>N44</b> |
|  |  |  |           | 4.0 m (13.12 ft)  | <b>N45</b> |
|  |  |  |           | 5.0 m (16.40 ft)  | <b>N46</b> |
|  |  |  |           | 6.0 m (19.69 ft)  | <b>N47</b> |
|  |  |  |           | 7.0 m (22.97 ft)  | <b>N48</b> |
|  |  |  |           | 8.0 m (26.25 ft)  | <b>N49</b> |
|  |  |  |           | 9.0 m (29.53 ft)  | <b>N50</b> |
|  |  |  |           | 10.0 m (32.81 ft)   | <b>N51</b> |
| <b>Nom. diam.</b>  |  |  |           |   |            |
| <b>Nom. press.</b>   |  |  |           |   |            |
| <ul style="list-style-type: none"> <li>Connection to DIN 11851 with slotted union nut               <ul style="list-style-type: none"> <li>- DN 50 PN 25</li> <li>- DN 65 PN 25</li> <li>- DN 80 PN 25</li> </ul> </li> <li>Connection to DIN 11851 with threaded socket               <ul style="list-style-type: none"> <li>- DN 50 PN 25</li> <li>- DN 65 PN 25</li> <li>- DN 80 PN 25</li> </ul> </li> <li>Tri-Clamp connection to DIN 32676/ ISO 2852               <ul style="list-style-type: none"> <li>- DN 50/2 inch PN 16</li> <li>- DN 65/2½ inch PN 16</li> <li>- DN 80/3 inch PN 10</li> </ul> </li> </ul> |  | <b>1 E</b><br><b>1 F</b><br><b>1 G</b><br><br><b>2 E</b><br><b>2 F</b><br><b>2 G</b><br><br><b>4 M</b><br><b>4 N</b><br><b>4 P</b> |           |   |            |
| Other version<br>Add Order codes and plain text:<br>Process connection: ..., Nominal diameter: ...;<br>Nominal pressure: ...   |  | <b>9 A</b>   |           | <b>H 1 Y</b>  |            |
| <b>Filling liquid</b>  |  |  |           |   |            |
| <ul style="list-style-type: none"> <li>Food oil (FDA listed)</li> </ul>  |  | <b>7</b>   |           |   |            |
| Other version<br>Add Order code and plain text:<br>Filling liquid: ...   |  | <b>9</b>   |           | <b>M 1 Y</b>  |            |
| <b>Connection to transmitter</b>   |  |  |           |   |            |
| through capillary, Length: <sup>1)</sup>   |  |  |           |   |            |
| <ul style="list-style-type: none"> <li>1.0 m (3.28 ft)</li> <li>1.6 m (5.25 ft)</li> <li>2.5 m (8.20 ft)</li> <li>4.0 m (13.1 ft)</li> <li>6.0 m (19.7 ft)</li> <li>8.0 m (26.25 ft)</li> <li>10.0 m (32.8 ft)</li> </ul>  |  | <b>2</b><br><b>3</b><br><b>4</b><br><b>5</b><br><b>6</b><br><b>7</b><br><b>8</b>   |           |   |            |
| <b>Special lengths for capillaries</b>   |  |  |           |   |            |
| <ul style="list-style-type: none"> <li>2.0 m (6.56 ft)</li> <li>3.0 m (9.84 ft)</li> <li>5.0 m (16.40 ft)</li> <li>7.0 m (23.97 ft)</li> <li>9.0 m (29.53 ft)</li> </ul>   |  | <b>9</b><br><b>9</b><br><b>9</b><br><b>9</b><br><b>9</b>   |           | <b>N 1 C</b><br><b>N 1 E</b><br><b>N 1 G</b><br><b>N 1 J</b><br><b>N 1 L</b>  |            |

<sup>1)</sup> Max. capillary length, see section "Technical description"

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Quick-release diaphragm seals

#### Selection and Ordering data

##### Further designs

Please add **"-Z"** to Article No. and specify Order code.

##### PVC protective tube

over the spiral protective tube of the capillaries  
(color: black)

|                   |            |
|-------------------|------------|
| 1.0 m (3.28 ft)   | <b>N60</b> |
| 1.6 m (5.25 ft)   | <b>N61</b> |
| 2.0 m (6.56 ft)   | <b>N62</b> |
| 2.5 m (8.20 ft)   | <b>N63</b> |
| 3.0 m (9.84 ft)   | <b>N64</b> |
| 4.0 m (13.12 ft)  | <b>N65</b> |
| 5.0 m (16.40 ft)  | <b>N66</b> |
| 6.0 m (19.69 ft)  | <b>N67</b> |
| 7.0 m (22.97 ft)  | <b>N68</b> |
| 8.0 m (26.25 ft)  | <b>N69</b> |
| 9.0 m (29.53 ft)  | <b>N70</b> |
| 10.0 m (32.81 ft) | <b>N71</b> |

##### Negative pressure service

for use in low-pressure range for transmitters for

- differential pressure

**V03**

##### Extended negative pressure service

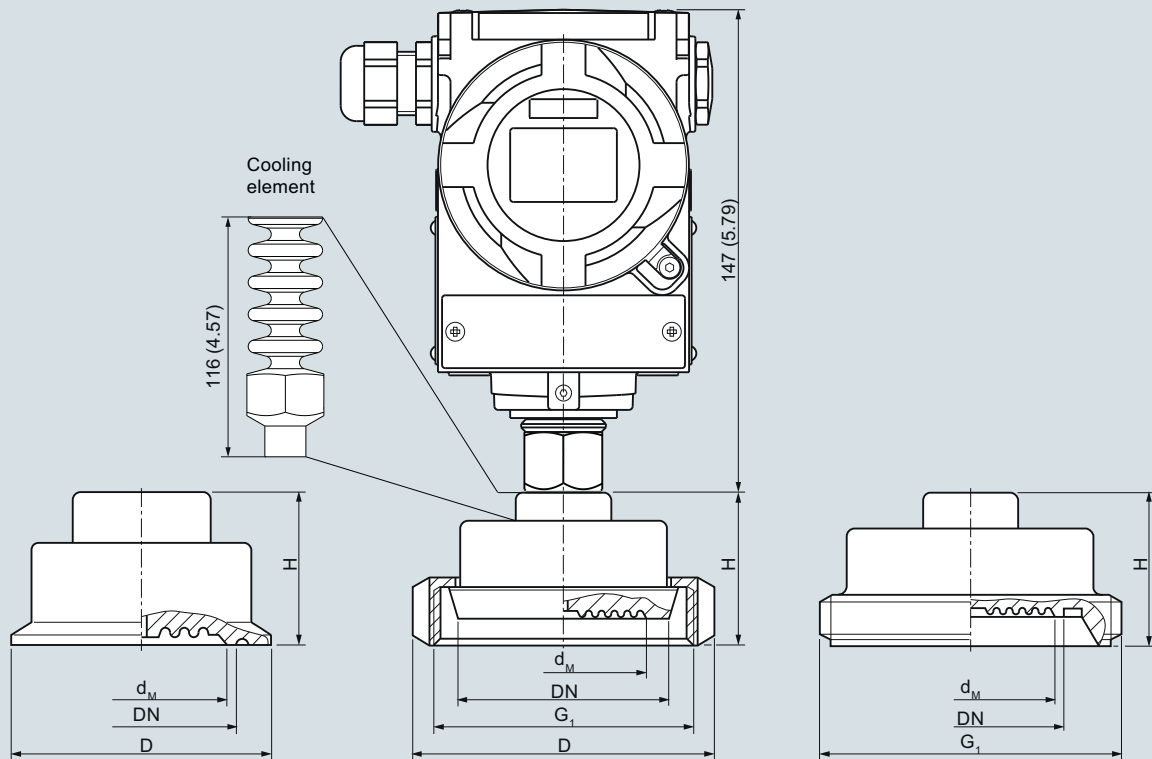
for use in low-pressure range for transmitters for

- differential pressure

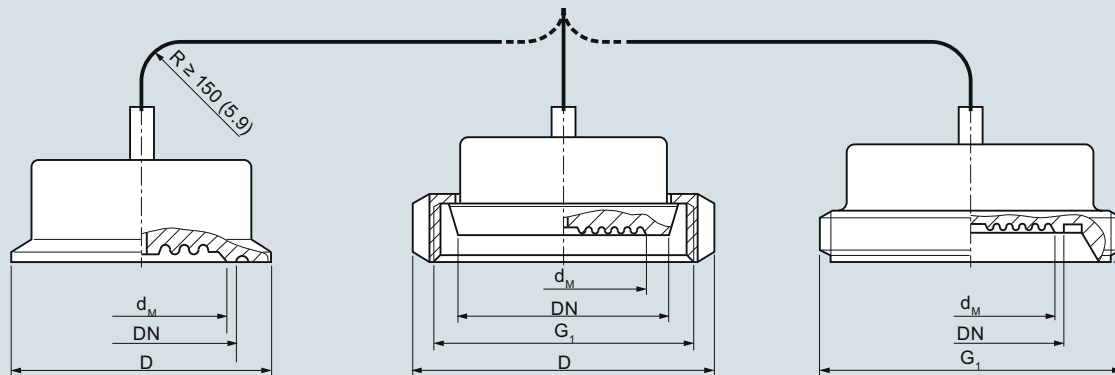
**V53**



## Dimensional drawings



Mounted directly on SITRANS P transmitter for pressure



Mounted on SITRANS P transmitter for pressure or differential pressure and flow

Quick-release diaphragm seal, dimensions in mm (inch)

## Clamp connection (left)

| DN           | Ø d <sub>M</sub> | Ø D         | H         |
|--------------|------------------|-------------|-----------|
| 40 (1½ inch) | 32 (1.26)        | 50.5 (2)    | 35 (1.38) |
| 50 (2 inch)  | 40 (1.57)        | 64 (2.52)   | 35 (1.38) |
| 65 (2½ inch) | 52 (2.05)        | 77.5 (3.05) | 35 (1.38) |
| 80 (3 inch)  | 72 (2.83)        | 91 (3.58)   | 35 (1.38) |

## Connection to DIN 11851 with slotted union nut (center)

| DN | Ø d <sub>M</sub> | Ø D | H  | G <sub>1</sub> |
|----|------------------|-----|----|----------------|
| 25 | 25               | 63  | 36 | Rd 52x1/6      |
| 32 | 32               | 70  | 36 | Rd 52x1/6      |
| 40 | 40               | 78  | 36 | Rd 65x1/6      |
| 50 | 52               | 112 | 36 | Rd 78x1/6      |
| 65 | 65               | 112 | 36 | Rd 95x1/6      |
| 80 | 72               | 127 | 36 | Rd 110x1/6     |
| 25 | 25               | 63  | 36 | Rd 52x1/6      |

## Connection to DIN 11851 with threaded socket (right)

| DN | Ø d <sub>M</sub> | H  | G <sub>1</sub> |
|----|------------------|----|----------------|
| 25 | 25               | 36 | Rd 52x1/6      |
| 32 | 32               | 36 | Rd 52x1/6      |
| 40 | 40               | 36 | Rd 65x1/6      |
| 50 | 52               | 36 | Rd 78x1/6      |
| 65 | 65               | 36 | Rd 95x1/6      |
| 80 | 72               | 36 | Rd 110x1/6     |

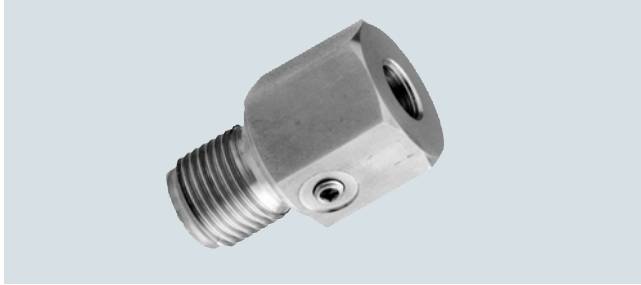
d<sub>M</sub> Effective diaphragm diameter

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Miniature diaphragm seals

#### Overview



Miniature diaphragm seals

The miniature diaphragm seals are available for the following SITRANS P pressure transmitter series for pressure:

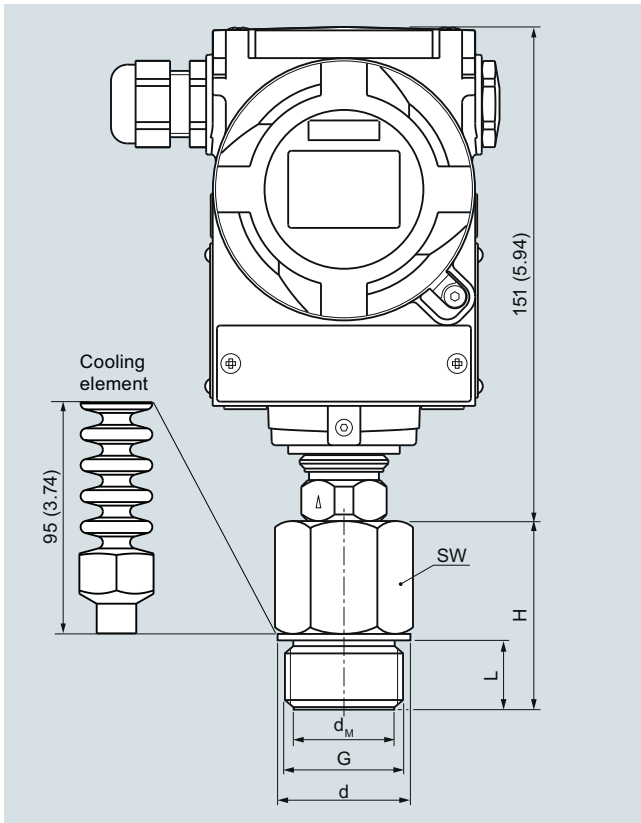
- P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus

Suitable for high pressures, contaminated, fibrous and viscous media in the chemical, paper, food and drink industries.

#### Design

- Flush-mounted diaphragm
- No dead spaces
- Fixed threaded stems

#### Dimensional drawings



Miniature diaphragm seal, dimensions in mm (inch)

| G    | Ø d <sub>M</sub> |        | SW |        | Ø d |        | L  |        | H  |        |
|------|------------------|--------|----|--------|-----|--------|----|--------|----|--------|
|      | mm               | (inch) | mm | (inch) | mm  | (inch) | mm | (inch) | mm | (inch) |
| G1B  | 25               | (0.98) | 41 | (1.61) | 39  | (1.53) | 28 | (1.1)  | 56 | (2.21) |
| G1½B | 40               | (1.57) | 55 | (2.17) | 60  | (2.36) | 30 | (1.18) | 50 | (1.97) |
| G2B  | 50               | (1.97) | 60 | (2.36) | 70  | (2.76) | 30 | (1.18) | 63 | (2.48) |

| G       | Ø d <sub>M</sub> |        | SW |        | L  |        | H  |        |
|---------|------------------|--------|----|--------|----|--------|----|--------|
|         | mm               | (inch) | mm | (inch) | mm | (inch) | mm | (inch) |
| 1"-NPT  | 27               | (1.06) | 41 | (1.61) | 25 | (0.98) | 40 | (1.57) |
| 1½"-NPT | 34               | (1.34) | 55 | (2.17) | 26 | (1.02) | 45 | (1.77) |
| 2"-NPT  | 46               | (1.81) | 65 | (2.56) | 26 | (1.02) | 45 | (1.77) |

d<sub>M</sub>: Effective diaphragm diameter

#### Technical specifications

##### Miniature diaphragm seals

|  |  |
|--|--|
| Span with  |  |
| • G1B and 1"-NPT   | > 6 bar (> 87 psi)   |
| • G1½B and 1½"-NPT   | > 2 bar (> 29 psi)   |
| • G2B and 2"-NPT   | > 600 mbar (> 8.7 psi)   |
| Filling liquid   | Silicone oil M5 or food oil (FDA listed)   |
| Material   |  |
| • Main body  | Stainl. steel mat No. 1.4404/ 316L or Hastelloy C276, mat No. 2.4819   |
| • Diaphragm  | Stainl. steel mat No. 1.4404 / 316L or Hastelloy C276, mat. No. 2.4819   |
| Maximum pressure   | 100% of nominal pressure of pressure transmitter, up to maximum of PN 400 (5802 psi) (depending on the seal used)                          |
| Temperature of use   | Same as pressure transmitter   |
| Temperature range of medium  | Same as pressure transmitter   |
| Max. recommended process temperature                                       | 150 °C (302 °F)  |
| Weight   |  |
| • G1B and 1"-NPT   | Approx. 0.3 kg (approx. 0.66 lb)   |
| • G1½B and 1½"-NPT   | Approx. 0.5 kg (approx. 1.10 lb)   |
| • G2B and 2"-NPT   | Approx. 0.8 kg (approx. 1.76 lb)   |
| <b>Certificate and approvals</b>   |  |
| Classification according to pressure equipment directive (DGRL 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) |

| Selection and Ordering data  |   | Article No. Ord. code           |  | Selection and Ordering data  |  | Order code |  |
|--|---|---------------------------------|--|--|--|------------|--|
| <b>Miniature diaphragm seals</b>   |   | 7MF4960-                        |  | <b>Further designs</b>   |  |            |  |
| directly fitted to SITRANS P pressure transmitters for pressure; type, 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (vacuum-proof design) and 7MF802-... <sup>1)</sup> ; must be ordered separately<br>Material: Stainless steel, mat. No. 1.4404/316L<br>Nominal pressure, see "Pressure transmitters" |   | 1 0                             |  | Please add "-Z" to Article No. and specify Order code.   |  |            |  |
| ➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.  |   |                                 |  | <b>Remote seal nameplate</b>   |  | <b>B20</b> |  |
|  |   |                                 |  | Attached out of stainless steel, contains MLFB and order number of the remote seal   |  |            |  |
|  |   |                                 |  | <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>   |  | <b>C11</b> |  |
|  |   |                                 |  | <b>Inspection certificate</b><br>to EN 10204, section 3.1  |  | <b>C12</b> |  |
|  |   |                                 |  | <b>2.2 Certificate of FDA approval of fill oil</b><br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"  |  | <b>C17</b> |  |
|  |   |                                 |  | <b>Functional safety certificate ("SIL 2") to IEC 61508</b><br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)                                  |  | <b>C20</b> |  |
|  |   |                                 |  | <b>Functional safety certificate ("SIL 2/3") to IEC 61508</b><br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)                                |  | <b>C23</b> |  |
|  |   |                                 |  | <b>Certification acc. to NACE MR-0175</b><br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) |  | <b>D07</b> |  |
|  |   |                                 |  | <b>Certification acc. to NACE MR-0103</b><br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) |  | <b>D08</b> |  |
|  |   |                                 |  | <b>Cooling element</b><br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.   |  | <b>R22</b> |  |
|  |   |                                 |  | <b>Negative pressure service</b><br>for use in low-pressure range for transmitters for<br>• gauge and absolute pressure from the pressure series   |  | <b>V01</b> |  |
|  |   |                                 |  | <b>Extended negative pressure service</b><br>for use in low-pressure range for transmitters for<br>• gauge and absolute pressure from the pressure series                                  |  | <b>V51</b> |  |
| <b>Process connection</b>  |   | C<br>D<br>E<br>K<br>L<br>M<br>Z |  | J 1 Y  |  |            |  |
| • G1B<br>• G1½B<br>• G2B<br>• 1" - NPT<br>• 1½" - NPT<br>• 2" - NPT<br>Other version, add Order code and plain text:<br>Process connection: ...  |   |                                 |  |  |  |            |  |
| <b>Material</b>  |   |                                 |  |  |  |            |  |
| Remote seal enclosure  | Wetted parts materials  |                                 |  |  |  |            |  |
| Stainless steel<br>mat. No. 1.4404/316L  | Stainless steel<br>mat. No. 1.4404/316L                                   | A                               |  |  |  |            |  |
| Hastelloy C276   | Hastelloy C276  | J                               |  |  |  |            |  |
| Stainless steel<br>mat. No. 1.4404/316L  | Other version<br>Add Order code and plain text:<br>Wetted parts materials | Z                               |  | K 1 Y  |  |            |  |
| <b>Wetted parts materials</b>  |   |                                 |  |  |  |            |  |
| • Stainless steel 316L<br>Other version, add Order code and plain text:<br>Wetted parts materials: ...   |   | A<br>Z                          |  | K 1 Y  |  |            |  |
| <b>Filling liquid</b>  |   |                                 |  |  |  |            |  |
| • Silicone oil M5<br>• Food oil (FDA listed)<br>Other version, add Order code and plain text:<br>Filling liquid: ...   |   | 1<br>7<br>9                     |  | M 1 Y  |  |            |  |

<sup>1)</sup> With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.

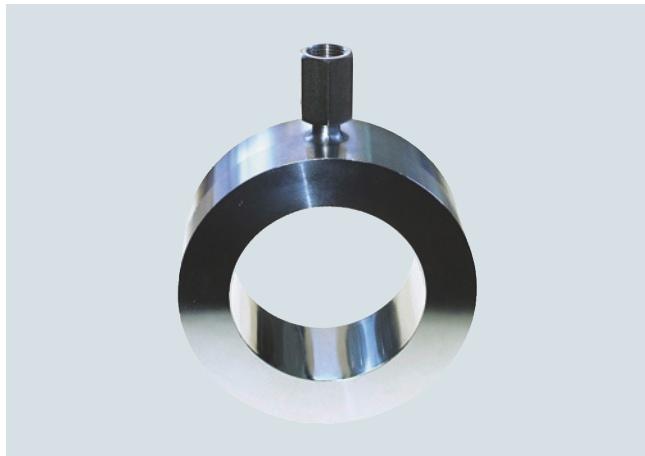
## Pressure Measurement

### Remote seals for transmitters and pressure gauges SITRANS P DS III

#### Clamp-on seals of flange design

1

#### Overview



Inline seals for flange-mounting

The inline seal is completely integrated in the process line. It is particularly suitable for flowing and highly viscous media.

The inline remote seal consists of a cylindrical jacket into which a thin-walled pipe is welded. It is clamped directly between two flanges in the pipeline.

#### Design

- Inline seals for flange-mounting (flange design) to EN/ASME for SITRANS P pressure transmitters
  - For pressure: P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
  - For differential pressure and flow: DS III with HART, DS III with PROFIBUS PA, DS III with FOUNDATION Fieldbus and P500
- Sealing face to EN 1092-1 or ASME B16.5
- Connection to the transmitter directly or by means of a flexible capillary (max. 10 m long)
- See Technical data for details of materials used for the wetted parts
- Material used for the capillary, the guard sleeve, the seal's main body and the measuring cell: Stainless steel, mat.-No. 1.4571
- Filling liquid: Silicone oil, high-temperature oil, halocarbon oil, food oil (FDA listed) or glycerin/water (not suitable for uses in low-pressure range)

#### Function

The measured pressure is transferred from the diaphragm to the filling liquid and passes either directly or through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

#### Note:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof remote seal (see Selection and Ordering data).

#### Technical specifications

##### Inline seals for flange-mounting

|  |   |
|--|---|
| Nominal diameter   | Nominal pressure  |
| • DN 25  | PN 6 ... PN 100   |
| • DN 40  | PN 6 ... PN 100   |
| • DN 50  | PN 6 ... PN 100   |
| • DN 80  | PN 6 ... PN 100   |
| • DN 100   | PN 6 ... PN 100   |
| • 1 inch   | Class 150 ... class 2500  |
| • 1½ inch  | Class 150 ... class 2500  |
| • 2 inch   | Class 150 ... class 2500  |
| • 3 inch   | Class 150 ... class 2500  |
| • 4 inch   | Class 150 ... class 2500  |
| Process connection   | Flange to EN 1092-1 or ASME B 16.5  |
| Sealing face   | <ul style="list-style-type: none"> <li>• for stainless steel mat. no. 1.4404/316L according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA</li> <li>• for all other materials according to EN 1092-1, form B2 or ASME B16.5 RFSF</li> </ul>  |
| Materials  | Stainless steel 1.4404/316L<br>Stainless steel 1.4404/316L<br>Stainless steel 1.4404/316L<br><ul style="list-style-type: none"> <li>• Without coating</li> <li>• ECTFE coating (for vacuum on request)</li> <li>• PFA coating</li> </ul> Monel 400, mat. No. 2.4360<br>Hastelloy C276, mat. No. 2.4819<br>Hastelloy C4, mat. No. 2.4602<br>Tantalum |
| • Main body  |   |
| • Diaphragm  |   |
| • Wetted parts   |   |
| • Capillary  | Stainless steel, mat. No. 1.4571/316Ti  |
| • Sheath   | Spiral protective tube made of stainless steel, mat. No. 1.4301/316   |
| Capillary  |   |
| • Length   | Max. 10 m (32.8 ft)   |
| • Internal diameter  | 2 mm (0.079 inch)   |
| • Minimum bending radius   | 150 mm (5.9 inch)   |
| Filling liquid   | Silicone oil M5<br>Silicone oil M50<br>High-temperature oil<br>Halocarbon oil<br>Food oil (FDA listed)  |
| Permissible ambient temperature  | See pressure transmitters, see filling liquid   |
| Weight   | Approx. 4 kg (8.82 lb)  |
| <b>Certificates and approvals</b>  |   |
| Classification according to pressure equipment directive (DGRL 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord  |

| Selection and Ordering data  |   | Article No.Ord. code |  |
|--|---|----------------------|--|
| <b>Inline seal for flange-mounting for SITRANS P pressure transmitters</b>   |   |                      |  |
| <b>for gauge pressure</b><br>7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; must be ordered separately, scope of delivery: 1 off   | 7MF4980-  |                      |  |
| <b>for differential pressure and flow</b><br>7MF243-...; 7MF4433 or 7MF54-...; order separately, scope of delivery: 1 pair (set); Material: Completely of stainless steel, mat. No. 1.4404/316L; Process connection to EN 1092-1 or ASME B16.5; sealing face to EN 1092-1, form B1, or to ASME B16.5 RF 125 ... 250 AA   | 7MF4983-  |                      |  |
| <a href="#">↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>  | 10-B  |                      |  |
| <b>Nominal diameter and nominal pressure</b><br><br>• DN 25 PN 6 ... 100<br>• DN 40 PN 6 ... 100<br>• DN 50 PN 6 ... 100<br>• DN 80 PN 6 ... 100<br>• DN 100 PN 6 ... 100<br><br>• 1 inch Class 150 ... 2500<br>• 1½ inch Class 150 ... 2500<br>• 2 inch Class 150 ... 2500<br>• 3 inch Class 150 ... 2500<br>• 4 inch Class 150 ... 2500<br><br>Other version<br>Add Order code and plain text:<br>Nominal diameter: ...; Nominal pressure: ... | B<br>D<br>E<br>G<br>H<br><br>L<br>M<br>N<br>P<br>Q<br>Z | J1Y                  |  |
| <b>Wetted parts materials</b><br>• Stainless steel 316L<br>- Without coating<br>- With PFA coating <sup>2)</sup><br>- With ECTFE coating <sup>2)3)</sup><br>• Monel 400, mat. No. 2.4360<br>• Hastelloy C276, mat. No. 2.4819<br>• Hastelloy C4, mat. No. 2.4602<br>• Tantalum<br>Other version<br>Add Order code and plain text:<br>Wetted parts materials: ...   | A<br>D<br>F<br>G<br>J<br>U<br>K<br>Z                    | K1Y                  |  |
| <b>Filling liquid</b><br>• Silicone oil M5<br>• Silicone oil M50<br>• High-temperature oil<br>• Halocarbon oil (for measuring O <sub>2</sub> ) <sup>4)</sup><br>• Food oil (FDA listed)<br>Other version<br>Add Order code and plain text:<br>Filling liquid: ...  | 1<br>2<br>3<br>4<br>7<br>9                              | M1Y                  |  |

| Selection and Ordering data   |  | Article No.Ord. code   |  |
|---|--|--|--|
| <b>Inline seal for flange-mounting for SITRANS P pressure transmitters</b>  |  |  |  |
| <b>for gauge pressure</b><br>7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; must be ordered separately, scope of delivery: 1 off  | 7MF4980-   |  |  |
| <b>for differential pressure and flow</b><br>7MF243-...; 7MF4433 or 7MF54-...; order separately, scope of delivery: 1 pair (set); Material: Completely of stainless steel, mat. No. 1.4404/316L; Process connection to EN 1092-1 or ASME B16.5; sealing face to EN 1092-1, form B1, or to ASME B16.5 RF 125 ... 250 AA  | 7MF4983-   |  |  |
| <a href="#">↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>   | 10-B   |  |  |
| <b>Connection to transmitter</b><br>• direct (only for 7MF4980) through capillary, length: <sup>5)</sup><br>• 1.0 m (3.28 ft)<br>• 1.6 m (5.25 ft)<br>• 2.5 m (8.20 ft)<br>• 4.0 m (13.1 ft)<br>• 6.0 m (19.7 ft)<br>• 8.0 m (26.25 ft)<br>• 10.0 m (32.8 ft)<br><br><b>Special lengths for capillaries</b><br>• 2.0 m (6.56 ft)<br>• 3.0 m (9.84 ft)<br>• 5.0 m (16.40 ft)<br>• 7.0 m (23.97 ft)<br>• 9.0 m (29.53 ft)<br><br><u>only for 7MF4983-...</u><br>• 11.0 m (36.09 ft)<br>• 12.0 m (39.37 ft)<br>• 13.0 m (42.65 ft)<br>• 14.0 m (45.93 ft)<br>• 15.0 m (49.21 ft) | 0<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br><br>9<br>9<br>9<br>9<br>9<br><br>9<br>9<br>9<br>9<br>9 | N1C<br>N1E<br>N1G<br>N1J<br>N1L<br><br>N1N<br>N1P<br>N1Q<br>N1R<br>N1S |  |

1) With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.

2) Only for use in non-hazardous atmospheres.

3) For vacuum on request.

4) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10

5) Max. capillary length, see section "Technical description"

# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

## Clamp-on seals of flange design

1

| Selection and Ordering data   | Order code | Selection and Ordering data  | Order code |
|---|------------|--|------------|
| <b>Further designs</b>  |            | <b>Further designs</b>   |            |
| Please add <b>"-Z"</b> to Article No. and specify Order code.   |            | Please add <b>"-Z"</b> to Article No. and specify Order code.  |            |
| <b>Spark arrestor</b><br>With spark arrestor for mounting on zone 0 (including documentation)   |            | <b>PE protective tube</b><br>over the spiral protective tube of the capillaries (color: white)         |            |
| • Pressure and absolute pressure  | <b>A01</b> | 1.0 m (3.28 ft)  | <b>N20</b> |
| • for differential pressure transmitters  | <b>A02</b> | 1.6 m (5.25 ft)  | <b>N21</b> |
| <b>Remote seal nameplate</b>  | <b>B20</b> | 2.0 m (6.56 ft)  | <b>N22</b> |
| Attached out of stainless steel, contains MLFB and order number of the remote seal  |            | 2.5 m (8.20 ft)  | <b>N23</b> |
| <b>Oil- and grease-free cleaned version</b>   | <b>C10</b> | 3.0 m (9.84 ft)  | <b>N24</b> |
| Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2  |            | 4.0 m (13.12 ft)   | <b>N25</b> |
| <b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>  | <b>C11</b> | 5.0 m (16.40 ft)   | <b>N26</b> |
| <b>Inspection certificate</b><br>to EN 10204, section 3.1   | <b>C12</b> | 6.0 m (19.69 ft)   | <b>N27</b> |
| <b>2.2 Certificate of FDA approval of fill oil</b><br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"   | <b>C17</b> | 7.0 m (22.97 ft)   | <b>N28</b> |
| <b>Functional safety certificate ("SIL 2") to IEC 61508</b><br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)   | <b>C20</b> | 8.0 m (26.25 ft)   | <b>N29</b> |
| <b>Functional safety certificate ("SIL 2/3") to IEC 61508</b>   | <b>C23</b> | 9.0 m (29.53 ft)   | <b>N30</b> |
| <b>Certification acc. to NACE MR-0175</b><br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)  | <b>D07</b> | 10.0 m (32.81 ft)  | <b>N31</b> |
| <b>Certification acc. to NACE MR-0103</b><br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)  | <b>D08</b> | <u>only for 7MF4983-...</u>  |            |
| <b>Oil- and grease-free cleaned version</b><br>Oil- and grease-free cleaned and packed version, <u>only for oxygen application</u> , only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 | <b>E10</b> | 11.0 m (36.09 ft)  | <b>N32</b> |
| <b>One-sided mounting on differential pressure transmitters</b><br>(only for 7MF4980-...)<br>on high-pressure side  | <b>H10</b> | 12.0 m (39.37 ft)  | <b>N33</b> |
| on low-pressure side  | <b>H11</b> | 13.0 m (42.65 ft)  | <b>N34</b> |
|   |            | 14.0 m (45.93 ft)  | <b>N35</b> |
|   |            | 15.0 m (49.21 ft)  | <b>N36</b> |
|   |            | <b>PTFE protective tube</b><br>over the spiral protective tube of the capillaries (color: transparent) |            |
|   |            | 1.0 m (3.28 ft)  | <b>N40</b> |
|   |            | 1.6 m (5.25 ft)  | <b>N41</b> |
|   |            | 2.0 m (6.56 ft)  | <b>N42</b> |
|   |            | 2.5 m (8.20 ft)  | <b>N43</b> |
|   |            | 3.0 m (9.84 ft)  | <b>N44</b> |
|   |            | 4.0 m (13.12 ft)   | <b>N45</b> |
|   |            | 5.0 m (16.40 ft)   | <b>N46</b> |
|   |            | 6.0 m (19.69 ft)   | <b>N47</b> |
|   |            | 7.0 m (22.97 ft)   | <b>N48</b> |
|   |            | 8.0 m (26.25 ft)   | <b>N49</b> |
|   |            | 9.0 m (29.53 ft)   | <b>N50</b> |
|   |            | 10.0 m (32.81 ft)  | <b>N51</b> |
|   |            | <u>only for 7MF4983-...</u>  |            |
|   |            | 11.0 m (36.09 ft)  | <b>N52</b> |
|   |            | 12.0 m (39.37 ft)  | <b>N53</b> |
|   |            | 13.0 m (42.65 ft)  | <b>N54</b> |
|   |            | 14.0 m (45.93 ft)  | <b>N55</b> |
|   |            | 15.0 m (49.21 ft)  | <b>N56</b> |

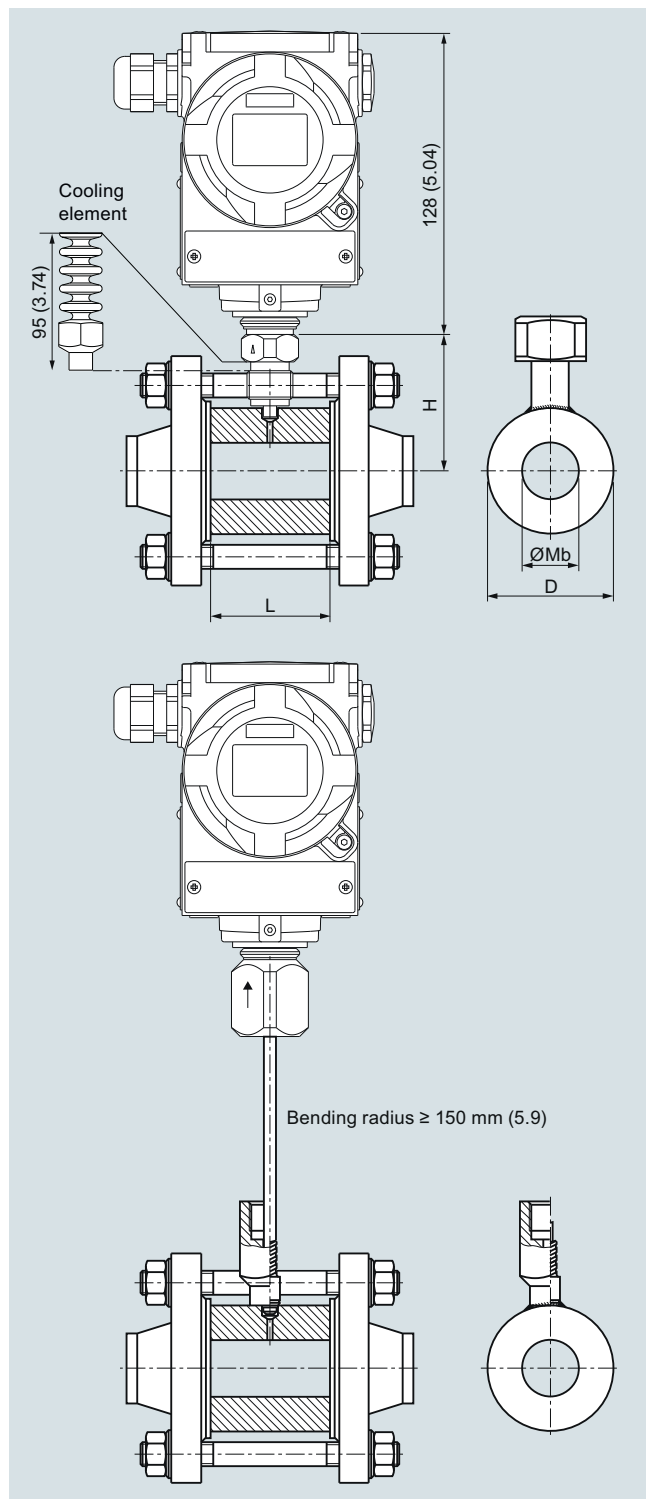
| Selection and Ordering data   | Order code                   |
|---|------------------------------|
| <b>Further designs</b>  |                              |
| Please add <b>"-Z"</b> to Article No. and specify Order code.   |                              |
| <b>PVC protective tube</b><br>over the spiral protective tube of the capillaries<br>(color: black)  |                              |
| 1.0 m (3.28 ft)   | <b>N60</b>                   |
| 1.6 m (5.25 ft)   | <b>N61</b>                   |
| 2.0 m (6.56 ft)   | <b>N62</b>                   |
| 2.5 m (8.20 ft)   | <b>N63</b>                   |
| 3.0 m (9.84 ft)   | <b>N64</b>                   |
| 4.0 m (13.12 ft)  | <b>N65</b>                   |
| 5.0 m (16.40 ft)  | <b>N66</b>                   |
| 6.0 m (19.69 ft)  | <b>N67</b>                   |
| 7.0 m (22.97 ft)  | <b>N68</b>                   |
| 8.0 m (26.25 ft)  | <b>N69</b>                   |
| 9.0 m (29.53 ft)  | <b>N70</b>                   |
| 10.0 m (32.81 ft)   | <b>N71</b>                   |
| <u>only for 7MF4983-...</u>   |                              |
| 11.0 m (36.09 ft)   | <b>N72</b>                   |
| 12.0 m (39.37 ft)   | <b>N73</b>                   |
| 13.0 m (42.65 ft)   | <b>N74</b>                   |
| 14.0 m (45.93 ft)   | <b>N75</b>                   |
| 15.0 m (49.21 ft)   | <b>N76</b>                   |
| <b>Cooling element</b><br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.  | <b>R22</b>                   |
| <b>Negative pressure service</b><br>for use in low-pressure range for transmitters for<br><ul style="list-style-type: none"> <li>• gauge and absolute pressure from the pressure series</li> <li>• differential pressure</li> </ul> Note:<br>Suffix "Y01" required with pressure transmitter          | <b>V01</b><br><br><b>V03</b> |
| <b>Extended negative pressure service</b><br>for use in low-pressure range for transmitters for<br><ul style="list-style-type: none"> <li>• gauge and absolute pressure from the pressure series</li> <li>• differential pressure</li> </ul> Note:<br>Suffix "Y01" required with pressure transmitter | <b>V51</b><br><br><b>V53</b> |

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Clamp-on seals of flange design

#### Dimensional drawings



Inline seal for flange-mounting, connected to SITRANS P pressure transmitter, dimensions in mm (inch)

#### Connection to EN 1092-1

| DN<br>mm | PN<br>bar | D<br>mm | Mb<br>mm | L<br>mm | H<br>mm |
|----------|-----------|---------|----------|---------|---------|
| 25       | 6 ... 100 | 63      | 28.5     | 60      | 78.5    |
| 40       | 6 ... 100 | 85      | 43       | 60      | 89.5    |
| 50       | 6 ... 100 | 95      | 54.5     | 60      | 92.5    |
| 80       | 6 ... 100 | 130     | 82.5     | 60      | 112     |
| 100      | 6 ... 100 | 150     | 107      | 60      | 122     |

#### Connection to ASME B16.5

| DN<br>(inch) | Class        | D<br>mm<br>(inch) | Mb<br>mm<br>(inch) | L<br>mm<br>(inch) | H<br>mm<br>(inch) |
|--------------|--------------|-------------------|--------------------|-------------------|-------------------|
| 1            | 150 ... 2500 | 63<br>(2.48)      | 28.5<br>(1.12)     | 60<br>(2.36)      | 78.5<br>(3.1)     |
| 1½           | 150 ... 2500 | 85<br>(3.35)      | 43<br>(1.69)       | 60<br>(2.36)      | 89.5<br>(3.4)     |
| 2            | 150 ... 2500 | 95<br>(3.74)      | 54.5<br>(2.15)     | 60<br>(2.36)      | 92.5<br>(3.72)    |
| 3            | 150 ... 2500 | 130<br>(5.12)     | 82.5<br>(3.25)     | 60<br>(2.36)      | 112<br>(4.4)      |
| 4            | 150 ... 2500 | 150<br>(5.9)      | 107<br>(4.21)      | 60<br>(2.36)      | 122<br>(4.8)      |



**Overview**

Quick-release inline seals, to DIN 11851 with threaded socket



Quick-release inline seals, with clamp connection

Quick-release inline seals for pressure are available for the following SITRANS P pressure transmitter series:

- P300
- DS III with HART
- DS III with PROFIBUS PA
- DS III with FOUNDATION Fieldbus

**Application**

The quick-release inline seal is a special design for flowing media and high-viscosity media. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. The measured medium flows unhindered through the inline seal and results in self-cleaning of the measuring chamber. Furthermore, the inline seal can be cleaned by a pig.

**Design**

The quick-release clamp is available in two versions:

- DIN 11851 with threaded socket
- Clamp connection

The inline seal is connected to the pressure transmitter either directly or by way of a capillary.

**Function**

The measured pressure is transferred from the diaphragm, mounted on the inner circumference of the inline seal, to the filling liquid and then passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the inline seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

**Note:**

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof pressure transmitter (see Selection and Ordering data).

**Technical specifications**

| Inline seals of quick-release design for pressure                          |  |                  |
|--|--|------------------|
| Connection   | Nominal diameter   | Nominal pressure |
| • To DIN 11851 with threaded socket  | DN 25  | PN 40            |
|  | DN 40  | PN 40            |
|  | DN 50  | PN 25            |
|  | DN 65  | PN 25            |
|  | DN 80  | PN 25            |
|  | DN 100   | PN 25            |
| • Clamp connection   | 1½ inch  | PN 40            |
|  | 2 inch   | PN 40            |
|  | 2½ inch  | PN 40            |
|  | 3 inch   | PN 40            |
| Material   |  |                  |
| • Main body  | Stainless steel 1.4404/316L  |                  |
| • Diaphragm  | Stainless steel 1.4404/316L  |                  |
| Capillary  |  |                  |
| • Length   | Max. 10 m (32.8 ft)  |                  |
| • Internal diameter  | 2 mm (0.079 inch)  |                  |
| • Minimum bending radius   | 150 mm (5.9 inch)  |                  |
| • Sheath   | Spiral protective tube made of stainless steel, mat. No. 1.4301/316  |                  |
| Filling liquid   | • Food oil (FDA listed)  |                  |
| Permissible ambient temperature  | Dependent on the pressure transmitter and the filling liquid of the remote seal<br>More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals |                  |
| Weight   | Approx. 4 kg (approx. 8.82 lb)   |                  |
| <b>Certificate and approvals</b>   |  |                  |
| Classification according to pressure equipment directive (DGRL 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord   |                  |
| EHEDG  | Complies with EHEDG recommendations  |                  |

# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

## Quick-release inline seals

### Selection and Ordering data

#### Quick-release inline seal

for SITRANS P pressure transmitters for pressure  
7MF2033-...; 7MF403-... and 7MF423-...  
together with Order code "V01" (Negative pressure service) and 7MF802-...<sup>1)</sup>; must be ordered separately  
Filling liquid: Food oil (FDA listed)  
Material: Stainless steel 316L

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Nominal diameter Nominal pressure

- Connection to DIN 11851 with screw necks
  - DN 25 PN 40
  - DN 40 PN 40
  - DN 50 PN 25
  - DN 65 PN 25
  - DN 80 PN 25
  - DN 100 PN 25
- Clamp connection
  - 1½ inch PN 16
  - 2 inch PN 16
  - 2½ inch PN 16
  - 3 inch PN 10

Other version

Add Order codes and plain text:

Process connection: ..., Nominal diameter: ...;  
Nominal pressure: ...

#### Filling liquid

- Food oil (FDA listed)

Other version

Add Order code and plain text:

Filling liquid: ...

#### Connection to transmitter

- Direct

Through capillary, length:<sup>2)</sup>

- 1.0 m (3.28 ft)
- 1.6 m (5.25 ft)
- 2.5 m (8.20 ft)
- 4.0 m (13.1 ft)
- 6.0 m (19.7 ft)
- 8.0 m (26.25 ft)
- 10.0 m (32.8 ft)

#### Special lengths for capillaries

- 2.0 m (6.56 ft)
- 3.0 m (9.84 ft)
- 5.0 m (16.40 ft)
- 7.0 m (23.97 ft)
- 9.0 m (29.53 ft)

Article No. Ord. code

7 M F 4 9 5 0 -

A 0 - B

2 B

2 D

2 E

2 F

2 G

2 H

4 L

4 M

4 N

4 P

9 Z

H 1 Y

7

9

M 1 Y

0

2

3

4

5

6

7

8

9

N 1 C

9

N 1 E

9

N 1 G

9

N 1 J

9

N 1 L

### Selection and Ordering data

#### Further designs

Please add "-Z" to Article No. and specify Order code.

#### Remote seal nameplate

Attached out of stainless steel, contains MLFB and order number of the remote seal

#### Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2

Inspection certificate  
to EN 10204, section 3.1

#### 2.2 Certificate of FDA approval of fill oil

Only in conjunction with "Food-grade oil" fill liquid (FDA listed)

#### Functional safety certificate ("SIL 2") to IEC 61508

(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)

#### Functional safety certificate ("SIL 2/3") to IEC 61508

(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)

#### One-sided mounting on differential pressure transmitters

on high-pressure side  
on low-pressure side

#### PE protective tube

over the spiral protective tube of the capillaries (color: white)

1.0 m (3.28 ft)

1.6 m (5.25 ft)

2.0 m (6.56 ft)

2.5 m (8.20 ft)

3.0 m (9.84 ft)

4.0 m (13.12 ft)

5.0 m (16.40 ft)

6.0 m (19.69 ft)

7.0 m (22.97 ft)

8.0 m (26.25 ft)

9.0 m (29.53 ft)

10.0 m (32.81 ft)

#### PTFE protective tube

over the spiral protective tube of the capillaries (color: transparent)

1.0 m (3.28 ft)

1.6 m (5.25 ft)

2.0 m (6.56 ft)

2.5 m (8.20 ft)

3.0 m (9.84 ft)

4.0 m (13.12 ft)

5.0 m (16.40 ft)

6.0 m (19.69 ft)

7.0 m (22.97 ft)

8.0 m (26.25 ft)

9.0 m (29.53 ft)

10.0 m (32.81 ft)

Order code

B20

C11

C12

C17

C20

C23

H10

H11

N20

N21

N22

N23

N24

N25

N26

N27

N28

N29

N30

N31

N40

N41

N42

N43

N44

N45

N46

N47

N48

N49

N50

N51

<sup>1)</sup> With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.

<sup>2)</sup> Max. capillary length, see section "Technical description"

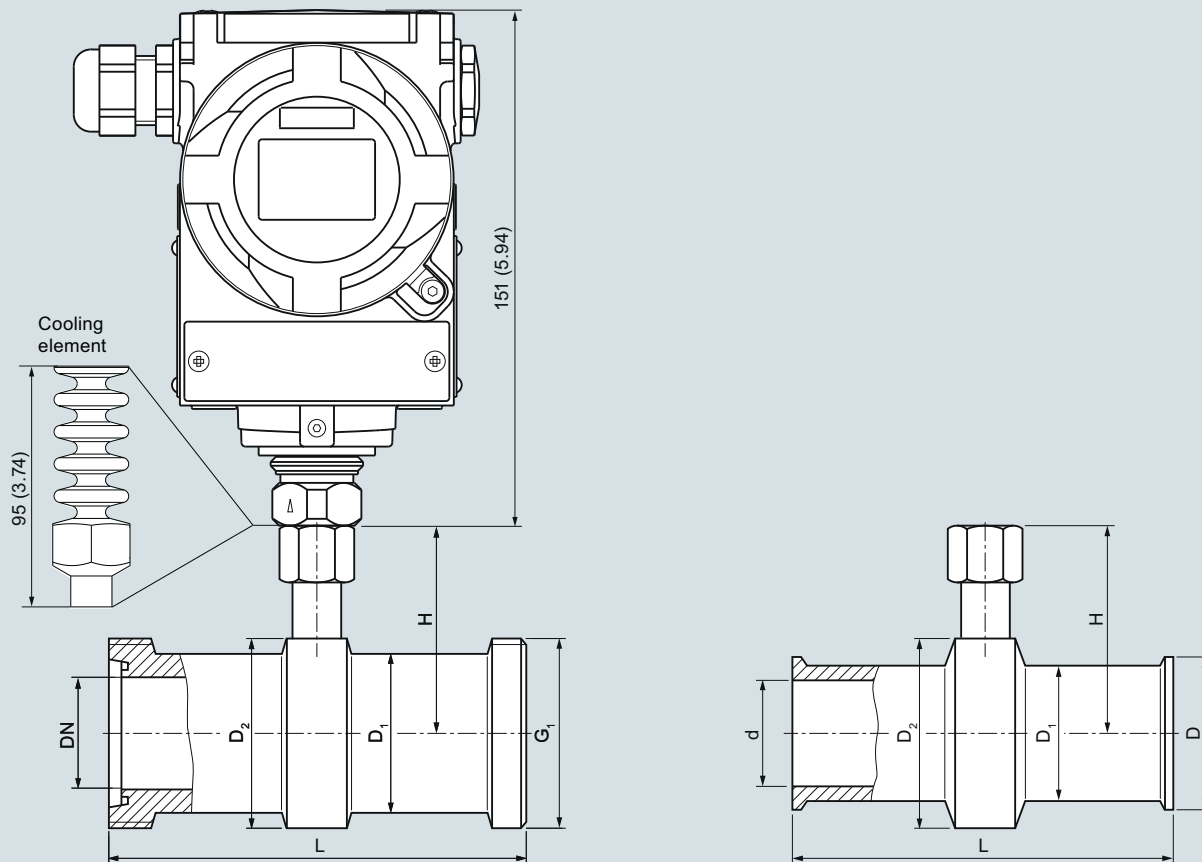
| Selection and Ordering data   | Order code |
|---|------------|
| <b>Further designs</b>  |            |
| Please add <b>"-Z"</b> to Article No. and specify Order code.   |            |
| <b>PVC protective tube</b><br>over the spiral protective tube of the capillaries<br>(color: black)  |            |
| 1.0 m (3.28 ft)   | <b>N60</b> |
| 1.6 m (5.25 ft)   | <b>N61</b> |
| 2.0 m (6.56 ft)   | <b>N62</b> |
| 2.5 m (8.20 ft)   | <b>N63</b> |
| 3.0 m (9.84 ft)   | <b>N64</b> |
| 4.0 m (13.12 ft)  | <b>N65</b> |
| 5.0 m (16.40 ft)  | <b>N66</b> |
| 6.0 m (19.69 ft)  | <b>N67</b> |
| 7.0 m (22.97 ft)  | <b>N68</b> |
| 8.0 m (26.25 ft)  | <b>N69</b> |
| 9.0 m (29.53 ft)  | <b>N70</b> |
| 10.0 m (32.81 ft)   | <b>N71</b> |
| <b>Cooling element</b><br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.                        | <b>R22</b> |
| <b>Negative pressure services</b><br>for use in low-pressure range for transmitters for<br>• gauge and absolute pressure from the pressure series         | <b>V01</b> |
| <b>Extended negative pressure service</b><br>for use in low-pressure range for transmitters for<br>• gauge and absolute pressure from the pressure series | <b>V51</b> |

## Pressure Measurement

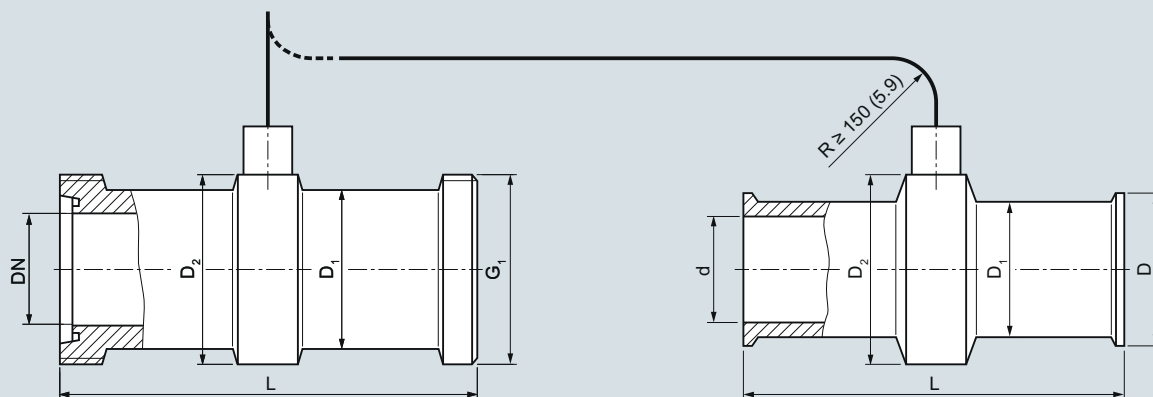
Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Quick-release inline seals

#### Dimensional drawings



Mounted directly on SITRANS P transmitter for pressure



Mounted on SITRANS P transmitter for pressure or differential pressure and flow

#### Connection to DIN 11851 with screw necks

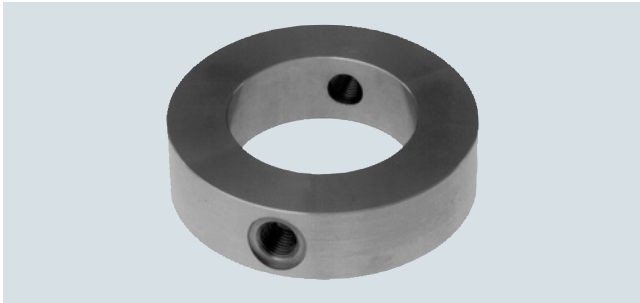
| DN  | Ø D <sub>1</sub> | Ø D <sub>2</sub> | H    | L   | G <sub>1</sub> |
|-----|------------------|------------------|------|-----|----------------|
| 25  | 38               | 52               | 68   | 128 | Rd 52x1/6      |
| 40  | 55               | 65               | 74.5 | 160 | Rd 65x1/6      |
| 50  | 68               | 78               | 81   | 170 | Rd 78x1/6      |
| 65  | 85               | 95               | 89.5 | 182 | Rd 95x1/6      |
| 80  | 110              | 110              | 97   | 182 | Rd 110x1/4     |
| 100 | 130              | 130              | 107  | 182 | Rd 110x1/4     |

#### Clamp connection for pipes to BS 4825/3 and o.D. tubes

| d         | Ø D <sub>1</sub> | Ø D <sub>2</sub> | H           | L          | D           |
|-----------|------------------|------------------|-------------|------------|-------------|
| mm (inch) | mm (inch)        | mm (inch)        | mm (inch)   | mm (inch)  | mm (inch)   |
| 22.2 (1)  | 38 (1.5)         | 50 (1.97)        | 67 (2.64)   | 114 (4.49) | 50.5 (1.98) |
| 34.9 (1½) | 43 (1.69)        | 65 (2.56)        | 74.5 (2.93) | 146 (5.75) | 50.5 (1.98) |
| 47.6 (2)  | 56 (2.2)         | 75 (2.95)        | 79.5 (3.13) | 156 (6.14) | 64 (2.52)   |
| 60.3 (2½) | 68 (2.68)        | 77 (3.03)        | 80.5 (3.17) | 156 (6.14) | 77.5 (3.05) |
| 73.0 (3)  | 82 (3.23)        | 91 (3.58)        | 87.5 (3.44) | 156 (6.14) | 91 (3.58)   |

Quick-release inline seal, dimensions in mm (inch)

## Overview



Flushing ring

Flushing rings are required for flange-mounted and sandwich-type remote seals (Article No. 7MF4900 ... 7MF4923) if the danger exists that the process conditions and the geometry of the connection could cause the medium to form deposits or blockages.

The flushing ring is clamped between the process flange and the remote seal.

Deposits can be flushed away from the diaphragm through the holes in the side, or the pressure volume can be vented. Different nominal diameters and forms permit adaptation to the respective process flange.

**Process connection**

For flanges to EN and ASME:  
DN 50, 80, 100, 125; PN 16 ... 100 or  
DN 2 inch, 3 inch, 4 inch, 5 inch; Class 150 ... 600

**Standard design**

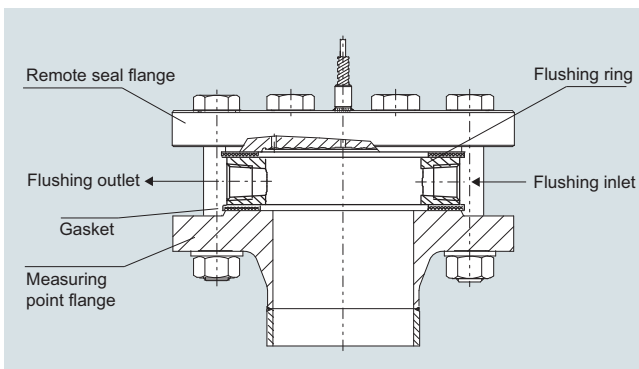
Material: CrNi-Stahl, mat. No. 1.4404/316L  
Sealing faces and flushing holes: See Selection and Ordering data

## Technical specifications

**Flushing ring for remote seals of sandwich and flange design**

| Nominal diameter                      | Nominal pressure  |
|---------------------------------------|---|
| • DN 50                               | PN 16 ... PN 100  |
| • DN 80                               | PN 16 ... PN 100  |
| • DN 100                              | PN 16 ... PN 100  |
| • DN 125                              | PN 16 ... PN 100  |
| • 2 inch                              | Class 150 ... class 600   |
| • 3 inch                              | Class 150 ... class 600   |
| • 4 inch                              | Class 150 ... class 600   |
| • 5 inch                              | Class 150 ... class 600   |
| Sealing face                          |   |
| • To EN 1092-1                        | Form B1<br>Form B2<br>Form D/Form D<br>Form C/Form C<br>Form C/Form C<br>Form E<br>Form F<br>RF 125 ... 250 AA<br>RFSF<br>RJF ring groove |
| • To ASME B16.5                       | • G $\frac{1}{4}$<br>• G $\frac{1}{2}$<br>• $\frac{1}{4}$ -18 NPT<br>• $\frac{1}{2}$ -14 NPT  |
| Flushing holes (2 off), female thread | Stainless steel 1.4404/316L   |
| Material                              |   |

## Design



Installation example

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

### Flushing rings for diaphragm seals

1

#### Selection and Ordering data

Article No.Ord. code

##### Flushing ring

7MF4925 -

for remote seals 7MF4900 to 7MF4923

1

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

##### Nom. diam.

##### Nom. press.

- DN 50 PN 16 ... PN 100
- DN 80 PN 16 ... PN 100
- DN 100 PN 16 ... PN 100
- DN 125 PN 16 ... PN 100

A  
B  
C  
D

- 2 inch Class 150 ... 600
- 3 inch Class 150 ... 600
- 4 inch Class 150 ... 600
- 5 inch Class 150 ... 600

G  
H  
J  
K

Other version

Add Order code and plain text:

Nominal diameter: ...; Nominal pressure: ...

Z

J 1 Y

##### Sealing face

- EN 1092-1
  - Form B1
  - Form B2
  - Form C/Form C
  - Form D/Form C
  - Form D/Form D
- Form E
- Form F
- ASME B16.5
  - RF 125 ... 250 AA
  - RFSF
  - RJF ring groove

A  
C  
D  
E  
FG  
HM  
Q  
R  
Z

K 1 Y

Other version

Add Order code and plain text:

Sealing face: ...

##### Flushing holes (2 off)

- Female thread G $\frac{1}{4}$
- Female thread G $\frac{1}{2}$
- Female thread  $\frac{1}{4}$ -18 NPT
- Female thread  $\frac{1}{2}$ -14 NPT

1  
2  
3  
4

##### Material

- Stainless steel 316L

Other version

Add Order code and plain text:

Material: ...

0  
9

M 1 Y

##### Further designs

Please add "-Z" to Article No. and specify Order code.

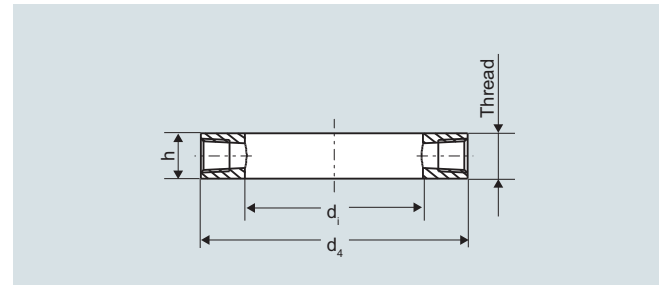
Order code

##### Inspection certificate

to EN 10204, section 3.1

C12

#### Dimensional drawings



Flushing ring, dimension drawing

##### Connection to EN 1092-1

| DN<br>(mm) | PN<br>(bar) | d <sub>4</sub><br>(mm) | d <sub>i</sub><br>(mm) | h<br>(mm) | Weight<br>(kg) |
|------------|-------------|------------------------|------------------------|-----------|----------------|
| 50         | 16 ... 100  | 102                    | 62                     | 30        | 1.10           |
| 80         | 16 ... 100  | 138                    | 92                     | 30        | 1.90           |
| 100        | 16 ... 100  | 162                    | 92                     | 30        | 3.15           |
| 125        | 16 ... 100  | 188                    | 126                    | 30        | 3.50           |

##### Connection to ASME B 16.5

| DN<br>inch | Class       | d <sub>4</sub><br>mm<br>(in.) | d <sub>i</sub><br>mm<br>(in.) | h<br>mm<br>(in.) | Weight<br>kg<br>(lb) |
|------------|-------------|-------------------------------|-------------------------------|------------------|----------------------|
| 2          | 150 ... 600 | 92<br>(3.62)                  | 62<br>(2.44)                  | 30<br>(1.18)     | 0.60<br>(1.32)       |
| 3          | 150 ... 600 | 127<br>(5)                    | 92<br>(3.62)                  | 30<br>(1.18)     | 1.05<br>(2.31)       |
| 4          | 150 ... 600 | 157<br>(6.18)                 | 92<br>(3.62)                  | 30<br>(1.18)     | 2.85<br>(6.28)       |
| 5          | 150 ... 600 | 185.5<br>(7.3)                | 126<br>(4.96)                 | 30<br>(1.18)     | 3.30<br>(7.28)       |

**Overview**

This section shows examples of typical measuring setups for using SITRANS P pressure transmitters with and without remote seals.

Equations for calculating start of scale and full scale are provided for each example.

Questionnaires are included to help you select the right combination of remote seal and pressure transmitter.

**Installation**

Remote seals of sandwich design are fitted between the connection flange of the measuring point and a dummy flange. Remote seals of flange design are fitted directly on the connection flange of the measuring point. The respective pressure rating of the dummy flange or the flanged remote seal must be observed.

The pressure transmitter should be installed below the connection flange (and below the lower connection flange in the case of differential pressure transmitters). This arrangement must be used in the low-pressure range.

When measuring at pressures above atmospheric, the pressure transmitter can also be installed above the connection flange.

The capillaries between the remote seal and the pressure transmitter should be as short as possible to obtain a good transmission response.

**Offset of measuring range**

If there is a difference in height between the two connection flanges when measuring with two remote seals, an additional differential pressure will result from the oil filling of the remote seal capillaries. This results in a measuring range offset which has to be taken into account when you set the pressure transmitter.

An offset in the measuring range also occurs when combining a remote seal with a transmitter if the remote seal is not installed at the same height as the transmitter.

**Pressure transmitter output**

If the level, separation layer or density increase in closed vessels, the differential pressure and hence the output signal of the pressure transmitter also increase.

For an inverted relationship between the differential pressure and the output signal, the start-of-scale and full-scale values of the SITRANS P must be interchanged.

With open vessels, a rising pressure is usually assigned to an increasing level, separation layer or density.

**Influence of ambient temperature**

Temperature differences between the individual capillaries and between the individual remote seals should be avoided.

Temperature variations in the area of the measuring setup cause a change in volume of the filling liquid and hence measuring errors.

**Notes**

- For the separation layer measurement, the separation layer has to be positioned between the two spigots. Also you must make sure that the level in the container is always above the top spigot.
- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot.

**Possible combinations of pressure transmitters and remote seals**

| Type of installation              | Pressure transmitters   | Remote seals  |
|-----------------------------------|---|---|
| A/B                               | 7MF2033<br>7MF4033<br>7MF4034<br>7MF4035<br>7MF8023<br>7MF8024<br>7MF8025   | 7MF4900<br>7MF4910<br>7MF4920   |
| C <sub>1</sub> and C <sub>2</sub> | 7MF4233<br>7MF4234<br>7MF4235<br><br>7MF4333<br>7MF4334<br>7MF4335  | 7MF4900<br>7MF4910<br>7MF4920<br>(negative pressure service in each case)<br><br>7MF4901<br>7MF4921 |
| D                                 | 7MF2433<br>7MF2434<br>7MF2435<br>7MF4433<br>7MF4434<br>7MF4435<br>7MF4533<br>7MF4534<br>7MF4535<br>7MF5403<br>7MF5413 | 7MF4903<br>7MF4923  |
| E                                 | 7MF2433<br>7MF2434<br>7MF2435<br>7MF4433<br>7MF4434<br>7MF4435<br>7MF4533<br>7MF4534<br>7MF4535<br>7MF5403<br>7MF5413 | 7MF4913   |
| G, H and J                        | 7MF2433<br>7MF2434<br>7MF2435<br>7MF4433<br>7MF4434<br>7MF4435<br>7MF4533<br>7MF4534<br>7MF4535<br>7MF5403<br>7MF5413 | 7MF4903<br>7MF4923  |

## Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

1

### Measuring setups with remote seals

#### Dimensional drawings

##### Types of installation for pressure and level measurements (open vessels)

**Installation type A**

Pressure transmitter above the measuring point

**Installation type B**

Pressure transmitter below the measuring point

$H_1 \leq 7 \text{ m (23 ft)}$ , with halocarbon oil as filling liquid only  $H_1 \leq 4 \text{ m (13.1 ft)}$

**Installation type A**

Start-of-scale:  $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_1$

Full-scale:  $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_1$

**Installation type B**

Start-of-scale:  $p_{MA} = \rho_{FL} \cdot g \cdot H_U + \rho_{Oil} \cdot g \cdot H_1$

Full-scale:  $p_{ME} = \rho_{FL} \cdot g \cdot H_O + \rho_{Oil} \cdot g \cdot H_1$

**Legend**

$p_{MA}$  Start-of-scale value to be set

$p_{ME}$  Full-scale value to be set

$\rho_{FL}$  Density of medium in vessel

$\rho_{Oil}$  Density of filling oil in the capillary to the remote seal

$g$  Local acceleration due to gravity

$H_U$  Start-of-scale value

$H_O$  Full-scale value

$H_1$  Distance between vessel flange and pressure trans.

##### Types of installation for absolute level measurements (closed vessels)

**Installation type C<sub>1</sub>**

**Installation type C<sub>2</sub>**

Pressure transmitter for absolute pressure always below the measuring point:  $H_1 \geq 200 \text{ mm (7.9 inch)}$

**Installation type C<sub>1</sub> and C<sub>2</sub>**

Start-of-scale:  $p_{MA} = p_{START} + \rho_{Oil} \cdot g \cdot H_1$

Full-scale:  $p_{ME} = p_{END} + \rho_{Oil} \cdot g \cdot H_1$

**Legend**

$p_{MA}$  Start-of-scale value to be set

$p_{ME}$  Full-scale value to be set

$p_{START}$  Start-of-scale value

$p_{END}$  Full-scale value

$\rho_{Oil}$  Density of filling oil in the capillary to the remote seal

$g$  Local acceleration due to gravity

$H_1$  Distance between vessel flange and pressure trans.

##### Type of installation for differential pressure and flow measurements

**Installation type D Filter monitoring**

**Installation type D**

Start-of-scale:  $p_{MA} = p_{START} - \rho_{Oil} \cdot g \cdot H_V$

Full-scale:  $p_{ME} = p_{END} - \rho_{Oil} \cdot g \cdot H_V$

**Legend**

$p_{MA}$  Start-of-scale value to be set

$p_{ME}$  Full-scale value to be set

$p_{START}$  Start-of-scale value

$p_{END}$  Full-scale value

$\rho_{Oil}$  Density of filling oil in the capillary to the remote seal

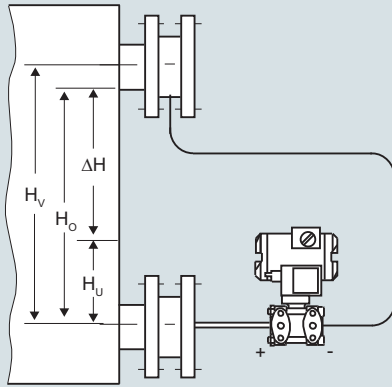
$g$  Local acceleration due to gravity

$H_V$  Distance between the measuring points (spigots)



**Types of installation for level measurements (closed vessels)**

Installation type E



Installation type E

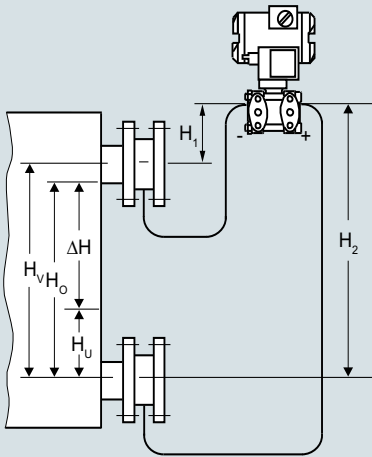
$$\text{Start-of-scale: } p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$$

$$\text{Full-scale: } p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$$

## Legend

|              |  |
|--------------|--|
| $p_{MA}$     | Start-of-scale value to be set                             |
| $p_{ME}$     | Full-scale value to be set                                 |
| $\rho_{FL}$  | Density of medium in vessel                                |
| $\rho_{Oil}$ | Density of filling oil in the capillary to the remote seal |
| $g$          | Local acceleration due to gravity                          |
| $H_U$        | Start-of-scale value                                       |
| $H_O$        | Full-scale value   |
| $H_V$        | Distance between the measuring points (spigots)            |

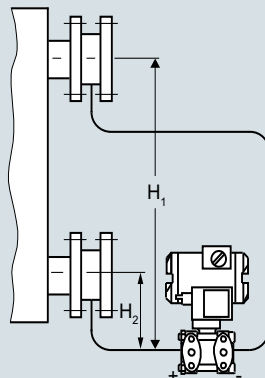
Installation type G



Pressure transmitter for differential pressure  
above the upper measuring point, no vacuum

$H_2 \leq 7 \text{ m (23 ft)}$ , with halocarbon oil as filling  
liquid only  $H_1 \leq 4 \text{ m (13.1 ft)}$

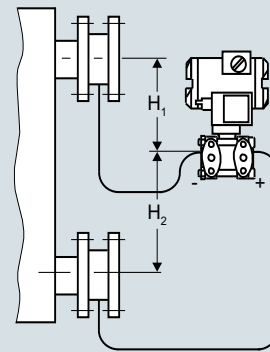
Installation type H



below the lower measuring point

Installation type for vacuum applications

Installation type J



between the measuring points, no vacuum

$H_2 \leq 7 \text{ m (23 ft)}$ , with halocarbon oil as filling  
liquid only  $H_2 \leq 4 \text{ m (13.1 ft)}$

Installation type G, H and J

$$\text{Start-of-scale: } p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$$

$$\text{Full-scale: } p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$$

## Legend

|              |  |
|--------------|--|
| $p_{MA}$     | Start-of-scale value to be set                             |
| $p_{ME}$     | Full-scale value to be set                                 |
| $\rho_{FL}$  | Density of medium in vessel                                |
| $\rho_{Oil}$ | Density of filling oil in the capillary to the remote seal |

|       |   |
|-------|---|
| $g$   | Local acceleration due to gravity               |
| $H_U$ | Start-of-scale value                            |
| $H_O$ | Full-scale value                                |
| $H_V$ | Distance between the measuring points (spigots) |

# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

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## Measuring setups without remote seals

### Overview

#### Notes

- For the separation layer measurement, the separation layer has to be positioned between the two spigots.

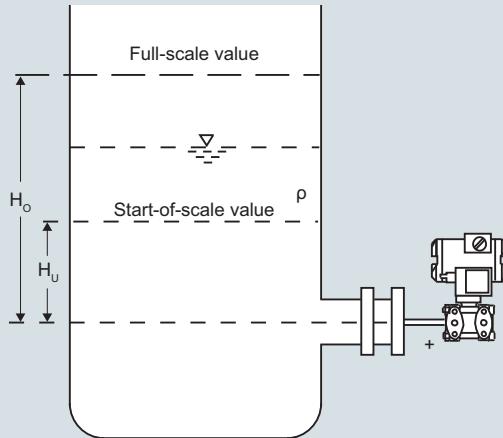
Also you must make sure that the level in the container is always above the top spigot.

- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot

### Dimensional drawings

#### Pressure transmitters for differential pressure, for flanging

##### Measuring setups for open containers



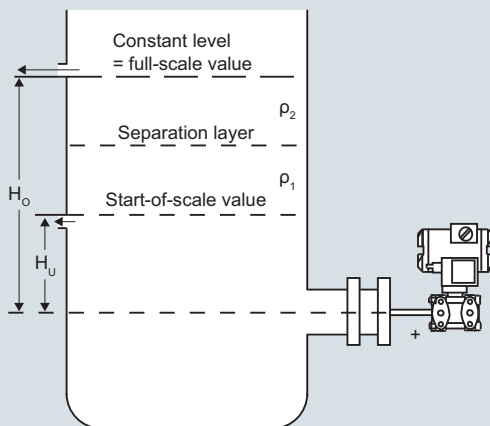
#### Level measurement

$$\text{Start-of-scale: } p_{MA} = \rho \cdot g \cdot H_u$$

$$\text{Full-scale: } p_{ME} = \rho \cdot g \cdot H_o$$

#### Legend

|          |                                   |
|----------|-----------------------------------|
| $p_{MA}$ | Start-of-scale value to be set    |
| $p_{ME}$ | Full-scale value to be set        |
| $\rho$   | Density of medium in vessel       |
| $g$      | Local acceleration due to gravity |
| $H_u$    | Start-of-scale value              |
| $H_o$    | Full-scale value                  |



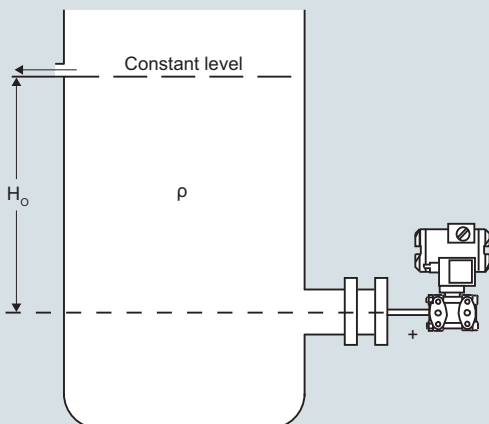
#### Separation layer measurement

$$\text{Start-of-scale: } p_{MA} = g \cdot (H_u \cdot \rho_1 + (H_o - H_u) \cdot \rho_2)$$

$$\text{Full-scale: } p_{ME} = \rho_1 \cdot g \cdot H_o$$

#### Legend

|          |                                   |
|----------|-----------------------------------|
| $p_{MA}$ | Start-of-scale value to be set    |
| $p_{ME}$ | Full-scale value to be set        |
| $\rho_1$ | Density of heavier liquid         |
| $\rho_2$ | Density of lighter liquid         |
| $g$      | Local acceleration due to gravity |
| $H_u$    | Start-of-scale value              |
| $H_o$    | Full-scale value                  |



#### Density measurement

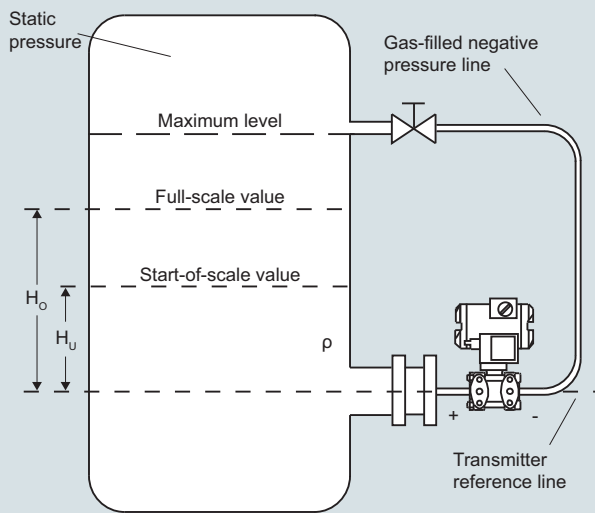
$$\text{Start-of-scale: } p_{MA} = \rho_{MIN} \cdot g \cdot H_o$$

$$\text{Full-scale: } p_{ME} = \rho_{MAX} \cdot g \cdot H_o$$

#### Legende

|              |                                     |
|--------------|-------------------------------------|
| $p_{MA}$     | Start-of-scale value to be set      |
| $p_{ME}$     | Full-scale value to be set          |
| $\rho_{MIN}$ | Minimum density of medium in vessel |
| $\rho_{MAX}$ | Maximum density of medium in vessel |
| $g$          | Local acceleration due to gravity   |
| $H_o$        | Full-scale value in m               |

## Measuring setups for closed containers



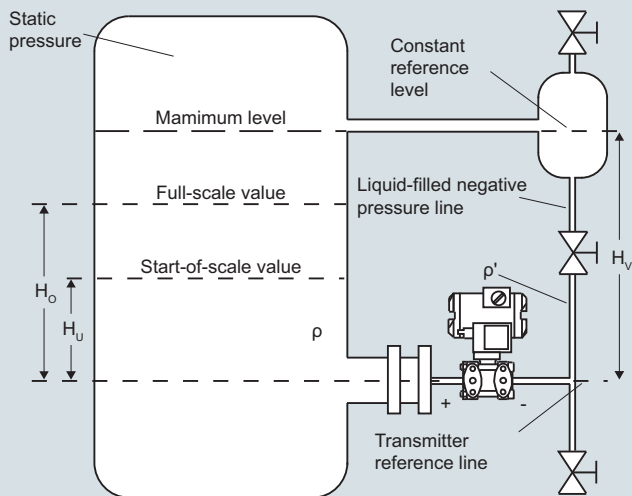
## Level measurement, Version 1

$$\text{Start-of-scale: } \Delta p_{MA} = \rho \cdot g \cdot H_U$$

$$\text{Full-scale: } \Delta p_{ME} = \rho \cdot g \cdot H_O$$

## Legend

|                 |                                   |
|-----------------|-----------------------------------|
| $\Delta p_{MA}$ | Start-of-scale value to be set    |
| $\Delta p_{ME}$ | Full-scale value to be set        |
| $\rho$          | Density of medium in vessel       |
| $g$             | Local acceleration due to gravity |
| $H_U$           | Start-of-scale value              |
| $H_O$           | Full-scale value                  |



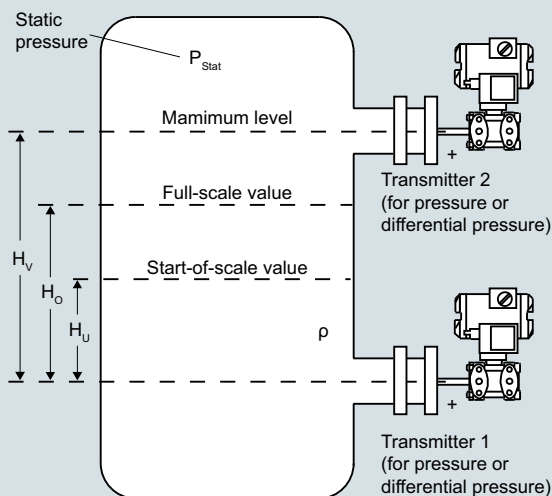
## Level measurement, Version 2

$$\text{Start-of-scale: } \Delta p_{MA} = g \cdot (H_U \cdot \rho - H_V \cdot \rho')$$

$$\text{Full-scale: } \Delta p_{ME} = g \cdot (H_O \cdot \rho - H_V \cdot \rho')$$

## Legend

|                 |   |
|-----------------|---|
| $\Delta p_{MA}$ | Start-of-scale value to be set  |
| $\Delta p_{ME}$ | Full-scale value to be set  |
| $\rho$          | Density of medium in vessel   |
| $\rho'$         | Density of liquid in the negative pressure line (corresponding to the temperature existing there) |
| $g$             | Local acceleration due to gravity   |
| $H_U$           | Start-of-scale value  |
| $H_O$           | Full-scale value  |
| $H_V$           | Distance between the measuring points (spigots)   |



## Level measurement, Version 3

$$\text{Start-of-scale: } \Delta p_{MA} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_U}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$$

$$\text{Full-scale: } \Delta p_{ME} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_O}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$$

## Legend

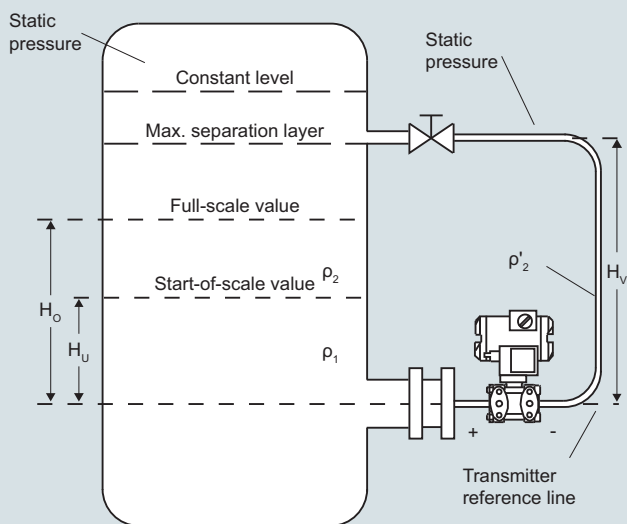
|                 |   |
|-----------------|---|
| $\Delta p_{MA}$ | Start-of-scale value to be set                  |
| $\Delta p_{ME}$ | Full-scale value to be set                      |
| $\rho$          | Density of medium in vessel                     |
| $g$             | Local acceleration due to gravity               |
| $H_U$           | Start-of-scale value                            |
| $H_O$           | Full-scale value                                |
| $H_V$           | Distance between the measuring points (spigots) |

The pressure measuring range ( $\pm$  level) will be calculated by subtraction of measuring range of transmitter 1 minus measuring range of transmitter 2 in the process control system.

# Pressure Measurement

Remote seals for transmitters and pressure gauges  
SITRANS P DS III

## Measuring setups without remote seals



### Separation layer measurement

$$\text{Start-of-scale: } \Delta p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2 - H_V \cdot \rho'_2)$$

$$\text{Full-scale: } \Delta p_{ME} = g \cdot (H_O \cdot \rho_1 - H_V \cdot \rho'_2)$$

### Legend

|                 |   |
|-----------------|---|
| $\Delta p_{MA}$ | Start-of-scale value to be set  |
| $\Delta p_{ME}$ | Full-scale value to be set  |
| $\rho_1$        | Density of heavier liquid with separation layer in vessel   |
| $\rho_2$        | Density of lighter liquid with separation layer   |
| $\rho'_2$       | Density of liquid in the negative pressure line (corresponding to the temperature existing there) |
| $g$             | Local acceleration due to gravity   |
| $H_U$           | Start-of-scale value  |
| $H_O$           | Full-scale value  |
| $H_V$           | Distance between the measuring points (spigots)   |

### Overview

All shut-off fittings can be secured onto walls, racks (72 mm grid) and vertical and horizontal pipes.

This offers the advantage when assembling a plant that the shut-off fittings can be secured first and the lines for the medium and differential pressure connected to them. It is then possible to check all connections for leaks and to blow out or flush the pipes in order to remove dirt (welding residues, shavings etc.).

The measuring instruments can be screwed onto the shut-off fittings right at the end when all piping has been completed.

If an instrument has to be removed for maintenance, the fittings and pipes remain as they are. It is only necessary to close the valves – the instrument can then be removed, and refitted following maintenance.

#### **Classification according to pressure equipment directive (PED 2014/68/EU):**

For gases of fluid group 1 and liquids of fluid group 1; compliance with requirements of article 4, paragraph 3 (sound engineering practice).

#### **New standard IEC 61518/DIN EN 61518**

The flange connection between transmitter and valve manifold was modified in the new standard IEC 61518/DIN EN 61518. The only connection thread approved for use in the process flanges of the pressure transmitter is  $7/16-20$  UNF.

The valve manifolds for M12 screws, including the accessory sets, have therefore been deleted.

#### **Material acceptance test certificate to EN 10204-3.1**

If a material acceptance test certificate to EN 10204-3.1 is required when ordering valve manifolds or shut-off fittings, please note that a single certificate is sufficient for each ordered item type. This means that you will only be charged for one certificate in the cost calculations.

#### **Minimum/maximum operating temperatures**

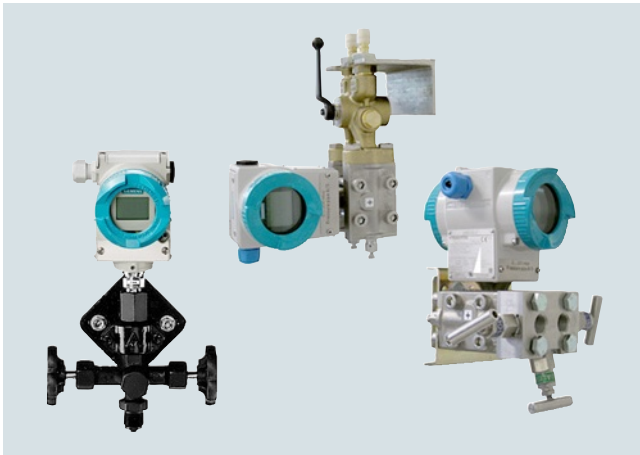
The maximum operating temperatures are given for each value or valve manifold.

The minimum operating temperatures depend on the material used for the valves or valve manifold.

They are as follows:

| Material        | Minimum operating temperature           |
|-----------------|---|
| Brass           | -10 °C (-14 °F) according to EN 12516-4 |
| Steel           | -10 °C (-14 °F) according to AD200-W10  |
| Stainless steel | -40 °C (-40 °F)                         |

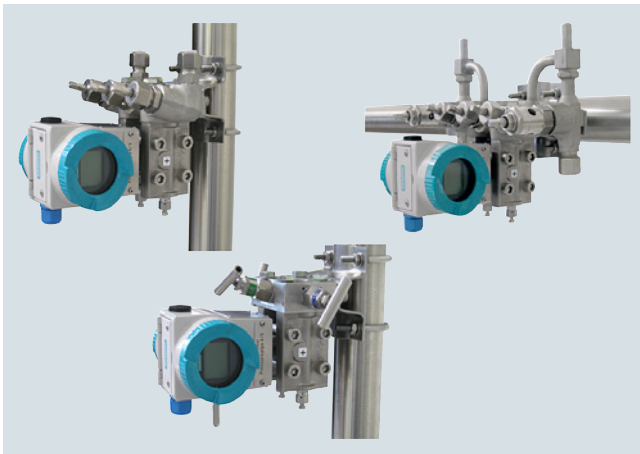
### Pressure transmitters with shut-off fittings - mounting examples



SITRANS P transmitter for gauge pressure with double shut-off valve, SITRANS P pressure transmitter with multiway cock or 3-spindle valve manifold



SITRANS P pressure transmitter for differential pressure, mounted in protective box (available on request)



SITRANS P transmitter for differential pressure with 3-way valve manifold, 3-spindle valve manifold or valve manifold combination DN 5/DN 8



SITRANS P pressure transmitter mounted on valve combination "Mono-flange" for direct connection to flanges (available on request)







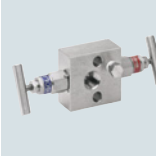
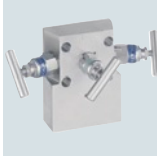
# Pressure Measurement



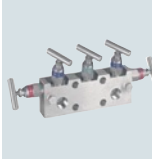








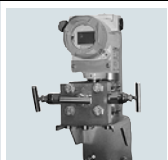

## Fittings

### Selection aid

1

#### Selection of available shut-off valves

| Transmitters  | Shut-off valves for general applications                                     | Page  | Shut-off valves for special applications   | Page   |
|---|--|-------|--|--|
| <b>Relative and absolute pressure transmitters with process connection G½" male thread</b><br>e.g. <ul style="list-style-type: none"> <li>• SITRANS P200 7MF1565-...</li> <li>• SITRANS P210 7MF1566-...</li> <li>• SITRANS P220 7MF1567-...</li> <li>• SITRANS P300 7MF802-...0.-...</li> <li>• SITRANS P310 7MF2033-...0.-...</li> <li>• SITRANS P DS III series 7MF403-...0.-... and 7MF423-...0.-...</li> <li>• SITRANS P410 7MF243-...0.-... C41</li> </ul>              | Shut-off valves/double shut-off valves to DIN 16270, DIN 16271 and DIN 16272 | 1/492 |   | 1/495<br>   |
|   |  |       | 2-spindle valve manifold DN 5 for installation in protective boxes 7MF9412-1B  | 1/513<br>   |
| <b>Gauge and absolute pressure transmitters with process connection ½"-14 NPT female or male thread</b><br>e.g. <ul style="list-style-type: none"> <li>• SITRANS P200 7MF1565-...</li> <li>• SITRANS P210 7MF1566-...</li> <li>• SITRANS P220 7MF1567-...</li> <li>• SITRANS P300 7MF802-...1.-...</li> <li>• SITRANS P310 7MF2033-...1.-...</li> <li>• SITRANS P DS III series 7MF403-...1.-... and 7MF423-...1.-...</li> <li>• SITRANS P410 7MF243-...1.-... C41</li> </ul> | Double shut-off valve DN 5 7MF9011-4EA, -4FA, -4GA and -4KA                  | 1/495 | <br>7MF9011-4FA<br><br>7MF9011-4KA | 1/495<br>   |
| <b>Absolute pressure transmitter with process connection to IEC 61518/DIN EN 61518</b><br>e.g. <ul style="list-style-type: none"> <li>• SITRANS P DS III series 7MF433-...</li> </ul>   | 2-spindle valve manifold DN 5 7MF9411-5A.                                    | 1/498 |   | 1/513<br> |

| Transmitters   | Shut-off valves for general applications                              | Page  | Shut-off valves for special applications   | Page  |
|--|---|-------|--|---|
| <b>Differential pressure transmitter with process connection to IEC 61518/DIN EN 61518</b><br><br>e.g.<br>SITRANS P310<br>7MF2433-...<br><br>SITRANS P DS III series<br>7MF443-... and<br>7MF453-...<br><br>SITRANS P410<br>7MF443-... C41;<br>7MF453-... C41<br><br>SITRANS P500<br>7MF54-... | For 3/5-spindle valve manifold DN 5<br>7MF9411-5B. and<br>7MF9411-5C. | 1/498 | <br><br>3-way valve manifolds, DN 5, forged version 7MF9410-1..                 | 1/503<br>  |
|  |   |       | <br><br>5-way valve manifolds, DN 5, forged version 7MF9410-3..                 | 1/503<br>  |
|  | PN 100 multiway cocks<br>7MF9004-...                                  | 1/501 | <br><br>3-way valve manifolds, DN 8, forged version 7MF9416-1.. and 7MF9416-2.. | 1/506<br>  |
|  |   |       | <br><br>Valve manifold combination DN 5/DN 8 for vapor measurement 7MF9416-6..  | 1/509<br>  |
|  |   |       | Valve manifold combination DN 8 for vapor measurement 7MF9416-4..  | 1/511<br>  |
|  |   |       | 3- and 5-spindle valve manifolds for DN 5 for installation in protective boxes<br>7MF9412-1D. and<br>7MF9412-1E.   | 1/513<br><br> |
|  |   |       | 3- and 5-spindle valve manifolds for vertical differential pressure lines<br>7MF9413-1..   | 1/517<br>  |
|  |   |       | Low-pressure multiway cock<br>7MF9004-4..  | 1/520<br>  |

## Pressure Measurement

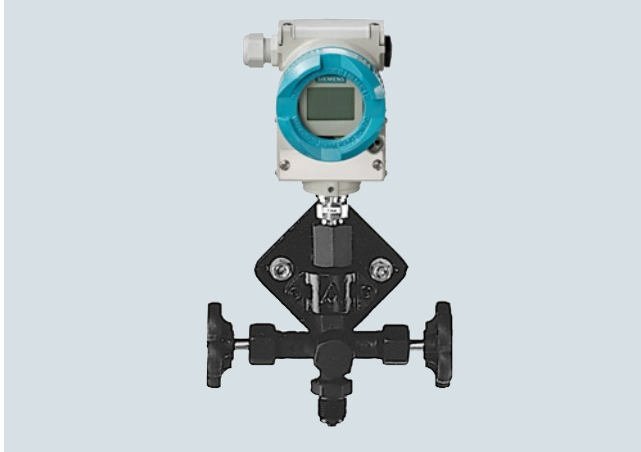
### Fittings

### Shut-off valves for gauge and absolute pressure transmitters

#### Shut-off valves to DIN 16270, DIN 16271 and DIN 16272

1

#### Overview



Transmitter for pressure with double shut-off valve 7MF9401-...

The shut-off valves for pressure gauges are used to shut off the line of the measured medium when dealing with aggressive and non-aggressive gases, vapors and liquids.

#### Design

A water trap must be connected upstream of the shut-off valve in the case of temperatures of the medium above 120 °C. The shut-off valves form B have a shaft with which they can be secured on an instrument bracket. An adapter is therefore not required to secure these valves. The vent/test connection can be shut off separately with the double shut-off valves DN 5. This permits checking of the zero on the pressure gauge. In addition, the characteristic of the pressure gauge can be checked using an external pressure source. The valve packing material is PTFE.

#### Selection and Ordering data

Article No.

##### Shut-off valves, form B, DIN 16270

without test collar, connection shank,  
without certificate

| Material<br>Valve housing | Maximum permissible<br>working pressure |
|---------------------------|---|
|---------------------------|---|

|   |  |
|---|--|
| CW614N (CuZn39Pb3)250 bar (3626 psi)<br>(mat. No. 2.0402) |  |
|---|--|

7MF9401-7AA

|                             |                    |
|-----------------------------|--------------------|
| P250GH<br>(mat. No. 1.0460) | 400 bar (5800 psi) |
|-----------------------------|--------------------|

7MF9401-7AB

|   |                    |
|---|--------------------|
| X 6 CrNiMoTi 17 12 2<br>(mat. No. 1.4571/316Ti) | 400 bar (5800 psi) |
|---|--------------------|

7MF9401-7AC

##### Shut-off valves, form B, DIN 16271

with test collar, connection shank,  
without certificate

| Material<br>Valve housing | Maximum permissible<br>working pressure |
|---------------------------|---|
|---------------------------|---|

|   |  |
|---|--|
| CW614N (CuZn39Pb3)250 bar (3626 psi)<br>(mat. No. 2.0402) |  |
|---|--|

7MF9401-7BA

|                             |                    |
|-----------------------------|--------------------|
| P250GH<br>(mat. No. 1.0460) | 400 bar (5800 psi) |
|-----------------------------|--------------------|

7MF9401-7BB

|   |                    |
|---|--------------------|
| X 6 CrNiMoTi 17 12 2<br>(mat. No. 1.4571/316Ti) | 400 bar (5800 psi) |
|---|--------------------|

7MF9401-7BC

#### Selection and Ordering data

Article No.

##### Shut-off valves, form B, DIN 16270

without test collar, pipe union with ferrule  
12 S DIN EN ISO 8434-1, without certificate

| Material<br>Valve housing | Maximum permissible<br>working pressure |
|---------------------------|---|
|---------------------------|---|

|                             |                    |
|-----------------------------|--------------------|
| P250GH<br>(mat. No. 1.0460) | 400 bar (5800 psi) |
|-----------------------------|--------------------|

7MF9401-8AB

|   |                    |
|---|--------------------|
| X 6 CrNiMoTi 17 12 2<br>(mat. No. 1.4571/316Ti) | 400 bar (5800 psi) |
|---|--------------------|

7MF9401-8AC

##### Shut-off valves, form B, DIN 16271

with test collar, pipe union with ferrule  
12 S DIN EN ISO 8434-1, without certificate

| Material<br>Valve housing | Maximum permissible<br>working pressure |
|---------------------------|---|
|---------------------------|---|

|                             |                    |
|-----------------------------|--------------------|
| P250GH<br>(mat. No. 1.0460) | 400 bar (5800 psi) |
|-----------------------------|--------------------|

7MF9401-8BB

|   |                    |
|---|--------------------|
| X 6 CrNiMoTi 17 12 2<br>(mat. No. 1.4571/316Ti) | 400 bar (5800 psi) |
|---|--------------------|

7MF9401-8BC

##### Double shut-off valves, form B, DIN 16272

with test collar, connection shank,  
without certificate

| Material<br>Valve housing | Maximum permissible<br>working pressure |
|---------------------------|---|
|---------------------------|---|

|   |  |
|---|--|
| CW614N (CuZn39Pb3)250 bar (3626 psi)<br>(mat. No. 2.0402) |  |
|---|--|

7MF9401-7DA

|                             |                    |
|-----------------------------|--------------------|
| P250GH<br>(mat. No. 1.0460) | 400 bar (5800 psi) |
|-----------------------------|--------------------|

7MF9401-7DB

|   |                    |
|---|--------------------|
| X 6 CrNiMoTi 17 12 2<br>(mat. No. 1.4571/316Ti) | 400 bar (5800 psi) |
|---|--------------------|

7MF9401-7DC

##### Double shut-off valves, form B, DIN 16272

with test collar, pipe union with ferrule  
12 S DIN EN ISO 8434-1, without certificate

| Material<br>Valve housing | Maximum permissible<br>working pressure |
|---------------------------|---|
|---------------------------|---|

|                             |                    |
|-----------------------------|--------------------|
| P250GH<br>(mat. No. 1.0460) | 400 bar (5800 psi) |
|-----------------------------|--------------------|

7MF9401-8DB

|   |                    |
|---|--------------------|
| X 6 CrNiMoTi 17 12 2<br>(mat. No. 1.4571/316Ti) | 400 bar (5800 psi) |
|---|--------------------|

7MF9401-8DC

#### Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

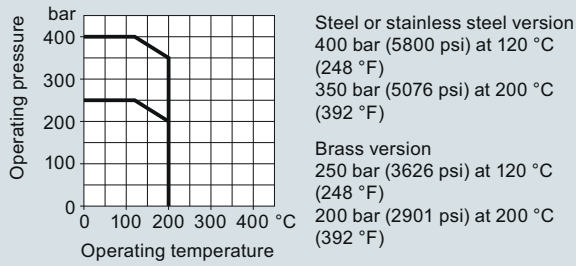
Material acceptance test certificate  
EN 10204-3.1

7MF9000-8AD

Instrument bracket, see page 1/497.

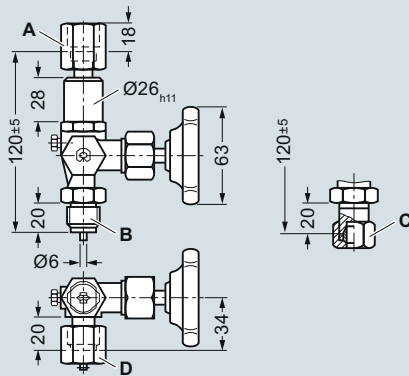


## Characteristic curves



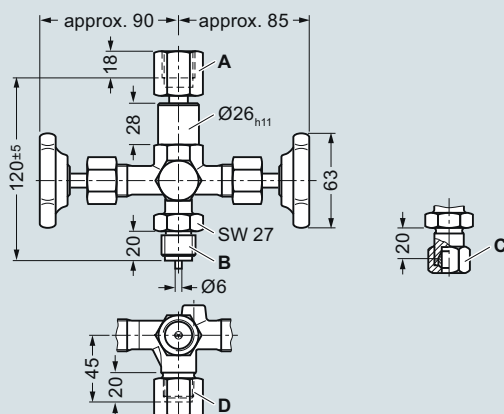
Permissible operating pressure as a function of the permissible operating temperature

## Dimensional drawings



- A Connection on device side: to DIN 16284, G½, SW 27
- B Connection on measurement side: connection shank to DIN EN 837-1, G½
- C Connection on measurement side: pipe union with ferrule 12 mm diameter, S series, to DIN EN ISO 8434-1
- D Connection on test collar (with sealing cap): thread M20 x 1,5

Shut-off valve, form B, dimension drawing, dimensions in mm



- A Connection on device side: to DIN 16284, G½, SW 27
- B Connection on measurement side: connection shank to DIN EN 837-1, G½
- C Connection on measurement side: pipe union with ferrule 12 mm diameter, S series, to DIN EN ISO 8434-1
- D Connection on test collar (with sealing cap): thread M20 x 1,5

Double shut-off valve, form B, dimension drawing, dimensions in mm

# Pressure Measurement

## Fittings

### Shut-off valves for gauge and absolute pressure transmitters

#### Angle adapter

1

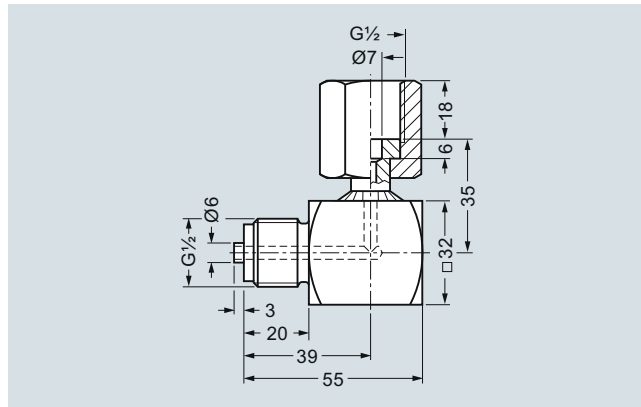
#### Overview



P300 pressure transmitter with shut-off valve and angle adapter

The angle adapter enables pressure transmitters with top displays to be read from the front.

#### Dimensional drawings



Angle adapter, dimensions in mm

#### Selection and Ordering data

##### Article No.

#### Angle adapters

**7MF9401-7WA**

Material: X 12 CrNiMoTi 17 12 2 (mat. No. 1.45714/316Ti), max. permissible operating pressure 400 bar (5800 psi)

#### Accessories

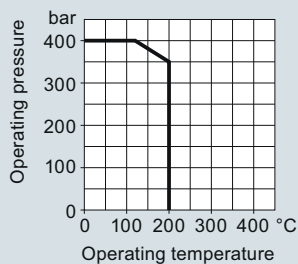
Factory test certificate EN 10204-2.2

**7MF9000-8AB**

Material acceptance test certificate EN 10204-3.1

**7MF9000-8AD**

#### Characteristic curves



Stainless steel version  
400 bar (5800 psi) at 120 °C  
(248 °F)  
350 bar (5076 psi) at 200 °C  
(392 °F)

Permissible operating overpressure as a function of the permissible operating temperature

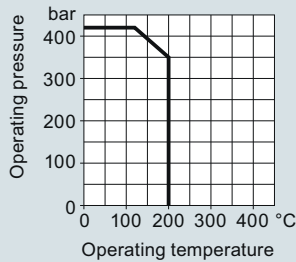
## Overview

The double shut-off valves DN 5 are suitable for pressure gauges and pressure transmitters and available in 5 versions:

- Sleeve-nipple
- Sleeve-sleeve
- Sleeve-collar
- Collar-collar
- Collar-sleeve

The valve packing material is PTFE.

## Characteristic curves



420 bar (6092 psi) at 120 °C  
(248 °F)  
350 bar (5076 psi) at 200 °C  
(392 °F)

Permissible operating pressure as a function of the permissible operating temperature

## Selection and Ordering data

Article No.

### Shut-off valve DN 5

Material: X 6 CrNiMoTi 17 13 2  
(W.-Nr. 1.4404/316L), max. permissible  
operating overpressure 420 bar (6092 psi)

- Sleeve-sleeve

**7MF9011-3HA**

### Double shut-off valves DN 5

Material: X 6 CrNiMoTi 17 13 2 (mat. No.  
1.4404/316L), max. permissible working  
pressure 420 bar (6092 psi);

- Sleeve-nipple connection
- Sleeve-sleeve
- Sleeve-collar
- Collar-collar
- Collar-sleeve

**7MF9011-4EA**  
**7MF9011-4HA**  
**7MF9011-4FA**  
**7MF9011-4GA**  
**7MF9011-4KA**

### Accessories

Factory test certificate EN 10204-2.2

**7MF9000-8AB**

Material acceptance test certificate  
EN 10204-3.1

**7MF9000-8AD**

### Further designs

Order code

Add "-Z" to Article No. and specify Order  
code.

Oil- and grease-free cleaning for oxygen  
applications, max. pressure PN 100 (1450 psi)  
and max. temperature 60 °C (140 °F)

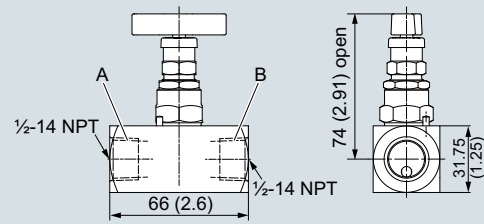
**S12**

**NACE MR-0175-certified**

**D07**

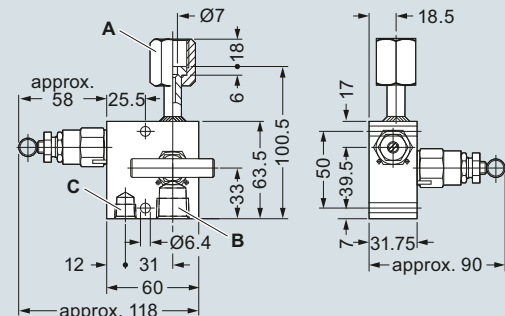
incl. acceptance test certificate 3.1 to EN 10204

## Dimensional drawings



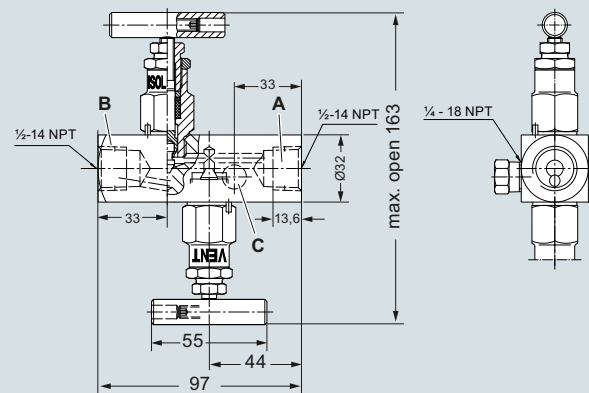
- A Connection on device side: 1/2-14 NPT  
B Connection on measurement side: 1/2-14 NPT

Shut-off valve DN 5 (sleeve-sleeve) 7MF9011-3HA, dimensions in mm (inch)



- A Connection on device side: nipple to DIN 16284, G $\frac{1}{2}$ , SW 27  
B Connection on measurement side: 1/2-14 NPT  
C Vent and test connection: 1/4-18 NPT

Double shut-off valve DN 5 (sleeve-nipple) 7MF9011-4EA, dimensions in mm



- A Connection on device side : 1/2-14 NPT  
B Connection on measurement side: 1/2-14 NPT  
C Vent and test connection: 1/4-18 NPT

Double shut-off valve DN 5 (sleeve-sleeve) 7MF9011-4HA, dimensions in mm

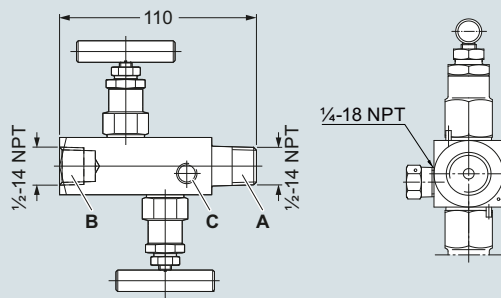
## Pressure Measurement

### Fittings

### Shut-off valves for gauge and absolute pressure transmitters

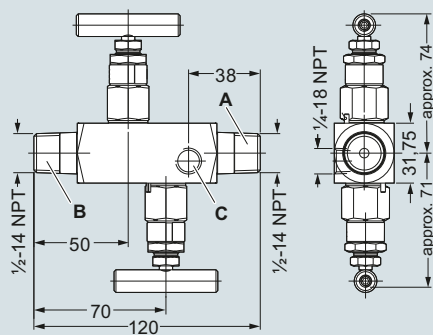
1

#### Shut-off valves/Double shut-off valves



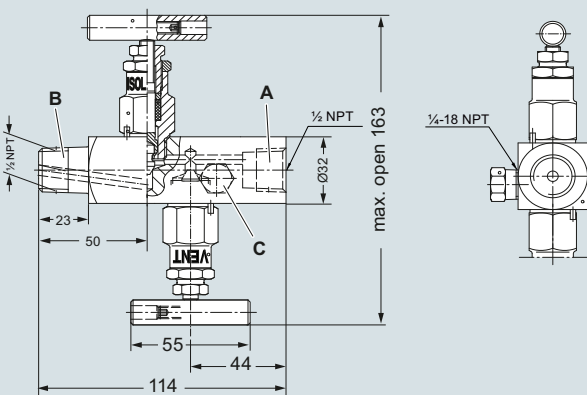
- A Connection on device side : 1/2-14 NPT
- B Connection on measurement side: 1/2-14 NPT
- C Vent and test connection: 1/4-18 NPT

Double shut-off valve DN 5 (sleeve-collar) 7MF9011-4FA,  
dimensions in mm



- A Connection on device side : 1/2-14 NPT
- B Connection on measurement side: 1/2-14 NPT
- C Vent and test connection: 1/4-18 NPT

Double shut-off valve DN 5 (collar-collar) 7MF9011-4GA,  
dimensions in mm



- A Connection on device side : 1/2-14 NPT
- B Connection on measurement side: 1/2-14 NPT
- C Vent and test connection: 1/4-18 NPT

Double shut-off valve DN 5 (collar-sleeve) 7MF9011-4KA,  
dimensions in mm

## Overview

The mounting set is suitable for the double shut-off valves 7MF9011-4.A and for wall, rack and pipe mounting.

## Selection and Ordering data

Article No.

## Mounting set for shut-off valves

- 7MF9011-4DA and -4EA

made of stainless steel, scope of delivery:  
1x mounting bracket,  
2x hexagon screws M6x40,  
1x mounting clip,  
2x washers 8.4 to DIN 125;  
2x hexagon nuts 8.4 to DIN EN 24032

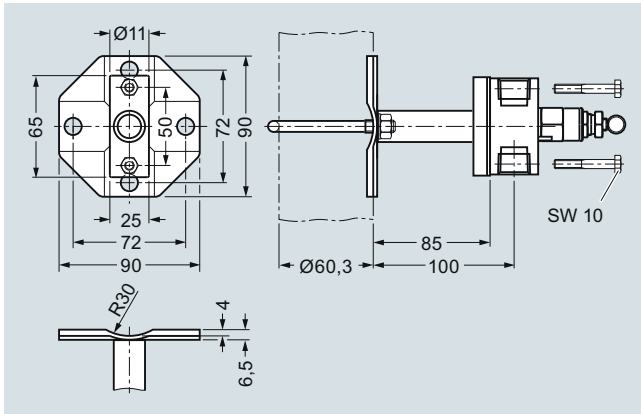
7MF9011-8AB

- 7MF9011-4FA, -4GA, 4HA, -4KA and -3HA

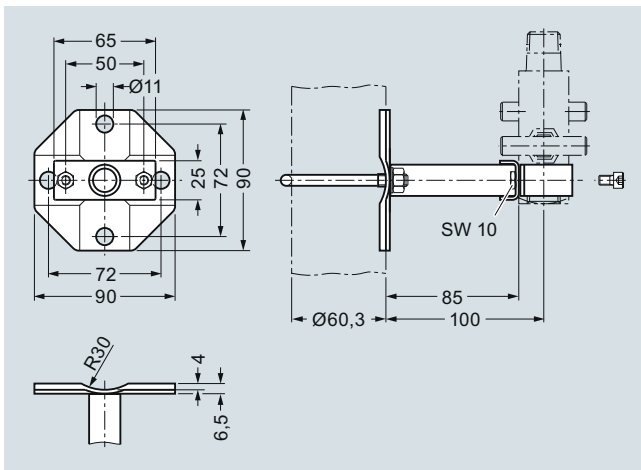
made of stainless steel, scope of delivery:  
1x mounting bracket,  
2x hexagon screws M6x10,  
1x mounting clip,  
2x washers 8.4 to DIN 125;  
2x hexagon nuts 8.4 to DIN EN 24032

7MF9011-8AC

## Dimensional drawings



Mounting bracket (7MF9011-8AB) for shut-off valves 7MF9011-4DA and 7MF9011-4EA for wall, rack or pipe mounting, dimensions in mm



Mounting bracket (7MF9011-8AC) for shut-off valves 7MF9011-4FA and 7MF9011-4GA for wall, rack or pipe mounting, dimensions in mm

## Overview

The instrument brackets are needed to mount the following units:

- Pressure gauges with threaded connection at the bottom
- Shut-off valves to DIN 16270, DIN 16271 and DIN 16272 (7MF9401-7.. and 7MF9401-8..)

## Selection and Ordering data

Article No.

## Instrument bracket, form H, DIN 16281

(e.g. for gauge)  
made of aluminium alloy, painted black,  
**for wall mounting**, screw-type bracket cover

- Projection length 60 mm
- Projection length 100 mm

M56340-A0046  
M56340-A0047

## Instrument bracket, form A, DIN 16281

(e.g. for transmitter)  
made of annealed cast iron, galvanized and  
primed **for mounting on a wall** or rack or  
on a sectional rail (horizontal/vertical);  
Screw-type bracket cover

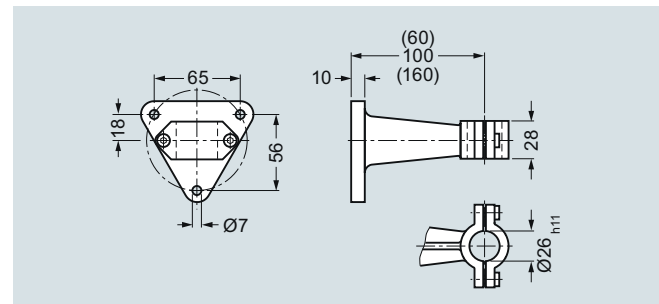
M56340-A0053

## Instrument bracket, form A, DIN 16281

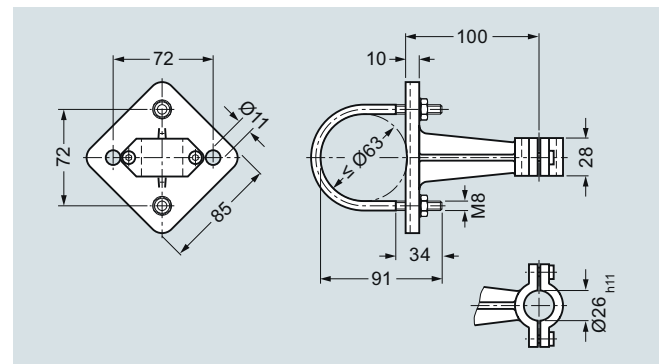
(e.g. for transmitter)  
made of annealed cast iron, galvanized and  
primed with pipe clamp for **wall and pipe  
mounting** (horizontal/vertical)  
Screw-type bracket cover

M56340-A0079

## Dimensional drawings



Instrument bracket form H, for wall mounting, M56340-A0046/-A0047, dimensions in mm



Instrument bracket form A, wall or pipe mounting, M56340-A0053/-A0079, dimensions in mm

## Pressure Measurement

### Fittings

### Shut-off valves for differential pressure transmitters

#### 2-, 3- and 5-spindle valve manifolds DN 5

1

#### Overview



The 2-spindle, 3-spindle and 5-spindle valve manifolds 7MF9411-5.. are for pressure transmitters for absolute pressure or differential pressure.

The valve manifolds are used to shut off the differential pressure lines and to check the pressure transmitter zero.

The 2-spindle and the 5-spindle valve manifold enable in addition venting on the transmitter side and checking of the pressure transmitter characteristic.

#### Benefits

- Max. working pressure 420 bar (6092 psi)
- Each available in version for oxygen

#### Application

The spindle valve manifolds DN 5 are designed for liquids and gases.

Each is available in a version for oxygen on request.

#### Design

All versions of the valve manifolds have a process connection 1/2-14 NPT. The connection for the pressure transmitter is always designed as a flange connection to IEC 61518/DIN EN 61518, form B. The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection 1/4-18 NPT.

The valves have an external spindle thread.

#### Materials used

| Component  | Material             | Mat. No.     |
|------------|----------------------|--------------|
| Housing    | X 2 CrNiMo 17 13 2   | 1.4404/316L  |
| Cones      | X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti |
| Spindles   | X 2 CrNiMo 18 10     | 1.4404/316L  |
| Head parts | X 5 CrNiMo 18 10     | 1.4401/316   |
| Packings   | PTFE                 | -            |

#### Function

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

#### Selection and Ordering data

##### Valve manifolds DN 5

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

for liquids and gases, for flanging to pressure transmitters for absolute and differential pressure, max. working pressure 420 bar (order accessory set with Order code), without certificate

- 2-spindle valve manifold
- 3-spindle valve manifold
- 5-spindle valve manifold

##### Accessories

Factory test certificate EN 10204-2.2

Material acceptance test certificate EN 10204-3.1

#### Article No.

7MF9411-5A

A

5A

5B

5C

#### Selection and Ordering data

##### Further designs<sup>1)</sup>

Please add "-Z" to Article No. and specify Order code.

##### Accessory set to EN

(connection between valve manifold and pressure transmitter)

for valve manifold 7MF9411-5A.

2x screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1; chromized steel  
1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K35

7MF9411-7DB

2x screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1; **stainless steel**

1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K45

7MF9411-7DC

for valve manifold 7MF9411-5B. and -5C.

4x screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1; chromized steel  
2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K36

7MF9411-5DB

4x screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1; **stainless steel**

2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K46

7MF9411-5DC

##### Accessory set to DIN<sup>2)</sup>

(connection between valve manifold and pressure transmitter)

for valve manifold 7MF9411-5A.

2x screws M10x45 to DIN EN 24014; chromized steel  
2x washers Ø 10.5 mm to DIN 125; 1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K15

7MF9411-7BB

2x screws M10x45 to DIN EN 24014; **stainless steel**

2x washers Ø 10.5 mm to DIN 125, **stainless steel**; 1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K25

7MF9411-7BC

| Selection and Ordering data   | Order code                             | Article No.        |
|---|--|--------------------|
| <b>Further designs<sup>1)</sup></b>   |  |                    |
| Please add <b>"-Z"</b> to Article No. and specify Order code.<br><br>for valve manifolds 7MF9411-5B.<br>and -5C.<br><br>4x screws M10x45 to DIN EN 24014; chromized steel<br>4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)<br>Flange connection with M10 screws only permissible up to PN 160. | <b>K16</b>                             | <b>7MF9411-6BB</b> |
| 4x screws M10x45 to DIN EN 24014; <b>stainless steel</b><br>4x washers Ø 10.5 mm to DIN 125, <b>stainless steel</b> ;<br>2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)<br>Flange connection with M10 screws only permissible up to PN 160.  | <b>K26</b>                             | <b>7MF9411-6BC</b> |
| <b>Mounting plate</b>   |  |                    |
| • for valve manifold, made of electrogalvanized sheet-steel<br>- <b>for wall mounting</b> or for securing on rack (72 mm grid), weight 0.5 kg<br>Scope of delivery:<br>1 mounting plate with bolts for mounting on valve manifold   | <b>M11</b>                             | <b>7MF9006-6EA</b> |
| - <b>for pipe mounting</b> , weight 0.7 kg<br>Scope of delivery:<br>1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm) and fastening screws for mounting on valve manifold  | <b>M12</b>                             | <b>7MF9006-6GA</b> |
| • for valve manifold, made of <b>stainless steel 316L</b><br>- <b>for wall mounting</b> or for securing on rack (72 mm grid), weight 0.5 kg<br>Scope of delivery:<br>1 mounting plate with bolts for mounting on valve manifold   | <b>M21</b>                             | <b>7MF9006-6EC</b> |
| - <b>for pipe mounting</b> , weight 0.7 kg<br>Scope of delivery:<br>1x mounting plate M21, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)  | <b>M22</b>                             | <b>7MF9006-6GC</b> |
| <b>Valve manifold 100 bar</b>   |  |                    |
| Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)<br>• for 7MF9411-5A.<br>• for 7MF9411-5B.<br>• for 7MF9411-5C.   | <b>S12</b><br><b>S13</b><br><b>S14</b> |                    |
| <b>NACE MR-0175-certified</b><br>incl. acceptance test certificate 3.1 to EN 10204  |  | <b>D07</b>         |

**Accessories****Accessory set for 2-, 3- and 5-spindle valve manifolds**2-spindle valve manifold DN 5

- K35: 2 screws  $\frac{7}{16}$ -20 UNF x 1 3/4 inch to ASME B18.2.1, 1 flat gasket
- K15: 2 screws M10x45 to DIN EN 24014, 2 washers, 1 flat gasket

3-spindle and 5-way valve manifold DN 5

- K36: 4 screws  $\frac{7}{16}$ -20 UNF x 1 3/4 inch to ASME B18.2.1, 2 flat gaskets
- K16: 4 screws M10x45 to DIN EN 24014, 4 washers, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

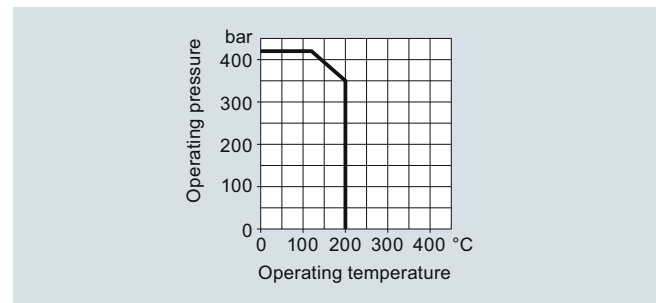
**Note:** Flange connection with M10 screws only permissible up to PN 160!**Mounting plate**

Made of electrogalvanized sheet-steel

- M11: For wall mounting or for securing on rack (72 mm grid)  
Scope of delivery:  
- 1 mounting plate with bolts for mounting on valve manifold
- M12: For pipe mounting  
Scope of delivery:  
- 1 mounting plate M11  
- 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

**Valve manifold 100 bar, suitable for oxygen**

- S12: For 2-way valve manifold
- S13: For 3-way valve manifold
- S14: For 5-way valve manifold

**Characteristic curves**

Valve manifolds PN 5 (7MF9411-5..), permissible working pressure as a function of the permissible working temperature

<sup>1)</sup> When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Article No.

<sup>2)</sup> Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)!

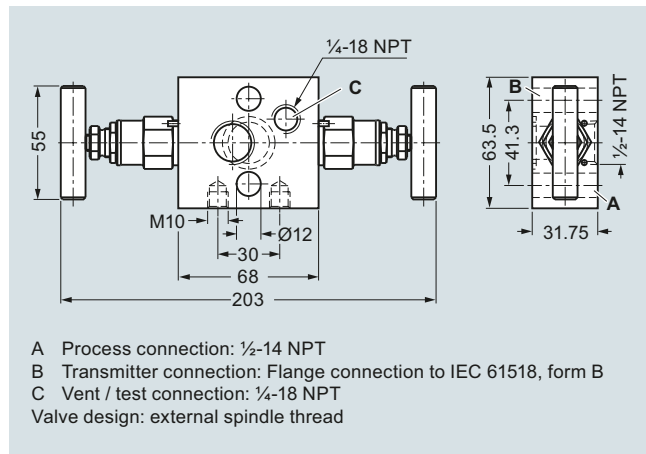
# Pressure Measurement

## Fittings

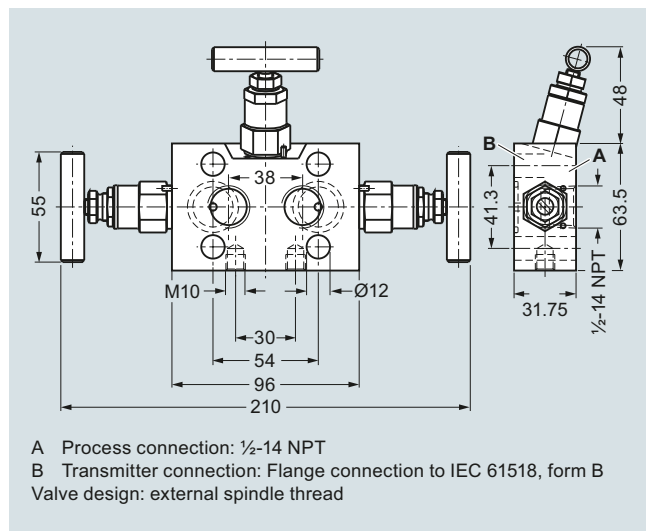
### Shut-off valves for differential pressure transmitters

#### 2-, 3- and 5-spindle valve manifolds DN 5

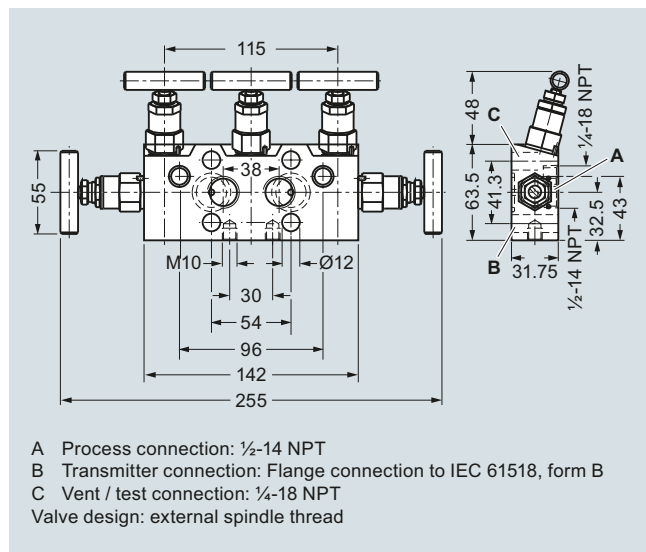
#### Dimensional drawings



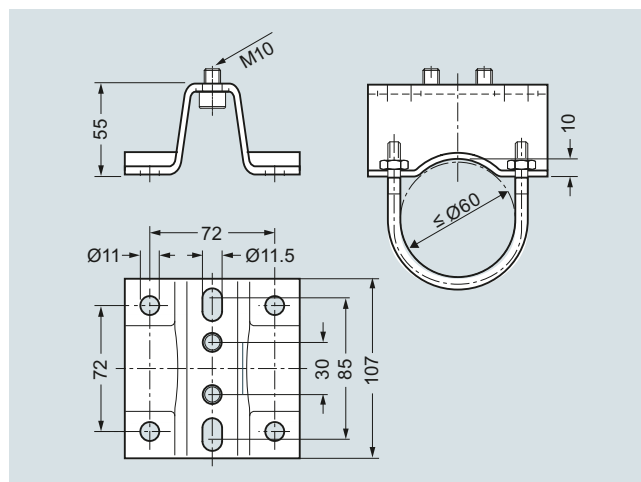
2-spindle valve manifold DN 5 (7MF9411-5A.), dimensions in mm



3-spindle valve manifold DN 5 (7MF9411-5B.), dimensions in mm

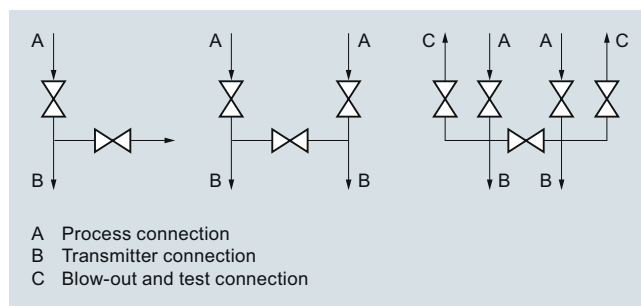


5-spindle valve manifold DN 5 (7MF9411-5C.), dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

#### Schematics



2-spindle, 3-spindle and 5-spindle valve manifold DN 5, connections



## Overview



Multiway cock PN 100 (1450 psi) (7MF9004-1P.) for differential pressure transmitters

The multiway cock PN 100 (1450 psi) can be flanged to pressure transmitters for differential pressure.

## Benefits

- Version available for aggressive liquids, gases and vapors
- Robust design
- Oil-free and grease-free version possible
- One-hand operation

## Application

The PN 100 (1450 psi) multiway cock is available in versions for aggressive and non-aggressive liquids, gases and vapors.

## Design

The multiway cock can be flanged with four screws to pressure transmitters for differential pressure.

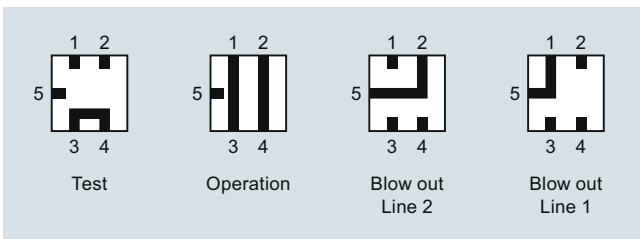
The PN 100 (1450 psi) has 2 process connections and one blow-out connection. A steel version of the multiway cock is available for non-aggressive media, and a stainless steel version for aggressive media. The housing is forged in one piece. The switching lever is removable.

Sealing can be improved during operation.

**Note:** An accessory set is always required for flanging of the multiway cock to a differential pressure transmitter.

## Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Testing the pressure transmitter zero



Cock positions; the symbols are printed on the cock

## Technical specifications

| Multiway cocks PN 100                |  |   |
|--------------------------------------|--|---|
| Measured medium                      | Water, non-aggressive liquids and gases        | Aggressive liquids, gases and vapors        |
| Material                             | P250GH, mat. No.: 1.0460                       | X 6 CrNiMoTi 17 12 2, mat. No. 1.4571/316Ti |
| Connections                          | Steel, for pipe Ø 12 mm, L series              | Stainless steel, for pipe Ø 12 mm, L series |
| • Process connection                 | 2 bulkhead glands                              |   |
| • Connection for blowing out         | Pipe union with ferrule                        |   |
| Max. permissible working temperature | 200 °C (392 °F)                                |   |
| Max. permissible working pressure    | 100 bar (1450 psi) (up to max. 60 °C (140 °F)) |   |
| Weight                               | 2.5 kg   |   |

## Selection and Ordering data

| Multiway cock PN 100 (1450 psi)   | Article No.                                 |
|---|---|
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a><br>for flanging to pressure transmitters, weight 2.5 kg (without accessory set), without certificate<br>For water and non-aggressive gases and vapors<br>For aggressive liquids, gases and vapors | <b>7MF9004-1P</b><br><b>1P</b><br><b>1Q</b> |
| <b>Accessories</b>  |   |
| Factory test certificate EN 10204-2.2   | <b>7MF9000-8AB</b>                          |
| Material acceptance test certificate EN 10204-3.1   | <b>7MF9000-8AD</b>                          |

## Selection and Ordering data

| Further designs <sup>1)</sup>  | Order code               | Article No.                              |
|--|--------------------------|--|
| Please add <b>'-Z'</b> to Article No. and specify Order code.  |                          |  |
| <b>Accessory set to EN</b><br>(required for flanging, weight 0.2 kg)<br>4x screws 7/16-20 UNF x 1 inch to ASME B18.2.1; chromized steel<br>2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)  | <b>L31</b>               | <b>7MF9004-5CC</b>                       |
| <b>Accessory set to DIN</b><br>(required for flanging, weight 0.2 kg)<br>4x screws M10x25 to DIN EN 24017; chromized steel, 4x washers Ø 10.5 mm to DIN 125; 2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)  |                          |  |
| • Standard design<br>• Version for oxygen (together with Order code S11)   | <b>L11</b><br><b>L15</b> | <b>7MF9004-6AD</b><br><b>7MF9004-6AE</b> |
| <b>Multiway cock in oil-free and grease-free design</b><br>Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F), BAM-tested lubricant, gasket suitable for oxygen measurement (only with Article No. 7MF9004-1Q.Z) | <b>S11</b>               |  |
| <b>Mounting bracket</b><br>Required for wall mounting or for securing on rack (72 mm grid), made of electrogalvanized sheet-steel, weight 0.85 kg  | <b>M13</b>               | <b>7MF9004-6AA</b>                       |
| <b>NACE MR-0175-certified</b><br>incl. acceptance test certificate 3.1 to EN 10204 (only available for version 7MF9004-1QA)  | <b>D07</b>               |  |

<sup>1)</sup> When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Article No.

## Pressure Measurement

### Fittings

### Shut-off valves for differential pressure transmitters

#### Multiway cocks PN 100

##### Accessories

##### Accessory set for multiway cock PN 100

- L31: 4 screws  $7/16$ -20 UNF x 1 inch, 2 flat gaskets
- L11: 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets
- L15 (suitable for oxygen): 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

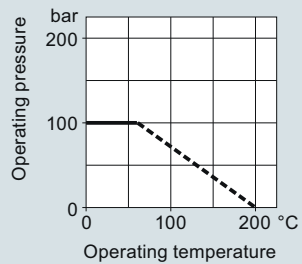
##### Multiway cock in oil-free and grease-free design

- S11 (only for aggressive liquids, gases and vapors (7MF9004-1Q.)): Max. PN 63 (914 psi) (instead of PN 100 (1450 psi)), BAM-tested lubricant, gasket suitable for oxygen

##### Mounting brackets

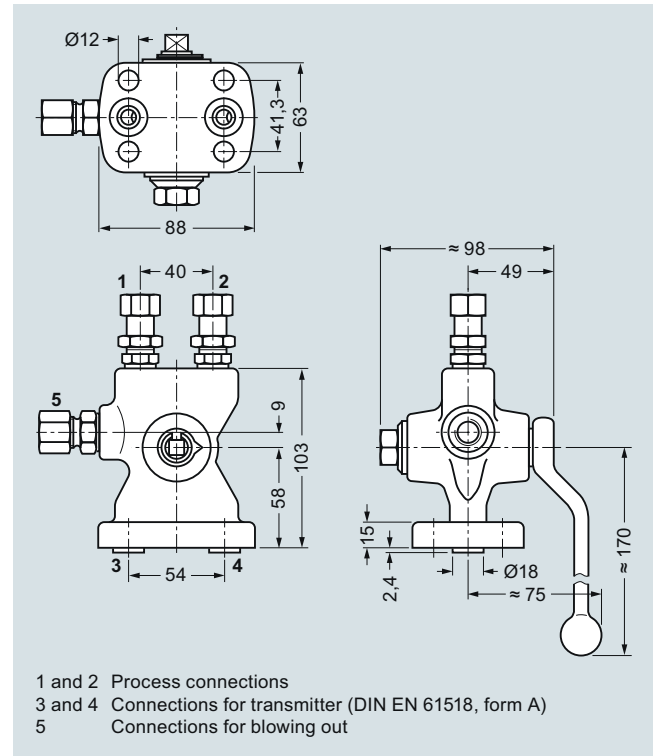
- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

##### Characteristic curves

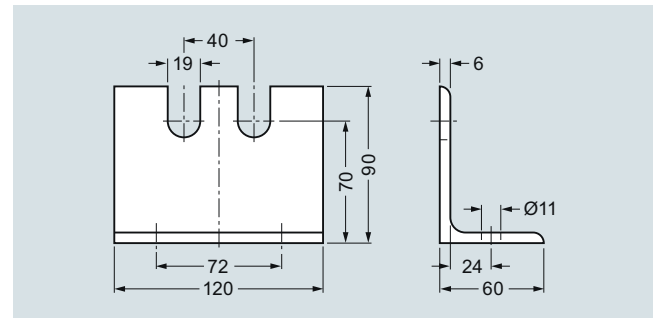


Multiway cock PN 100 (1450 psi), permissible operating pressure as a function of the permissible operating temperature

##### Dimensional drawings



Multiway cock 7MF9004-1P. for flanging to pressure transmitters for differential pressure, dimensions in mm



Mounting bracket 7MF9004-6AA (M13), dimensions in mm

## Overview



The three-spindle and five-spindle valve manifolds DN 5 (7MF9410-1../-3..) are used to shut off the differential pressure lines and to check the transmitter zero.

In addition, the five-way valve manifold permits blowing out of the differential pressure lines.

## Benefits

- Available for aggressive and non-aggressive liquids and gases
- Max. working pressure 420 bar (6092 psi), with version for oxygen max. 100 bar (1450 psi)

## Application

The 3-way and 5-way valve manifolds are available in versions for aggressive and non-aggressive liquids and gases.

Mounting plates are available for wall mounting, for securing to mounting racks or for pipe mounting.

## Design

The process connection of the 3-way and 5-way valve manifolds is a pipe union with ferrule.

Both valve manifolds have 2 flange connections for connecting a pressure transmitter.

In addition, the five-way valve manifold has 2 blow-out connections.

Depending on the version the valve manifold has either 3 or 5 valves, each with an internal spindle thread.

## Materials used

| Component   | For non-aggressive liquids and gases |              | For aggressive liquids and gases |              |
|-------------|--------------------------------------|--------------|----------------------------------|--------------|
|             | Material                             | Mat. No.     | Material                         | Mat. No.     |
| Housing     | P250GH                               | 1.0460       | X 6 CrNiMoTi17 12 2              | 1.4571/316Ti |
| Head parts  | C 35                                 | 1.0501       |                                  |              |
| Spindles    | X 12 CrMoS 17                        | 1.4104       |                                  |              |
| Cones       | X 35 CrMo 17 hardened and tempered   | 1.4122       |                                  |              |
| Valve seats | X 6 CrNiMoTi 17 12 2                 | 1.4571/316Ti |                                  |              |
| Packings    | PTFE                                 | -            | PTFE                             | -            |

## Function

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero
- In addition, the five-way valve manifold permits blowing out of the differential pressure lines.

## Selection and Ordering data

Article No.

### 3-way valve manifold DN 5

7MF9410 - A

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

For flanging to pressure transmitters for differential pressure, process connection: Pipe union with ferrule, max. working pressure 420 bar (6092 psi), weight 2.9 kg (order accessory set and mounting plate with Order code), without certificate

- for non-aggressive liquids and gases
- for aggressive liquids and gases

### 5-way valve manifold DN 5

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

For flanging to pressure transmitters for differential pressure, process connection: Pipe union with ferrule, max. working pressure 420 bar (6092 psi), weight 4.4 kg (order accessory set and mounting plate with Order code), without certificate

- for non-aggressive liquids and gases
- for aggressive liquids and gases

## Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

# Pressure Measurement

## Fittings

### Shut-off valves for differential pressure transmitters

1

#### 3-way and 5-way valve manifolds DN 5

| Selection and Ordering data  | Order code                             | Article No.  |
|--|--|--|
| <b>Further designs<sup>1)</sup></b><br>Please add "-Z" to Article No. and specify Order code.  |  |  |
| <b>Accessory set to EN</b><br>(required for flanging, weight 0.2 kg)<br><br>4x screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2; chromized steel<br>2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)   | <b>B31</b>                             | <b>7MF9010-5CC</b>   |
| 4x screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2; chromized steel<br>2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)   | <b>B34</b>                             | <b>7MF9410-5CA</b>   |
| <b>Accessory set to DIN<sup>2)</sup></b><br>(required for flanging, weight 0.2 kg)<br><br>4x screws M10x55 to DIN EN 24014; chromized steel<br>4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)<br><br>• Standard design<br>• Version for oxygen   | <b>B11</b><br><b>B15</b><br><b>B16</b> | <b>7MF9010-6AD</b><br><b>7MF9010-6AE</b><br><b>7MF9010-6CC</b> |
| 4x screws M10x55 to DIN EN 24014; chromized steel<br>4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)  |  |  |
| <b>Mounting plate</b><br>for valve manifold, made of electrogalvanized sheet-steel<br><b>for wall mounting</b> or for securing on rack (72 mm grid), weight 0.5 kg<br>Scope of delivery:<br>1 mounting plate with bolts for mounting on valve manifold<br><br><b>for pipe mounting</b> , weight 0.7 kg<br>Scope of delivery:<br>1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm) | <b>M11</b><br><br><b>M12</b>           | <b>7MF9006-6EA</b><br><br><b>7MF9006-6GA</b>                   |
| <b>Valve manifold 100 bar</b><br>suitable for oxygen<br><br>for 7MF9410-1F<br>for 7MF9410-3F   | <b>S13</b><br><b>S14</b>               |  |
| <b>NACE MR-0175-certified</b><br>incl. acceptance test certificate 3.1 to EN 10204 (only available for version 7MF9410-1FA and -3FA)   | <b>D07</b>                             |  |

<sup>1)</sup> When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Article No.

<sup>2)</sup> Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)

#### Accessories

##### Accessory set for 3-way and 5-way valve manifold DN 5 for flanging

- B31: 4 screws  $\frac{7}{16}$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B18.2.1, 2 flat gaskets
- B34: 4 screws  $\frac{7}{16}$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B11: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets
- B15 (suitable for oxygen): 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

O-ring to DIN 3771, 20 x 2.65 – S – FPM90, max. 420 bar (6092 psi), 120 °C (248 °F)

**Note:** M10 screws only permissible up to PN 160 (2320 psi)!

##### Mounting plate

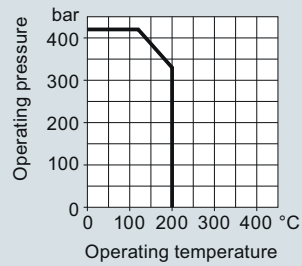
Made of electrogalvanized sheet-steel

- M11: For wall mounting or for securing on rack (72 mm grid)  
Scope of delivery:  
- 1 mounting plate 7MF9006-6EA with bolts for mounting on valve manifold
- M12: For pipe mounting  
Scope of delivery:  
- 1 mounting plate M11  
- 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

##### Valve manifold 100 bar, suitable for oxygen

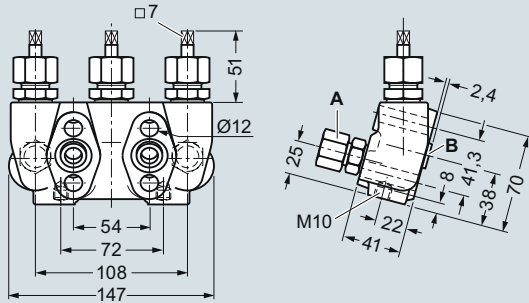
S12: Only in combination with versions for aggressive liquids and gases

## Characteristic curves



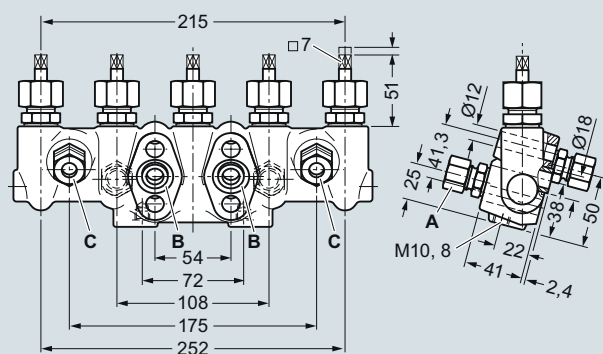
Permissible operating pressure as a function of the permissible operating temperature

## Dimensional drawings



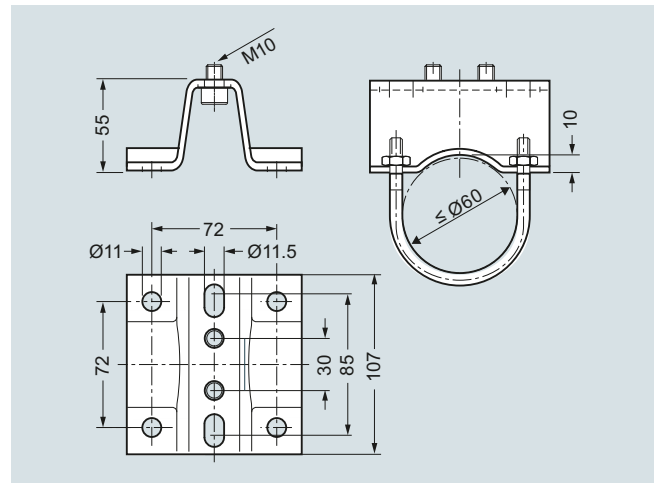
- A Process connection (e.g. on primary device): Pipe union with ferrule, diameter 12 mm, S series to DIN 2353  
 B Transmitter connection: Flange connection to EN 61518, form A  
 Valve design: internal spindle thread

3-way valve manifold DN 5 (7MF9410-1..), dimensions in mm



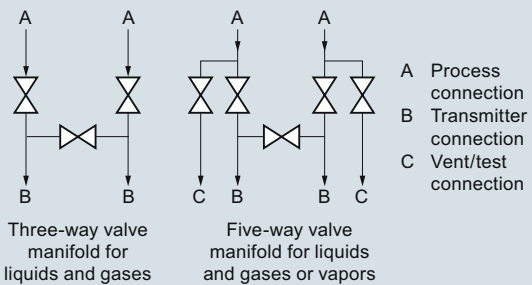
- A Process connection (e.g. on primary device): Pipe union with ferrule, diameter 12 mm, S series to DIN 2353  
 B Transmitter connection: Flange connection to EN 61518, form A  
 C Blow-out connection: Pipe union with ferrule, diameter 12 mm, S series to DIN 2353  
 Valve design: internal spindle thread

5-way valve manifold DN 5 (7MF9410-3..), dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

## Schematics



3-way and 5-way valve manifolds, connections

## Pressure Measurement

### Fittings

### Shut-off valves for differential pressure transmitters

#### 3-way valve manifold DN 8

1

#### Overview



The 3-way valve manifold DN 8 (7MF9416-1../-2..) is for pressure transmitters for differential pressure. It is used to shut off and blow out differential pressure lines and to test the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to test the pressure transmitter characteristic.

#### Benefits

- For aggressive and non-aggressive liquids and gases
- The maximum working pressure is 420 bar (6092 psi).

#### Application

The 3-way valve manifold is available in versions for aggressive and non-aggressive liquids and gases.

Mounting plates are available for wall mounting, for securing to mounting racks or for pipe mounting.

#### Design

For the process connection on the version for non-aggressive media it is possible to choose between a pipe union with ferrule and welding pins.

The version for aggressive media always has a pipe union with ferrule.

Both versions are available optionally with a test connection M20x1.5.

The valves have an internal spindle thread.

#### Materials used

| Component   | For non-aggressive liquids and gases |              | For aggressive liquids and gases |              |
|-------------|--------------------------------------|--------------|----------------------------------|--------------|
|             | Material                             | Mat. No.     | Material                         | Mat. No.     |
| Housing     | P250GH                               | 1.0460       | X 6 CrNiMoTi17 12 2              | 1.4571/316Ti |
| Head parts  | C 35                                 | 1.0501       |                                  |              |
| Spindles    | X 12 CrMoS 17                        | 1.4104       |                                  |              |
| Cones       | X 35 CrMo 17 hardened and tempered   | 1.4122       |                                  |              |
| Valve seats | X 6 CrNiMoTi 17 12 2                 | 1.4571/316Ti |                                  |              |
| Packings    | PTFE                                 | -            | PTFE                             | -            |

#### Function

The 3-way valve manifold DN 8 performs two functions as standard:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

All versions are also available with a test connection, to which a test device for checking the pressure transmitter characteristic can be connected.

#### Selection and Ordering data

Article No.

##### 3-way valve manifold DN 8

7MF9416 - A

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

For flanging to pressure transmitters for differential pressure, max. working pressure 420 bar (6092 psi), (order accessory set and mounting plate with Order code), without certificate

For non-aggressive liquids and gases  
process connection: Pipe union with ferrule Ø 12 mm

- without test connection
- with test connection

1 B

1 C

For non-aggressive liquids and gases  
process connection: Welding pin Ø 14 x 2.5

- without test connection
- with test connection

2 C

2 D

For aggressive liquids and gases  
process connection: Pipe union with ferrule Ø 12 mm

- without test connection
- with test connection

1 D

1 E

#### Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

| Selection and Ordering data   | Order code | Article No.        |
|---|------------|--------------------|
| <b>Further designs<sup>1)</sup></b><br>Please add "-Z" to Article No. and specify Order code.   |            |                    |
| <b>Accessory set to EN</b><br>(required for flanging, weight 0.2 kg)<br><br>4x screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2; chromized steel<br>2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)            | <b>B31</b> | <b>7MF9010-5CC</b> |
| 4x screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2; chromized steel<br>2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)  | <b>B34</b> | <b>7MF9410-5CA</b> |
| <b>Accessory set to DIN<sup>2)</sup></b><br>(required for flanging, weight 0.2 kg)<br><br>4x screws M10x55 to DIN EN 24014; chromized steel<br>4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F) | <b>B11</b> | <b>7MF9010-6AD</b> |
| 4x screws M10x55 to DIN EN 24014; chromized steel<br>4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)   | <b>B16</b> | <b>7MF9010-6CC</b> |
| <b>Mounting plate</b><br>For valve manifold, made of electrogalvanized sheet-steel<br><br><b>for wall mounting</b> or for securing on rack (72 mm grid), weight 0.5 kg<br>Scope of delivery:<br>1 mounting plate with bolts for mounting on valve manifold        | <b>M11</b> | <b>7MF9006-6EA</b> |
| <b>for pipe mounting</b> , weight 0.7 kg<br>Scope of delivery:<br>1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)  | <b>M12</b> | <b>7MF9006-6GA</b> |
| <b>NACE MR-0175-certified</b><br>incl. acceptance test certificate 3.1 to EN 10204 (only available for version 7MF9416-1DA and -1EA)  | <b>D07</b> |                    |

- 1) When ordering accessory set or mounting together with the valve manifold, please use Order code; otherwise use Article No.  
2) Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)!

## Accessories

### Accessory set for 3-way valve manifold DN 8 for flanging

- B31: 4 screws  $\frac{7}{16}$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B18.2.1, 2 flat gaskets
- B34: 4 screws  $\frac{7}{16}$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B11: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. 420 bar (6092 psi), 120 °C (248 °F)

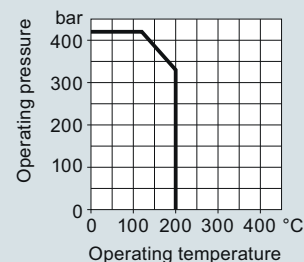
**Note:** M10 screws only permissible up to PN 160 (2320 psi)!

### Mounting plate

Made of electrogalvanized sheet-steel

- M11: For wall mounting or for securing on rack (72 mm grid)  
Scope of delivery:  
- 1 mounting plate with bolts for mounting on valve manifold
- M12: For pipe mounting  
Scope of delivery:  
- 1 mounting plate M11  
- 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

## Characteristic curves



3-way valve manifold DN 8, permissible working pressure as a function of the permissible working temperature



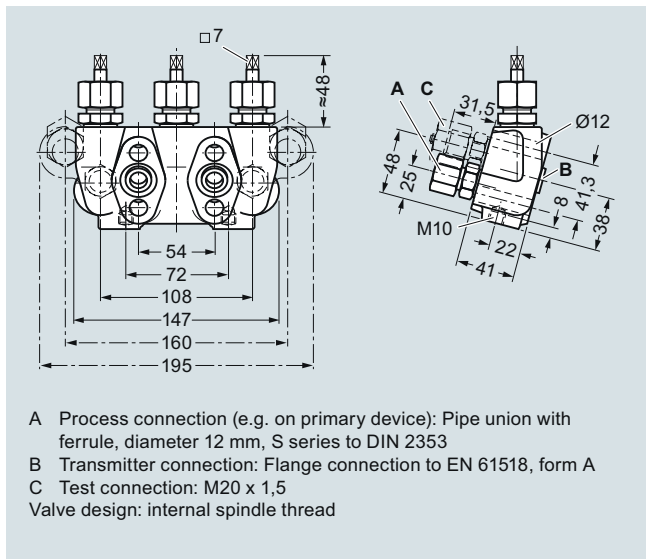
# Pressure Measurement

## Fittings

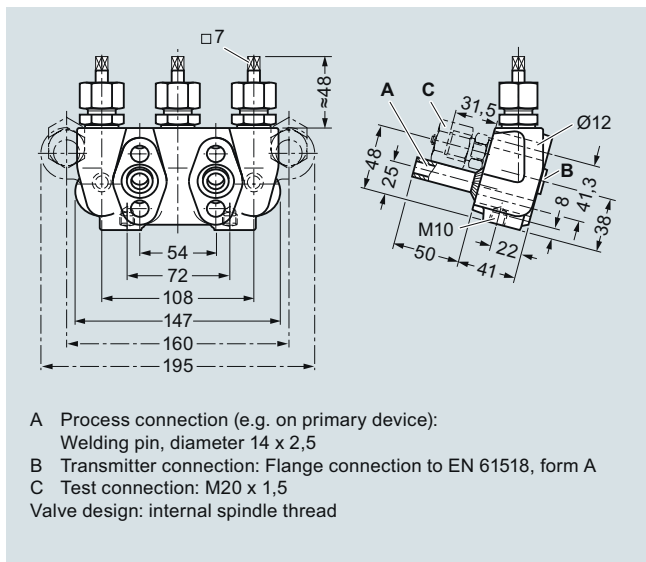
### Shut-off valves for differential pressure transmitters

#### 3-way valve manifold DN 8

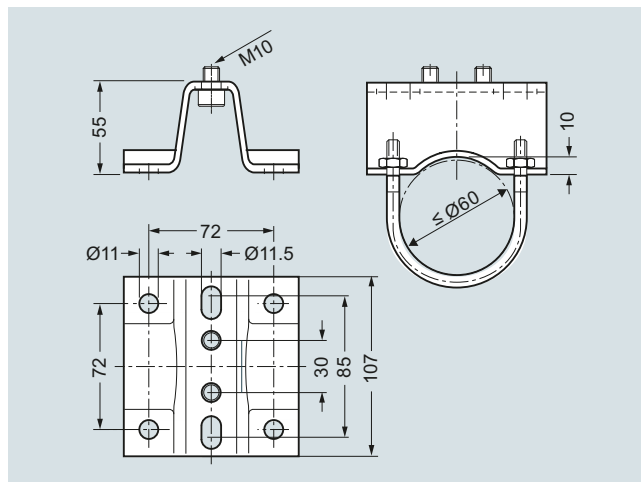
##### Dimensional drawings



3-way valve manifold DN 8 (7MF9416-1..) with pipe union, dimensions in mm

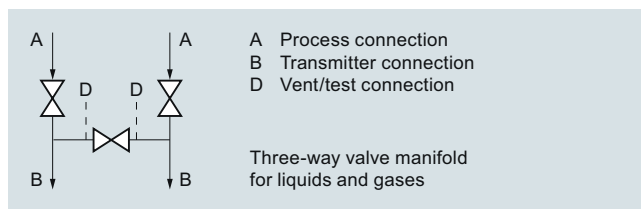


3-way valve manifold DN 8 (7MF9416-2..) with welding pin, dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

##### Schematics



3-way valve manifold DN 8, connections



## Overview



The valve manifold combination DN 5/DN 8 (7MF9416-6..) is for pressure transmitters for differential pressure.

The combination is used to shut off and blow out differential pressure lines and to test the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to test the pressure transmitter characteristic.

## Benefits

- Max. working pressure 420 bar (6092 psi)

## Application

The valve manifold combination DN 5/DN 8 is designed for vapors.

## Design

The valve manifold combination DN 5/DN 8 has a process connection with welding pins.

The connection for the pressure transmitter is designed as a flange connection, while the blow-out connection is designed as a pipe union with ferrule.

The manifold valves have an internal spindle thread, while the blow-out valves have an external spindle thread.

The optional test connections are M20x1.5.

## Materials used

| Component    | Valve manifold DN 5 |              | Blow-out valves DN 8                             |          |
|--------------|---------------------|--------------|--|----------|
|              | Material            | Mat. No.     | Material   | Mat. No. |
| Housing      | P250GH              | 1.0460       | 16 Mo 3  | 1.5415   |
| Head parts   | C 35                | 1.0501       | 21 CrMo V57                                      | 1.7709   |
| Spindles     | X 12<br>CrMoS 17    | 1.4104       | X 20 Cr 13                                       | 1.4021   |
| Cones        | X 35<br>CrMo 17     | 1.4122       | X 35<br>CrMo 17<br>hardened<br>and tem-<br>pered | 1.4122   |
| Valve seats  | X 6 CrNiMoTi        | 1.4571/316Ti | X 20 Cr 13                                       | 1.4021   |
| Packings     | PTFE                | -            | Pure<br>graphite                                 | -        |
| Welding pins | -                   | -            | 16 Mo 3  | 1.5415   |

## Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Checking the pressure transmitter zero

As an option it is possible to order a version with a test connection, to which a test device for checking the transmitter characteristic can be connected.

## Selection and Ordering data

Article No.

## Valve manifold combination DN 5/DN 8 for vapors

7MF9416-6 A

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

For flanging to pressure transmitters for differential pressure, max. working pressure 420 bar (6092 psi), also available in stainless steel on request (order accessory set with Order code), without certificate

- without test connection
- with test connection M20 × 1.5

C  
D

## Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

## Selection and Ordering data

Order code

Article No.

Further designs<sup>1)</sup>

Please add "-Z" to Article No. and specify Order code.

## Accessory set to EN

(required for flanging, weight 0.2 kg)

B34

7MF9410-5CA

4x screws  $\frac{7}{16}$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B18.2; chromized steel  
2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)

Accessory set to DIN<sup>2)</sup>

(required for flanging, weight 0.2 kg)

B16

7MF9010-6CC

4x screws M10x55 to DIN EN 24014; chromized steel  
4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F); Flange connection to DIN 19213 only permissible up to PN 160!

<sup>1)</sup> When ordering accessory set together with the valve manifold combination, please use Order code; otherwise use Article No.

<sup>2)</sup> Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)



## Overview



The valve manifold combination DN 8 (7MF9416-4..) is for pressure transmitters for differential pressure.

It is used to shut off and blow out the differential pressure lines and to check the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to check the pressure transmitter characteristic.

## Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Checking the pressure transmitter zero

As an option it is possible to order a version with a test connection, to which a test device for checking the pressure transmitter characteristic can be connected.

## Selection and Ordering data

Article No.

## Valve manifold combination DN 8 for vapors

7MF9416 - A

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

for flanging to pressure transmitters for differential pressure, with mounting plate, max. working pressure 420 bar (6092 psi), also available in stainless steel on request (order accessory set with Order code), without certificate

- without test connection
- with test connection M20 × 1.5

4 C  
4 D

## Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

## Benefits

- Max. working pressure 420 bar (6092 psi)

## Application

The valve manifold combination DN 8 is designed for vapors.

## Design

The valve manifold combination DN 8 has a process connection with welding pins.

The connection for the pressure transmitter is designed as a flange connection, while the blow-out connection is designed as a pipe union with ferrule.

The manifold valves have an internal spindle thread, while the blow-out valves have an external spindle thread.

The optional test connection is M20x1.5.

The valve manifold combination DN 8 is supplied with a mounting plate.

## Materials used

| Component    | Valve manifold   |              | Blow-out valves                                  |          |
|--------------|------------------|--------------|--|----------|
|              | Material         | Mat. No.     | Material   | Mat. No. |
| Housing      | P250GH           | 1.0460       | 16 Mo 3  | 1.5415   |
| Head parts   | C 35             | 1.0501       | 21 CrMo V57                                      | 1.7709   |
| Spindles     | X 12<br>CrMoS 17 | 1.4104       | X 20 Cr 13                                       | 1.4021   |
| Cones        | X 35<br>CrMo 17  | 1.4122       | X 35<br>CrMo 17<br>hardened<br>and tem-<br>pered | 1.4122   |
| Valve seats  | X 6 CrNiMoTi     | 1.4571/316Ti | X 20 Cr 13                                       | 1.4021   |
| Packings     | PTFE             | -            | Pure<br>graphite                                 | -        |
| Welding pins | -                | -            | 16 Mo 3  | 1.5415   |

## Selection and Ordering data

Order code

Article No.

Further designs<sup>1)</sup>

Please add "-Z" to Article No. and specify Order code.

## Accessory set to EN

(required for flanging, weight 0.2 kg)

B34

7MF9410-5CA

4x screws  $\frac{7}{16}$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B18.2; chromized steel  
2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)

Accessory set to DIN<sup>2)</sup>

(required for flanging, weight 0.2 kg)

B16

7MF9010-6CC

4x screws M10x55 to DIN EN 24014; chromized steel  
4x washers Ø 10.5 mm to DIN 125;  
2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)  
Flange connection to DIN 19 213 only permissible up to PN 160!

<sup>1)</sup> When ordering accessory set together with the valve manifold combination, please use Order code; otherwise use Article No.

<sup>2)</sup> Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)

## Accessories

## Accessory set for valve manifold combination DN 8 for flanging

- B34: 4 screws  $\frac{7}{16}$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B 18.2.1, 2 O-rings (FPM 90)
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers Ø 10.5 to DIN 125

O-ring to DIN 3771, 20 x 2.65 – S – FPM90, max. 420 bar (6092 psi), 120 °C (248 °F)

**Note:** M10 screws only permissible up to PN 160 (2321 psi)!

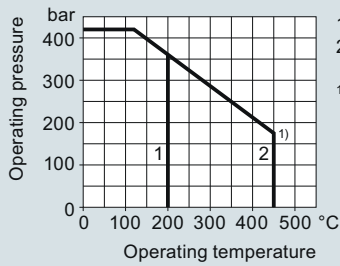
# Pressure Measurement

## Fittings

### Shut-off valves for differential pressure transmitters

#### Valve manifold combination DN 8

##### Characteristic curves

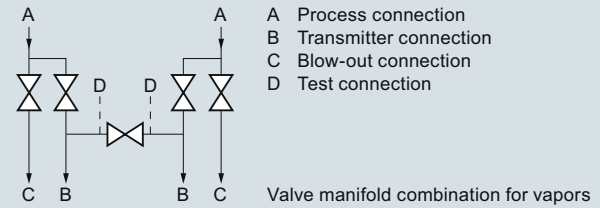


- 1 Valve manifold  
2 Blow-out connection

1) According to DIN 19210 the design can be such that the temperatures for the differential pressure line can be set approx. 100 °C (212 °F) lower than the media temperature.

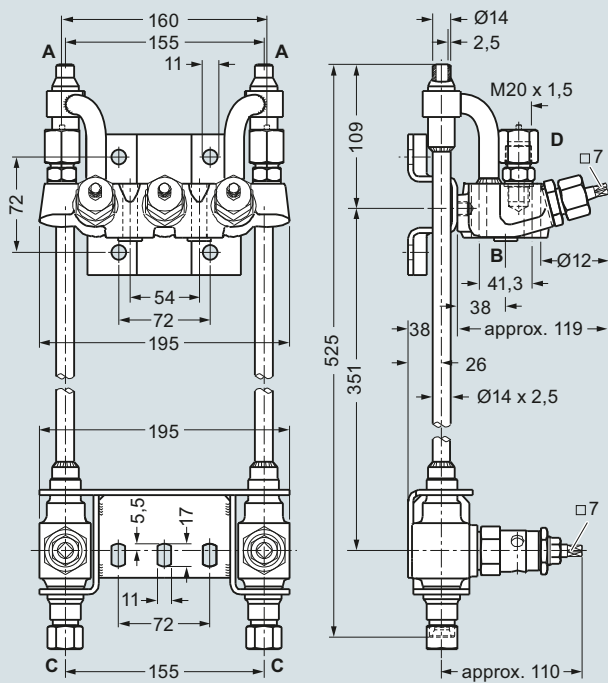
Permissible operating pressure as a function of the permissible operating temperature

##### Schematics



Valve manifold combination DN 8, connections

##### Dimensional drawings



- A Process connection (e.g. on primary device): Welding pin  
B Transmitter connection: Flange connection to EN 61518, form A  
C Blow-out connection: Pipe union with ferrule, diameter 14 mm, S series to DIN 2353  
D Test connection (only with Article No. 7MF9416-4D.): M20 x 1,5
- Valve design:  
- Manifold valves: internal spindle thread  
- Blow-out valves: external spindle thread

Valve manifold combination DN 8 (7MF9416-4..), dimensions in mm

## Overview



The 2-spindle, 3-spindle and 5-spindle valve manifolds (7MF9412-1..) are used to shut off the differential pressure lines and to check the transmitter zero.

The five-spindle valve manifold permits venting on the transmitter side and checking of the transmitter characteristic.

These valve manifolds are preferentially used when mounting in protective boxes. In addition, they can also be used for wall, frame or pipe mounting together with the mounting bracket.

Transmitters of the DS series can be operated and read from the front when using these valve manifolds.

## Application

The valve manifolds DN 5 are designed for liquids and vapors and for installing in protective boxes.

Each is available in a version for oxygen on request

## Design

All versions of the spindle manifolds have a process connection 1/2-14 NPT.

The connection for the pressure transmitter is always designed as a flange connection to IEC 61518/DIN EN 61518, Form A.

The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection 1/4-18 NPT.

The valves have an external spindle thread.

## Materials used

| Components | Material             | Mat. No.     |
|------------|----------------------|--------------|
| Housing    | X 2 CrNiMo 17 13 2   | 1.4404/316L  |
| Cones      | X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti |
| Spindles   | X 2 CrNiMo 18 10     | 1.4404/316L  |
| Head parts | X 5 CrNiMo 18 10     | 1.4401/316   |
| Packings   | PTFE                 | -            |

## Functions

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

## Selection and Ordering data

Article No.

## Valve manifolds DN 5 for mounting in protective boxes

7MF9412 - A

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

for liquids and gases  
for flanging to pressure transmitters for absolute and differential pressure  
Material: stainless steel, mat. No: 1.4404/316L  
max. working pressure 420 bar (6092 psi)  
(order accessory set with Order code),  
without certificate

- 2-spindle valve manifold with rotating sleeve G1/2 1 B
- 2-spindle valve manifold with flange connection 1 C
- 3-spindle valve manifold 1 D
- 5-spindle valve manifold 1 E

## Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

## Selection and Ordering data

Order code

Article No.

Further designs<sup>1)</sup>

Please add "-Z" to Article No. and specify Order code.

## Accessory set to EN

(connection between valve manifold and pressure transmitter)

for valve manifold 7MF9412-1C.

2x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel  
1x O-ring to DIN 3771,  
20 x 2.65 - S - FPM90,  
max. permissible 420 bar (6092 psi), 120 °C (248 °F)

F32

7MF9412-6CA

2x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel  
1x gasket made of PTFE,  
max. permissible 420 bar (6092 psi), 80 °C (176 °F)<sup>2)</sup>

F35

7MF9412-6DA

for valve manifold 7MF9412-1D and -1E.

4x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel  
2x O-rings to DIN 3771,  
20 x 2.65 - S - FPM90,  
max. permissible 420 bar (6092 psi), 120 °C (248 °F)<sup>2)</sup>

F34

7MF9412-6GA

4x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel  
2x flat gaskets made of PTFE,  
max. permissible 420 bar (6092 psi), 80 °C (176 °F)<sup>2)</sup>

F36

7MF9412-6HA

# Pressure Measurement

## Fittings

### Shut-off valves for differential pressure transmitters

#### 2-, 3- and 5-spindle valve manifolds for installing in protective boxes

1

| Selection and Ordering data   | Order code | Article No.        |
|---|------------|--------------------|
| <b>Further designs<sup>1)</sup></b>   |            |                    |
| Please add <b>"-Z"</b> to Article No. and specify Order code.   |            |                    |
| <b>Accessory set to DIN</b><br>(connection between valve manifold and pressure transmitter)<br><u>For valve manifold 7MF9412-1C.</u>  |            |                    |
| 2x screws M10x50 to DIN EN 24014; chromized steel<br>2x washers Ø 10.5 mm to DIN 125;<br>1x O-ring to DIN 3771,<br>20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F) <sup>2)</sup>  | <b>F12</b> | <b>7MF9412-6AA</b> |
| 2x screws M10x50 to DIN EN 24014; chromized steel<br>2x washers Ø 10.5 mm to DIN 125;<br>1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F) <sup>2)</sup>                            | <b>F15</b> | <b>7MF9412-6BA</b> |
| <u>For valve manifold 7MF9412-1D and -1E.</u>   |            |                    |
| 4x screws M10x50 to DIN EN 24014; chromized steel<br>4x washers Ø 10.5 mm to DIN 125;<br>2x O-rings to DIN 3771,<br>20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F) <sup>2)</sup> | <b>F14</b> | <b>7MF9412-6EA</b> |
| 4x screws M10x50 to DIN EN 24014; chromized steel<br>4x washers Ø 10.5 mm to DIN 125;<br>2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F) <sup>2)</sup>                      | <b>F16</b> | <b>7MF9412-6FA</b> |
| <b>Mounting bracket</b><br>required for wall mounting or for securing to mounting rack, with bolts for mounting on valve manifold   |            |                    |
| • for valve manifolds 7MF9412-1B. and -1C.  | <b>M14</b> | <b>7MF9006-6LA</b> |
| • for valve manifold 7MF9412-1D.  | <b>M17</b> | <b>7MF9006-6NA</b> |
| • for valve manifold 7MF9412-1E.  | <b>M18</b> | <b>7MF9006-6PA</b> |
| <b>Mounting clip</b><br>2 off, to secure mounting bracket to pipe   | <b>M16</b> | <b>7MF9006-6KA</b> |
| <b>Valve manifold 100 bar</b><br>Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)   |            |                    |
| • for valve manifolds 7MF9412-1B. and -1C.  | <b>S12</b> |                    |
| • for valve manifold 7MF9412-1D.  | <b>S13</b> |                    |
| • for valve manifold 7MF9412-1E.  | <b>S14</b> |                    |
| <b>NACE MR-0175-certified</b><br>incl. acceptance test certificate 3.1 to EN 10204  | <b>D07</b> |                    |

- <sup>1)</sup> When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Article No.  
<sup>2)</sup> Flange connections with M10 screws only permissible up to PN 160 (2321 psi)!

## Accessories

### Accessory set for 2-, 3- and 5-spindle valve manifolds (Connection between manifold and transmitter)

#### 2-spindle valve manifold DN 5 with flange connection

- F32: 2 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 1 O Ring (FPM90)
- F35: 2 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 1 flat-gasket
- F12: 2 screws M10x50 to DIN EN 24014, 2 washers, 1 O-ring (FPM90)
- F15: 2 screws M10x50 to DIN EN 24014, 2 washers, 1 flat gasket

#### 3-spindle and 5-way valve manifold DN 5

- F34: 4 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 2 O-rings (FPM90)
- F36: 4 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 2 flat-gaskets
- F14: 4 screws M10x50 to DIN EN 24014, 4 washers, 2 O-rings (FPM90)
- F16: 4 screws M10x50 to DIN EN 24014, 4 washers, 2 flat-gaskets

Washers Ø 10.5 to DIN 125

Flat-gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

O-ring to DIN 3771, 20 x 2.65 - S - FPM90; max. 420 bar (6092 psi), 120 °C (248 °F)

#### Note:

Flange connections with M10 screws only permissible up to PN 160 (2321 psi)!

### Mounting bracket for wall mounting or for securing to mounting rack

With bolts for mounting on valve manifold

- M14: For 2-spindle valve manifold DN 5
- M17: For 3-spindle valve manifold DN 5
- M18: For 5-spindle valve manifold DN 5

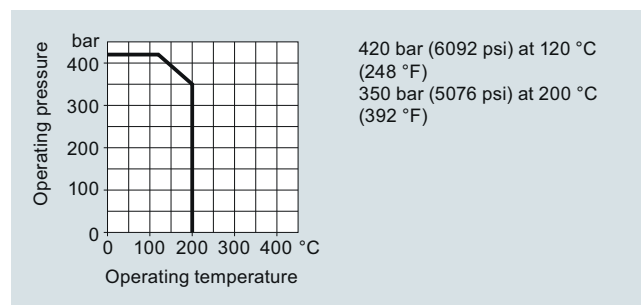
### Mounting clips (2 off)

- M16: For securing the mounting brackets M14, M17 and M18 to pipe

### Valve manifold 100 bar, suitable for oxygen

- S12: For 2-spindle valve manifold DN 5
- S13: For 3-spindle valve manifold DN 5
- S14: For 5-spindle valve manifold DN 5

## Characteristic curves



Permissible operating pressure as a function of the permissible operating temperature





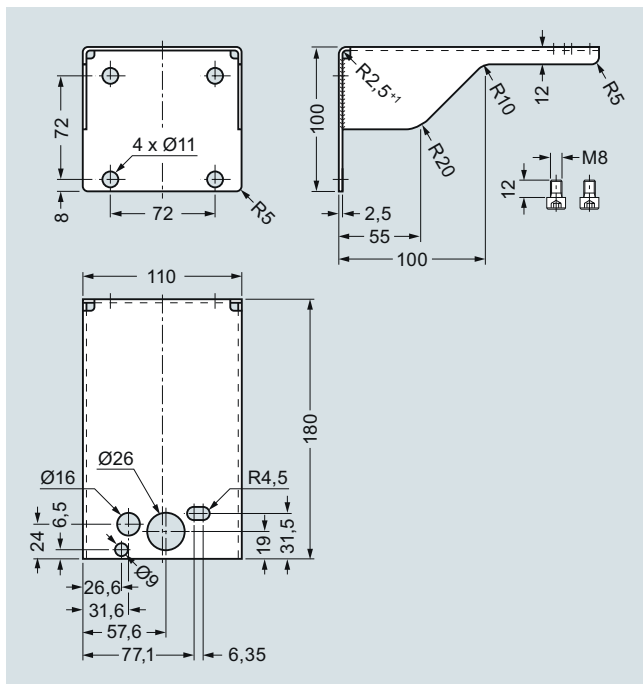
# Pressure Measurement

## Fittings

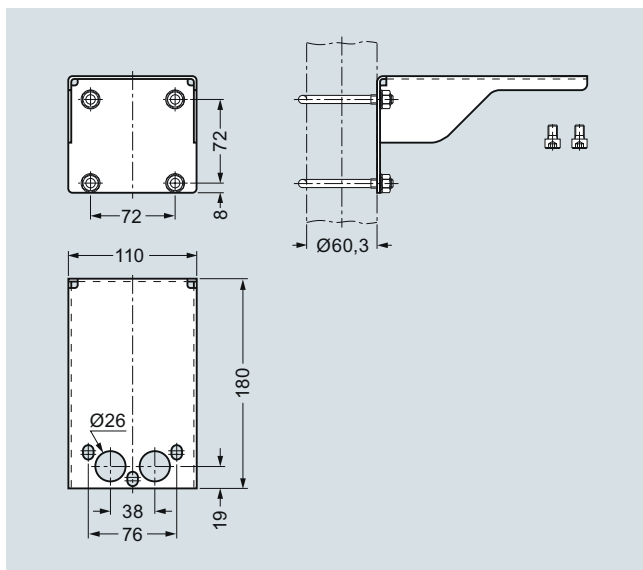
### Shut-off valves for differential pressure transmitters

#### 2-, 3- and 5-spindle valve manifolds for installing in protective boxes

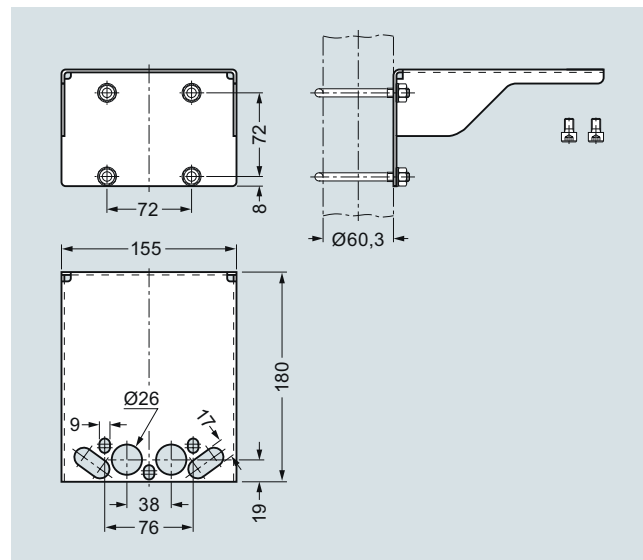
1



Mounting bracket (7MF9006-6LA)/(M14) for 2-spindle valve manifolds, dimensions in mm

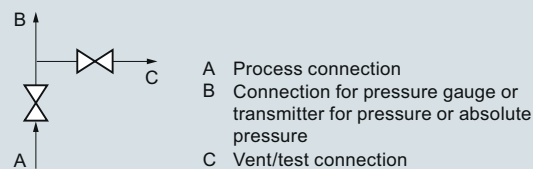


Mounting bracket (7MF9006-6NA)/(M17) for 3-spindle valve manifolds, dimensions in mm

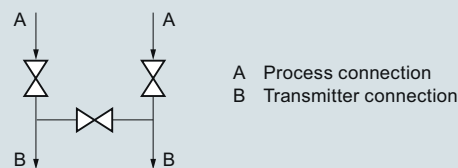


Mounting bracket (7MF9006-6PA)/(M18) for 5-spindle valve manifolds, dimensions in mm

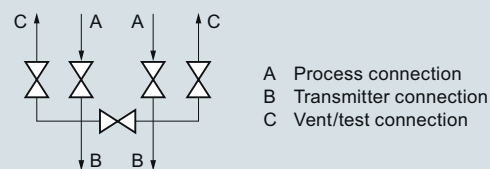
#### Schematics



2-spindle valve manifold DN 5 (with rotating sleeve G $\frac{1}{2}$  or flange connection), connections



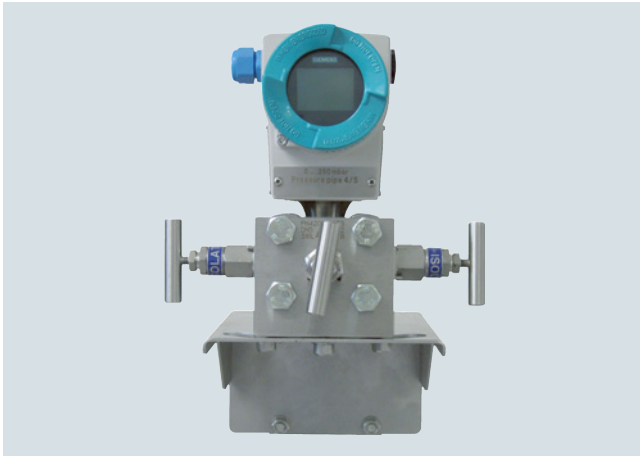
3-spindle valve manifold DN 5, connections



5-spindle valve manifold DN 5, connections



## Overview



These 3-spindle and 5-spindle valve manifolds 7MF9413-1.. were developed specially for vertical differential pressure lines.

The valve manifolds are used to shut off the differential pressure lines and to check the pressure transmitter zero.

The 5-spindle valve manifold permits venting on the transmitter side and checking of the pressure transmitter characteristic.

## Benefits

- For vertical differential pressure lines
- Max. operating pressure 420 bar (6092 psi)
- Transmitters of the DS series can be operated and read from the front.

## Application

The 3-spindle and 5-spindle valve manifolds for vertical differential pressure lines are for liquids and gases. The valve manifolds are flanged on the pressure transmitter.

## Design

All versions of the spindle valve manifolds have a process connection 1/2-14 NPT.

The connection for the pressure transmitter is always designed as a flange connection to IEC 61518/DIN EN 61518, form B.

The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection 1/4-18 NPT.

Materials used:

| Component  | Material             | Mat. No.     |
|------------|----------------------|--------------|
| Housing    | X 2 CrNiMo 17 13 2   | 1.4404/316L  |
| Cones      | X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti |
| Spindles   | X 2 CrNiMo 18 10     | 1.4404/316L  |
| Head parts | X 5 CrNiMo 18 10     | 1.4401/316   |
| Packings   | PTFE                 | -            |

## Function

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

## Selection and Ordering data

Article No.

## Valve manifolds for vertical differential pressure lines

7MF9413-1D

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

for liquids and gases  
for flanging to pressure transmitters for absolute and differential pressure  
Material: stainless steel, mat. No: 1.4404/316L  
max. working pressure 420 bar (6092 psi)  
(order accessory set with Order code),  
without certificate

- 3-spindle valve manifold
- 5-spindle valve manifold

1D  
1E

## Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

## Selection and Ordering data

Order code

Article No.

Further designs<sup>1)</sup>

Please add "-Z" to Article No. and specify Order code.

## Accessory set to EN

(connection between valve manifold and pressure transmitter)

4x screws 7/16-20 UNF x 1 1/4 inch to ASME B18.2.1; chromized steel  
2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K36

7MF9411-5DB

Accessory set to DIN<sup>2)</sup>

(connection between valve manifold and pressure transmitter)

4x screws M10x45 to DIN EN 24014; chromized steel  
4x washers Ø 10.5 mm to DIN 125;  
2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F); Flange connection with M10 screws only permissible up to PN 160 (2321 psi).

K16

7MF9411-6BB

## Mounting bracket

required for wall mounting or for securing to mounting rack, with bolts for mounting on valve manifold

- for valve manifold 7MF9413-1D.
- for valve manifold 7MF9413-1E.

M17

7MF9006-6NA

M18

7MF9006-6PA

required for mounting on 2" stand-pipe, with bolts for mounting on valve manifold

- for valve manifold 7MF9413-1D.

M19

7MF9006-6QA

## Mounting clip

2 off, to secure mounting bracket to pipe

M16

7MF9006-6KA

## Valve manifold 100 bar (1450 psi)

suitable for oxygen

- for valve manifold 7MF9413-1D.
- for valve manifold 7MF9413-1E.

S13

S14

## NACE MR-0175-certified

incl. acceptance test certificate 3.1 to EN 10204

D07

<sup>1)</sup> When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Article No.

<sup>2)</sup> Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)!

## Pressure Measurement

### Fittings

### Shut-off valves for differential pressure transmitters

1

## 3- and 5-spindle valve manifolds for vertical angular differential pressure lines

### Accessories

#### Accessory set (connection between manifold and transmitter)

- K36: 4 screws  $7/16$ -20 UNF x  $1\frac{3}{4}$  inch to ASME B18.2.1, 2 flat gaskets
- K16: 4 screws M10x45 to DIN EN 24014, 4 washers, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

**Note:** Flange connection with M10 screws only permissible up to PN 160 (2321 psi)!

#### Mounting bracket for wall mounting or for securing to mounting rack

With bolts for mounting on valve manifold

- M17: For 3-spindle valve manifold
- M18: For 5-spindle valve manifold

#### Mounting bracket for mounting on 2" standpipe

With bolts for mounting on valve manifold

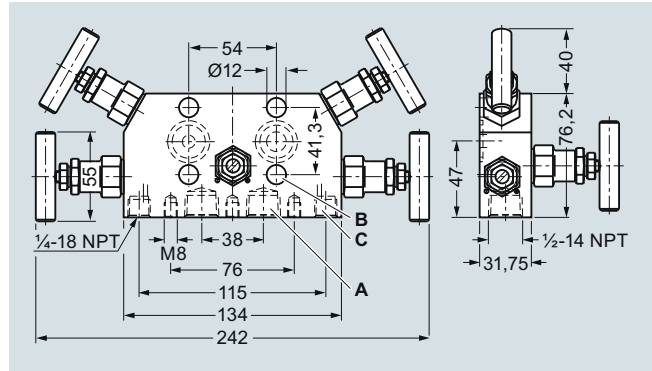
- M19: For 3-spindle valve manifold

#### Mounting clips (2 off)

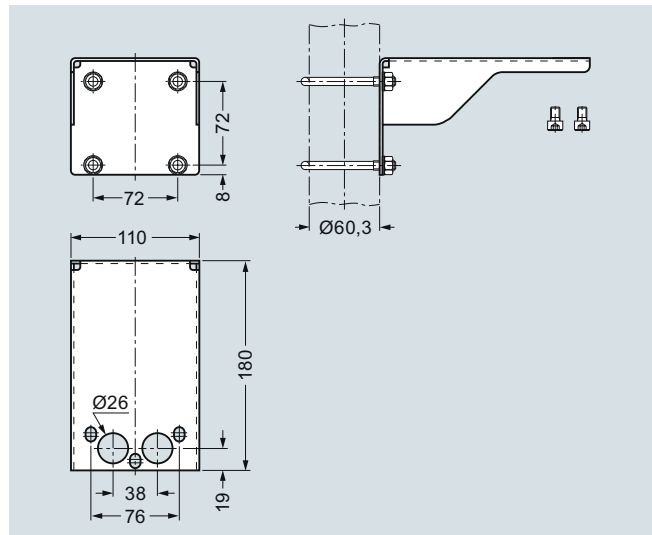
For securing the mounting brackets M17, M18 and M19 to pipe

#### Valve manifold 100 bar, suitable for oxygen

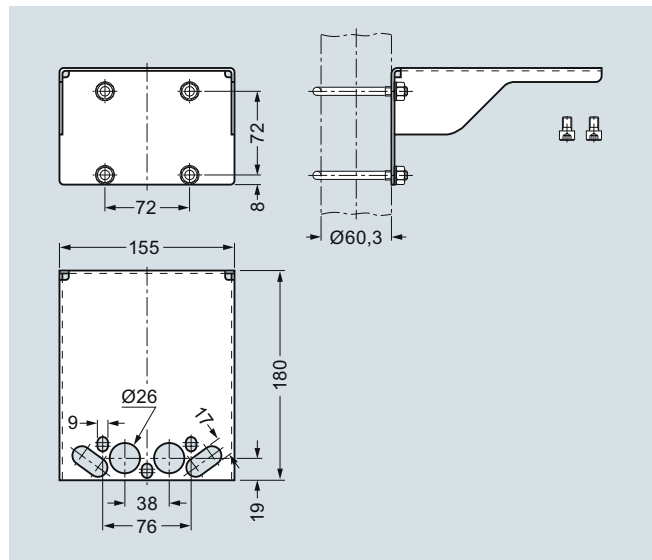
- For 3-spindle valve manifold
- For 5-spindle valve manifold



5-spindle valve manifold 7MF9413-1E. for vertical differential pressure lines, dimensions in mm

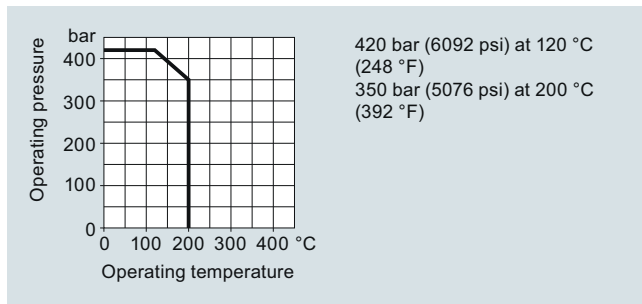


Mounting bracket (7MF9006-6NA)/(M17) for 3-spindle valve manifolds, dimensions in mm



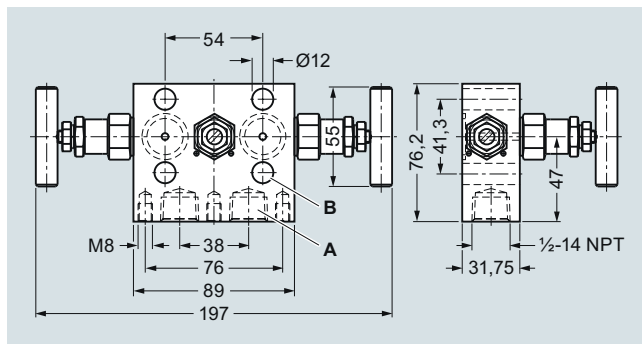
Mounting bracket (7MF9006-6PA)/(M18) for 5-spindle valve manifolds, dimensions in mm

### Characteristic curves

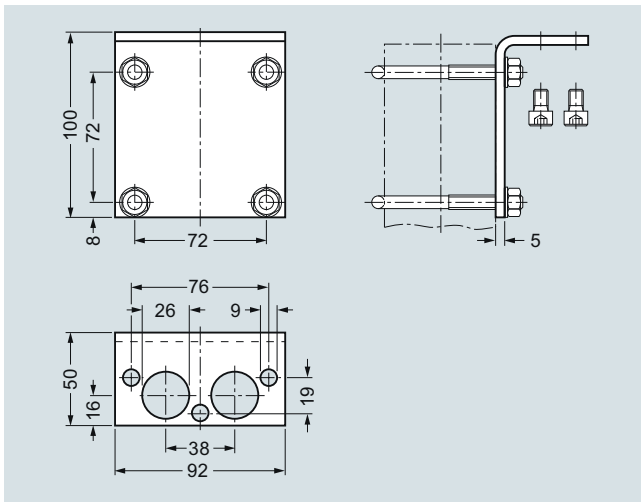


Permissible operating pressure as a function of the permissible operating temperature

### Dimensional drawings

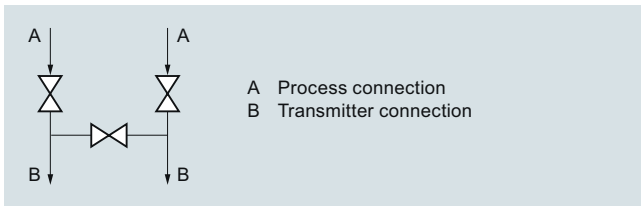


3-spindle valve manifold 7MF9413-1D. for vertical differential pressure lines, dimensions in mm

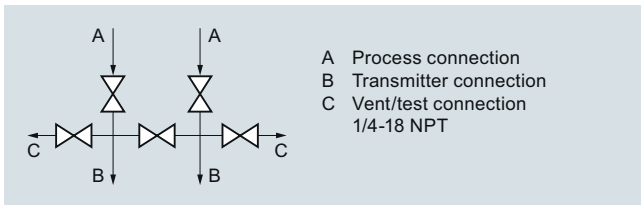


Mounting bracket (7MF9006-6QA)/(M19) for 3-spindle valve manifolds, dimensions in mm

### Schematics



3-spindle valve manifold for vertical differential pressure lines, connections



5-spindle valve manifold for vertical differential pressure lines, connections

## Pressure Measurement

### Fittings

### Shut-off valves for differential pressure transmitters

1

#### Low-pressure multiway cock

##### Overview



The low-pressure multiway cock 7MF9004-4CA/-4DA can be flanged to pressure transmitters for differential pressure.

##### Benefits

- Robust design
- For liquids and gases
- One-hand operation

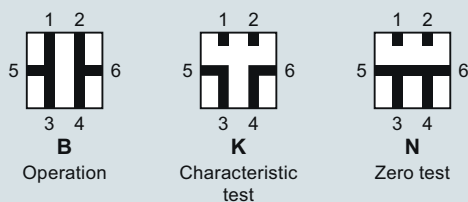
##### Design

The multiway cock has 2 process connections and 2 test connections, which are available in 2 versions (with sealing screws  $G^{3/8}$  or quick-release couplings). The housing is made of hot-pressed brass CuZn39Pb3, CW 614N. Test connections with sealing screws or with self-sealing quick-release couplings.

**Note:** An accessory set is always required for flanging of the multiway cock to a differential pressure transmitter.

##### Function

- Shutting off the differential pressure lines
- Testing the pressure transmitter zero
- Testing the pressure transmitter characteristic



Cock positions; the symbols are printed on the cock

##### Selection and Ordering data

Article No.

##### Low-pressure multiway cock

for liquids and gases, for flanging to pressure transmitters, max. working pressure 25 bar (363 psi), max. working temperature 60 °C (140 °F) (up to 80 °C (176 °F) for a short time), weight 1.75 kg (without accessory set)

##### Test connections

2x sealing screws  $G^{3/8}$

2x quick-release couplings

7MF9004-4CA

7MF9004-4DA

##### Accessories

Test report to EN 10204-3.1

Material acceptance test certificate to EN 10204-3.1

7MF9000-8AB

7MF9000-8AD

##### Selection and Ordering data

Order code

Article No.

##### Further designs<sup>1)</sup>

Please add "-Z" to Article No. and specify Order code.

##### Accessory set to EN

(required for flanging, weight 0.2 kg)

4x screws  $7/16$ -20 UNF x 1 inch to ASME B18.2.1; chromized steel  
2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

L31

7MF9004-5CC

##### Accessory set to DIN

(required for flanging, weight 0.2 kg)

4x screws M10x25 to DIN EN 24017; chromized steel  
4x washers Ø 10.5 mm to DIN 125;  
2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

• Standard design

L11

7MF9004-6AD

• Version for oxygen

L15

7MF9004-6AE

##### Multiway cock in oil-free and grease-free design

BAM-tested lubricant, gasket suitable for oxygen

S11

##### Mounting bracket

required for wall mounting or for securing on rack (72 mm grid), made of electrogalvanized sheet-steel, weight 0.85 kg

M13

7MF9004-6AA

<sup>1)</sup> When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Article No.

**Accessories****Accessory set for low-pressure multiway cock**

- L31: 4 screws  $7/16$ -20 UNF x 1 inch, 2 flat gaskets
- L11: 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets
- L15 (suitable for oxygen): 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

**Multiway cock in oil-free and grease-free design**

- S11: BAM-tested lubricant, gasket suitable for oxygen

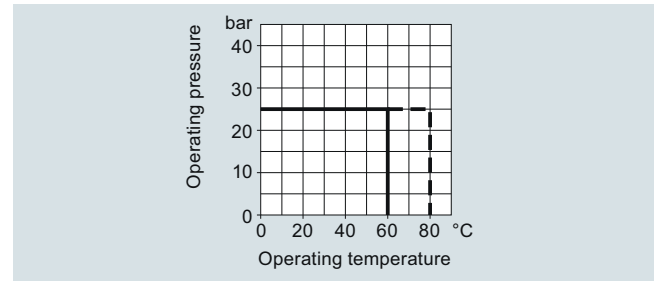
**Mounting brackets**

- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

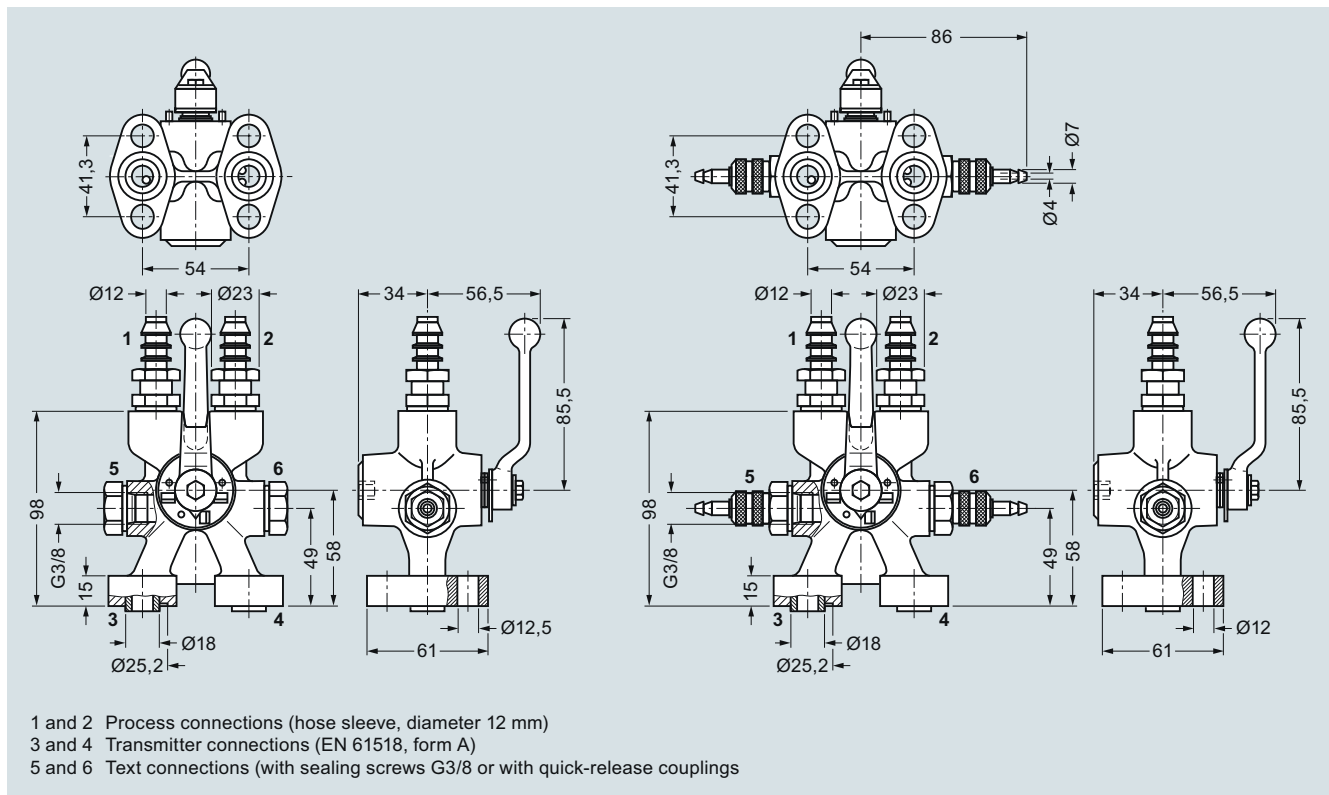
**Options**

Test connections

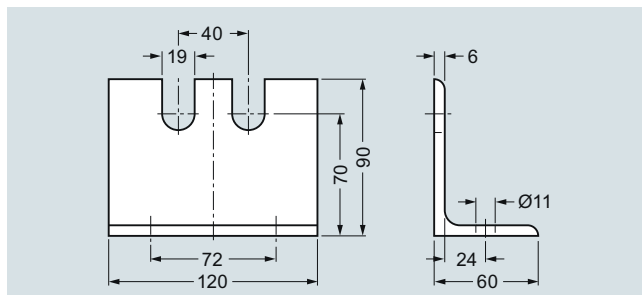
- 2 sealing screws  $G^{3/8}$
- 2 quick-release couplings

**Characteristic curves**

Low-pressure multiway cock, permissible operating pressure as a function of the permissible operating temperature

**Dimensional drawings**

Low-pressure multiway cock 7MF9004-4CA/-4DA for direct flanging to pressure transmitters for differential pressure, dimensions in mm



Mounting bracket 7MF9004-6AA (M13), dimensions in mm

# Pressure Measurement

## Fittings

### Accessories

1

#### Oval flange

##### Overview



The oval flange 7MF9408-2C, for pressure transmitters for absolute pressure and differential pressure has a 1/2-14 NPT female thread and is designed for max. operating pressure 400 bar (5800 psi).

##### Accessories

###### Accessory set for oval flange

- E36: 2 screws 7/16-20 UNF x 1 1/2 inch to ASME B18.2.1, 1 flat gasket
- E34: 2 screws 7/16-20 UNF x 1 1/2 inch to ASME B18.3, 1 O-ring (FPM 90)
- E13: 2 screws M10x40 to DIN EN 4762, 2 washers, 1 O-ring (FPM 90)
- E16: 2 screws M10x40 to DIN EN ISO 4762, 2 washers, 1 flat gasket

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

O-ring to DIN 3771, 20 x 2.65 – S – FPM90, max. 420 bar (6092 psi), 120 °C (248 °F)

**Note:** M10 screws only permissible up to PN 160 (2321 psi)!

##### Selection and Ordering data

Article No.

###### Oval flange

with female thread 1/2-14 NPT, max. working pressure 420 bar (6092 psi), flange connection to IEC 61518/DIN EN 61518, form A

###### Material

P250GH, mat. No.: 1.0460

X 2 CrNiMo 17 13 2, mat. No. 1.4404/316L

7MF9408-2CE

7MF9408-2CL

##### Selection and Ordering data

Order code

Article No.

###### Further designs<sup>1)</sup>

Please add "-Z" to Article No. and specify Order code.

###### Accessory set to EN

2x screws 7/16-20 UNF x 1 1/2 inch to ASME B 18.2.3; chromized steel  
1x flat gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

E36

7MF9408-5DA

2x screws 7/16-20 UNF x 1 1/2 inch to ASME B 18.2.3; chromized steel  
1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)

E34

7MF9408-5CA

###### Accessory set to DIN

2x screws M10x40 to DIN EN ISO 4762; chromized steel  
2x washers Ø 10.5 mm to DIN 125; 1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 160 bar (2321 psi), 120 °C (248 °F)<sup>2)</sup>

E13

7MF9408-6AA

2x screws M10x40 to DIN EN ISO 4762; chromized steel  
2x washers Ø 10.5 mm to DIN 125; 1x flat gasket made of PTFE, max. permissible 160 bar (2321 psi), 80 °C (176 °F)<sup>2)</sup>

E16

7MF9408-6BA

###### NACE MR-0175-certified

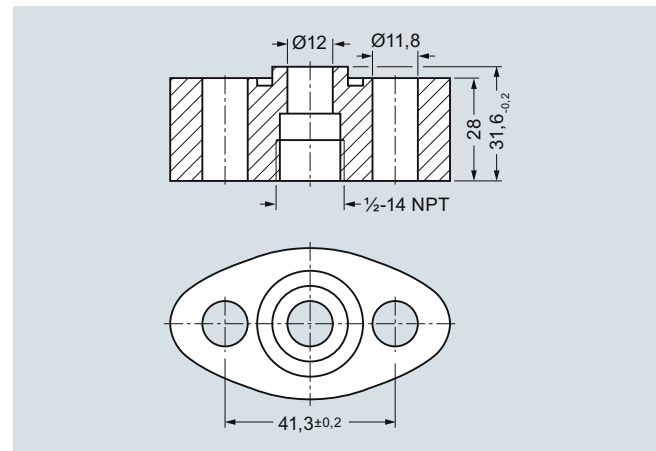
incl. acceptance test certificate 3.1 to EN 10204

D07

<sup>1)</sup> When ordering accessory set together with the oval flange, please use Order code; otherwise use Article No.

<sup>2)</sup> Flange connections with M10 screws only permissible up to PN 160 (2321 psi)

##### Dimensional drawings



Oval flange 7MF9408-2C., dimensions in mm

**Overview**

Adapters enable e.g. a transition from medium connections with NPT thread to shut-off valves to DIN 16270 ... 16272 or pipes in conjunction with a connection gland (e.g. 7MF9008).

**Design**

The connection pieces are made of X 6 CrNiMoTi 17 12 2, mat. No. 1.4571 and available in 3 versions

- Thread 1/4-18 NPT and connection shank G1/2 to DIN EN 837-1
- Thread 1/2-14 NPT and connection shank G1/2 to DIN EN 837-1
- Thread 1/2-14 NPT and thread 1/2-14 NPT

**Selection and Ordering data**

Article No.

**Mounting collar**

Max. operating pressure: 689 bar (10 000 psi),  
Weight: 0.2 kg

with thread 1/4-18 NPT – G1/2

**7MF9001-1AA**

with thread 1/2-14 NPT – G1/2

**7MF9001-1CA**

with thread 1/2-14 NPT – 1/2-14 NPT

**7MF9001-1DA**

with thread 1/2-14 NPT – M20 x 1.5

**7MF9001-1EA**

with pipe union with ferrule 12 S,  
max. operating pressure 630 bar (9 100 psi),  
Ø 12 mm – 1/2-14 NPT

• 9 SMnPb 28, mat. No. 1.0718

**7MF9008-1CA**

• X 6 CrNiMoTi 17 122, mat. No. 1.4571

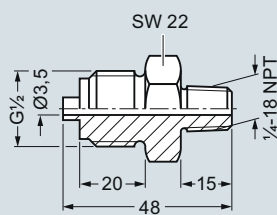
**7MF9008-1CB**

with pipe union with ferrule 14 S,  
max. operating pressure 630 bar (9 100 psi),  
Ø 14 mm – 1/2-14 NPT

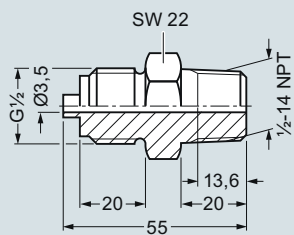
• 9 SMnPb 28, mat. No. 1.0718

**7MF9008-1CC**

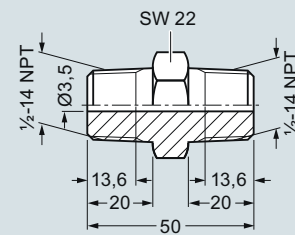
• X 6 CrNiMoTi 17 122, mat. No. 1.4571

**7MF9008-1CD****Dimensional drawings**

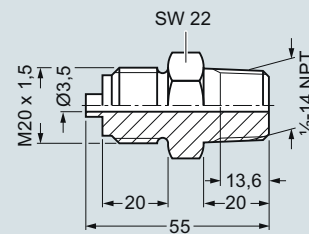
Connection piece with thread 1/4-18 NPT and connection shank G1/2 (7MF9001-1AA), dimensions in mm



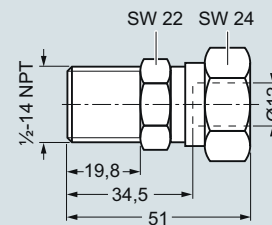
Connection piece with thread 1/2-14 NPT and connection shank G1/2 (7MF9001-1CA), dimensions in mm



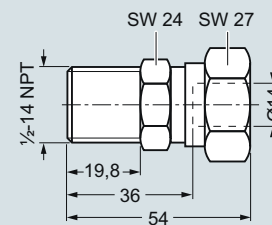
Connection piece with thread 1/2-14 NPT and thread 1/2-14 NPT (7MF9001-1DA), dimensions in mm



Connection piece with thread 1/2-14 NPT and connection shank M20 x 1.5 (7MF9001-1EA), dimensions in mm



Connection piece with pipe union with ferrule 12 S, Ø 12 mm and thread 1/2-14 NPT (7MF9008-1CA and -1CB), dimensions in mm



Connection piece with pipe union with ferrule 14 S, Ø 14 mm and thread 1/2-14 NPT (7MF9008-1CC and -1CD), dimensions in mm

# Pressure Measurement

Fittings

Accessories

1

## Connection glands

### Overview

Connection glands to connect medium or differential pressure lines to collars G½ to DIN EN 837-1

- For rated pressures up to PN 630 (9137psi)
- For oxygen only up to PN 250 (3626 psi)

### Selection and Ordering data

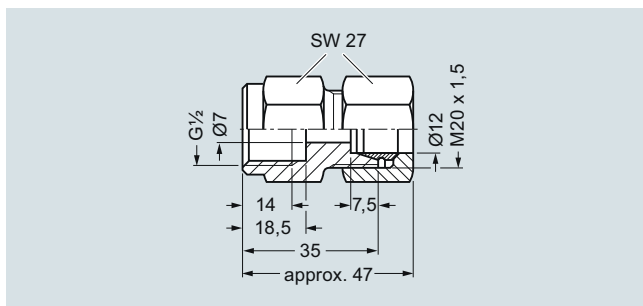
Article No.

#### Connection screwed gland for pipelines

(weight 0.2 kg)

| Material  | Design      |                    |
|---|-------------|--------------------|
| 11SMn30<br>(mat. No. 1.0715)                    | Standard    | <b>7MF9008-1GA</b> |
| X 6 CrNiMoTi 17 12 2<br>(mat. No. 1.4571/316Ti) | Standard    | <b>7MF9008-1GB</b> |
| X 6 CrNiMoTi 17 12 2<br>(mat. No. 1.4571/316Ti) | Grease-free | <b>7MF9008-1GC</b> |

### Dimensional drawings



Connection gland 7MF9008-1G., dimensions in mm



**Overview**

Connection parts G $\frac{1}{2}$  for pressure gauges and shut-off fittings are available in 3 versions:

- Nipple connection
- Clamping sleeve
- Collar connection piece

**Selection and Ordering data**

Article No.

**Adapters G $\frac{1}{2}$** 

for pressure gauges and shut-off fittings

**Nipple connection**

G $\frac{1}{2}$  to DIN 16284 (union nut with nipple and gasket); max. working pressure 400 bar (5802 psi); weight 0.1 kg;  
connection: G $\frac{1}{2}$  to DIN EN 837-1;  
Female thread G $\frac{1}{2}$

| Material  | Mat. No. |
|-----------|----------|
| CuZn39Pb3 | CW 614N  |

**M56340-A0001**

|                         |        |
|-------------------------|--------|
| Union nut<br>9 SMn 28 k | 1.0715 |
| Nipple:<br>RSt 37-2     | 1.0037 |

**M56340-A0002**

|                                 |              |
|---------------------------------|--------------|
| Union nut<br>X 8 CrNiS 18 9     | 1.4305       |
| Nipple:<br>X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti |

**M56340-A0003****Nipple connection**

M20 x 1.5 to DIN 16284 (union nut with nipple and gasket); max. working pressure 400 bar (5802 psi); weight 0.1 kg;  
connection: M20 x 1.5 to DIN EN 837-1;  
Female thread M20 x 1.5

| Material | Mat. No. |
|----------|----------|
|----------|----------|

|                                 |              |
|---------------------------------|--------------|
| Union nut<br>X 8 CrNiS 18 9     | 1.4305       |
| Nipple:<br>X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti |

**M56340-A0008****Clamping sleeve**

G $\frac{1}{2}$  to DIN 16283; max. working pressure 400 bar (5802 psi); weight 0.1 kg;  
Connections: G $\frac{1}{2}$  to DIN EN 837-1;  
Female thread: G $\frac{1}{2}$  right-hand G $\frac{1}{2}$  left-hand

| Material  | Mat. No. |
|-----------|----------|
| CuZn39Pb3 | CW614N   |

**M56340-A0004**

|            |        |
|------------|--------|
| 9 SMn 28 k | 1.0715 |
|------------|--------|

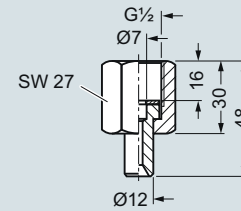
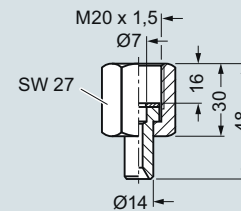
**M56340-A0005****Collar-adapter**

max. working pressure; weight 0.1 kg;  
Connections: G $\frac{1}{2}$  to DIN EN 837-1;  
Male thread: G $\frac{1}{2}$ , G $\frac{1}{2}$

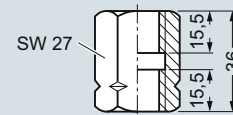
| Material  | Mat. No. |
|-----------|----------|
| CuZn39Pb3 | CW614N   |

**M56340-A0006**

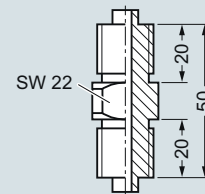
|            |        |
|------------|--------|
| 9 SMn 28 k | 1.0715 |
|------------|--------|

**M56340-A0007****Dimensional drawings**Nipple connection G $\frac{1}{2}$  (M56340-A0001 to -A0003), dimensions in mm

Nipple connection M20 x 1.5 (M56340-A0008), dimensions in mm



Clamping sleeve (M56340-A0004/-A0005), dimensions in mm



Collar connection piece (M56340-A0006/-A0007), dimensions in mm

# Pressure Measurement

## Fittings

## Accessories

1

### Water traps, Sealing rings to EN 837-1

#### Overview

Water traps protect pressure gauges and shut-off fittings from heating up (e.g. by steam) by the water column produced by the water trap.

The max. working temperature is 120 °C (248 °F) at 100 bar (1450 psi), 300 °C (572 °F) at 80 bar (1160 psi) or 400 °C (752 °F) at 63 bar (914 psi). If the temperature of the measured medium is higher, a sufficiently long line has to be connected upstream of the trap to enable heat dissipation.

#### Design

The water traps are available in U shape (type B) or circular shape (type D) to DIN 16282. They have a weld-on end  $\varnothing$  20 mm  $\times$  2.6 mm on the measurement side. The connection on the device side is a clamping sleeve  $G\frac{1}{2}$  to DIN 16283.

The water traps are made of steel (P250GH) or stainless steel (X 6 CrNiMoTi 17 12 2)

Water traps are designed as standard for max. operating temperature 120 °C (248 °F) at max. operating pressure 100 bar (1450 psi) (300 °C (572 °F) at 80 bar (1160 psi), 400 °C (752 °F) at 63 bar (914 psi)). Water traps for higher operating pressures and temperatures are available on request.

#### Selection and Ordering data

Article No.

##### Water traps

for pressure gauges and pressure transmitters, max. working temperature 120 °C (248 °F), max. working pressure 100 bar (1450 psi) (or 300 °C (572 °F) at 80 bar (1160 psi), or 400 °C (752 °F) at 63 bar (914 psi)), weight 0.7 kg

##### Water trap B to DIN 16282

| Material             | Mat. No.     |
|----------------------|--------------|
| P235GH               | 1.0345       |
| X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti |

|                      |              |                     |
|----------------------|--------------|---------------------|
| P235GH               | 1.0345       | <b>M56340-A0043</b> |
| X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti | <b>M56340-A0061</b> |

##### Water trap D to DIN 16282

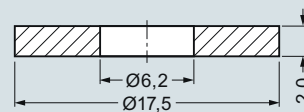
| Material             | Mat. No.     |
|----------------------|--------------|
| P235GH               | 1.0345       |
| X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti |

|                      |              |                     |
|----------------------|--------------|---------------------|
| P235GH               | 1.0345       | <b>M56340-A0045</b> |
| X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti | <b>M56340-A0063</b> |

#### Overview

The sealing rings to EN 837-1 are required to seal measuring instruments for pressure with the process connection  $G\frac{1}{2}B$ .

#### Dimensional drawings



Sealing ring 7MF9007-7A. to EN 837-1, dimensions in mm

#### Selection and Ordering data

Article No.

##### Sealing ring to EN 837-1 for thread $G\frac{1}{2}$ made of

(packing unit 100 pcs)

- Copper
- Soft iron
- Stainless steel, mat.-No. 1.4571
- PTFE

**7MF9007-7AA****7MF9007-7AB****7MF9007-7AC****7MF9007-7AD**

##### Accessories

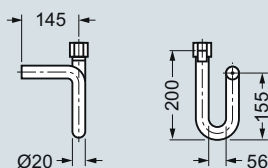
Test report to EN 10204-3.1

**7MF9000-8AB**

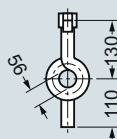
Material acceptance test certificate to EN 10204-3.1

**7MF9000-8AD**

#### Dimensional drawings



Water traps, type B, M56340-A0043/-A0061, dimensions in mm



Water traps, type D, M56340-A0045/-A0063, dimensions in mm

**Overview**

The pressure surge reducer protects the pressure gauge against damage, premature wear and tear and inaccurate/fluctuating indications.

**Application**

The pressure reducer is used when pulsations occur in the measured medium (e.g. in slow-running vapor engines, piston pumps and compressors), or if drastic fluctuations are likely to occur in the measured medium (e.g. in hydraulic presses and tensile testing machines).

**Design**

- Enclosure made of brass or stainless steel (mat. no. 1.4571)
- Adjustable nozzle
- Sleeve for connection to the measuring instrument
- Pin for connection to supply lead

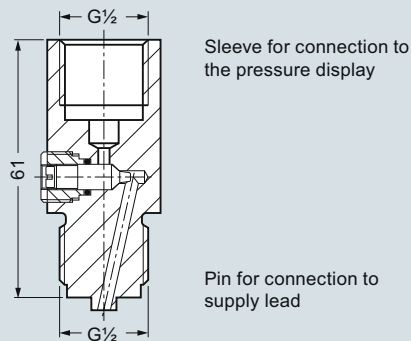
**Selection and Ordering data**

Article No.

**Pressure surge reducer**

Weight approx. 0.21 kg

| Material        | Full-scale value   | Weight approx. in kg |                   |
|-----------------|--------------------|----------------------|-------------------|
| Brass           | 250 bar (3626 psi) | 0.21                 | <b>M56340-A54</b> |
| Stainless steel | 600 bar (8702 psi) | 0.21                 | <b>M56340-A59</b> |

**Dimensional drawings**

Pressure surge reducer, dimensions in mm

# Pressure Measurement

## Fittings

### Accessories

1

## Primary shut-off valves

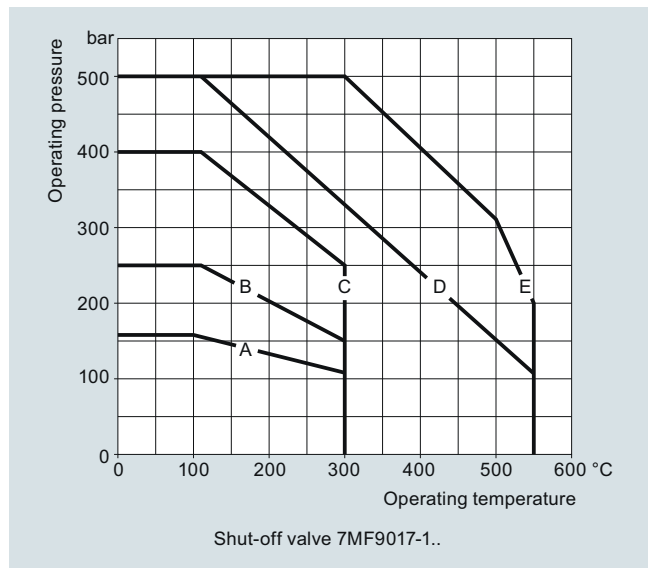
### Overview

Primary shut-off valves are available in the following versions:

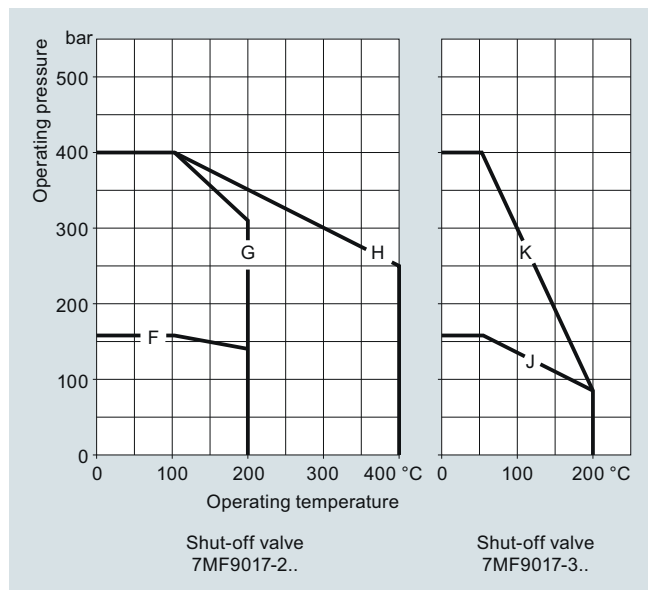
- For non-corrosive liquids, gases and vapors
- For corrosive liquids and gases
- Grease-free for oxygen

The shut-off valves are available in various materials and with various connections (see Selection and Ordering data)

### Characteristic curves

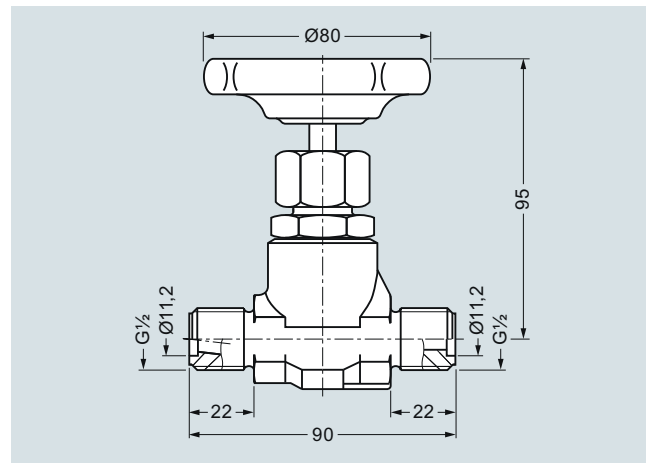


Shut-off valve 7MF9017-1.., permissible working pressure as a function of the permissible working temperature

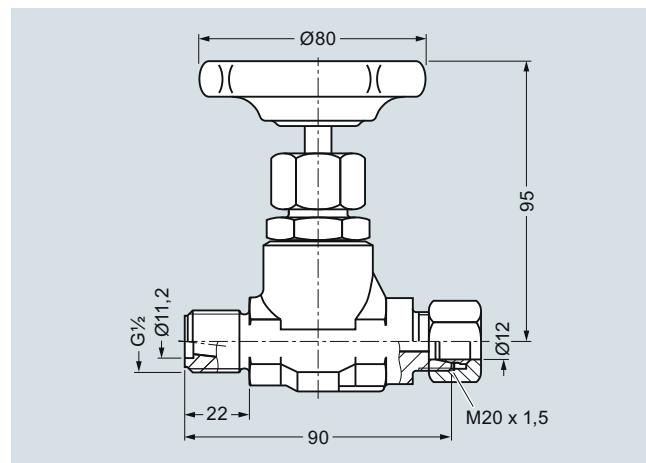


Shut-off valve 7MF9017-2.. and -3.., permissible working pressure as a function of the permissible working temperature

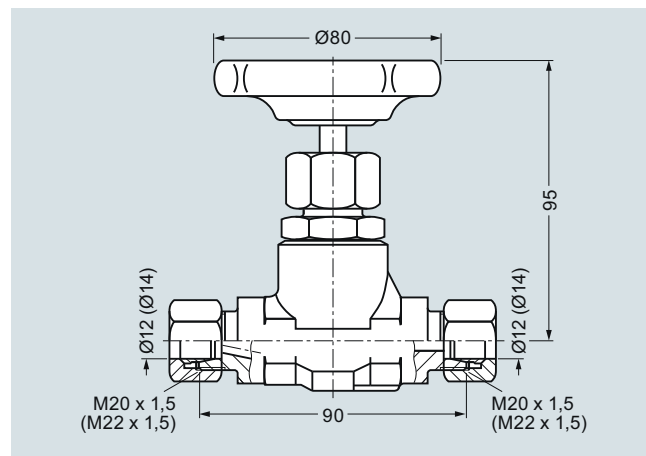
### Dimensional drawings



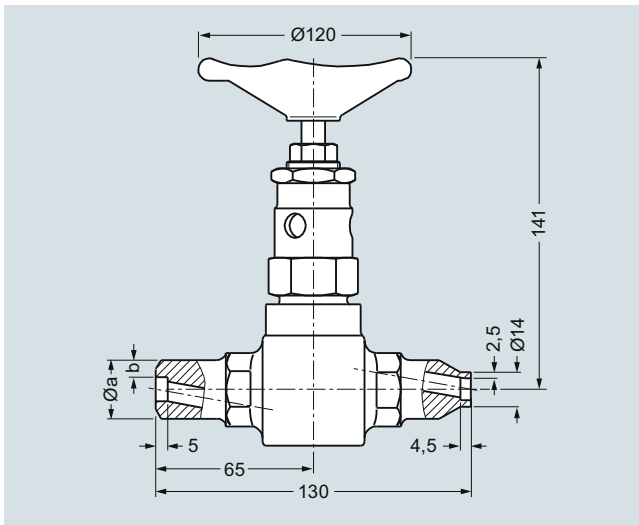
Shut-off valve 7MF9017-1A.., dimensions in mm



Shut-off valve 7MF9017-1B. and -2B., dimensions in mm



Shut-off valves 7MF9017-1C., -1D. and -2C., dimensions in mm



Shut-off valves 7MF9017-, dimensions in mm

| Ø A x b          | 7MF9017-         |
|------------------|------------------|
| 14 mm x 2.5 mm   | 1F. and 1G.      |
| 21.3 mm x 6.3 mm | 1H. and 2H.      |
| 24 mm x 7.1 mm   | 1J., 1K. and 2J. |

**Selection and Ordering data****Primary shut-off valves, without certificate**

| Max. working pressure   | Charac-teristic <sup>1)</sup> | Material             | Mat. No.     | Spindle thread | Connections  | Approx. weight kg | Article No.      |
|---|-------------------------------|----------------------|--------------|----------------|--|-------------------|------------------|
| <b>Shut-off valve for non-aggressive liquids, gases and vapors</b>                    |                               |                      |              |                |  |                   | <b>7MF9017-1</b> |
| ➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. |                               |                      |              |                |  |                   | <b>A</b>         |
| 160 bar (2321 psi)  | A                             | P250GH               | 1.0460       | Internal       | Threaded socket G½ form R, DIN 19207                             | 0.8               | <b>A</b>         |
| 160 bar (2321 psi)  | A                             | P250GH               | 1.0460       | Internal       | Threaded socket G½ form R, DIN 19207                             | 0.8               | <b>B</b>         |
|   |                               |                      |              |                | DIN 19207 and pipe union with ferrule for pipe Ø 12 mm, S series |                   |                  |
| 400 bar (5800 psi)  | C                             | P250GH               | 1.0460       | Internal       | Pipe union with ferrule for pipe Ø 12 mm, S series               | 1                 | <b>C</b>         |
| 400 bar (5800 psi)  | C                             | P250GH               | 1.0460       | Internal       | Pipe union with ferrule for pipe Ø 14 mm, S series               | 1                 | <b>D</b>         |
| 500 bar (7252 psi)  | D                             | 16 Mo 3              | 1.5415       | External       | Welding sleeves Ø 14 mm x 2.5 mm                                 | 1.6               | <b>F</b>         |
| 500 bar (7252 psi)  | E                             | 11 CrMo 9 10         | 1.7383       | External       | Welding sleeves Ø 14 mm x 2.5 mm                                 | 1.6               | <b>G</b>         |
| 500 bar (7252 psi)  | D                             | 16 Mo 3              | 1.5415       | External       | Welding sleeves Ø 21.3 mm x 6.3 mm and Ø 14 mm x 2.5 mm          | 1.6               | <b>H</b>         |
| 500 bar (7252 psi)  | D                             | 16 Mo 3              | 1.5415       | External       | Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm            | 1.6               | <b>J</b>         |
| 500 bar (7252 psi)  | E                             | 11 CrMo 9 10         | 1.7383       | External       | Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm            | 1.6               | <b>K</b>         |
| <b>Shut-off valve for aggressive liquids and gases</b>                                |                               |                      |              |                |  |                   | <b>7MF9017-2</b> |
| 160 bar (2321psi)   | F                             | X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti | Internal       | Threaded socket G½ form R, DIN 19207                             | 0.8               | <b>A</b>         |
|   |                               |                      |              |                | DIN 19207 and pipe union with ferrule for pipe Ø 12 mm, S series |                   | <b>B</b>         |
| 400 bar (5800 psi)  | G                             | X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti | Internal       | Pipe union with ferrule for pipe Ø 12 mm, S series               | 1                 | <b>C</b>         |
| 400 bar (5800 psi)  | H                             | X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti | External       | Welding sleeves Ø 21.3 mm x 6.3 mm and Ø 14 mm x 2.5 mm          | 1.6               | <b>H</b>         |
| 400 bar (5800 psi)  | H                             | X 6 CrNiMoTi 17 12 2 | 1.4571/316Ti | External       | Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm            | 1.6               | <b>J</b>         |

**Accessories**

Factory test certificate EN 10204-2.2

Material acceptance test certificate EN 10204-3.1

<sup>1)</sup> See Figure "Permissible working pressure as a function of the permissible working temperature"**7MF9000-8AB**  
**7MF9000-8AD**

# Pressure Measurement

## Fittings

## Accessories

1

### Compensation vessels

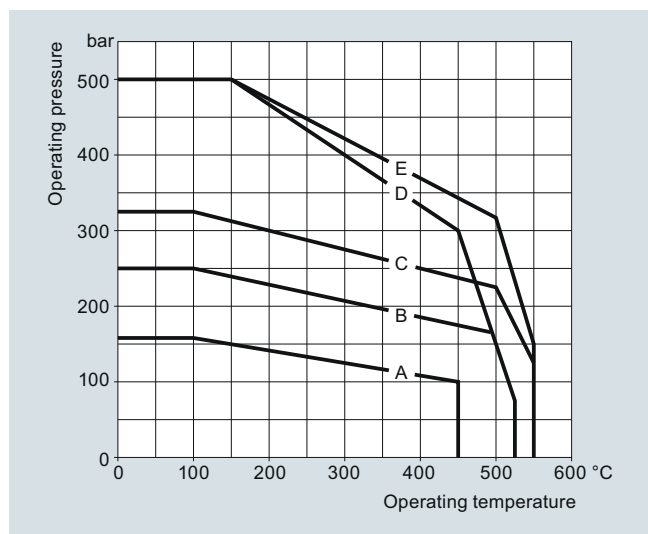
#### Overview

The compensation vessels prevent the level difference which occurs with pressure changes in the pressure lines and which falsifies the measurement.

According to DIN 19211, the temperature in the compensation vessel must be assumed to be 50 K less than the steam temperature in the pipe when calculating the wall thicknesses. This is because the temperature in the compensation vessel during operation can only rise up to the saturated steam temperature.

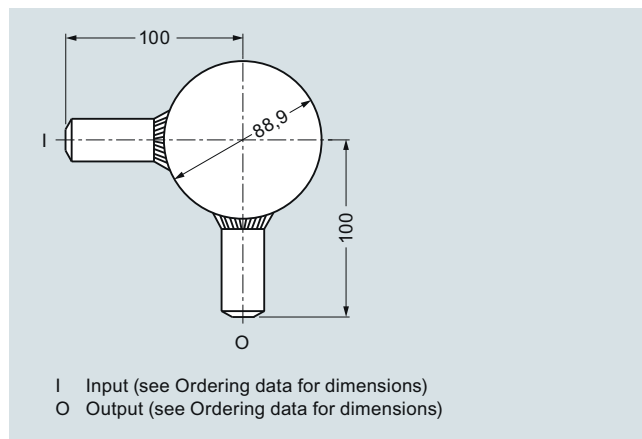
A material acceptance test certificate A to EN 10204-3.1 is available for the materials from which the compensation vessels are made.

#### Characteristic curves

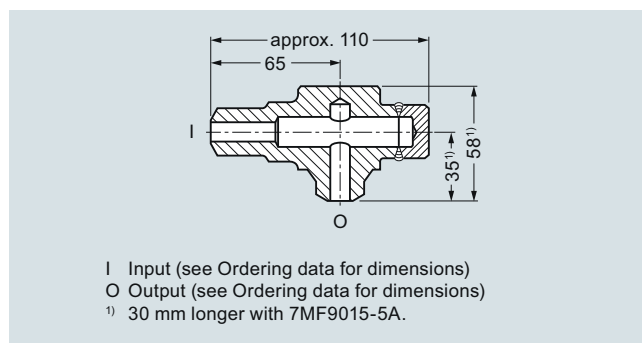


Permissible operating pressure as a function of the permissible operating temperature

#### Dimensional drawings



Compensation vessel 7MF9015-1..., dimensions in mm



Compensation vessel 7MF9015-5..., dimensions in mm

#### Selection and Ordering data

##### Compensation vessel, without certificate

| Max. working pressure   | Charac-<br>teristic <sup>1)</sup> | Material     | Mat. No. | Connections<br>Input                                   | Output   | Approx.<br>contents<br>cm <sup>3</sup> | Approx.<br>weight<br>kg | Article No. |
|---|-----------------------------------|--------------|----------|--|--|--|-------------------------|-------------|
| <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a> |                                   |              |          |  |  |  |                         |             |
| 160 bar (2321 psi)  | A                                 | 16 Mo 3      | 1.5415   | Threaded socket G $\frac{1}{2}$ ,<br>form R, DIN 19207 | Threaded socket G $\frac{1}{2}$ ,<br>form V, DIN 19207 | 250                                    | 0.8                     | 7MF9015-1A  |
| 250 bar (3626 psi)  | B                                 | 16 Mo 3      | 1.5415   | Welding sleeve<br>Ø 21.3 mm × 6.3 mm                   | Welding sleeve<br>Ø 21.3 mm × 6.3 mm                   | 250                                    | 0.8                     | 7MF9015-1B  |
| 250 bar (3626 psi)  | B                                 | 16 Mo 3      | 1.5415   | Welding sleeve<br>Ø 24 mm × 7.1 mm                     | Welding sleeve<br>Ø 24 mm × 7.1 mm                     | 250                                    | 1                       | 7MF9015-1C  |
| 500 bar (7252 psi)  | E                                 | 11 CrMo 9 10 | 1.7383   | Welding sleeve<br>Ø 24 mm × 7.1 mm                     | Welding sleeve<br>Ø 24 mm × 7.1 mm                     | 170                                    | 1                       | 7MF9015-1D  |
| 250 bar (3626 psi)  | B                                 | 16 Mo 3      | 1.5415   | Welding sleeve<br>Ø 33.7 mm × 4.5 mm                   | Welding sleeve<br>Ø 24 mm × 7.1 mm                     | 700                                    | 0.7                     | 7MF9015-1E  |
| 160 bar (2321 psi)  | A                                 | 16 Mo 3      | 1.5415   | Threaded socket G $\frac{1}{2}$ ,<br>form R, DIN 19207 | Threaded socket G $\frac{1}{2}$ ,<br>form V, DIN 19207 | 20                                     | 1.6                     | 7MF9015-5A  |
| 500 bar (7252 psi)  | D                                 | 16 Mo 3      | 1.5415   | Welding sleeve<br>Ø 21.3 mm × 6.3 mm                   | Welding sleeve<br>Ø 21.3 mm × 6.3 mm                   | 20                                     | 1.6                     | 7MF9015-5B  |
| 500 bar (7252 psi)  | D                                 | 16 Mo 3      | 1.5415   | Welding sleeve<br>Ø 24 mm × 7.1 mm                     | Welding sleeve<br>Ø 24 mm × 7.1 mm                     | 20                                     | 1.6                     | 7MF9015-5C  |
| 500 bar (7252 psi)  | E                                 | 11 CrMo 9 10 | 1.7383   | Welding sleeve<br>Ø 24 mm × 7.1 mm                     | Welding sleeve<br>Ø 24 mm × 7.1 mm                     | 20                                     | 1.6                     | 7MF9015-5D  |

#### Accessories

Factory test certificate EN 10204-2.2

Material acceptance test certificate EN 10204-3.1

<sup>1)</sup> See Figure "Permissible working pressure as a function of the permissible working temperature"

7MF9000-8AB  
7MF9000-8AD

**Overview**

Connection parts are available in the following versions:

- Threaded flange pair G $\frac{1}{2}$  with stainless steel gasket
- Nipple G $\frac{1}{2}$  form V to DIN 19207
- Union nut G $\frac{1}{2}$  made of C 35 to DIN 16284
- Gasket B $\frac{1}{2}$  (grooved) to DIN 19207

All connection parts are also available grease-free for oxygen.

**Selection and Ordering data**

Article No.

**Threaded flange pair G $\frac{1}{2}$** 

- with stainless steel gasket
- grease-free for oxygen, with stainless steel gasket

Scope of delivery:

2x threaded flanges G $\frac{1}{2}$  to DIN 19207; material: P250GH (mat. No. 1.0460)

4x hexagon screws M10x45 to DIN EN 24014; Material: C35E (mat. No. 1.1181)

4x hexagon screws M10x50 to DIN EN 24032

1x gasket G $\frac{1}{2}$  (7MF9007-6BA) grooved, to DIN 19207;  
Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

Only for 7MF9007-4CA!

1x gasket G $\frac{1}{2}$  (7MF9007-6CA), grease-free for oxygen, grooved, to DIN 19207;  
Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

Only for 7MF9007-4DA!

**7MF9007-4CA****7MF9007-4DA****Nipple G $\frac{1}{2}$** 

to DIN 19207

- Material: 16 Mo 3 (mat. No. 1.5415)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

**7MF9007-4KA****7MF9007-4LA****Union nut G $\frac{1}{2}$** 

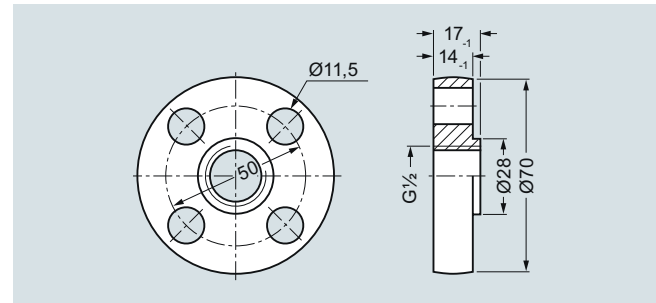
to DIN 16284

- Material: C35E (mat. No. 1.1181)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

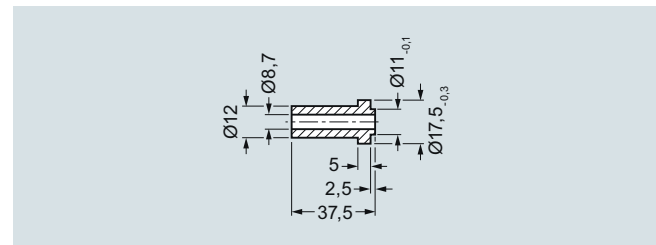
**7MF9007-4MA****7MF9007-4NA****Gasket G $\frac{1}{2}$** 

to DIN 19207, grooved

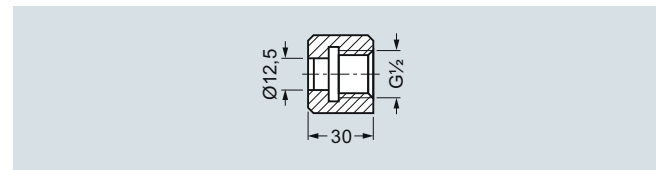
- Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

**7MF9007-6BA****7MF9007-6CA****Dimensional drawings**

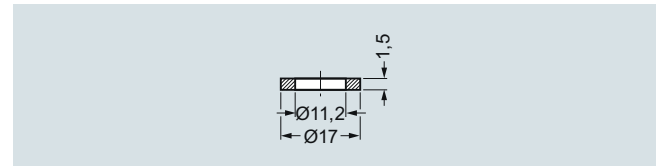
Threaded flange 7MF9007-4CA/-4DA, dimensions in mm



Nipple G $\frac{1}{2}$  7MF9007-4KA/-4LA, dimensions in mm



Union nut G $\frac{1}{2}$  7MF9007-4MA/-4NA, dimensions in mm



Gasket 7MF9007-6BA/-6CA, dimensions in mm

Pressure Measurement

Notes

1