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SINAMICS Shortform Catalogue

Variable Speed Drives effective November 2017

SINAMICS V20
SINAMICS V90
SINAMICS G120C
SINAMICS G120P
SINAMICS G120 Modular
SINAMICS G110M
SINAMICS G110D
SINAMICS G120D

www.siemens.co.uk/drives

Variable speed drives, low voltage motors and geared motor units. A world of applications - one solution

Siemens Industry supplies a comprehensive range of automation, electrical distribution and drives products worldwide and is the largest supplier of variable speed drives in Europe.

Our multi-award winning drives manufacturing facility in Congleton, Cheshire was voted 'Best Electronics & Electrical Plant' in the 2015 Best Factory Awards, celebrating UK manufacturing Excellence and ranks amongst the world's largest variable speed drive factories, producing over 1.2 million electrical devices including 500,000 variable speed drives a year.

This latest edition of the shortform catalogue highlights the main features and benefits of our **SINAMICS** drives family, which complement our latest drives, low voltage motors and geared motors catalogues. With a reputation for innovative technology and the highest quality, our complete family of **SINAMICS** and **MICROMASTER** drives can fulfil a vast range of application requirements. Add to that our high efficiency motors and gear boxes, then Siemens has the optimum cost effective solution for all drive applications.

No product range is complete without a comprehensive service, support and training package, which is where Siemens stands out amongst other suppliers. Whether you are looking for applications assistance, training solutions, or breakdown support, you can be assured of a professional and efficient service from Siemens. Our aim is to provide our customers with an outstanding level of support, which safeguards production and contributes to our customers future success.

Call our hotline to arrange a free consultation with one of our expert drive specialists –

From UK Tel: 08458 507600
From IRL Tel: 1890 507600

E-mail:
sales.gbi.industry@siemens.com

Contents

SINAMICS News

SINAMICS V90 Profinet – Epos Integrated Basic Positioner

The Sinamics V90 Profinet version is now available with the Epos Basic Positioner, which makes it Possible to save up to 16 target positions in the drive system including the matching speeds and accelerations. The system also supports 'MDI - Manual Direct Input'.

SIMOTICS 1FL6 Low Inertia/High Dynamic motors with Absolute Single Turn Encoder & changes of motor connectors

We have now added the option of a Single Turn Absolute Encoder to the SIMOTICS 1FL6 Low Inertia/High Dynamic motor range.We are changing the design of the motor connectors on 1FL6 motors in Shaft Heights 45, 65 and 90 of the High Inertia version andShaft Height 50 of the Low Inertia version. The straight connectors on themotors will be replaced with 90° angled connectors and the 90°angled connectors on the cablesby straight connectors (as with Simotics 1FK/1FT Servo Motors).

Drive, motor, cable and connector part numbers will change and the updated versions appear in this catalogue

SINAMICS V20 - Smart access module

The SINAMICS V20 Smart Access is a Web Server Module which is simply plugs into the front of theSINAMICS V20 allowing you to commission, operate or diagnose fault wirelessly from your mobile device.

The interface is designed like an app making it easyand intuitive to operate without the need to downloadanything to your device; all you need is a HTML5 capable browser

SINAMICS News

IOP-2, a new design packed with more functions is now available.

The SINAMICS IOP-2 offers the following essential product features and benefits:

- Series commissioning using the clone function allowing quick commissioning without expert knowledge
- User-defined parameter list with a reduced number of self-selected parameters
- Simple commissioning of standard applications using wizards, it is not necessary to know the parameter structure.
- Simple local commissioning using the handheld version
- Integrated plain text help function to locally display and remove fault messages
- Fast diagnostics at the drive using the innovative plain text display
- High contrast graphics-capable colour display to show status values - such as pressure or flow as bar diagrams - output fields or to display curves
- Ease of use - with its membrane keypad with central sensor control panel and integrated control keys make it simpler to enter values, navigate through lists and menus – and commission drives using wizards.
- Status display with freely selectable units to specify physical values
- User-specific parameter names in the status screen. Drives can be manually and intuitively operated without requiring any additional equipment:
  - Operating mode switchover – manual/automatic mode
  - Start / stop
  - Setpoint input
  - Jog mode
  - Changing the direction of rotation
- Available user interface languages:

  German, English, French, Italian, Spanish, Portuguese, Dutch, Swedish, Russian, Czech, Polish, Turkish, Finnish and simplified Chinese
- Diagnostics using plain text display, can be used locally on-site without documentation

The SINAMICS IOP-2 with V2.0 firmware can be used with SINAMICS converters G120 (CU240B-2, CU240E-2), G120P (CU230P-2), G120C, G120D (CU240D-2, CU250D-2), G110M, G110D and SIMATIC ET 200pro FC-2 with firmware release ≤ V4.7 SP6.

IOP-2	6SL3255-0AA00-4JA2
IOP-2 Handheld	6SL3255-0AA00-4HA1

SINAMICS News

The SINAMICS G120C FSD, FSE and FSF

As new members of the SINAMICS G120C family, extend the power range from 22 kW Low Overload (LO) to 132 kW LO.

These newly released compact 3AC 400V ... 480V converters can be easily integrated within your automation system using TIA Portal, are available with Profinet Communication and Safe Torque Off (STO) safety function and the additional benefits of:

- High Power Density Components to reduce module size
- Side by side mounting
- DC Choke to limit Harmonics

Integration using TIA Portal

- Longer cable lengths as standard* **FSD & FSE** 200m shielded / 300m unshielded **FSF** 300m shielded / 450m unshielded *without any EMC requirements
- EMC Shielding plates as standard
- Modified connections to simplify cabling

The SINAMICS PM240P-2 FSD, FSE and FSF

Have supplement the SINAMICS G120P familyproviding dedicated and optimized solutions to meet industrial pump and fan applications.The newly released SINAMICS power modules are available in 3AC 400 ... 480 V and 3AC 500 ... 690V versions with supported power ranges from 22 kW (LO) to 132 kW (LO) and 11 kW (LO) to 132 kW (LO) respectfully.

Being part of our modular solution a range of control units so suit the application can be used. Additional benefits are:

- High Power Density Components to reduce module size
- Side by side mounting
- DC Choke to limit Harmonics
- Safe Torque Off (STO) to SIL3/Ple using terminals on the Power Module
- Integration using TIA Portal
- Longer cable lengths as standard* **FSD & FSE** 200m shielded / 300m unshielded **FSF** 300m shielded / 450m unshielded *without any EMC requirements
- EMC Shielding plates as standard
- Modified connections to simplify cabling

SINAMICS News

MICROMASTER 4

For more than 16 years the MICROMASTER 4 family of Variable Speed Drives have been used by industry to cover a range of applications, however, technology and market requirements do not stand still so have announced the 'Phase Out' of the Micromaster 4 series in October 2017 with discontinuation at a later date

MICROMASTER 420

- **The universal**
- **Power: 0.37 – 11 kW**

MICROMASTER 430

- **The specialist for pumps and fans**
- **Power: 7.5 – 250 kW**

MICROMASTER 440

- **The all-rounder**
- **Power: 0.37 – 250 kW**

October 2017

'Phase-out' announcement of the Micromaster range.

See attached flyer at the back of this catalogue

!

The SINAMICS* converter family is our drive system for the future and offers significant advantages in performance, functionality and supports trends that were either not able to be realized with MICROMASTER 4 – or only with considerable difficulty, e.g.

- Integrated Drive Safety
- Integrated Profibus, Profinet/Ethernet IP Communication
- A standard USB interface for PC connection
- Coated circuit boards for a more robust product
- Installation easier and quicker by using pluggable terminals (FSA to FSC)
- Integrated DC Choke for reduced harmonics and longer cable lengths as standard (FSD to FSE)
- Integrated functions for energy efficiency
- Integrated technology functions, Positioning functionality
- Push-through cooling concept
- Standard tools available – Sizer, Starter, Startdrive (TIA Portal)
- and many more...

Support when switching over to SINAMICS:

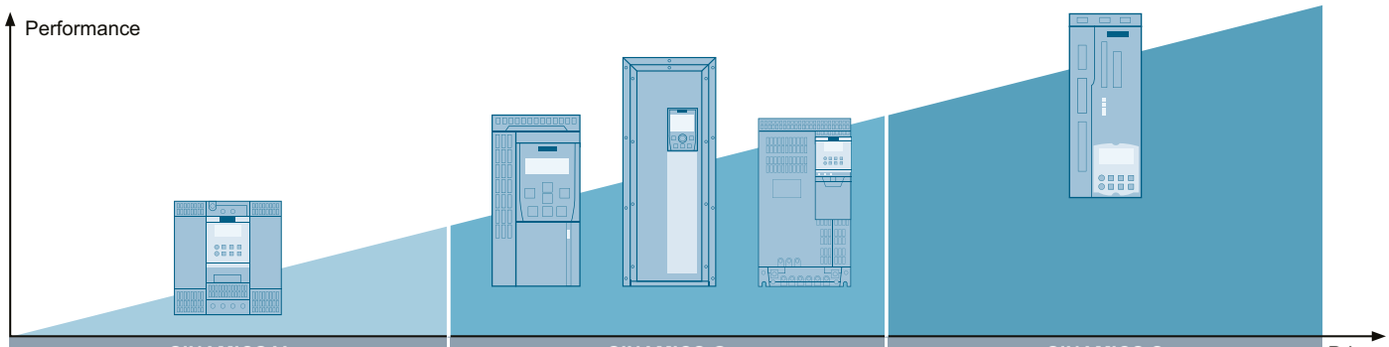
Use the selection matrix on page x as a guide to your selection, use our SINAMICS Drive catalogue D31 or on-line with the DT Configurator at: **www.siemens.com/dtconfigurator**

A web based conversion tool is also available at: **www.automation.siemens.com/mc-app/mm4Converter/index** where you can enter the current MICROMASTER order number and obtain a recommendation for an alternative SINAMICS converter and to help with the commissioning we have developed a tool to translate parameters between Micromaster and Sinamics

Call 08458 507600 or e-mail sales.gbi.industry@siemens.com for further information or assistance with selection and you and your customers can benefit from the advantages of the innovative Siemens SINAMICS drive system

SINAMICS Family

SINAMICS is the most comprehensive drive family available today. It is based on a simple, integrated engineering concept, inherently providing innovative, energy-efficient solutions for the future. No matter which application you have, Siemens offers you the optimum drive - from one source.



SINAMICS V	SINAMICS G	SINAMICS S
These drives focus on the essentials both in terms of hardware and functionality. This results in a high degree of ruggedness combined with low investment costs. Operator control is performed directly on the drive without any additional engineering tools. SINAMICS V is particularly suitable for applications that do not require any specialist knowledge on drives.	The SINAMICS G drives display their technological strengths to full effect. Their range of outputs extends from 0.12 kW to 400 kW. Users of these drives benefit from a standardised and simple operating concept. This cuts the costs for training and service. Another impressive feature of SINAMICS G is its optimum price/performance ratio.	The SINAMICS S drives have been specifically developed for use in complex machine and plant engineering applications and to meet the demands of a broad range of motion control tasks. All SINAMICS S drives are engineered for maximum integration.

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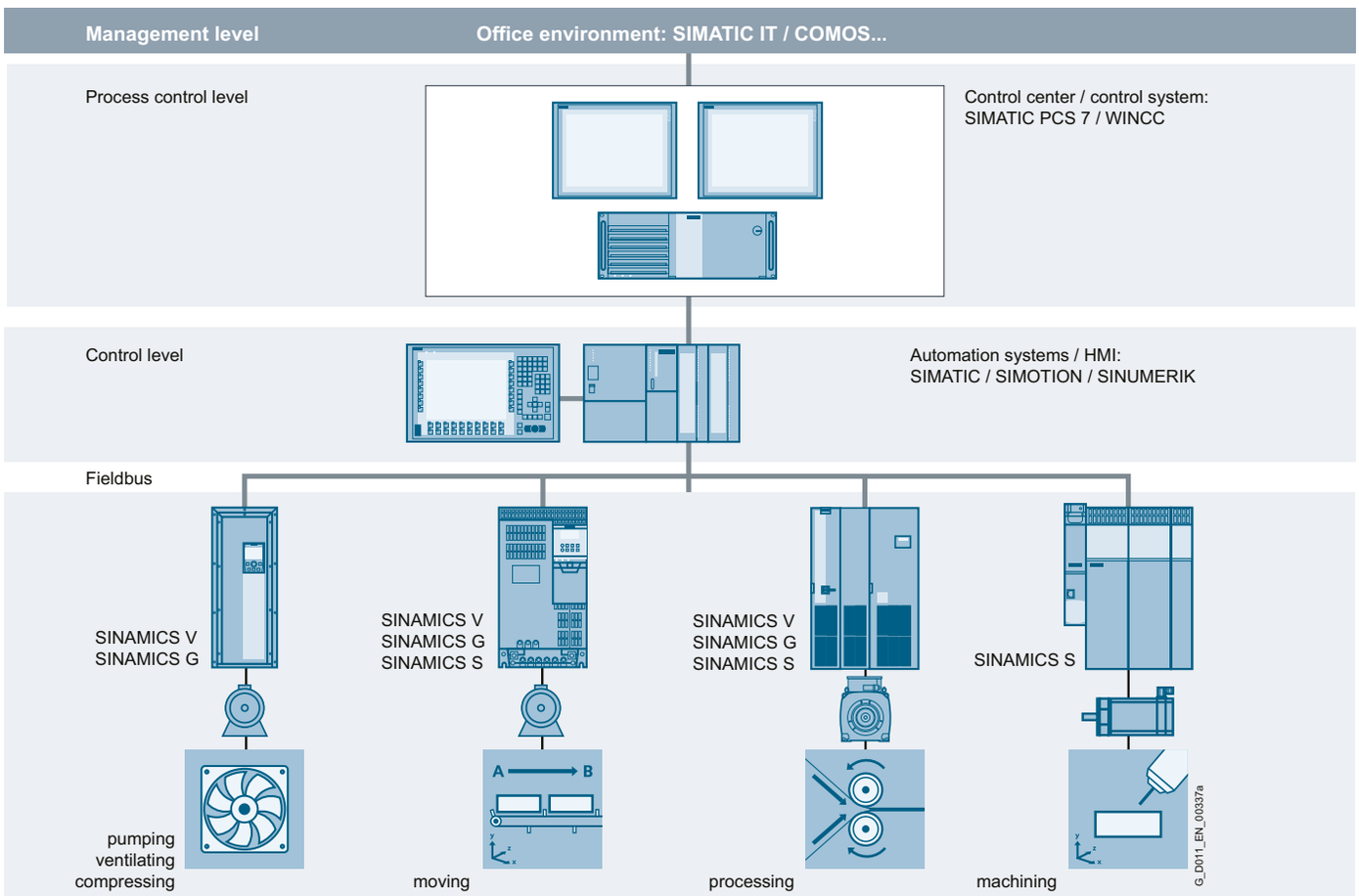
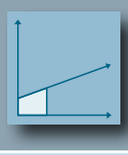
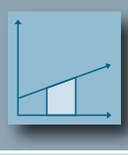
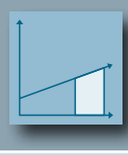
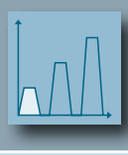
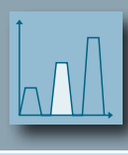
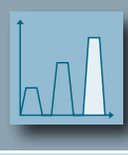
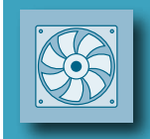
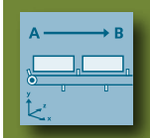
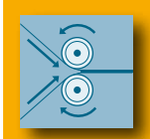
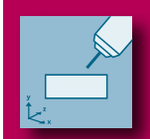
SINAMICS is also an integral component of the Siemens “Totally Integrated Automation” concept having a wide range of communications options available for connection to the automation system if required.



Typical applications that fall under the technology of Pumping/Ventilating/Compressing, Moving, Processing and Machining can be found opposite.

Typical Applications

Performance* / Purpose	Continuous motion			Discontinuous motion		
	Basic	Medium	High	Basic	Medium	High
						
Pumping Ventilating Compressing 	Centrifugal pumps Radial / axial fans Compressors **V20** **G110** **G120C** **G120P**	Centrifugal pumps Radial / axial fans Compressors **G120P** G130/G150	Eccentric spiral / worm / screw pumps S120	Hydraulic pumps Dosing pumps **G120**	Hydraulic pumps Dosing pumps S110	Descaling pumps Hydraulic pumps S120
Moving 	Belt conveyors Roller conveyors Chain conveyors **V20** **G110** **G110D** **G120C** **G110M**	Belt conveyors Roller conveyors Chain conveyors Vertical / horizontal material handling Elevators / escalators Gantry cranes Ship's drives Cable railways **G120** **G120D** G130/G150	Elevators Container cranes Mine hoists Open cast mine excavators Test stands S120 DCM	Accelerating conveyors Rack feeders **V90** **G120** **G120D**	Accelerating conveyors Rack feeders Cross cutters Roll changers S110 DCM	Rack feeders Robotics Pick & place Indexing tables Cross cutters Roller feeds Engaging/ disengaging S120 DCM
Processing 	Mills Mixers Kneaders Crushers Agitators Centrifuges **G120C** **V20**	Mills Mixers Kneaders Crushers Agitators Centrifuges Extruders Rotary furnaces **G120** G130/G150	Extruders Winders / unwinders Leading / following drives Calendars Mechanical presses Printing machines Rotary furnaces S120 DCM	Tubular bagging machines Single axis motion control i.e. Positioning profiles Path profiles **V90** **G120**	Tubular bagging machines Single axis motion control i.e. Positioning profiles Path profiles S110	Servo presses Rolling mill drives Coordinated multi-axis motion control i.e. Multi-axis positioning Can discs Interpolation S120 DCM
Machining 	Main drives i.e. Turning Milling Drilling S110	Main drives i.e. Drilling Sawing S110 S120	Main drives i.e. Turning Milling Drilling Gear cutting Grinding S120	Axis drives i.e. Turning Milling Drilling S110	Axis drives i.e. Drilling Sawing S110 S120	Axis drives i.e. Turning Milling Drilling Laser machining Gear cutting Grinding Nibbling and punching S120

*Requirements regarding torque, speed and position precision/axis co-ordination/functionality.

Drives Overview

SINAMICS V20 Pages 9 to 10

0.12kW ... 3kW, 200V ... 240V 1 AC

0.37kW ... 30kW, 380V ... 480V 3AC

A compact, simple and cost effective drive for many automation tasks that is packed with features seldom found in a basic drive.

SINAMICS V90 Pages 11 to 16

0.05 kW ... 0.75kW, 200V ... 240V 1Ø AC

0.05 kW ... 2 kW, 200V ... 240V 3Ø AC

0.4 kW ... 7 kW, 380V ... 480V 3Ø AC

Integrated Safety

PROFINET

The V90 is an entry level Servo Drive ideally suited for Micro Automation solutions in conjunction with an S7 1200 / S7 1500 and now available with PROFINET

SINAMICS G120C Pages 17 to 18

0.55kkW – 132 kW, 380 V ... 480 V 3 AC

Integrated Safety

The SINAMICS G120C is a compact variable speedspecifically designed for OEM's who require a cost effective, space saving design that is simple to operate and has a broad range of functions.

Ideal for Conveyors, pumps, fans, compressors, mixers & extruders

SINAMICS G120P Pages 19 to 22

IP55: 0.37 kW ... 90 kW, 380V ... 480V 3Ø AC with PM230

IP20: 0.37 kW ... 75 kW, 380V ... 480V 3Ø AC with PM230

IP20: 90 kW ... 132 kW, 380V ... 480V 3Ø AC with PM240-2

IP20: 22 kW ... 132 kW, 380V ... 480V 3Ø AC with PM240P-2

IP20: 11 kW ... 132 kW, 500V ... 690V 3Ø AC with PM240P-2

IP20 Chassis: 160 kW ... 560 kW, 380V ... 480V 3Ø AC with PM330

Integrated Safety*

The SINAMICS G120P is an IP55 or IP20 rated innovative, energy efficient variablespeed drive specifically tailored to pump, fan, compressor and HVAC applications. This modular drive solution comprises a power modular (PM), control unit (CU) and optional operator (OP)

*Depends on combination of Power Module and Control Unit

SINAMICS G120 Modular Pages 22 to 32

0.55 kW ... 4 kW, 200V ... 240V 1Ø AC

0.55 kW ... 55 kW, 200V ... 240V 3Ø AC

0.37 kW ... 250 kW, 380V ... 480V 3Ø AC

11 kW ... 132 kW, 500V ... 690V 3Ø AC

Integrated Safety*

The SINAMICS G120 is a modular drive solution comprising a Power Module (PM) and Control Unit (CU) and is designed to provide precise and cost effective speed/torque control of AC motors in a wide range of industrial applications.

*Depends on combination of Power Module and Control Unit

Distributed Drives

SINAMICS G110M

Pages 33 to 34

0.37 kW ... 4 kW, 380 V ... 480 V 3 AC

Integrated Safety

The SINAMICS G110M is a 'Motor-mounted drive' than can be combined with a number of Siemens motors or as a complete drive/motor/gearbox solution.

SINAMICS G110D

Pages 35 to 36

0.75 kW ... 7.5 kW, 380 V ... 500 V 3 AC

This is a simpler version of the higher-performance SINAMICS G120D and offers the same mounting footprint, low profile design and rugged metal enclosure so can be located close to the motor. Communications can be carried out using ASI interface.

SINAMICS G120D

Pages 37 to 38

0.75 kW ... 7.5 kW, 380 V ... 500 V 3 AC

Integrated Safety

Distributed version of the G120 for cabinet free applications. Compact design with Regenerative Energy capability, this drive has been specifically designed for sophisticated conveyor applications. Communication via Profibus or Profinet.

Contact our Customer Care Centre
From UK Tel: 08458 507600
From IRL Tel: 1890 507600
Email: sales.gbi.industry@siemens.com

SINAMICS G130

110 kW ... 560 kW, 380 V ... 480 V 3 AC
110 kW ... 560 kW, 500 V ... 600 V 3 AC
75 kW ... 800 kW, 660 V ... 690 V 3 AC

SINAMICS G150

110 kW ... 900 kW, 380 V ... 480 V 3 AC
110 kw ...1000 kW, 500 V ...600 V 3 AC
75 kW ... 2700 kW, 660 V ... 690 V 3 AC

Integrated Safety

The SINAMICS G130 Chassis units and the SINAMICS G150 Cabinet units are variable speed drives specifically designed to meet single motor applications with square-law and constant load characteristics without regenerative feedback into the mains supply.

Typical Applications:
Pumps, fans and compressors
Mixers, extruders crushers...

Further information: Catalogue D11
G130 online: www.siemens.com/sinamics-G130
G150 online: www.siemens.com/sinamics-G150

Engineered Drive

Contact our Customer Care Centre
From UK Tel: 08458 507600
From IRL Tel: 1890 507600
Email: sales.gbi.industry@siemens.com

SINAMICS S120

0.12 kW ... 4.0 kW, 200 V ... 240 V 1 AC
0.37 kW ... 3000 kW, 380 V ... 480 V 3 AC
11 kW ... 4500 kW, 500 V ... 690 V 3 AC

Integrated Safety

The SINAMICS S120 is a modular drive system with servo and vector control capabilities for sophisticated tasks. Versions are available for single and multi-axis applications.

Typical Applications

- Packaging, plastics, printing and paper machines
- Woodworking, glass and ceramics
- Steel industry
- ...and many more
- Textiles
- Machine tools
- Hoisting and cranes

Further information: Catalogue D21.4
S120 online: www.siemens.com/sinamics-S120

SINAMICS V20

Design

With the SINAMICS V20, Siemens offers you a compact, simple and cost-effective drive solution for many automation tasks that is packed with features and benefits seldom found in a basic drive.

Benefits

- Wall mounting, side-by-side mounting, push-through mounting for FSB to FSE
- Analogue, USS and Modbus RTU via terminal connections
- Integrated braking chopper for 7.5 kW to 30 kW
- Parameter loading without power connected with optional Parameter Loader
- Smart Access Module allows wireless connection transforming your mobile device or laptop into a virtual operator panel for commissioning, operation, diagnostics and maintenance. NEW
  (Requires a drive with Hardware version FS09 or higher / FW version 3.92 or higher)
- Integrated application and connection macros
- Keep Running Mode' for uninterrupted operation
- Wide range of voltages, advanced cooling design and coated PCB's for increased robustness
- ECO mode, V/f, V²/f
- Hibernation mode
- DC coupling

Applications

- Centrifugal pumps, radial / axial fans and compressors
- Belt, roller and chain conveyors
- Mills, mixers, kneaders, crushers, agitators, centrifuges and textile applications

[1] 1Ø AC 230V FSAA/FSAB unfiltered devices as well as 3Ø AC 400V unfiltered devices can be operated on an IT network

[2] 1Ø AC devices can also be connected to two phases of a 3Ø AC 230 V supply system. You can find detailed information at: **http://support.industry.siemens.com/cs/document/109476260**

Technical data	
Electrical data	**SINAMICS V20**
Line voltages & Power Ranges	200 ...240V 1 AC (-10% +10%) 0.12 kW ...3.0 kW 380 ...480V 3 AC (-15% +10%) 0.37 kW ...30 kW
Line supply types	TN, TT, TT earthed line, IT [1]
Line frequency	50 / 60 Hz
Output frequency	0 ... 550 Hz
Overload	See page 10
Control Modes	V/f linear, square & multipoint, Flux Current Control
Digital Inputs (DI)	4, Optically isolated PNP/NPN (selectable)
Digital Outputs (DO)	2, 1 transistor output, 1 relay output
Analogue Inputs (AI)	2, Can be used as Digital Inputs
Analogue Outputs (AO)	1, (0 ...20mA)
Communication	RS485 / USS / Modbus RTU
Functions	
Software Functions	ECO mode, Hibernation mode, energy consumption monitoring, auto restart, flying start, PID controller, BICO connection, hammer start, super torque mode, blockage clearing mode, motor staging, boost, wobble, slip compensation, dual ramp
Monitoring/protection functions	Frost, anti condensation and cavitation protection. Kinetic buffering, Load failure protection Undervoltage, overvoltage, ground fault, short circuit, stall protection, thermal motor and power module protection, temperature
Mechanical data	
Degree of protection	IP20
Cooling type	Convection / Fan (dependent on module)
Environment	
Ambient temperature (operating)	-10 ... 60°C, between 40 ... 60°C with derating
Motor Cable Length FSA - FSD/FSE	Unshielded: 50m/100m Shielded: 25m/50m Longer cable lengths possible with output reactors
Standards	
In conformance with the following standards	**EN61800-3 category C1, 1st environment (residential):** • 1AC 230 V 0.12 to 0.75 kW with integrated EMC filter, or unfiltered with external line filter, shielded cables ≤ 5 m **EN61800-3 category C2, 1st environment (domestic):** • 1AC 230 V 1.1 to 3 kW with integrated EMC filter, shielded cables ≤ 25 m • 3AC 400 V without integrated EMC filter with external line filter,shielded cables FSA up to FSE ≤ 25 m. To achieve 25 m shielded motor cable length with FSA, unfiltered devices with external filter have to be used **EN61800-3 category C3, 2nd environment (industrial):** • 3AC 400 V with integrated EMC filter,shielded cables:FSA ≤ 10 m,FSB up to FSD ≤ 25 m, FSE ≤ 50 m CE, cULus, RCM, KC

SINAMICS V20

Supply Voltage: 200 ...240V 1Ø AC		Power Modules	
HO Rating	**Frame Size**	**Industrial**	**Filtered C1 ##**
0.12 kW / 0.9 A	AA	6SL3210-5BB11-2UV1	6SL3210-5BB11-2BV1
0.25 kW / 1.7 A	AA	6SL3210-5BB12-5UV1	6SL3210-5BB12-5BV1
0.37 kW / 2.3 A	AA	6SL3210-5BB13-7UV1	6SL3210-5BB13-7BV1
0.55 kW / 3.2 A	AB	6SL3210-5BB15-5UV1	6SL3210-5BB15-5BV1
0.75 kW / 4,2 A	AB	6SL3210-5BB17-5UV1	6SL3210-5BB17-5BV1
HO Rating	**Frame size**	**Industrial**	**Filtered C2 ##**
1.1 kW / 6.0 A	B*	6SL3210-5BB21-1UV0	6SL3210-5BB21-1AV0
1.5 kW / 7.8 A	B*	6SL3210-5BB21-5UV0	6SL3210-5BB21-5AV0
2.2 kW / 11 A	C*	6SL3210-5BB22-2UV0	6SL3210-5BB22-2AV0
3 kW / 13.6 A	C*	6SL3210-5BB23-0UV0	6SL3210-5BB23-0AV0

Supply Voltage: 380 ...480V 3Ø AC			Power Modules	
LO Rating at 400 V	**HO Rating at 400 V**	**Frame Size**	**Industrial**	**Filtered C3 ##**
0.37 kW / 1.3 A	0.37 kW / 1.3 A	A	6SL3210-5BE13-7UV0	6SL3210-5BE13-7CV0
0.55 kW / 1.7 A	0.55 kW / 1.7 A	A	6SL3210-5BE15-5UV0	6SL3210-5BE15-5CV0
0.75 kW / 2.2 A	0.75 kW / 2.2 A	A	6SL3210-5BE17-5UV0	6SL3210-5BE17-5CV0
1.1 kW / 3.1 A	1.1 kW / 3.1 A	A*	6SL3210-5BE21-1UV0	6SL3210-5BE21-1CV0
1.5 kW / 4.1 A	1.5 kW / 4.1 A	A*	6SL3210-5BE21-5UV0	6SL3210-5BE21-5CV0
2.2 kW / 5.6 A	2.2 kW / 5.6 A	A*	6SL3210-5BE22-2UV0	6SL3210-5BE22-2CV0
3 kW / 7.3 A	3 kW / 7.3 A	B*	6SL3210-5BE23-0UV0	6SL3210-5BE23-0CV0
4 kW / 8.8 A	4 kW / 8.8 A	B*	6SL3210-5BE24-0UV0	6SL3210-5BE24-0CV0
5.5 kW / 12.5 A	5.5 kW / 12.5 A	C*	6SL3210-5BE25-5UV0	6SL3210-5BE25-5CV0
7.5 kW / 16.5 A	7.5 kW / 16.5 A	D**	6SL3210-5BE27-5UV0	6SL3210-5BE27-5CV0
11 kW / 25 A	11 kW / 25 A	D**	6SL3210-5BE31-1UV0	6SL3210-5BE31-1CV0
15 kW / 31 A	15 kW / 31 A	D**	6SL3210-5BE31-5UV0	6SL3210-5BE31-5CV0
22 kW / 45 A	18.5 kW / 38 A	E **	6SL3210-5BE31-8UV0	6SL3210-5BE31-8CV0
30 kW / 60 A	22 kW / 45 A	E **	6SL3210-5BE32-2UV0	6SL3210-5BE32-2CV0

Overload up to 15 kW:
High Overload (HO): 1.5 x Rated Current for 60s in a 300s cycle

Overload from 18.5 kW
Low Overload (LO): 110% LO rating for 60 s within a cycle time of 300 s: High Overload (HO): 150% HO rating for 60 s within a cycle time of 300 s

* 1 Fan, ** 2 Fans, # Catogry C1 - 1st environment (residential), ## C2 - 1st environment (residential domestic), ### C3 - 2nd environment (industrial)
- see page 63 for specific categorisations

Options	
6SL3255-0VE00-0UA1	Parameter Loader
6SL3255-0VA00-4BA1	V20 Basic Operator Panel (for door mounting, with RJ45 connection)
6SL3255-0VA00-2AA1	BOP Interface (for door mounting, with RJ45 connection) Cable between BOP Interface and BOP is now a standard LAN cable with RJ45 connectors - not supplied
6SL3255-0VA00-5AA0	Smart Access Module - requires a drive with Hardware version FS09 or higher / FW version 3.92 or higher
6SL3201-2AD20-8VA0	Braking Module (230 V 1AC: 8A, 400 V 3AC: 7A) for FSA to FSC. Module integrated into FSD and FSE
6SL3054-4AG00-2AA0	Sinamics SD Card 512Mb
6SL3255-0VC00-0HA0	RS485 Terminators (50 pieces)
6SL3261-1BA00-0AA0	DIN Rail kit for FSA, FSAA & FSAB *
6SL3261-1BB00-0AA0	DIN Rail kit for FSB
6SL3266-1ER00-0VA0	Migration mounting kit to fit FSAA and FSAB to former FSA
6SL3256-0VE00-6AA0	I/O Extension Module

Shield Connection Kits	
6SL3266-1AR00-0VA0	FSAA and FSAB
6SL3266-1AA00-0VA0	FSA
6SL3266-1AB00-0VA0	FSB
6SL3266-1AC00-0VA0	FSC
6SL3266-1AD00-0VA0	FSD
6SL3266-1AE00-0VA0	FSE

* Installation of FSA with fan refer to V20 manual. Installation with FSAA and FSAB install with migration mounting kit
For Input / Output Reactors and Braking Resistors please see SINAMICS Accessories on page 41.

SINAMICS V90 & SIMOTICS 1FL6 Servo Motors

Design

SINAMICS V90 combined with SIMOTICS 1FL6 Servo Motors are designed to meet general purpose servo applications ranging from 0.05 kW to 7 kW and is an ideal choice for a micro automation solution with a servo drive.

Benefits

- Optimized servo performance
- Choice of control: Pulse Train Interface or PROFINET
- Auto tuning enables machines to achieve a high dynamic performance
- Automatic suppression of machine resonances
- Choice of Motor Encoders (TTL or Absolute)
- Integrated Safe Torque Off (STO)
- Integrated braking resistor in all frame sizes
- Integrated holding brake switch for 400V version, external relay required for 200V version
- Parameter cloning
- All motors are IP65 and equipped with an oil seal

Easy commissioning with SINAMICS V-ASSISTANT

- Intuitive menu navigation
- Simple to use
- Graphics guide the user through the commissioning
- Advanced tools such as 'Trace', Servo Tuning and Control Panel to optimize the machine performance
- ...and many more

SINAMICS V-Assistant can be downloaded from our Support Site F.O.C. via the following link:

https://support.industry.siemens.com/cs/ww/en/view/104427104

~ Position and Speed Control in combination with motion (TO) axis of SIMATIC S7 1500 T-CPU / S7-1500 / S7 1200

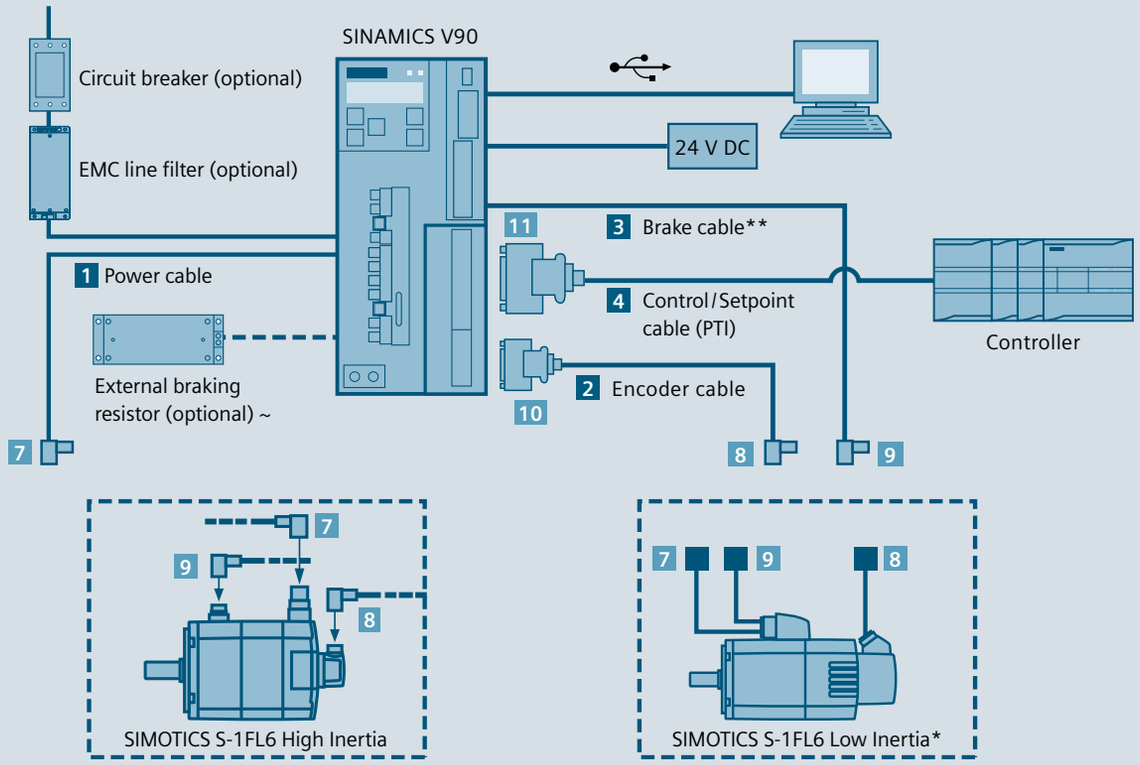
**For very low speed, high accuracy or high dynamic application TTL encoder is not recommended

Technical data		
Electrical data	**SINAMICS V20**	
Line voltages & Power Ranges	200 V ... 240 V 1Ø AC (-15% +10%) 0.05 kW ...0.75 kW 200 V ... 240 V 3Ø AC (-15% +10%) 0.05 kW ...2 kW 380 ...480V 3Ø AC (-15% +10%) 0.4 kW ...7.0 kW	
Line supply types	TN, TT, IT* TT earthed line * without EMC filter	
Line frequency	50/60 Hz (-±10%)	
Control System	Servo contol	
Control modes		
Pulse Train Interface version	Positioning with Pulse train, internal positioning, speed, torque	
Profinet Version	Speed control via PROFINET (PROFIdrive profile *), EPos	
Interfaces (1)	**PTI version**	**PROFINET version**
Digital Inputs (DI)	10, NPN /PNP	4, NPN/PNP
Digital Outputs (DO)	6, NPN	2, NPN/PNP
Analogue Inputs (AI)	2, (±10V, 13 bit)	
Analogue Outputs (AO)	2, (±10V, 10 bit)	
Safety Input (STO)	Dedicated terminal	
Communication	2 channel, one for 5V differential, one for 24V single ended	PROFINET RT/IRT interface with 2 ports (RJ45 sockets)
Programming interface	Mini USB	
Interfaces (2)	**200V version PTI or PN**	**400V version PTI or PN**
Encoder	Incremental : TTL 2500 ppr ** Absolute: 21 bit single-turn (available end 2016)	Incremental : TTL 2500 ppr Absolute: 20 bit single-turn +12 bit multi-turn
Memory Card	Micro SD Card	SD Card
Functions		
Monitoring/ protection functions	Overvoltage, undervoltage, ground fault, output short circuit, I^2T, IGBT overtemperature. Motor overtemperature is calculated by I2t and protected by the output current from the drive	
Safety Functions	Safe Torque Off (STO) via terminal	
Mechanical data		
Degree of protection	IP20	
Cooling type	200V version: FSA to FSC - Convection, FSD - fan 400V version: FSAA & FSA - Convection, FSB & FSC - fan	
Environment		
Ambient temperature (operating)	0 ...45°C without derating, 45° ... 55°C with derating	
Standards		
In conformance with the following standards	CE, KC, EAC, cULus, C-tick, Safety Integrated functions: STO - SIL2, PLd	
Technical Data	**1FS6 Motor Low Inertia**	**1FS6 Motor High Inertia**
Operating Temperature	0 ~ 40°C SH20-40, 0 ~ 30°C SH50	0 ~ 40°C without restriction
Degree of protection	IP65	
Construction	IM B5 (IM V1 and IM V3	
Thermal Class	B (130°C)	

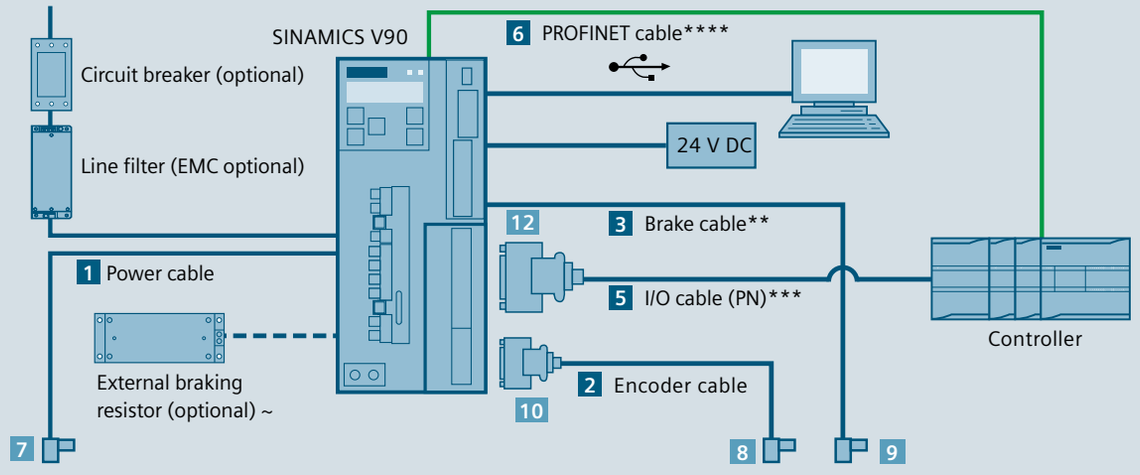
Explanation of safety functions can be found on page 62

System Connection Diagram

System connection diagram for the SINAMICS V90 pulse train version



System connection diagram of SINAMICS V90 PROFINET version



1	Power cable	7	Power connector (motor side)
2	Encoder cable	8	Encoder connector (motor side)
3	Brake cable	9	Brake connector (motor side)
4	Control/Setpoint cable (pulse train version)	10	Encoder connector (drive side)
5	I/O cable (PROFINET version)	11	Setpoint connector (Pulse train version)
6	PROFINET cable	12	I/O connector (PROFINET version)

* SIMOTICS S-1FL6 Low Inertia motors SH20, SH30, SH40 use outlet connection concept.

** Brake cable connection shown here is for 400 V version only. The 200 V version requires an external relay to connect the motor brake cable. The relay has to be connected via the setpoint cable for the SINAMICS V90 pulse train version and via I/O cable for the SINAMICS V90 PROFINET version.

*** I/O cable is necessary for the brake control of the SINAMICS V90 PROFINET 200 V version, and for applications requiring additional DI/DO in addition to PROFINET communication.

**** For further information of PROFINET cable refer to http://automation.siemens.com/sc-static/catalogs/catalog/IK_PI_2015_en.pdf

~ Information regarding external braking resistor sizes can be found in the V90 Technical Manual

SINAMICS V90, 200 ... 240V 1/3 Ø AC Drive with SIMOTICS 1FL6 Low Inertia Servo Motors with Inc. Encoder

1FL6 Low Inertia/High Dynamic Servo Motor with							Supply Voltage 200...240V 1Ø AC						
Rated Power kW	Rated Torque Nm	Rated Speed rpm	Shaft Height mm	Incremental TTL Encoder			Max. motor kW	Rated Current Amps	Frame size	Industrial V90 Drive			Part Number Additional. EMC Filter
0.05	0.16	3000	SH20	1FL6022-2AF21-1A	•	1	0.10	1.2	A*/B*	6SL3210-5FB10-1U	•	0	6SL3203-0BE15-0VA0
0.1	0.32	3000	SH20	1FL6024-2AF21-1A	•	1	0.10	1.2	A*/B*	6SL3210-5FB10-1U	•	0	6SL3203-0BE15-0VA0
0.2	0.64	3000	SH30	1FL6032-2AF21-1A	•	1	0.20	1.4	A*/B*	6SL3210-5FB10-2U	•	0	6SL3203-0BE15-0VA0
0.4	1.27	3000	SH30	1FL6034-2AF21-1A	•	1	0.40	2.6	B	6SL3210-5FB10-4U	•	1	6SL3203-0BE15-0VA0
0.75	2.39	3000	SH40	1FL6042-2AF21-1A	•	1	0.75	4.7	C	6SL3210-5FB10-8U	•	0	6SL3203-0BE15-0VA0

1FL6 Servo Motor - Low Inertia/High Dynamic							Supply Voltage 200...240V 3Ø AC						
Rated Power kW	Rated Torque Nm	Rated Speed rpm	Shaft Height mm	Part number TTL Encoder			Max. motor kW	Rated Current Amps	Frame size	Industrial V90 Drive			Part Number Additional. EMC Filter
1.00	3.18	3000	SH40	1FL6044-2AF21-1A	•	1	1.00	6.3	D	6SL3210-5FB11-0U	•	1	6SL3203-0BE21-2VA0
1.50	4.78	3000	SH50	1FL6052-2AF21-0A	•	1	1.50	10.6	D	6SL3210-5FE11-5U	•	0	6SL3203-0BE21-2VA0
2.00	6.37	3000	SH50	1FL6054-2AF21-0A	•	1	2.00	11.6	D	6SL3210-5FB12-0U	•	0	6SL3203-0BE21-2VA0

Shaft Version and Brake	
With Keyway w/o Holding Brake	A
With Keyway with Holding Brake	B
Plain Shaft w/o Holding Brake	G
Plain Shaft with Holding Brake	H

Communication	
Pulse Train (PTI)	A
Profinet	F

*FSA with Pulse Train Interface / * FSB with Profinet Communication

**For very low speed, high accuracy or high dynamic application TTL encoder is not recommended

SINAMICS V90, 200 ... 240V 1/3 Ø AC Drive with SIMOTICS 1FL6 Low Inertia Servo Motors with Abs. Encoder

1FL6 Low Inertia/High Dynamic Servo Motor with								Supply Voltage 200...240V 1Ø & 3Ø AC						
Rated Power kW	Rated Torque Nm	Rated Speed rpm	Shaft Height mm	Absolute Encoder Select Single-Turn or Multi-Turn below				Max. motor kW	Rated Current Amps	Frame size	Industrial V90 Drive			Part Number Additional. EMC Filter
0.05	0.16	3000	SH20	1FL6022-2AF21-1	•	•	1	0.10	1.2	A*/B*	6SL3210-5FB10-1U	•	0	6SL3203-0BE15-0VA0
0.10	0.32	3000	SH20	1FL6024-2AF21-1	•	•	1	0.10	1,2	A*/B*	6SL3210-5FB10-1U	•	0	6SL3203-0BE15-0VA0
0.20	0.64	3000	SH30	1FL6032-2AF21-1	•	•	1	0.20	1.4	A*/B*	6SL3210-5FB10-2U	•	0	6SL3203-0BE15-0VA0
0.40	1.27	3000	SH30	1FL6034-2AF21-1	•	•	1	0.40	2.6	B	6SL3210-5FB10-4U	•	1	6SL3203-0BE15-0VA0
0.75	2.39	3000	SH40	1FL6042-2AF21-1	•	•	1	0.75	4.7	C	6SL3210-5FB10-8U	•	0	6SL3203-0BE15-0VA0

1FL6 Low Inertia/High Dynamic Servo Motor with								Supply Voltage 200...240V 3Ø AC						
Rated Power kW	Rated Torque Nm	Rated Speed rpm	Shaft Height mm	Absolute Encoder Select Single-Turn or Multi-Turn below				Max. motor kW	Rated Current Amps	Frame size	Industrial V90 Drive			Part Number Additional. EMC Filter
1.00	3.18	3000	SH40	1FL6044-2AF21-1	•	•	1	1.00	6.3	D	6SL3210-5FB11-0U	•	1	6SL3203-0BE21-2VA0
1.50	4.78	3000	SH50	1FL6052-2AF21-1	•	•	1	1.50	10.6	D	6SL3210-5FE11-5U	•	0	6SL3203-0BE21-2VA0
2.00	6.37	3000	SH60	1FL6054-2AF21-1	•	•	1	2.00	11.6	D	6SL3210-5FB12-0U	•	0	6SL3203-0BE21-2VA0

Encoder Type		
Absolute encoder single-turn 21-bit	M	
Absolute encoder xx-bit + xx-bit multi-turn	X	
Shaft Version and Brake		
With Keyway w/o Holding Brake		A
With Keyway with Holding Brake		B
Plain Shaft w/o Holding Brake		G
Plain Shaft with Holding Brake		H

Communication	
Pulse Train (PTI)	A
Profinet	F

* FSA with Pulse Train Interface / * FSB with Profinet Communication

Connectors and cables between V90 and PLC - Pulse Train version	Part Number
Control/setpoint cable - 1 meter with 50 pin MDR connector on drive end, free pins to PLC (MDR 50 pin, free pins to controller)	6SL3260-4NA00-1VB0
Control/setpoint cable - 0.5 meter with 50 pin MDR connector drive end, terminal block PLC side	6SL3260-4NA00-1VA5
Connectors and cables between V90 and PLC - PROFINET version	**Part Number**
I/O cable, 1 meter with 20 pin MDR connector on drive end, free pins to PLC	6SL3260-4MA00-1VB0
PROFINET Cable sold by the meter	6XV1840-2AH10
Options	
Micro SD Card - for use with 200V V90 - No Siemens part so use one from any reputable manufacturer	

Connecting Cables & Protection

MOTION CONNECT 300 Cables												Recommended fuse/circuit breaker - IEC complient			
Connection between SINAMICS V90 Converter and SIMOTICS S-1FL6 Low Inertia/High Dynamic motor with Incremental TTL Encoder												Fuse		Circuit breaker	
Power Cable				TTL Encoder Cable				Brake Cable				Rated Current	Part Number	Rated Current	Part Number
6FX3002-5CK01-1	•	•	0	6FX3002-2CT20-1	•	•	0	6FX3002-5BK02-1	•	•	0	6A	3NA3801	2.8 A - 4.0 A	3RV2011-1EA10
6FX3002-5CK01-1	•	•	0	6FX3002-2CT20-1	•	•	0	6FX3002-5BK02-1	•	•	0	6A	3NA3801	2.8 A - 4.0 A	3RV2011-1EA10
6FX3002-5CK01-1	•	•	0	6FX3002-2CT20-1	•	•	0	6FX3002-5BK02-1	•	•	0	6A	3NA3801	2.8 A - 4.0 A	3RV2011-1EA10
6FX3002-5CK01-1	•	•	0	6FX3002-2CT20-1	•	•	0	6FX3002-5BK02-1	•	•	0	10A	3NA3803	2.8 A - 4.0 A	3RV2011-1EA10
6FX3002-5CK01-1	•	•	0	6FX3002-2CT20-1	•	•	0	6FX3002-5BK02-1	•	•	0	16A	3NA3805	5.5 A - 8 A	3RV2011-1HA10

MOTION CONNECT 300 Cables												Recommended fuse/circuit breaker - IEC complient			
Connection between SINAMICS V90 Converter and SIMOTICS S-1FL6 Low Inertia/High Dynamic motor												Fuse		Circuit breaker	
Power Cable				TTL Encoder Cable				Brake Cable				Rated Current	Part Number	Rated Current	Part Number
6FX3002-5CK01-1	•	•	0	6FX3002-2CT20-1	•	•	0	6FX3002-5BK02-1	•	•	0	16A	3NA3805	7 A - 10 A	3RV2011-1JA10
6FX3002-5CK32-1	•	•	0	6FX3002-2CT12-1	•	•	0	6FX3002-5BL03-1	•	•	0	25A	3NA3810	10 A - 16 A	3RV2011-4AA10
6FX3002-5CK32-1	•	•	0	6FX3002-2CT12-1	•	•	0	6FX3002-5BL03-1	•	•	0	25A	3NA3810	10 A - 16 A	3RV2011-4AA10
Length															
Length: 3m	A	D			A	D			A	D					
Length: 5m	A	F			A	F			A	F					
Length: 10m	B	A			B	A			B	A					
Length: 20m	C	A			C	A			B	A					

Connecting Cables & Protection

MOTION CONNECT 300 Cables																			
Connection between SINAMICS V90 Converter and SIMOTICS S-1FL6 Low Inertia/High Dynamic motor with Absolute Encoder																Recommended fuse/circuit breaker - IEC complient: Fuse		Circuit breaker	
Power Cable				Absolute Encoder Cable								Brake Cable				Rated Current	Part Number	Rated Current	Part Number
6FX3002-5CK01-1	•	•	0	6FX3002-2	•	•	20-1	•	•	0		6FX3002-5BK02-1	•	•	0	6A	3NA3801	2.8 A - 4.0 A	3RV2011-1EA10
6FX3002-5CK01-1	•	•	0	6FX3002-2	•	•	20-1	•	•	0		6FX3002-5BK02-1	•	•	0	6A	3NA3801	2.8 A - 4.0 A	3RV2011-1EA10
6FX3002-5CK01-1	•	•	0	6FX3002-2	•	•	20-1	•	•	0		6FX3002-5BK02-1	•	•	0	6A	3NA3801	2.8 A - 4.0 A	3RV2011-1EA10
6FX3002-5CK01-1	•	•	0	6FX3002-2	•	•	20-1	•	•	0		6FX3002-5BK02-1	•	•	0	10A	3NA3803	2.8 A - 4.0 A	3RV2011-1EA10
6FX3002-5CK01-1	•	•	0	6FX3002-2	•	•	20-1	•	•	0		6FX3002-5BK02-1	•	•	0	16A	3NA3805	5.5 A - 8 A	3RV2011-1HA10

MOTION CONNECT 300 Cables																Recommended fuse/circuit breaker - IEC complient			
Connection between SINAMICS V90 Converter and SIMOTICS S-1FL6 Low Inertia/High Dynamic motor with Absolute Encoder																Fuse		Circuit breaker	
Power Cable				Absolute Encoder Cable								Brake Cable				Rated Current	Part Number	Rated Current	Part Number
6FX3002-5CK01-1	•	•	0	6FX3002-2	•	•	20-1	•	•	0		6FX3002-5BK02-1	•	•	0	16A	3NA3805	7 A - 10 A	3RV2011-1JA10
6FX3002-5CK31-1	•	•	0	6FX3002-2	•	•	10-1	•	•	0		6FX3002-5BL02-1	•	•	0	25A	3NA3810	10 A - 16 A	3RV2011-4AA10
6FX3002-5CK31-1	•	•	0	6FX3002-2	•	•	10-1	•	•	0		6FX3002-5BL02-1	•	•	0	25A	3NA3810	10 A - 16 A	3RV2011-4AA10
Length																			
Length: 3m	A	D						A	D				A	D					
Length: 5m	A	F						A	F				A	F					
Length: 10m	B	A						B	A				B	A					
Length: 20m	C	A						C	A				B	A					
Encoder type																			
Absolute Single-turn					D	B													
Absolute Multi-turn							Not yet available												

Connectors	Used at	Part Number		Qty
50 pin MDR connector for PTI version	Drive end	6SL3260-2NA00-0VA0		30
20 pin MDR connector for PROFINET version	Drive end	6SL3260-2MA00-0VA0		5
Encoder connector	Drive end	6FX2003-0SB14		30
PROFINET connector 180° (straight) cable outlet	Drive end	6GK1901-1BB10-2AA0		1
Power Connector	Motor end	6FX2003-0LL1	•	see below
Incremental TTL Encoder connector 2500 ppr	Motor end	6FX2003-0SL1	•	see below
Absolute Encoder connector - all variants	Motor end	6FX2003-0DB1	•	see below
Brake connector	Motor end	6FX2003-0LL5	•	see below
For Simotics 1FL6 motors with shaft heights 45, 50, 65 & 90			1	30
For Simotics 1FL6 motors with shaft heights 20, 30 & 40			2	5

SINAMICS V90, 380 ... 480V 3 Ø AC Drive with SIMOTICS 1FL6 High Inertia Servo Motors with Inc. Encoder

1FS6 High Inertia Servo Motor with								Supply Voltage 380 ...480V 3 AC						
Rated Power kW	Rated Torque Nm	Rated Speed rpm	Shaft Height mm	Incremental TTL Encoder				Max. motor kW	Rated Current Amps	Frame size	Industrial V90 Drive			Additional Filter to use with Industrial V90*
0.40	1.27	3000	SH45	1FL6042-1AF61-2A	•	1		0.40	1.2	AA	6SL3210-5FE10-4U	•	0	6SL3203-0BE15-0VA0
0.75	2.39	3000	SH45	1FL6044-1AF61-2A	•	1		0.75	2.1	A	6SL3210-5FE10-8U	•	0	6SL3203-0BE15-0VA0
0.75	3.58	2000	SH65	1FL6061-1AC61-2A	•	1		0.75	3	A	6SL3210-5FE11-0U	•	0	6SL3203-0BE15-0VA0
1.00	4.77	2000	SH65	1FL6062-1AC61-2A	•	1		1.00	3	A	6SL3210-5FE11-0U	•	0	6SL3203-0BE15-0VA0
1.50	7.16	2000	SH65	1FL6064-1AC61-2A	•	1		1.50	5.3	B	6SL3210-5FE11-5U	•	0	6SL3203-0BE21-2VA0
1.75	8.40	2000	SH65	1FL6066-1AC61-2A	•	1		1.75	5.3	B	6SL3210-5FE11-5U	•	0	6SL3203-0BE21-2VA0
2.00	9.50	2000	SH65	1FL6067-1AC61-2A	•	1		2.00	7.8	B	6SL3210-5FE12-0U	•	0	6SL3203-0BE21-2VA0
2.50	11.90	2000	SH90	1FL6090-1AC61-2A	•	1		2.50	7.8	B	6SL3210-5FE12-0U	•	0	6SL3203-0BE21-2VA0
3.50	16.70	2000	SH90	1FL6092-1AC61-2A	•	1		3.50	11	C	6SL3210-5FE13-5U	•	0	6SL3203-0BE22-0VA0
5.00	23.90	2000	SH90	1FL6094-1AC61-2A	•	1		5.00	12.6	C	6SL3210-5FE15-0U	•	0	6SL3203-0BE22-0VA0
7.00	33.40	2000	SH90	1FL6096-1AC61-2A	•	1		7.00	13.2	C	6SL3210-5FE17-0U	•	0	6SL3203-0BE22-0VA0

Shaft Version and Brake	
With Keyway w/o Holding Brake	A
With Keyway with Holding Brake	B
Plain Shaft w/o Holding Brake	G
Plain Shaft with Holding Brake	H

Communication	
Pulse Train (PTI)	A
Profinet	F

SINAMICS V90, 380...480V 3Ø AC Drive with SIMOTICS 1FL6 High Inertia Servo Motors with Abs.Encoder

1FS6 High Inertia Servo Motor with								Supply Voltage 380 ...480V 3 AC						
Rated Power kW	Rated Torque Nm	Rated Speed rpm	Shaft Height mm	Absolute Encoder 20 bit Single-Turn + 12 bit Multi-Turn				Max. motor kW	Rated Current Amps	Frame size	Industrial V90 Drive			Part Number Additional. EMC Filter
0.40	1.27	3000	SH45	1FL6042-1AF61-2L	•	1		0.40	1.2	AA	6SL3210-5FE10-4U	•	0	6SL3203-0BE15-0VA0
0.75	2.39	3000	SH45	1FL6044-1AF61-2L	•	1		0.75	2.1	A	6SL3210-5FE10-8U	•	0	6SL3203-0BE15-0VA0
0.75	3.58	2000	SH65	1FL6061-1AC61-2L	•	1		0.75	3	A	6SL3210-5FE11-0U	•	0	6SL3203-0BE15-0VA0
1.00	4.77	2000	SH65	1FL6062-1AC61-2L	•	1		1.00	3	A	6SL3210-5FE11-0U	•	0	6SL3203-0BE15-0VA0
1.50	7.16	2000	SH65	1FL6064-1AC61-2L	•	1		1.50	5.3	B	6SL3210-5FE11-5U	•	0	6SL3203-0BE21-2VA0
1.75	8.40	2000	SH65	1FL6066-1AC61-2L	•	1		1.75	5.3	B	6SL3210-5FE11-5U	•	0	6SL3203-0BE21-2VA0
2.00	9.50	2000	SH65	1FL6067-1AC61-2L	•	1		2.00	7.8	B	6SL3210-5FE12-0U	•	0	6SL3203-0BE21-2VA0
2.50	11.90	2000	SH90	1FL6090-1AC61-2L	•	1		2.50	7.8	B	6SL3210-5FE12-0U	•	0	6SL3203-0BE21-2VA0
3.50	16.70	2000	SH90	1FL6092-1AC61-2L	•	1		3.50	11	C	6SL3210-5FE13-5U	•	0	6SL3203-0BE22-0VA0
5.00	23.90	2000	SH90	1FL6094-1AC61-2L	•	1		5.00	12.6	C	6SL3210-5FE15-0U	•	0	6SL3203-0BE22-0VA0
7.00	33.40	2000	SH90	1FL6096-1AC61-2L	•	1		7.00	13.2	C	6SL3210-5FE17-0U	•	0	6SL3203-0BE22-0VA0

Shaft Version and Brake	
With Keyway w/o Holding Brake	A
With Keyway with Holding Brake	B
Plain Shaft w/o Holding Brake	G
Plain Shaft with Holding Brake	H

Communication	
Pulse Train (PTI)	A
Profinet	F

Connectors and cables between V90 and PLC - Pulse Train version	Part Number
Control/setpoint cable - 1 meter with 50 pin MDR connector on drive end, free pins to PLC (MDR 50 pin, free pins to controller)	6SL3260-4NA00-1VB0
Control/setpoint cable - 0.5 meter with 50 pin MDR connector drive end, terminal block PLC side	6SL3260-4NA00-1VA5
Connectors and cables between V90 and PLC - PROFINET version	**Part Number**
I/O cable, 1 meter with 20 pin MDR connector on drive end, free pins to PLC	6SL3260-4MA00-1VB0
PROFINET Cable sold by the meter	6XV1840-2AH10
Options	
Sinamics SD Card - for use with 400V version of V90	6SL3054-4AG00-2AA0

Connecting Cables & Protection

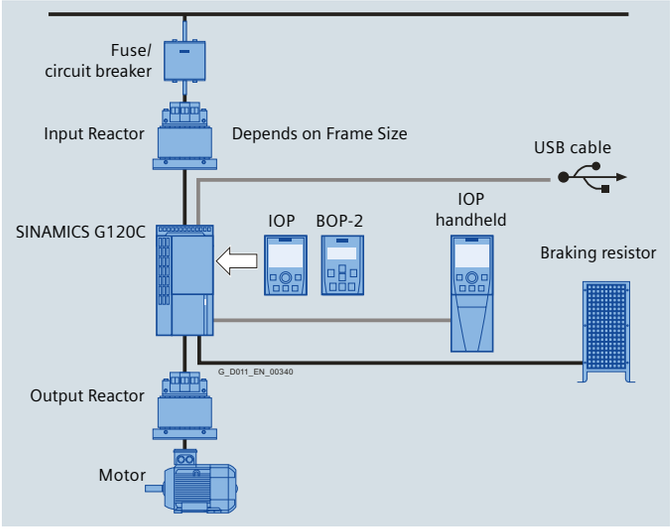
MOTION CONNECT 300 Cables												Recommended fuse/circuit breaker - IEC compliant			
Connection between V90 and SIMOTICS S-1FL6 HI with Inc. TTL Encoder												Fuse		Circuit breaker	
Power Cable				TTL Encoder Cable				Brake Cable				Rated Current	Part Number	Rated Current	Part Number
6FX3002-5CL01-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	6A	3NA3801-6	3.2 A	3RV1021-1DA10
6FX3002-5CL01-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	6A	3NA3801-6	4A	3RV1021-1EA10
6FX3002-5CL01-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	10A	3NA3803-6	5.5A	3RV1021-1FA10
6FX3002-5CL01-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	10A	3NA3803-6	3.2A	3RV1021-1FA10
6FX3002-5CL11-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	10A	3NA3803-6	10A	3RV1021-1HA10
6FX3002-5CL11-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	10A	3NA3803-6	10A	3RV1021-1HA10
6FX3002-5CL11-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	16A	3NA3805-6	16 A	3RV1021-4AA10
6FX3002-5CL11-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	16A	3NA3805-6	16 A	3RV1021-4AA10
6FX3002-5CL11-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	20A	3NA3807-6	20 A	3RV1021-4BA10
6FX3002-5CL11-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	20A	3NA3807-6	20 A	3RV1021-4BA10
6FX3002-5CL11-1	•	•	0	6FX3002-5BL02-1	•	•	0	6FX3002-5BL02-1	•	•	0	25A	3NA3810-6	25 A	3RV1021-4DA10
Length															
Length: 3m	A	D			A	D			A	D					
Length: 5m	A	F			A	F			A	F					
Length: 7m	A	H			A	H			A	H					
Length: 10m	B	A			B	A			B	A					
Length: 15m	B	F			B	F			B	F					
Length: 20m	C	A			C	A			C	A					

Connecting Cables & Protection

MOTION CONNECT 300 Cables												Recommended fuse/circuit breaker - IEC compliant			
Connection between SINAMICS V90 Converter and SIMOTICS S-1FL6 High Inertia motor												Fuse		Circuit breaker	
Power Cable				ABS. Encoder Cable				Brake Cable				Rated Current	Part Number	Rated Current	Part Number
6FX3002-5CL01-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	6A	3NA3801-6	3.2 A	3RV1021-1DA10
6FX3002-5CL01-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	6A	3NA3801-6	4A	3RV1021-1EA10
6FX3002-5CL01-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	10A	3NA3803-6	5.5A	3RV1021-1FA10
6FX3002-5CL01-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	10A	3NA3803-6	3.2A	3RV1021-1FA10
6FX3002-5CL11-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	10A	3NA3803-6	10A	3RV1021-1HA10
6FX3002-5CL11-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	10A	3NA3803-6	10A	3RV1021-1HA10
6FX3002-5CL11-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	16A	3NA3805-6	16 A	3RV1021-4AA10
6FX3002-5CL11-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	16A	3NA3805-6	16 A	3RV1021-4AA10
6FX3002-5CL11-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	20A	3NA3807-6	20 A	3RV1021-4BA10
6FX3002-5CL11-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	20A	3NA3807-6	20 A	3RV1021-4BA10
6FX3002-5CL11-1	•	•	0	6FX3002-2DB10-1	•	•	0	6FX3002-5BL02-1	•	•	0	25A	3NA3810-6	25 A	3RV1021-4DA10
Length															
Length: 3m	A	D			A	D			A	D					
Length: 5m	A	F			A	F			A	F					
Length: 7m	A	H			A	H			A	H					
Length: 10m	B	A			B	A			B	A					
Length: 15m	B	F			B	F			B	F					
Length: 20m	C	A			C	A			C	A					

Connectors	Used at	Part Number		Qty
50 pin MDR connector for PTI version	Drive end	6SL3260-2NA00-0VA0		30
20 pin MDR connector for PROFINET version	Drive end	6SL3260-2MA00-0VA0		5
Encoder connector	Drive end	6FX2003-0SB14		30
PROFINET connector 180° (straight) cable outlet	Drive end	6GK1901-1BB10-2AA0		1
Power Connector	Motor end	6FX2003-0LL1	•	see below
Incremental TTL Encoder connector 2500 ppr	Motor end	6FX2003-0SL1	•	see below
Absolute Encoder connector - all variants	Motor end	6FX2003-0DB1	•	see below
Brake connector	Motor end	6FX2003-0LL5	•	see below
For Simotics 1FL6 motors with shaft heights 45, 50, 65 & 90			1	30
For Simotics 1FL6 motors with shaft heights 20, 30 & 40			2	5

SINAMICS G120C



Design

The SINAMICS G120C is a variable speed drive specifically designed for OEMs who require a cost effective, space saving design that is simple to operate and has a broad range of functions. Now available from 0.55 kW to 132 kW (LO)

Benefits

- Compact design, high power density
- Available with and without an EMC filter,
- USS/Modbus RTU , PROFIBUS and PROFINET * interfaces *(PROFINET only on FSD to FSF)
- Simple commissioning with Starter or StartDrive
- Interchangeable memory card for backup and serial commissioning
- Side by side mounting without de-rating
- Pluggable terminals for easy installation with FSAA to FSC
- Integrated braking chopper, motor holding brake control
- Integrated PID controller
- Analogue Input - Selectable between -10V .. +10V, 0/4 .. 20mA)
- STO Safety Function
- Coated boards for robustness
- Energy saving counter, energy consumption computer
- Automatic flux reduction
- Software functions for auto restart, flying restart, ramp smoothing and adjustable ramp up/down times
- Skip frequencies to avoid resonance
- Fast, repeatable digital inputs for fast reaction applications
- Extensive protection features
- USB connectivity
- Quick commissioning with BOP-2 and IOP operator panels

Applications

- Conveyors, pumps, fans, compressors, mixers & extruders

Technical data	
Electrical data	**SINAMICS G120C**
Line voltages	380 V... 480 V 3 AC + 10%, -20%
Power ranges	0.55kW ... 132kW (LO)
Line supply types	TN, TT, IT (without filter)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 550Hz V/f, 0 ... 240 Hz Vector
Pulse frequency	4 kHz (up to 16 kHz with derating)
Open-loop control	V/f (linear, square law, FCC, ECO) Vector control without encoder
Digital inputs (DI)	6
Digital outputs (DO)	2, 1 x relay, 1 x transistor
Analogue inputs (AI)	1 (selectable between -10 ...+10V, 0/4 ...20mA)
Analogue outputs (AO)	1 (0 ... 10V, 0/4 ... 20mA)
Failsafe inputs (F-DI)	1 (uses 2 digital inputs - DI14 & DI15)
Communication interface	RS485/USS/Modbus RTU: PROFIBUS DP: PROFINET: CANopen
Interface to	RS485/USS/Modbus RTU:PROFIBUS: PROFINET *
Functions	
Software functions	Setpoint input, 16 fixed frequencies (programmable), ramp smoothing, jog, slip compensation, BICO technology, command sets (2), flying restart, automatic restart, PID controller, energy consumption counter, energy saving computer, auto ramping, kenetic buffering, DC braking, compound braking, braking with brake chopper, brake relay control via CU
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor overtemperature, inverter overtemperature
Safety functions	STO
Mechanical Data	
Degree of protection	IP20
Cooling type	Fan
Standards	
In conformance with the following standards	EN ISO 13849-1 PLd & Cat 3, IEC61508 SIL2 cULus, CE, c-tick

Explanation of safety functions can be found on page 62

SINAMICS G120C

Supply Voltage - 380 V... 480 V 3 AC					
Rating		Frame Size	Communication Interface	Industrial	Filtered#
LO (VT)	HO (CT)				
0.55 kW / 1.7 A	0.37 kW / 1.3 A	AA	USS/Modbus RTU	6SL3210-1KE11-8UB	6SL3210-1KE11-8AB
			PROFIBUS DP	6SL3210-1KE11-8UP	6SL3210-1KE11-8AP
			PROFINET	6SL3210-1KE11-8UF	6SL3210-1KE11-8AF
0.75 kW / 2.2 A	0.55 kW / 1.7 A	AA	USS/Modbus RTU	6SL3210-1KE12-3UB	6SL3210-1KE12-3AB
			PROFIBUS DP	6SL3210-1KE12-3UP	6SL3210-1KE12-3AP
			PROFINET	6SL3210-1KE12-3UF	6SL3210-1KE12-3AF
1.1 kW / 3.1 A	0.75 kW / 2.2 A	AA	USS/Modbus RTU	6SL3210-1KE13-2UB	6SL3210-1KE13-2AB
			PROFIBUS DP	6SL3210-1KE13-2UP	6SL3210-1KE13-2AP
			PROFINET	6SL3210-1KE13-2UF	6SL3210-1KE13-2AF
1.5 kW / 4.1 A	1.1 kW / 3.1 A	AA	USS/Modbus RTU	6SL3210-1KE14-3UB	6SL3210-1KE14-3AB
			PROFIBUS DP	6SL3210-1KE14-3UP	6SL3210-1KE14-3AP
			PROFINET	6SL3210-1KE14-3UF	6SL3210-1KE14-3AF
2.2 kW / 5.6 A	1.5 kW / 4.1 A	AA	USS/Modbus RTU	6SL3210-1KE15-8UB	6SL3210-1KE15-8AB
			PROFIBUS DP	6SL3210-1KE15-8UP	6SL3210-1KE15-8AP
			PROFINET	6SL3210-1KE15-8UF	6SL3210-1KE15-8AF
3.0 kW / 7.3 A	2.2 kW / 5.6 A	A	USS/Modbus RTU	6SL3210-1KE17-5UB	6SL3210-1KE17-5AB
			PROFIBUS DP	6SL3210-1KE17-5UP	6SL3210-1KE17-5AP
			PROFINET	6SL3210-1KE17-5UF	6SL3210-1KE17-5AF
4.0 kW / 8.8 A	3.0 kW / 7.3 A	A	USS/Modbus RTU	6SL3210-1KE18-8UB	6SL3210-1KE18-8AB
			PROFIBUS DP	6SL3210-1KE18-8UP	6SL3210-1KE18-8AP
			PROFINET	6SL3210-1KE18-8UF	6SL3210-1KE18-8AF
5.5 kW / 12.5 A	4.0 kW / 8.8 A	B	USS/Modbus RTU	6SL3210-1KE21-3UB	6SL3210-1KE21-3AB
			PROFIBUS DP	6SL3210-1KE21-3UP	6SL3210-1KE21-3AP
			PROFINET	6SL3210-1KE21-3UF	6SL3210-1KE21-3AF
7.5 kW / 16.5 A	5.5 kW / 12.5 A	B	USS/Modbus RTU	6SL3210-1KE21-7UB	6SL3210-1KE21-7AB
			PROFIBUS DP	6SL3210-1KE21-7UP	6SL3210-1KE21-7AP
			PROFINET	6SL3210-1KE21-7UF	6SL3210-1KE21-7AF
11 kW / 25 A	7.5 kW / 16.5 A	C	USS/Modbus RTU	6SL3210-1KE22-6UB	6SL3210-1KE22-6AB
			PROFIBUS DP	6SL3210-1KE22-6UP	6SL3210-1KE22-6AP
			PROFINET	6SL3210-1KE22-6UF	6SL3210-1KE22-6AF
15 kW / 31 A	11 kW / 25 A	C	USS/Modbus RTU	6SL3210-1KE23-2UB	6SL3210-1KE23-2AB
			PROFIBUS DP	6SL3210-1KE23-2UP	6SL3210-1KE23-2AP
			PROFINET	6SL3210-1KE23-2UF	6SL3210-1KE23-2AF
18.5 kW / 37 A	15 kW / 31 A	C	USS/Modbus RTU	6SL3210-1KE23-8UB	6SL3210-1KE23-8AB
			PROFIBUS DP	6SL3210-1KE23-8UP	6SL3210-1KE23-8AP
			PROFINET	6SL3210-1KE23-8UF	6SL3210-1KE23-8AF
22 kW / 43 A	18.5 kW / 37 A	D	PROFINET	6SL3210-1KE24-4UF1	6SL3210-1KE24-4AF1
30 kW / 58 A	22 kW / 43 A	D	PROFINET	6SL3210-1KE26-0UF1	6SL3210-1KE26-0AF1
37 kW / 68 A	30 kW / 58 A	D	PROFINET	6SL3210-1KE27-0UF1	6SL3210-1KE27-0AF1
45 kW / 82.5 A	37 kW / 68 A	D	PROFINET	6SL3210-1KE28-4UF1	6SL3210-1KE28-4AF1
55 kW / 103 A	45 kW / 82.5 A	E	PROFINET	6SL3210-1KE31-1UF1	6SL3210-1KE31-1AF1
75 kW / 136 A	55 kW / 103 A	F	PROFINET	6SL3210-1KE31-4UF1	6SL3210-1KE31-4AF1
90 kW / 164 A	75 kW / 136 A	F	PROFINET	6SL3210-1KE31-7UF1	6SL3210-1KE31-7AF1
110 kW / 201 A	90 kW / 164 A	F	PROFINET	6SL3210-1KE32-1UF1	6SL3210-1KE32-1AF1
132 kW / 327 A	110 kW / 201 A	F	PROFINET	6SL3210-1KE32-4UF1	6SL3210-1KE32-4AF1

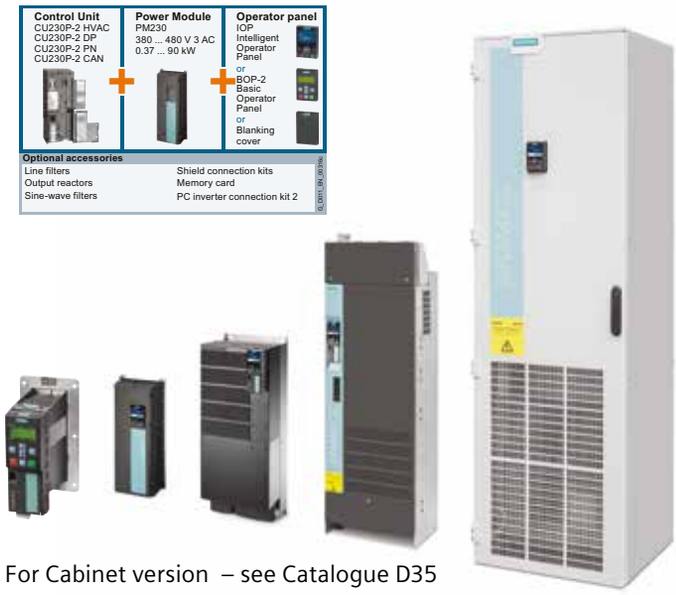
LO = Low Overload rating (Variable torque) - 1.5 x LO current rating for 3s plus 1.1 x LO output current rating for 57s in a 300 s cycle
HO = High Overload rating (Constant torque) - 2 x HO current rating for 3s plus 1.5 x HO current rating for 57s in a 300 s cycle
# EMC filtering suitable for the 1st environment - see page 63 for specific categorisations

Options	
6SL3255-0AA00-4CA1	Basic Operator Panel 2 (BOP2)
6SL3255-0AA00-4JA2	Intelligent Operator Panel (IOP-2)
6SL3256-0AP00-0JA0	IOP / BOP2 Door Mounting Kit (for IP20 version mounted in a cabinet)
6SL3255-0AA00-4HA1	IOP Handheld (inc. Holder, IOP-2, cable, charging unit and rechargeable batteries)
6SL3255-0AA00-2CA0	PC Inverter connection kit 2 (For G120C, G120P and G120 Control Units CU230P-2, CU230B-2, CU230E-2 & CU250S-2, G110M & G120-D)
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB

Shield Connection Kits for Power and Signal Cables
A set of shield plates is included in the scope of delivery

For Input / Output Reactors and Braking Resistors please see SINAMICS Accessories on page 42.

SINAMICS G120P



For Cabinet version – see Catalogue D35

Design

The SINAMICS G120P is an innovative, energy efficient variable speed drive specifically designed for pump, fan and compressor applications in the process, water and building automation industries.

The SINAMICS G120P is a modular solution consisting of a Power Module (PM), Control Unit (CU) and optional Operator Panel (IOP or BOP-2) and suitable for 3Ø 380-480V AC with power ranges of 0.37 kW to 560 kW utilising PM230/PM240-2/ PM330 and 3Ø 500-690V AC with PM330 Cabinet versions are also available. Please see Catalogue D35 for full details.

Benefits

- Flexible – choice of Power and Control Module
- Wide Power range 0.25 kW to 630kW
- Versions with different IP ratings
- Advanced hardware and software solutions to reduce energy consumption
- Minimum harmonics - line reactor not needed for PM230
- Specialised HVAC functions with CU230P-2 HVAC inc. Hibernation mode, Multi Zone Control, 4 PID controllers, Essential Service Mode, Real time clock
- 'STO' Safety function now available on PM230 IP55 and IP20 in Frame Size A to C (0.37kW to 18.5kW (LO))

Applications

- Pumps, fans, compressors and HVAC

Technical data	
Electrical data	**SINAMICS G120P**
Line Voltage Power ranges	**380 V ... 480 V 3 AC ± 10% (-20%<1 min with PM240P-2)** PM230 IP20: 0.37kW ... 70kW (LO) PM230 IP55: 0.37kW... 90 kW (LO) PM240P-2 IP20: 22 kW ... 132 kW (LO) PM330 IP20: 160 kW ... 560 kW (LO) PM330 Cabinet: 110 kW ... 560 kW LO)
	500 V ... 690 V 3 AC Â± 10% (-20%<1 min with PM240P-2) PM240P-2 IP20: 11 kW ... 132 kW (LO) PM330 IP20: 315 kW ... 630 kW (LO) PM330 Cabinet: 315 kW ... 630 kW LO)
Line supply types	IP65: TN, IP20: TN (filtered) TN/IT/TT (unfilteted)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 550Hz V/f, 0 ... 200 Vector
Pulse frequency	PM230: 4kHz (up to 16kHz with derating) PM240P-2, 400V: 4 kHz <75 kW (LO), 2kHz â‰¥ 75 kW (LO) Other frequencies available, check installation manual and derating PM240P-2, 690V: 2 kHz, can be adjusted to 4 kHz Check derating PM330: Self adjusting up to 4 kHz
Open loop control	V/f (linear, square law, FCC, ECO) Vector & Torque control without encoder
Inputs / Outputs	See Control Units table on page 24
Communication Interfaces	Control Unit dependent. See Control Units table on page 24
External Interface to	PC via USB, BOP-2, IOP or Handheld IOP, SINAMICS MMC card or SIMATIC SD card
Functions	
Software Functions	See Contol Units on page 24
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor overtemperature, inverter overtemperature
Safety functions	STO with CU240E-2 & PM230 IP20/IP55 FSA to FSC to SIL2/Pld via terminals or via PROFISafe STO with CU240E-2 & PM240P-2 to SIL3 Ple via terminal on Power Module or SIL2/Pld via Profisafe
Braking Types	PM230: DC Braking PM240P-2: DC Braking, Compound Braking PM330:DC, Regenerative via External Braking Chopper & Resistor
Mechanical Data	
Degree of protection	With operator panel: IP20 or IP54/UL Type 12 With blanking cover: IP20 or IP55/UL Type 12 Cabinet: IP20, IP21, IP23, IP43, IP54 via option
Cooling type	Fan
Standards	
In conformance with the following standards	PM230: UL*, cUL#, CE, C-Tick, SEMI F47 PM240P-2:UL, cULus, CE, EAC, KC, (RCM formerly C-Tick) PM330: cULus, CE, C-Tick, GOST-R (EAC), KC
Safety functions	EN ISO 13849-1 , IEC61508

Explanation of safety functions can be found on page 62

SINAMICS G120P, PM230, IP55 Applications

Supply Voltage: 380 ... 480V 3Ø AC				
Rating at 400V		Frame size	PM230 IP55	
LO	HO		Filter Class A	Filter Class B
0.37 kW / 1.3 A	0.25 kW / 0.9A	A	6SL3223-0DE13-7AG1	6SL3223-0DE13-7BG1
0.55 kW / 1.7A	0.37 kW / 1.3 A	A	6SL3223-0DE15-5AG1	6SL3223-0DE15-5BG1
0.75 kW / 2.2 A	0.55 kW / 1.7 A	A	6SL3223-0DE17-5AG1	6SL3223-0DE17-5BG1
1.1 kW / 3.1 A	0.75 kW / 2.2 A	A	6SL3223-0DE21-1AG1	6SL3223-0DE21-1BG1
1.5 kW / 4.1 A	1.1 kW / 3.1 A	A	6SL3223-0DE21-5AG1	6SL3223-0DE21-5BG1
2.2 kW / 5.9 A	1.5 kW / 4.1 A	A	6SL3223-0DE22-2AG1	6SL3223-0DE22-2BG1
3 kW / 7.7 A	2.2 kW / 5.9 A	A	6SL3223-0DE23-0AG1	6SL3223-0DE23-0BG1
4 kW / 10.2 A	3 kW / 7.7 A	B	6SL3223-0DE24-0AG1	6SL3223-0DE24-0BG1
5.5 kW / 13.2 A	4 kW / 10.2 A	B	6SL3223-0DE25-5AG1	6SL3223-0DE25-5BG1
7.5 kW / 18 A	5.5 kW / 13.2 A	B	6SL3223-0DE27-5AG1	6SL3223-0DE27-5BG1
11 kW / 26 A	7.5 kW / 18 A	C	6SL3223-0DE31-1AG1	6SL3223-0DE31-1BG1
15 kW / 32 A	11 kW / 26 A	C	6SL3223-0DE31-5AG1	6SL3223-0DE31-5BG1
18.5 kW / 38 A	15 kW / 32 A	C	6SL3223-0DE31-8AG1	-
18.5 kW / 38 A	15 kW / 32 A	D	-	6SL3223-0DE31-8BA0
22 kW / 45 A	18.5 kW / 38 A	D	6SL3223-0DE32-2AA0	6SL3223-0DE32-2BA0
30 kW / 60 A	22 kW / 45 A	D	6SL3223-0DE33-0AA0	6SL3223-0DE33-0AA0
37 kW / 75 A	30 kW / 60 A	E	6SL3223-0DE33-7AA0	6SL3223-0DE33-7BA0
45 kW / 90 A	37 kW / 75 A	E	6SL3223-0DE34-5AA0	6SL3223-0DE34-5BA0
55 kW / 110 A	45 kW / 90 A	F	6SL3223-0DE35-5AA0	6SL3223-0DE35-5BA0
75 kW / 145 A	55 kW / 110 A	F	6SL3223-0DE37-5AA0	6SL3223-0DE37-5BA0
90 kW / 178 A	75 kW / 145 A	F	6SL3223-0DE38-8AA0	6SL3223-0DE38-8BA0

PM230: LO (Low Overload) FSA to FSC: 1.5 x LO current rating for 3s plus 1.1 x LO current rating for 57s within a cycle time of 300s
FSD to FSF: 1.1 x LO current rating for 60s within a cycle time of 300s.
PM230: HO(High Overload) FSA to FSC: 2 x HO current rating for 3s plus 1.5 x HO current rating for 57s within a cycle time of 300s.
FSD to FSF: 1.5 x LO current rating for 60s within a cycle time of 300s.

SINAMICS G120P, PM230, IP20 Applications

Supply Voltage: 380 ... 480V 3Ø AC						
Rating at 400V		Frame size	PM230 IP20		PM230 IP20 Push Through	
LO (VT)	HO (CT)		Unfiltered	Filter Class A	Unfiltered	Filter Class A
0.37kW / 1.3A	0.25kW / 0.9A	A	6SL3210-1NE11-3UG1	6SL3210-1NE11-3AG1		
0.55kW / 1.7A	0.37kW / 1.3A	A	6SL3210-1NE11-7UG1	6SL3210-1NE11-7AG1		
0.75kW / 2.2A	0.55kW / 1.7A	A	6SL3210-1NE12-2UG1	6SL3210-1NE12-2AG1		
1.1kW / 3.1A	0.75kW / 2.2A	A	6SL3210-1NE13-1UG1	6SL3210-1NE13-1AG1		
1.5kW / 4.1A	1.1kW / 3.1A	A	6SL3210-1NE14-1UG1	6SL3210-1NE14-1AG1		
2.2kW / 5.9A	1.5kW / 4.1A	A	6SL3210-1NE15-8UG1	6SL3210-1NE15-8AG1		
3kW / 7.7A	2.2kW / 5.9A	A	6SL3210-1NE17-7UG1	6SL3210-1NE17-7AG1	6SL3211-1NE17-7UL1	6SL3211-1NE17-7AL1
4kW / 10.2A	3kW / 7.7A	B	6SL3210-1NE21-0UG1	6SL3210-1NE21-0AG1		
5.5kW / 13.2A	4kW / 10.2A	B	6SL3210-1NE21-3UG1	6SL3210-1NE21-3AG1		
7.5kW / 18A	5.5kW / 13.2A	B	6SL3210-1NE21-8UG1	6SL3210-1NE21-8AG1	6SL3211-1NE21-8UL1	6SL3211-1NE21-8AL1
11kW / 26A	7.5kW / 18A	C	6SL3210-1NE22-6UG1	6SL3210-1NE22-6AG1		
15kW / 32A	11kW / 26A	C	6SL3210-1NE23-2UG1	6SL3210-1NE23-2AG1		
18.5kW / 38A	15kW / 32A	C	6SL3210-1NE23-8UG1	6SL3210-1NE23-8AG1	6SL3211-1NE23-8UL1	6SL3211-1NE23-8AL1
22kW / 45A	18.5kW / 38A	D	6SL3210-1NE24-5UL0	6SL3210-1NE24-5AL0		
30kW / 60A	22kW / 45A	D	6SL3210-1NE26-0UL0	6SL3210-1NE26-0AL0		
37kW / 75A	30kW / 60A	E	6SL3210-1NE27-5UL0	6SL3210-1NE27-5AL0		
45kW / 90A	37kW / 75A	E	6SL3210-1NE28-8UL0	6SL3210-1NE28-8AL0		
55kW / 110A	45kW / 90A	F	6SL3210-1NE31-1UL0	6SL3210-1NE31-1AL0		
75kW / 145A	55kW / 110A	F	6SL3210-1NE31-5UL0	6SL3210-1NE31-5AL0		

PM230: LO (Low Overload) FSA to FSC: 1.5 x LO current rating for 3s plus 1.1 x LO current rating for 57s within a cycle time of 300s
FSD to FSF: 1.1 x LO current rating for 60s within a cycle time of 300s.
PM230: HO(High Overload) FSA to FSC: 2 x HO current rating for 3s plus 1.5 x HO current rating for 57s within a cycle time of 300s.
FSD to FSF: 1.5 x LO current rating for 60s within a cycle time of 300s.

For Output Reactors please see SINAMICS Accessories on page 43

SINAMICS G120P, PM240P-2/PM330, IP20 Industrial Applications – 380V ... 480V 3Ø AC

PM240P-2 Supply Voltage: 380 ... 480V 3Ø AC				
Rating at 400V		Frame size	PM240P-2 IP20	
LO	HO		Unfiltered	Filter Class A
22 kW / 45 A	18.5 kW / 38 A	FSD	6SL3210-1RE24-5UL0	6SL3210-1RE24-5AL0
30 kW / 60 A	22 kW / 45 A	FSD	6SL3210-1RE26-0UL0	6SL3210-1RE26-0AL0
37 kW / 75 A	30 kW / 60 A	FSD	6SL3210-1RE27-5UL0	6SL3210-1RE27-5AL0
45 kW / 90 A	37 kW / 75 A	FSE	6SL3210-1RE28-8UL0	6SL3210-1RE28-8AL0
55 kW / 110 A	45 kW / 90 A	FSE	6SL3210-1RE31-1UL0	6SL3210-1RE31-1AL0
75 kW / 145 A	55 kW / 110 A	FSF	6SL3210-1RE31-5UL0	6SL3210-1RE31-5AL0
90 kW / 178 A	75 kW / 145 A	FSF	6SL3210-1RE31-8UL0	6SL3210-1RE31-8AL0
110 kW / 205 A	90 kW / 178 A	FSF	6SL3210-1RE32-1UL0	6SL3210-1RE32-1AL0
132 kW / 250A	110 kW / 205 A	FSF	6SL3210-1RE32-5UL0	6SL3210-1RE32-5AL0

PM330 Supply Voltage: 380 ... 480V 3Ø AC				
Rating at 400V		Frame size		Additional Filter to use with unfiltered PM330*
LO	HO			
160 kW / 300 A	132 kW / 240 A	GX	6SL3310-1PE33-0AA0	6SL3000-0BE33-1AA0
200 kW / 370 A	160 kW / 296 A	GX	6SL3310-1PE33-7AA0	6SL3000-0BE33-1AA0
250 kW / 460 A	200 kW / 368 A	GX	6SL3310-1PE34-6AA0	6SL3000-0BE35-0AA0

PM240-2: LO (Low Overload)	1.35 x LO current rating for 3s plus 1.1 x LO current rating for 57s plus 1 x LO current rating for 240s in a 300 s cycle
PM240-2: HO (High Overload	1.5 x HO current rating for 60 seconds plus 1 x HO current rating for 240 seconds in a 300s cycle
PM330: LO (Low Overload)	1.1 x LO current rating for 60s OR 1.35 x LO current rating for 3s in a 300s cycle
PM330: HO (High Overload)	1.5 x HO current rating for 60s in a 300s cycle

Other chassis modules in the range 380V ... 480V up to 560kW are available on request
Cabinet drives are also available in 380V ... 480V starting at 110 kW up to 560 kW
Please contact our Large Drives depatment on 08458 507600 or e-mail sales.gbi.industry@siemens.com

For Input / Output Reactors and Braking Resistors from PM330 please see SINAMICS Accessories on page 44

SINAMICS G120P, PM240P-2, IP20 Industrial Applications – 500V ... 690V 3Ø AC

PM240P-2 Supply Voltage: 500 ... 690V 3Ø AC				
Rating at 690V		Frame size	PM240P-2 IP20	
LO	HO		Unfiltered	Filter Class A
11 kW / 14 A	7.5 kW / 11 A	FSD	6SL3210-1RH21-4UL0	6SL3210-1RH21-4AL0
15 kW / 19 A	11 kW / 14 A	FSD	6SL3210-1RH22-0UL0	6SL3210-1RH22-0AL0
18.5 kW / 23 A	15 kW / 19 A	FSD	6SL3210-1RH22-3UL0	6SL3210-1RH22-3AL0
22 kW / 27 A	18.5 kW / 23 A	FSD	6SL3210-1RH22-7UL0	6SL3210-1RH22-7AL0
30 kW / 35 A	22 kW / 27 A	FSD	6SL3210-1RH23-5UL0	6SL3210-1RH23-5AL0
37 kW / 42 A	30 kW / 35 A	FSD	6SL3210-1RH24-2UL0	6SL3210-1RH24-2AL0
45 kW / 52 A	37 kW / 42 A	FSE	6SL3210-1RH25-2UL0	6SL3210-1RH25-2AL0
55 kW / 62 A	45 kW / 52 A	FSE	6SL3210-1RH26-2UL0	6SL3210-1RH26-2AL0
75 kW / 80 A	55 kW / 62 A	FSF	6SL3210-1RH28-0UL0	6SL3210-1RH28-0AL0
90 kW / 100A	75 kW / 80 A	FSF	6SL3210-1RH31-0UL0	6SL3210-1RH31-0AL0
110 kW / 115 A	90 kW / 100A	FSF	6SL3210-1RH31-2UL0	6SL3210-1RH31-2AL0
132 kW / 142 A	110 kW / 115 A	FSF	6SL3210-1RH31-4UL0	6SL3210-1RH31-4AL0

PM240P-2: LO (Low Overload)	1.35 x LO current rating for 3s plus 1.1 x LO current rating for 57s plus 1 x LO current rating for 240s in a 300 s cycle
PM240P-2: HO (High Overload)	1.5 x HO current rating for 60 seconds plus 1 x HO current rating for 240 seconds in a 300s cycle

Other chassis modules in the range 500V ... 690V from 315 kW up to 630kW are available on request
Cabinet drives are also available in 500V ... 690V starting at 315 kW up to 630 kW
Please contact our Large Drives depatment on 08458 507600 or e-mail sales.gbi.industry@siemens.com

SINAMICS G120P Control Units and Options for PM230 & PM240P-2

Control Units (all PM's)	Designation	Interfaces	DI	DO	AI	AO	F-DI	Safety
6SL3243-0BB30-1HA3	CU230P-2 HVAC	RS485/USS/Modbus/BACnet	6	3	4^	2	-	No
6SL3243-0BB30-1PA3	CU230P-2 DP	Profibus DP	6	3	4^	2	-	No
6SL3243-0BB30-1FA0	CU230P-2 PN	Profinet	6	3	4^	2	-	No
6SL3244-0BB12-1BA1	CU240E-2	RS485/USS	6	3	2*	2	1~	STO
6SL3244-0BB12-1PA1	CU240E-2 DP	Profibus DP	6	3	2*	2	1~	STO
6SL3244-0BB12-1FA0	CU240E-2 PN	Profinet	6	3	2*	2	1~	STO

DI - Digital Inputs, DO- Digital Outputs, AI - Analogue Inputs, AO - Analogue Outputs, F-DI - Failsafe Digital Inputs
* Selectable between 0...10V, -10...+10V, 0/2...20mA, 0/4...20mA or can be used as digital inputs if required
^ 2 of the 4 Analogue inputs are selectable between 0...10V, -10.. +10V, 0/ ...20mA, 0/4...20mA or can be used as digital inputs if required
~ Each "Failsafe" Input utilises two Digital Inputs from the module

Options	
6SL3255-0AA00-4CA1	Basic Operator Panel 2 (BOP2)
6SL3255-0AA00-4JA2	Intelligent Operator Panel-2 (IOP-2)
6SL3256-0AP00-0JA0	IOP / BOP2 Door Mounting Kit (for IP20 version mounted in a cabinet)
6SL3256-1BA00-0AA0	Blanking cover for PM230 IP55
6SL3255-0AA00-4HA1	IOP-2 Handheld (inc. Holder, IOP-2, cable, charging unit and rechargeable batteries)
6SL3255-0AA00-2CA0	PC Inverter connection kit 2 (for G120C, G120P and G120 Control Units CU230P-2, CU230B-2, CU230E-2 & CU250S-2, G110M & G120-D)
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB
Control Unit Shield connection kits	
6SL3264-1EA00-0FA0	Shield Connection Kit 1 for CU230P-2 HVAC/DP/CAN
6SL3264-1EA00-0HB0	Shield Connection Kit 3 for CU230P-2 PN & CU240E-2 PN
6SL3264-1EA00-0HA0	Shield Connection Kit 2 for CU240E-2 non PN units
Power Module Shield connection kits. Note: Shielding kits for PM230 IP20 FSA to FSC are supplied with the Power Modules	
6SL3262-1AD00-0DA0	PM230 IP20 - Frame size FSD and FSE
6SL3262-1AF00-0DA0	PM230 IP20 - Frame size FSF
6SL3266-1EA00-0DA0	PM230 IP20 Push Through - Frame size FSA
6SL3266-1EB00-0DA0	PM230 IP20 Push Through - Frame size FSB
6SL3266-1EC00-0DA0	PM230 IP20 Push Through - Frame size FSC
Push trough mounting frames	
6SL3260-6AA00-0DA0	Push trough mounting frame Frame size FSA
6SL3260-6AB00-0DA0	Push trough mounting frame Frame size FSB
6SL3260-6AC00-0DA0	Push trough mounting frame Frame size FSC

Note: The 9 pin D-Type connector used to connect the CU230P-2 to the BOP-2 or IOP with the PM230 IP55 is supplied with the Power Module.
The 9 pin connector to connect the CU240E-2 to the BOP-2 or IOP with the PM230 IP55 is not supplied with the Power Module but can be obtained from our partner KnorrTec – Bridge Connector CU240x-2 with Order Number 10055500
KnorrTec, Kapellenbergstrase 34, 93176 Beratzhausen – Germany Tel. +49 (9493) 9519690 Fax +49 (9493) 9519679 Web: www.knorrtec.de E-mail: info@knorrtec.de

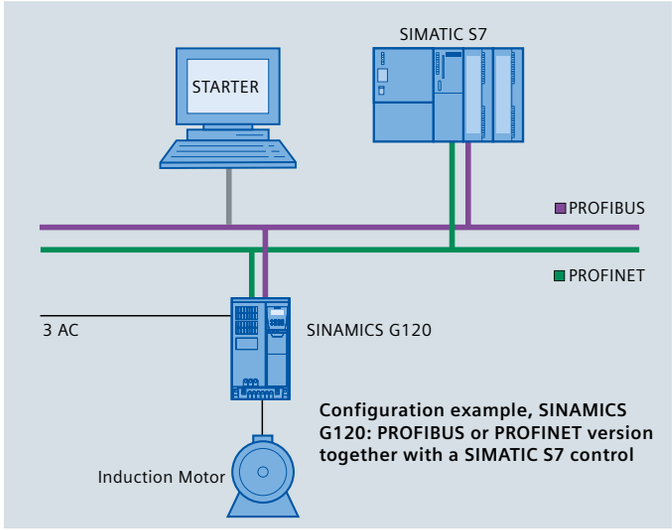
SINAMICS G120P Control Units and Options for PM330

Control Units (all PM's)	Designation	Interfaces	DI	DO	AI	AO	F-DI	Safety
6SL3243-0BB30-1HA3	CU230P-2 HVAC	RS485/USS/Modbus/BACnet	6	3	4^	2	-	No
6SL3243-0BB30-1PA3	CU230P-2 DP	Profibus DP	6	3	4^	2	-	No
6SL3243-0BB30-1FA0	CU230P-2 PN	Profinet	6	3	4^	2	-	No

DI - Digital Inputs, DO- Digital Outputs, AI - Analogue Inputs, AO - Analogue Outputs, F-DI - Failsafe Digital Inputs
* Selectable between 0...10V, -10...+10V, 0/2...20mA, 0/4...20mA or can be used as digital inputs if required
^ 2 of the 4 Analogue inputs are selectable between 0...10V, -10.. +10V, 0/ ...20mA, 0/4...20mA or can be used as digital inputs if required
~ Each "Failsafe" Input utilises two Digital Inputs from the module

Options	
6SL3255-0AA00-4CA1	Basic Operator Panel 2 (BOP2)
6SL3255-0AA00-4JA2	Intelligent Operator Panel-2 (IOP-2)
6SL3256-0AP00-0JA0	IOP / BOP2 Door Mounting Kit (for IP20 version mounted in a cabinet)
6SL3255-0AA00-4HA1	IOP-2 Handheld (inc. Holder, IOP-2, cable, charging unit and rechargeable batteries)
6SL3255-0AA00-2CA0	PC Inverter connection kit 2 (for G120C, G120P and G120 Control Units CU230P-2, CU240E-2 & CU250S-2, G110M , G120-D)
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB
Braking Module for PM330	
6SL3760-1AE32-6AA0	Braking Module for PM330 (160 kW to 400 kW)
Control Unit Shield connection kits	
6SL3264-1EA00-0FA0	Shield Connection Kit 1 for CU230P-2 HVAC/DP/CAN
6SL3264-1EA00-0HB0	Shield Connection Kit 3 for CU230P-2 PN & CU240E-2 PN

SINAMICS G120 Modular Overview



Configuration example, SINAMICS G120: PROFIBUS or PROFINET version together with a SIMATIC S7 control

Design

The SINAMICS G120 is a modular drive solution comprising of a Control Unit (CU), Power Module (PM) and optional Operator panel (OP). The G120 drive is designed to provide precise and cost effective speed/torque control and now position control of AC motors in a wide range of industrial application.

Benefits

- Modular - flexible expansion capability
- Flexibility - with a wide range of control units, Power modules and additional components
- Compact space saving design
- Fast commissioning with Starter or StartDrive
- Operational Memory Card for backup and transfer of parameters for serial commissioning
- Integrated control functionality with BICO technology
- Innovative cooling concept and coated electronic boards
- Reduced harmonics (PM230/PM250)
- Fast commissioning with Starter or StartDrive

Integrated Safety

When used with the appropriate Control Unit and Power Module will provide integrated safety functions certified to EN ISO 13849-1 PLd, IEC61508 SIL2 and EN954-1 Cat.3.Ple / SIL3 with PM250-2 FSD-FSF via dedicated terminal.

Energy Saving

with 'Efficient Infeed Technology' (PM250) and innovative control functions e.g. ECO Mode, Hibernation, Profienergy.

Control Unit - overview on page 18	
CU230P-2	specialist for pumps, fans, compressors and HVAC with additional features for these applications -
CU240E-2	with extended communication interfaces and Inputs/Outputs, is ideal for applications without encoderbut where basic or extended safety is required
CU250S-2	for demanding applications where an encoder is required to give speed, torque or positioning accuracy
Power Modules	
PM230 IP20: 0.37 kW ... 75 kW (LO) 380 V - 480 V 3Ø AC ±10%	**Designed specifically for pumps, fans and compressors**, this low harmonic drive for non-dynamic applications is available in IP20 and IP20 push-through variants
PM240-2 0.55 kW ... 4 kW (LO), 200V ... 240V 3Ø AC ±10% 0.55 kW ... 55 kW (LO) 200V ... 240 V 3Ø AC ±10%* 0.37 kW ... 132 kW (LO) 380V ... 480 V 3Ø AC ±10%* 11 kW ... 132 kW (LO) 500V ... 690 V 3Ø AC ±10%* *FSD to FSF -20% +10% **PM240** 160 kW ... 250 kW, 380V ... 480V 3Ø AC ±10%	The PM240 and PM240-2 have an integrated braking chopper so loads can be dynamically braked through an optional external resistor. **Typical applications:** A Universal Drive for a variety of industrial application e.g. fans, pumps, compressors, extruders, mixers, crushers and high performance conveyors.
PM250 5.5 kW ... 90 kW (LO), 380 V - 480 V 3 AC ±10%	The PM250 has 'Efficient Infeed Technology' (p49), which regenerates braking energy back into the mains supply. This technology also reduces the line harmonics so input reactors are not necessary. **Typical applications:** A Universal Drive for a variety of industrial application as with PM 240 and any regenerative applications where braking resistors would normally be used.
Operator Panel and additional components	
Basic Operator Panel (BOP), Basic Operator Panel 2 (BOP-2), Intelligent Operator Panel (IOP) and Handheld IOP. Door Mounting Kits for BOP-2 and IOP. Shield connection kits for Control Units and Power Modules, Memory cards and brake relays are also available.	
See the 'SINAMICS ACCESSORIES' from page 38 for Input Reactors, Output Reactors and Braking Resistors.	

Control Units: Overview

	Specialist for pumps, fans & compressors				For standard applications - pumps, fans, compressors, conveyors, mixers & extruders						Applications requiring positioning with encoder			
	CU230P-2 HVAC	CU230P-2 CAN	CU230P-2 DP	CU230P-2 PN	CU240E-2	CU240E-2 DP	CU240E-2 PN	CU240E-2 F	CU240E-2 DP F	CU240E-2 PN F	CU250S-2	CU250S-2 CAN	CU250S-2 DP	CU250S-2 PN
Can be used on Power Modules														
PM230 IP55	✓	✓	✓	✓	✓#	✓#	✓#	-	-	-	-	-	-	-
PM230 IP20	✓	✓	✓	✓	✓#	✓#	✓#	✓	✓	✓	-	-	-	-
PM240	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PM240-2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PM250	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Inputs/Outputs/Encoder														
Digital Inputs (DI)	6	6	6	6	6	6	6	6	6	6	11	11	11	11
Digita Inputs - Failsafe (F-DI)	-	-	-	-	1~	1~	1~	3~	3~	3~	3~	3~	3~	3~
Digital Outputs (DO)	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Digital Outputs - Failsafe (F-DO)	-	-	-	-	-	-	-	-	-	-	1"	1"	1"	1"
Digita Inputs/Outputs (DI/DO)	-	-	-	-	-	-	-	-	-	-	4	4	4	4
Analogue Inputs (AI)	4^	4^	4^	4^	2*	2*	2*	2*	2*	2*	2	2	2	2
Analogue Outputs (AO)	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Encoder	-	-	-	-	-	-	-	-	-	-	✓ see foot note below			
Bus Interface - Profinet / Ethernet IP														
RS485 / USS / Modbus RTU	✓	-	-	-	✓	-	-	✓	-	-	✓	-	-	-
BACnet Ms/TP, P1 Protocoll (from F/W V4.6)	✓	-	-	-	-	-	-	-	-	-	-	-	-	-
CANOpen	-	-	-	-	-	-	-	-	-	-	-	✓	-	-
Profibus (DP)	-	-	✓	-	-	✓	-	-	✓	-	-	-	✓	-
Profinet (PN) or TCP/IP (from F/W V4.6)	-	-	-	✓	-	-	✓	-	-	✓	-	-	-	✓
Interfaces to:														
Operator Panels	Basic Operator Panel 2 (BOP-2), Intelligent Operator Panel (IOP) - plugged in, door mount or handheld													
Memory Card	SINAMICS SD Card (512Mb)										1x SD for Firmware/Servo/Safety			
PC Interface	USB										USB			
Safety functions. Note: No Safety if used with PM230 IP20 or IP55														
Refer to page 59 for descriptions of Safety Functions	-	-	-	-	STO			STO, SS1, SLS, SDI, SSM			Basic: STO, SS1, SBC Extend: SLS, SSM, SDI			
Open loop / Closed loop control types														
V/f linear/square/selectable	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
V/f with flux Current Control (FCC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
V/f ECO linear/square	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vector w/o Encoder	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Torque Control w/o Encoder	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vector with Encoder	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓
Torque with Encoder	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓
Functions														
Application macro, Setpoint input, 16 fixed frequencies (programmable), jog, digital motorised potentiometer, ramp smoothing, extended ramp function generator, slip compensation, signal interconnection with BICO technology, trace function, energy saving display, switchable drive and command data sets (4), free function blocks for logic and arithmetic operations, technology controller (internal PID), flying restart, automatic restart, thermal motor protection (I^2t, PTC/KTY/Thermo-Click, thermal inverter protection, motor identification, motor holding brake (not with CU230P-2), auto ramping and kinetic buffering.														
3 additional PID controllers, 2 zone controller, energy saving function (Hibernation) with internal and external PID controller, essential services mode, belt and dry pump monitoring.	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-
Brake Relay Control via CU (not with PM230)	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Safety brake relay	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓
Braking functions	PM230 - DC Braking only, PM240 & PM240-2 - DC. Compound and Dynamic with braking chopper, PM250 - Regernative													

* Selectable between 0...10V, -10...+10V, 0/2...20mA, 0/4...20mA or can be used as digital inputs if required.
^ 2 of the 4 Analogue inputs are selectable between 0...10V, -10...+10V, 0/...20mA, 0/4...20mA or can be used as digital inputs if required.
~ Each "Failsafe input utilises two digital inputs from the module. " Each "Failsafe Output utilises two digital outputs from the module.
# A longer 'D Type' extender is used to connect to the BOP-2/IOP to the IP55 version of Power Module. This extender is not part of the scope of supply and available through KnorrTec. See page 17
Encoder: TTL/HTL incremental, SIN/COS incremental, SSI absolute, EnDat absolute and Resolvers are supported. See technical manual for possible combinations.

PM230 IP20

Drive Design

Modular - consisting of Control Unit (CU), Power Module (PM) and optional Operator Panel (OP)

PM230 IP20 Industrial and Filtered
(0.37 kW to 75kW 3Ø AC 380V ... 480V)

PM230 IP20 Industrial and Filtered Push Through
(3 kW, 7.5 kW & 15 kW 3Ø AC 380V ... 480V)

PM230 Power Modules are designed for pump, fan and compressors applications with square characteristic (Variable Torque). Braking choppers are not fitted so this power module is not suited for dynamic applications.

The highest power rating of FSA to FSC is also availableas 'Push Through' where the heat sink pushes through the back of the cabinet reducing the heat inside the Cabinet.

'Push-Through' version

Benefits

- Modular with flexible expansion capability
- Compact space saving design
- Simple fast commissioning
- Wide range of Control Units with different communication
- interfaces available
- Line harmonics are significantly reduced: - the Total Harmonic Distortion (THD) is below the limit required by EN/ IEC 61000-3-12. Additional line reactors are not needed and should not be connected
- High Active Power Component - draws less current from the supply for the same drive power so smaller cables can be used
- Optional SD card for backup and series commissioning

Applications

- Pumps, fans and compressors.

Technical data	
Electrical data	**SINAMICS G120 PM230 IP20 version**
Line voltages	380 V... 480 V 3 AC ± 10%
Power ranges	0.37 kW ... 70kW (LO)
Line supply types	TN (filtered) TN/IT/TT (unfiltered)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 550Hz V/f, 0 ... 240 Hz Vector
Pulse frequency	4kHz (up to 16kHz with derating)
CU's permissable	CU230P-2, CU240B-2, CU240E-2
Open loop control	V/f (linear, square law, FCC, ECO) Vector & Torque control without encoder
Inputs / Outputs	See Control Units
External Interface to	PC via USB, BOP-2, IOP or Handheld IOP, SINAMICS MMC card or SIMATIC SD card
Functions	
Software Functions	See Contol Units on page 24
Protection functions	Overvoltage, under voltage, overload, ground fault, short circuit, stall, motor blocking, motor over temperature, inverter over temperature
Safety functions	**STO is now available with PM230 FSA to FSC Power Modules with CU240E-2, CU240E-2 DP or PN**
Braking Types	PM230: DC Braking
Mechanical Data	
Degree of protection	IP20
Cooling type	Fan
Standards	
In conformance with the following standards	PM230 IP20: UL, cUL*, CE, C-Tick, SEMI F47 *FSA to FSC STO to EN ISO 13849-1 PLd, IEC61508 SIL2

Explanation of safety functions can be found on page 62

Control Units	Designation	Interfaces	DI	DO	AI	AO	F-DI	Safety
6SL3243-0BB30-1HA3	CU230P-2 HVAC	RS485/USS/Modbus/BACnet	6	3	4	2	-	-
6SL3243-0BB30-1PA3	CU230P-2 DP	Profibus DP	6	3	4	2	-	-
6SL3243-0BB30-1FA0	CU230P-2 PN	Profinet	6	3	4	2	-	-
6SL3244-0BB12-1BA1	CU240E-2	RS485/USS	6	3	2*	2	1	STO~
6SL3244-0BB12-1PA1	CU240E-2 DP	Profibus DP	6	3	2*	2	1	STO~
6SL3244-0BB12-1FA0	CU240E-2 PN	Profinet	6	3	2*	2	1	STO~

DI - Digital Inputs, DO- Digital Outputs, AI - Analogue Inputs, AO - Analogue Outputs* Selectable between 0...10V, -10...+10V, 0/2...20mA, 0/4...20mA or can be used as digital inputs if required
^ 2 of the 4 Analogue inputs are selectable between 0...10V, -10.. +10V, 0/ ...20mA, 0/4...20mA or can be used as digital inputs if required
~ Utilises 2 Digital Inputs for the Safety Input

PM230 IP20

Supply Voltage: 380 ... 480V 3Ø AC						
Rating at 400V		Frame	PM230 IP20		PM230 IP20 Push Through	
LO (VT)	HO (CT)	Size	Unfiltered	Filter Class A	Unfiltered	Filter Class A
0.37kW / 1.3A	0.25kW / 0.9A	A	6SL3210-1NE11-3UG1	6SL3210-1NE11-3AG1		
0.55kW / 1.7A	0.37kW / 1.3A	A	6SL3210-1NE11-7UG1	6SL3210-1NE11-7AG1		
0.75kW / 2.2A	0.55kW / 1.7A	A	6SL3210-1NE12-2UG1	6SL3210-1NE12-2AG1		
1.1kW / 3.1A	0.75kW / 2.2A	A	6SL3210-1NE13-1UG1	6SL3210-1NE13-1AG1		
1.5kW / 4.1A	1.1kW / 3.1A	A	6SL3210-1NE14-1UG1	6SL3210-1NE14-1AG1		
2.2kW / 5.9A	1.5kW / 4.1A	A	6SL3210-1NE15-8UG1	6SL3210-1NE15-8AG1		
3kW / 7.7A	2.2kW / 5.9A	A	6SL3210-1NE17-7UG1	6SL3210-1NE17-7AG1	6SL3211-1NE17-7UG1	6SL3211-1NE17-7AG1
4kW / 10.2A	3kW / 7.7A	B	6SL3210-1NE21-0UG1	6SL3210-1NE21-0AG1		
5.5kW / 13.2A	4kW / 10.2A	B	6SL3210-1NE21-3UG1	6SL3210-1NE21-3AG1		
7.5kW / 18A	5.5kW / 13.2A	B	6SL3210-1NE21-8UG1	6SL3210-1NE21-8AG1	6SL3211-1NE21-8UG1	6SL3211-1NE21-8AG1
11kW / 26A	7.5kW / 18A	C	6SL3210-1NE22-6UG1	6SL3210-1NE22-6AG1		
15kW / 32A	11kW / 26A	C	6SL3210-1NE23-2UG1	6SL3210-1NE23-2AG1		
18.5kW / 38A	15kW / 32A	C	6SL3210-1NE23-8UG1	6SL3210-1NE23-8AG1	6SL3211-1NE23-8UG1	6SL3211-1NE23-8AG1
22kW / 45A	18.5kW / 38A	D	6SL3210-1NE24-5UL0	6SL3210-1NE24-5AL0		
30kW / 60A	22kW / 45A	D	6SL3210-1NE26-0UL0	6SL3210-1NE26-0AL0		
37kW / 75A	30kW / 60A	E	6SL3210-1NE27-5UL0	6SL3210-1NE27-5AL0		
45kW / 90A	37kW / 75A	E	6SL3210-1NE28-8UL0	6SL3210-1NE28-8AL0		
55kW / 110A	45kW / 90A	F	6SL3210-1NE31-1UL0	6SL3210-1NE31-1AL0		
75kW / 145A	55kW / 110A	F	6SL3210-1NE31-5UL0	6SL3210-1NE31-5AL0		

LO (VT) = Low Overload (Variable Torque) - FSA to FSC: 1.5 x LO current rating for 3s plus 1.1 x LO current rating for 57s within a cycle time of 300s
- FSD to FSF: 1.1 x LO current rating for 60s within a cycle time of 300s

HO (CT) = High Overload (Constant Torque) - FSA to FSC: 2 x HO current rating for 3s plus 1.5 x HO current rating for 57s within a cycle time of 300s.
- FSD to FSF:1.5 x HO current rating for 60s within a cycle time of 300s.

EMC filtering suitable for the 1st environment - see page 60 for specific categorisations

Options	
6SL3255-0AA00-4CA1	Basic Operator Panel 2 (BOP2)
6SL3255-0AA00-4JA1	Intelligent Operator Panel (IOP)
6SL3256-0AP00-0JA0	IOP / BOP2 Door Mounting Kit (for IP20 version mounted in a cabinet)
6SL3255-0AA00-4HA0	IOP Handheld (inc. Holder, IOP, cable, charging unit and rechargeable batteries)
6SL3255-0AA00-2CA0	PC Inverter connection kit 2 for G120C, G120P and G120 Control Units CU230P-2, CU230B-2, CU230E-2 & CU250S-2, G110M & G120-D
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB
Control Unit Shield connection kits	
6SL3264-1EA00-0FA0	Shield Connection Kit 1 for CU230P-2 Control Units
6SL3264-1EA00-0HA0	Shield Connection Kit 2 for CU240B/E-2 Control Units
6SL3264-1EA00-0HB0	Shield Connection Kit 3 for CU230P-2 PN and CU240B/E-2 PN Control Units
Power Module Shield connection kits. Note: Shielding kits for PM230 IP20 FSA to FSC are supplied with the Power Modules	
6SL3262-1AD00-0DA0	Shield Connection Kit Frame Size FSD
6SL3262-1AF00-0DA0	Shield Connection Kit Frame Size FSF
Push trough mounting frames	
6SL3260-6AA00-0DA0	Push trough mounting frame Frame size FSA
6SL3260-6AB00-0DA0	Push trough mounting frame Frame size FSB
6SL3260-6AC00-0DA0	Push trough mounting frame Frame size FSC

The 9 pin connector to connect the CU240E-2 to the BOP-2 or IOP with the PM230 IP55 is not supplied with the Power Module but can be obtained from our partner KnorrTec – Bridge Connector CU240x-2 with Order Number 10055500

KnorrTec, Kapellenbergstraße 34, 93176 Beratzhausen – Germany Tel. +49 (9493) 9519690. Fax +49 (9493) 9519679. Web: www.knorrtec.de. E-mail: info@knorrtec.de

PM240-2/PM240

Drive Design

Modular - consisting of Control Unit (CU), Power Module (PM) and optional Operator Panel (OP)

PM240-2 Industrial and Filtered (0.37 kW to 132kW) - see voltages

PM240-2 Industrial and Filtered Push Through (0.75 kW, 1.5 kW & 4 kW 1/3 AC 200 V) (3 kW, 7.5 kW & 15 kW 3 AC 400 V)

The PM240-2 has the same functionality as the PM240 but based on a new hardware platform allowing higher power density products to be used so reducing the size of the modules.The highest power rating of FSA to FSC is also availableas 'Push Through' where the heatsink pushes through theback of the cabinet reducing the heat inside the Cabinet.

Benefits

- Modular with flexible expansion capability
- Compact space saving design due to Higher Power Density – Higher Power rating in a smaller device and 'side by side' mounting saving space in the cabinet
- Simple fast commissioning with Starter or Startdrive
- Wide range of Control Units with different communication interfaces available

FSA to FSF

- FSA now available with Integrated Class A Filter
- Pluggable terminals for easy panel wiring

FSD to FSF

- Cooling fan controlled by demand, quieter operation
- Operating between -10° to 60° (with derating)
- DC Link reactor included for reduced harmonics so an Input Reactor is not required
- Longer Cable lengths as standard of 200m Shielded or 300m Unshielded so an Output Reactor may not be required
- STO to Ple, SIL3 via dedicated input. PLd, SIL2 via network

Applications

- A universal drive for a variety of industrial applications e.g. fans, pumps, compressors, extruders, mixers, crushers and high performance conveyors

Technical data	
Electrical data	**SINAMICS G120 PM240-2**
Line voltages & Power ranges	200V... 240V 1Ø AC ± 10%: 0.55 kW ... 4 kW (LO) 200V... 240V 3Ø AC ± 10%: 0.55 kW ... 55 kW (LO)* 380V... 480V 3Ø AC ± 10%: 0.55 kW ... 132 kW (LO)* 500V... 690V 3Ø AC ± 10%: 11 kW ... 132 kW (LO)* *PM240-2 FSD to FSE -20% +10%
	SINAMICS G120 PM240 FSGX
	380V... 480V 3Ø AC ± 10%: 160 kW ... 250 kW (LO)
Line supply types	TN (filtered) TN/IT/TT (unfiltered)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 550Hz V/f, 0 ... 240Hz Vector
Pulse frequency	PM240-2: 200V; 4kHz, 400V; 4kHz, 690V; 2kHz PM240 FSGX: 2kHz For higher frequencies see derating data
CU's permissable	CU230P-2, CU240B-2, CU240E-2, CU250S-2
Comm's Interface selected by CU type	HVAC - RS485/USS/Modbus RTU, BACnet MS/TP, P1 protocol: PROFIBUS DP: Profinet/Ethernet IP: CANopen
Open loop control	V/f (linear, square law, FCC, ECO) Vector & Torque control without encoder CU250S-2 Vector & Torque control with encoder
Inputs / Outputs	See Contol Units on page 20
External Interface to	PC via USB, BOP-2, IOP or Handheld IOP, SINAMICS MMC card or SIMATIC SD card
Functions	
Software Functions	See Contol Units on page 24
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor overtemperature, inverter overtemperature
Safety functions	Dependend on Control Unit
Braking Types	DC, Compound and Dynamic with Braking Chopper and Braking Resistor
Mechanical Data	
Degree of protection	IP20
Cooling type	Fan
Standards	
In conformance with the following standards	PM240-2 FSA-FSC: UL, cUL, CE, C-Tick, SEMI F47 PM240-2 FSD-FSE: UL, cUL, CE, C-Tick, SEMI F47, KCC PM240 FSGX: UL, cUL, CE, C-Tick, SEMI F47
Safety functions with approperiate CU	PM240-2 FSA-FSE: EN ISO 13849-1 PLd, IEC61508 SIL2 PM240 FSGX: EN ISO 13849-1 PLd, IEC61508 SIL2 PLe and SIL3 (STO only) possible with FSD-FSF via dedicated safety terminal on Power Module

Explanation of safety functions can be found on page 62

PM240-2 1Ø AC 200 ... 240V

Supply Voltage: 200 ... 240V 1Ø AC						
Rating at 200V		Frame	Standard Cabinet varient		Push Through varient	
LO (VT)	HO (CT)	Size	PM240-2 Unfiltered	PM240-2 Filtered*	PM240-2 Unfiltered	PM240-2 Filtered*
0.55 kW / 3.2A	0.37 kW / 2.3 A	A	6SL3210-1PB13-0UL0	6SL3210-1PB13-0AL0	—	—
0.75 kW / 4.2 A	0.55 kW / 3.2 A	A	6SL3210-1PB13-8UL0	6SL3210-1PB13-8AL0	6SL3211-1PB13-8UL0	6SL3211-1PB13-8AL0
1.1 kW / 6.0 A	0.75 kW / 4.2 A	B	6SL3210-1PB15-5UL0	6SL3210-1PB15-5AL0	—	—
1.5 kW / 7.4 A	1.1 kW / 6.0 A	B	6SL3210-1PB17-4UL0	6SL3210-1PB17-4AL0	—	—
2.2 kW / 10.4 A	1.5 kW / 7.4 A	B	6SL3210-1PB21-0UL0	6SL3210-1PB21-0AL0	6SL3211-1PB21-0UL0	6SL3211-1PB21-0AL0
3 kW / 13.6 A	2.2 kW / 10.4 A	C	6SL3210-1PB21-4UL0	6SL3210-1PB21-4AL0	—	—
4 kW / 17.5 A	3 kW / 13.6 A	C	6SL3210-1PB21-8UL0	6SL3210-1PB21-8AL0	6SL3211-1PB21-8UL0	6SL3211-1PB21-8AL0

EMC filtering suitable for the 1st environment; additional filter options available on request - please refer to page 51 for specific categorisations

LO (VT) = Low Overload (Variable Torque): 1.5 x LO current for 3s plus 1.1 x LO current for 57s within a cycle time of 300s.

HO (CT) = High Overload (Constant Torque): 2 x HO current for 3s plus 1.5 x HO current for 57s within a cycle time of 300s.

Power Module Shield connection kits.	
Shielding kits for PM240-2 FSA to FSF are supplied with the Power Modules.	
Push Through Mountinf Frames	
6SL3260-6AA00-0DA0	Push through mounting frame Frame size FSA
6SL3260-6AB00-0DA0	Push through mounting frame Frame size FSB
6SL3260-6AC00-0DA0	Push through mounting frame Frame size FSC

PM240-2 3Ø AC 200 ... 240V

Supply Voltage: 200 ... 240V 3Ø AC						
Rating at 200V		Frame	Standard Cabinet varient		Push Through varient	
LO (VT)	HO (CT)	Size	PM240-2 Unfiltered	PM240-2 Filtered*	PM240-2 Unfiltered	PM240-2 Filtered*
0.55 kW / 3.2A	0.37 kW / 2.3 A	A	6SL3210-1PB13-0UL0	6SL3210-1PB13-0AL0	—	—
0.75 kW / 4.2 A	0.55 kW / 3.2 A	A	6SL3210-1PB13-8UL0	6SL3210-1PB13-8AL0	6SL3211-1PB13-8UL0	6SL3211-1PB13-8AL0
1.1 kW / 6.0 A	0.75 kW / 4.2 A	B	6SL3210-1PB15-5UL0	6SL3210-1PB15-5AL0	—	—
1.5 kW / 7.4 A	1.1 kW / 6.0 A	B	6SL3210-1PB17-4UL0	6SL3210-1PB17-4AL0	—	—
2.2 kW / 10.4 A	1.5 kW / 7.4 A	B	6SL3210-1PB21-0UL0	6SL3210-1PB21-0AL0	6SL3211-1PB21-0UL0	6SL3211-1PB21-0AL0
3 kW / 13.6 A	2.2 kW / 10.4 A	C	6SL3210-1PB21-4UL0	6SL3210-1PB21-4AL0	—	—
4 kW / 17.5 A	3 kW / 13.6 A	C	6SL3210-1PB21-8UL0	6SL3210-1PB21-8AL0	6SL3211-1PB21-8UL0	6SL3211-1PB21-8AL0
5.5 kW / 22 A	4 kW / 17.5 A	C	6SL3210-1PC22-2UL0	6SL3210-1PC22-2AL0	—	—
7.5 kW / 28 A	5.5 kW / 22 A	C	6SL3210-1PC22-8UL0	6SL3210-1PC22-8AL0	—	—
11 kW / 42 A	7.5 kW / 28 A	D	6SL3210-1PC24-2UL0	—	—	—
15 kW / 54 A	11 kW / 42 A	D	6SL3210-1PC25-4UL0	—	—	—
18.5 kW / 68 A	15 kW / 54 A	D	6SL3210-1PC26-8UL0	—	—	—
22 kW / 80 A	18.5 kW / 68 A	E	6SL3210-1PC28-0UL0	—	—	—
30 kW / 104 A	22 kW / 80 A	E	6SL3210-1PC31-1UL0	—	—	—
37 kW / 130 A	30 kW / 104 A	F	6SL3210-1PC31-3UL0	—	—	—
45 kW / 154 A	37 kW / 130 A	F	6SL3210-1PC31-6UL0	—	—	—
55 kW / 178 A	45 kW / 154 A	F	6SL3210-1PC31-8UL0	—	—	—

Power Module Shield connection kits.	
Shielding kits for PM240-2 FSA to FSF are supplied with the Power Modules.	
Push Through Mountinf Frames	
6SL3260-6AA00-0DA0	Push through mounting frame Frame size FSA
6SL3260-6AB00-0DA0	Push through mounting frame Frame size FSB
6SL3260-6AC00-0DA0	Push through mounting frame Frame size FSC

EMC filtering suitable for the 1st environment; additional filter options available on request - please refer to page 51 for specific categorisations

LO (VT) = Low Overload (Variable Torque): 1.5 x LO current for 3s plus 1.1 x LO current for 57s within a cycle time of 300s.

HO (CT) = High Overload (Constant Torque): 2 x HO current for 3s plus 1.5 x HO current for 57s within a cycle time of 300s.

P.T.O. for 380V ... 480 V and 500 ... 690 V Power Modules, Control Units and Options

PM240-2/PM240 3Ø AC 380V ... 480V

Supply Voltage: 380 ... 480V 3Ø AC with PM240-2 & PM240 FSGX						
Rating at 400V		Frame	Standard Cabinet varient		Push Through varient	
LO	HO	Size	PM240-2 Unfiltered	PM240-2 Filtered*	PM240-2 Unfiltered	PM240-2 Filtered*
0.55 kW / 1.7 A	0.37 kW / 1.3 A	A	6SL3210-1PE11-8UL1	6SL3210-1PE11-8AL1	—	—
0.75 kW / 2.2 A	0.55 kW / 1.7 A	A	6SL3210-1PE12-3UL1	6SL3210-1PE12-3AL1	—	—
1.1 kW / 3.1 A	0.75 kW / 2.2 A	A	6SL3210-1PE13-2UL1	6SL3210-1PE13-2AL1	—	—
1.5 kW / 4.1 A	1.1 kW / 3.1 A	A	6SL3210-1PE14-3UL1	6SL3210-1PE14-3AL1	—	—
2.2 kW / 5.9 A	1.5 kW / 4.1 A	A	6SL3210-1PE16-1UL1	6SL3210-1PE16-1AL1	—	—
3 kW / 7.7 A	2.2 kW / 5.9 A	A	6SL3210-1PE18-0UL1	6SL3210-1PE18-0AL1	6SL3211-1PE18-0UL1	6SL3211-1PE18-0AL1
4 kW / 10.2 A	3 kW / 7.7 A	B	6SL3210-1PE21-1UL0	6SL3210-1PE21-1AL0	—	—
5.5 kW / 13.2 A	4 kW / 10.2 A	B	6SL3210-1PE21-4UL0	6SL3210-1PE21-4AL0	—	—
7.5 kW / 18 A	5.5 kW / 13.2 A	B	6SL3210-1PE21-8UL0	6SL3210-1PE21-8AL0	6SL3211-1PE21-8UL0	6SL3211-1PE21-8AL0
11 kW / 26 A	7.5 kW / 18 A	C	6SL3210-1PE22-7UL0	6SL3210-1PE22-7AL0	—	—
15 kW / 32 A	11 kW / 26 A	C	6SL3210-1PE23-3UL0	6SL3210-1PE23-3AL0	6SL3211-1PE23-3UL0	6SL3211-1PE23-3AL0
18.5 kW / 38 A	15 kW / 32 A	D	6SL3210-1PE23-8UL0	6SL3210-1PE23-8AL0		
22 kW / 45 A	18.5 kW / 38 A	D	6SL3210-1PE24-5UL0	6SL3210-1PE24-5AL0		
30 kW / 60 A	22 kW / 45 A	D	6SL3210-1PE26-0UL0	6SL3210-1PE26-0AL0		
37 kW / 75 A	30 kW / 60 A	D	6SL3210-1PE27-5UL0	6SL3210-1PE27-5AL0		
45 kW / 90 A	37 kW / 75 A	E	6SL3210-1PE28-8UL0	6SL3210-1PE28-8AL0		
55 kW / 110A	45 kW / 90 A	E	6SL3210-1PE31-1UL0	6SL3210-1PE31-1AL0		
75 kW / 145 A	55 kW / 110 A	F	6SL3210-1PE31-5UL0	6SL3210-1PE31-5AL0		
90 kW / 178 A	75kW / 145 A	F	6SL3210-1PE31-8UL0	6SL3210-1PE31-8AL0		
110 kW / 205 A	90 kW / 178 A	F	6SL3210-1PE32-1UL0	6SL3210-1PE32-1AL0		
132 kW / 250 A	110kW / 205A	F	6SL3210-1PE32-5UL0	6SL3210-1PE32-5AL0		

Rating at 400V		Frame	Standard Cabinet varient		Additional Filter to use with unfiltered PM240
LO	HO	Size	PM240 Unfiltered	PM240 Filtered*	
160 kW / 302 A	132kW / 250 A	FSGX	6SL3224-0XE41-3UA0	< ---------- = ---------- >	6SL3000-0BE34-4AA0
200 kW / 370 A	160kW / 302 A	FSGX	6SL3224-0XE41-6UA0	< ---------- = ---------- >	6SL3000-0BE34-4AA0
250 kW / 477 A	200kW / 370 A	FSGX	6SL3224-0XE42-0UA0	< ---------- = ---------- >	6SL3000-0BE36-0AA0

PM240-2: LO = Low Overload: 1.5 x LO current for 3s plus 1.1 x LO current for 57s within a cycle time of 300s.
PM240-2: HO = High Overload: 2 x HO current for 3s plus 1.5 x HO current for 57s within a cycle time of 300s.

PM240: LO = Low Overload for Frame Size GX: 1.5 x LO current for 1s plus1.1 x LO current for 59s within a cycle time of 300s.
PM240: HO = High Overload for Frame Size GX: 1.6 x HO current for 3s plus1.36 x HO current for 57s within a cycle time of 300s.

Power Module Shield connection kits.	
Shielding kits for PM240-2 FSA to FSF are supplied with the Power Modules. No shielding kit for PM240 FSGX	
Push Through Mounting Frames	
6SL3260-6AA00-0DA0	Push through mounting frame Frame size FSA
6SL3260-6AB00-0DA	Push through mounting frame Frame size FSB
6SL3260-6AC00-0DA0	Push through mounting frame Frame size FSC

PM240-2 3Ø AC 500 ... 690V

Supply Voltage: 500 ... 690V 3Ø AC						
Rating at		Frame	Standard Cabinet varient		Push Through varient	
LO (VT)	HO (CT)	Size	PM240-2 Unfiltered	PM240-2 Filtered*	PM240-2 Unfiltered	PM240-2 Filtered*
11 kW / 14 A	7.5 kW / A	D	6SL3210-1PH21-4UL0	6SL3210-1PH21-4AL0	—	—
15 kW / 19 A	11 kW / 14 A	D	6SL3210-1PH22-0UL0	6SL3210-1PH22-0AL0	—	—
18.5 kW / 23 A	15 kW / 19 A	D	6SL3210-1PH22-3UL0	6SL3210-1PH22-3AL0	—	—
22 kW / 27 A	18.5 kW / 23 A	D	6SL3210-1PH22-7UL0	6SL3210-1PH22-7AL0	—	—
30 kW / 35 A	22 kW / 27 A	D	6SL3210-1PH23-5UL0	6SL3210-1PH23-5AL0	—	—
37 kW / 42 A	30 kW / 35 A	D	6SL3210-1PH24-2UL0	6SL3210-1PH24-2AL0	—	—
45 kW / 52 A	37 kW / 42 A	E	6SL3210-1PH25-2UL0	6SL3210-1PH25-2AL0	—	—
55 kW / 62 A	45 kW / 52 A	E	6SL3210-1PH26-2UL0	6SL3210-1PH26-2AL0	—	—
75 kW / 80 A	55 kW / 62 A	F	6SL3210-1PH28-0UL0	6SL3210-1PH28-0AL0	—	—
90 kW / 100 A	75 kW / 80 A	F	6SL3210-1PH31-0UL0	6SL3210-1PH31-0AL0	—	—
110 kW / 115 A	90 kW / 100 A	F	6SL3210-1PH31-2UL0	6SL3210-1PH31-2AL0	—	—
132 klW / 142 A	110 kW / 115 A	F	6SL3210-1PH31-4UL0	6SL3210-1PH31-4AL0	—	—

EMC filtering suitable for the 1st environment; additional filter options available on request - please refer to page 60 for specific categorisations
LO (VT) = Low Overload (Variable Torque): 1.5 x LO current for 3s plus 1.1 x LO current for 57s within a cycle time of 300s.
HO (CT) = High Overload (Constant Torque): 2 x HO current for 3s plus 1.5 x HO current for 57s within a cycle time of 300s.

Power Module Shield connection kits.
Shielding kits for PM240-2 are supplied with the Power Modules

Control Units and Options

Control Units	Designation	Interfaces	DI	DO	DI/DO	AI	AO	F-DI	F-DO	Encoder	Safety
Specialist for Pumps, Fans, Compressors and HVAC											
6SL3243-0BB30-1HA3	CU230P-2 HVAC	RS485/USS/Modbus/BACnet	6	3	-	4^	2	-	-	-	-
6SL3243-0BB30-1PA3	CU230P-2 DP	Profibus DP	6	3	-	4^	2	-	-	-	-
6SL3243-0BB30-1FA0	CU230P-2 PN	Profinet	6	3	-	4^	2	-	-	-	-
Extended Applications requiring more I/O and Basic Safety											
6SL3244-0BB12-1BA1	CU240E-2	RS485/USS	6	3	-	2*	2	1~	-	-	STO
6SL3244-0BB12-1PA1	CU240E-2 DP	Profibus DP	6	3	-	2*	2	1~	-	-	STO
6SL3244-0BB12-1FA0	CU240E-2 PN	Profinet	6	3	-	2*	2	1~	-	-	STO
Extended Applications requiring more I/O and Extended Safety											
6SL3244-0BB13-1BA1	CU240E-2 F	RS485/USS	6	3	-	2*	2	3~	-	-	STO,SS1,SLS, SDI, SSM
6SL3244-0BB13-1PA1	CU240E-2 DP F	Profibus DP	6	3	-	2*	2	3~	-	-	
6SL3244-0BB13-1FA0	CU240E-2 PN-F	Profinet	6	3	-	2*	2	3~	-	-	
Applications requiring Extended I/O, Extended Safety and Encoder Feedback											
6SL3246-0BA22-1BA0	CU250S-2	RS485/USS	13	3	4	2	2	3~	1"	Various ¤	Basic: STO, SS1, SBC Extended: SLS, SSM, SDI Extended functions via license (see below)
6SL3246-0BA22-1PA0	CU250S-2 DP	Profibus DP	13	3	4	2	2	3~	1"	Various ¤	
6SL3246-0BA22-1FA0	CU250S-2 PN	Profinet	13	3	4	2	2	3~	1"	Various ¤	
6SL3246-0BA22-1CA0	CU250S-2 CAN	CANopen	13	3	4	2	2	3~	1"	Various ¤	

* Selectable between 0...10V, -10...+10V, 0/2...20mA, 0/4...20mA or can be used as digital inputs if required
^ 2 of the 4 Analogue inputs are selectable between 0...10V, -10.. +10V, 0/ ...20mA, 0/4...20mA or can be used as digital inputs if required
~ Each "Failsafe input utilises two digital inputs from the module. ' Each "Failsafe Output utilises two digital outputs from the module
¤ Encoder: TTL/HTL incremental encoder, SSI absolute, EnDat absolute and resolvers are supported. See technical manual for possible combinations
STO - Safe Torque Off, SS1 - Safe Stop 1, SBC - Safe Brake Control , SLS - Safe Limited Speed, SSM - Safe Speed Monitor, SDI - Safe Direction Indication

Options	
6SL3255-0AA00-4CA1	Basic Operator Panel 2 (BOP2)
6SL3255-0AA00-4JA1	Intelligent Operator Panel (IOP)
6SL3255 0AA00 4JA2	Intelligent Operator Panel (IOP-2)
6SL3256-0AP00-0JA0	IOP / BOP2 Door Mounting Kit (for IP20 version mounted in a cabinet)
6SL3255-0AA00-4HA0	IOP Handheld (inc. Holder, IOP, cable, charging unit and rechargeable batteries)
6SL3255-0AA00-2CA0	PC Inverter connection kit 2 for G120C, G120P and G120 Control Units CU230P-2, CU230B-2, CU230E-2 & CU250S-2, G110M & G120-D
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB
6SL3074-0AA10-0AA0	Extended Safety license (SLS, SSM, SDI) for CU250S-2
6SL3074-7AA04-0AA0	Extended Functions license (EPos) for CU250S-2
6SL3054-4AG00-2AA0-Z F01	SD card + Extended Safety license (SLS, SSM, SDI) for CU250S-2
6SL3054-4AG00-2AA0-Z E01	SD card + Extended Functions license (EPos) for CU250S-2
6SL3054-4AG00-2AA0-Z F01 E01	SD card + Extended Safety + Extended Functions license for CU250S-2
6SL3252-0BB00-0AA0	Brake relay (including cable harness for connection to the Power Module)
6SL3252-0BB01-0AA0	Safe Brake Relay (including cable harness for connection to the Power Module)
Control Unit Shield Connection Kits	
6SL3264-1EA00-0FA0	Shield Connection Kit 1 for CU230P-2 Control Units
6SL3264-1EA00-0HA0	Shield Connection Kit 2 for CU240B/E-2 Control Units
6SL3264-1EA00-0HB0	Shield Connection Kit 3 for CU230P-2 PN and CU240B/E-2 PN Control Units
6SL3264-1EA00-0LA0	Shield Connection Kit 4 for CU250S-2 Control Units (all variants)
Power Module Shield connection kits.	
Shielding kits for PM240-2 FSA to FSF are supplied with the Power Modules	
Push trough mounting frames	
6SL3260-6AA00-0DA0	Push through mounting frame Frame size FSA
6SL3260-6AB00-0DA0	Push through mounting frame Frame size FSB
6SL3260-6AC00-0DA0	Push through mounting frame Frame size FSC

PM250

Design

The G120 is a modular drive consisting of Control Unit (CU), Power Module (PM) and optional Operator Panel (OP) and is designed to provide precise and cost effective speed/torque control of AC Motors in a wide range of industrial applications.

PM 250 (5.5 kW to 90 kW)

- has 'Efficient Infeed Technology' (p58), which regenerates braking energy back into the mains supply. This saves space and wiring in the cabinet, time in dimensioning the braking resistor and the heat losses generated during braking. The innovative circuitry also reduces line harmonics so an input reactor is not required.

Benefits over PM240

- Efficient Infeed Technology
- Reduced harmonics

Applications

A Universal Drive for a variety of industrial application e.g. fans, pumps, compressors, extruders, mixers, crushers and high performance conveyors.

Technical data	
Electrical data	**SINAMICS G120 PM250**
Line voltage	380 V ... 480 V 3 AC, ±10 %
Power ranges	7.5 kW ... 90 kW (LO)
Line supply types	TN (with filter), TN, TT, IT (without filter)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 550 Hz V/f, 0 ... 240 Hz Vector
Pulse frequency	4 kHz (up to 16 kHz with derating)
Common Functions	
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor overtemperature, inverter overtemperature, parameter locking
Software functions	See Control Unit Overview on page 20
Safety functions	See table below
Mechanical Data	
Cooling Type	Fan
Degree of protection	IP20
Standards	
In conformance with the following standards	UL*, cUL*, CE, c-tick * with Filter Class A EN ISO 13849-1 PLd & Cat 3, IEC61508 SIL2

Control Units											
Control Unit	**Designation**	**Interfaces**	**DI**	**DO**	**DI/DO**	**AI**	**AO**	**F-DI**	**F-DO**	**Encoder**	**Safety**
6SL3243-0BB30-1HA3	CU230P-2 HVAC	RS485/USS/Modbus/BACnet	6	3	-	4^	2	-	-	-	-
6SL3243-0BB30-1PA3	CU230P-2 DP	Profibus DP	6	3	-	4^	2	-	-	-	-
6SL3243-0BB30-1FA0	CU230P-2 PN	Profinet	6	3	-	4^	2	-	-	-	-
6SL3244-0BB12-1BA1	CU240E-2	RS485/USS	6	3	-	2*	2	1~	-	-	STO
6SL3244-0BB12-1PA1	CU240E-2 DP	Profibus DP	6	3	-	2*	2	1~	-	-	STO
6SL3244-0BB12-1FA0	CU240E-2 PN	Profinet	6	3	-	2*	2	1~	-	-	STO
6SL3244-0BB13-1BA1	CU240E-2 F	RS485/USS	6	3	-	2*	2	3~	-	-	STO, SS1, SLS, SDI, SSM
6SL3244-0BB13-1PA1	CU240E-2 DP F	Profibus DP	6	3	-	2*	2	3~	-	-	
6SL3244-0BB13-1FA0	CU240E-2 PN-F	Profinet	6	3	-	2*	2	3~	-	-	
6SL3246-0BA22-1BA0	CU250S-2	RS485/USS	11	3	4	2	2	3~	1*	Various ¤	Basic: STO, SS1, SBC Extended: SLS, SSM, SDI Extended functions via license (see below)
6SL3246-0BA22-1PA0	CU250S-2 DP	Profibus DP	11	3	4	2	2	3~	1*	Various ¤	
6SL3246-0BA22-1FA0	CU250S-2 PN	Profinet	11	3	4	2	2	3~	1*	Various ¤	
6SL3246-0BA22-1CA0	CU250S-2 CAN	CANopen	11	3	4	2	2	3~	1*	Various ¤	

* Selectable between 0...10V, -10...+10V, 0/2...20mA, 0/4...20mA or can be used as digital inputs if required.
^ 2 of the 4 Analogue inputs are selectable between 0...10V, -10...+10V, 0/...20mA, 0/4...20mA or can be used as digital inputs if required.
~ Each "Failsafe input utilises two digital inputs from the module. " Each "Failsafe Output utilises two digital outputs from the module.
¤ Encoder: TTL/HTL incremental, SIN/COS incremental, SSI absolute, EnDat absolute and Resolvers are supported. See technical manual for possible combinations.

Explanation of safety functions can be found on page 62

PM250

Supply Voltage: 380V ... 480V AC				
Rating		Frame Size	Power Modules	
LO (VT)	HO (CT)		Industrial	Filtered#
7.5 kW / 18 A	5.5 kW / 13.2 A	C		6SL3225-0BE25-5AA1
11 kW / 25 A	7.5 kW / 19 A	C		6SL3225-0BE27-5AA1
15 kW / 32 A	11 kW / 26A	C		6SL3225-0BE31-1AA1
18.5 kW / 38 A	15 kW / 32 A	D	6SL3225-0BE31-5UA0	6SL3225-0BE31-5AA0
22 kW / 45 A	18.5 kW / 38A	D	6SL3225-0BE31-8UA0	6SL3225-0BE31-8AA0
30 kW / 60 A	22 kW / 45 A	D	6SL3225-0BE32-2UA0	6SL3225-0BE32-2AA0
37 kW / 75 A	30 kW / 60 A	E	6SL3225-0BE33-0UA0	6SL3225-0BE33-0AA0
45 kW / 90 A	37 kW / 75 A	E	6SL3225-0BE33-7UA0	6SL3225-0BE33-7AA0
55 kW / 110 A	45 kW / 90 A	F	6SL3225-0BE34-5UA0	6SL3225-0BE34-5AA0
75 kW / 145 A	55 kW / 110 A	F	6SL3225-0BE35-5UA0	6SL3225-0BE35-5AA0
90 kW / 178 A	75 kW / 145 A	F	6SL3225-0BE37-5UA0	6SL3225-0BE37-5AA0

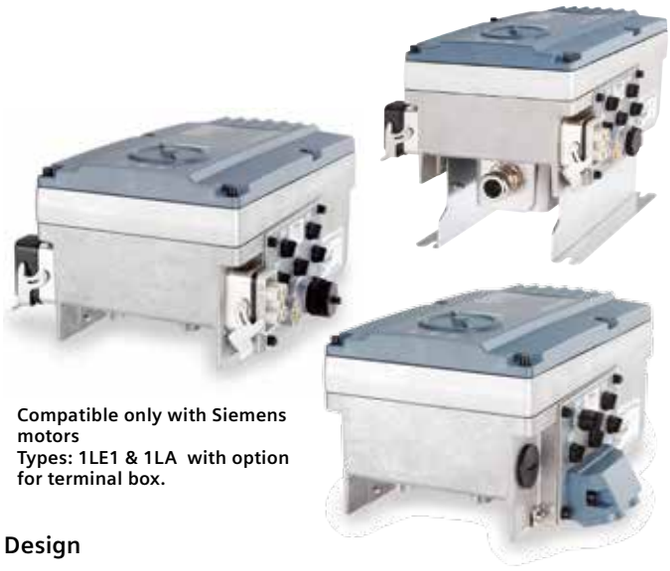
LO (VT) = Low Overload (Variable Torque) - 1.5 x LO current rating for 3s plus 1.1 x LO current rating for 57s within a cycle time of 300s.

HO (CT) = High Overload (Constant Torque) - 2 x HO current rating for 3s plus 1.5 x HO current rating for 57s within a cycle time of 300s.

EMC filtering generally suitable for 1st environment; additional filter options available on request - please refer to page 60 for specific categorisations.

Options	
6SL3255-0AA00-4CA1	Basic Operator Panel 2 (BOP2)
6SL3255-0AA00-4JA1	Intelligent Operator Panel (IOP)
6SL3255 0AA00 4JA2	Intelligent Operator Panel (IOP-2)
6SL3256-0AP00-0JA0	IOP / BOP2 Door Mounting Kit (for IP20 version mounted in a cabinet)
6SL3255-0AA00-4HA0	IOP Handheld (inc. Holder, IOP, cable, charging unit and rechargeable batteries)
6SL3255-0AA00-2CA0	PC Inverter Connection Kit 2 for G120C and G120 control units CU230P-2, CU240BE-2, CU240E-2 and CU250S-2
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB
6SL3074-0AA10-0AA0	Extended Safety license (SLS, SSM, SDI) for CU250S-2
6SL3074-7AA04-0AA0	Extended Functions license (EPos) for CU250S-2
6SL3054-4AG00-2AA0-Z F01	SD card + Extended Safety license (SLS, SSM, SDI) for CU250S-2
6SL3054-4AG00-2AA0-Z E01	SD card + Extended Functions license (EPos) for CU250S-2
6SL3054-4AG00-2AA0-Z F01 E01	SD card + Extended Safety + Extended Functions license (EPos) for CU250S-2
6SL3252-0BB00-0AA0	Brake relay (including cable harness for connection to the Power Module)
6SL3252-0BB01-0AA0	Safe Brake Relay (including cable harness for connection to the Power Module)
Control Unit Shield Connection Kits	
6SL3264-1EA00-0FA0	Shield Connection kit 1 for CU230P-2 Control Units
6SL3264-1EA00-0HA0	Shield Connection kit 2 for CU240B/E-2 Control Units
6SL3264-1EA00-0HB0	Shield Connection kit 3 for CU230P-2 PN and CU240B/E-2 PN Control Units
6SL3264-1EA00-0LA0	Shield Connection kit 4 for CU250S-2 Control Units (all variants)
Power Module Shield Connection Kits	
6SL3262-1AC00-0DA0	Frame size FSC
6SL3262-1AD00-0DA0	Frame size FSD and FSE
6SL3262-1AF00-0DA0	Frame size FSF
Chemical Industry Module	
6SL3255-0BT01-0PA0	Chemical module
6SL3260-4TA00-1AA6	Fixing kit

SINAMICS G110M



Compatible only with Siemens motors
Types: 1LE1 & 1LA with option for terminal box.

Design

The G110M is a motor–mounted drive in power ratings from 0.37 kW to 4 kW. The drive consists of a Power Module (PM) selected for the kW rating of the motor and Control Unit (CU) selected for the communication interface and the method of connection. The G110M can be combined with a selection of motors or as a complete drive/motor/gearbox.

Benefits

- Compact design
- Easy to commission
- Wide range of Communication choices
- Choice of connection methods
- Optional Integrated Braking Resistor
- Quick Stop Function
- Local Inputs / Outputs
- STO Safety Integrated Function. See page 62.

Applications

- Conveyors

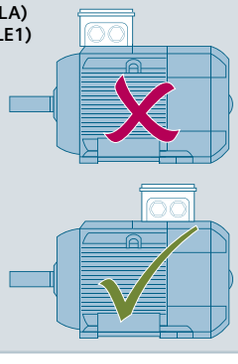
Technical data	
Electrical data	**SINAMICS G110M**
Line Voltages & Power Ranges	380 ...480V 3 AC (-10% +10%) 0.37 kW ...4.0 kW
Line Supply Types	TN, TT
Line Frequency	47 ...63 Hz
Output Frequency	0 ... 550 Hz V/f (from FW 4.7), 0 ... 200 Hz Vector
Pulse Frequency	4 kH Standard, 2 ... 16 kHz in 2 kHz steps possible (see de-rating table in catalogue)
Control modes	V/f linear, square & multipoint, Flux Current Control FCC, Sensorless Vector
Digital Inputs (DI)	4, Programable, PNP,Simatic compatable Optional 1 safety input for STO uses 2 of the digital inputs
Digital Outputs (DO)	2, (24V DC 0 ... 0.5A), Programmable
Analogue Inputs (AI)	2, (0 ... 10V or 0 ... 20mA, 12 bit), can be used as additional DI if required
Communication interface	RS485 / USS / Modbus RTU, Profibus, Profinet/ EtherNet IP, ASi
Functions	
Software Functions	16 fixed frequencies, BICO Connection, Auto Restart, Slip Compensation, Free Function Blocks, Ramp Smoothing, 3 switchable command and drive data sets, Flying Restart, Jog, Technology PID, Setpoint input, Motor Identification, Brake control
Monitoring/ protection functions	Undervoltage, overvoltage, overload, ground fault, short circuit, stall protection, motor and power module temperature protection, parameter lock
Mechanical Data	
Degree of protection	IP65 with HANQ, IP66 with cable gland
Cooling type	Fan cooling from motor fan
Environment	
Ambient temperature (operating)	10 ...40°C, between 40 ... 55°C with derating
Standards	
In conformance with the following standards	UL, cUL, CE, c-tick EN ISO 13849-1 PLd & Cat 3, IEC61508 SIL2

PM240M - Power Modules - Supply Voltage - 380 V... 480 V 3 AC		
HO (CT) Rating	**Frame Size**	**Filtered Class A**
0.37 kW / 1.3 A	A	6SL3517-1BE11-3AM0
0.75 kW / 2.2 A	A	6SL3517-1BE12-3AM0
1.1 kW / 3.1 A	A	6SL3517-1BE13-3AM0
1.5 kW / 4.1 A	A	6SL3517-1BE14-3AM0
2.2 kW / 5.6 A	B	6SL3517-1BE16-3AM0
3.0 kW / 7.3 A	B	6SL3517-1BE17-7AM0
4.0 kW / 8.8 A	B	6SL3517-1BE21-0AM0

Overload: 0.37 ... 3kW - 2 x HO current for 3s plus 1.5 x HO current for 57s in a 300s cycle. Overload: 4 kW - 1.6 x HO current for 3s plus 1.5 x HO current for 57s in a 300s cycle.
EMC filtering generally suitable for 1st environment; additional filter options available on request - please refer to page 60 for specific categorisations.

400 V 3 AC 50 Hz Motors Pulse Frequency 4 kHz							
G110M Frame Size	**Power kW**	**SIMOTICS GP 2-pole**			**SIMOTICS GP 4-pole**		
		2-pole	**Frame Size**		**4-pole**	**Frame Size**	
FSA	0.37	1LA7070-2AA	71M	IE1	1LA7073-4AB	71M	IE1
FSA	0.37	1LA9070-2KA	71M	IE2	1LA9073-4KA	71M	IE2
FSA	0.75	1LE1001-0DA2	80M	IE2	1LE1001-0DB3	80M	IE2
FSA	1.1	1LE1001-0DA3	80M	IE2	1LE1001-0EB0	90S	IE2
FSA	1.5	1LE1001-0EA0	90S	IE2	1LE1001-0EB4	90L	IE2
FSB	2.2	1LE1001-0EA4	90L	IE2	1LE1001-1AB4	100L	IE2
FSB	3	1LE1001-1AA4	100L	IE2	1LE1001-1AB5	100L	IE2
FSB	4	1LE1001-1BA2	112M	IE2	1LE1001-1BB2	112M	IE2

Option M64 (1LA)
Option H08 (1LE1)



G110M

Control Units									
Part Number	**Designation**	**Interface**	**Connection**	**Motor Frame Size**	**DI**	**DO**	**AI**	**F-DI**	**Safety**
6SL3544-0LB02-1BA0	CU240M	RS485/USS/Modbus RTU	Gland	71	4	2	2^	1*	STO
6SL3544-0MB02-1BA0	CU240M	RS485/USS/Modbus RTU	Gland	80/90	4	2	2^	1*	STO
6SL3544-0NB02-1BA0	CU240M	RS485/USS/Modbus RTU	Gland	100/112	4	2	2^	1*	STO
6SL3544-0LB02-1PA0	CU240M DP	Profibus	Gland	71	4	2	2^	1*	STO
6SL3544-0MB02-1PA0	CU240M DP	Profibus	Gland	80/90	4	2	2^	1*	STO
6SL3544-0NB02-1PA0	CU240M DP	Profibus	Gland	100/112	4	2	2^	1*	STO
6SL3544-0LB02-1FA0	CU240M PN	Profinet	Gland	71	4	2	2^	1*	STO
6SL3544-0MB02-1FA0	CU240M PN	Profinet	Gland	80/90	4	2	2^	1*	STO
6SL3544-0NB02-1FA0	CU240M PN	Profinet	Gland	100/112	4	2	2^	1*	STO
6SL3544-0LB02-1MA0	CU240M AS-i	AS-i	Gland	71	4	2	2^	1*	STO
6SL3544-0MB02-1MA0	CU240M AS-i	AS-i	Gland	80/90	4	2	2^	1*	STO
6SL3544-0NB02-1MA0	CU240M AS-i	AS-i	Gland	100/112	4	2	2^	1*	STO
6SL3544-0TB02-1PA0	CU240M DP	Profibus	HANQ	71	4	2	2^	1*	STO
6SL3544-0PB02-1PA0	CU240M DP	Profibus	HANQ	80/90	4	2	2^	1*	STO
6SL3544-0QB02-1PA0	CU240M DP	Profibus	HANQ	100/112	4	2	2^	1*	STO
6SL3544-0TB02-1FA0	CU240M PN	Profinet	HANQ	71	4	2	2^	1*	STO
6SL3544-0PB02-1FA0	CU240M PN	Profinet	HANQ	80/90	4	2	2^	1*	STO
6SL3544-0QB02-1FA0	CU240M PN	Profinet	HANQ	100/112	4	2	2^	1*	STO
6SL3544-0TB02-1MA0	CU240M AS-i	AS-i	HANQ	71	4	2	2^	1*	STO
6SL3544-0PB02-1MA0	CU240M AS-i	AS-i	HANQ	80/90	4	2	2^	1*	STO
6SL3544-0QB02-1MA0	CU240M AS-i	AS-i	HANQ	100/112	4	2	2^	1*	STO

*Uses 2 Digital Inputs for 1 Safety Input ; ^ Can be used as additional Digital Inputs but only at 10V.

Options	
6SL3555-0PV00-0AA0	G110M 24 VDC power supply#
6SL3555-0PR01-0AA0	Repair Switch#
6SL3566-1GA00 -0GA0	Wall Mounting Kit (Select CU for motor frame size 71)
6SL3501-0BE18-8AA0	G110M internal braking resistor for FSA
6SL3501-0BE22-0AA0	G110M internal braking resistor for FSB

Options	
6SL3054-4AG00-2AA0	SD card 512 MB
6SL3255-0AA00-4HA0	IOP Handheld with IOP as of V1.5
3RK1922-2BP00	RS232 Connecting Cable for IOP Handheld
6SL3566-2VA00 -0GA0	SINAMICS G110M INST-KIT-GLANDS
6SL3566-2LA00 -0GA0	SINAMICS G110M INST-KIT-HANQ

#The 24V Power Supply and Repair Switch fit in the same location so cannot be used together

Preassembled cables - Communications	Profinet M12 to M12 - Straight	Profinet M12 to RJ45 - Straight	Profibus M12 to M12 - Straight
0.3m	6XV1870-8AE30	-	6XV1830-3DE30
0.5m	6XV1870-8AE50	-	6XV1830-3DE50
1.0m	6XV1870-8AH10	-	6XV1830-3DH10
1.5m	6XV1870-8AH15	-	6XV1830-3DH15
2m	6XV1870-8AH20	6XV1871-5TH20	6XV1830-3DH20
3m	6XV1870-8AH30	6XV1871-5TH30	6XV1830-3DH30
5m	6XV1870-8AH50	6XV1871-5TH50	6XV1830-3DH50
10m	6XV1870-8AN10	6XV1871-5TN10	6XV1830-3DN10
15m	6XV1870-8AN15	6XV1871-5TN15	6XV1830-3DN15
Connectors	Profinet M12 Pro Metal		
1 piece	6GK1901-0DB20-6AA0	-	-
8 piece	6GK1901-0DB20-6AA8	-	-
5 piece (male)	-	-	6GK1905-0EA00
5 piece (female)	-	-	6GK1905-0EB00
Preassembled cables - 24 V Power	7/8" to 7/8" 24V - Straight	7/8" 90° to free ends	7/8" 90° to 90°
0.3m	6XV1822-5BE30	-	-
0.5m	6XV1822-5BE50	-	-
1.0m	6XV1822-5BH10	-	-
1.5m	6XV1822-5BH15	-	-
2m	6XV1822-5BH20	-	-
3m	6XV1822-5BH30	3RK1902-3GB30	3RK1902-3NB30
5m	6XV1822-5BH50	3RK1902-3GB50	3RK1902-3NB50
10m	6XV1822-5BN10	3RK1902-3GC10	3RK1902-3NC10
15m	6XV1822-5BN15	-	
Connectors	7/8" Straight		
5 pieces female	6GK1905-0FA00	-	3RK1902-3BA00
5 pieces male	6GK1905-0FB00	-	3RK1902-3DA00

Mains Supply Cable - HANQ	Angled connector to free end
2.5m, 4x4mm²	3RK1911-0DB13
5m, 4x4mm²	3RK1911-0DB33

Mains connector - HANQ	Feed - Female	Forward - Male
For 2.5mm² cable	3RK1911-2BE50	3RK1911-2BF50
For 4mm² cable	3RK1911-2BE10	3RK1911-2BF10

A complete list of connectors and cables can be found on our support site support.automation.siemens.com/ww/view/wn/65355810.

SINAMICS G110D

Design

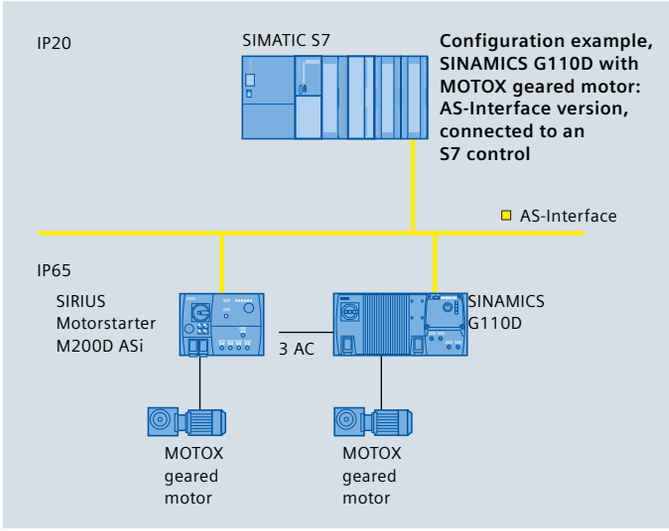
SINAMICS G110D distributed inverter is a simpler version of the higher-performance SINAMICS G120D. It still offers the same advantages of modularity, low-profile design and IP65 rated rugged metal enclosure so the drive can be located close to the motor.

Benefits

- Power Range - 0.75 kW to 7.5 kW
- Identical footprint for all power ranges (depth changes) and same as G120D drive
- Integrated chopper for braking with an optional resistor
- Integrated class A EMC filter (acc.to EN55011)
- High overload capacity
- Wide range of protection for drive and motor
- Rugged IP65 enclosure
- Versions with and without isolation (maintenance switch)
- Optional key selection switch for switching between manual-automatic and activating the 'Quick-Stop' function
- Drive is mounted close to the motor saving on expensive cabinets, long cable runs and EMC issues
- TIA integration through the AS Interface
- Interchangeable MMC Card for fast commissioning and backup

Applications

- Conveyor and logistics solutions
- Basic performance applications at airports or in food & beverage, packaging, automotive industries and material handling



Configuration example, SINAMICS G110D with MOTOX geared motor: AS-Interface version, connected to an S7 control

Technical data	
Electrical data	**SINAMICS G110D**
Line voltages	380 V ... 500 V 3 AC, ±10 %
Power ranges	0.75 kW ... 7.5 kW
Line supply types	TN, TT
Line frequency	47 ... 63 Hz
Output frequency	0 ... 550 Hz V/f
Pulse frequency	4 kHz (up to 16 kHz with derating)
Open loop control	V/f (linear, square law, FCC)
Digital inputs (DI)	4
Digital outputs (DO)	0
Analog inputs (AI)	1 (0 ...10V)
Analog outputs (AO)	0
Failsafe inputs (F-DI)	0
Communication interface	AS Interface (Version 3)
External interface to	PC via RS232 or USB via optical interface, SINAMICS MMC card or SIMATIC SD card
Functions	
Software functions	Setpoint input, 6 fixed frequencies (programmable), ramp smoothing, jog, slip compensation, BICO technology, free function blocks for logic operations, selectable data & command sets (3), flying restart, automatic restart, motor identification, PID controller, DC braking, brake control
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor overtemperature, inverter overtemperature, parameter locking
Safety functions	
Mechanical Data	
Degree of protection	IP65
Cooling type	FSA Convection, FSB & FSC Fan
Standards	
In conformance with the following standards	UL 508C (UL list No. E121068), CE, c-tick

G110D

Supply Voltage - 380 V... 500 V 3 AC		Power Modules		
Rating		Frame Size	Filtered # without Maintenance Switch (isolator)	Filtered # with Maintenance Switch (isolator)
0.75 kW / 2.3 A		FSA	6SL3511-0PE17-5AM0	6SL3511-1PE17-5AM0
1.5 kW / 4.3 A		FSA	6SL3511-0PE21-5AM0	6SL3511-1PE21-5AM0
3.0 kW / 7.7 A		FSA	6SL3511-0PE23-0AM0	6SL3511-1PE23-0AM0
4.0 kW / 10.2 A		FSB	6SL3511-0PE24-0AM0	6SL3511-1PE24-0AM0
5.5 kW / 13.2 A		FSC	6SL3511-0PE25-5AM0	6SL3511-1PE25-5AM0
7.5 kW / 19.0 A		FSC	6SL3511-0PE27-5AM0	6SL3511-1PE27-5AM0

Control Units	Designation	Interfaces	DI	DO	AI	AO	F-DI	Safety
Inc. with PM		Analogue & ASI	4	-	1	-	-	-

DI - Digital Inputs, DO- Digital Outputs, AI - Analogue Inputs, AO - Analogue Outputs.
EMC filtering generally suitable for 1st environment. Please refer to page 60 for specific categorisations.

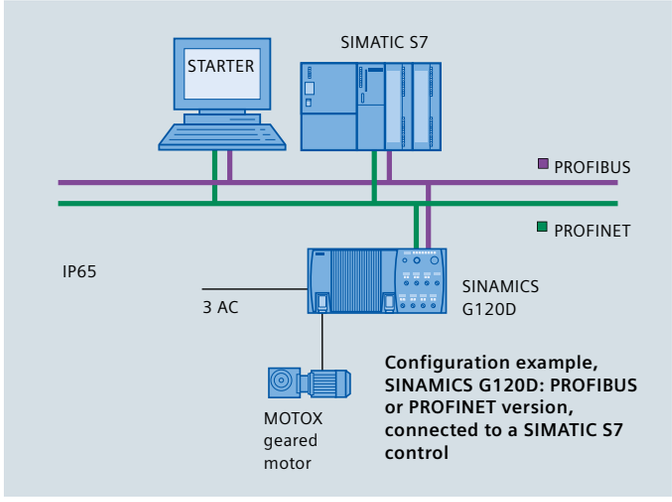
Options	
6SL3255-0AA00-4HA0	IOP Handheld (inc. Holder, IOP, cable, charging unit and rechargeable batteries)
3RK1922-2BP00	RS232 Interface cable for communication with a PC or Handheld IOP - 2.5m
6SL3555-0PA00-2AA0	USB Cable for communication with a PC - 2.5m
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB (requires Memory Card Holder)
6SL3555-0PM00-0AA0	SD Memory Card Holder
6SL3555-0PL00-2AA0	Manual / Local contol key switch
Connectors/Cables	
3RK1901-1NR21	AS Interface Cable M12 Branch 1m
3RK1901-1NR22	AS Interface Cable M12 Branch 2m
3RK1902-4CA00-4AA0	M12 Socket (Angled)
3RK1902-4BH15-5AA0	M12 Plug-in cable for Inputs/Outputs 1.5m
3RK1902-4BH50-5AA0	M12 Plug-in cable for Inputs/Outputs 5m
3RK1902-4HC01-5AA0	M12 Plug-in cable for Inputs/Outputs 10m
3RK1902-4BA00-5AA0	M12 Connector (Straight)
3RK1902-4DA00-5AA0	M12 Connector (Angled)
3RK1911-0DB13	Connecting cable prefabricated at one end for Power Supply 1.5m
3RK1911-0DB33	Connecting cable prefabricated at one end for Power Supply 5m
3RK1911-2BE50	Connector Set for Power Supply 2.5 mm²
3RK1911-2BE10	Connector Set for Power Supply 4 mm²
3RK1911-2BE30	Connector Set for Power Supply 6 mm²

A complete list of connectors and cables can be found on our support site support.automation.siemens.com/ww/view/wn/65355810.

G110D
with Isolator (maintenance switch)

G110D
with Isolator (maintenance switch)
and optional key switch

SINAMICS G120D



Configuration example, SINAMICS G120D: PROFIBUS or PROFINET version, connected to a SIMATIC S7 control

Design

The SINAMICS G120D inverter is the “distributed” brother of the SINAMICS G120 series. It’s inherited many of the PM250 power module features including ‘Efficient Infeed Technology’ and safety functions. With its modularity, communication and IP65 rating it’s the ideal choice for conveyor and logistics applications requiring 3-ph 380V to 480V AC, 0.75 kW to 7.5 kW distributed solution.

Benefits

- Power range - 0.75 kW to 7.5 kW
- Modular design – spare parts stock to a minimum
- Identical footprint for all power ranges (depth changes) and same as G110D drive
- Efficient Infeed Technology – regenerative braking energy is fed back into the mains supply (P58)
- Integrated class A EMC filter (acc.to EN55011)
- High overload capacity
- Wide range of protection for drive and motor
- Low harmonics
- Rugged IP65 enclosure
- Drive is mounted close to the motor saving on expensive cables, long cable runs and EMC issues
- TIA integration through Profibus and Profinet Communications
- Integrated Safety functions without an encoder STO, SS1 and SLS certified to EN ISO 13849-1 PLd, IEC61508 SIL2 and Cat 3
- Interchangeable MMC Card for fast commissioning and backup

Applications

- Demanding conveyor and logistics solutions
- High performance applications at airports or in food & beverage, automotive industry and material handling

Technical data	
Electrical data	**SINAMICS G120D**
Line voltages	380 V ... 500 V 3 AC, ±10 %
Power ranges	0.75 kW ... 7.5 kW
Line supply types	TN, TT
Line frequency	47 ... 63 Hz
Output frequency	0 ... 550 Hz V/f, 0 ... 200 Hz Vector
Pulse frequency	4 kHz (up to 16 kHz with derating)
Open loop/closed loop	V/f (linear, square law, FCC) Vector control with and without encoder Torque control with and without encoder (not CU250-2)
Digital inputs (DI)	CU dependent - see page 38
Digital outputs (DO)	CU dependent - see page 38
Analogue inputs (AI)	CU dependent - see page 38
Failsafe inputs (F-DI)	CU dependent - see page 38
Failsafe outputs (F-DO)	CU dependent - see page 38
Communication interface	PROFIBUS DP, PROFINET
External interface to	PC via RS232 or USB via optical interface, SINAMICS SD card
Functions	
Software functions	Setpoint input, 16 fixed frequencies (programmable), ramp smoothing, jog, slip compensation, BICO technology, command sets (3), flying restart, automatic restart, PID controller, regenerative braking, brake relay control via CU, free function blocks, 3 drive and command data sets, Motor ID
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor overtemperature, inverter overtemperature
Safety functions	STO, SS1, SLS, SDI, SSM - CU dependent
Mechanical Data	
Degree of protection	IP65
Cooling type	FSA & FSB convection, FSC Fan
Standards	
In conformance with the following standards	UL 508C (UL list No. E121068), CE, c-tick EN ISO 13849-1 PLd & Cat 3, IEC61508 SIL2

Explanation of safety functions can be found on page 62

G120D

Supply Voltage - 380 ... 500V 3 AC		Power Modules
Rating	**Frame Size**	**Filtered #**
0.75 kW / 2.2 A	A	6SL3525-0PE17-5AA1
1.5 kW / 4.1 A	A	6SL3525-0PE21-5AA1
3 kW / 7.7 A	B	6SL3525-0PE23-0AA1
4 kW / 10.2 A	C	6SL3525-0PE24-0AA1
5.5 kW / 13.2 A	C	6SL3525-0PE25-5AA1
7.5 kW / 19.0 A	C	6SL3525-0PE27-5AA1

EMC filtering generally suitable for 1st environment. Please refer to page 60 for specific categorisations.
Overload: Average maxinum rated output current during a 300s cycle: 1.5 x rated current for 60s over a 300s cycle time, 2 x rated current for 3s over a 300s cycle time.

Control Units	Designation	Interfaces	DI	DO	F-DI	F-DO	AI	Encoder HTL / SSI	Safety
Standard									
6SL3544-0FB20-1PA0	CU240D-2 DP	Profibus DP	6	2	1~	-	2	1 / -	STO
6SL3544-0FB20-1FA0	CU240D-2 PN	Profinet	6	2	1~	-	2	1 / -	STO
Fail-safe									
6SL3544-0FB21-1PA0	CU240D-2 DP-F	Profibus DP	6	2	3~	1*	2	1 / -	STO, SS1, SLS, SSM, SDI
6SL3544-0FB21-1FA0	CU240D-2 PN-F	Profinet	6	2	3~	1*	2	1 / -	STO, SS1, SLS, SSM, SDI
6SL3544-0FA21-1FB0	CU240D-2 PN-F PP	PushPull	6	2	3~	1*	2	1 / -	STO, SS1, SLS, SSM, SDI
With Basic Positioner (EPos) and fail-safe									
6SL3546-0FB21-1PA0	CU2450D-2 DP-F	Profibus DP	6	2	3~	1*		1 / 1	STO, SS1, SLS, SSM, SDI
6SL3546-0FB21-1FA0	CU250D-2 PN-F	Profinet	6	2	3~	1*		1 / 1	STO, SS1, SLS, SSM, SDI
6SL3546-0FB21-1FB0	CU245D-2 PN-F PP	PushPull	6	2	3~	1*		1 / 1	STO, SS1, SLS, SSM, SDI

~ Each "Failsafe input utilises two digital inputs from the module. " Each "Failsafe output utilises two digital outputs from the module.
Fiber Optic versions of CU240D-2 PN-F and CU250D-2 PN-F are available on request

Options			
6SL3255-0AA00-4HA0	IOP Handheld (inc. Rechargable Batteries, Charging Unit, 3m RS232 Cable and 1m USB Cable)		
6SL3255-0AA00-2CA0	PC Connection Kit 2		
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB		
Profint Connection Cables and connectors M12		**7/8" Control Unit Power Cables**	
6XV1870-8AE30	Preassembled Profinet Cable 0.3m	6XV1822-5BE30	Preassembled Cable 0.3m
6XV1870-8AE50	Preassembled Profinet Cable 0.5m	6XV1822-5BE50	Preassembled Cable 0.5m
6XV1870-8AH10	Preassembled Profinet Cable 1.0m	6XV1822-5BH10	Preassembled Cable 1.0m
6XV1870-8AH15	Preassembled Profinet Cable 1.5m	6XV1822-5BH15	Preassembled Cable 1.5m
6XV1870-8AH20	Preassembled Profinet Cable 2m	6XV1822-5BH20	Preassembled Cable 2m
6XV1870-8AH30	Preassembled Profinet Cable 3m	6XV1822-5BH30	Preassembled Cable 3m
6XV1870-8AH50	Preassembled Profinet Cable 5m	6XV1822-5BH50	Preassembled Cable 5m
6XV1870-8AN10	Preassembled Profinet Cable 10m	6XV1822-5BN10	Preassembled Cable 10m
6XV1870-8AN15	Preassembled Profinet Cable 15m	6XV1822-5BN15	Preassembled Cable 15m
6GK1901-0DB20-6AA0	M12 Plug PRO Metal Enclosure - 1 unit	6GK1905-0FA00	7/8" Plastic Enclosure with Pin insert (5 uniuts)
6GK1901-0DB20-6AA8	M12 Plug PRO Metal Enclosure - 8 units	6GK1905-0FB00	7/8" Plastic Enclosure with Socket insert (5 uniuts)
6SL3255-0AH00-2CA0	PC Connection Kit 2	6GK1907-0AB10-6AA0	Power Plug PRO for PP units
6GK1901-1BB10-6AA0	RJ45 PLUG PRO connector		
Profibus Connecting Cables and connectors M12		**Conection cable for Digital Inputs and Outputs**	
6XV1830-3DE30	Preassembled Profibus Cable 0.3m	3RK1902-4HB15-5AA0	Preassembled Cable 1.5m
6XV1830-3DE50	Preassembled Profibus Cable 0.5m	3RK1902-4HB50-5AA0	Preassembled Cable 5m
6XV1830-3DH10	Preassembled Profibus Cable 1.0m	3RK1902-4HC01-5AA0	Preassembled Cable 10m
XV1830-3DH15	Preassembled Profibus Cable 1.5m	3RK1902-4BA00-5AA0	M12 Connector Straight
6XV1830-3DH20	Preassembled Profibus Cable 2m	3RK1902-4DA00-5AA0	M12 Connector Angled
6XV1830-3DH30	Preassembled Profibus Cable 3m	**Power Connecting Cable for Power Modules**	
6XV1830-3DH50	Preassembled Profibus Cable 5m	3RK1911-0DB13	Preassembled Cable 1.5m
6XV1830-3DN10	Preassembled Profibus Cable 10m	3RK1911-0DB33	Preassembled Cable 5m
6XV1830-3DN15	Preassembled Profibus Cable 15m	3RK1911-2BE50	Connector set 2.5mm2
6GK1905-0EA00	Profibus M12 Metal Enclosure with Pin insert (5 uniuts)	3RK1911-2BE10	Connector set 4mm2
6GK1905-0EA00	Profibus M12 Metal Enclosure with socket insert (5 units)	3RK1911-2BE30	Connector set 6mm2

A complete list of connectors and cables can be found on our support site support.automation.siemens.com/ww/view/wn/65355810.

SINAMICS Options

BOP-2 Operator Panel

The Basic Operator Panel 2 can be used to commission and monitor the drive as well as input parameters. With its 2 line menu driven display and ability to display parameter number and value, basic commissioning can be carried out easily and in most cases without a parameter list.

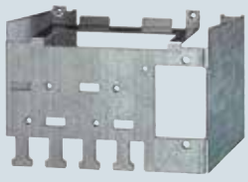
IOP-2 / Handheld IOP-2

The Intelligent Operator Panel is a very user friendly powerful Operator Panel. Thanks to its large clear text display, menu prompting and Application Wizards you are easily guided through the commissioning process. Mounted on the Control Unit or on the control cabinet door using a door mounting kit. Also available as a 'Hand Held' unit, comes supplied with IOP, holder, cable, charging unit and rechargeable batteries.

Shield Connection Kit

Makes it easy to bond the shields of supply cables and ensures optimum EMC performance.
Includes

- A shield bonding plate for the power module
- A shield bonding plate for the controlmodule
- Connection elements
- Mounting surface for Brake Relay and Safe Brake Relay



SD Card

The SD card allows.

- Parameter settings can be written from the card to the drive or saved from the drive to the card
- Up to 100 parameter sets can be stored
- Supports series commissioning without the use of additional commissioning tools (e.g. BOP & STARTER)

Brake Relay

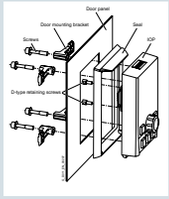
The brake relay has a switch contact (NO contact) to control the motor brake coil.
Order no.: 6SL3252-0BB00-0AA0

Safe Brake Relay

The Safe Brake Relay controls a 24 V motor brake.The inverter monitors the brake control using theSafe Brake Relay as part of the Integrated Safety Function Safe Brake Control (SBC).
Order number: 6SL3252-0BB01-0AA0

Mounting Kits

Using the optional door mounting kit, the IOP can be easily fitted in a control cabinet.



PC Inverter Connection Kit

For controlling or commissioning a drive directly from a PC via STARTER commissioning software.

PC Inverter Connection Kit 2 (for Control Units G120C, G120 CU230P-2, CU240B-2, CU240E-2, CU250S-2, G110M & G120D)

Chemical Module

We can now provide two options for the connection of motor thermistors for ATEX applications.The 'Chemical' Module CM240NE has now been certified to work with the CU250S-2 DP Control Unit and is designed with a NAMUR terminal strip according to NE 37.

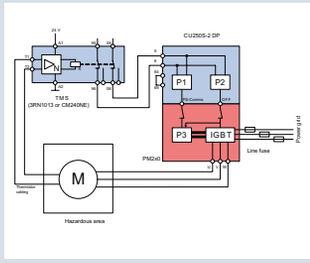
CM240NE: 6SL3255-0BT01-0PA0 Fitting Kit: 6SL3260-4TA00-1AA6

Call 08458 507600 (option 2) or email sales.industry.gbi@siemens.com for prices.

See the D31 2014 Catalogue for full product details.

Alternatively the 3RN1013 has also been certified with the CU250S-2 Control Unit where a NAMUR terminal strip is not required.

Both solutions can be used to drive the STO (Safe Torque Off) input to switch off the Drive pulses off without the need for a line contactor.



Please see http://support.automation.siemens.com/WW/view/en/96034800 for further details.

SINAMICS Accessories

Input Reactors

Input Reactors (sometimes called line chokes or line reactors) are current-limiting devices and oppose rapid changes in current because of their impedance and are commonly used with Variable Speed Drives to:

- Reduce harmonic distortion of the input line current to comply with standards
- Improve input line current balance
- Reduce nuisance trips caused by voltage spikes and power line notches.
- Protect the drive from in-rush current caused by sudden power line surges and dips.
- Extend the life of the drives capacitors by reducing the internal heating caused by ripple current

For the benefits above we would always recommend the fitting of an Input Reactor unless specified otherwise

Input Reactors are not allowed when using PM230, PM250, PM250D Power Modules

Input Reactors are not required for PM240-2 FSD to FSE as they have a DC Choke installed.

An Input Reactor is always needed when fitting a Line Filter to a PM330

Output Reactors

The fast changing pulse-width modulation (PWM) voltage pulses in Variable Speed Drives can interact with the inductance and capacitance of long motor cables. This, in turn, can result in very high peak voltages as high as 1,600V at motor terminals and the longer the cable the higher the peak overvoltage at the motor terminals. This stresses the motor windings and can reduce the motors life.

Output reactors reduce the magnitude of these peaks because the cable capacitance reverses polarity more slowly across the reactor inductance, thereby attenuating the amplitudes of the current peaks.

When using output reactors to extend the permissible cable length, the following should be checked on the Drive/Power Module type and Frame size: Maximum permissible output frequency and pulse frequency - see main catalogue for details

The output reactor must be installed as close as possible to the Power Module

Braking Resistors

When a motor is braked, electrical energy is returned to the Variable Speed Drive and 'DC link' bus voltage will increase until the drive trips due to a 'Bus Overvoltage'.

There are drives with Power Modules that can return this voltage back to the mains supply (such as PM250/PM250D). Another solution is to use a 'Transistor Chopper 'on the DC Bus of the drive which feeds a resistor. The 'Braking Resistor 'transforms the regenerative electrical energy into thermal energy which is dissipated into the atmosphere. The term used is 'Dynamic Braking.

Care should be taken in sizing the ventilation requirements of the cabinet so the heatgenerated by the resistor is dissipated effectively and does not overheat other devices

SINAMICS V20, G110M, G120C, G120 with Power Modules PM240-2, PM240 either have an integrated 'Braking Chopper' or can have them as an option to connect to a Braking Resistor

SINAMICS V20 Accessories

V20 - Supply Voltage: 200 ... 240V 1Ø AC					Protection devices corresponding to IEC Standard		
Rated Power (HO)	**Frame size**	**Input Reactor**	**Output Reactor**	**Braking Resistor**	**Amps**	**Fuse**	**Cct. Breaker**
0.12 kW	AA	6SE6400-3CC00-4AB3	6SE6400-3TC00-4AD3	6SE6400-4BC05-0AA0	10	3NA3803	3RV2011-1DA10
0.25 kW	AA	6SE6400-3CC00-4AB3	6SE6400-3TC00-4AD3	6SE6400-4BC05-0AA0	10	3NA3803	3RV2011-1FA10
0.37 kW	AA	6SE6400-3CC01-0AB3	6SE6400-3TC00-4AD3	6SE6400-4BC05-0AA0	10	3NA3803	3RV2011-1HA10
0.55 kW	AB	6SE6400-3CC01-0AB3	6SE6400-3TC00-4AD3	6SE6400-4BC05-0AA0	10	3NA3803	3RV2011-1JA10
0.75 kW	AB	6SE6400-3CC01-0AB3	6SE6400-3TC00-4AD3	6SE6400-4BC05-0AA0	16	3NA3805	3RV2011-1KA10
1.1 kW	B	6SE6400-3CC02-6BB3	6SE6400-3TC01-0BD3	6ES6400-4BC11-2BA0	20	3NA3807	3RV2021-4BA10
1.5 kW	B	6SE6400-3CC02-6BB3	6SE6400-3TC01-0BD3	6ES6400-4BC11-2BA0	32	3NA3812	3RV2021-4CA10
2.2 kW	C	6SE6400-3CC02-6BB3	6SE6400-3TC01-0BD3	6ES6400-4BC11-2BA0	35	3NA3814	3RV2021-4EA10
3 kW	C	6SE6400-3CC03-5CB3	6SE6400-3TC03-2CD3	6SE6400-4BC12-5CA0	50	3NA3820	3RV1031-4FA10

V20 Supply Voltage: 380 ... 480V 3Ø AC					Protection devices corresponding to IEC Standard		
Rated Power (HO)	**Frame size**	**Input Reactor**	**Output Reactor**	**Braking Resistor**	**Amps**	**Fuse**	**Cct. Breaker**
0.37 kW	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	6	3NA3801	3RV2011-1CA10
0.55 kW	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	6	3NA3801	3RV2011-1DA10
0.75 kW	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	6	3NA3801	3RV2011-1EA10
1.1 kW	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	6	3NA3801	3RV2011-1FA10
1.5 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	10	3NA3803	3RV2011-1HA10
2.2 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE18-8CA0	6SL3201-0BE21-0AA0	16	3NA3805	3RC2011-1JA10
3 kW	B	6SL3203-0CE21-0AA0	6SL3202-0AE18-8CA0	6SL3201-0BE21-0AA0	16	3NA3805	3RV2011-1KA10
4 kW	B	6SL3203-0CE21-0AA0	6SL3202-0AE21-8CA0	6SL3201-0BE21-0AA0	20	3NA3807	3RV2021-4AA10
5.5 kW	C	6SL3203-0CE21-8AA0	6SL3202-0AE21-8CA0	6SL3201-0BE21-8AA0	32	3NA3812	3RV2021-4BA10
7.5 kW	D	6SL3203-0CE21-8AA0	6SL3202-0AE23-8CA0	6SL3201-0BE21-8AA0	63	3NA3822	3LV1103-1KM30-0AA0
11 kW	D	6SL3203-0CE23-8AA0	6SL3202-0AE23-8CA0	6SL3201-0BE23-8AA0	63	3NA3822	3LV1104-1KM30-0AA0
15 kW	D	6SL3203-0CE23-8AA0	6SL3202-0AE23-8CA0	6SL3201-0BE23-8AA0	63	3NA3822	3LV1105-1KM30-0AA0
Rated Power (LO)	**Frame size**	**Input Reactor**	**Output Reactor**	**Braking Resistor**	**Amps**	**Fuse**	**Cct. Breaker**
22 kW	E	6SL3203-0CJ24-5AA0	6SE6400-3TC03-8DD0	6SE6400-4BD21-2DA0	63	3NA3022	3LV1108-1KM30-0AA0
30 kW	E	6SL3203-0CD25-3AA0	6SE6400-3TC05-4DD0	6SE6400-4BD21-2DA0	80	3NA3024	3LV1108-1KM30-0AA0

SINAMICS G120C Accessories

G120C Supply Voltage 380 ... 480V 3Ø AC					Protection devices corresponding to IEC Standard		
Rating LO	Frame size	Line Reactor	Output Reactor	Braking Resistor	Amps	Fuse	Cct. Breaker
0.55 kW	AA	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	10	3NA3803	3RV2011-1JA10
0.75 kW	AA	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	10	3NA3803	3RV2011-1JA10
1.1 kW	AA	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	10	3NA3803	3RV2011-1JA10
1.5 kW	AA	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	10	3NA3803	3RV2011-1JA10
2.2 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	6SL3201-0BE21-0AA0	10	3NA3803	3RV2011-1JA10
3.0 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE18-8CA0	6SL3201-0BE21-0AA0	16	3NA3805	3RV2011-4AA10
4.0 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE18-8CA0	6SL3201-0BE21-0AA0	16	3NA3805	3RV2011-4AA10
5.5 kW	B	6SL3203-0CE21-8AA0	6SL3202-0AE21-8CA0	6SL3201-0BE21-8AA0	32	3NA3812	3RV2021-4EA10
7.5 kW	B	6SL3203-0CE21-8AA0	6SL3202-0AE21-8CA0	6SL3201-0BE21-8AA0	32	3NA3812	3RV2021-4EA10
11 kW	C	6SL3203-0CE23-8AA0	6SL3202-0AE23-8CA0	6SL3201-0BE23-8AA0	63	3NA3822	3RV1041-4JA10
15 kW	C	6SL3203-0CE23-8AA0	6SL3202-0AE23-8CA0	6SL3201-0BE23-8AA0	63	3NA3822	3RV1041-4JA10
18.5 kW	C	6SL3203-0CE23-8AA0	6SL3202-0AE23-8CA0	6SL3201-0BE23-8AA0	63	3NA3822	3RV1041-4JA10
22 kW	D	Integrated DC Choke	6SE6400-3TC07-5ED0	JJY: 023422620001	80	3NA3824	
30 kW	D	Integrated DC Choke	6SE6400-3TC07-5ED0	JJY: 023424020001	100	3NA3830	
37 kW	D	Integrated DC Choke	6SE6400-3TC07-5ED0	JJY: 023424020001	100	3NA3830	
45 kW	D	Integrated DC Choke	6SE6400-3TC14-5FD0	JJY: 023434020001	125	3NA3832	
55 kW	E	Integrated DC Choke	6SE6400-3TC14-5FD0	JJY: 023434020001	160	3NA3836	
75 kW	F	Integrated DC Choke	6SE6400-3TC14-5FD0	JJY: 023454020001	200	3NA3140	
90 kW	F	Integrated DC Choke	6SE6400-3TC14-5FD0	JJY: 023454020001	250	3NA3142	
110 kW	F	Integrated DC Choke	6SL3000-2BE32-1AA0	JJY: 023464020001	315	3NA3250	
132 kW	F	Integrated DC Choke	6SL3000-2BE32-6AA0	JJY: 023464020001	350	3NA3252	

For UL/cUL devices see Catalogue D31 or Operating Instructions available form Siemens Industry Online Support

G120C Supply Voltage: 380 ... 480V 3Ø AC					Protection devices corresponding to IEC Standard		
Rating LO	Frame size	Footprint Input Reactor	Footprint Output Reactor	Footprint Braking Resistor	Amps	Fuse	Cct. Breaker
0.55 kW	AA	6SE6400-3CC00-2AD3	6SE6400-3TC00-4AD2	6SE6400-4BD11-0AA0	10	3NA3803	3RV2011-1JA10
0.75 kW	AA	6SE6400-3CC00-4AD3	6SE6400-3TC00-4AD2	6SE6400-4BD11-0AA0	10	3NA3803	3RV2011-1JA10
1.1 kW	AA	6SE6400-3CC00-4AD3	6SE6400-3TC00-4AD2	6SE6400-4BD11-0AA0	10	3NA3803	3RV2011-1JA10
1.5 kW	AA	6SE6400-3CC00-6AD3	6SE6400-3TC00-4AD2	6SE6400-4BD11-0AA0	10	3NA3803	3RV2011-1JA10
2.2 kW	A	Drives Option Partner *	Drives Option Partner *	-	10	3NA3803	3RV2011-1JA10
3.0 kW	A	Drives Option Partner *	Drives Option Partner *	-	16	3NA3805	3RV2011-4AA10
4.0 kW	A	Drives Option Partner *	Drives Option Partner *	-	16	3NA3805	3RV2011-4AA10
5.5 kW	B	Drives Option Partner *	Drives Option Partner *	-	32	3NA3812	3RV2021-4EA10
7.5 kW	B	Drives Option Partner *	Drives Option Partner *	-	32	3NA3812	3RV2021-4EA10
11 kW	C	Drives Option Partner *	Drives Option Partner *	-	63	3NA3822	3RV1041-4JA10
15 kW	C	Drives Option Partner *	-	-	63	3NA3822	3RV1041-4JA10
18.5 kW	C	Drives Option Partner *	-	-	63	3NA3822	3RV1041-4JA10

For UL/cUL devices see Catalogue D31 or Operating Instructions available form Siemens Industry Online Support

* For detailed information please refer to www.siemens.com/drives-options-partner

SINAMICS G120P, PM230, IP55 Accessories

PM230 Supply Voltage: 380 ... 480V 3Ø AC			Protection devices corresponding to IEC Standard		
Rated Power (LO)	Frame size	Output Reactor	Amps	Fuse	Cct. Breaker
0.37 kW	A	6SL3202-0AE16-1CA0	10	3NA3803	3RV2011-1CA10
0.55 kW	A	6SL3202-0AE16-1CA0	10	3NA3803	3RV2011-1DA10
0.75 kW	A	6SL3202-0AE16-1CA0	10	3NA3803	3RV2011-1FA10
1.1 kW	A	6SL3202-0AE16-1CA0	10	3NA3803	3RV2011-1GA10
1.5 kW	A	6SL3202-0AE16-1CA0	10	3NA3803	3RV2011-1JA10
2.2 kW	A	6SL3202-0AE16-1CA0	10	3NA3803	3RV2011-1KA10
3 kW	A	6SL3202-0AE18-8CA0	10	3NA3803	3RV2021-4AA10
4 kW	B	6SL3202-0AE21-8CA0	16	3NA3805	3RV2021-4BA10
5.5 kW	B	6SL3202-0AE21-8CA0	20	3NA3807	3RV2021-4BA10
7.5 kW	B	6SL3202-0AE21-8CA0	25	3NA3810	3RV1031-4EA10
11 kW	C	6SL3202-0AE23-8CA0	35	3NA3814	3RV1031-4FA10
15 kW	C	6SL3202-0AE23-8CA0	50	3NA3820	3RV1031-4HA10
18.5 kW (Filtered A)	C	6SL3202-0AE23-8CA0	50	3NA3820	3RV1042-4KA10
18.5 kW (Filtered B)	D	6SE6400-3TC03-8DD0	50	3NA3820	3RV1042-4KA10
22 kW	D	6SE6400-3TC03-8DD0	63	3NA3822	3RV1042-4KA10
30 kW	D	6SE6400-3TC05-4DD0	80	3NA3824	3RV1042-4MA10
37 kW	E	6SE6400-3TC08-0ED0	100	3NA3830	3VL1712-.DD33-.... *
45 kW	E	6SE6400-3TC07-5ED0	125	3NA3832	3VL1716-.DD33-.... *
55 kW	F	6SE6400-3TC14-5FD0	160	3NA3836	3VL3720-.DC36-.... *
75 kW	F	6SE6400-3TC15-4FD0	200	3NA3140	3VL3725-.DC36-.... *
90 kW	F	6SE6400-3TC14-5FD0	250	3NA3144	3VL4731-.DC36-.... *

* See LV10 catalogue to complete the part number
For UL/cUL devices see Catalogue D31 or Operating Instructions available form Siemens Industry Online Support

SINAMICS G120P, PM230, IP20 Accessories

PM230 Supply Voltage: 380 ... 480V 3Ø AC			Protection devices corresponding to IEC Standard		
Rated Power (LO)	Frame size	Output Reactor	Amps	Fuse	Cct. Breaker
0.37 kW	A	6SL3202-0AE16-1CA0	16	3NE1813-0	—
0.55 kW	A	6SL3202-0AE16-1CA0	16	3NE1813-0	—
0.75 kW	A	6SL3202-0AE16-1CA0	16	3NE1813-0	—
1.1 kW	A	6SL3202-0AE16-1CA0	16	3NE1813-0	—
1.5 kW	A	6SL3202-0AE16-1CA0	16	3NE1813-0	—
2.2 kW	A	6SL3202-0AE16-1CA0	16	3NE1813-0	—
3 kW / 3 kW PT	A	6SL3202-0AE18-8CA0	16	3NE1813-0	—
4 kW	B	6SL3202-0AE21-8CA0	16	3NE1813-0	—
5.5 kW	B	6SL3202-0AE21-8CA0	20	3NE1814-0	—
7.5 kW / 7.5 kW PT	B	6SL3202-0AE21-8CA0	25	3NE1815-0	—
11 kW	C	6SL3202-0AE23-8CA0	35	3NE1803-0	—
15 kW	C	6SL3202-0AE23-8CA0	50	3NE1817-0	—
18.5 kW / 18.5 kW PT	C	6SL3202-0AE23-8CA0	50	3NE1817-0	—
22 kW	D	6SE6400-3TC03-8DD0	63	3NE1818-0	—
30 kW	D	6SE6400-3TC05-4DD0	80	3NE1820-0	—
37 kW	E	6SE6400-3TC08-0ED0	100	3NE1021-0	—
45 kW	E	6SE6400-3TC07-5ED0	125	3NE1022-0	—
55 kW	F	6SE6400-3TC14-5FD0	160	3NE1224-0	—
75 kW	F	6SE6400-3TC15-4FD0	200	3NE1225-0	—

* See LV10 catalogue to complete the part number
For UL/cUL devices see Catalogue D31 or Operating Instructions available form Siemens Industry Online Support

SINAMICS G120P, PM240P-2, IP20

PM240P-2 Supply Voltage: 380 ... 480V 3Ø AC					Protection devices corresponding to IEC Standard		
Rating (LO)	Frame size	Input Reactor	Output Reactor	Braking Resistor	Amps	Fuse	Cct. Breaker
22 kW	FSD	Integrated DC Choke	N/A	N/A			
30 kW	FSD	Integrated DC Choke	N/A	N/A			
37 kW	FSD	Integrated DC Choke	N/A	N/A			
45 kW	FSE	Integrated DC Choke	N/A	N/A			
55 kW	FSE	Integrated DC Choke	N/A	N/A			
75 kW	FSF	Integrated DC Choke	N/A	N/A			
90 kW	FSF	Integrated DC Choke	N/A	N/A			
110 kW	FSF	Integrated DC Choke	N/A	N/A			
132 kW	FSF	Integrated DC Choke	N/A	N/A			

PM240P-2 Supply Voltage: 500 ... 690V 3Ø AC					Protection devices corresponding to IEC Standard		
Rating (LO)	Frame size	Input Reactor	Output Reactor	Braking Resistor	Amps	Fuse	Cct. Breaker
11 kW	FSD	Integrated DC Choke	N/A	N/A			
15 kW	FSD	Integrated DC Choke	N/A	N/A			
18.5 kW	FSD	Integrated DC Choke	N/A	N/A			
22 kW	FSD	Integrated DC Choke	N/A	N/A			
30 kW	FSD	Integrated DC Choke	N/A	N/A			
37 kW	FSD	Integrated DC Choke	N/A	N/A			
45 kW	FSE	Integrated DC Choke	N/A	N/A			
55 kW	FSE	Integrated DC Choke	N/A	N/A			
75 kW	FSF	Integrated DC Choke	N/A	N/A			
90 kW	FSF	Integrated DC Choke	N/A	N/A			
110 kW	FSF	Integrated DC Choke	N/A	N/A			
132 kW	FSF	Integrated DC Choke	N/A	N/A			

SINAMICS G120P, PM330, IP20

PM330 Supply Voltage: 380 ... 480V 3Ø AC					Protection devices corresponding to IEC Standard			
Rating (LO)	Frame size	Line Reactor	Output Reactor	Braking Resistor	Semiconductor			
					Amps	Fuse	Amps	Fuse
160 kW	GX	6SL3000-0CE33-3AA0	6SL3000-2BE33-2AA0	6SL3760-1AE32-6AA0	450	3NE1333-2	400	3NA3260
200 kW	GX	6SL3000-0CE35-1AA0	6SL3000-2BE33-8AA0	6SL3760-1AE32-6AA0	500	3NE1334-2	500	3NA3365
250 kW	GX	6SL3000-0CE35-1AA0	6SL3000-2BE35-0AA0	6SL3760-1AE32-6AA0	560	3NE1435-2	630	3NA3372

SINAMICS G120, PM240-2 Accessories

PM240-2 Supply Voltage: 200 ... 240V 1Ø AC					Protection devices corresponding to IEC Standard		
Rated Power (LO)	**Frame size**	**Input Reactor**	**Output Reactor**	**Braking Resistor**	**Amps**	**Fuse**	**Cct. Breaker**
0.55 kW	A	In preparation	6SL3202-0AE16-1CA0	JJY:023146720008	10	3NA3803	3RV2011-1JA10
0.75 kW & PT	A	In preparation	6SL3202-0AE16-1CA0	JJY:023146720008	10	3NA3803	3RV2011-1JA10
1.1 kW	B	In preparation	6SL3202-0AE16-1CA0	JJY:023151720007	32	3NA3812	3RV2021-4EA10
1.5 kW	B	In preparation	6SL3202-0AE18-8CA0	JJY:023151720007	32	3NA3812	3RV2021-4EA10
2.2 kW & PT	B	In preparation	6SL3202-0AE21-8CA0	JJY:023151720007	32	3NA3812	3RV2021-4EA10
3 kW	C	In preparation	6SL3202-0AE21-8CA0	JJY:023163720018	50	3NA3820	3RV1031-4HA10
4 kW & PT	C	In preparation	6SL3202-0AE21-8CA0	JJY:023163720018	50	3NA3820	3RV1031-4HA10

PM240-2 Supply Voltage: 200 ... 240V 3Ø AC					Protection devices corresponding to IEC Standard		
Rated Power (LO)	**Frame size**	**Input Reactor**	**Output Reactor**	**Braking Resistor**	**Amps**	**Fuse**	**Cct. Breaker**
0.55 kW	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	JJY:023146720008	16	3NA3805	3RV2011-4AA10
0.75 kW & PT	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	JJY:023146720008	16	3NA3805	3RV2011-4AA10
1.1 kW	B	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	JJY:023151720007	32	3NA3812	3RV2021-4EA10
1.5 kW	B	6SL3203-0CE21-0AA0	6SL3202-0AE18-8CA0	JJY:023151720007	32	3NA3812	3RV2021-4EA10
2.2 kW & PT	B	6SL3203-0CE21-0AA0	6SL3202-0AE21-8CA0	JJY:023151720007	32	3NA3812	3RV2021-4EA10
3 kW	C	6SL3203-0CE21-8AA0	6SL3202-0AE21-8CA0	JJY:023163720018	50	3NA3820	3RV1031-4HA10
4 kW & PT	C	6SL3203-0CE21-8AA0	6SL3202-0AE21-8CA0	JJY:023163720018	50	3NA3820	3RV1031-4HA10
5.5 kW	C	6SL3203-0CE23-8AA0	6SL3202-0AE23-8CA0	JJY:023433720001	50	3NA3820	3RV1031-4HA10
7.5 kW	C	6SL3203-0CE23-8AA0	6SL3202-0AE23-8CA0	JJY:023433720001	50	3NA3820	3RV1031-4HA10
11 kW	D	Not required	Not required	JJY:023422620002	63	3NE1818-0	3VL1706-2D.3.-....*
15 kW	D	Not required	Not required	JJY:023422620002	80	3NE1820-0	3VL1708-2D.3.-....*
18.5 kW	D	Not required	Not required	JJY:023422620002	100	3NE1021-0	3VL1710-2D.3.-....*
22 kW	E	Not required	Not required	JJY:023423320001	100	3NE1021-0	3VL1712-2DD33-.... *
30 kW	E	Not required	Not required	JJY:023423320001	160	3NE1224-0	3VL1716-2DD33-.... *
37 kW	F	Not required	Not required	JJY:023434020003	200	3NE1225-0	3VL3720-3DC33-.... *
45 kW	F	Not required	Not required	JJY:023434020003	200	3NE1225-0	3VL3720-3DC33-.... *
55 kW	F	Not required	Not required	JJY:023434020003	250	3NE1227-0	3VL3725-3DC33-.... *

* See LV10 catalogue to complete the part number

For UL/cUL devices see Catalogue D31, Operating Instructions or Supplementary information from Siemens Industry Online Support at:

Supplementary information for PM240-2 FSA to FSC can be found at the following link:https://support.industry.siemens.com/cs/gb/en/view/109479152

Supplementary information for PM240-2 FSD to FSF can be found at the following link: https://support.industry.siemens.com/cs/gb/en/view/109486009

SINAMICS G120, PM240-2, IP20 Accessories

PM240-2 Supply Voltage: 380 ... 480V 3Ø AC					Protection devices corresponding to IEC Standard		
Rating LO (VT)	Frame size	Input Reactor	Output Reactor	Braking Resistor	Amps	Fuse	Cct. Breaker
0.55 kW	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	16	3NA3805	3RV2011-4AA10
0.75 kW	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	16	3NA3805	3RV2011-4AA10
1.1 kW	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	16	3NA3805	3RV2011-4AA10
1.5 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0	16	3NA3805	3RV2011-4AA10
2.2 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	6SL3201-0BE21-0AA0	16	3NA3805	3RV2011-4AA10
3 kW & PT	A	6SL3203-0CE21-0AA0	6SL3202-0AE18-8CA0	6SL3201-0BE21-0AA0	16	3NA3805	3RV2011-4AA10
4 kW	B	6SL3203-0CE21-8AA0	6SL3202-0AE21-8CA0	6SL3201-0BE21-8AA0	32	3NA3812	3RV2021-4EA10
5.5 kW	B	6SL3203-0CE21-8AA0	6SL3202-0AE21-8CA0	6SL3201-0BE21-8AA0	32	3NA3812	3RV2021-4EA10
7.5 kW & PT	B	6SL3203-0CE21-8AA0	6SL3202-0AE21-8CA0	6SL3201-0BE21-8AA0	32	3NA3812	3RV2021-4EA10
11 kW	C	6SL3203-0CE23-8AA0	6SL3202-0AE23-8CA0	6SL3201-0BE23-8AA0	50	3NA3820	3RV1031-4HA10
15 kW & PT	C	6SL3203-0CE23-8AA0	6SL3202-0AE23-8CA0	6SL3201-0BE23-8AA0	50	3NA3820	3RV1031-4HA10
18.5 kW	D	Not required	Not required	JJY:023422620001	63	3NE1818-0	3VL1706-2D.3.-....*
22 kW	D	Not required	Not required	JJY:023422620001	80	3NE1820-0	3VL1708-2D.3.-....*
30 kW	D	Not required	Not required	JJY:023424020001	100	3NE1021-0	3VL1710-2D.3.-....*
37 kW	D	Not required	Not required	JJY:023424020001	100	3NE1021-0	3VL1710-2D.3.-....*
45 kW	E	Not required	Not required	JJY:023434020001	125	3NE1022-0	3VL1712-2DD33-.... *
55 kW	E	Not required	Not required	JJY:023434020001	160	3NE1224-0	3VL1716-2DD33-.... *
75 kW	F	Not required	Not required	JJY:023454020001	200	3NE1225-0	3VL3720-3DC33-.... *
90 kW	F	Not required	Not required	JJY:023454020001	250	3NE1227-0	3VL3725-3DC33-.... *
110kW	F	Not required	Not required	JJY:023464020001	315	3NE1230-0	3VL4731-3DC36-.... *
132kW	F	Not required	Not required	JJY:023464020001	350	3NE1331-0	3VL4740-3DC36-.... *

PM240-2 Supply Voltage: 500 ... 690V 3Ø AC					Protection devices corresponding to IEC Standard		
Rating LO (VT)	Frame size	Input Reactor	Output Reactor	Braking Resistor	Amps	Fuse	Cct. Breaker
11 kW	D	Not required	Not required	JJY:023424020002	25	3NE1815-0	3VL1702-2D.3.-....*
15 kW	D	Not required	Not required	JJY:023424020002	25	3NE1815-0	3VL1703-2D.3.-....*
18.5 kW	D	Not required	Not required	JJY:023424020002	35	3NE1803-0	3VL1703-2D.3.-....*
22 kW	D	Not required	Not required	JJY:023424020002	35	3NE1803-0	3VL1704-2DD33-.... *
30 kW	D	Not required	Not required	JJY:023424020002	50	3NE1817-0	3VL1705-2DD33-.... *
37 kW	D	Not required	Not required	JJY:023424020002	63	3NE1818-0	3VL1706-2DD33-.... *
45 kW	E	Not required	Not required	JJY:023434020002	80	3NE1820-0	3VL1708-2DD33-.... *
55 kW	E	Not required	Not required	JJY:023434020002	80	3NE1820-0	3VL1710-2DD33-.... *
75 kW	F	Not required	Not required	JJY:023464020002	100	3NE1021-0	3VL1712-2DD33-.... *
90 kW	F	Not required	Not required	JJY:023464020002	125	3NE1022-0	3VL1712-2DD33-.... *
110kW	F	Not required	Not required	JJY:023464020002	160	3NE1224-0	3VL1716-2DD33-.... *
132kW	F	Not required	Not required	JJY:023464020002	200	3NE1225-0	3VL3720-3DC33-.... *

* See LV10 catalogue to complete the part number
For UL/cUL devices see Catalogue D31, Operating Instructions or Supplementary information from Siemens Industry Online Support at:
Supplementary information for PM240-2 FSA to FSC can be found at the following link:https://support.industry.siemens.com/cs/gb/en/view/109479152
Supplementary information for PM240-2 FSD to FSF can be found at the following link: https://support.industry.siemens.com/cs/gb/en/view/109486009

SINAMICS G120, PM240 Accessories

G120 PM240 - Supply Voltage 380 ... 480V 3Ø AC					Protection devices corresponding to IEC Standard		
Rated Power (LO)	Frame size	Input Reactor PM240	Output Reactor PM240, PM250	Braking Resistor PM240	Amps	Fuse	Cct. Breaker
160 kW	GX	6SL3000-0CE33-3AA0	6SL3000-2BE33-2AA0	6SL3000-1BE31-3AA0	355	3NA3254	3VL4740-.DC36-.... *
200 kW	GX	6SL3000-0CE35-1AA0	6SL3000-2BE33-8AA0	6SL3000-1BE32-5AA0	400	3NA3260	3VL5750-.DC36-.... *
250 kW	GX	6SL3000-0CE35-1AA0	6SL3000-2BE35-8AA0	6SL3000-1BE32-5AA0	630	3NA3372	3VL5750-.DC36-.... *

SINAMICS G120, PM250 Accessories

G120 PM250 - Supply Voltage 380 ... 480V 3Ø AC			Protection devices corresponding to IEC Standard		
Rated Power (LO)	Frame size	Output Reactor PM240, PM250	Amps	Fuse	Cct. Breaker
7.5 kW	C	6SL3202-0AJ23-2CA0	20	3NA3807	3RV1031-4EA10
11 kW	C	6SL3202-0AJ23-2CA0	32	3NA3812	3RV1031-4FA10
15 kW	C	6SL3202-0AJ23-2CA0	35	3NA3814	3RV1031-4HA10
18.5 kW	D	6SE6400-3TC05-4DD0	50	3NA3820	3RV1042-4KA10
22 kW	D	6SE6400-3TC03-8DD0	63	3NA3822	3RV1042-4KA10
30 kW	D	6SE6400-3TC05-4DD0	80	3NA3824	3RV1042-4MA10
37 kW	E	6SE6400-3TC08-0ED0	100	3NA3830	3VL1712-.DD33-.... *
45 kW	E	6SE6400-3TC07-5ED0	125	3NA3832	3VL1716-.DD33-.... *
55 kW	F	6SE6400-3TC14-5FD0	160	3NA3836	3VL3720-.DC36-.... *
75 kW	F	6SE6400-3TC15-4FD0	200	3NA3140	3VL3725-.DC36-.... *
90 kW	F	6SE6400-3TC14-5FD0	250	3NA3144	3VL4731-.DC36-.... *

* See LV10 catalogue to complete the part number
For UL/cUL devices see Catalogue D31 or Operating Instructions available form Siemens Industry Online Support

SINAMICS G110M, G110D, G120D Accessories

G110M - Supply Voltage 380 ... 480V 3Ø AC			Protection devices corresponding to IEC Standard		
Rating	**Frame size**	**Sinamics G110D**	**Amps**	**Fuse**	**Cct. Breaker**
0.37 kW	A	6SL3517-1BE11-3AM0	10	3NA3803	3RV2011-1JA10
0.75 kW	A	6SL3517-1BE12-3AM0	10	3NA3803	3RV2011-1JA10
1.1 kW	A	6SL3517-1BE13-3AM0	10	3NA3803	3RV2011-1JA10
1.5 kW	A	6SL3517-1BE14-3AM0	10	3NA3803	3RV2011-1JA10
2.2 kW	B	6SL3517-1BE16-3AM0	20	3NA3807	3RV2021-4BA10
3.0 kW	B	6SL3517-1BE17-3AM0	20	3NA3807	3RV2021-4BA10
4.0 kW	B	6SL3517-1BE21-3AM0	20	3NA3807	3RV2021-4BA10

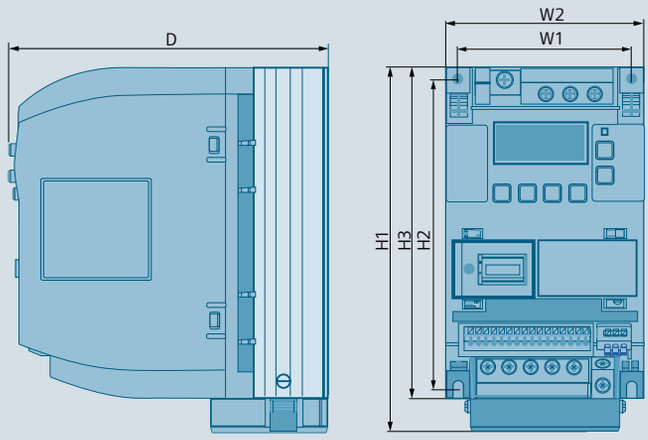
G110D – Supply voltage 380 ... 500V 3Ø AC			Protection devices corresponding to IEC Standard		
Rating	**Frame size**	**Sinamics G110D**	**Amps**	**Fuse**	**Cct. Breaker**
0.75 kW	A	6SL3511-.PE17-5AM0	10	3NA3803	3RV2011-1FA10
1.5 kW	A	6SL3511-.PE21-5AM0	10	3NA3803	3RV2011-1JA10
3.0 kW	A	6SL3511-.PE23-0AM0	16	3NA3805	3RV2021-4AA10
4 kW	B	6SL3511-.PE24-0AM0	20	3NA3807	3RV2021-4BA10
5.5 kW	C	6SL3511-.PE25-5AM0	20	3NA3807	3RV2021-4EA10
7.5 kW	C	6SL3511-.PE27-5AM0	32	3NA3812	3RV2021-4FA10

G120D – Supply voltage 380 ... 500V 3Ø AC			Protection devices corresponding to IEC Standard		
Rating	**Frame size**	**Sinamics G110D**	**Amps**	**Fuse**	**Cct. Breaker**
0.75 kW / 2.2 A	A	6SL3525-0PE17-5AA1	10	3NA3803	3RV2011-1JA10
1.5 kW / 4.1 A	A	6SL3525-0PE21-5AA1	10	3NA3803	3RV2011-1JA10
3 kW / 7.7 A	B	6SL3525-0PE23-0AA1	16	3NA3805	3RV2011-4AA10
4 kW / 10.2 A	C	6SL3525-0PE24-0AA1	20	3NA3807	3RV2021-4BA10
5.5 kW / 13.2 A	C	6SL3525-0PE25-5AA1	20	3NA3807	3RV2021-4BA10
7.5 kW / 19.0 A	C	6SL3525-0PE27-5AA1	32	3NA3812	3RV2021-4PA10

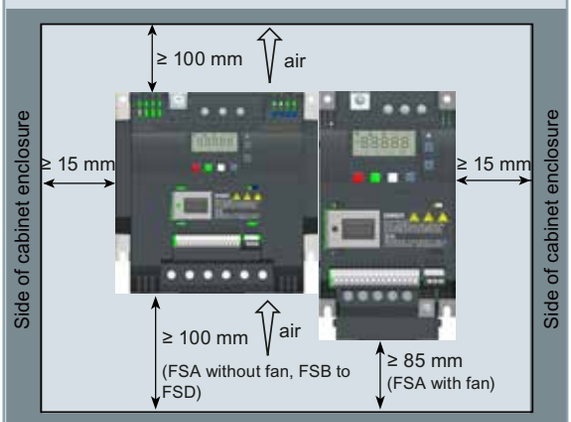
For UL/cUL devices see Catalogue D31 or Operating Instructions available form Siemens Industry Online Support

SINAMICS V20 Dimensions

SINAMICS V20 device



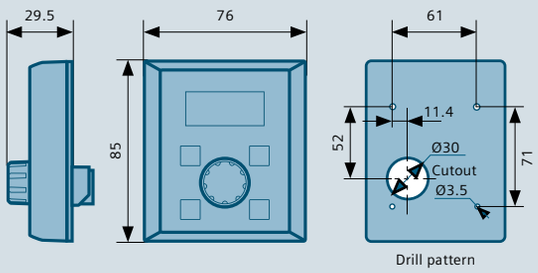
Ventilation Clearances



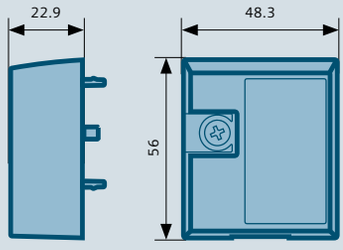
Frame Size	Width (mm)		Height (mm)			Depth (mm) D	Drill Ø	Screw	Tightening torque	Weight (kg) approx.
	W1	W2	H1	H2	H3					
FSAA	58	68		132	142	107.8	4.6	2 x M4	1.8Nm ±10%	0.7
FSAB	58	68		132	142	127.8	4.6	2 x M4	1.8Nm ±10%	0.9
FSA	79	90	166	140	150	145.5	4.6	4 x M4	1.8Nm ±10%	1.05
FSB	127	140	160	135	—	164.5	4.6	4 x M4	1.8Nm ±10%	1.8
FSC	170	184	182	140	—	169	5.8	4 x M5	2.5Nm ±10%	2.6
FSD	223	240	206.5	166	—	172.5	5.8	4 x M5	2.5Nm ±10%	4.3
FSE	228	245	264.5	206	—	209	5.8	4 x M5	2.5Nm ±10%	6.6

Note: H1: Height with fan, H3: Height without fan
For FSAA/FSAB you only need two holes for cabinet mounting, Top RHS, Bottom LHS
Cut-out dimensions for 'Push-Through' can be found in the V20 Compact Operating Instructions at
https://support.industry.siemens.com/cs/gb/en/view/109736382

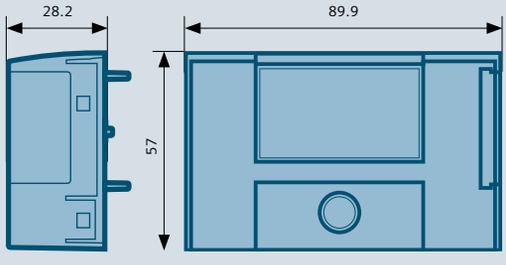
V20 BOP (Basic Operator Panel)



V20 BOP (Basic Operator Panel) interface



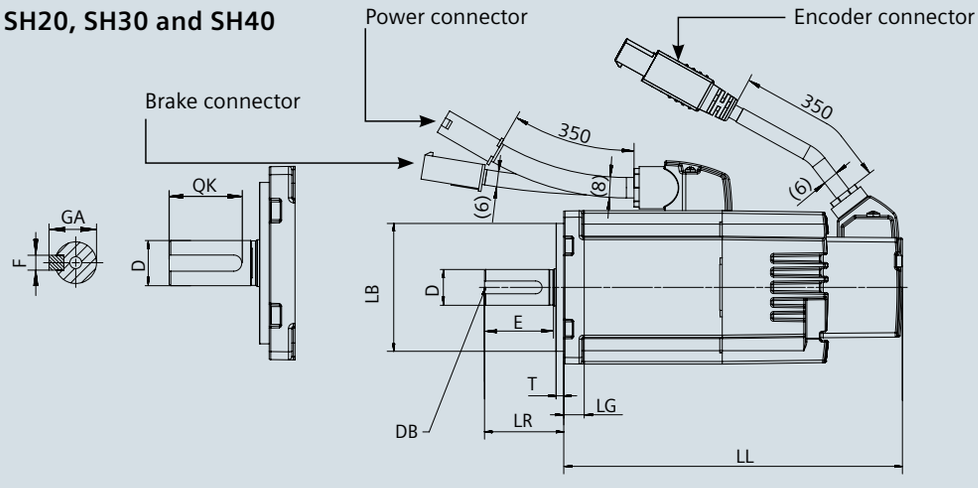
V20 Parameter loader



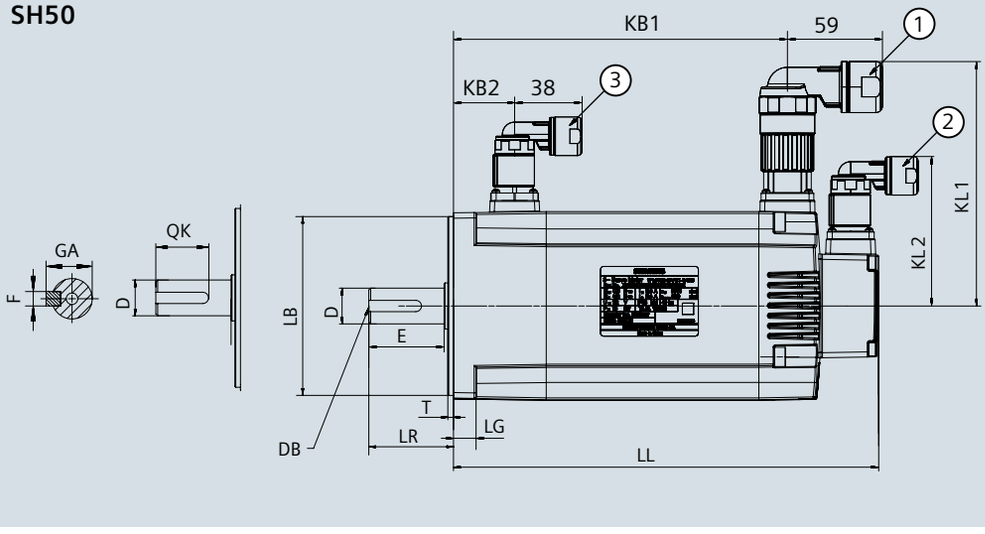
SIMOTICS S-1FL6 Low Inertia

Shaft height																Without brake		With brake				
	Type	LC	LA	LZ	LB	LH	LR	T	LG	D	DB	E	QK	GA	F	LL	KB1	LL	KB1	KB2	KL1	KL2
20	1FL6022-2AF	40	46	4.5	30	40	25	2.5	6	8	M3x8	22	17.5	9	3	86	–	119	–	–	–	–
	1FL6024-2AF	40	46	4.5	30	40	25	2.5	6	8	M3x8	22	17.5	9	3	106	–	139	–	–	–	–
30	1FL6032-2AF	60	70	5.5	50	50	31	3	8	14	M4x15	26	22.5	16	5	98	–	132.5	–	–	–	–
	1FL6034-2AF	60	70	5.5	50	50	31	3	8	14	M4x15	26	22.5	16	5	123	–	157.5	–	–	–	–
40	1FL6042-2AF	80	90	7	70	60	35	3	8	19	M6x16	30	28	21.5	6	139	–	178.3	–	–	–	–
	1FL6044-2AF	80	90	7	70	60	35	3	8	19	M6x16	30	28	21.5	6	158.8	–	198.1	–	–	–	–
50	1FL6052-2AF	100	115	9	95	–	45	3	12	19	M6x16	40	28	21.5	6	192	143.5	226	177.5	32.5	135	80
	1FL6054-2AF	100	115	9	95	–	45	3	12	19	M6x16	40	28	21.5	6	216	167.5	250	201.5	32.5	135	80

SH20, SH30 and SH40



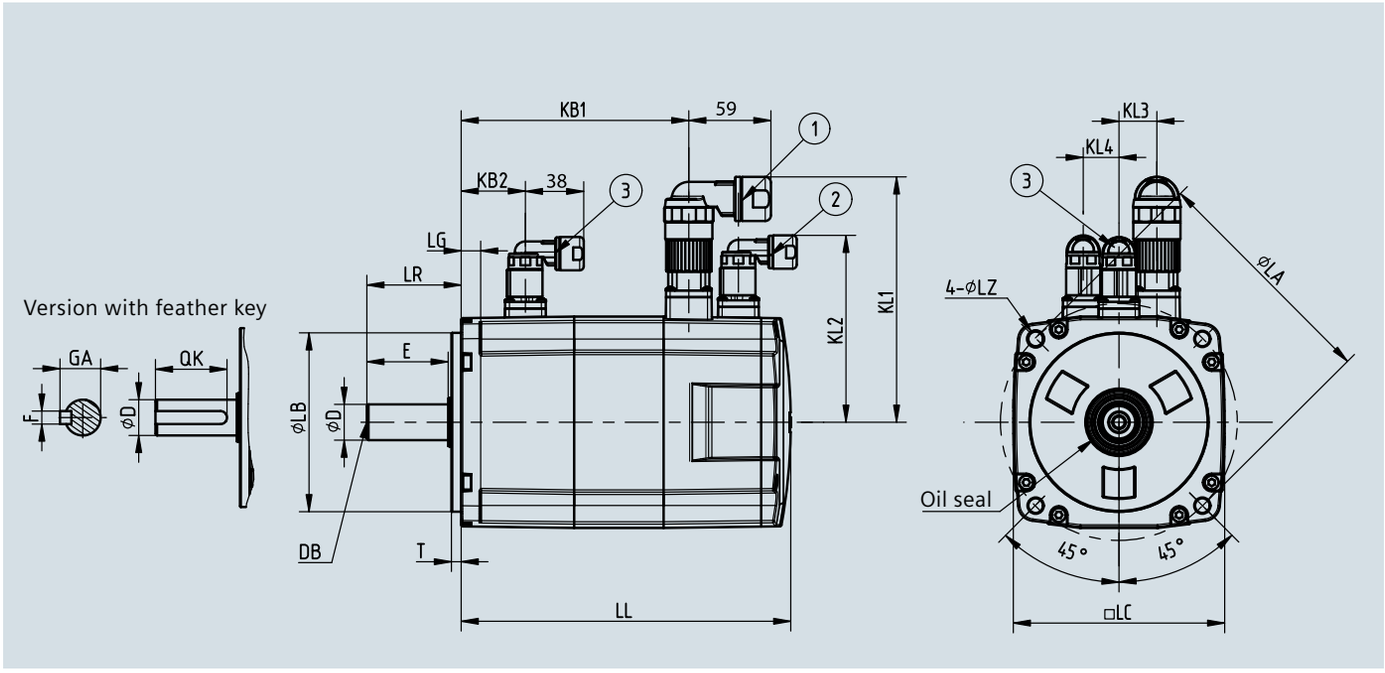
SH50



Note: Power connector, Incremental encoder connector, Brake connector
Connectors should be ordered separately, for ordering information please refer to section "Options" in this document.
Outline dimensions of incremental encoder connector brake connector are the same.

SINAMICS 1FL6 High Inertia with TTL Encoder

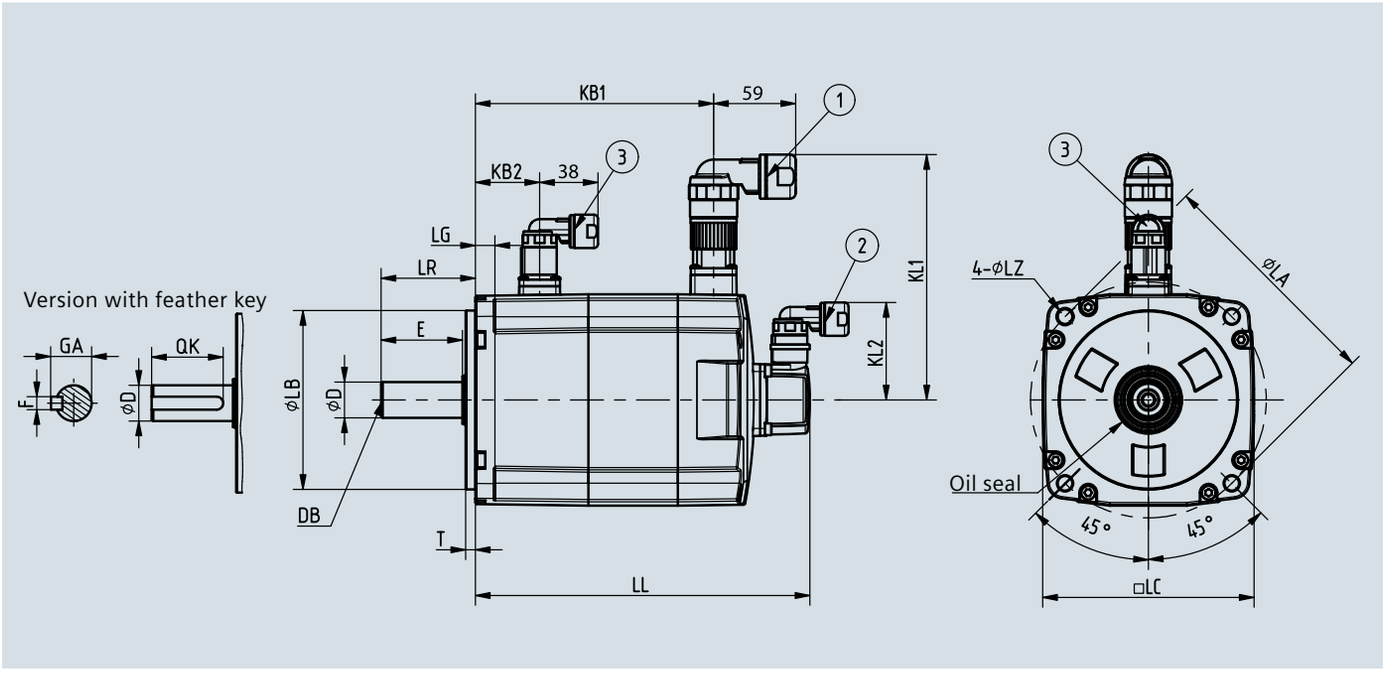
Shaft height	Type	LC	LA	LZ	LB	LR	T	LG	D	DB	E	QK	GA	F	Without brake			With brake						
															LL	KB1	KB2	LL	KB1	KB2	KL1	KL2	KL3	KL4
45	1FL6042-1AF	90	100	7	80	35	4	10	19	M6x16	30	25	21.5	6	154.5	93.5	-	201	140	31.5	136	92	-	-
	1FL6044-1AF	90	100	7	80	35	4	10	19	M6x16	30	25	21.5	6	201.5	140.5	-	248	187	31.5	136	92	-	-
65	1FL6061-1AC	130	145	9	110	58	6	12	22	M8x16	50	44	25	8	148	85.5	-	202.5	140	39.5	158	115	23	22
	1FL6062-1AC	130	145	9	110	58	6	12	22	M8x16	50	44	25	8	181	118.5	-	235.5	173	39.5	158	115	23	22
	1FL6064-1AC	130	145	9	110	58	6	12	22	M8x16	50	44	25	8	181	118.5	-	235.5	173	39.5	158	115	23	22
	1FL6066-1AC	130	145	9	110	58	6	12	22	M8x16	50	44	25	8	214	151.5	-	268.5	206	39.5	158	115	23	22
	1FL6067-1AC	130	145	9	110	58	6	12	22	M8x16	50	44	25	8	247	184.5	-	301.5	239	39.5	158	115	23	22
90	1FL6090-1AC	180	200	13.5	114.3	80	3	18	35	M12x25	75	60	38	10	189.5	140	-	255	206	44.5	184	149	34	34
	1FL6092-1AC	180	200	13.5	114.3	80	3	18	35	M12x25	75	60	38	10	211.5	162	-	281	232	44.5	184	149	34	34
	1FL6094-1AC	180	200	13.5	114.3	80	3	18	35	M12x25	75	60	38	10	237.5	188	-	307	258	44.5	184	149	34	34
	1FL6096-1AC	180	200	13.5	114.3	80	3	18	35	M12x25	75	60	38	10	289.5	240	-	359	310	44.5	184	149	34	34



Note: Power connector, Incremental encoder connector, Brake connector
Connectors should be ordered separately, for ordering information please refer to section “Options” in this document.
Outline dimensions of incremental encoder connector brake connector are the same.
Shaft height 90 motor has M8 screws for eyebolts.

SINAMICS 1FL6 High Inertia with Abs. Encoder

Shaft height	Type	LC	LA	LZ	LB	LR	T	LG	D	DB	E	QK	GA	F	Without brake			With brake						
															LL	KB1	KB2	LL	KB1	KB2	KL1	KL2	KL3	KL4
45	1FL6042-1AF	90	100	7	80	35	4	10	19	M6x16	30	25	21.5	6	157	100	-	203.5	147	31.5	136	60	-	-
	1FL6044-1AF	90	100	7	80	35	4	10	19	M6x16	30	25	21.5	6	204	147	-	250.5	194	31.5	136	60	-	-
65	1FL6061-1AC	130	145	9	110	58	6	12	22	M8x16	50	44	25	8	151	92	-	205.5	147	39.5	158	60	-	-
	1FL6062-1AC	130	145	9	110	58	6	12	22	M8x16	50	44	25	8	184	125	-	238.5	180	39.5	158	60	-	-
	1FL6064-1AC	130	145	9	110	58	6	12	22	M8x16	50	44	25	8	184	125	-	238.5	180	39.5	158	60	-	-
	1FL6066-1AC	130	145	9	110	58	6	12	22	M8x16	50	44	25	8	217	158	-	271.5	213	39.5	158	60	-	-
	1FL6067-1AC	130	145	9	110	58	6	12	22	M8x16	50	44	25	8	250	191	-	304.5	246	39.5	158	60	-	-
90	1FL6090-1AC	180	200	13.5	114.3	80	3	18	35	M12x25	75	60	38	10	197	135	-	263	201	44.5	184	60	-	-
	1FL6092-1AC	180	200	13.5	114.3	80	3	18	35	M12x25	75	60	38	10	223	161	-	289	227	44.5	184	60	-	-
	1FL6094-1AC	180	200	13.5	114.3	80	3	18	35	M12x25	75	60	38	10	249	187	-	315	253	44.5	184	60	-	-
	1FL6096-1AC	180	200	13.5	114.3	80	3	18	35	M12x25	75	60	38	10	301	239	-	367	305	44.5	184	60	-	-

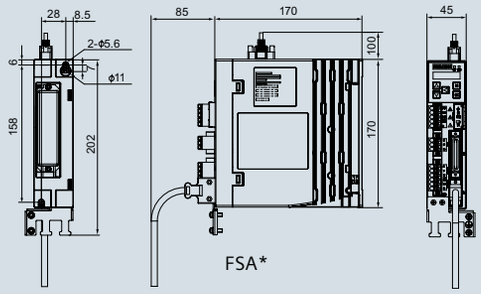


Note: Power connector, Absolute encoder connector, Brake connector
Connectors should be ordered separately, for ordering information please refer to section “Options” in this document.
Outline dimensions of absolute encoder connector brake connector are the same.
Shaft height 90 motor has M8 screws for eyebolts.

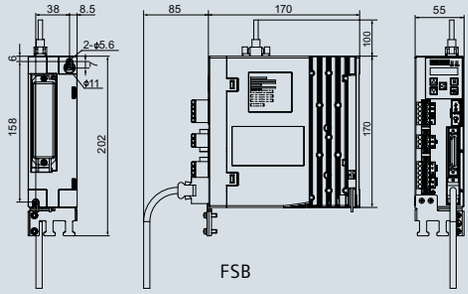
SINAMICS V90

Dimension drawings (mm)

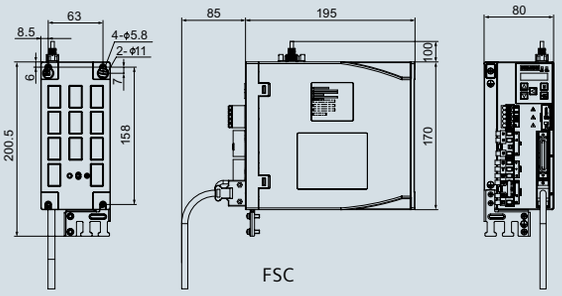
SINAMICS V90 200 V frame size A*



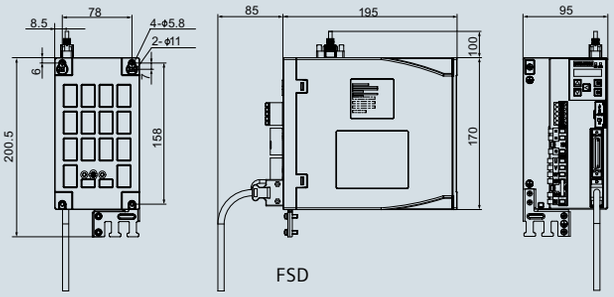
SINAMICS V90 200 V frame size B



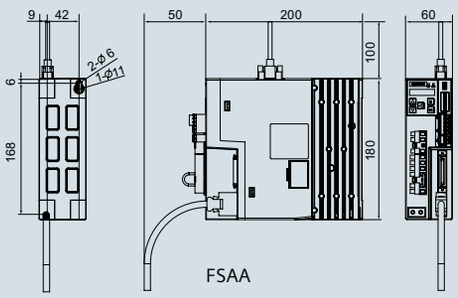
SINAMICS V90 200 V frame size C



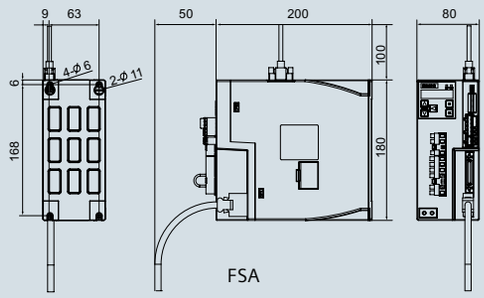
SINAMICS V90 200 V frame size D



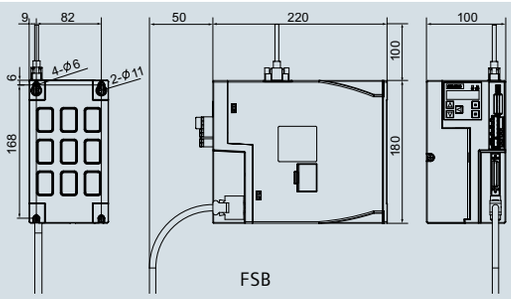
SINAMICS V90 400 V frame size AA



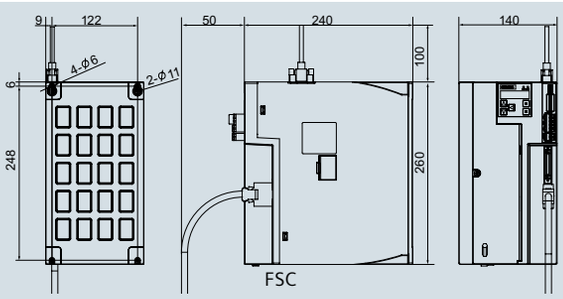
SINAMICS V90 400 V frame size A



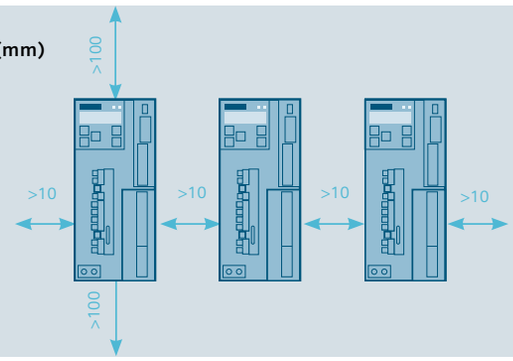
SINAMICS V90 400 V frame size B



SINAMICS V90 400 V frame size C

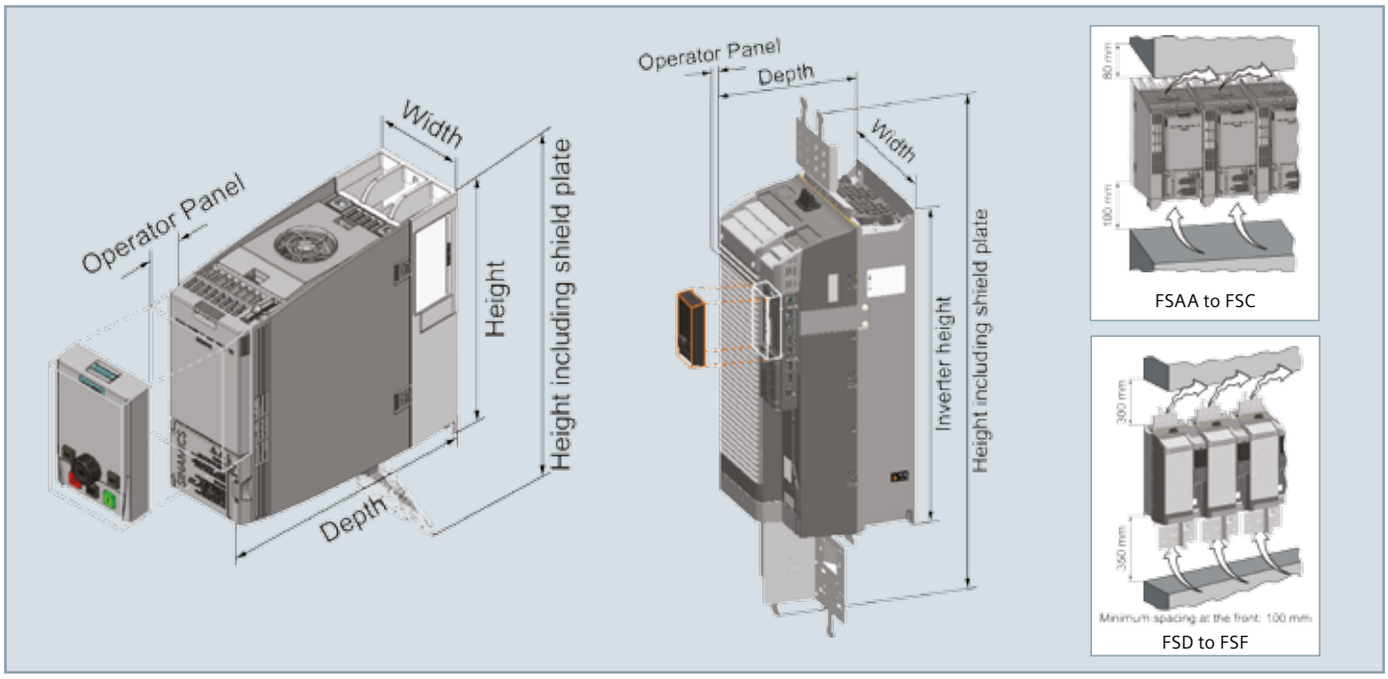


Mounting clearances (mm)

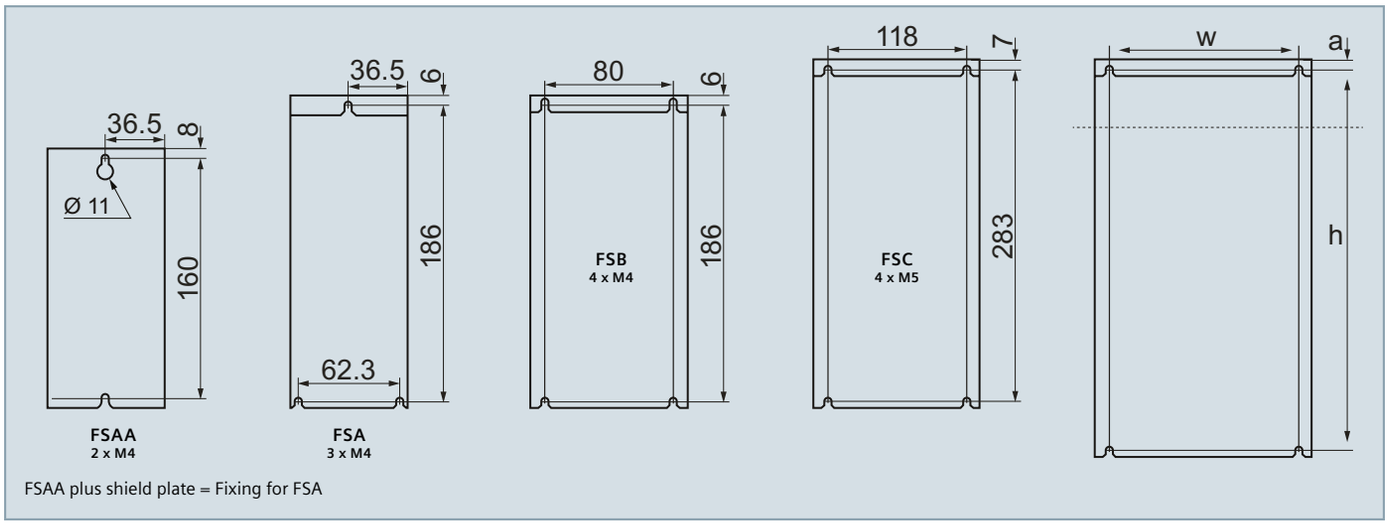


* SINAMICS V90 PROFINET 200 V version is not available in frame size A (FSA).
The power range from 0.1 kW to 0.4 kW is covered with frame size B (FSB)

SINAMICS G120C



Frame Size	kW rating (LO)	Height	Height inc. shield plate(s)	Height of lower shield plate	Height of upper shield plate	Width	Depth with PN intetface	Depth with USS/Modbus or Profibus interface
AA	0.55 kW - 2.2 kW	173mm	268mm	95mm	95mm	-	178mm	155mm
A	3.0 kW - 4.0 kW	196mm	276mm	80mm	80mm	-	226mm	203mm
B	5.5 kW - 7.5 kW	196mm	276mm	80mm	80mm	-	226mm	203mm
C	11 kW - 18.5 kW	295mm	375mm	80mm	80mm	-	226mm	203mm
D	22 kW - 45 kW	472mm	708mm	84mm	84mm	152mm	237mm	-
E	55 kW	551mm	850mm	123mm	123mm	177mm	237mm	-
F	75 kW - 132 kW	708mm	1107mm	142mm	142mm	257mm	357mm	-

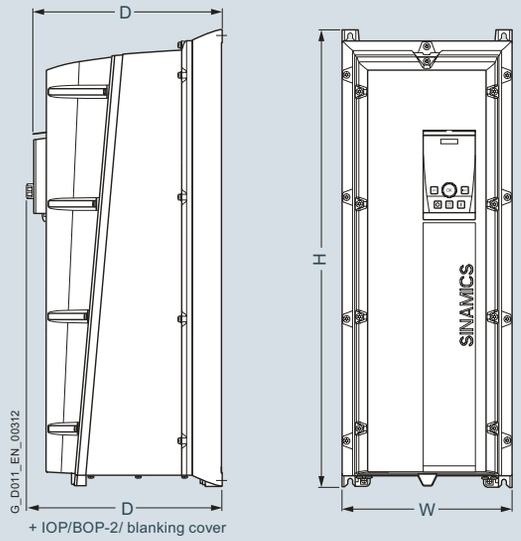


FSAA plus shield plate = Fixing for FSA

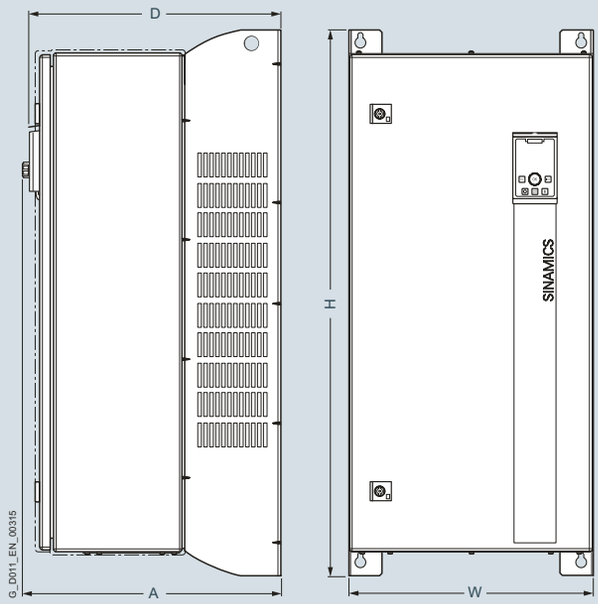
Frame Size	kW rating (LO)	w	h	a	Bolts/Nuts/ Washers/ Torque
AA	0.55 kW - 2.2 kW	-	-	-	2 x M4 / 2.5 Nm
A	3.0 kW - 4.0 kW	-	-	-	3 x M4 / 2.5 Nm
B	5.5 kW - 7.5 kW	-	-	-	4 x M4 / 2.5 Nm
C	11 kW - 18.5 kW	-	-	-	4 x M5 / 2.5 Nm
D	22 kW - 45 kW	170mm	430mm	7mm	4 x M5 / 6.0 Nm
E	55 kW	230mm	509mm	8.5mm	4 x M6 / 10.0 Nm
F	75 kW - 132 kW	270mm	680mm	13mm	4 x M8 / 25.0 Nm

SINAMICS G120P PM230 IP55

Dimension Diagrams - G120P, IP55



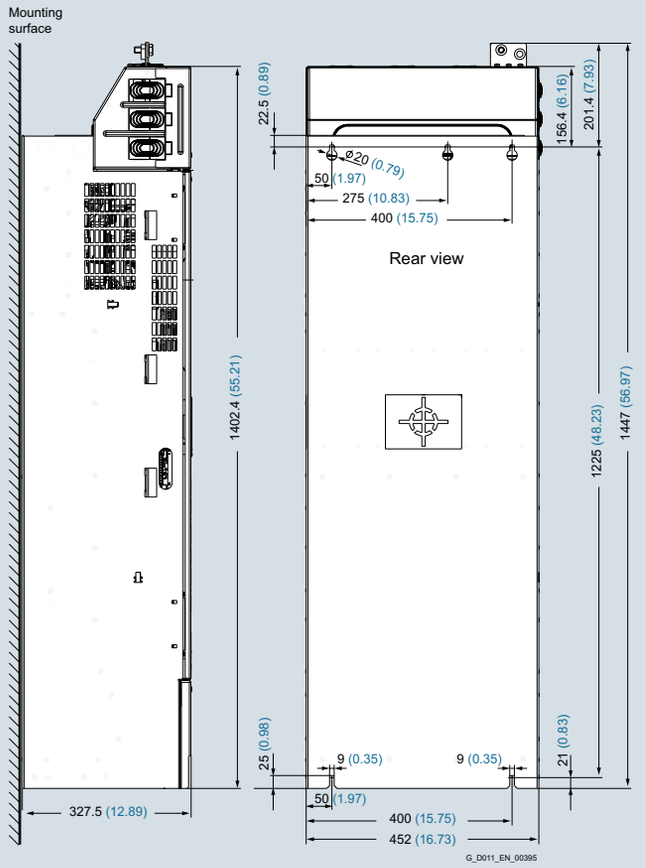
Frame sizes A, B and C



Frames size D, E and F

SINAMICS G120P PM330

Dimension Diagrams



Ventilation Clearances (mm)				
Top	Bottom	Side	Front	Fixing
200	200	30	30	M8

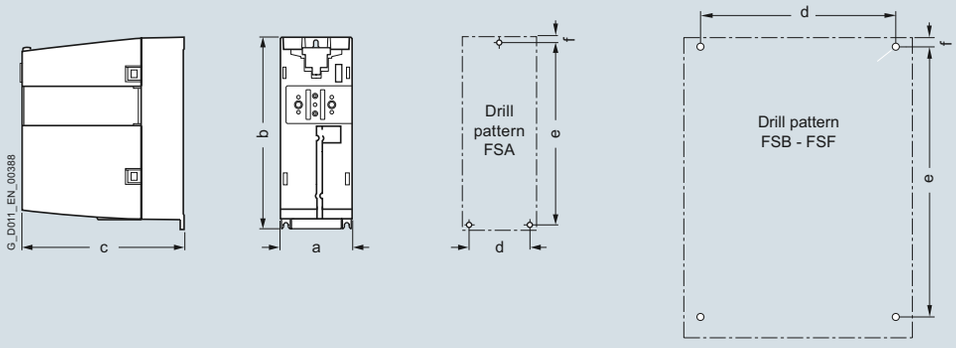
Notes G120P IP55 Installation For cabinet sizing purposes, please allow 3% of the drive rating as heat loss.

				Allow ventilation clearances around the drives as follows:				
Frame size	Dimensions			Above / Below mm	Side < 40°C	Side > 40°C	Drill & Fixing Pattern	
	D	W	H				Fixing	Drill - W x L
A	249mm	154mm	460mm	100	0	0	4 x M4	132 x 445 x 4.5 Ø
B	249mm	180mm	540mm	100	0	0	4 x M4	158 x 224 x 4.5 Ø
C	249mm	230mm	620mm	125	0	0	4 x M5	208 x 604 x 5.5 Ø
D	329mm	320mm	640mm	300	0	50	4 x M8	285 x 600 x 8.5 Ø
E	329mm	320mm	751mm	300	0	50	4 x M8	285 x 710 x 8.5 Ø
F	416mm	410mm	910mm	350	0	50	4 x M8	370 x 870 x 8.5 Ø

Note: Depth D increases by 7mm with BOP-2/Blanking cover and 17mm with an IOP

SINAMICS PM230 IP20/PM240-2 IP20 Dimensions

Dimension Diagrams

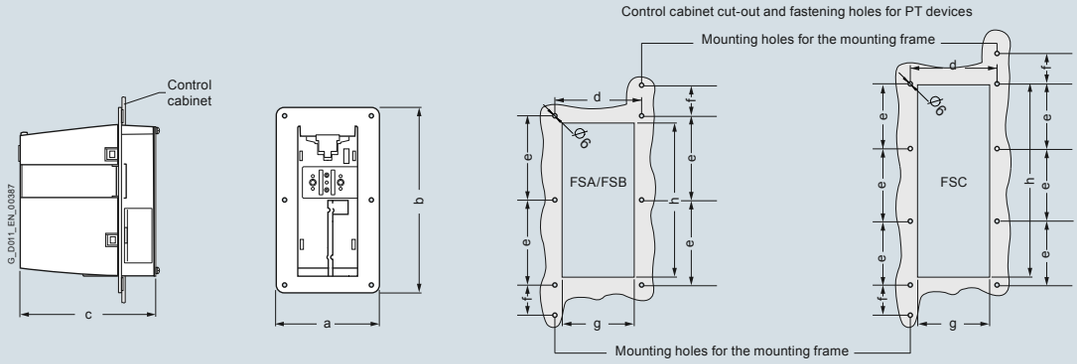


PM230 IP20 Standard variant / PM240P-2 Frame size D and above									
Frame size	Dimensions in mm			Drilling dimensions in mm			Cooling clearances in mm		Mounting
	a (width)	b (height)	c (depth)	d	e	f	Top/Bottom	Side *	
FSA	73	196	165	62.3	186	6	80/100	0	3 x M4
FSB	100	292	165	80	281	6	80/100	0	4 x M4
FSC	140	335	165	120	343	6	80/100	0	4 x M5
FSD	200	472	237	170	430	11	300/300	50	4 x M6
FSE	275	551	237	230	509	11	300/300	50	4 x M6
FSF	305	708	357	270	680	11	350/350	50	4 x M8
PM230 IP20 Standard variant / PM240P-2 Frame size D and above									
FSA	73	196	165	62.3	186	6	80/100	0	3 x M4

- When the CU230P-2 Control Unit is plugged on, the depth increases by 58 mm
- When the CU240B-2 or CU240E-2 Control Unit is plugged on, the depth increases by 40 mm
- When the IOP is plugged on, the depth increases by a further 25 mm
- When the BOP-2 is plugged on, the depth increases by a further 15 mm

*The power modules can be mounted side by side but a clearance of 1mm is recommended for tolerance reasons

Dimension Diagrams



PM230 IP20 Push Through variant											
Frame size	Dimensions in mm			Drilling dimensions in mm			Section of cabinet		Cooling clearances in mm		Mounting
	a (width)	b (height)	c (depth)	d	e	f	g (width)	h (height)	Top/ Bottom	Side *	
FSA	125.9	238	171	106	103	27	88	198	80/100	0	M5
FSB	153.9	345	171	154	147.5	34.5	116	304	80/100	0	M5
FSC	200	410.5	171	174	123	30.5	156	365	80/100	0	M5
PM240-2 IP20 Push Through variant											
FSA	125.9	238	171	106	103	27	88	198	80/100	0	M5

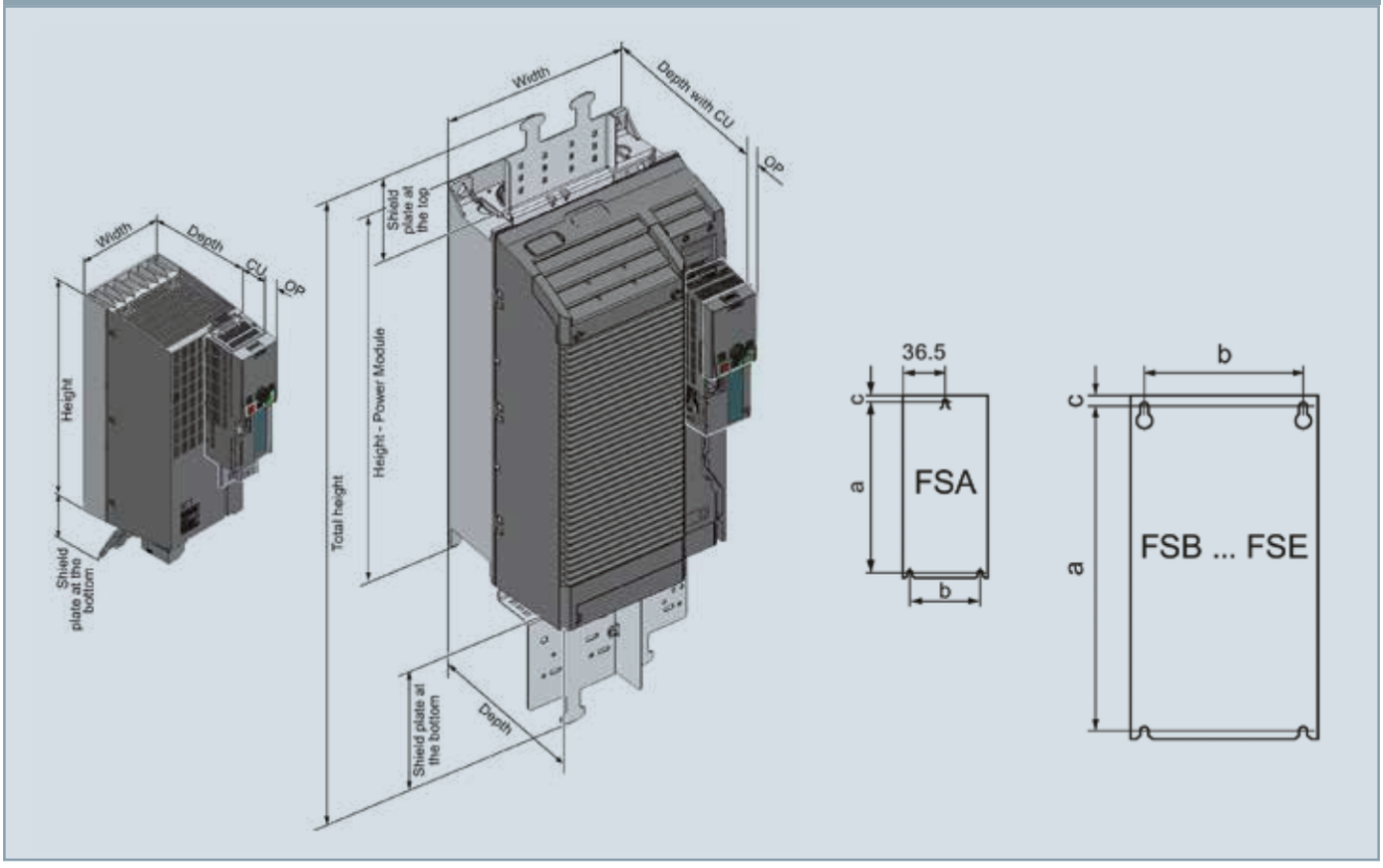
" Overall depth, of which 117.7 mm is inside and 53.1 mm is outside the control cabinet.

- When the CU230P-2 Control Unit is plugged on, the depth increases by 58 mm
- When the CU240B-2 or CU240E-2 Control Unit is plugged on, the depth increases by 40 mm
- When the IOP / IOP-2 is plugged on, the depth increases by a further 25 mm
- When the BOP-2 is plugged on, the depth increases by a further 15 mm

* The power modules can be mounted side by side but a clearance of 1mm is recommended for tolerance reasons

SINAMICS G120, PM240-2, IP20

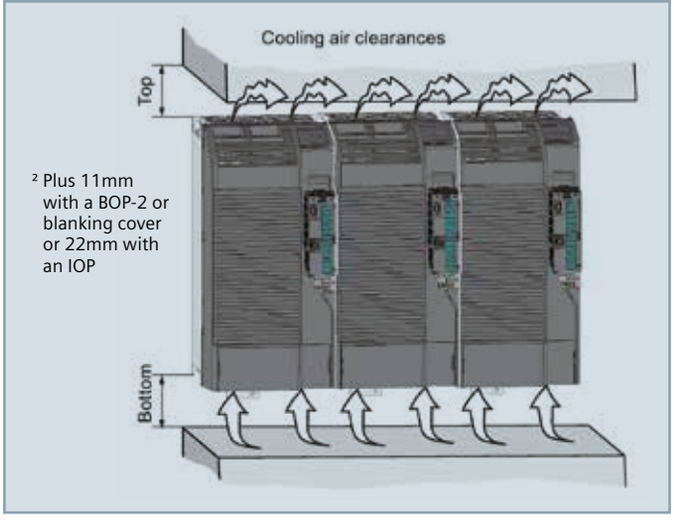
Dimension Diagrams



For cabinet sizing purposes please allow 3% of the drive rating as heat loss

Frame Size	Width (mm)	Height (mm)				Depth (mm)			Weight (kg)	Drilling dimensions (mm)			Fixing	
		Power Module	Shield plate at the bottom	Shield plate at the top	Total	Without CU	with CU230P-2^ CU250S-2^	with CU240B-2^ CU240E-2^		a	b	c	Screws	Torque
FSA	73	196	80	—	276	165	228	206	1.4	186	62.3	6	3 x M4	2.5
FSB	100	291	79	—	370	165	228	206	2.9	281	80	6	4 x M4	2.5
FSC	140	355	77	—	432	165	228	206	5.2	343	120	6	4 x M5	3
FSD	200	472	152	83.5	707.5	237	255.5	237	17	430	170	7	4 x M5	6
FSE	275	551	177	122.5	850	237	255.5	237	26	509	230	8.5	4 x M5	10
FSF	305	708	257	142	1107	357	375.5	357	57	680	270	13	4 x M8	25

Cooling Clearance



[2] Plus 11mm with a BOP-2 or blanking cover or 22mm with an IOP

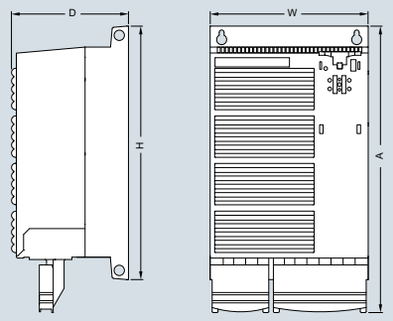
^ Depth increases by 12mm with BOP-2/Blanking cover or 22mm with an IOP

Ventilation Clearances (mm)			
	Top	Bottom	Front
FSA	80	100	100
FSB	80	100	100
FSC	80	100	100
FSD	300	350	100
FSE	300	350	100
FSF	300	350	100

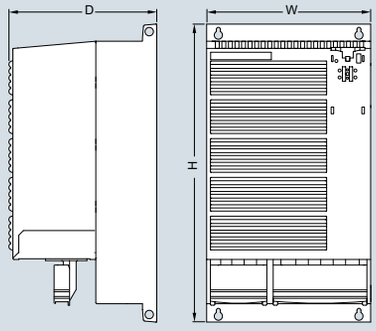
[1] Power Modules can be mounted and Operated side by side. For tolerance reasons we recommend a lateral distance of approx. 1mm

SINAMICS G120, PM240/PM250

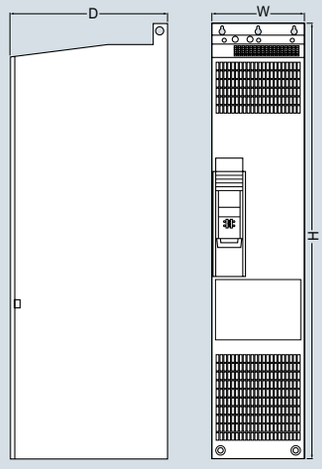
Frame Size D & D with Filter
Frame Size E & E with Filter



Frame Size F & F with Filter



Frame Size GX



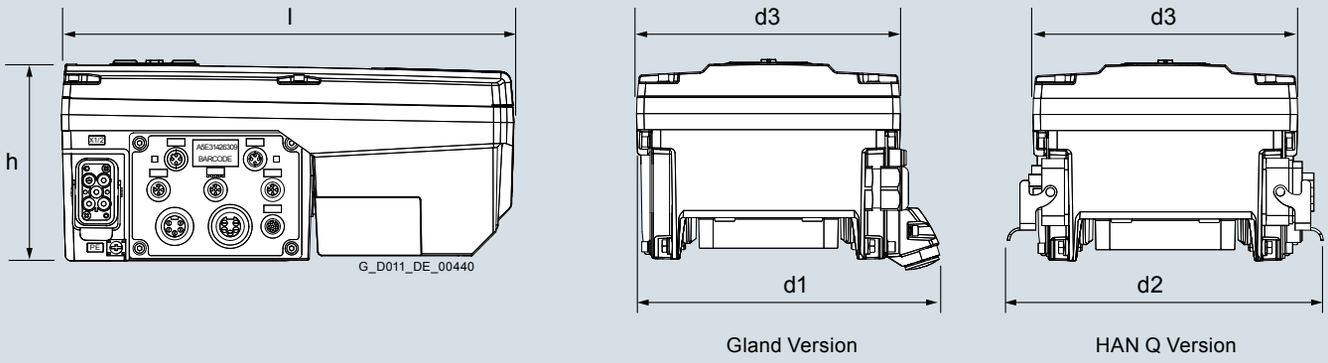
Notes on Power Module Installation:
PM240/PM250/PM260 - for cabinet sizing purposes, please allow 3% of the drive rating as heat loss.
PM340 - for cabinet sizing purposes, please allow 4% of the drive rating as heat loss.

Frame size	Dimensions				Allow ventilation clearances around the drives as follows:				Drill & Fixing Pattern	
	A	W	H	D	Above / Below mm	Side < 40°C	Side > 40°C	Front	Fixing	Drill - W x L
A	-	73mm	173mm	145mm	100	0	30	0	2 x M4	0 x 160 x 4.5 Ø
B	-	153mm	270mm	165mm	100	0	40	30 ~	4 x M4	133 x 258 x 4.5 Ø
C / C + filter	-	189mm	334mm	185mm	125	0	50	30 ~	4 x M5	167 x 323 x 5.5 Ø
D	419mm	275mm	361mm	204mm	300	0	0	30 ~	4 x M8	235 x 325 x 8.5 Ø
D + filter	512mm	275mm	455mm	204mm	300	0	0	30 ~	4 x M8	235 x 419 x 8.5 Ø
E	499mm	275mm	441mm	204mm	300	0	0	30 ~	4 x M8	235 x 405 x 8.5 Ø
E + filter	635mm	275mm	577mm	204mm	300	0	0	30 ~	4 x M8	235 x 541 x 8.5 Ø
F	-	350mm	634mm	316mm	350	0	0	30 ~	4 x M8	300 x 598 x 8.5 Ø
F + filter	-	350mm	934mm	316mm	350	0	0	30 ~	4 x M8	300 x 899 x 8.5 Ø
GX	-	326mm	1533mm	547mm	250 / 150	0	0	50	6 x M8	125 x 125 x 1506 x 8.5 Ø

Note: PM240 & PM250 depth increases by 65mm with CU230P-2 or 46mm with CU240B-2/E-2 or 62mm with CU250S-2 and a further 12mm with BOP-2 / Blanking Plate or 22mm with an IOP.

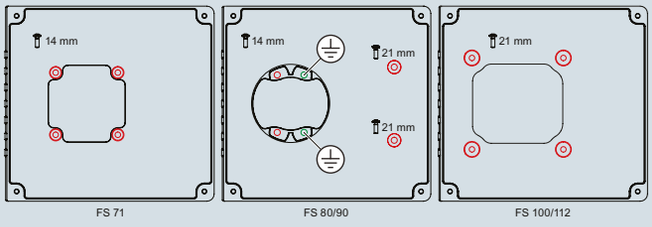
SINAMICS G110M

Dimension Diagrams



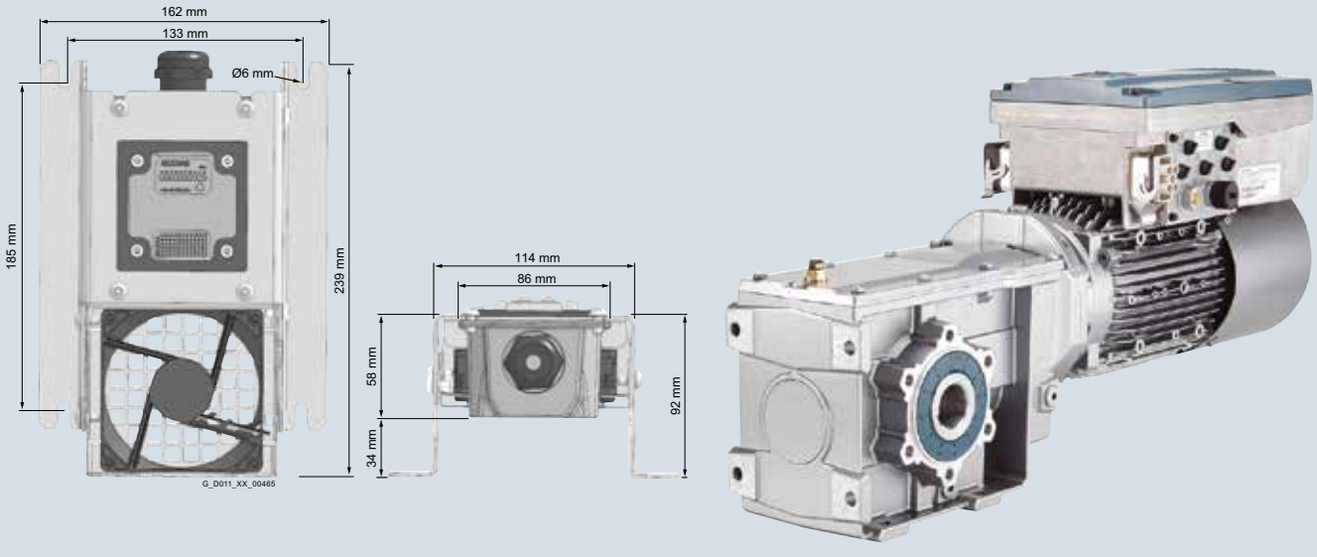
Frame size	Dimensions				
	H	I	D1	D2	D3
FSA	135mm	270mm	208mm	216mm	161mm
FSB	135mm	309mm	208mm	216mm	161mm

Terminal house fixing points



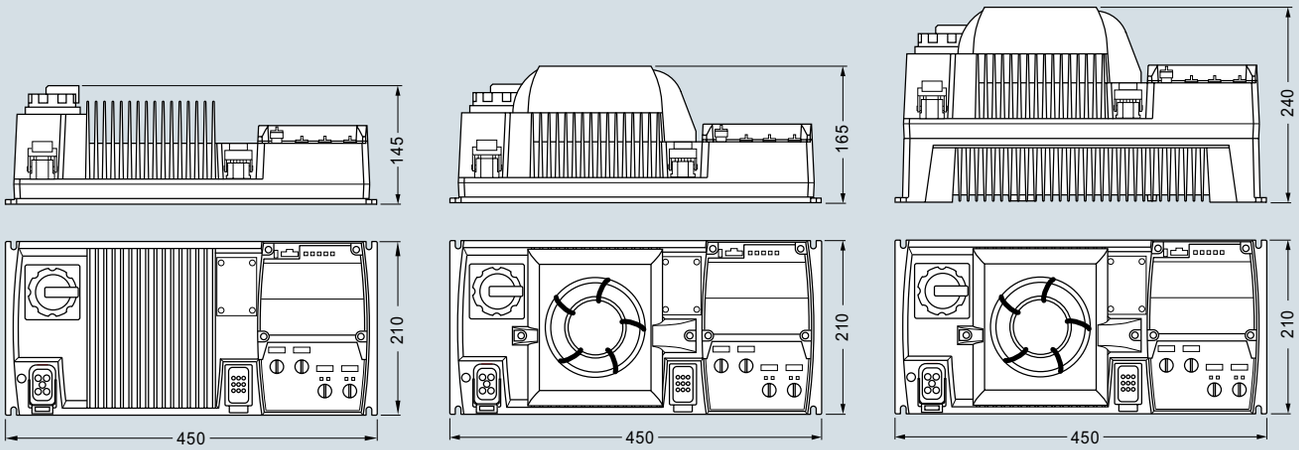
Please note that the fixing points(for securing the terminal housing to the motor) are indicated in RED. The FS 80/90 terminal housing has six fixing points, two of which are marked in GREEN and indicated by the ground symbol. These fixing points provide the correct earthing between the terminal housing and the motor and MUST be used.
All fixing bolts for the terminal housing are supplied with each terminal housing.

Wall mount kit



SINAMICS G110D/G120D

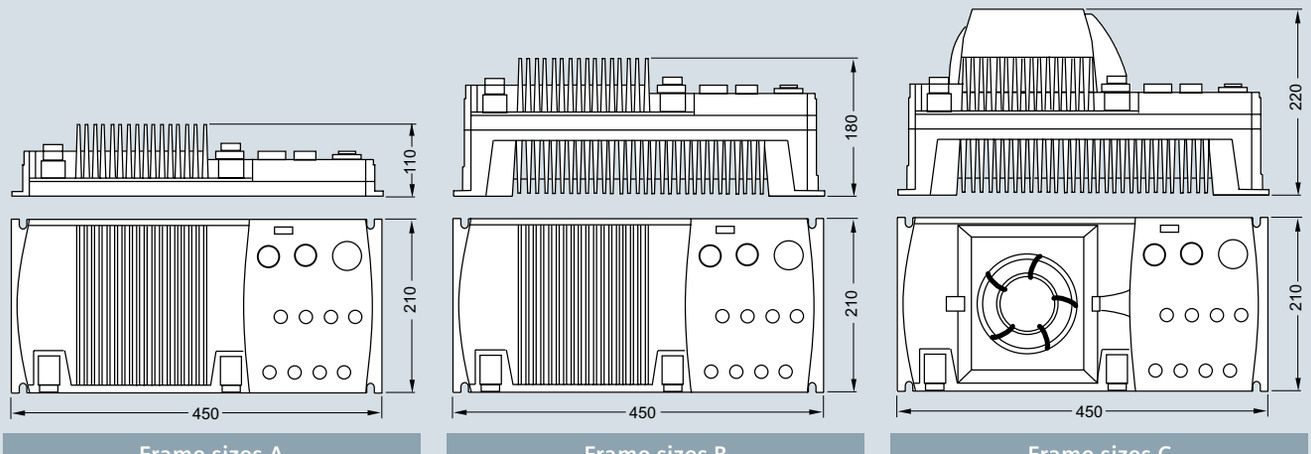
G110D



Frame sizes A | Frame sizes B | Frame sizes C

G110D - Sizes shown with maintenance switch fitted. Frame size 'A' height reduces by 20mm without maintenance switch fitted.
Ventilation clearances please see below.

G120D



Frame sizes A | Frame sizes B | Frame sizes C

G110D & G120D - Allow ventilation clearances around the drive

Frame size	Above mm	Below mm	Drill & Fixing Pattern - Drill - W x L
A	150	150	425 x 195
B	150	150	425 x 195
C	150	150	425 x 195

Energy Efficient Drives

Electric motors represent almost two thirds of the total industrial power demand. The amount of energy used will have a big impact on operating costs as well as the effects on the environment.

Efficient Infeed Technology - provides the ability to feed back regenerative energy developed with motor braking into the mains supply. Traditionally this energy would be dissipated as heat through an additional braking resistor.

Efficient Infeed Technology has significant benefits:

- Continuous braking with 100% rated power
- Energy savings through regenerative feedback
- Braking resistor, line reactor and brake chopper are eliminated
- Configuration costs for brake resistor and cabling eliminated
- Lower harmonic content than standard inverters
- Less space than a conventional converter
- Up to 22% lower power infeed
- No additional heat generated through braking
- Cost and space savings

Example:

An application with a hoist drive of a stacker crane was made using standard technology compared with 'Efficeient Infeed Technology'. The result was a cost saving of 40% and a space saving of 77%. How was this achieved?

Reduced costs:

No Input Choke required
No braking resistors required
Lower Energy costs

Reduced space:

No Input Choke required
No braking resistors required

	Standard Technology	Efficient Infeed Technology
Line reactor	Required	Not required
Braking resistor	Required	Not required
Configuration overhead	Standard	Low
Generated harmonics	Standard	Minimal
Heat generated when braking	Yes	No
Power infeed	Standard	Approx. 22% less
Power consumption	Standard	Approx. 22% less
Energy efficiency	Standard	Good
Reactive power compensation	No	Yes
Installation outlay	Standard	Low

G_D011_EN_00182

Release energy-saving potential and optimise energy usage

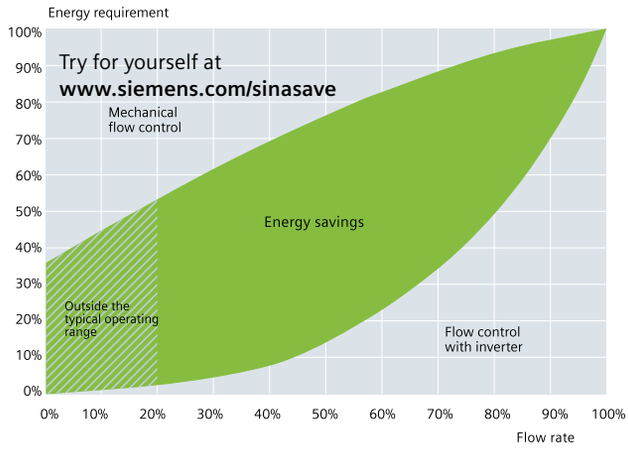
SINAMICS inverters with intelligent functions make it possible. Depending on the application and the load profile, with the intelligent energy-saving functions in SINAMICS inverters, energy usage can be reduced.

ECOmode - In the ECOmode, the motor operating point in the partial load range is automatically adapted and optimised. This function reduces motor losses for machines that do not require the high torque over the complete operating range.

Hibernation mode - Variable-speed drives that are temporarily used are switched into the hibernation mode. The drive is automatically reactivated depending on the demand.

Bypass mode - Using the bypass mode, the inverter is electrically bypassed as soon as the motor frequently operates close to its operating speed. This allows inverter losses to be avoided, and the overall efficiency increases.

Motor staging - In pump, fan and compressor applications requiring high power ratings, the complete power demand is distributed over several motors. These motors are switched in and out using partially or fully controlled cascades in conjunction with inverters, therefore facilitating an energy-efficient drive system.



Energy consumption values/energy-saving counter - During operation, the actual energy consumption can be output - or using an energy-saving counter - the amount of energy accumulated over the operating hours is compared to a fixed speed drive and the difference is output.

PROFIenergy for sustainability -
SINAMICS G with PROFINET interface supports PROFIenergy. PROFIenergy is a PROFINET-based profile that allows loads to be centrally coordinated and controlled independent of any particular manufacturer and device. Further, it can also provide standardised analytical data for the energy management process.

www.siemens.com/energy-efficiency-production

Integrated Safety in Drives

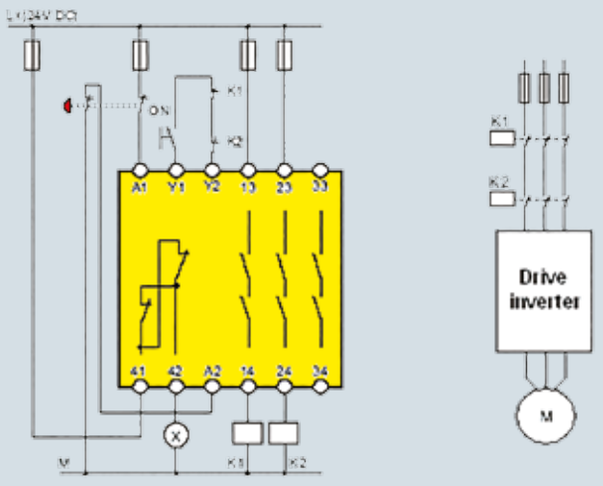
"The prevention of accidents should not be seen as a piece of legislation, but as moral obligation and sound economic sense."

Werner von Siemens, 1880

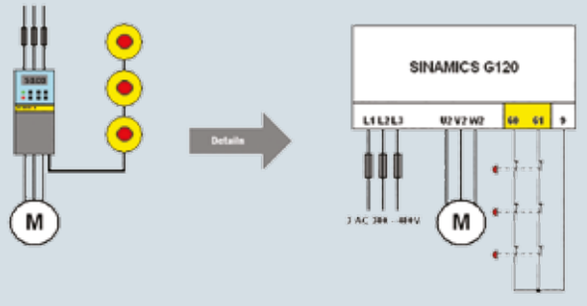
The trend towards greater complexity and increasing modularity in machines has seen a shift in safety functions away from traditional design (using contactors between drive and motor) and into the machine control system and drives. This gives many benefits:

- Complex hardware used to implement safety functions is no longer necessary
- Integrated safety functions act much faster than the traditional designs
- Implementation over a fieldbus e.g. Profibus to reduce wiring overheads
- Perceived to be less interfering so the temptation to bypass the safety system by the machine operator is significantly reduced
- Comprehensive diagnostics reduce downtimes increasing productivity

Example - Traditional Safety System (STO)



Example - Integrated Safety Technology (STO)



The use of certified integrated safety functions simplifies the certification of the safety category that is required for a machine.

The implementation of safety concepts is based on the idea that safety-relevant events will first be detected, then evaluated, and then reacted upon. Fail-safe drives are characterised by their integrated safety functions, which they provide to the user as possible responses to safety-relevant events. The most important integrated safety functions available for Siemens drives are described below, as defined in Part 5-2 of the international standard IEC 61800 for variable-speed drive systems.

Description of Safety functions:

- **Safe Torque Off (STO)**
  This function disables the drive pulses and stops the motor developing torque - zero torque condition
- **Safe Stop 1 (SS1)**
  The drive brakes the motor and then activates the STO function and SBC (if used)
- **Safely Limited Speed (SLS)**
  This function monitors the drive and depending on the mode selected either limits the motor speed to a safe value or monitors for maximum speed as set in parameters
- **Safe Brake Control (SBC)**
  This function safely applies a holding brake after STO is activated, which means that the drive can no longer move, e.g. due to gravity
- **Safe Direction Detection (SDI)**
  This function ensures that a selected direction of rotation is maintained
- **Safe Stop 2 (SS2)**
  Like the SSI function, the SS2 function actively decelerates the motor, however when stationary the SOS function is used instead of STO
- **Safe Operating Stop (SOS)**
  The stationary motor is held in position and monitored by the drive. Full torque is available. SOS is ideal for applications where the drive must apply a holding torque i.e waiting for a machine function to finish
- **Safe Speed Monitor (SSM)**
  This function reports if the speed goes below a specified speed. No drive-autonomous response occurs

Safety Integrated certified to EN954-1,

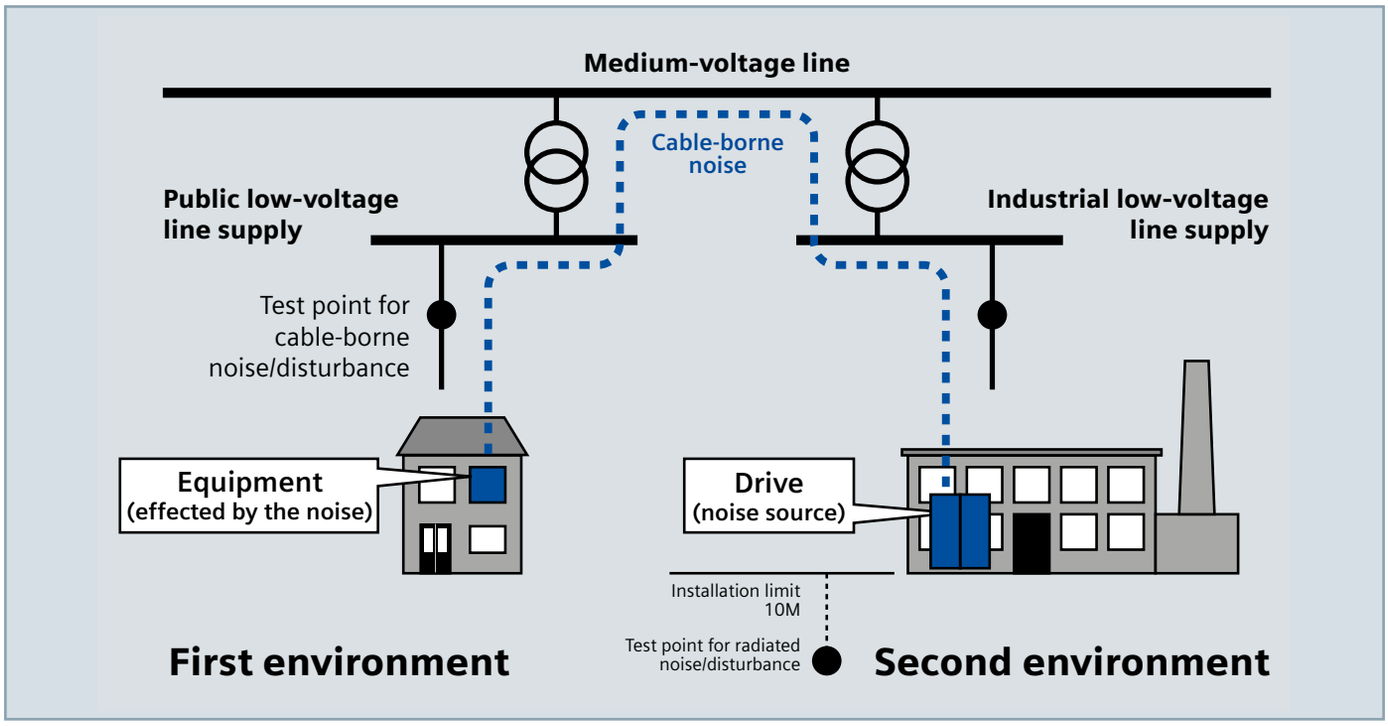
EN ISO 13849-1 PLd & Cat3, IEC61508 SIL2.

Note: Not all Siemens drives have integrated safety functions. The functions available on each drive are drive dependent and some functions may require a licence.

Electromagnetic Compatibility (EMC)

Electromagnetic compatibility describes - according to the definition of the EMC directive - "the capability of a device to work satisfactorily in the electromagnetic environment without itself causing electromagnetic interferences which are unacceptable for other devices present in this environment". To guarantee that the appropriate EMC directives are observed, the devices must demonstrate sufficiently high noise immunity, and also the emitted interference must be limited to acceptable values.

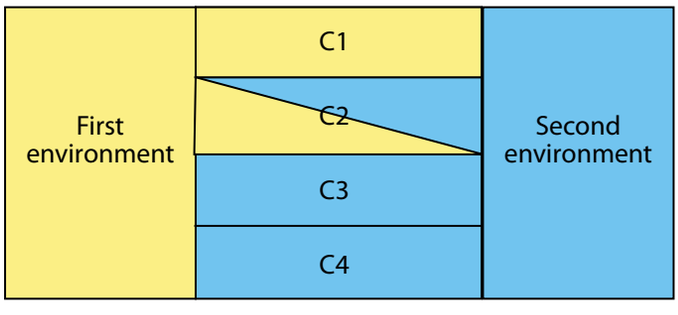
The EMC requirements for variable-speed drive systems are described in the product standard EN 61800-3. A variable speed drive system (or power drive system, PDS) consists of the drive converter and the electric motor including cables. The driven machine is not part of the drive system. EN 61800-3 defines different limits depending on the location of the drive system, referred to as the first and second environments:



The **first environment** comprises living accommodation or locations where the drive system is directly connected to the public low-voltage network without an intermediate transformer.

The **second environment** is understood to be all locations outside living areas. These are basically industrial areas which are powered from the medium-voltage network via their own transformers.

Four different categories are defined in EN 61800-3 Ed.2 depending on the location and the power of the drive:



Category C1: Drive systems for rated voltages < 1000 V for unlimited use in the first environment.

Category C2: Stationary drive systems for rated voltages < 1000 V for use in the second environment. Use in the first environment is possible if the drive system is installed and used by qualified personnel. The warning and installation information supplied by the manufacturer must be observed.

Category C3: Drive systems for rated voltages < 1000 V for exclusive use in the second (industrial) environment.

Category C4: Drive systems for rated voltages > 1000 V or for rated currents > 400 A for use in complex systems in the second environment.

Notes: The level of EMC filtering should be selected to match the specific application and environment.

Correct installation techniques are mandatory in order to meet the requirements of the EMC directive and to comply with warranty requirements.

Further information regarding EMC can be found via the following links:

Control panels - The EMC Directive 2014/30/EU in Practice: https://support.industry.siemens.com/cs/gb/en/view/109739796

EMC - electromagnetic compatibility -Easy, manageable, comprehensible: https://support.industry.siemens.com/cs/gb/en/view/103704610

EMC design guideline 01/2012: https://support.industry.siemens.com/cs/ww/en/view/60612658

Video for EMC-compliant control cabinet configuration: https://www.youtube.com/watch?v=l4MPlTeHVfk

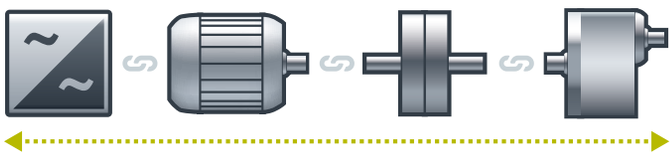
Integrated Drive Systems

Integrated Drive Systems is Siemens' trendsetting answer to the high degree of complexity that characterises drive and automation technology today. The world's only true one-stop solution for entire drive systems is characterised in particular by its threefold integration: Horizontal, vertical, and lifecycle integration ensure that every drive system component fits seamlessly into the whole system, into any automation environment, and even into the entire lifecycle of a plant.

The outcome is an optimal workflow – from engineering all the way to service that entails more productivity, increased efficiency, and better availability. That's how Integrated Drive Systems reduces time to market and time to profit.

Horizontal integration

Integrated drive portfolio: The core elements of a fully integrated drive portfolio are frequency converters, motors, couplings, and gear units. At Siemens, they're all available from a single source. Perfectly integrated, perfectly interacting. For all power and performance classes. As standard solutions or fully customized. No other player in the market can offer a comparable portfolio. Moreover, all Siemens drive components are perfectly matched, so they are optimally interacting.



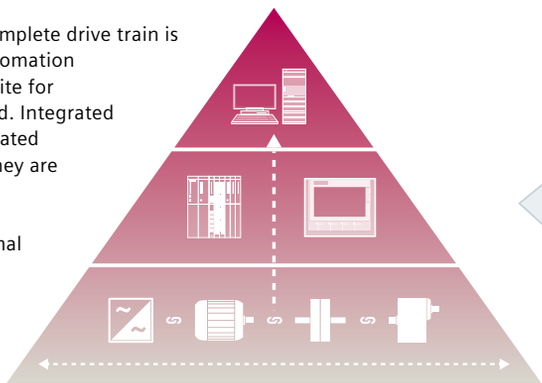
You can boost the availability of your application or plant to up to

99%*

*e.g., conveyor application

Vertical integration

Thanks to **vertical integration**, the complete drive train is seamlessly integrated in the entire automation environment – an important prerequisite for production with maximum value added. Integrated Drive Systems are part of Totally Integrated Automation (TIA), which means that they are perfectly embedded into the system architecture of the entire industrial production process. This enables optimal processes through maximum communication and control.



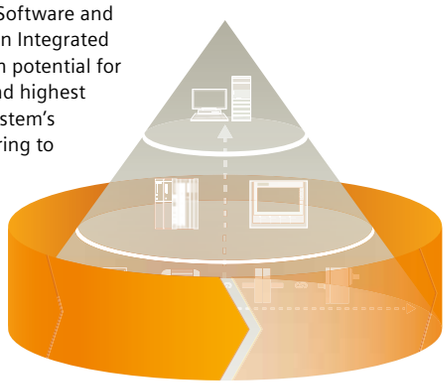
With TIA Portal you can cut your engineering time by up to

30%

Lifecycle integration

Lifecycle integration adds the factor of time: Software and service are available for the entire lifecycle of an Integrated Drive System. That way, important optimization potential for maximum productivity, increased efficiency, and highest availability can be leveraged throughout the system's lifecycle – from planning, design, and engineering to operation, maintenance, and all the way even to modernization.

With Integrated Drive Systems, assets become important success factors. They ensure shorter time to market, maximum productivity and efficiency in operation, and shorter time to profit.



With Integrated Drive Systems you can reduce your maintenance costs by up to

15%

siemens.com/ids

Low Voltage Motors

Low Voltage Motors

As global market leaders, we ship more than 16,000MW of motor power annually - a complete portfolio of standard motors and customised designs which cover every application from pumps, fans and compressors through to highly sophisticated drive systems .

Technical data	
Frame Sizes	63 - 450
Power Range	0.09 to 1,250kW
Number of Poles	2, 4 ,6, 8
Degree of Protection	IP55 (or greater)
Voltages	All commom voltages
Frequency	50Hz and 60Hz
Design	B3, B5, B35, B14 and others
Enclosure	Aluminium: 63 - 225 frame Cast Iron: 71 - 450 frame
Type of Cooling	Fan or Force Cooled
Temperature Class	F, utlised according to B
Insulating System	Inverter-proof insulation system DURIGNIT ® IR 2000

Features and Benefits

- IE1 - IE4 motors in standard frame sizes - no increase in frame due to higher efficiency
- Available for direct online as well as variable speed drive operation including IE4
- Rotatable terminal box
- Service factor of up to 1.2
- Inverter resistant patented insulation system (supply voltages <500V)
- Modular mounting concept including force ventilation kits, encoders and brake modules
- Increased power line: with one standard power step higher - with the same shaft height

Energy Efficiency Legislation

Important dates and minimum efficiency requirement as per EuP are;

1st Jan 2015

IE3 for 7.5kW to 375kW or IE2 plus Inverter

1st Jan 2017

IE3 for 0.75kW to 375kW or IE2 plus Inverter

Performance Line Range

Cast iron motors for rugged environements and come with following features as standard:

Thermistors

- 63 Bearing size for increased cantilever forces
- Steel rating plate
- Metal fan cowl
- C3 Paint finish
- Regreasable bearings from 160 frame
- 3 Year Warranty

Ideal solution for Water (WIMES) and Process Industries

SIMOTICS FD Motors

- Converter-optimized low-voltage induction motors
- Rugged cast iron design available in Air Cooled (IC411/ IC416), Water Cooled and Open Air Cooled
- 200 kW - 1600 kW in Shafts 315, 355, 400 and 450
- Flexible terminal box positions
- Motor designed for rated pulsefrequency of Siemens Drives
- Options for Condition Monitoring
- Hazardous Zones 2 or 22 version
- Cooling is realized through the slots in square laminated stator core. Two separate cooling circuits ensure even temperature distribution in the active motor area increasing motor's life-time

VSD10 Motor Range

- Motors designed specifically for inverter duty
- Available from 2.2kW - 200kW
- KTY protection as standard
- Guaranteed motor power when fed from Siemens drive
- Fast and straightforward commissioning by transferring the motor code to the converter
- Flexible operation (4Q) possible with SINAMICS G/S converters (ALM,SLM,BLM)
- Suited for frequent switching operation cycles due to low moment of inertia

Hazardous Area Motors

- Up to IE3 efficiency Hazardous Area Motors
- Cast Iron design for Zone 1
- Zone 2, 21 & 22 in Cast Iron and Aluminium
- The motors are designed in accordance with Directive 94/9/EC (ATEX 95 previously ATEX 100a)
- LOHER Chemstar range - specifically designed for extreme hazardous enviornments. Available with up to IP67 protection, temperature range of -55°C to 70°C and Grade B Vibration

Please send motor enquiries to Sales.GBI.industry@siemens.com or call 08458 507600 for assistance

Gearboxes

SIMOGEAR - Siemens Standard Geared Motor

	Inline Geared Motor	Flange Mounted Geared Motor	Helical Bevel 2-stage	Helical bevel 3-stage	Worm Geared Motor 2-stage	Worm Geared Motor 1-stage
						
Gear Unit Size	E39...E149 (1-stage) Z19...Z189 (2-stage) D19...D189 (2-stage)	FZ29...FZ229 (2-stage) FD29...FD229 (3-stage)	B19...B49 (2-stage)	K39...K229 (3-stage)	C29...C89 (2-stage)	S09...S29 (1-stage)
Ratio Range	1,1...10 (1-stage) 3,4...60,97 (2-stage) 39.34...330 (3-stage) 250...50,000 (mulit-stage)	3,57...60,21 (2-stage) 46,36...357 (3-stage) 250...50,000 (multi-stage)	3,47...59,28 (2-stage)	5,17...244 (3-stage) 250...50,000 (multi-stage)	10,290 (2-stage) 250...25,000 (multi-stage)	5...100 (1-stage)
Max Motor Power (kW)	200	200	7.5	200	15	0.75

SIEMENS Standard Gear units offer you all the options you need to drive your equipment. With the most comprehensive range of Mechanical Transmission products in the field Siemens can give you a standard solution with a fast delivery from our site in Leeds or an industry specific solution. Alternatively we can use our onsite design department to help you design a fully customised mixture of our products to give you the most optimised solution.

Siemens - Comprehensive Range of Couplings

		Couplings	Flexible Couplings	High Flexible Couplings
Overall torque range 10...10,000,000 Nm	Overall size range: 48...2800 mm	FLUDEX (Fluid Coupling)	N-EUPEX (Claw Coupling)	ELPEX (Rubber Coupling)
				
		ARPEX (All steel disc Coupling)	BIPEX (Jaw Coupling)	ELPEX-B (Rubber Tire Coupling)
				
		ZAPEX (Gear Coupling)	RUPEX (Pin & Bush Coupling)	ELPEX-S (Rubber Disc Coupling)
				

Siemens has the most comprehensive range of couplings in the world. So regardless of what your application is we have the right coupling for you. We can meet any torque or speed requirement you have and bridge any DBSE your systems demands. Using our vast range we can create hybrid systems to include mechanical torque limiters and/or soft starts. We can absorb your high vibrational loads or give precise positioning.

TIA Portal - StartDrive

With the Totally Integrated Automation Portal (TIA Portal), Siemens follows a vision of providing an engineering framework for implementing automation solutions in all industries around the globe. From designing, commissioning, operating and maintaining to upgrading automation systems, TIA Portal saves engineering time, cost, and effort. and second environments:

With the integration of SINAMICS Startdrive , our vision now extends to drive technology. This means that a wealth of functions are provided – but at the same time with simple usability.

- The same user navigation for control system, HMI and drive technology increases the engineering productivity and reduces the potential for making errors
- A common hardware configuration for all components of the application facilitates that the converter automatically goes online, even beyond network boundaries (routing functionality). This significantly simplifies commissioning.
- Common data management for the control system and converter in one tool automatically guarantees consistency, e.g. the bus address and message frame types. As a consequence, commissioning times and potential errors are significantly reduced
- A common library concept guarantees the simple reusability of the converter, including the parameters and hardware components
- The effective and intuitive communication connection between the converter and the control using drag & drop simplifies configuring considerably
- Useful functions such as undo/redo or copy/paste, known from the Windows environment, facilitate an intuitive workstyle and allow drive configurations to be simply copied

SINAMICS StartDrive is available with Simatic V14, can be ordered as a ‘Stand’ alone package with the following Order number: 6SL3072-4DA02-0XG0 or can be downloaded via our support site via the flowing link:

http://support.automation.siemens.com/WW/view/en/68034568

The following drives are integrated into StartDrive:

G120 (CU230P-2, CU240B-2, CU240E-2, CU250S-2), G120P, G120C, G120D, G110M and V90 Profinet

SINAMICS StartDrive offers significant benefits

- Users can easily parameterize their converters supported by user-friendly wizards and screen forms
- For the experienced user the complete parameter list is available
- The various steps when engineering a converter are intuitively structured according to the particular task and promote a structured workflow
- Additional user-friendly functions – for example toggling between SI/US units for the converters – simplify engineering
- Intuitive parameterization of the safety functions integrated in the drive using graphic screen forms.
- Simple configuration of the matching SIMOTICS motors.
- Diagnostics are passed through to the PLC/HMI in plain text
- The trace function allows you to easily remedy faults when commissioning on after installation

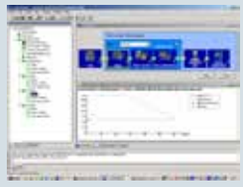
Experience once gained – for example how to configure acontrol system – can be simply applied when configuringthe converter. This significantly reduces training and engineering costs.

Drives Software & Configurators

SIZER Configuring Tool

The SINAMICS MICROMASTER SIZER tool supports the sizing, configuration and selection of the components required for drive applications step by step. A parts list, technical specifications, characteristic curves and dimensions drawings are then available to export.

Sizer can be purchased on DVD with order code 6SL3070-0AA00-0AG0 or downloaded free of charge if you hold a license from a purchased version at: www.siemens.com/sizer



STARTER Commissioning Tool

STARTER is the graphical commissioning package for the MICROMASTER and SINAMICS Drive range. Simple wizards to guide you through the commissioning stages gives you the ability to generate user definable parameter sets and take control of the drive locally. STARTER can run as a stand-alone PC application, however the tool is also integrated Drives ES and SIMOTION SCOUT.

Starter can be purchased on DVD with order code 6SL3072-0AA00-0AG0 or downloaded free of charge if you hold a license from a purchased version at: www.siemens.com/starter

SINAMICS StartDrive

SINAMICS StartDrive is the optional Drive Tool that can be integrated into the TIA Portal and can be used for configuring, commissioning and performing diagnostics.

For more information please see the information on the opposite page or on the web at www.siemens.com/startdrive

Micromaster Migration Tool

If you want the SINAMICS equivalent of your current Micromaster 420, 430 or 440 than please use our 'Migration Tool'. Just type in the part number of your Micromaster and you will be given a recommended SINAMICS equivalent and alternatives.

To try the tool please use the following link:

http://www.automation.siemens.com/mc-app/mm4Converter/index.html

DT Configurator

The Drive Technology (DT) Configurator supports you when selecting the optimum products for your application – starting from gearboxes, motors, converters as well as the associated options and components up to control systems, software licenses and connection systems. Whether with little or detailed product knowledge you can easily, quickly and efficiently configure your particular drive using product group pre-eselectors, targeted navigation through selection menus or by entering item numbers directly to select the products. You can find the DT Configurator at: www.siemens.com/dtconfigurator

SINASAVE

SinaSave software calculates the great savings possible for your motor and drive applications (up to 70 percent is possible) and how quickly your investment in an energy-efficient

www.siemens.com/sinasave

APPs

The following Apps are available free of charge for both Apple and Android devices at:

www.siemens.com/industry-apps

Sinamics Selector

Sinamics Support

Online Support

Industry Services

Service, Spares, Technical Support

From project concept to implementation and beyond, Siemens Industry provides comprehensive life cycle support:

- Field service – Service Engineers performing installation, commissioning, maintenance and breakdown recovery
- Technical support
- Application consultancy and Product Specialists
- Spares - Warranty handling, spare parts, service exchange and repairs
- Optimisation and Modernisation
- Online – a comprehensive information system available on the internet

In addition to the above, we offer a number of proactive services to enhance the availability and performance of all types of installations, such as:

Service / maintenance contract options

- 7 days / week, 365 days / year
- Fast response to site
- Tailored service contracts available to meet individual customer requirements

Asset management options

- Plant maintenance management – including preventative measures
- Bonded stock availability
- Repair contracts
- Software update service (SUS)
- Leasing

Process improvement strategies

- Consultancy
- Site audits

SITRAIN - Customer Training Solutions

Customer training is part of a range of Siemens support programmes aimed at optimising the skills of staff involved in designing, installing and maintaining Siemens automation and drives systems.

As part of the comprehensive programme of training solutions for Siemens automation and drives applications, SITRAIN offers the following SINAMICS G120 Drives Course which can be attended in standard format as a scheduled course. Alternatively the course can be tailored to customer requirements and delivered either at Siemens or the customer site.

Professional Training from SITRAIN

- Is the fastest way to acquire knowledge
- Reduces the cost of downtime and system building
- Assists the retention of staff
- Builds staff confidence and competence
- Supported QA and Health & safety requirements
- Offers Siemens certification options

SINAMICS G120 Parameterizing & Commissioning course.

Code: DR-G12-PM (3 days) £1500.00 + VAT per person.

This is a practical introduction to commissioning and maintaining the SINAMIC G120 drive, as well as the use of associated software, and includes:

- SINAMICS Overview
- SINAMICS G120 Hardware Overview
- Commissioning with STARTER
- Control Word, Status Word, Setpoint
- Parameters and BICO Technology
- Integration in SIMATIC
- Control
- Converter Functions
- Data Management
- Diagnostics
- Safety Functions – Safety Integrated

Drives Training Solutions

As well as training for the SINAMICS G120 drives family, SITRAIN UK can deliver drives training solutions for Masterdrive VC, Micromaster MM4, SINAMICS G110, S120, S150, G130, G150, SINAMICS DC and Perfect Harmony Drives.

Customer Care Centre

From UK Tel: 08458 507600
From IRL Tel: 1890 507600
E-mail: service.gbi.industry@siemens.com

Send your Technical Support request directly to a Siemens Technical Support expert via our on-line Support Request: www.siemens.co.uk/automation-sr

For all your training needs and to make a booking, contact:

Tel: +44 (0)161 446 6111
Fax: +44 (0)161 446 5742
E-mail: training.ad.uk@siemens.com
Internet: www.siemens.co.uk/sitrain

Useful Information

Catalogues		
Standard Drives	SINAMICS G110 SINAMICS G120C SINAMICS G120 SINAMICS G110M SINAMICS G110D SINAMICS G120D SINAMICS S110 SINAMICS G120P	D31 D31 D31 D31 D31 D31 D31 D35
Engineered Drives	SINAMICS S120	D21.4
Large Drives	SINAMICS G130 / G150	D11
DC Drives	SINAMICS DCM	D23.1
Motion Control Motors		PM21
Low Voltage Motors		D81.1
Gearboxes	Simogear Geared Motors G110M Simogear Gearboxes	MD50.1 MD50.1 MD50.11

Please call our literature hotline on 0845 7 70 50 70 to obtain any of the above catalogues or further information on the complete range of automation and drives products. Alternatively, literature can be ordered on line at: www.siemens.co.uk/automationliterature

Websites	
Siemens Industry	www.siemens.co.uk/industry
Siemens Drives Technologies Home page	www.siemens.co.uk/drives
SINAMICS V20	www.siemens.com/sinamics-V20
SINAMICS V90	www.siemens.com/sinamics-V90
SINAMICS G110	www.siemens.com/sinamics-G110
SINAMICS G120C	www.siemens.com/sinamics-G120C
SINAMICS G120P	www.siemens.com/sinamics-G120P
SINAMICS G120	www.siemens.com/sinamics-G120
SINAMICS G110M	www.siemens.com/sinamics-G110M
SINAMICS G110D	www.siemens.com/sinamics-G110D
SINAMICS G120D	www.siemens.com/sinamics-G120D
SINAMICS MICROMASTER	www.siemens.com/micromaster
SINAMICS S110	www.siemens.com/sinamics-S110
SINAMICS S120	www.siemens.com/sinamics-S120
SINAMICS G130	www.siemens.com/sinamics-G130
SINAMICS G150	www.siemens.com/sinamics-G150
Motors	www.siemens.com/motors
Geared Motors	www.siemens.com/gearedmotors
Pumps, Fans and Compressors	www.siemens.com/pumps www.siemens.com/fans www.siemens.com/compressors
Solution Partners	www.siemens.com/automation/solutionpartner
DT Configurator	www.siemens.com/dtconfigurator
SIANSAVE	www.siemens.com/automation/sinasave
Industry Apps	www.siemens.com/industry-apps

From UK Tel: 08458 507600 From IRL Tel: 1890 507600
E-mail: sales.gbi.industry@siemens.com

Siemens Drives and Motor Enquiry Sheet

Type of Application		
Quantity		
Supply Voltage		If other, please specify
Type of Drive		
Basic project requirement		
Cable lengths		
Environmental Conditions		

Customer Contact Details

Name	
Company	
Tel	
Email	
Customer Ref.	
Siemens Ref.	

Notes

Company Structure	
Specified Business/Relationship with Siemens	
Decision Maker	
Timescales	
Assistance required	
Serial/one off	
Trading Information	
Budget or detailed quote	

Motor Specifications

Speed (rpm)		Feed back device	
Load Torque (Nm)		Rotary/Linear movement	
Rated Voltage (v)		Mass to be moved	
Rated Output (kW)		Interis or torque speed requirements	
Min Load Speed (rpm)		Required velocity	
Power at Min Load Speed		Type of mechanical arrangement	
Max Load Speed		Brake required	
Power at Max Load Speed		Hanging load or hoisting application	
Paint finish, if any		Environment conditions	
Type of cooling		Special considerations	
Motor Altitude (m)			

Drive Specifications

Power (kW)			Safety Integrated	
Drive Altitude (m)			Harmonic Considerations	
Type of Control Required			Type of Cooling Required	
Load Characteristics		If other, please specify	RFI / EMC Requirements	
Overload Requirements		If other, please specify	Output Choke	
IP Protection		If other, please specify	Machine duty cycle	
Braking		If other, please specify		
Braking Cycle				
Number of axis required				
Power ride through function				

Panel Requirements

Type of cooling	
Panel Glanding	
Cable requirements std/flex	
Standard panel mounting kit	
Bulkhead connections	
Door mounted operator interface	

Customer specific requirements

Customer Capability of PLCs		PLC - Will system include PLC control, if so which	
Is training/support required		Type of communication bus	
Is a RSC contract required		Is there a size restriction for the elcetrical panels	

Siemens
Sir William Siemens House
Princess Road
Manchester M20 2UR

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www.siemens.co.uk/drives