

SIEMENS



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Shortform Catalogue

Variable Speed Drives October 2013

SINAMICS G110
SINAMICS G120C
SINAMICS G120P
SINAMICS G120
SINAMICS G110D
SINAMICS G120D

SINAMICS S110
SINAMICS G130 / G150
SINAMICS S120
MICROMASTER 420 / 430 / 440
High Efficiency Motors
Integrated Drive Systems

Drives Overview

Variable Speed Drives



SINAMICS G110

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

This compact entry level drive is the ideal solution for low cost, low power solutions such as small pumps and fans, barriers, doors and billboards.

Full details can be found on pages 7 and 8



SINAMICS G120C

0.55 kW ... 18.5 kW, 380 V ... 480 V 3 AC

The SINAMICS G120C is a compact variable speed specifically designed for OEMs 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 and extruders.

Full details can be found on pages 9 and 10



SINAMICS G120P

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

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

The SINAMICS G120P is an IP55 or IP20 rated innovative, energy efficient variable-speed 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 panel.

Full details can be found on pages 11 and 12



SINAMICS G120 Modular

0.37 kW ... 250 kW, 380 V ... 480 V / 500 V ... 690 V 3 AC

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.



(depending on Control Unit and Power Module)

Full details can be found on pages 13 to 22

Distributed Drives



SINAMICS G110D

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

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

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.



Full details can be found on pages 23 to 26

Simple Servo / Positioning Drive



SINAMICS S110

0.12 kW ... 0.75 kW, 200 V ... 240 V 1 AC

0.37 kW ... 90 kW, 380 V ... 480 V 3 AC



Many applications in machine construction require accurate positioning from point X to point Y quickly and precisely by the simplest possible method. The SINAMICS S110 is an ideal solution for this type of application and is specifically designed to position an axis accurately and effectively.

Full details can be found on pages 27 and 28



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



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.

Brief details can be found on page 29

Engineered Drive



SINAMICS S120

0.12 kW ... 0.75 kW, 200 V ... 240 V 1 AC

0.37 kW ... 3000 kW, 380 V ... 480 V 3 AC

75 kW ... 4500 kW, 500 V ... 690 V 3 AC

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
- Textiles
- Woodworking, glass and ceramics
- Machine tools
- Steel industry
- Hoisting and cranes
- and many more

Brief details can be found on page 29



MICROMASTER 420

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

0.37 kW ... 11 kW, 380 V ... 480 V 3 AC

The 'Universal' drive for a range of variable speed applications such as fans, pumps and conveyor systems.

MICROMASTER 430

7.5 kW ... 250 kW, 380 V ... 480 V 3 AC

The 'Specialist' for fans and pumps.

MICROMASTER 440

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

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

SINAMICS - Performance Levels

For every application, power rating and performance level

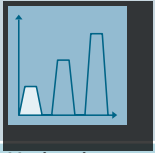
Simply select your application to see which SINAMICS inverter is the best choice - for every application, power rating and performance level.

Performance *		Continuous motion				
		Basic	Medium	High		
Purpose						
	Pumping Ventilating Compressing	Centrifugal pumps Radial / axial fans Compressors	G110 G120C G130/G150	Centrifugal pumps Radial / axial fans Compressors	G120C G120P G120 G130/ G150	Eccentric spiral / worm / screw pumps S120
	Moving	Belt conveyors Roller conveyors Chain conveyors	G110 G110D G120C G130/G150	Belt conveyors Roller conveyors Chain conveyors Vertical / horizontal material handling Elevators / escalators Gantry cranes Ship's drives Cable railways	G110D G120C G120 G130/ G150 S120	Elevators Container cranes Mine hoists Open cast mine excavators Test stands S120
	Processing	Mills Mixers Kneaders Crushers Agitators Centrifuges	G120C G130/G150	Mills Mixers Kneaders Crushers Agitators Centrifuges Extruders Rotary furnaces	G120C G120 G130/ G150	Extruders Winders / unwinders Leading / following drives Calendars Mechanical presses Printing machines Rotary furnaces S120
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	

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

Discontinuous motion

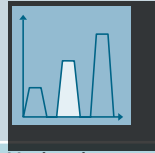
Basic



Hydraulic pumps
Dosing pumps

S110

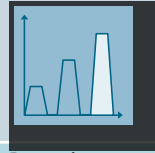
Medium



Hydraulic pumps
Dosing pumps

S110

High



Descaling pumps
Hydraulic pumps

S120

Accelerating conveyors
Rack feeders

G120D
S110

Accelerating conveyors
Rack feeders
Cross cutters
Roll changers

S110
S120

Rack feeders
Robotics
Pick & place
Indexing tables
Cross cutters
Roller feeds
Engaging/disengaging

S120

Tubular bagging machines
Single axis motion control i.e.

- Positioning profiles
- Path profiles

S110

Tubular bagging machines
Single axis motion control i.e.

- Positioning profiles
- Path profiles

S110
S120

Servo presses
Rolling mill drives
Coordinated multi-axis motion control i.e.

- Multi-axis positioning
- Can discs
- Interpolation

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

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 direction you wish to go, Siemens offers you the optimum drive – from one source for every application.

Solutions for your specific application

With SINAMICS, you always achieve your objectives. No matter whether it involves flow control applications such as pumps, fans and compressors, or processing applications such as extruding and crushing; from lifting and moving applications such as conveyors and elevators to complex motion control applications such as milling, turning and machining – Siemens SINAMICS drives offer you a unique range of power and performance.

Minimise your costs

The engineering costs for configuring and commissioning drive solutions must be kept as low as possible. Using SINAMICS, you minimize your costs – with integrated and standard tools for selecting, configuring and commissioning – permitting fast, straightforward engineering at a favorable cost.



G120 Control Unit CU250S-2 VECTOR

The Control Unit CU250S-2 Vector is the successor of the popular CU240S for applications requiring accurate speed / torque control or positioning utilizing encoder feedback.

Technical Information

The CU250S-2 Control Unit has the following inputs and outputs and are classified as 'Failsafe' devices:

- 11 digital inputs, isolated, PNP/NPN switching
- 6 digital inputs of the total can be used as F-DI
- 2 digital outputs as F-DO, relay NO/NC, 30V DC 0.5A
- 1 digital output as open collector 30V DC 0.5A
- 2 analogue inputs 0 - 10V, 0/4 - 20mA
- 2 analogue outputs 0 - 10V, 0/4 - 20mA
- 1 motor temperature sensor input for PTC, KTY, Thermo-Click
- +24V output connections , +24V/200mA and +10V/10mA

Communication Interfaces:

- RS485/USS/Modbus, Profibus DP, Profinet/Ethernet IP and CANbus

Encoder Interfaces:

- Terminals: Resolver or HTL
- Sub D Connector: TTL/HTL,SSI
- Drive CLiQ: TTL/HTL, SSI, Resolver, EnDat, DQ Encoder

A matrix is included in the technical documentation detailing the combinations of encoders that can be used together.

Safety:

The CU250S-2 has Safe Torque Off (STO), Safe Stop 1 (SS1) and Safe Brake Control (SBC) as standard.

Safe Speed Monitor (SSM), Safe Direction Indication (SDI) and Safe Limited Speed (SLS) are available as a licensed option loaded on to a SD Card. See page 50 for details on these functions.

The CU250S-2 can be used on the following Power Modules Vector - PM240, PM240-2, PM250 and PM340 1 phase.

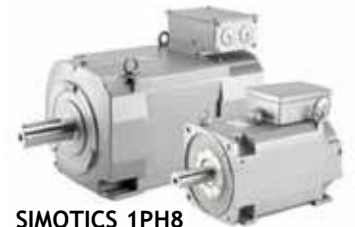
CU250S-2 VECTOR Application area

Performance *	Continuous motion			Discontinuous motion		
	Basic	Medium	High	Basic	Medium	High
Pumping Ventilating Compressing	Radial / axial fans Compressors G120		/ screw pumps	Dosing pumps	Dosing pumps	Hydraulic pumps
Meching	Roll conveyors Roller conveyors G120 G120 Clean conveyors G120	Extruders Control systems Rise headers Open End view Inverters Text stands	Accelerating conveyors Roll headers	Accelerating conveyors G120 Cross cutters Roll changers	Accelerating conveyors S110 Cross cutters Roll headers Charging/charging	Roll headers S110 Rolling Pick & place Cross cutters Roll headers Charging/charging
Automation		Extruders Winders / junctions Landing / following drives Calculators Mechanical presses Pressing machines Rotary furnaces	Tubular bagging conveyors Single axis motion control i.e. - Positioning profiles - Path profiles	S110 Tubular bagging conveyors S110 Coordinated multi-axis motion control i.e. - Multi-axis positioning - Can drive - Interpolation	S110 Servo presses S110 Rolling mill drives Coordinated multi-axis motion control i.e. - Multi-axis positioning - Can drive - Interpolation	S110
Meching	main drives i.e. S110 Turning Milling Drilling	main drives i.e. S110 Turning Milling Drilling Gear cutting Grinding	main drives i.e. S110 Turning Milling Drilling	main drives i.e. S110 Turning Milling Drilling	main drives i.e. S110 Turning Milling Drilling Laser machining Gear cutting Grinding Hobbing and planishing	main drives i.e. S110

Motors:

The CU250S-2 Vector is capable of controlling a variety of asynchronous motors e.g.

SIMOTICS 1LA7/1LE1

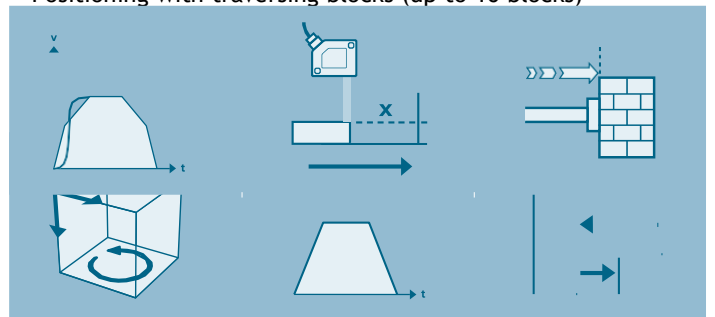


SIMOTICS 1PH8

Positioning with EPos:

The EPos (Easy Positioning) is available as a licensed option loaded onto a SD Card. The functions available are:

- Linear axis and rotary axis
- Absolute and relative positioning
- Speed, acceleration/deceleration and jerk limitation can be specified
- Travel to fixed stop
- Monitoring functions
- Intervention (e.g. setpoint changes) possible, even during movement
- Operating Modes
- Direct setpoint value specification (MDI)
- Positioning with traversing blocks (up to 16 blocks)



Linear & rotary axes

Positioning

Automatic
positioning

Travel to fixed
stop

Migration from CU240S to CU250-2 VECTOR				
CU240S	Part Number	CU250S-2	Part Number	Options required for CU250S-2
CU240S (RS485)	6SL3244-0BA20-1BA0	CU250S-2 (RS485), (STO, SBC and SS1)	6SL3246-0BA22-1BA0	-
CU240S DP	6SL3244-0BA20-1PA0	CU250S-2 DP (STO, SBC and SS1)	6SL3246-0BA22-1PA0	-
CU240S DP-F (STO, SBC, SS1, SLS)	6SL3244-0BA21-1PA0	CU250S-2 DP (STO, SBC and SS1)	6SL3246-0BA22-1PA0	SD card with Extended Safety license (SLS, SSM, SDI) 6SL3054-4AG00-2AA0-Z F01
CU240S PN	6SL3244-0BA20-1FA0	CU250S-2 PN (STO, SBC and SS1)	6SL3246-0BA22-1FA0	-
CU240S PN-F (STO, SBC, SS1, SLS)	6SL3244-0BA21-1FA0	CU250S-2 PN (STO, SBC and SS1)	6SL3246-0BA22-1FA0	SD card with Extended Safety license (SLS, SSM, SDI) 6SL3054-4AG00-2AA0-Z F01



The Ethernet Industrial Protocol (EtherNet / IP) is an open standard for industrial networks described in IEC 61158. EtherNet / IP is used to transfer cyclic I/O data and acyclic parameter data and was developed in association with the ODVA (Open DeviceNet Vendor Association) and is widely used as a standard communication protocol in the US.

EtherNet / IP uses the “Common Industrial Protocol” (CIP) as application layer. This application layer and open software and hardware interfaces allow seamless connection of automation components from the field level to the control level up to the management level.

- 10 and 100Mbit/s data communication with Ethernet Twisted Pair cables or optical transmission
- Switched Ethernet
- Construction with star, tree, ring, and other topologies
- Master slave principle
- Optional communication profile based on PROFIDRIVE or AC/DC drive profile according OVDA

EtherNet / IP is now available on all drives with Profinet communication from Firmware 4.6.

Motor Reactors

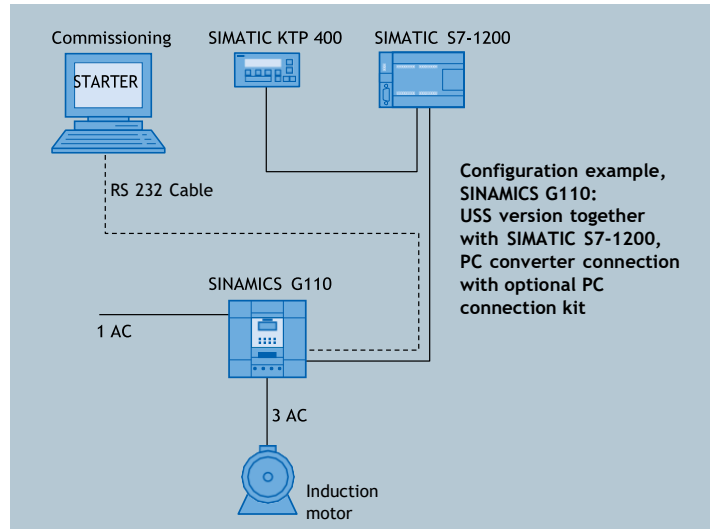
Motor Reactors or Output Reactors reduce the voltage loading on the motor windings. At the same time, the capacitive charge / discharge currents, which place an additional load on the power section when long cables are used are reduced.

Motor Reactors are now available for G120C, G120 PM230 IP55 and IP20 versions and PM240-2 Power Modules.



SINAMICS G110

The versatile single-motor drive for low power ratings



Design

The SINAMICS G110 is a variable speed drive with basic functions for a variety of industrial applications. This particularly compact drive operates with voltage frequency control on single phase supplies (200V to 240V) with power ratings of 0.12 kW to 3.0 kW. It's the ideal solution for low cost, low power applications.

Benefits

- Easy to install, parameterise and commission
- Fast series commissioning by copying parameters
- Flexibility - choice of Analogue or USS, with or without filter
- Dip switch to select 50/60 Hz
- Software functions for auto restart, flying restart, ramp smoothing and adjustable ramp up/down times
- Skip frequencies to avoid resonance
- Protection features for drive and motor
- Fast, repeatable digital inputs for fast reaction applications
- Fast current limiting when sudden load changes occur

Low cost does not mean compromise

- A maximum overload rating of 150% of rated output current for 60 seconds
- Standard pulse frequency of 8kHz without de-rating (extendable to 16kHz for low noise applications)
- Extensive protection features - Under Voltage, Over voltage, Earth Faults, Short Circuits, Stall protection. I²t motor thermal and motor and drive over temperature

Applications

- Conveyor, pump and fan
- Factory/garage door and barriers
- Moving billboards
- Applications in the food & beverage, packaging, textile and medical industries

Technical data	
Electrical data	SINAMICS G110
Line voltages	200 V... 240 V 1 AC ± 10%
Power ranges	0.12 kW ... 3.0 kW
Line supply types	TN, TT, IT (without filter)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 640 Hz V/f
Pulse frequency	8 kHz (up to 16 kHz with derating)
Open-loop control	V/f linear (with programmable voltage boost) V/f square, multipoint
Digital inputs (DI)	3
Digital outputs (DO)	1
Analog inputs (AI)	1 (0 ... 10V, or can be used as a 4th Digital input)
Analog outputs (AO)	0
Failsafe inputs (F-DI)	0
Communication interface	RS485/USS: Analogue
External interface to	PC via RS232, BOP
Functions	
Software functions	3 fixed frequencies (programmable), 1 skippable frequency (programmable) DC braking, compound braking
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, Thermal motor protection I ² T, motor overtemperature, inverter overtemperature
Safety functions	None
Mechanical data	
Degree of protection	IP20
Cooling type	Convection
Standards	
In conformance with the following standards	UL, cUL, CE, c-tick

SINAMICS G110

Part Numbers

Supply Voltage - 200 V ... 240 V 1 AC			Power Modules	
Rating	Frame Size	Type	Industrial	Filtered #
0.12 kW / 0.9 A	A	Analogue	6SL3211-0AB11-2UA1	6SL3211-0AB11-2BA1
		USS	6SL3211-0AB11-2UB1	6SL3211-0AB11-2BB1
0.25 kW / 1.7 A	A	Analogue	6SL3211-0AB12-5UA1	6SL3211-0AB12-5BA1
		USS	6SL3211-0AB12-5UB1	6SL3211-0AB12-5BB1
0.37 kW / 2.3 A	A	Analogue	6SL3211-0AB13-7UA1	6SL3211-0AB13-7BA1
		USS	6SL3211-0AB13-7UB1	6SL3211-0AB13-7BB1
0.55 kW / 3.2 A	A	Analogue	6SL3211-0AB15-5UA1	6SL3211-0AB15-5BA1
		USS	6SL3211-0AB15-5UB1	6SL3211-0AB15-5BB1
0.75 kW / 3.9 A	A	Analogue	6SL3211-0AB17-5UA1	6SL3211-0AB17-5BA1
		USS	6SL3211-0AB17-5UB1	6SL3211-0AB17-5BB1
1.1 kW / 6.0 A	B	Analogue	6SL3211-0AB21-1UA1	6SL3211-0AB21-1AA1
		USS	6SL3211-0AB21-1UB1	6SL3211-0AB21-1AB1
1.5 kW / 7.8 A	B	Analogue	6SL3211-0AB21-5UA1	6SL3211-0AB21-5AA1
		USS	6SL3211-0AB21-5UB1	6SL3211-0AB21-5AB1
2.2 kW / 11 A	C	Analogue	6SL3211-0AB22-2UA1	6SL3211-0AB22-2AA1
		USS	6SL3211-0AB22-2UB1	6SL3211-0AB22-2AB1
3 kW / 13.6 A	C	Analogue	6SL3211-0AB23-0UA1	6SL3211-0AB23-0AA1
		USS	6SL3211-0AB23-0UB1	6SL3211-0AB23-0AB1

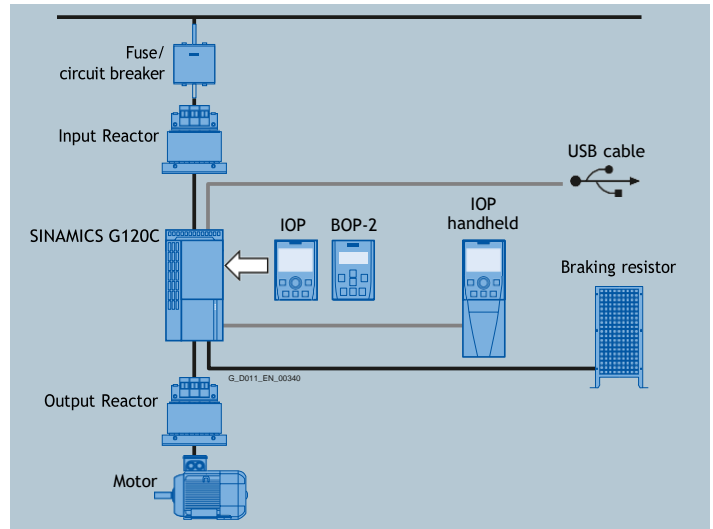
Version with flat heat sink also available.

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

Options	
6SL3255-0AA00-4BA1	Basic Operator Panel (BOP)
6SL3255-0AA00-2AA1	PC Connection Kit (inc connector, RS232 cable (3m) and Starter DVD)
6SL3097-4CA00-0YG1	Manual collection on DVD
6SL3072-0AA00-0AG0	STARTER commissioning tool (on DVD)

Supply Voltage - 200 V ... 240 V 1 AC		
Rating	Frame Size	Input Reactor
0.12 kW	A	6SE6400-3CC00-4AB3
0.25 kW	A	6SE6400-3CC00-4AB3
0.37 kW	A	6SE6400-3CC01-0AB3
0.55 kW	A	6SE6400-3CC01-0AB3
0.75 kW	A	6SE6400-3CC01-0AB3
1.1 kW	B	6SE6400-3CC02-6BB3
1.5 kW	B	6SE6400-3CC02-6BB3
2.2 kW	C	6SE6400-3CC02-6BB3
3 kW	C	6SE6400-3CC03-5CB3

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.

The compactness of this drive is achieved through the use of high power density components so only three frame sizes cover power ratings of 0.55 kW to 18.5 kW.

Benefits

- Compact design, high power density
- Available with and without filter and with Profibus DP, Profinet, CAN, USS & Modbus RTU Interfaces
- 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
- Integrated braking chopper, motor holding brake control (simplified)
- Integrated PID controller
- Analogue Input - Selectable between -10V .. +10V, 0/4 .. 20mA)
- STO Safety Function
- Coated boards for robustness
- Energy saving calculator, energy consumption calculator, automatic flux reduction, automatic flow 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	0.55 kW ... 18.5 kW
Line supply types	TN, TT, IT (without filter)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 650 Hz 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
Analogue inputs (AI)	1 (selectable between -10 ... +10V, 0/4 ... 20mA)
Analogue outputs (AO)	1
Failsafe inputs (F-DI)	1 (uses 2 digital inputs - DI14 & DI15)
Communication interface	RS485/USS/Modbus RTU: PROFIBUS DP: PROFINET: CANopen
External interface to	PC via USB, IOP or Handheld IOP, SINAMICS MMC card or SIMATIC SD card
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, kinetic buffering, DC braking, compound braking, braking with brake chopper, brake relay control via CU (simplified)
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	Convection
Standards	
In conformance with the following standards	cULus, CE, c-tick EN954-1 Cat3, EN ISO 13849-1 PLd, IEC61508 SIL2

SINAMICS G120C

Part Numbers

Supply Voltage - 380 V... 480 V 3 AC		Power Modules		
Rating	Frame Size	Communication Interface	Industrial	Filtered #
LO (VT)	HO (CT)			
0.55 kW / 1.7 A	0.37 kW / 1.3 A	A	USS/MOD Bus RTU 6SL3210-1KE11-8UB1	6SL3210-1KE11-8AB1
			Profibus 6SL3210-1KE11-8UP1	6SL3210-1KE11-8AP1
			Profinet 6SL3210-1KE11-8UF1	6SL3210-1KE11-8AF1
0.75 kW / 2.2 A	0.55 kW / 1.7 A	A	USS/MOD Bus RTU 6SL3210-1KE12-3UB1	6SL3210-1KE12-3AB1
			Profibus 6SL3210-1KE12-3UP1	6SL3210-1KE12-3AP1
			Profinet 6SL3210-1KE12-3UF1	6SL3210-1KE12-3AF1
1.1 kW / 3.1 A	0.75 kW / 2.2 A	A	USS/MOD Bus RTU 6SL3210-1KE13-2UB1	6SL3210-1KE13-2AB1
			Profibus 6SL3210-1KE13-2UP1	6SL3210-1KE13-2AP1
			Profinet 6SL3210-1KE13-2UF1	6SL3210-1KE13-2AF1
1.5 kW / 4.1 A	1.1 kW / 3.1 A	A	USS/MOD Bus RTU 6SL3210-1KE14-3UB1	6SL3210-1KE14-3AB1
			Profibus 6SL3210-1KE14-3UP1	6SL3210-1KE14-3AP1
			Profinet 6SL3210-1KE14-3UF1	6SL3210-1KE14-3AF1
2.2 kW / 5.6 A	1.5 kW / 4.1 A	A	USS/MOD Bus RTU 6SL3210-1KE15-8UB1	6SL3210-1KE15-8AB1
			Profibus 6SL3210-1KE15-8UP1	6SL3210-1KE15-8AP1
			Profinet 6SL3210-1KE15-8UF1	6SL3210-1KE15-8AF1
3.0 kW / 7.3 A	2.2 kW / 5.6 A	A	USS/MOD Bus RTU 6SL3210-1KE17-5UB1	6SL3210-1KE17-5AB1
			Profibus 6SL3210-1KE17-5UP1	6SL3210-1KE17-5AP1
			Profinet 6SL3210-1KE17-5UF1	6SL3210-1KE17-5AF1
4.0 kW / 8.8 A	3.0 kW / 7.3 A	A	USS/MOD Bus RTU 6SL3210-1KE18-8UB1	6SL3210-1KE18-8AB1
			Profibus 6SL3210-1KE18-8UP1	6SL3210-1KE18-8AP1
			Profinet 6SL3210-1KE18-8UF1	6SL3210-1KE18-8AF1
5.5 kW / 12.5 A	4.0 kW / 8.8 A	B	USS/MOD Bus RTU 6SL3210-1KE21-3UB1	6SL3210-1KE21-3AB1
			Profibus 6SL3210-1KE21-3UP1	6SL3210-1KE21-3AP1
			Profinet 6SL3210-1KE21-3UF1	6SL3210-1KE21-3AF1
7.5 kW / 16.5 A	5.5 kW / 12.5 A	B	USS/MOD Bus RTU 6SL3210-1KE21-7UB1	6SL3210-1KE21-7AB1
			Profibus 6SL3210-1KE21-7UP1	6SL3210-1KE21-7AP1
			Profinet 6SL3210-1KE21-7UF1	6SL3210-1KE21-7AF1
11 kW / 25 A	7.5 kW / 16.5 A	C	USS/MOD Bus RTU 6SL3210-1KE22-6UB1	6SL3210-1KE22-6AB1
			Profibus 6SL3210-1KE22-6UP1	6SL3210-1KE22-6AP1
			Profinet 6SL3210-1KE22-6UF1	6SL3210-1KE22-6AF1
15 kW / 31 A	11 kW / 25 A	C	USS/MOD Bus RTU 6SL3210-1KE23-2UB1	6SL3210-1KE23-2AB1
			Profibus 6SL3210-1KE23-2UP1	6SL3210-1KE23-2AP1
			Profinet 6SL3210-1KE23-2UF1	6SL3210-1KE23-2AF1
18.5 kW / 37 A	15 kW / 31 A	C	USS/MOD Bus RTU 6SL3210-1KE23-8UB1	6SL3210-1KE23-8AB1
			Profibus 6SL3210-1KE23-8UP1	6SL3210-1KE23-8AP1
			Profinet 6SL3210-1KE23-8UF1	6SL3210-1KE23-8AF1

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 300s 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 300s cycle.

EMC filtering suitable for 1st environment - see page 51 for specific categorisations.

Options	
6SL3255-0AA00-4CA1	Basic Operator Panel 2 (BOP-2)
6SL3255-0AA00-4JA1	Intelligent Operator Panel (IOP)
6SL3256-0AP00-0JA0	IOP/BOP-2 Door Mounting Kit
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
6SL3254-0AM00-0AA0	SINAMICS Micro Memory Card (MMC) 64MB
6SL3054-4AG00-2AA0	SINAMICS SD card 512MB

Supply Voltage - Three phase 380 V... 480 V		Power Modules		
Rating	Frame Size	Line Reactor	Output Reactor	Brake Resistor
LO (VT)				
0.55 kW - 1.1 kW	A	6SL3203-OCE13-2AA0	6SL3202-OAE16-1CA0	6SL3201-OBE14-3AA0
1.5 kW	A	6SL3203-OCE21-0AA0	6SL3202-OAE16-1CA0	6SL3201-OBE14-3AA0
2.2 kW	A	6SL3203-OCE21-0AA0	6SL3202-OAE16-1CA0	6SL3201-OBE21-0AA0
3.0 kW - 4.0 kW	A	6SL3203-OCE21-0AA0	6SL3202-OAE18-8CA0	6SL3201-OBE21-0AA0
5.5 kW - 7.5 kW	B	6SL3203-OCE21-8AA0	6SL3202-OAE21-8CA0	6SL3201-OBE21-8AA0
11 kW - 18.5 kW	C	6SL3203-OCE23-8AA0	6SL3202-OAE23-8CA0	6SL3201-OBE23-8AA0

SINAMICS G120P

The versatile single-motor drive for pumps, fans and compressors



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 3 ph 380-480V AC mains supplies and with power ranges of 0.37 kW to 90 kW.

Benefits

- Flexible - choice of Power and Control Module
- Wide Power range
- Versions with different IP ratings
- Advanced hardware and software solutions to reduce energy consumption
- Minimum harmonics - line reactor not needed
- ECO mode - adaption to load conditions
- Hibernation mode
- Multi Zone Control
- Automatic restart after power failure or fault
- Flying restart - control of a rotating load
- Integrated PID Controllers
- Essential Service Mode
- Isolated Digital Inputs and Outputs, Analogue Input
- Fast commissioning with Starter or StartDrive
- Wizards functions for commissioning, maintenance and diagnostics with IOP
- Parameter backup or cloning with MMC/SD card
- Real time clock

Applications

- Pumps for pressure boosting and level control
- Fans for cooling towers, air supply or extraction in tunnels, multi-story car parks or stairwells
- Compressors
- HVAC solutions

Technical data	
Electrical data	SINAMICS G120P PM230 with CU230P-2
Line voltages	380 V ... 480 V 3 AC, ±10 %
Power ranges	IP55: 0.37 kW ... 90 kW IP20: 0.37 kW ... 75 kW
Line supply types IP55	TN
Line supply types IP20	TN (filtered), TN/IT/TT (unfiltered)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 650 Hz V/f, 0 ... 200 Hz Vector
Pulse frequency	4 kHz (up to 16 kHz with derating)
Open loop control	V/f (linear, square law, FCC, ECO) Vector & Torque control without encoder
Digital inputs (DI)	6
Digital outputs (DO)	3
Analog inputs (AI)	4 (2 selectable -10..+10V, 0/4 ..20mA)
Analog outputs (AO)	2
Communication interface	RS485/USS/Modbus RTU/BACnet: PROFIBUS DP: Profinet: CANopen
External interface to	PC via USB, BOP-2, IOP or Handheld IOP, SINAMICS MMC card or SIMATIC SD card
Functions	
Software functions	Setpoint input, 16 fixed frequencies (programmable), ramp smoothing, jog, slip compensation, BICO technology, free function blocks, switchable data and command sets (4), flying restart, automatic restart, PID controllers (4), hibernation, belt and dry pump monitor, auto ramping, kinetic buffering, DC braking
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor overtemperature, inverter overtemperature, parameter locking
Safety functions	None
Mechanical data	
Degree of protection	IP55/UL Type 12 - with blanking cover or BOP-2 IP54/UL Type 12 - with IOP or IP20 version for cabinet mounting
Cooling type	Convection
Standards	
In conformance with the following standards	UL, CE, c-tick

SINAMICS G120P

Part Numbers

Control Units	Designation	Interfaces	DI	DO	AI	AO	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
6SL3243-0BB30-1CA3	CU230P-2 CAN	CANopen	6	3	4 [^]	2	No

DI - Digital Inputs, DO - Digital Outputs, AI - Analogue Inputs, AO - Analogue Outputs.

[^] 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.

Power Module PM230		Power Modules				
Supply Voltage - 380 V ... 480 V 3 AC						
Rating	Frame Size	PM230 IP55 Class A	PM230 IP55 Class B	PM230 IP20 Unfiltered	PM230 IP20 Class A	
LO (VT)	HO (CT)					
0.37 kW / 1.3 A	0.25 kW / 0.9 A	A	6SL3223-ODE13-7AA0	6SL3223-ODE13-7BA0	6SL3210-1NE11-3UL0	6SL3210-1NE11-3AL0
0.55 kW / 1.7 A	0.37 kW / 1.3 A	A	6SL3223-ODE15-5AA0	6SL3223-ODE15-5BA0	6SL3210-1NE11-7UL0	6SL3210-1NE11-7AL0
0.75 kW / 2.2 A	0.55 kW / 1.7 A	A	6SL3223-ODE17-5AA0	6SL3223-ODE17-5BA0	6SL3210-1NE12-2UL0	6SL3210-1NE12-2AL0
1.1 kW / 3.1 A	0.75 kW / 2.2 A	A	6SL3223-ODE21-1AA0	6SL3223-ODE21-1BA0	6SL3210-1NE13-1UL0	6SL3210-1NE13-1AL0
1.5 kW / 4.1 A	1.1 kW / 3.1 A	A	6SL3223-ODE21-5AA0	6SL3223-ODE21-5BA0	6SL3210-1NE14-1UL0	6SL3210-1NE14-1AL0
2.2 kW / 5.9 A	1.5 kW / 4.1 A	A	6SL3223-ODE22-2AA0	6SL3223-ODE22-2BA0	6SL3210-1NE15-8UL0	6SL3210-1NE15-8AL0
3.0 kW / 7.7 A	2.2 kW / 5.9 A	A	6SL3223-ODE23-0AA0	6SL3223-ODE23-0BA0	6SL3210-1NE17-7UL0	6SL3210-1NE17-7AL0
4 kW / 10.2 A	3 kW / 7.7 A	B	6SL3223-ODE24-0AA0	6SL3223-ODE24-0BA0	6SL3210-1NE21-0UL0	6SL3210-1NE21-0AL0
5.5 kW / 13.2 A	4 kW / 10.2 A	B	6SL3223-ODE25-5AA0	6SL3223-ODE25-5BA0	6SL3210-1NE21-3UL0	6SL3210-1NE21-3AL0
7.5 kW / 18 A	5.5 kW / 13.2 A	B	6SL3223-ODE27-5AA0	6SL3223-ODE27-5BA0	6SL3210-1NE21-8UL0	6SL3210-1NE21-8AL0
11 kW / 26 A	7.5 kW / 18 A	C	6SL3223-ODE31-1AA0	6SL3223-ODE31-1BA0	6SL3210-1NE22-6UL0	6SL3210-1NE22-6AL0
15 kW / 32 A	11 kW / 26 A	C	6SL3223-ODE31-5AA0	6SL3223-ODE31-5BA0	6SL3210-1NE23-2UL0	6SL3210-1NE23-2AL0
18.5 kW / 38 A	15 kW / 32 A	C	6SL3223-ODE31-8AA0	-	6SL3210-1NE23-8UL0	6SL3210-1NE23-8AL0
18.5 kW / 38 A	15 kW / 32 A	D	-	6SL3223-ODE31-8BA0	-	-
22 kW / 45 A	18.5 kW / 38 A	D	6SL3223-ODE32-2AA0	6SL3223-ODE32-2BA0	6SL3210-1NE24-5UL0	6SL3210-1NE24-5AL0
30 kW / 60 A	22 kW / 45 A	D	6SL3223-ODE33-0AA0	6SL3223-ODE33-0BA0	6SL3210-1NE26-0UL0	6SL3210-1NE26-0AL0
37 kW / 75 A	30 kW / 60 A	E	6SL3223-ODE33-7AA0	6SL3223-ODE33-7BA0	6SL3210-1NE27-5UL0	6SL3210-1NE27-5AL0
45 kW / 90 A	37 kW / 75 A	E	6SL3223-ODE34-5AA0	6SL3223-ODE34-5BA0	6SL3210-1NE28-8UL0	6SL3210-1NE28-8AL0
55 kW / 110 A	45 kW / 90 A	F	6SL3223-ODE35-5AA0	6SL3223-ODE35-5BA0	6SL3210-1NE31-1UL0	6SL3210-1NE31-1AL0
75 kW / 145 A	55 kW / 110 A	F	6SL3223-ODE37-5AA0	6SL3223-ODE37-5BA0	6SL3210-1NE31-5UL0	6SL3210-1NE31-5AL0
90 kW / 178 A	75 kW / 145 A	F	6SL3223-ODE38-8AA0	6SL3223-ODE38-8BA0	-	-
Push Through Variant						
LO (VT)	HO (CT)				PM230 IP20 Unfiltered	PM230 IP20 Class A
3.0 kW / 7.7 A	2.2 kW / 5.9 A	A			6SL3210-1NE17-7UL0	6SL3210-1NE17-7AL0
7.5 kW / 18 A	5.5 kW / 13.3 A	B			6SL3210-1NE21-8UL0	6SL3210-1NE21-8AL0
18.5 kW / 38 A	15 kW / 32 A	C			6SL3210-1NE23-8UL0	6SL3210-1NE23-8AL0

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.

Options	
6SL3256-1BA00-0AA0	Blanking cover for IP55 modules - required if no OP fitted
6SL3255-0AA00-4CA1	Basic Operator Panel 2 (BOP2)
6SL3255-0AA00-4JA1	Intelligent Operator Panel (IOP)
6SL3256-0AP00-0JA0	IOP / BOP2 Door Mounting Kit (see page 30)
6SL3255-0AA00-4HA0	IOP Handheld (see page 30)
6SL3255-0AA00-2CA0	PC Inverter Connection Kit 2 for G120C and G120 control units CU230P-2, CU240BE-2, CU240E-2 and CU250S-2
6SL3254-0AM00-0AA0	SINAMICS Micro Memory Card (MMC) 64MB
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
Power Module Shield Connection Kits	
6SL3262-1AD00-0DA0	PM230 IP20 - Frame size FSD and FSE
6SL3266-1AF00-0DA0	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 Through 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

SINAMICS G120 Modular Overview



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

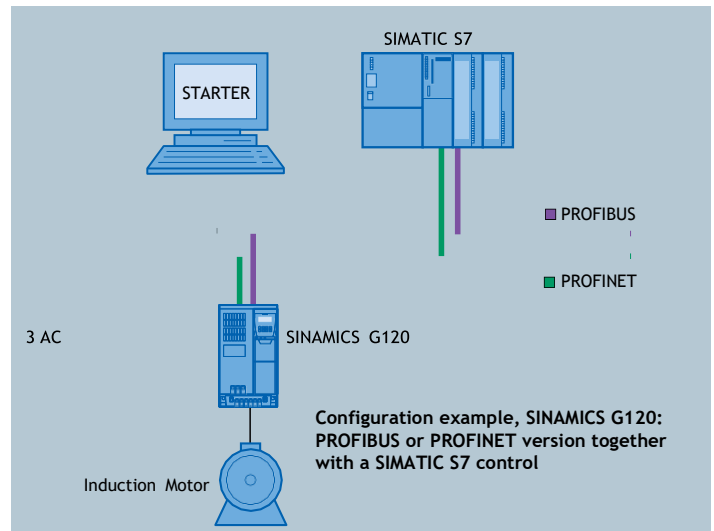
- Modular - flexible expansion capability
- Flexibility - with a wide range of control units, Power modules and additional components
- Compact space saving design
- Fast commissioning with Starter or StartDrive
- Operational Memory Card for backup and transfer of parameters for serial commissioning
- 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.

Energy Saving

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



Control Unit - overview on page 14

CU230P-2	specialist for pumps, fans, compressors and HVAC with additional features for these applications - see page 14
CU240B-2	for basic applications without encoder and without safety requirements
CU240E-2	with extended communication interfaces and Inputs/Outputs, is ideal for applications without encoder but where basic or extended safety is required
CU250S-2	for demanding applications where an encoder is required to give speed, torque or positioning accuracy with both a synchronous motors and synchronous servos (in preparation)

Power Modules

PM230 IP55: 0.37 kW ... 90 kW, IP20: 0.37 kW ... 75 kW 380 V - 480 V 3 AC ±10%	Designed specifically for pumps, fans and compressors , this low harmonic drive for non-dynamic applications is available in an IP55, IP20 and IP20 push-through variants
PM240 0.37 kW ... 250 kW, 380 V - 480 V 3 AC ±10%	The PM240 and PM240-2 have an integrated braking chopper so loads can be dynamically braked through an optional external resistor.
PM240-2 0.55 kW ... 3 kW (up to 15kW to follow in 2014) 380 V - 480 V 3 AC ±10%	Typical applications: A Universal Drive for a variety of industrial application e.g. fans, pumps, compressors, extruders, mixers, crushers and high performance conveyors.
PM250 7.5 kW ... 90 kW, 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 e.g. fans, pumps, compressors, extruders, mixers, crushers, high performance conveyors 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' page for Input Reactors, Output Reactors and Braking Resistors.

Control Units: Overview

	Basic functions		Specialist for pumps, fans & compressors				For standard applications - pumps, fans, compressors conveyors, mixers & extruders						Applications requiring positioning with encoder or simple servo control (servo in preparation)			
							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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Vector			
PM240-2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Vector / Servo (in preparation)			
PM250	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Vector			
PM340 1 Phase	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	Vector / Servo (in preparation)			
PM340 3 phase	-	-	-	-	-	-	-	-	-	-	-	-	Vector			
Inputs/Outputs/Encoder																
Digital Inputs (DI)	4	4	6	6	6	6	6	6	6	6	6	6	11	11	11	11
Digital Inputs - Failsafe (F-DI)	-	-	-	-	-	-	1-	1-	1-	3-	3-	3-	3-	3-	3-	3-
Digital Outputs (DO)	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Digital Outputs - Failsafe (F-DO)	-	-	-	-	-	-	-	-	-	-	-	-	1"	1"	1"	1"
Digital Inputs/Outputs (DI/DO)	-	-	-	-	-	-	-	-	-	-	-	-	4	4	4	4
Analogue Inputs (AI)	1*	1*	4^	4^	4^	4^	2*	2*	2*	2*	2*	2*	2	2	2	2
Analogue Outputs (AO)	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Encoder	-	-	-	-	-	-	-	-	-	-	-	-	✓ see foot note below			
Bus Interface																
RS485 / USS / Modbus RTU	✓	-	✓	-	-	-	✓	-	-	✓	-	-	✓	-	-	-
BACnet Ms/TP, P1 Protocol (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	1 x SIMATICs Micro Memory Card (MMC) or 1 x SIMATIC Memory Card (SD)												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 50 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	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓
Servo 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 (I²t, 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 & PM340 - DC. Compound and Dynamic with braking chopper, PM250/PM260 - Regenerative															

* 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.

SINAMICS G120 Modular - PM230

The versatile single-motor drive for pumps, fans and compressors



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 MMC or SC card for backup and series commissioning

Applications

Pumps, fans and compressors.

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. The PM230 is available in an IP55 or IP20 format and is designed for pump, fan and compressor applications with a square law characteristic. Braking choppers are not fitted so solutions using PM230 are not suited for dynamic applications.

PM 230 IP55 (0.37 kW to 90 kW)

- available with Class A or Class B EMC Filtering
The IP rating is maintained with a blanking cover or BOP-2 but reduces to IP54 if an IOP is fitted.

PM 230 IP20 (0.37 kW to 75 kW)

PM230 Push Through IP 20 (1.1 , 2.2 & 3.0 kW) - available unfiltered or Class A EMC Filtering and is designed for cabinet mounting. The highest power rating of FSA to FSC is also available as 'Push-through' where the heat sink pushes through the back of the cabinet minimising the heat inside the cabinet.

Technical data	
Electrical data	SINAMICS G120 PM 230
Line voltages	380 V ... 480 V 3 AC, ±10 %
Power ranges	IP55: 0.37kW to 90kW, IP20: 0.37kW to 75kW
Line supply types IP55	TN
Line supply types IP20	TN (filtered), TN, TT, IT (unfiltered)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 650 Hz V/f, 0 ... 200 Hz Vector
Pulse frequency	4 kHz (up to 16 kHz with derating)
Functions	
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor overtemperature, inverter overtemperature, parameter locking
Software functions	See Control Units overview on page 14
Mechanical data	
Degree of protection	IP20 version and IP55 version (IP54 with IOP)
Cooling type	Convection
Standards	
In conformance with the following standards	UL, CE, c-tick

Control Units							
Control Unit	Designation	Interfaces	DI	DO	AI	AO	Can be used on PM230 in IP:
6SL3243-0BB30-1HA3	CU230P-2 HVAC	RS485/USS/Modbus/BACnet	6	3	4 [^]	2	IP55 & IP20
6SL3243-0BB30-1PA3	CU230P-2 DP	Profibus DP	6	3	4 [^]	2	IP55 & IP20
6SL3243-0BB30-1FA0	CU230P-2 PN	Profinet	6	3	4 [^]	2	IP55 & IP20
6SL3243-0BB30-1CA3	CU230P-2 CAN	CANopen	6	3	4 [^]	2	IP55 & IP20
6SL3244-0BB00-1BA1	CU240B-2	RS485/USS	4	1	1 [*]	1	IP20
6SL3244-0BB00-1PA1	CU240B-2 DP	Profibus DP	4	1	1 [*]	1	IP20
6SL3244-0BB12-1BA1	CU240E-2	RS485/USS	6	3	2 [*]	2	IP20
6SL3244-0BB12-1PA1	CU240E-2 DP	Profibus DP	6	3	2 [*]	2	IP20
6SL3244-0BB12-1FA0	CU240E-2 PN	Profinet	6	3	2 [*]	2	IP20

* 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.

NOTE: No Integrated Safety functions can be used with the PM230 Power Modules even if the Control Unit is capable.

SINAMICS G120 PM230

Part Numbers

Power Module PM230		Power Modules				
Supply Voltage - 380 V ... 480 V 3 AC			PM230 IP55 Class A	PM230 IP55 Class B	PM230 IP20 Unfiltered	PM230 IP20 Class A
Rating		Frame Size				
LO (VT)	HO (CT)					
0.37 kW / 1.3 A	0.25 kW / 0.9 A	A	6SL3223-ODE13-7AA0	6SL3223-ODE13-7BA0	6SL3210-1NE113-UL0	6SL3210-1NE11-3AL0
0.55 kW / 1.7 A	0.37 kW / 1.3 A	A	6SL3223-ODE15-5AA0	6SL3223-ODE15-5BA0	6SL3210-1NE11-7UL0	6SL3210-1NE11-7AL0
0.75 kW / 2.2 A	0.55 kW / 1.7 A	A	6SL3223-ODE17-5AA0	6SL3223-ODE17-5BA0	6SL3210-1NE12-2UL0	6SL3210-1NE12-2AL0
1.1 kW / 3.1 A	0.75 kW / 2.2 A	A	6SL3223-ODE21-1AA0	6SL3223-ODE21-1BA0	6SL3210-1NE13-1UL0	6SL3210-1NE13-1AL0
1.5 kW / 4.1 A	1.1 kW / 3.1 A	A	6SL3223-ODE21-5AA0	6SL3223-ODE21-5BA0	6SL3210-1NE14-1UL0	6SL3210-1NE14-1AL0
2.2 kW / 5.9 A	1.5 kW / 4.1 A	A	6SL3223-ODE22-2AA0	6SL3223-ODE22-2BA0	6SL3210-1NE15-8UL0	6SL3210-1NE15-8AL0
3.0 kW / 7.7 A	2.2 kW / 5.9 A	A	6SL3223-ODE23-0AA0	6SL3223-ODE23-0BA0	6SL3210-1NE17-7UL0	6SL3210-1NE17-7AL0
4 kW / 10.2 A	3 kW / 7.7 A	B	6SL3223-ODE24-0AA0	6SL3223-ODE24-0BA0	6SL3210-1NE21-0UL0	6SL3210-1NE21-0AL0
5.5 kW / 13.2 A	4 kW / 10.2 A	B	6SL3223-ODE25-5AA0	6SL3223-ODE25-5BA0	6SL3210-1NE21-3UL0	6SL3210-1NE21-3AL0
7.5 kW / 18 A	5.5 kW / 13.2 A	B	6SL3223-ODE27-5AA0	6SL3223-ODE27-5BA0	6SL3210-1NE21-8UL0	6SL3210-1NE21-8AL0
11 kW / 26 A	7.5 kW / 18 A	C	6SL3223-ODE31-1AA0	6SL3223-ODE31-1BA0	6SL3210-1NE22-6UL0	6SL3210-1NE22-6AL0
15 kW / 32 A	11 kW / 26 A	C	6SL3223-ODE31-5AA0	6SL3223-ODE31-5BA0	6SL3210-1NE23-2UL0	6SL3210-1NE23-2AL0
18.5 kW / 38 A	15 kW / 32 A	C	6SL3223-ODE31-8AA0	-	6SL3210-1NE23-8UL0	6SL3210-1NE23-8AL0
18.5 kW / 38 A	15 kW / 32 A	D	-	6SL3223-ODE31-8BA0	-	-
22 kW / 45 A	18.5 kW / 38 A	D	6SL3223-ODE32-2AA0	6SL3223-ODE32-2BA0	6SL3210-1NE24-5UL0	6SL3210-1NE24-5AL0
30 kW / 60 A	22 kW / 45 A	D	6SL3223-ODE33-0AA0	6SL3223-ODE33-0BA0	6SL3210-1NE26-0UL0	6SL3210-1NE26-0AL0
37 kW / 75 A	30 kW / 60 A	E	6SL3223-ODE33-7AA0	6SL3223-ODE33-7BA0	6SL3210-1NE27-5UL0	6SL3210-1NE27-5AL0
45 kW / 90 A	37 kW / 75 A	E	6SL3223-ODE34-5AA0	6SL3223-ODE34-5BA0	6SL3210-1NE28-8UL0	6SL3210-1NE28-8AL0
55 kW / 110 A	45 kW / 90 A	F	6SL3223-ODE35-5AA0	6SL3223-ODE35-5BA0	6SL3210-1NE31-1UL0	6SL3210-1NE31-1AL0
75 kW / 145 A	55 kW / 110 A	F	6SL3223-ODE37-5AA0	6SL3223-ODE37-5BA0	6SL3210-1NE31-5UL0	6SL3210-1NE31-5AL0
90 kW / 178 A	75 kW / 145 A	F	6SL3223-ODE38-8AA0	6SL3223-ODE38-8BA0	-	-

Push Through Variant						
					PM230 IP20 Unfiltered	PM230 IP20 Class A
3.0 kW / 7.7 A	2.2 kW / 5.9 A	A			6SL3210-1NE17-7UL0	6SL3210-1NE17-7AL0
7.5 kW / 18 A	5.5 kW / 13.3 A	B			6SL3210-1NE21-8UL0	6SL3210-1NE21-8AL0
18.5 kW / 38 A	15 kW / 32 A	C			6SL3210-1NE23-8UL0	6SL3210-1NE23-8AL0

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

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

Options	
6SL3256-1BA00-0AA0	Blanking cover for IP55 modules - required if no OP fitted
6SL3255-0AA00-4CA1	Basic Operator Panel 2 (BOP-2)
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 and G120 control units CU230P-2, CU240BE-2, CU240E-2 and CU250S-2
6SL3254-0AM00-0AA0	SINAMICS Micro Memory Card (MMC) 64MB
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 kit 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 Through 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

SINAMICS G120 Modular - PM240-2

The versatile single-motor drive



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.

PM240-2 Power Modules (0.55 kW to 3 kW)

PM240-2 Push Through Filtered (2.2 kW)

PM240-2 Push Through Unfiltered (3.0 kW)

have 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 and allow side by side mounting. The highest power rating of each frame size is also available as 'Push Through' where the heatsink pushes through the back of the cabinet reducing the heat inside the cabinet.

Benefits of G120 with PM240-2 over PM240

Can be used with CU250S-2 in Vector or Servo Mode (planned)

- Compact space saving design using High Density components
- Side by side mounting saves space
- Variants with 'Push Through' reduces heat in the cabinet

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 PM 240-2
Line voltage	380 V ... 480 V 3 AC, ±10 %
Power ranges	0.55 kW ... 3.0 kW. FSB and FSC to follow
Line supply types	TN (with filter), TN, TT, IT (without filter)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 650 Hz V/f, 0 ... 200 Hz Vector
Pulse frequency	4 kHz up to 16 kW - with derating
Functions	
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor over-temperature, inverter overtemperature, parameter locking
Software functions	See Control Unit Overview on page 14
Safety functions	See table below
Standards	
In conformance with the following standards	UL, cUL, CE, c-tick EN954-1 Cat3, EN ISO 13849-1 PLd, 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	-	-	-	-	
6SL3243-0BB30-1CA3	CU230P-2 CAN	CANopen	6	3	-	4 [^]	1	-	-	-	-	
6SL3244-0BB00-1BA1	CU240B-2	RS485/USS	4	1	-	1 [*]	1	-	-	-	-	
6SL3244-0BB00-1PA1	CU240B-2 DP	Profibus DP	4	1	-	1 [*]	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.

SINAMICS G120 PM240-2

Part Numbers

Power Module PM240-2		Power Modules				Push Through variant	
Supply Voltage - 380 V ... 480 V 3 AC		Rating	Frame Size	PM240-2 Unfiltered	PM240-2 Filtered #	PM240-2 Unfiltered	PM240-2 Filtered #
LO (VT)	HO (CT)						
0.55 kW / 1.7 A	0.37 kW / 1.3 A	A	6SL3210-1PE11-8UL0	6SL3210-1PE11-8AL0	-	-	
0.75 kW / 2.2 A	0.55 kW / 1.7 A	A	6SL3210-1PE12-3UL0	6SL3210-1PE12-3AL0	-	-	
1.1 kW / 3.1 A	0.75 kW / 2.2 A	A	6SL3210-1PE13-2UL0	6SL3210-1PE13-2AL0	-	-	
1.5 kW / 4.1 A	1.1 kW / 3.1 A	A	6SL3210-1PE14-3UL0	6SL3210-1PE14-3AL0	-	-	
2.2 kW / 5.9 A	1.5 kW / 4.1 A	A	6SL3210-1PE16-1UL0	6SL3210-1PE16-1AL0	-	6SL32110-1PE16-1AL0	
3 kW / 7.7 A	2.2 kW / 5.9 A	A	6SL3210-1PE18-0UL0	-	6SL3211-1PE18-0UL0	-	

EMC filtering generally suitable for 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.
 PM240-2 FSB ,FSC and Push-Through variants will be available in February 2014.
 PM240-2 200 ...240 V 1 AC version will be available April 2014.

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 and G120 control units CU230P-2, CU240BE-2, CU240E-2 and CU250S-2
6SL3254-0AM00-0AA0	SINAMICS Micro Memory Card (MMC) 64MB
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB
6SL3074-0AA10-0AA0	Extended Safety license (SLS, SSM, SDI) for CU250S-2 in Vector or Servo Mode
6SL3074-7AA04-0AA0	Extended Functions license (EPos) for CU250S-2 in Vector Mode
6SL3054-4AG00-2AA0-Z F01	SD card + Extended Safety license (SLS, SSM, SDI) for CU250S-2 in Vector or Servo Mode
6SL3054-4AG00-2AA0-Z E01	SD card + Extended Functions license (EPos) for CU250S-2 in Vector Mode
6SL3054-4AG00-2AA0-Z F01 E01	SD card + Extended Safety + Extended Functions license (EPos) for CU250S-2 in Vector Mode
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)
Push Through 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

SINAMICS G120 Modular - PM240

The versatile single-motor drive



Benefits

- Modular with flexible expansion capability
- Compact space saving design
- Wide range of Control Units with different communication interfaces available
- Simple fast commissioning
- Integrated safety with the appropriate CU
- Built in braking chopper (except for FSGX)
- Precise control with Encoder feedback and optional positioning with EPos (easy positioning) with CU250S-2
- Optional positioning with EPos (easy positioning)
- Optional MMC or SC card for backup and series commissioning

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 240 Power Modules (0.37 kW to 250 kW)

- has an integrated braking chopper to enable loads to be dynamically braked. The energy produced during braking is dissipated through optional externally connected resistors. For frame size GX this is via an optional braking module to connect the braking resistor.

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 PM 240
Line voltage	380 V ... 480 V 3 AC, ±10 %
Power ranges	0.37 kW ... 250 kW
Line supply types	TN (with filter), TN, TT, IT (without filter)
Line frequency	47 ... 63 Hz
Output frequency	0 ... 650 Hz V/f, 0 ... 200 Hz Vector
Pulse frequency	4 kHz (up to 75 kW - up to 16 kHz with derating) 2 kHz (from 90 kW - up to 16 kHz with derating)
Functions	
Protection functions	Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor over-temperature, inverter overtemperature, parameter locking
Software functions	See Control Unit Overview on page 14
Safety functions	See table below
Standards	
In conformance with the following standards	UL, cUL, CE, c-tick EN954-1 Cat3, EN ISO 13849-1 PLd, 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	-	-	-	-	
6SL3243-0BB30-1CA3	CU230P-2 CAN	CANopen	6	3	-	4 [^]	1	-	-	-	-	
6SL3244-0BB00-1BA1	CU240B-2	RS485/USS	4	1	-	1*	1	-	-	-	-	
6SL3244-0BB00-1PA1	CU240B-2 DP	Profibus DP	4	1	-	1*	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	
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 □	Extended functions via license (see below)	
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.

SINAMICS G120 PM240

Part Numbers

Power Module PM240		Power Modules			
Supply Voltage - 380 V ... 480 V 3 AC					
Rating	Frame Size	PM240 Unfiltered	PM240 Filtered #	Additional Filter to use with unfiltered PM240	
LO (VT)	HO (CT)				
0.37 kW / 1.3 A		A	6SL3224-OBE13-7UA0	→ = ←	6SE6400-2FA00-6AD0
0.55 kW / 1.7 A		A	6SL3224-OBE15-5UA0	→ = ←	6SE6400-2FA00-6AD0
0.75 kW / 2.2 A		A	6SL3224-OBE17-5UA0	→ = ←	6SE6400-2FA00-6AD0
1.1 kW / 3.1 A		A	6SL3224-OBE21-1UA0	→ = ←	6SE6400-2FA00-6AD0
1.5 kW / 4.1 A		A	6SL3224-OBE21-5UA0	→ = ←	6SE6400-2FA00-6AD0
2.2 kW / 5.9 A		B	6SL3224-OBE22-2UA0		6SL3224-OBE22-2AA0
3 kW / 7.7 A		B	6SL3224-OBE23-0UA0		6SL3224-OBE23-0AA0
4 kW / 10.2 A		B	6SL3224-OBE24-0UA0		6SL3224-OBE24-0AA0
LO (VT)	HO (CT)				
7.5 kW / 18 A	5.5 kW / 13.2 A	C	6SL3224-OBE25-5UA0		6SL3224-OBE25-5AA0
11 kW / 25 A	7.5 kW / 19 A	C	6SL3224-OBE27-5UA0		6SL3224-OBE27-5AA0
15 kW / 32 A	11 kW / 26 A	C	6SL3224-OBE31-1UA0		6SL3224-OBE31-1AA0
18.5 kW / 38 A	15 kW / 32 A	D	6SL3224-OBE31-5UA0		6SL3224-OBE31-5AA0
22 kW / 45 A	18.5 kW / 38 A	D	6SL3224-OBE31-8UA0		6SL3224-OBE31-8AA0
30 kW / 60 A	22 kW / 45 A	D	6SL3224-OBE32-2UA0		6SL3224-OBE32-2AA0
37 kW / 75 A	30 kW / 60 A	E	6SL3224-OBE33-0UA0		6SL3224-OBE33-0AA0
45 kW / 90 A	37 kW / 75 A	E	6SL3224-OBE33-7UA0		6SL3224-OBE33-7AA0
55 kW / 110 A	45 kW / 90 A	F	6SL3224-OBE34-5UA0		6SL3224-OBE34-5AA0
75 kW / 145 A	55 kW / 110 A	F	6SL3224-OBE35-5UA0		6SL3224-OBE35-5AA0
90 kW / 178 A	75 kW / 145 A	F	6SL3224-OBE37-5UA0		6SL3224-OBE37-5AA0
110 kW / 205 A	90 kW / 178 A	F	6SL3224-OBE38-8UA0	→ = ←	6SL3203-OBE32-5AA0
132 kW / 250 A	110 kW / 205 A	F	6SL3224-OBE41-1UA0	→ = ←	6SL3203-OBE32-5AA0
160 kW / 302 A	132 kW / 250 A	FSGX	6SL3224-OXE41-3UA0	→ = ←	6SL3000-OBE34-4AA0
200 kW / 370 A	160 kW / 302 A	FSGX	6SL3224-OXE41-6UA0	→ = ←	6SL3000-OBE34-4AA0
250 kW / 477 A	200kW / 370 A	FSGX	6SL3224-OXE42-0UA0	→ = ←	6SL3000-OBE36-0AA0

EMC filtering generally suitable for 1st environment; additional filter options available on request - please refer to page 51 for specific categorisations.
 LO (VT) = Low Overload (Variable Torque) - Up to 75kW (LO): 1.5 x LO current rating for 3s plus 1.1 x LO current rating for 57s within a cycle time of 300s.
 - From 90kW (LO): 1.5 x LO current rating for 1s plus 1.1 x LO current rating for 57s within a cycle time of 300s.

HO (CT) = High Overload (Constant Torque) - Up to 75kW (HO): 2 x HO current rating for 3s plus 1.5 x HO current rating for 57s within a cycle time of 300s.

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 and G120 control units CU230P-2, CU240BE-2, CU240E-2 and CU250S-2
6SL3254-0AM00-0AA0	SINAMICS Micro Memory Card (MMC) 64MB
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB
6SL3074-0AA10-0AA0	Extended Safety license (SLS, SSM, SDI) for CU250S-2 in Vector or Servo Mode
6SL3074-7AA04-0AA0	Extended Functions license (EPos) for CU250S-2 in Vector Mode
6SL3054-4AG00-2AA0-Z F01	SD card + Extended Safety license (SLS, SSM, SDI) for CU250S-2 in Vector or Servo Mode
6SL3054-4AG00-2AA0-Z E01	SD card + Extended Functions license (EPos) for CU250S-2 in Vector Mode
6SL3054-4AG00-2AA0-Z F01 E01	SD card + Extended Safety + Extended Functions license (EPos) for CU250S-2 in Vector Mode
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	
6SL3262-1AA00-0BA0	Frame size FSA
6SL3262-1AB00-0DA0	Frame size FSB
6SL3262-1AC00-0DA0	Frame size FSC
6SL3262-1AD00-0DA0	Frame size FSD and FSE
6SL3262-1AF00-0DA0	Frame size FSF

SINAMICS G120 Modular - PM250

The versatile single-motor drive



Applications

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

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 (7.5 kW to 90 kW)

- has 'Efficient Infeed Technology' (p49), 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

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	-	-	-	-
6SL3243-0BB30-1CA3	CU230P-2 CAN	CANopen	6	3	-	4 [^]	1	-	-	-	-
6SL3244-0BB00-1BA1	CU240B-2	RS485/USS	4	1	-	1 [*]	1	-	-	-	-
6SL3244-0BB00-1PA1	CU240B-2 DP	Profibus DP	4	1	-	1 [*]	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
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 □	Extended functions via license (see below)
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.

SINAMICS G120 PM250

Part Numbers

Supply Voltage - 380 V... 480 V 3 AC			Power Modules	
Rating	Frame Size	Industrial	Filtered #	
LO (VT)	HO (CT)			
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.

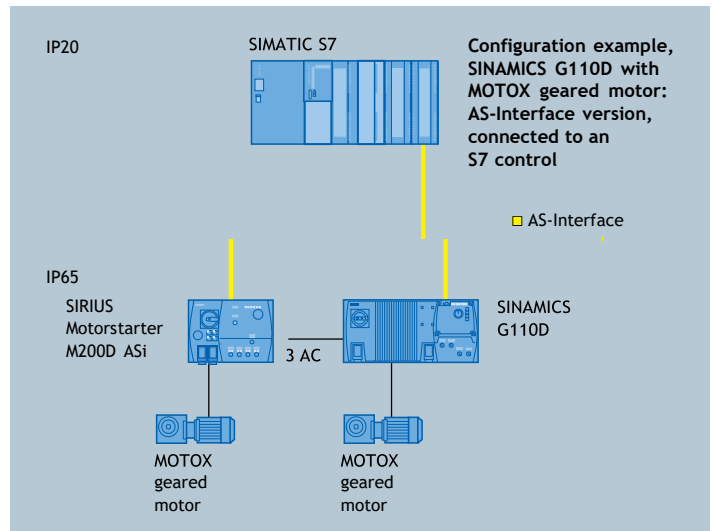
HO (CT) = High Overload (Constant Torque) - 2 x HO current rating for 3s plus 1.5 x HO current rating for 57s within a cycle time of 300s.

EMC filtering generally suitable for 1st environment; additional filter options available on request - please refer to page 51 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 and G120 control units CU230P-2, CU240BE-2, CU240E-2 and CU250S-2
6SL3254-0AM00-0AA0	SINAMICS Micro Memory Card (MMC) 64MB
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB
6SL3074-0AA10-0AA0	Extended Safety license (SLS, SSM, SDI) for CU250S-2 in Vector or Servo Mode
6SL3074-7AA04-0AA0	Extended Functions license (EPos) for CU250S-2 in Vector Mode
6SL3054-4AG00-2AA0-Z F01	SD card + Extended Safety license (SLS, SSM, SDI) for CU250S-2 in Vector or Servo Mode
6SL3054-4AG00-2AA0-Z E01	SD card + Extended Functions license (EPos) for CU250S-2 in Vector Mode
6SL3054-4AG00-2AA0-Z F01 E01	SD card + Extended Safety + Extended Functions license (EPos) for CU250S-2 in Vector Mode
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

SINAMICS G110D

The distributed single-motor drive for basic solutions



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

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 ... 640 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	Convection
Standards	
In conformance with the following standards	UL 508C (UL list No. E121068), CE, c-tick

SINAMICS G110D

Part Numbers

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-OPE17-5AM0	6SL3511-1PE17-5AM0
1.5 kW / 4.3 A	FSA	6SL3511-OPE21-5AM0	6SL3511-1PE21-5AM0
3.0 kW / 7.7 A	FSA	6SL3511-OPE23-0AM0	6SL3511-1PE23-0AM0
4.0 kW / 10.2 A	FSB	6SL3511-OPE24-0AM0	6SL3511-1PE24-0AM0
5.5 kW / 13.2 A	FSC	6SL3511-OPE25-5AM0	6SL3511-1PE25-5AM0
7.5 kW / 19.0 A	FSC	6SL3511-OPE27-5AM0	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 51 for specific categorisations.

Overload: Average maximum 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.

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
6SL3254-0AM00-0AA0	MMC Micro Memory Card (requires Memory Card Holder)
6SL3054-4AG00-2AA0	SINAMICS SD card 512 MB (requires Memory Card Holder)
6SL3555-0PM00-0AA0	MMC and SD Memory Card Holder
6SL3555-0PL00-2AA0	Manual / Local control 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 mm ²
3RK1911-2BE10	Connector Set for Power Supply 4 mm ²
3RK1911-2BE30	Connector Set for Power Supply 6 mm ²

A selection of pre-assembled motor cables are available from Harting or KnorrTec.



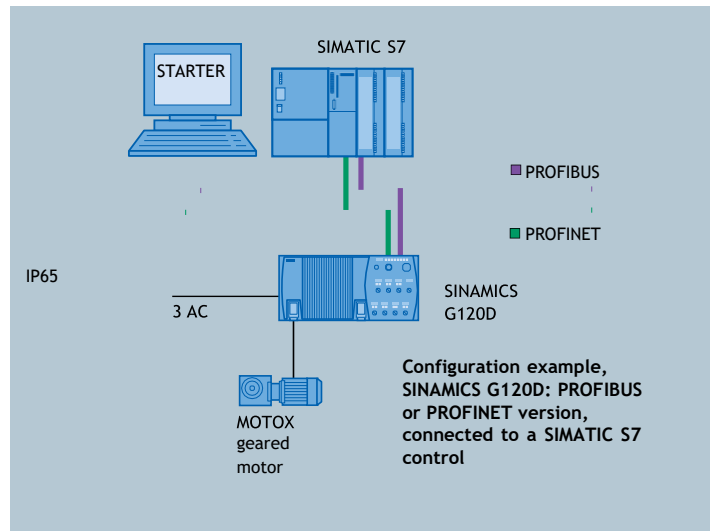
G110D
with Isolator (maintenance switch)



G110D
with Isolator (maintenance switch)
and optional key switch

SINAMICS G120D

The distributed single-motor drive for high-performance solutions



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 (P49)
- 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 EN954-1 Cat.3, EN ISO 13849-1 PLd and IEC61508 SIL2
- 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 ... 5000 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 ... 650 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/Torque control with and without encoder
Digital inputs (DI)	CU dependent - see page 26
Digital outputs (DO)	CU dependent - see page 26
Analogue inputs (AI)	CU dependent - see page 26
Failsafe inputs (F-DI)	CU dependent - see page 26
Failsafe outputs (F-DO)	CU dependent - see page 26
Communication interface	PROFIBUS DP, PROFINET
External interface to	PC via RS232 or USB via optical interface, SINAMICS MMC card or SIMATIC 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
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	Convection

Standards

In conformance with the following standards	UL 508C (UL list No. E121068), CE, c-tick EN954-1 Cat3, EN ISO 13849-1 PLd, IEC61508 SIL2
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SINAMICS G120D

Part Numbers

Supply Voltage - 380 V ... 480 V 3 AC		Power Modules
Rating	Frame Size	Filtered #
0.75 kW / 2.2 A	A	6SL3525-OPE17-5AA1
1.5 kW / 4.1 A	A	6SL3525-OPE21-5AA1
3 kW / 7.7 A	B	6SL3525-OPE23-0AA1
4 kW / 10.2 A	C	6SL3525-OPE24-0AA1
5.5 kW / 13.2 A	C	6SL3525-OPE25-5AA1
7.5 kW / 19.0 A	C	6SL3525-OPE27-5AA1

EMC filtering generally suitable for 1st environment. Please refer to page 51 for specific categorisations.

Overload: Average maximum rated output current during a 300s cycle: 1.5 x rated current for 60s over a 300s cycle time, 2 x rated current for 3c 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.

STO - Safe Torque Off, SS1 - Safe Stop 1, SLS - Safe Limited Speed, SSM - Safe Speed Monitor, SDI - Safe Direction Indication.

Options	
6SL3255-0AA00-4HA0	IOP Handheld (inc. Rechargeable Batteries, Charging Unit, 3m RS232 Cable and 1m USB Cable)
3RK1922-2BP00	RS232 Interface cable for communication with a PC or Handheld IOP - 2.5M
6SL3254-0AM00-0AA0	SINAMICS Micro Memory Card (MMC) 64MB
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 unuits)
6GK1901-0DB20-6AA8	M12 Plug PRO Metal Enclosure - 8 units	6GK1905-0FB00	7/8" Plastic Enclosure with Socket insert (5 unuits)
3RK1902-2DA00	M12 Plug PRO Metal Enclosure - 1 unit (angled)	6GK1907-0AB10-6AA0	Power Plug PRO for PP units
6GK1901-1BB10-6AA0	RJ45 PLUG PRO connector		

Profibus Connecting Cables and connectors M12		Connection 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
6XV1830-3DH15	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 unuits)	3RK1911-2BE10	Connector set 4mm2
6GK1905-0EA00	Profibus M12 Metal Enclosure with socket insert (5 unuits)	3RK1911-2BE30	Connector set 6mm2

SINAMICS S110

The specialist for basic positioning tasks



Design

The SINAMICS S110 positioning drive with its built-in basic positioning system is the ideal solution when you need to position a machine axis simply, quickly and accurately.

This modular drive solution consists of a Power Module (PM340) and Control Module (CU305) offering maximum flexibility whilst simplifying spare stock holding. Single phase and three phase versions are available with power ratings of 0.12 kW to 0.75 kW and 0.37 kW to 90 kW respectively.

The SINAMICS S110 offers you a choice of control via an analogue input (+/-10V), USS, PROFIBUS DP and PROFINET. All with a wide range of integrated safety functions as standard. Both synchronous servo and asynchronous induction motors can be controlled ensuring precise control and accurate positioning. Please refer to Chapter 11 of the DA31 Catalogue for suitable motors.

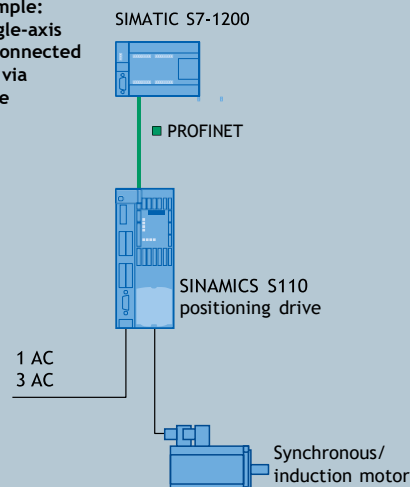
Benefits

- Wide range of power ranges
- A selection of control methods
- Closed-loop servo control
- Integrated safety functions
- EPos positioning functions for the most commonly used positioning tasks
- 16 positioning blocks
- BICO technology
- Simple drive engineering with SIZER
- User-friendly commissioning with STARTER including auto configuration using the electronic type plate and controller optimisation using auto-tuning

Applications

- Handling equipment
- Feeder and removal devices
- Stacking equipment
- Automatic assembly machines
- Laboratory automation
- Tool changers
- Tracking equipment, e.g. for solar panels
- Medical technology, e.g. for examination tables

Configuration example:
SINAMICS S110 single-axis
positioning drive connected
to an S7 1200 PLC via
PROFINET interface



Technical data

Electrical data	SINAMICS S110 PM340/CU305	
Line voltages; Power ranges	200 V ... 240 V 1 AC ± 10%; 0.12 kW ... 0.75 kW 380 V ... 480 V 3 AC ± 10%; 0.37 kW ... 90 kW	
Line supply types	TN (with filter), TN, TT, IT (without filter)	
Line frequency	47 ... 63 Hz	
Output frequency (servo)	0 ... 650 Hz	
Open-loop/closed-loop control	Induction Motor - torque/position control with encoder, speed control with & w/o encoder (V/f) Servo Motor - torque/position/speed control with encoder	
	Without Safety	With Safety
Digital inputs (DI)	11	5
Digital outputs (DO)	1	0
Digital inputs/outputs DIO	4	4
Failsafe digital inputs (F-DI)	0	3
Failsafe digital outputs (F-DO)	0	1
Analogue inputs	1 (-10 ... +10V (12 bit))	
Communication interfaces	PROFIBUS DP/RS485/USS, PROFINET or CANBus	
External interface to	PC via RS232 or USB via optical interface, SINAMICS MMC card or SIMATIC SD card	
Functions		
Technological functions	EPos positioning functions: Point-to-point positioning, absolute/relative; linear/rotary axis; flying positioning; traversing blocks (up to 16); BICO technology	
Safety functions	Basic: STO, SBC-, SS1. Extended: SS1,SS2 with SBR (Safe brake ramp), SOS,SLS,SDI,SSM	
Limits	Torque, current, power, speed	
Monitoring/Protection functions	Traversing range limits; following error; standstill; Overvoltage, undervoltage, overload, ground fault, short circuit, stall, motor blocking, motor overtemperature, inverter overtemperature	
Motors that can be connected	Synchronous Motors (e.g. 1FK7, 1FT7) Induction Motors (e.g. 1LA, 1PH8)	
Mechanical data		
Degree of protection	IP20	
Cooling type	Convection	
Standards		
In conformance with the following standards	UL 508C (UL list No. E121068), CE, cULus EN954-1 Cat3, EN ISO 13849-1 PLd, IEC61508 SIL2	

- Safe Brake Control on the Power Module via Safe Brake Relay.

SINAMICS S110

Part Numbers

Supply Voltage - 200 V ... 240 V 1 AC		Power Modules		
Rating	Frame Size	PM340 Industrial	PM340 Filtered #	Additional Filter to use with unfiltered PM340*
0.12 kW / 0.9 A	A	6SL3210-1SB11-0UA0	6SL3210-1SB11-0AA0	-
0.37 kW / 2.3 A	A	6SL3210-1SB12-3UA0	6SL3210-1SB12-3AA0	-
0.75 kW / 3.9 A	A	6SL3210-1SB14-0UA0	6SL3210-1SB14-0AA0	-
Supply Voltage - 380 V ... 480 V 3 AC		Power Modules		
Rating	Frame Size	PM340 Industrial	PM340 Filtered #	Additional Filter to use with unfiltered PM340*
0.37 kW / 1.3 A	A	6SL3210-1SE11-3UA0	→ = ←	6SE6400-2FA00-6AD0
0.55 kW / 1.7 A	A	6SL3210-1SE11-7UA0	→ = ←	6SE6400-2FA00-6AD0
0.75 kW / 2.2 A	A	6SL3210-1SE12-2UA0	→ = ←	6SE6400-2FA00-6AD0
1.1 kW / 3.1 A	A	6SL3210-1SE13-1UA0	→ = ←	6SE6400-2FA00-6AD0
1.5 kW / 4.1 A	A	6SL3210-1SE14-1UA0	→ = ←	6SE6400-2FA00-6AD0
2.2 kW / 5.9 A	B	6SL3210-1SE16-0UA0	6SL3210-1SE16-0AA0	-
3 kW / 7.7 A	B	6SL3210-1SE17-7UA0	6SL3210-1SE17-7AA0	-
4 kW / 10.2 A	B	6SL3210-1SE21-0UA0	6SL3210-1SE21-0AA0	-
7.5 kW / 18 A	C	6SL3210-1SE21-8UA0	6SL3210-1SE21-8AA0	-
11 kW / 25 A	C	6SL3210-1SE22-5UA0	6SL3210-1SE22-5AA0	-
15 kW / 32 A	C	6SL3210-1SE23-2UA0	6SL3210-1SE23-2AA0	-
18.5 kW / 38 A	D	6SL3210-1SE23-8UA0	6SL3210-1SE23-8AA0	-
22 kW / 45 A	D	6SL3210-1SE24-5UA0	6SL3210-1SE24-5AA0	-
30 kW / 60 A	D	6SL3210-1SE26-0UA0	6SL3210-1SE26-0AA0	-
37 kW / 75 A	E	6SL3210-1SE27-5UA0	6SL3210-1SE27-5AA0	-
45 kW / 90 A	E	6SL3210-1SE31-0UA0	6SL3210-1SE31-0AA0	-
55 kW / 100 A	F	6SL3210-1SE31-1UA0	6SL3210-1SE31-1AA0	-
75 kW / 145 A	F	6SL3210-1SE31-5UA0	6SL3210-1SE31-5AA0	-
90 kW / 178 A	F	6SL3210-1SE31-8UA0	6SL3210-1SE31-8AA0	-

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

* Additional unit to be used with the industrial drive.

Control Units	Designation	Interfaces	Inputs and Outputs
6SL3040-0JA01-0AA0	CU305 PN	 Profinet	see page 27
6SL3040-0JA00-0AA0	CU305 DP	 Profibus DP / RS485 / USS	see page 27
6SL3040-0JA02-0AA0	CU305 CAN	 CAN	see page 27

Options	
6SL3054-4AG00-0AA0	MMC Memory Card - Empty
6SL3054-4EE00-0AA0	MMC Memory Card with Firmware V 4.4
6SL3054-4EE00-0AA0-Z (Z=F01)	MMC Memory Card with Firmware V 4.4 and license for extended safety functions
6SL3074-0AA10-0AA0	License for extended safety functions (for separate order)
6SL3055-0AA00-4BA0	Basic Operator Panel 20 (BOP-20)
6SL3255-0AA00-4JA1	IOP - Intelligent Operator Panel - No direct connection on to CU, only for Door mounting
6SL3256-0AP00-0JA0	IOP Door Mounting Kit
6SL3255-0AA00-4HA0	IOP Handheld (including charging unit, rechargeable batteries and connecting cables)
6SL3252-0BB01-0AA0	Safe Brake Relay (including cable harness for connection to the power module)

Shield Connection Kits	
6SL3262-1AA00-0BA0	Frame Size FSA
6SL3262-1AB00-0DA0	Frame Size FSB
6SL3262-1AC00-0DA0	Frame Size FSC
6SL3262-1AD00-0DA0	Frame Size FSD and FSE
6SL3262-1AF00-0DA0	Frame Size FSF

SINAMICS G130 / G150



Design

The SINAMICS G130 Chassis units and 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.

Technical data

	G130	G150
380 V ... 480 V 3 AC, ± 10 %	110 kW ... 560 kW	110 kW ... 900 kW
500 V ... 600 V 3 AC, ± 10 %	110 kW ... 560 kW	110 kW ... 1000 kW
660 V ... 690 V 3 AC, ± 10 %	110 kW ... 560 kW	75 kW ... 2700 kW

Typical Applications

- Pumps, fans and compressors
- Mixers, extruders and crushers

Further information: Catalogue D11

G130 online: www.siemens.com/sinamics-G130

G150 online: www.siemens.com/sinamics-G150

Contact our Customer Care Centre

From UK Tel: 08458 507600

From IRL Tel: 1890 507600

Email: sales.gbi.industry@siemens.com

SINAMICS S120

Engineered Drives



Design

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

Technical data

	S120
200 V ... 240 V 1 AC, ± 10 %	0.12 kW ... 0.75 kW
380 V ... 480 V 3 AC, ± 10 %	0.37 kW ... 3000 kW
500 V ... 690 V 3 AC, ± 10 %	750 kW ... 4500 kW

Typical Applications

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

Further information: Catalogue PM21

S120 online: www.siemens.com/sinamics-S120

Contact our Customer Care Centre

From UK Tel: 08458 507600

From IRL Tel: 1890 507600

Email: sales.gbi.industry@siemens.com

Contact our Motion distributor, HMK Technical Services on 01260 279411, email to enquiries@hmkdirect.com

or visit their website at
www.hmkdirect.com

SINAMICS Options

BOP

The BOP - Basic Operator Panel can be used to commission drives, monitor drives in operation and input individual parameters. Values are displayed in a 5 digit display and plug directly into the Control Unit.

For G110

IOP

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.



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 control module
- Connection elements
- Mounting surface for Brake Relay and Safe Brake Relay



Brake Relay

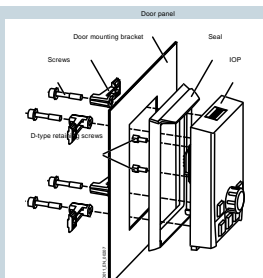
The brake relay has a switch contact (NO contact) to control the motor brake coil.

Order no.: 6SL3252-0BB00-0AA0



Mounting Kits

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



BOP-2

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 Handheld

This mobile version of the IOP has all the features of the plug in version. The unit comes supplied with rechargeable batteries, a charging unit, RS232 and USB connecting cables.



MMC / SD Card

The MMC / 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)



Safe Brake Relay

The Safe Brake Relay controls a 24 V motor brake. The inverter monitors the brake control using the Safe Brake Relay as part of the Integrated Safety Function Safe Brake Control (SBC).

Order number: 6SL3252-0BB01-0AA0



PC Inverter Connection Kit

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

PC Inverter Connection Kit (for G110)
6SL3255-0AA00-2AA1 - includes 9 pin sub-D connector, RS232 cable and STARTER on DVD.

PC Inverter Connection Kit-2 (for CU-2 Control Units)
6SL3255-0AA00-2CA0 - includes USB cable and STARTER on DVD.

SINAMICS Accessories

Line / Output Reactors & Braking Resistors

Line Reactors

The purpose of a line reactor is to reduce line side harmonic currents and harmonic effects. This applies particularly in the case of weak power supplies (network short circuit power $UK > 1\%$).

Not required for:
PM250 (G120)
PM250D (G120D)
PM230 (G120P)

Output Reactors

Output Reactors reduce the voltage loading on the motor windings. They also reduce the capacitive charge/discharge currents which place an additional load on the power module when long cables are used.

Please see the technical information for the drive in the D31/D31N catalogue.

Braking Resistors

Braking Resistors can be used to absorb the energy fed back by the motor during braking. The G120 PM240 and G120C have integrated braking choppers across the Complete power range except for PM240 FSDX which is by external braking chopper.

SINAMICS Accessories for G120C

Supply Voltage - Three phase 380...480 V

Rating LO (VT)	Frame Size	Line Reactor	Output Reactor	Brake Resistor
0.55 kW ... 1.1 kW	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0
1.5 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0
2.2 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	6SL3201-0BE21-0AA0
3.0 kW ... 4.0 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE18-8CA0	6SL3201-0BE21-0AA0
5.5 kW ... 7.5 kW	B	6SL3203-0CE21-8AA0	6SL3202-0AE21-8CA0	6SL3201-0BE21-8AA0
11 kW ... 18.5 kW	C	6SL3203-0CE23-8AA0	6SL3202-0AE23-8CA0	6SL3201-0BE23-8AA0

SINAMICS Accessories for G120P PM230 IP20 & IP55 Standard

Supply Voltage - Three phase 380...480 V

Rating LO (VT)	Frame Size	Line Reactor	Output Reactor	Brake Resistor
0.37 kW - 2.2 kW	A		6SL3202-0AE16-1CA0	
3 kW	A		6SL3202-0AE18-8CA0	
4 kW - 7.5 kW	B		6SL3202-0AE21-8CA0	
11 kW - 18.5 kW	C/D		6SL3202-0AE23-8CA0	
22 kW	D		6SE6400-3TC03-8DD0	
30 kW	D		6SE6400-3TC05-4DD0	
37 kW	E		6SE6400-3TC08-0ED0	
45 kW	E		6SE6400-3TC07-5ED0	
55 kW	F		6SE6400-3TC14-5FD0	
75 kW	F		6SE6400-3TC15-4FD0	
90 kW	F		6SE6400-3TC14-5FD0	

SINAMICS Accessories for G120P PM230 IP20 Push Through

Supply Voltage - Three phase 380...480 V

Rating LO (VT)	Frame Size	Line Reactor	Output Reactor	Brake Resistor
3 kW	A		6SL3202-0AE18-8CA0	
7.5 kW	B		6SL3202-0AE21-8CA0	
18.5 kW	C/D		6SL3202-0AE23-8CA0	

SINAMICS Accessories

Line / Output Reactors & Braking Resistors

SINAMICS Accessories for G120 PM240-2

Supply Voltage - Three phase 380...480 V

Rating LO (VT)	Frame Size	Line Reactor	Output Reactor	Brake Resistor
0.55 kW ...1.1 kW	A	6SL3203-0CE13-2AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0
1.5 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	6SL3201-0BE14-3AA0
2.2 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	6SL3201-0BE21-0AA0
3 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE18-8AC0	6SL3201-0BE21-0AA0

SINAMICS Accessories for G120-2 Push Through

Supply Voltage - Three phase 380...480 V

Rating LO (VT)	Frame Size	Line Reactor	Output Reactor	Brake Resistor
2.2 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE16-1CA0	6SL3201-0BE21-0AA0
3 kW	A	6SL3203-0CE21-0AA0	6SL3202-0AE18-8AC0	6SL3201-0BE21-0AA0

SINAMICS Accessories for G120 PM240 & S110 PM340

Supply Voltage - Single phase 200...240 V

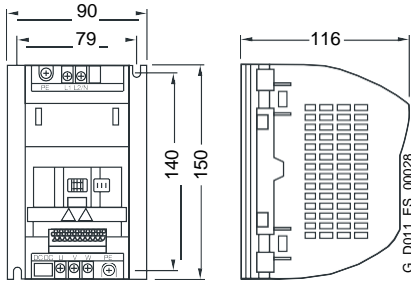
Rating LO (VT)	Frame Size	Line Reactor PM340 only	Output Reactor	Brake Resistor PM340 only
0.12 ..0.37kW	A	6SE6400-3CC00-4AB3		6SE6400-4BC05-0AA0
0.75 kW	A	6SE6400-3CC01-0AB3		6SE6400-4BC05-0AA0

Supply Voltage - Three phase 380...480 V

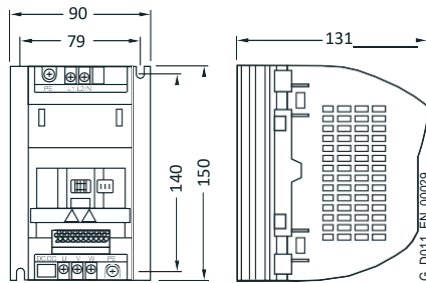
Rating LO (VT)	Frame Size	Line Reactor PM240 & PM340	Output Reactor PM240, PM250 & PM340	Brake Resistor PM240 & PM340
0.37 kW - 0.55 kW	A	6SE6400-3CC00-2AD3	6SE6400-3TC00-4AD2	6SE6400-4BD11-0AA0
0.75 kW - 1.1 kW	A	6SE6400-3CC00-4AD3	6SE6400-3TC00-4AD2	6SE6400-4BD11-0AA0
1.5 kW	A	6SE6400-3CC00-6AD3	6SE6400-3TC00-4AD2	6SE6400-4BD11-0AA0
2.2 kW - 3.0 kW	B	6SL3203-0CD21-0AA0	6SL3202-0AE21-0CA0	6SL3201-0BE12-0AA0
4 kW	B	6SL3203-0CD21-4AA0	6SL3202-0AE21-0CA0	6SL3201-0BE12-0AA0
7.5 kW - 11 kW	C	6SL3203-0CD22-2AA0	6SL3202-0AJ23-2CA0	6SE6400-4BD16-5CA0
15 kW	C	6SL3203-0CD23-5AA0	6SL3202-0AJ23-2CA0	6SE6400-4BD16-5CA0
18.5 kW	D	6SL3203-0CJ24-5AA0	6SE6400-3TC05-4DD0	6SE6400-4BD21-2DA0
22 kW	D	6SL3203-0CJ24-5AA0	6SE6400-3TC03-8DD0	6SE6400-4BD21-2DA0
30 kW	D	6SL3203-0CD25-3AA0	6SE6400-3TC05-4DD0	6SE6400-4BD21-2DA0
37 kW	E	6SL3203-0CJ28-6AA0	6SE6400-3TC08-0ED0	6SE6400-4BD22-2EA1
45 kW	E	6SL3203-0CJ28-6AA0	6SE6400-3TC07-5ED0	6SE6400-4BD22-2EA1
55 kW	F	6SE6400-3CC11-2FD0	6SE6400-3TC14-5FD0	6SE6400-4BD24-0FA0
75 kW	F	6SE6400-3CC11-2FD0	6SE6400-3TC15-4FD0	6SE6400-4BD24-0FA0
90 kW	F	6SE6400-3CC11-7FD0	6SE6400-3TC14-5FD0	6SE6400-4BD24-0FA0
110kW	F	6SL3000-0CE32-3AA0	6SL3000-2BE32-1AA0	6SE6400-4BD26-0FA0
132kW	F	6SL3000-0CE32-8AA0	6SL3000-2BE32-6AA0	6SE6400-4BD26-0FA0
160 kW	GX	6SL3000-0CE33-3AA0	6SL3000-2BE33-2AA0	6SL3000-1BE31-3AA0
200 kW	GX	6SL3000-0CE35-1AA0	6SL3000-2BE33-8AA0	6SL3000-1BE32-5AA0
250 kW	GX	6SL3000-0CE35-1AA0	6SL3000-2BE35-0AA0	6SL3000-1BE32-5AA0

SINAMICS G110 Dimensions

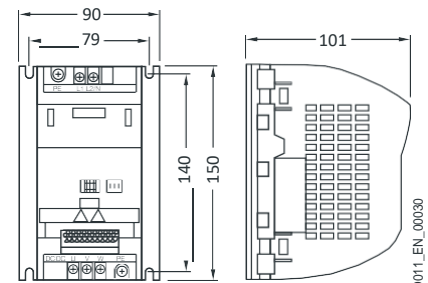
Dimension Diagrams - G110



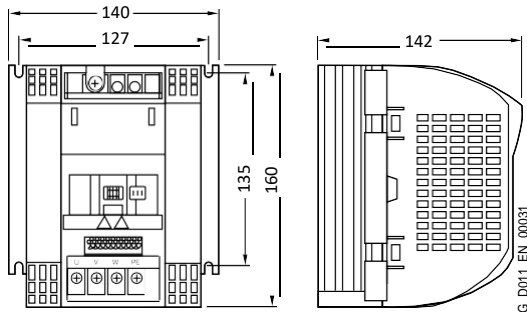
Frame size A
0.12 kW to 0.37 kW



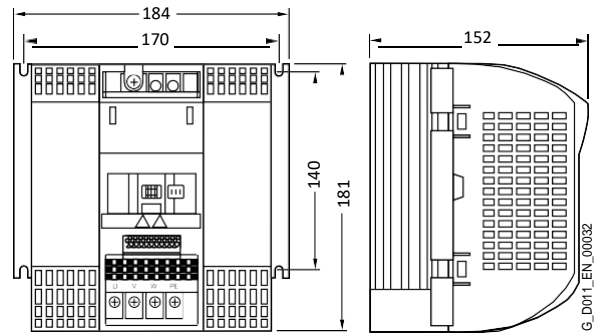
Frame size A
0.55 kW to 0.75 kW



Frame size A (with flat heat sink)
0.12 kW to 0.75 kW



Frame size B
1.1 kW to 1.5 kW



Frame size C
2.25 kW to 3.0 kW

Notes

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

Allow ventilation clearances around the drives as follows:

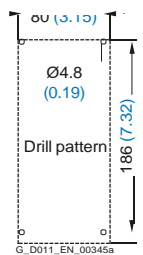
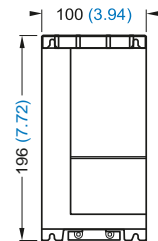
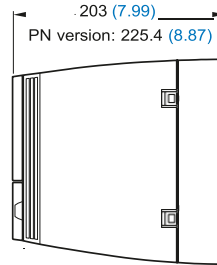
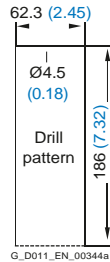
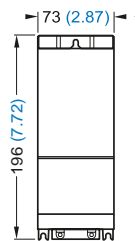
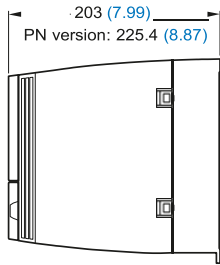
Frame size	Above mm	Below mm	Side mm	Fixing
A	100	100	0	2 x M4
B	100	100	0	2 x M4
C	100	100	0	4 x M5

Note: When the OP is plugged in the mounting depth increases by 8mm.

15mm clearance is required from the side of the enclosure.

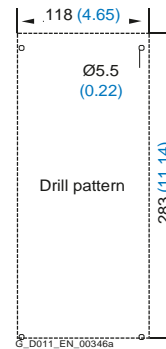
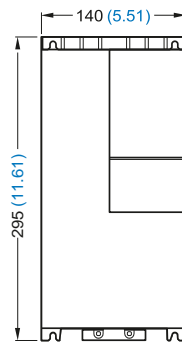
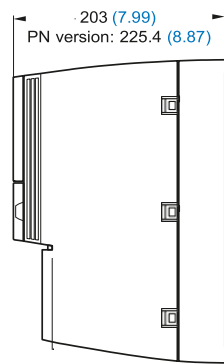
SINAMICS G120C Dimensions

Dimension Diagrams - G120C



Frame size A
0.55 kW - 4 kW

Frame size B
5.5 kW - 7.5 kW



Frame size C
11 kW - 18.5 kW

Notes G120C Installation

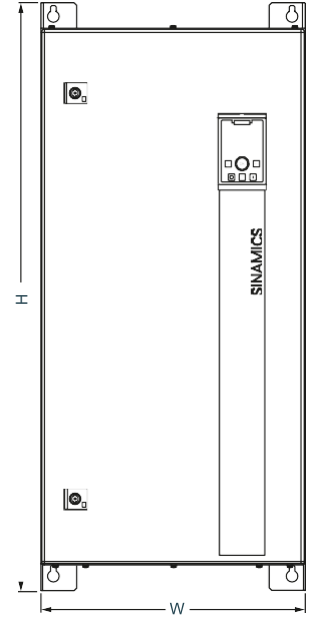
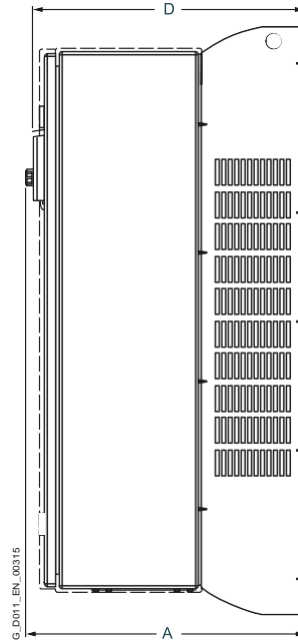
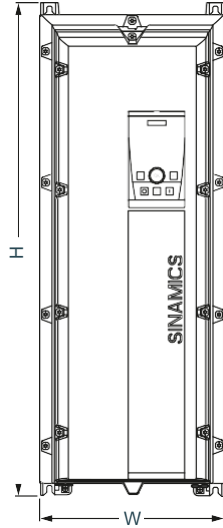
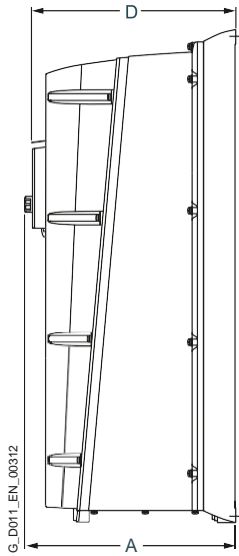
For cabinet sizing purposes, please allow 3% of the drive rating as heat loss.

Frame size	Dimensions			Allow ventilation clearances around the drives as follows:			Fixing
	W	H	D	Above / Below mm	Side < 40 °C	Side > 40 °C	
A	73mm	196mm	203mm 225.4mm (PN)	80 / 100	0	0	2 x M4
B	100mm	196mm	203mm 225.4mm (PN)	80 / 100	0	0	4 x M4
C	140mm	295mm	203mm 225.4mm (PN)	80 / 100	0	0	4 x M5

Note: Depth increases by 11mm with BOP-2 or 21mm with IOP.

SINAMICS G120P PM230 IP55

Dimension Diagrams - G120P IP55



Frame sizes A, B and C

Frames size D, E and F

Notes G120P IP55 Installation

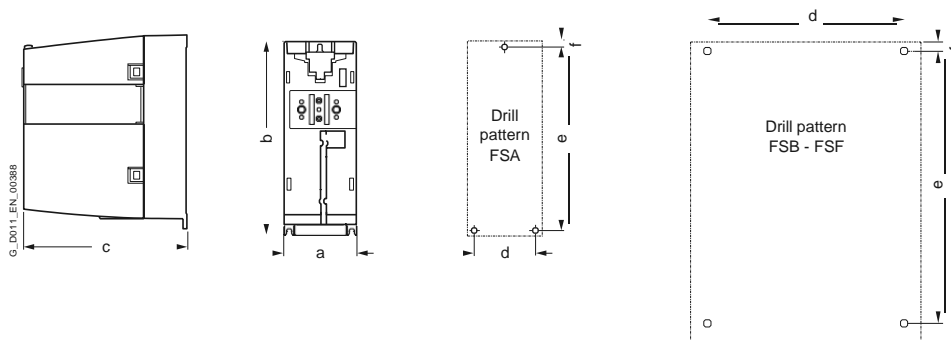
For cabinet sizing purposes, please allow 3% of the drive rating as heat loss.

Frame size	Dimensions				Allow ventilation clearances around the drives as follows:			Drill & Fixing Pattern	
	D	W	H	A	Above / Below mm	Side < 40°C	Side > 40°C	Fixing	Drill - W x L
A	249mm	154mm	460mm	264mm	100	0	0	4 x M4	132 x 445 x 4.5 Ø
B	249mm	180mm	540mm	264mm	100	0	0	4 x M4	158 x 224 x 4.5 Ø
C	249mm	230mm	620mm	264mm	125	0	0	4 x M5	208 x 604 x 5.5 Ø
D	329mm	320mm	640mm	344mm	300	0	50	4 x M8	285 x 600 x 8.5 Ø
E	329mm	320mm	751mm	344mm	300	0	50	4 x M8	285 x 710 x 8.5 Ø
F	416mm	410mm	910mm	431mm	350	0	50	4 x M8	370 x 870 x 8.5 Ø

Note: Depth increases by 5mm with BOP-2 / Blanking plate or 15mm with IOP (dimension A).

SINAMICS G120 Dimensions

PM230 IP20 / PM240-2 IP20



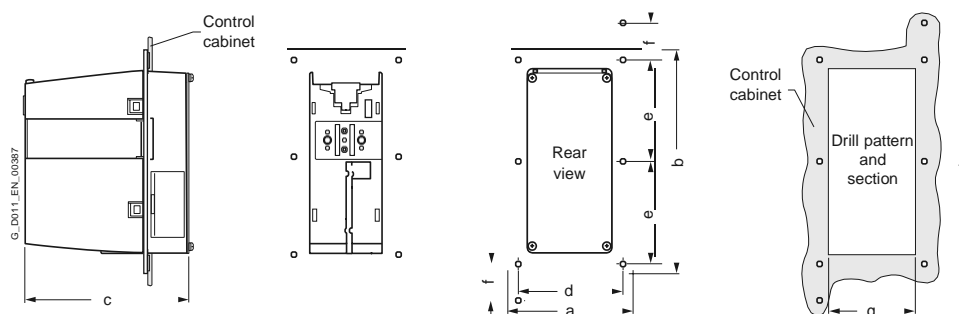
PM230 IP20 / PM240-2 IP20 Standard Variant

Frame size	Dimensions			Drilling dimensions			Cooling clearances		Mounting
	a (width)	b (height)	c (depth)	d	e	f	Top/Bottom	Side *	
FSA	73mm	196mm	165mm	62.3mm	186mm	6mm	80/100mm	0mm	3 x M4
FSB	100mm	292mm	165mm	80mm	281mm	6mm	80/100mm	0mm	4 x M4
FSC	140mm	335mm	165mm	120mm	343mm	6mm	80/100mm	0mm	4 x M5
FSD w/o filter	275mm	419mm	204mm	235mm	325mm	11mm	300/300mm	50mm	4 x M6
FSD with filter	275mm	512mm	204mm	235mm	419mm	11mm	300/300mm	50mm	4 x M6
FSE w/o filter	275mm	499mm	204mm	235mm	405mm	11mm	300/300mm	50mm	4 x M6
FSE with filter	275mm	635mm	204mm	235mm	514mm	11mm	300/300mm	50mm	4 x M6
FSF w/o filter	350mm	634mm	316mm	300mm	598mm	11mm	350/350mm	50mm	4 x M8
FSF with filter	350mm	934mm	316mm	300mm	899mm	11mm	350/350mm	50mm	4 x M8

PM240-2 IP20 Standard variant

FSA	73mm	196mm	165mm	62.3mm	186mm	6mm	80/100mm	0mm	3 x M4
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When the CU230P-2 Control Unit is plugged on, the depth increases by 58mm.
 When the CU240B-2 or CU240E-2 Control Unit is plugged on, the depth increases by 40mm or with CU250S-2 by 62mm.
 When the IOP is plugged on, the depth increases by a further 25mm.
 When the BOP-2 is plugged on, the depth increases by a further 15mm.
 The power modules can be mounted side by side but a clearance of 1mm is recommended for tolerance reasons.



PM230 IP20 / PM240-2 IP20 Push Through Variant

Frame size	Dimensions			Drilling dimensions			Section of cabinet		Cooling clearances		Mounting
	a (width)	b (height)	c (depth)	d	e	f	g (width)	h (height)	Top/Bottom	Side *	
FSA	125.9mm	238mm	171mm	106mm	103mm	27mm	88mm	198mm	80/100mm	0mm	M5
FSB	153.9mm	345mm	171mm	154mm	147.5mm	34.5mm	1160mm	304mm	80/100mm	0mm	M5
FSC	200mm	410.5mm	171mm	174mm	123mm	30.5mm	156mm	365mm	80/100mm	0mm	M5

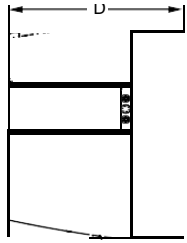
PM240-2 IP20 Push Through variant

FSA	125.9mm	238mm	165mm	106mm	103mm	27mm	88mm	198mm	80/100mm	0mm	M5
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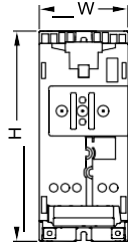
Overall depth, of which 117.7mm is inside and 53.1mm is outside the control cabinet.
 When the CU230P-2 Control Unit is plugged on, the depth increases by 58mm.
 When the CU240B-2 or CU240E-2 Control Unit is plugged on, the depth increases by 40mm or with CU250S-2 by 62mm.
 When the IOP is plugged on, the depth increases by a further 25mm.
 When the BOP-2 is plugged on, the depth increases by a further 15mm.
 The power modules can be mounted side by side but a clearance of 1mm is recommended for tolerance reasons.

SINAMICS G120 / S110 Dimensions

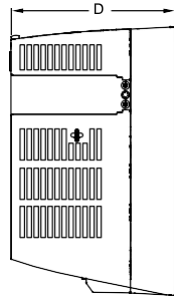
PM240 / PM250 / PM260 / PM340



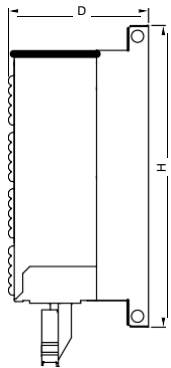
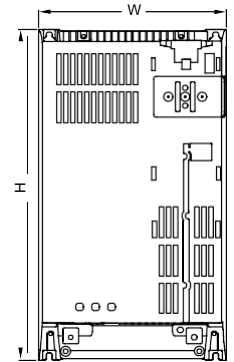
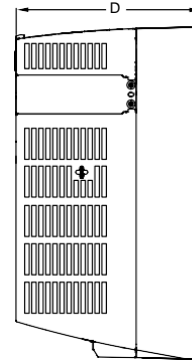
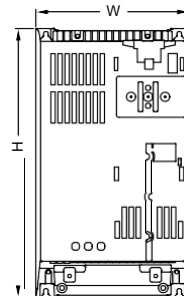
Frame size A



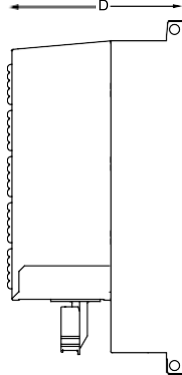
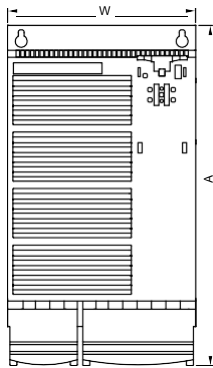
Frame size B



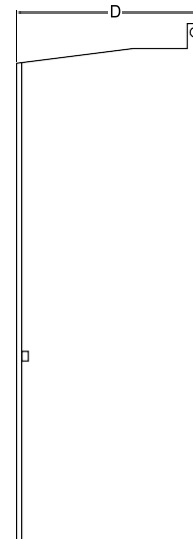
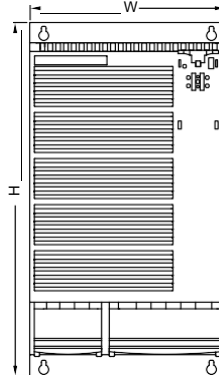
Frame size C



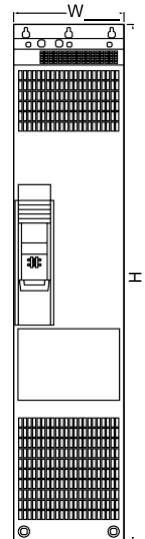
Frame size D & D with Filter
Frame size E & E with filter



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

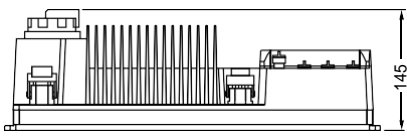
Note: PM240 & PM250 depth increases by 65mm with CU230P-2 or 46mm with CU240B-2/E-2 or 62mm with CU250S-2 and a further 12mm with BOP-2 / Blanking Plate or 22mm with an IOP.

PM340 FSA depth increases by 46mm with CU240E-2 and a further 12mm with BOP-2 / Blanking Plate or 22mm with an IOP.

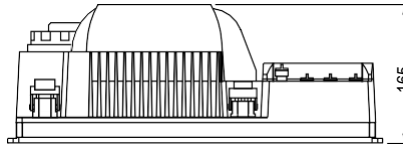
PM340 depth increases by 90mm with CU305 PB/CU305 CAN or 70mm with CU305 PN.

- PM340 only.

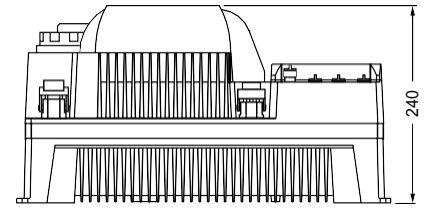
SINAMICS G110D Dimensions



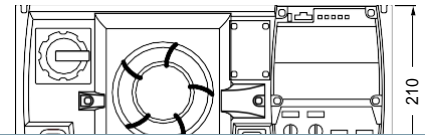
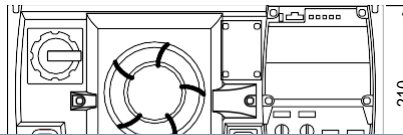
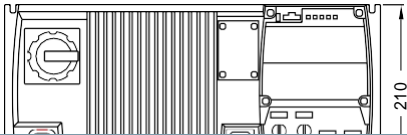
Frame size A



Frame size B



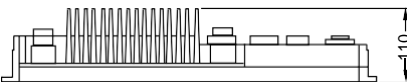
Frame size C



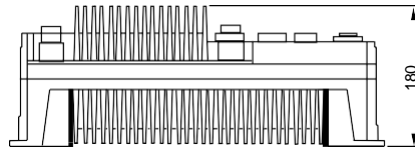
Sizes shown with Isolator (Maintenance Switch) fitted. Frame size A height reduces by 20mm without Isolator (Maintenance Switch).
Allow ventilation clearances around the drives as follows:

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

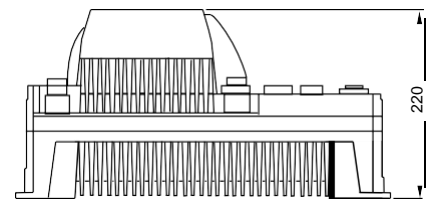
SINAMICS G120D Dimensions



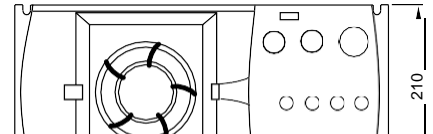
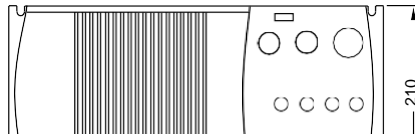
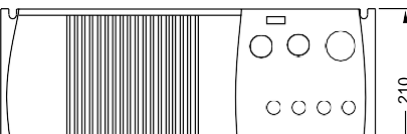
Frame size A



Frame size B



Frame size C



Notes G120D

Allow ventilation clearances around the drives as follows:

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