

A black, modular industrial drive unit, the Siemens SINAMICS G120, is shown from a low-angle perspective. The unit features a large, black, ribbed cooling grille on the left side. On the right side, there is a control panel with a green 'SIEMENS' logo at the top. Below the logo, there is a black rotary knob with 'OK' written on it. To the left of the knob is a small 'ESC' button, and to the right is a small 'INFO' button. Below the knob, there is a red emergency stop button with a white 'O' symbol, a black 'HAND AUTO' button, and a green 'I' button. Below these buttons, there is a small display screen showing a yellow bar graph and some text. The word 'SINAMICS' is printed vertically in white on the right side of the unit. The background is a light blue gradient.

SIEMENS

SINAMICS G120 — The modular drive

Space-saving, safe and flexible

usa.siemens.com/sinamics-g120

Answers for industry.

SINAMICS G120

Space-saving, safe and flexible

Whether pumping, ventilating, compressing, moving or processing, the SINAMICS G120 is the universal drive to address the widest range of requirements. It leverages its strengths in general machinery construction, as well as in the automotive, textile and packaging industries.

Its modular design and wide range of power ratings extending from 0.55 kW up to 250 kW (.75–300 hp) always ensures that you can configure the perfect drive for your application.

With SINAMICS G120, you will benefit from the wide range of possibilities that its modular design offers — including flexibility and cost-savings, thanks to the need for reduced spare parts. All of this is complemented by its user-friendliness — from installation through maintenance.

The advantages of the SINAMICS drives family — an overview:

- Wide range of power ratings from 0.12 kW ($\frac{1}{8}$ hp) to 85 MW
- Available in low-voltage, medium-voltage as well as DC versions
- High degree of flexibility and combinability
- Simple coupling to SIMATIC control systems and seamless automation integration through the Siemens Totally Integrated Automation Portal
- Higher-level, standard Safety Integrated concept
- Standard and unified functionality resulting from common hardware and software
- Common engineering for all drives — SIZER for engineering and STARTER/SINAMICS Startdrive for parameterization and commissioning

Mechanical system

- » Modular design
- » Innovative cooling concept for a higher degree of flexibility

Functionality

- » Comprehensive range of encoder interfaces
- » Application-oriented control modules with expanded I/O quantity scope
- » Positioning capability (EPos)
- » Safety Integrated: STO, SS1, SBC, SLS, SDI, SSM
- » Power Modules with low line harmonics
- » Energy recovery into the line supply without requiring additional modules
- » Integrated SIL3 on PM240-2 Frame sizes D, E and F



High-power density

- » Extremely compact design
- » Significantly smaller than previous generation

Communication

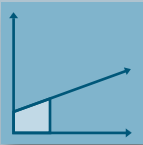
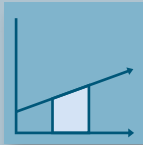
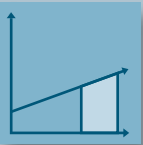
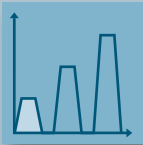
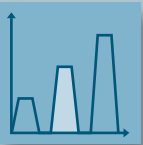
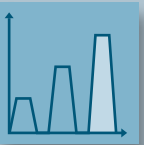

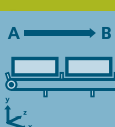
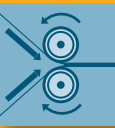

- » Integral part of Totally Integrated Automation — with interfaces for PROFINET and PROFIBUS
- » Supported profiles include PROFIdrive, PROFIsafe, PROFIenergy
- » Coupling to third-party systems via USS/Modbus RTU, CANopen, BacNet MS/TP, EtherNet/IP

PM240-2 Frame F

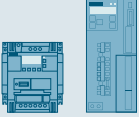
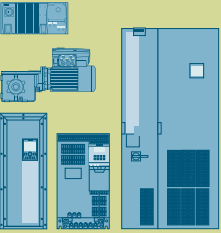
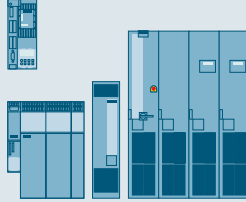
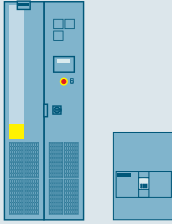
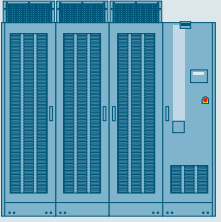
SINAMICS drives

Power and performance for every application

The modular SINAMICS G120 is suitable for the applications highlighted below.

Performance*	Continuous motion			Discontinuous motion		
	 Basic	 Medium	 High	 Basic	 Medium	 High
Purpose						
 Pumping / ventilating / compressing	Centrifugal pumps Radial/axial fans Compressors	Centrifugal pumps Radial/axial fans Compressors	Excentric screw pumps	Hydraulic pumps Dosing pumps		Descaling pumps Hydraulic pumps
 Moving	Conveyor belts Roll conveyors Chain conveyors	Conveyor belts Roller conveyors Chain conveyors Vertical material handling Elevators/escalators Gantry cranes Marine drives Cable railways	Elevators Container cranes Mine hoists Open-cast mine excavators Test stands	Accelerating conveyors Rack feeders	Accelerating conveyors Rack feeders Crosscutters Roll changers	Storage and retrieval machines Robotics Pick-and-place Rotary indexing machines Crosscutters Roll feeds Engaging/disengaging function
 Processing	Mills Mixers Kneaders Crushers Agitators Centrifuges	Mills Mixers Kneaders Crushers Agitators Centrifuges Extruders Rotary furnaces	Extruders Winders / unwinders Leading / following drives Calenders Main press drives Printing machines	Tubular bagging machines Single-axis motion control such as: • Positioning profiles • Path profiles		Servo presses Rolling mill drives Multi-axis motion control such as: • Multi-axis positioning • Cam discs • Interpolations
 Machining	Main drives for Turning Milling Drilling	Main drives for Drilling Sawing	Main drives for Turning Milling Drilling Gear cutting Grinding	Axis drives for Turning Milling Drilling	Axis drives for Drilling Sawing	Axis drives for Turning Milling Drilling Laser machining Gear cutting Grinding Nibbling and punching

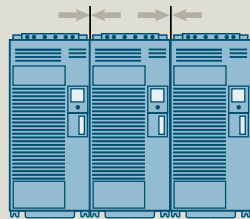
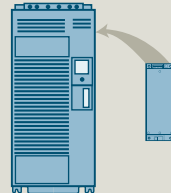
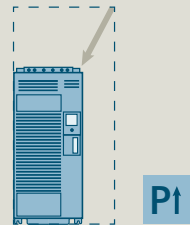
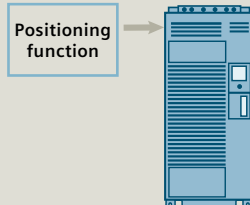
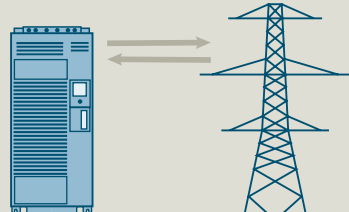
*) Requirements placed on the torque accuracy / speed accuracy / positioning accuracy / axis coordination / functionality

Low-voltage AC			DC-voltage DC	Medium-voltage AC
Basic performance	General performance	High-performance	DC applications	For applications with high power ratings
				
V-series	G-series	S-series	DCM	Medium-voltage series
0.12–30 kW	0.37–6,600 kW	0.15–5,700 kW	6 kW–3 MW	0.15–85 MW
When it comes to the hardware as well as the functionality, SINAMICS V drives concentrate on the essentials. This results in a high degree of ruggedness with low associated investment costs.	The functionality of SINAMICS G drives makes them the perfect choice when addressing basic and medium requirements relating to the control dynamic performance.	SINAMICS S drives are predestined for demanding single-axis and multi-axis applications in plant and machinery construction — as well as for the widest range of motion control tasks.	In addition to the highest power ratings, SINAMICS DC drives also offer the maximum degree of availability.	Our seamless and integrated range — which is unique worldwide — encompasses every dynamic response and performance level in voltage classes 2.3 to 11 kV.



Space-saving

Great design, innovative technology, extremely compact

<p>Side-by-side mounting</p> <p>Cost reduction by saving space in the control cabinet</p>	
<p>Same housing geometry for all voltages with and without filter A</p> <p>Space-saving as a result of the same frame size with integrated filter</p>	
<p>Higher power density</p> <p>Space-saving as a result of a higher power rating in a smaller space</p>	
<p>Integrated basic positioning functionality</p> <p>Modules can be eliminated, such as additional positioning modules, encoder interfaces, etc.</p>	
<p>Integrated energy recovery (Efficient Infeed Technology)</p> <p>With the PM250, excess energy can be directly fed back into the line supply</p>	



SINAMICS G120 — Frame size C, D and E

**Mounting dimensions PM240/PM240-2^{*)}
without/with integrated Class A line filter**

Frame size	W (mm)	H (mm)	D (mm)
FSA	73	196	165
FSB	100	292	
FSC	140	355	
FSD	200	472	237
FSE	275	551	
FSF	305	709	
FSGX	326	1,533	547

^{*)} Same frame size with and without filter A

**Mounting dimensions PM250
without/with integrated Class A line filter**

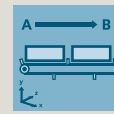
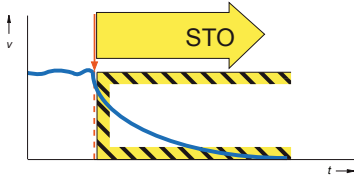
Frame size	W (mm)	H (mm)	D (mm)
FSC	189	334	185
FSD	275	419 / 512	204
FSE		499 / 635	
FSF	350	634 / 934	316

Safe

Safety functions in SINAMICS G120

Safe Torque Off (STO)

- Protects against inadvertent drive starting
- The drive is safely switched into a no-torque condition

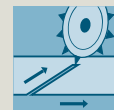
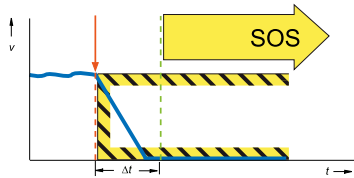


Conveyor belt

e.g. baggage handling / packet transport, feeding, removing

Safe Stop 1 (SS1)

- The drive is quickly stopped and safely monitored, especially for high moments of inertia
- An encoder is not required

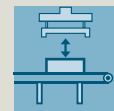
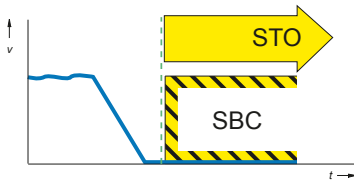


Saws

e.g. saws, unwinders, extruders, centrifuges, storage and retrieval machines

Safe Brake Control (SBC) with CU250S-2

- Safe control of holding brakes that are active in the no-current state
- Prevents sagging of suspended / pulling loads

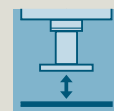
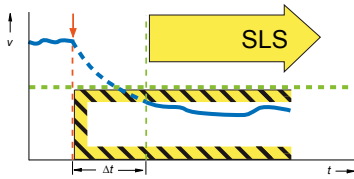


Crane

e.g. cranes, winders

Safely Limited Speed (SLS)

- Reduction and continuous monitoring of the drive speed to directly work at the machine while operational
- An encoder is not required

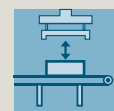
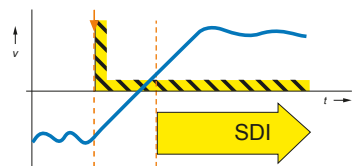


Press

e.g. presses, punches, winders, conveyor belts, grinding machines

Safe Direction (SDI)

- The function ensures that the drive can only rotate in the selected direction

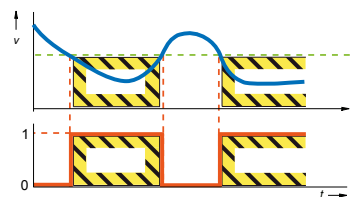


Loading gantry

e.g. storage and retrieval machines, presses, unwinders

Safe Speed Monitoring (SSM)

- The function provides a safe output signal, if the drive has fallen below the specified velocity limit



Milling tool

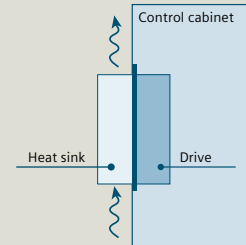
e.g. grinding machines, conveyor lines, drills, milling machines, packaging machines

Flexible

SINAMICS G120 is the reliable system for a variety of applications

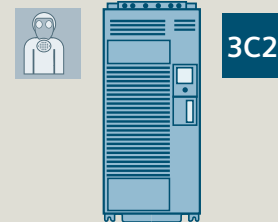
Push-through versions

- Lower temperature rise in the control cabinet
- Flexible control cabinet concepts



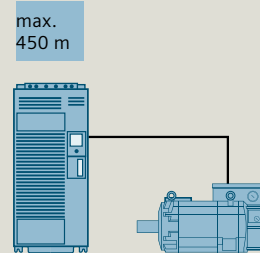
Components resistant to aggressive gases and coated modules

- Compliance with environmental class 3C2 (3C3 with SIPLUS)



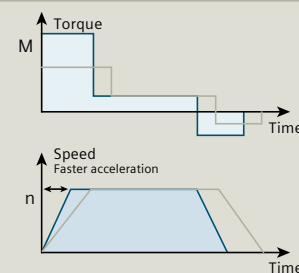
Optimized Power Module design

- Longer motor cables possible: shielded: 200m (660 ft.); unshielded: 450 m (1485 ft.)
- Elimination of an output reactor
- Insensitive to line fluctuations
- Up to IP20



Closed-loop control

- Rugged open-loop and closed-loop control response for drives with low dynamic requirements — as well as for demanding drives with speed and torque control

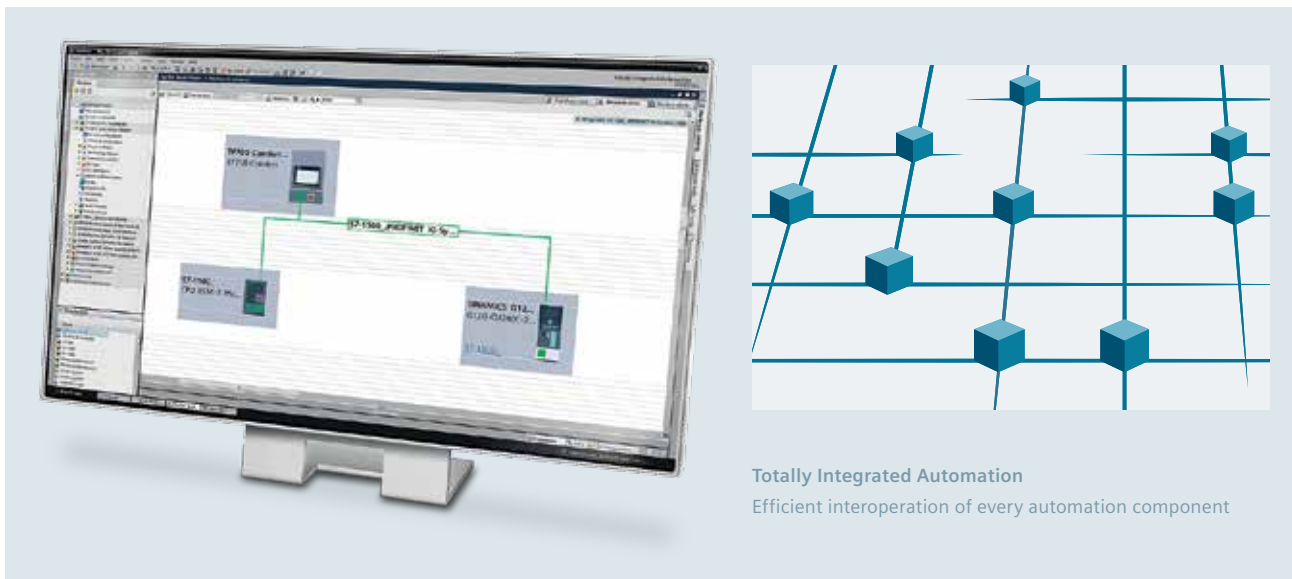


Integrated, intelligent and innovative

Down to the finest detail

With SINAMICS G120, we implement a holistic approach for automation and drive technology that paves the way for improved production. We can offer you everything to help you efficiently work with our innovative drives — and create the pre-conditions so that these devices can be seamlessly integrated into the automation environment.

Networked with the automation — Totally Integrated Automation

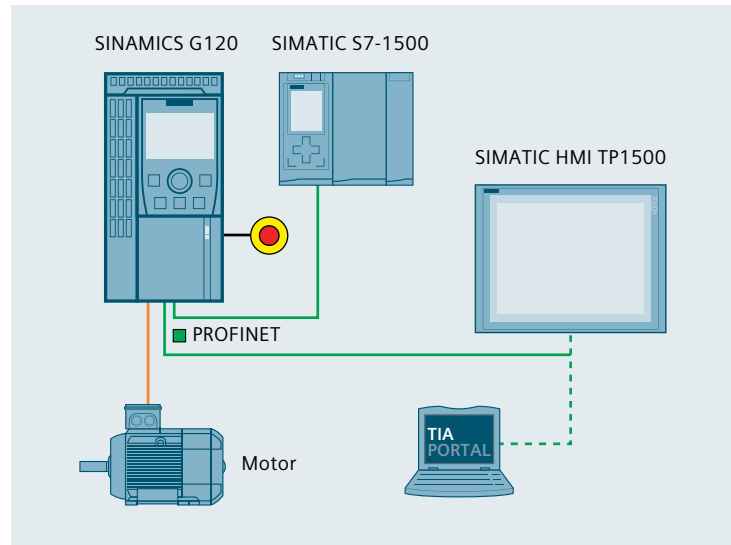


Using the Totally Integrated Automation Portal (TIA Portal), our innovative engineering framework for all automation tasks, SINAMICS drives can be simply and efficiently integrated into any automation environment — using the SINAMICS Startdrive commissioning software, an integral component of the TIA Portal. This simplifies engineering, commissioning and diagnostics.

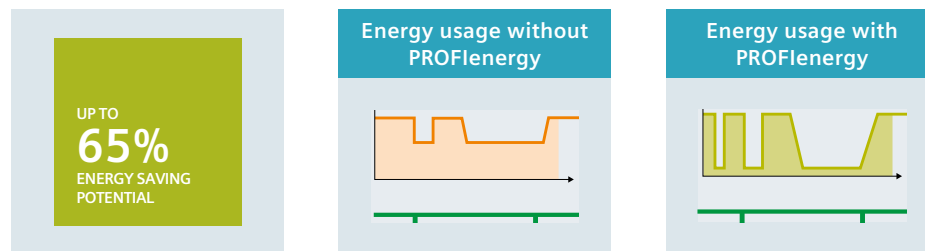
TIA Portal is the core of Totally Integrated Automation. The open system architecture covers the complete production process — and means that every automation component efficiently interacts with each other. This is achieved through consistent data management, global standards and unified hardware and software interfaces.

PROFINET — the leading Ethernet standard for industry

- PROFINET plays a central role within the scope of Totally Integrated Automation.
- The open Ethernet standard stands for fast and secure data exchange between all of the company hierarchic levels.
- Its flexibility, efficiency and performance create the optimum pre-condition for sustainably increasing productivity — and more competitiveness.



A systematic approach to higher energy efficiency



Our drives save energy through focused application-specific speed control as well as recovering braking energy up to 65% energy. Integrated energy-saving functions minimize your power costs even more.

With Efficient Infeed Technology, we offer an innovative feature, which also means that compact drives are capable of energy recovery.

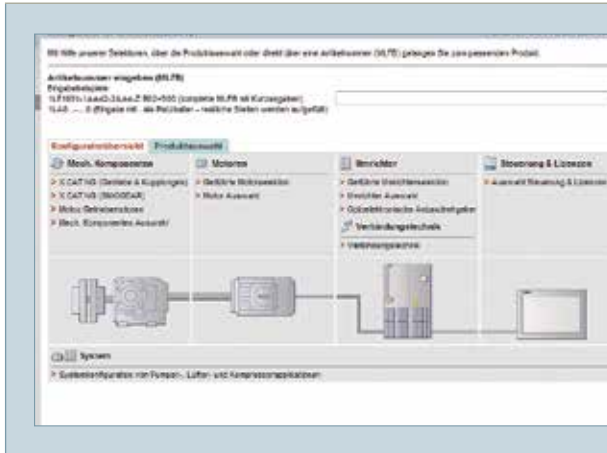
SINAMICS G120 with PROFINET interface supports PROFIenergy. With the PROFINET-based profile, loads can be shut-down independent of the manufacturer and device in non-operational periods — in a coordinated fashion and centrally-controlled.

Additional energy-saving functions

- ECO mode/flux reduction reduces motor currents in the partial load range
- Hibernation mode — the drive is automatically switched on and switched off depending upon the process requirements
- Energy balancing in the common DC link reduces the line current as a result of the high active power component
- Display of the electrical energy used
- Cascade — drives are switched on and switched off in stages depending upon the process requirement

Powerful software tools — support when selecting, commissioning and operating

The SINAMICS G120 is not only easy to configure, it already offers a high degree of operator-friendliness during commissioning and in subsequent operation. Standard software tools make this possible.



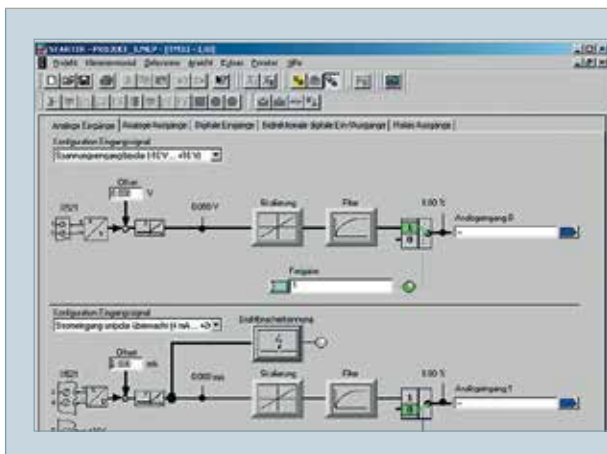
DT Configurator

- Fast product selection and ordering



SIZER

- Efficient engineering of a complete drive system



STARTER/SINAMICS Startdrive

- Configuration and commissioning in the Totally Integrated Automation Portal

Intelligent Operator Panel and Basic Operator Panel — intuitive operation and monitoring

For easy and efficient local operation and monitoring of the SINAMICS G120, two different operator panels are available — the Basic Operator Panel (BOP-2) and the Intelligent Operator Panel (IOP).

The IOP makes it simple to commission standard drives, thanks to the large plain text display, menu prompting and application wizards. By displaying parameters in plain text, explanatory help texts and parameter filters, commissioning can be essentially carried out without having to use a printed parameter list.

Drive troubleshooting is done in a user-friendly fashion using plain text display of the faults and alarms. Explanatory help texts are provided using the INFO key.

Up to four process values can be graphically or numerically visualized on the status screen. Process values can also be displayed in technological units.



SINAMICS IOP
14 interface languages available



SINAMICS BOP

IOP (Intelligent Operator Panel)	BOP-2 (Basic Operator Panel)	Your advantage
<ul style="list-style-type: none"> Series commissioning using the clone function User-defined parameter list where users can select the number of parameters Commissioning of standard applications using application-specific wizards, knowledge about parameters not necessary Simple commissioning on-site using a handheld terminal 	<ul style="list-style-type: none"> Good overview as parameters and parameter values are simultaneously displayed 	Fast commissioning without expert knowledge
<ul style="list-style-type: none"> The drive can be manually operated — it is possible to simply toggle between automatic and manual modes Graphic display of status values, e.g. pressure and flow in bar-type diagrams Status display with freely selectable units to specify physical values 	<ul style="list-style-type: none"> 2-line display for up to 2 process values with text Status display of pre-defined units 	High degree of operator-friendliness and intuitive operation
<ul style="list-style-type: none"> Diagnostics using a plain text display, without any documentation and locally on-site Simple update of languages, application wizards and firmware via USB 	<ul style="list-style-type: none"> Diagnostics with menu prompting with 7-segment display 	Minimized wait times
<ul style="list-style-type: none"> Can be mounted directly on the Control Unit, installed in the door or as handheld terminal (depends upon the drive type) 14 interface languages are available 	<ul style="list-style-type: none"> Can be mounted directly on the Control Unit or installed in the door (depends upon the drive type) 	Can be used flexibly

SINAMICS G120

User-friendliness through modularity

Flexible combinations, high degree of operator-friendliness and standard software make the SINAMICS G120 a user-friendly solution from the beginning.

Modularity offers you many advantages —

- Parts can be simply selected
- Lower costs and parts can be quickly replaced when service is required
- Fewer parts have to be stocked
- Can be simply expanded
- High reliability through integrated communication

SINAMICS G120
simply select —



SINAMICS selector app



Using this app, you can compile the order numbers for your SINAMICS G120 drive. It will guide you quickly and easily through the correct order numbers (MLFBs).

This is how it works

- Select SINAMICS frequency drives
- Select the rated power and device options
- Select accessories

You will be able to save and send your selection via e-mail. The pre-selection serves as the basis for an order specification with your distributor / Siemens.



Scan this
QR-code to
download
the app
free-of-charge

1



The choice is yours

You can select between two Power Modules depending upon your particular requirements.

**Standard braking response
with braking chopper**

PM240/PM240-2 Power Modules

The PM240/PM240-2 Power Modules are ideal for standard applications in general machinery construction.

**Innovative braking response
with energy recovery**

PM250 Power Modules

The PM250 Power Module is ideal for applications requiring energy recovery.

2



Select your Control Unit

**CU230P-2
Control Unit**

The CU230P-2 Control Unit is specifically designed for pump, fan and compressor applications

**CU240B-2 / CU240E-2
Control Unit**

The CU240B-2 / CU240E-2 are suitable for a multitude of applications in general machinery construction (e.g. mixers, agitators)

**CU250S-2
Control Unit**

The CU250S-2 is suitable for high-quality applications (e.g. extruders and centrifuges)

3



Select the optional components

Additional components are available depending upon your particular requirements, for example, an operator panel (IOP or BOP-2) or a blanking cover.



Your SINAMICS G120 drive has now been configured

Detailed information on products and options is provided in the current Catalog D 31 in Chapter "SINAMICS G120 standard inverters" or in the Siemens Industry Mall.

1 SINAMICS G120 — selecting the Power Module and power-dependent options

Power Modules PM240/PM240-2

What power is required? (LO = Low Overload; HO = High Overload) Definition HO/LO see p.18

PM240/PM240-2 Power Modules have an integrated braking chopper and are suitable for many applications in general machinery construction.



Is a filtered device of Class A required?

The integrated EMC filter (Class A filter) is required to maintain the cable-conducted interference voltages and the radiated disturbances for installations in compliance with EN 61800-3 Category C2.

Are additional external line filters required (for example to maintain specific EMC values)?

The external EMC filter (Class B filter) is also used to maintain cable-conducted interference voltages for installations according to EN 61800-3 Category C1. An unfiltered PM240-2 must be selected when using a Class B filter.

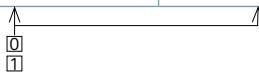
Power Modules 1/3AC PM240-2/200V – 240V +/-10 %

Rated power LO (kW)	Rated power (hp)	Output current LO (A) I _N	Output current HO (A) I _{CH}	Frame size		Unfiltered Power Modules (Part number)	Integrated Class A filter Power Modules (Part number)		Class A filter	Class B line filter
1AC / 3 AC 200V ... 240V										
0.55	0.75	3.2	2.3	FSA		6SL3210-1PB13-0UL0	6SL3210-1PB13-0AL0	The PM240-2 200V has now been completely selected.	integrated	–
0.75	1	4.2	3.2	FSA		6SL321□-1PB13-8UL0	6SL321□-1PB13-8AL0		integrated	–
1.1	1.5	6	4.2	FSB		6SL3210-1PB15-5UL0	6SL3210-1PB15-5AL0		integrated	–
1.5	2	7.4	6	FSB		6SL3210-1PB17-4UL0	6SL3210-1PB17-4AL0		integrated	–
2.2	3	10.4	7.4	FSB		6SL321□-1PB21-0UL0	6SL321□-1PB21-0AL0		integrated	–
3	4	13.6	10.4	FSC		6SL3210-1PB21-4UL0	6SL3210-1PB21-4AL0		integrated	–
4	5	17.5	13.6	FSC		6SL321□-1PB21-8UL0	6SL321□-1PB21-8AL0		integrated	–
3AC 200V ... 240V										
5.5	7.5	22	17.5	FSC		6SL3210-1PC22-2UL0	6SL3210-1PC22-2AL0	The PM240-2 200V has now been completely selected.	integrated	–
7.5	10	28	22	FSC		6SL3210-1PC22-8UL0	6SL3210-1PC22-8AL0		integrated	–
11	15	42	35	FSD		6SL3210-1PC24-2UL0	–		–	–
15	20	54	42	FSD		6SL3210-1PC25-4UL0	–		–	–
18.5	25	68	54	FSD		6SL3210-1PC26-8UL0	–		–	–
22	30	80	68	FSE		6SL3210-1PC28-0UL0	–		–	–
30	40	104	80	FSE		6SL3210-1PC31-1UL0	–		–	–

Power Modules 3AC PM240/PM240-2/380V – 400V +/-10 %

Rated power LO (kW)	Rated power (hp)	Output current LO (A)	Frame size HO (A)	Frame size	Unfiltered Power Modules (Part number)	Integrated Class A filter Power Modules (Part number)		Class A filter is integrated in the filter device up to 90 kW (Part number)	Class B line filter (subassembly) ³⁾ (Part number)
0.55	0.75	1.7	1.3	FSA	6SL3210-1PE11-8UL1	6SL3210-1PE11-8AL1	The PM240 / PM240-2 400V has now been completely selected.	integrated	6SL3203-0BE17-7BA0
0.75	1	2.2	1.7	FSA	6SL3210-1PE12-3UL1	6SL3210-1PE12-3AL1		integrated	6SL3203-0BE17-7BA0
1.1	1.5	3.1	2.2	FSA	6SL3210-1PE13-2UL1	6SL3210-1PE13-2AL1		integrated	6SL3203-0BE17-7BA0
1.5	2	4.1	3.1	FSA	6SL3210-1PE14-3UL1	6SL3210-1PE14-3AL1		integrated	6SL3203-0BE17-7BA0
2.2	3	5.9	4.1	FSA	6SL3210-1PE16-1UL1	6SL3210-1PE16-1AL1		integrated	6SL3203-0BE17-7BA0
3	4	7.7	5.9	FSA	6SL321□-1PE18-0UL1	6SL321□-1PE18-0AL1		integrated	6SL3203-0BE17-7BA0
4	5	10.2	7.7	FSB	6SL3210-1PE21-1UL0	6SL3210-1PE21-1AL0		integrated	6SL3203-0BE21-8BA0
5.5	7.5	13.2	10.2	FSB	6SL3210-1PE21-4UL0	6SL3210-1PE21-4AL0		integrated	6SL3203-0BE21-8BA0
7.5	10	18	13.7	FSB	6SL321□-1PE21-8UL0	6SL321□-1PE21-8AL0		integrated	6SL3203-0BE21-8BA0
11	15	26	18	FSC	6SL3210-1PE22-7UL0	6SL3210-1PE22-7AL0		integrated	6SL3203-0BE23-8BA0
15	20	32	26	FSC	6SL321□-1PE23-3UL0	6SL321□-1PE23-3AL0		integrated	6SL3203-0BE23-8BA0
18.5	25	38	32	FSD	6SL3210-1PE23-8UL0	6SL3210-1PE23-8AL0		integrated	–
22	30	45	38	FSD	6SL3210-1PE24-5UL0	6SL3210-1PE24-5AL0		integrated	–
30	40	60	45	FSD	6SL3210-1PE26-0UL0	6SL3210-1PE26-0AL0		integrated	–
37	50	75	60	FSD	6SL3210-1PE27-5UL0	6SL3210-1PE27-5AL0		integrated	–
45	60	90	75	FSE	6SL3210-1PE28-8UL0	6SL3210-1PE28-8AL0		integrated	–
55	75	110	90	FSE	6SL3210-1PE31-1UL0	6SL3210-1PE31-1AL0		integrated	–
75	100	145	110	FSF	6SL3224-0BE35-5UA0	6SL3224-0BE35-5AA0		integrated	–
90	125	178	145	FSF	6SL3224-0BE37-5UA0	6SL3224-0BE37-5AA0		integrated	–
110	150	205	178	FSF	6SL3224-0BE38-8UA0	–		6SL3203-0BE32-5AA0	–
132	200	250	205	FSF	6SL3224-0BE41-1UA0	–		6SL3203-0BE32-5AA0	–
160	250	302	250	FSGX ²⁾	6SL3224-0XE41-3UA0	–		6SL3000-0BE36-0AA0	–
200	300	370	302	FSGX ²⁾	6SL3224-0XE41-6UA0	–		6SL3000-0BE36-0AA0	–
250	400	477	370	FSGX ²⁾	6SL3224-0XE42-0UA0	–		6SL3000-0BE36-0AA0	–

Heat sink version Standard Push-through



¹⁾ 1AC line reactor as third-party option will be available soon. We recommend a line reactor for line supplies with uk < 1 %; alternatively, the next higher Power Module can be selected.

²⁾ A Braking Module is additionally required for frame size FSGX: 6SL3300-1AE32-5AA0

	Is a braking resistor required as a result of the application?	Should an output filter be used, for instance to be able to use long motor cables?		Is a shield plate required for the Power Module?
Line reactors: to smooth voltage peaks, buffer commutation dips and reduce the effects of harmonics on the drive and line supply.	Excess energy in the DC link is dissipated using a braking resistor. Frame sizes FSA to FSF already include an integrated braking chopper (electronic switch).	Output reactors reduce the voltage stress on the motor winding. The cable lengths between the drive and motor can be extended.	Sine-wave filters limit the voltage rate of rise and the capacitive recharging currents. An output reactor is not required.	The shield connection kit simplifies connecting the shields of supply and control cables, offers mechanical strain relief and guarantees an optimum EMC behavior.
3AC line reactor side-mounted ¹⁾ (Part number)	Braking resistors side-mounted (Part number)	Output reactor side-mounted (Part number)	Sine-wave filter	Shield plate for Power Modules
6SL3203-OCE13-2AA0	JJY:023146720008	6SL3202-OAE16-1CA0	–	included
6SL3203-OCE13-2AA0	JJY:023146720008	6SL3202-OAE16-1CA0	–	included
6SL3203-OCE21-0AA0	JJY:023151720007	6SL3202-OAE16-1CA0	–	included
6SL3203-OCE21-0AA0	JJY:023151720007	6SL3202-OAE18-8CA0	–	included
6SL3203-OCE21-0AA0	JJY:023151720007	6SL3202-OAE21-8CA0	–	included
6SL3203-OCE21-8AA0	JJY:023163720018	6SL3202-OAE21-8CA0	–	included
6SL3203-OCE21-8AA0	JJY:023163720018	6SL3202-OAE21-8CA0	–	included
6SL3203-OCE23-8AA0	JJY:023433720001	6SL3202-OAE23-8CA0	–	included
6SL3203-OCE23-8AA0	JJY:023433720001	6SL3202-OAE23-8CA0	–	included
integrated	6SE6400-4BC18-0DA0	not necessary	–	included
integrated	6SE6400-4BC18-0DA0	not necessary	–	included
integrated	6SE6400-4BC21-2EA0	not necessary	–	included
integrated	6SE6400-4BC21-2EA0	not necessary	–	included
integrated	6SE6400-4BC22-5FA0	not necessary	–	included

3AC line reactor side-mounted up to FSC; integrated from FSD (Part number)	Braking resistors side-mounted (Part number)	Output reactor side-mounted (Part number)	Sine-wave filter side-mounted (Part number)	Shield plate for Power Modules (Part number)
6SL3203-OCE13-2AA0	6SL3201-0BE14-3AA0	6SL3202-OAE16-1CA0	–	included
6SL3203-OCE13-2AA0	6SL3201-0BE14-3AA0	6SL3202-OAE16-1CA0	–	included
6SL3203-OCE13-2AA0	6SL3201-0BE14-3AA0	6SL3202-OAE16-1CA0	–	included
6SL3203-OCE21-0AA0	6SL3201-0BE14-3AA0	6SL3202-OAE16-1CA0	–	included
6SL3203-OCE21-0AA0	6SL3201-0BE21-0AA0	6SL3202-OAE16-1CA0	–	included
6SL3203-OCE21-0AA0	6SL3201-0BE21-0AA0	6SL3202-OAE18-8CA0	–	included
6SL3203-OCE21-8AA0	6SL3201-0BE21-8AA0	6SL3202-OAE21-8CA0	–	included
6SL3203-OCE21-8AA0	6SL3201-0BE21-8AA0	6SL3202-OAE21-8CA0	–	included
6SL3203-OCE21-8AA0	6SL3201-0BE21-8AA0	6SL3202-OAE21-8CA0	–	included
6SL3203-OCE23-8AA0	6SL3201-0BE23-8AA0	6SL3202-OAE23-8CA0	–	included
6SL3203-OCE23-8AA0	6SL3201-0BE23-8AA0	6SL3202-OAE23-8CA0	–	included
integrated	6SE6400-4BD21-2DA0	not necessary	–	included
integrated	6SE6400-4BD21-2DA0	not necessary	–	included
integrated	6SE6400-4BD22-2EA1	not necessary	–	included
integrated	6SE6400-4BD22-2EA1	not necessary	–	included
integrated	6SE6400-4BD24-0FA0	not necessary	–	included
integrated	6SE6400-4BD24-0FA0	not necessary	–	included
6SE6400-3CC11-2FD0	6SE6400-4BD24-0FA0	6SE6400-3TC15-4FD0	6SL3202-OAE31-5SA0	6SL3262-1AF00-0DA0
6SE6400-3CC11-7FD0	6SE6400-4BD24-0FA0	6SE6400-3TC14-5FD0	6SL3202-OAE31-8SA0	6SL3262-1AF00-0DA0
6SL3000-OCE32-3AA0	6SE6400-4BD26-0FA0	6SL3000-2BE32-1AA0	6SL3000-2CE32-3AA0	6SL3262-1AF00-0DA0
6SL3000-OCE32-8AA0	6SE6400-4BD26-0FA0	6SL3000-2BE32-6AA0	6SL3000-2CE32-3AA0	6SL3262-1AF00-0DA0
6SL3000-OCE33-3AA0	6SL3000-1BE31-3AA0	6SL3000-2BE33-2AA0	6SL3000-2CE32-8AA0	–
6SL3000-OCE35-1AA0	6SL3000-1BE32-5AA0	6SL3000-2BE33-8AA0	6SL3000-2CE33-3AA0	–
6SL3000-OCE35-1AA0	6SL3000-1BE32-5AA0	6SL3000-2BE35-0AA0	6SL3000-2CE34-1AA0	–

³⁾ An unfiltered Power Module is required to use the external Class B filter

⁴⁾ Side-mounted up to FSC; integrated from FSD

see Prodis: <http://support.automation.siemens.com/WW/view/de/84925578>

Power Modules 3AC PM240-2/500V – 690V +/-10 %

What power is required? (LO = Low Overload; HO = High Overload)					Is a filtered device of Class A required?		The PM240-2 690 V has now been completely selected	Are additional external line filters required (for example to maintain specific EMC values)?	
PM240/PM240-2 Power Modules have an integrated braking chopper and are suitable for many applications in general machinery construction.					The integrated EMC filter (Class A filter) is required to maintain the cable-conducted interference voltages and the radiated disturbances for installations in compliance with EN 61800-3 Category C2.				
Rated power LO (kW)	Rated power (hp)	Output current LO (A)	Output current HO (A)	Frame size	Unfiltered Power Modules (Part number)	Integrated Class A filter Power Modules (Part number)		Class A filter is already integrated	Class B line filter
11	10	14	11	FSD	6SL3210-1PH21-4UL0	6SL3210-1PH21-4AL0	integrated	–	
15	15	19	14	FSD	6SL3210-1PH22-0UL0	6SL3210-1PH22-0AL0	integrated	–	
18.5	20	23	19	FSD	6SL3210-1PH22-3UL0	6SL3210-1PH22-3AL0	integrated	–	
22	25	27	23	FSD	6SL3210-1PH22-7UL0	6SL3210-1PH22-7AL0	integrated	–	
30	30	35	27	FSD	6SL3210-1PH23-5UL0	6SL3210-1PH23-5AL0	integrated	–	
37	40	42	35	FSD	6SL3210-1PH24-2UL0	6SL3210-1PH24-2AL0	integrated	–	
45	50	52	42	FSE	6SL3210-1PH25-2UL0	6SL3210-1PH25-2AL0	integrated	–	
55	60	62	52	FSE	6SL3210-1PH26-2UL0	6SL3210-1PH26-2AL0	integrated	–	

Power Modules 3AC PM250/380V – 480V +/-10 %

What power is required? (LO = Low Overload; HO = High Overload)					Is a filtered device of Class A required?		The PM250 has now been completely selected	Are additional external line filters required (for example to maintain specific EMC values)?	
PM250 Power Modules have integrated energy recovery. This means that any braking energy is directly fed back into the line supply. Four-quadrant applications — a braking chopper is not required.					The integrated EMC filter (Class A filter) is required to maintain the cable-conducted interference voltages and the radiated disturbances for installations in compliance with EN 61800-3 Category C2.			The additional EMC filter (Class B filter) is also used to maintain cable-conducted interference voltages for installations according to EN 61800-3 Category C1.	
Rated power LO (kW)	Rated power (hp)	Output current LO (A)	Output current HO (A)	Frame size	Unfiltered Power Modules (Part number)	Integrated Class A filter Power Modules (Part number)		Class A filter is integrated in the filter device up to 90 kW (Part number)	Class B line filter (subassembly) ³⁾ (Part number)
7.5	10	18	13.2	FSC	—	6SL3225-0BE25-5AA1	integrated	6SL3203-0BD23-8SA0	
11	15	25	19	FSC	—	6SL3225-0BE27-5AA1	integrated	6SL3203-0BD23-8SA0	
15	20	32	26	FSC	—	6SL3225-0BE31-1AA1	integrated	6SL3203-0BD23-8SA0	
18.5	25	38	32	FSD	6SL3225-0BE31-5UA0	6SL3225-0BE31-5AA0	integrated	—	
22	30	45	38	FSD	6SL3225-0BE31-8UA0	6SL3225-0BE31-8AA0	integrated	—	
30	40	60	45	FSD	6SL3225-0BE32-2UA0	6SL3225-0BE32-2AA0	integrated	—	
37	50	75	60	FSE	6SL3225-0BE33-0UA0	6SL3225-0BE33-0AA0	integrated	—	
45	60	90	75	FSE	6SL3225-0BE33-7UA0	6SL3225-0BE33-7AA0	integrated	—	
55	75	110	90	FSF	6SL3225-0BE34-5UA0	6SL3225-0BE34-5AA0	integrated	—	
75	100	145	110	FSF	6SL3225-0BE35-5UA0	6SL3225-0BE35-5AA0	integrated	—	
90	125	178	145	FSF	6SL3225-0BE37-5UA0	6SL3225-0BE37-5AA0	integrated	—	

Missing options such as sine-wave filter, sub-chassis braking resistors, etc., can be supplied from audited drive option suppliers.
More detailed information is provided at www.siemens.com/sinamics-G120

³⁾ An unfiltered Power Module is required to use the external Class B filter

	Is a braking resistor required as a result of the application?	Should an output filter be used, for example, in order to be able to use longer motor cables?		Is a shield plate required for the Power Module?
Line reactors: to smooth voltage peaks, buffer commutation dips and reduce the effects of harmonics on the drive and line supply.	Excess energy in the DC link is dissipated using a braking resistor. Frame sizes FSA to FSF already include an integrated braking chopper (electronic switch).	Output reactors reduce the voltage stress on the motor winding. The cable lengths between the drive and motor can be extended.	Sine-wave filters limit the voltage rate of rise and the capacitive recharging currents. An output reactor is not required.	The shield connection kit simplifies connecting the shields of supply and control cables, offers mechanical strain relief and guarantees an optimum EMC behavior.
Line reactor	Braking resistors	Output reactor	Sine-wave filter	Shield plate for Power Modules
integrated	–	not necessary	–	included
integrated	–	not necessary	–	included
integrated	–	not necessary	–	included
integrated	–	not necessary	–	included
integrated	–	not necessary	–	included
integrated	–	not necessary	–	included
integrated	–	not necessary	–	included
integrated	–	not necessary	–	included

	Is a braking resistor required as a result of the application?	Should an output filter be used, for example, in order to be able to use longer motor cables?		Is a shield plate required for the Power Module?
In conjunction with the PM250, a line reactor is not required, and it is also not permissible that one is used.	The PM250 is capable of energy recovery. A braking resistor is not used, and it is also not permissible that one is used.	Output reactors reduce the voltage stress on the motor winding. The cable lengths between the drive and motor can be extended.	Sine-wave filters limit the voltage rate of rise and the capacitive recharging currents. An output reactor is not required.	The shield connection kit simplifies connecting the shields of supply and control cables, offers mechanical strain relief and guarantees an optimum EMC behavior.
Line reactor, side mounting up to FSC; subchassis from FSD	PM250 with energy recovery. As a consequence, it is not permissible that a braking resistor is used.	Subchassis output reactor (Part number)	Sine-wave filter FSC subchassis, from FSD, side-mounted (Part number)	Shield plate for Power Modules (Part number)
–	is not required	6SL3202-0AJ23-2CA0	6SL3202-0AE22-0SA0	6SL3262-1AC00-0DA0
–	is not required	6SL3202-0AJ23-2CA0	6SL3202-0AE23-3SA0	6SL3262-1AC00-0DA0
–	is not required	6SL3202-0AJ23-2CA0	6SL3202-0AE23-3SA0	6SL3262-1AC00-0DA0
–	is not required	6SE6400-3TC05-4DD0	6SL3202-0AE24-6SA0	6SL3262-1AD00-0DA0
–	is not required	6SE6400-3TC03-8DD0	6SL3202-0AE24-6SA0	6SL3262-1AD00-0DA0
–	is not required	6SE6400-3TC05-4DD0	6SL3202-0AE26-2SA0	6SL3262-1AD00-0DA0
–	is not required	6SE6400-3TC08-0ED0	6SL3202-0AE28-8SA0	6SL3262-1AD00-0DA0
–	is not required	6SE6400-3TC07-5ED0	6SL3202-0AE28-8SA0	6SL3262-1AD00-0DA0
–	is not required	6SE6400-3TC14-5FD0	6SL3202-0AE31-5SA0	6SL3262-1AF00-0DA0
–	is not required	6SE6400-3TC15-4FD0	6SL3202-0AE31-5SA0	6SL3262-1AF00-0DA0
–	is not required	6SE6400-3TC14-5FD0	6SL3202-0AE31-8SA0	6SL3262-1AF00-0DA0

Basis 3AC 380 V ... 480 V ± 10 %, see Catalog D 31 Chapter "SINAMICS G120 standard inverters"

2 SINAMICS G120 — selecting the optimum Control Unit



CU250S-2 Control Unit

Is an encoder used for signal feedback? Is integrated positioning capability required?				
no				yes (EPos positioning functionality through Extended Function license)
CU230P-2	CU240B-2	CU240E-2	CU240E-2 Failsafe	CU250S-2
Is integrated safety technology required?				
no		yes		
		STO (Safe Torque Off)	STO (Safe Torque Off) SS1 (Safe Stop 1) SLS (Safely Limited Speed) SSM (Safe Speed Monitor) SDI (Safe Direction)	STO (Safe Torque Off) SS1 (Safe Stop 1) SBC (Safe Brake Control) ¹⁾ SLS (Safely Limited Speed) ²⁾ SSM (Safe Speed Monitor) ²⁾ SDI (Safe Direction) ²⁾ ¹⁾ A Safe Brake Relay is required for the SBC function ²⁾ With Safety license
CU230P-2	CU240B-2	CU240E-2	CU240E-2 Failsafe	CU250S-2

How many inputs and outputs are required?					
Digital inputs (DI)	6	4	6	6	11
Failsafe DI	–	–	1 (opt. for 2 DI)	3 (opt. for 2 DI)	3 (opt. for 2 DI)
Digital outputs (DO)	3	1	3	3	3 (opt. 1 F-DO)
Fast DI/DO	–	–	–	–	4
Analog inputs	4	1	2	2	2
Analog outputs	2	1	2	2	2
	CU230P-2	CU240B-2	CU240E-2	CU240E-2 Failsafe	CU250S-2

What type of communication/bus system is required?					
USS, Modbus RTU	CU230P-2 HVAC	CU240B-2	CU240E-2	CU240E-2 F	CU250S-2
	6SL3243-0BB30-1HA3	6SL3244-0BB00-1BA1	6SL3244-0BB12-1BA1	6SL3244-0BB13-1BA1	6SL3246-0BA22-1BA0
BACnet MS/TP	CU230P-2 HVAC	–	–	–	–
	6SL3243-0BB30-1HA3				
PROFIBUS DP	CU230P-2 DP	CU240B-2 DP	CU240E-2 DP	CU240E-2 DP-F	CU250S-2 DP
	6SL3243-0BB30-1PA3	6SL3244-0BB00-1PA1	6SL3244-0BB12-1PA1	6SL3244-0BB13-1PA1	6SL3246-0BA22-1PA0
PROFINET/EtherNet/IP	CU230P-2 PN	–	CU240E-2 PN	CU240E-2 PN-F	CU250S-2 PN
	6SL3243-0BB30-1FA0		6SL3244-0BB12-1FA0	6SL3244-0BB13-1FA0	6SL3246-0BA22-1FA0
CANopen	CU230P-2 CAN	–	–	–	CU250S-2 CAN
	6SL3243-0BB30-1CA3				6SL3246-0BA22-1CA0

Permissible combinations with Power Modules					
PM230 (IP20)	yes	yes	yes	yes	no
PM240	yes	yes	yes	yes	yes
PM240-2	yes	yes	yes	yes	yes
PM250	yes	yes	yes	yes	yes

Which optional shield connection kit is required for the particular Control Unit?					
Shield connection kit 1 6SL3264-1EA00-0FA0	HVAC, PROFIBUS, CANopen	–	–	–	–
Shield connection kit 2 6SL3264-1EA00-0HA0	–	USS, Modbus RTU, PROFIBUS	USS, Modbus RTU, PROFIBUS	USS, Modbus RTU, PROFIBUS	–
Shield connection kit 3 6SL3264-1EA00-0HB0	PROFINET	PROFINET	PROFINET	PROFINET	–
Shield connection kit 4 6SL3264-1EA00-0LA0	–	–	–	–	All versions

3 SINAMICS G120 — optional system components and licenses

Description	Part number
Intelligent Operator Panel (IOP) (with 13 interface languages: German, English, French, Italian, Spanish, Portuguese, Dutch, Swedish, Russian, Czech, Polish, Turkish, Finnish)	6SL3255-0AA00-4JA1
Intelligent Operator Panel (IOP) (with the user interfaces simplified Chinese and English)	6SL3255-0AA00-4JC1
IOP Handheld (degree of protection IP54)	6SL3255-0AA00-4HA0
Basic Operator Panel (BOP-2)	6SL3255-0AA00-4CA1
Door mounting kit for BOP-2/IOP	6SL3256-0AP00-0JA0
SINAMICS Memory Card (SD-Card)	6SL3054-4AG00-2AA0
Additional licenses for CU250S-2	
SD card + license Extended Functions Safety (SLS, SSM, SDI)	6SL3054-4AG00-2AA0-Z F01
SD card + license Extended Functions basic positioning (EPos)	6SL3054-4AG00-2AA0-Z E01
SD card + license Extended Safety + basic positioning	6SL3054-4AG00-2AA0-Z F01+E01
License Extended Functions Safety for CU250S-2	6SL3074-0AA10-0AA0
License Extended Functions basic positioning (EPos)	6SL3074-7AA04-0AA0
Additional licenses for CU250S-2 plus firmware V4.7	
SD card + license Extended Functions Safety (SLS, SSM, SDI) + FW V4.7	6SL3054-7EH00-2BA0-Z F01
SD card + license Extended Functions basic positioning (EPos) + FW V4.7	6SL3054-7EH00-2BA0-Z E01
SD card + license Extended Functions Safety + basic positioning + FW V4.7	6SL3054-7EH00-2BA0-Z F01+E01
PC connection kit 2 (for CU230P-2, CU240B-2, CU240E-2, CU250S-2)	6SL3255-0AA00-2CA0
Brake Relay (for direct activation of a motor brake by the CU)	6SL3252-0BB00-0AA0
Safe Brake Relay (Safety version)	6SL3252-0BB01-0AA0
SINAMICS G120/G120C connector plug	6SL3200-0ST05-0AA0
SINAMICS G120/G120C fan unit	6SL3200-0SF12-0AA0
Push-through mounting frame for PM230 Power Modules, degree of protection IP20, as well as PM240-2	
frame size FSA	6SL3260-6AA00-0DA0
frame size FSB	6SL3260-6AB00-0DA0
frame size FSC	6SL3260-6AC00-0DA0

Software engineering and commissioning

Description	Part number
STARTER commissioning tool on DVD-ROM	6SL3072-0AA00-0AG0
SINAMICS Startdrive commissioning tool on DVD-ROM	6SL3072-4DA02-0XG0
SIZER for Siemens Drives engineering tool	6SL3070-0AA00-0AG0
CAD Creator	6SL3075-0AA00-0AG0

Detailed information about the products and options can be found in the current Catalog D 31, chapter "SINAMICS G120 standard inverters" or in the Siemens Industry Mall.

Power units	PM240 / PM240-2 IP20		PM250 IP20	
	General machinery construction; Braking with a braking resistor		General machinery construction; Braking with energy recovery	
Line voltage	1AC / 3AC 200 ... 240V +/-10 % 3AC 380V ... 480V +/-10 % 3AC 500V ... 690V +/-10 %		3AC 380V ... 480V +/-10 %	
Power HO = High Overload LO = Low Overload	HO 200 ... 240V 1AC 0.37 ... 3 kW (.5–4 hp) 3AC 0.37 ... 22 kW (.5–30 hp) 380 ... 480V 3AC 0.37 ... 200 kW (.5–250 hp) 500 ... 690V 3AC 7.5 ... 45 kW (10–60 hp)	LO 200 ... 240V 1AC 0.55 ... 4 kW (.75–5 hp) 3AC 0.55 ... 30 kW (.75–40 hp) 380 ... 480V 3AC 0.55–250 kW (.75–300 hp) 500 ... 690V 3AC 11 ... 55 kW (15–60 hp)	HO Unfiltered 15 ... 75 kW (20–100 hp) Filtered 5.5 ... 75 kW (7.5–125 hp)	LO Unfiltered 18.5 ... 90 kW (25–125 hp) Filtered 7.5 ... 90 kW (10–125 hp)
Rated input current (dependent upon the motor load and line impedance)	HO 200 ... 240V 1AC 6.6 ... 37.5 A 3AC 3.8 ... 83 A 380 ... 480V 3AC 2.0 ... 354 ¹⁾ /442 A 500 ... 690V 3AC 11 ... 54 A	LO 200 ... 240V 1AC 7.5 ... 43 A 3AC 4.3 ... 98 A 380 ... 480V 3AC 2.3 ... 354 ¹⁾ /442 A 500 ... 690V 3AC 14 ... 59 A	HO 13.2 ... 135 A	LO 18 ... 166 A
Rated output current (derating for ambient temperatures) > 40 °C (LO) or > 50 °C (HO)	HO 200 ... 240V 1AC 2.3 ... 13.6 A 3AC 2.3 ... 80 A 380 ... 480V 3AC 1.3 ... 370 A 500 ... 690V 3AC 11 ... 52 A	LO 200 ... 240V 1AC 3.2 ... 17.5 A 3AC 3.2 ... 104 A 380 ... 480V 3AC 1.7 ... 477 A 500 ... 690V 3AC 14 ... 62 A	HO 1.3 ... 145 A	LO 1.7 ... 178 A
Conformance with standards	UL, cUL, CE, C-Tick, SEMI F47		UL ²⁾ , cUL ²⁾ , CE, C-Tick	
CE Marking	According to the Low-Voltage Directive 2006/95/EC			
Electrical information				
Line frequency	47 ... 63 Hz			
Low Overload	Generally used for applications demanding a low level of dynamic performance (continuous operation), square-law torque characteristic with low breakaway torque and low-speed precision. For example: centrifugal pumps, radial/axial fans, reciprocating blowers, radial compressors, vacuum pumps, agitators, ...			
Overload capability (for Low Overload)	150% for 3 seconds plus 110% for 57 seconds within 300 seconds ³⁾			
High Overload	Generally used for applications demanding a higher dynamic performance (cyclic duty), as well as constant torque characteristics with a high breakaway torque. For example: conveyor belts, geared pumps, excentric worm pumps, mills, mixers, crushers, vertical conveying equipment, centrifuges, ...			
Overload capability (for High Overload)	200% for 3 seconds plus 150% for 57 seconds within 300 seconds ³⁾			
Overload capability (LO/HO)	When using the overload capability, the continuous output current is not reduced			
Output frequency	0 ... 550 Hz (control modes V/f and FCC)			
Pulse frequency	4 kHz (standard) or 4 ... 16 kHz (derating)		4 kHz (standard) or 4 kHz ... 16 kHz (derating) FSF: 4 kHz (standard) or 4 kHz ... 8 kHz (derating)	
Electromagnetic compatibility	Class A line filter available		Class A or B line filter ³⁾ available	
Functions				
Brake functions	Dynamic braking, DC braking, motor holding brake, compound brake		Energy recovery in regenerative operation	
Motors that can be connected	Three-phase induction motors and three-phase synchronous motors			
Protection functions	Under-voltage, over-voltage, over-modulation/overload. Ground fault, short circuit, stall protection, motor blocked protection, motor over-temperature, drive over-temperature, parameter inter-locking			

¹⁾ With line reactor

²⁾ UL certification is being drawn up for frame sizes FSD to FSF

³⁾ Only for frame size FSC

Control Units	CU230P-2	CU240B-2 / CU240E-2		CU250S-2
	Optimized for pumps, fans, compressors	Optimized for general applications in machinery construction, such as conveyor belts and mixers		For demanding applications in the standard drives domain, for example extruders, centrifuges
Architecture	Application-optimized number of I/O	Basic number of I/O	Standard number of I/O, integrated safety technology	Higher number of I/O, integrated safety technology and basic positioning function
Mounting dimensions [WxHxD]	73 x 199 x 65.5	73 x 199 x 46	73 x 199 x 46	73 x 199 x 46
Communication functions				
PROFINET	CU230P-2 PN	–	CU240E-2 PN, CU240E-2 PN-F	CU250S-2 PN
PROFIBUS DP	CU230P-2 DP	CU240B-2 DP	CU240E-2 DP, CU240E-2 DP-F	CU250S-2 DP
EtherNet/IP	CU230P-2 PN	–	CU240E-2 PN, CU240E-2 PN-F	CU250S-2 PN
Modbus RTU and USS	CU230P-2 HVAC	CU240B-2	CU240E-2, CU240E-2 F	CU250S-2
BACnet MS/TP	CU230P-2 HVAC	–	–	–
CANopen	CU230P-2 CAN	–	–	CU250S-2 CAN
USB interface	1	1	1	1
Safety functions according to Category 3 of EN 954-1 or acc. to SIL2 of IEC 61508				
Integrated safety function: STO	–	–	CU240E-2, DP, PN	–
STO, SS1, SLS, SDI, SSM	–	–	CU240E-2 F, DP-F, PN-F	–
STO, SBC, SS1	–	–	–	CU250S-2, DP, PN, CAN
STO, SBC, SS1, SLS, SSM, SDI	–	–	–	CU250S-2, DP, PN, CAN (SLS, SSM, SDI with Safety license)
Electrical information				
Supply voltage	24V DC (via Power Modules or externally)			
Digital inputs	6	4	6	11
Digital inputs failsafe	–	–	CU240E-2, CU240E-2 DP: 1 CU240E-2 DP-F: 3	3
Analog inputs, parameterizable	2 x (–10 to +10V, 0/4 to 20 mA) 1 x (0/4 to 20 mA, Pt1000/LG-Ni1000) 1 x (Pt1000/LG-Ni1000)	1 x (–10 to +10V, 0/4 to 20 mA)	2 x (–10 to +10V, 0/4 to 20 mA)	2 x (–10 to +10V, 0/4 to 20 mA)
Digital outputs	2 x (relay NO/NC, 250V AC, 2 A, 30V DC, 5 A) ¹⁾ 1 x (relay NO, 30V DC, 0.5 A)	1 x (transistor, 30V DC, 0.5 A) 1 x (relay NO/NC, 30V DC, 0.5 A)	1 x (transistor, 30V DC, 0.5 A) 2 x (relay NO/NC, 30V DC, 0.5 A)	4 x (transistor, 30V DC, 0.5 A) can be optionally used as digital inputs 1 x relay: NO: 30V DC, 0.5 A 2 x relay: NO/NC: 30V DC, 0.5 A
Analog outputs	2 x (0 to 10V, 0/4 to 20 mA)	1 x (0 to 10V, 0/4 to 20 mA)	1 x (0 to 10V, 0/4 to 20 mA) 1 x (0 to 10V, 0 to 20 mA)	2 x (0 to 10V, 0/4 to 20 mA)
Functions				
Open-loop/closed-loop control techniques	V/f (linear, square law, free, FFC, ECO), field-oriented control of speed and torque without encoder			
				Field-oriented control of speed and torque with encoder
Setpoints	Setpoint selection: analog value, fixed setpoints (max. 16), motorized potentiometer, communication interface, PID controller for process quantities			
	Setpoint channel: minimum speed, maximum speed, ramp-function generator with rounding, 4 skip frequencies			
Protection	Drives: over-voltage and under-voltage, as well as phase failure, over-current protection, overload I2t, over-temperature of the control module and power unit, wire breakage of analog signals, evaluation of 3 external faults/alarms			
	Motor: temperature monitoring with and without temperature sensor, over-speed, locked rotor and stall protection			
	Drive: torque monitoring for dry running protection, belt monitoring			
	Communication: telegram failure, bus interruption			
	Fault message memory: buffer for 8 fault cases, each with 8 faults and fault value and time, buffer for 56 alarms with alarm value and instant in time			
Mechanical information				
Degree of protection	IP20			
Software				
STARTER, SIZER, DT Configurator, SINAMICS Startdrive	x	x	x	x
Accessories				
	IOP, BOP-2, shield connection kit, PC inverter connection kit 2, memory card (SINAMICS SD card)			

¹⁾ For plants and systems corresponding to UL, the following applies: via terminals 18/20 (DO 0 NC) and 23/25 (DO 2 NC) max. 3 A, 30 V DC or 2 A, 250 V AC

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