



SIEMENS



siemens.com/distributors-sinamics

SINAMICS low-voltage inverters

Selection and ordering guide for distributors

Answers for industry.

Selection and ordering guide – useful information

0.12 up to 250 kW

Easy and compact inverters



SINAMICS V20



SINAMICS G120C

When operating pumps, fans and compressors, or for conveyor belt applications:
Siemens supplies the optimum inverter for each and every application – with SINAMICS, the most complete drive family that is presently available in the market.

! You can find more information here:
www.siemens.com/distributors-sinamics

To protect inverters against the effects of a short circuit, Siemens has an extensive range of SITOR semiconductor protection fuses from the SENTRON product family: www.siemens.com/sentron

All technical data is provided without any guarantee

Flexible and modular inverters



SINAMICS G120



SINAMICS G120P

This selection and ordering guide makes it easy for you to select the optimum inverter to address your specific requirements. It also provides you with the ordering data for the following SINAMICS inverters:

SINAMICS V20, SINAMICS G120C, SINAMICS G120, SINAMICS G120P

! You can take the current prices from the Price List D 31 P 2013, from Page 4 to Page 17 as well as the additional sheet for SINAMICS V20 (this is only applicable for Germany). Order number: E86060-P5531-A101-A2

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4

Selection and ordering guide – useful information



SINAMICS V20



SINAMICS G120C



SINAMICS G120



SINAMICS G120P

| | | |
|----------|-------------------------------------|------|
| 1 | Overview of SINAMICS | 1_03 |
| | SINAMICS application scale | 1_04 |
| | Product comparison | 1_07 |
| | Overload capability | 1_08 |
| 2 | Easy and compact inverters | 2_01 |
| | SINAMICS V20 | 2_02 |
| | SINAMICS G120C | 2_10 |
| 3 | Flexible and modular inverters | 3_01 |
| | SINAMICS G120 | 3_03 |
| | SINAMICS G120P | 3_14 |
| 4 | Value-added topics | |
| | Electromagnetic compatibility (EMC) | 4_01 |
| | Safety Integrated | 4_03 |
| | Energy efficiency | 4_07 |
| | TIA applications | 4_09 |

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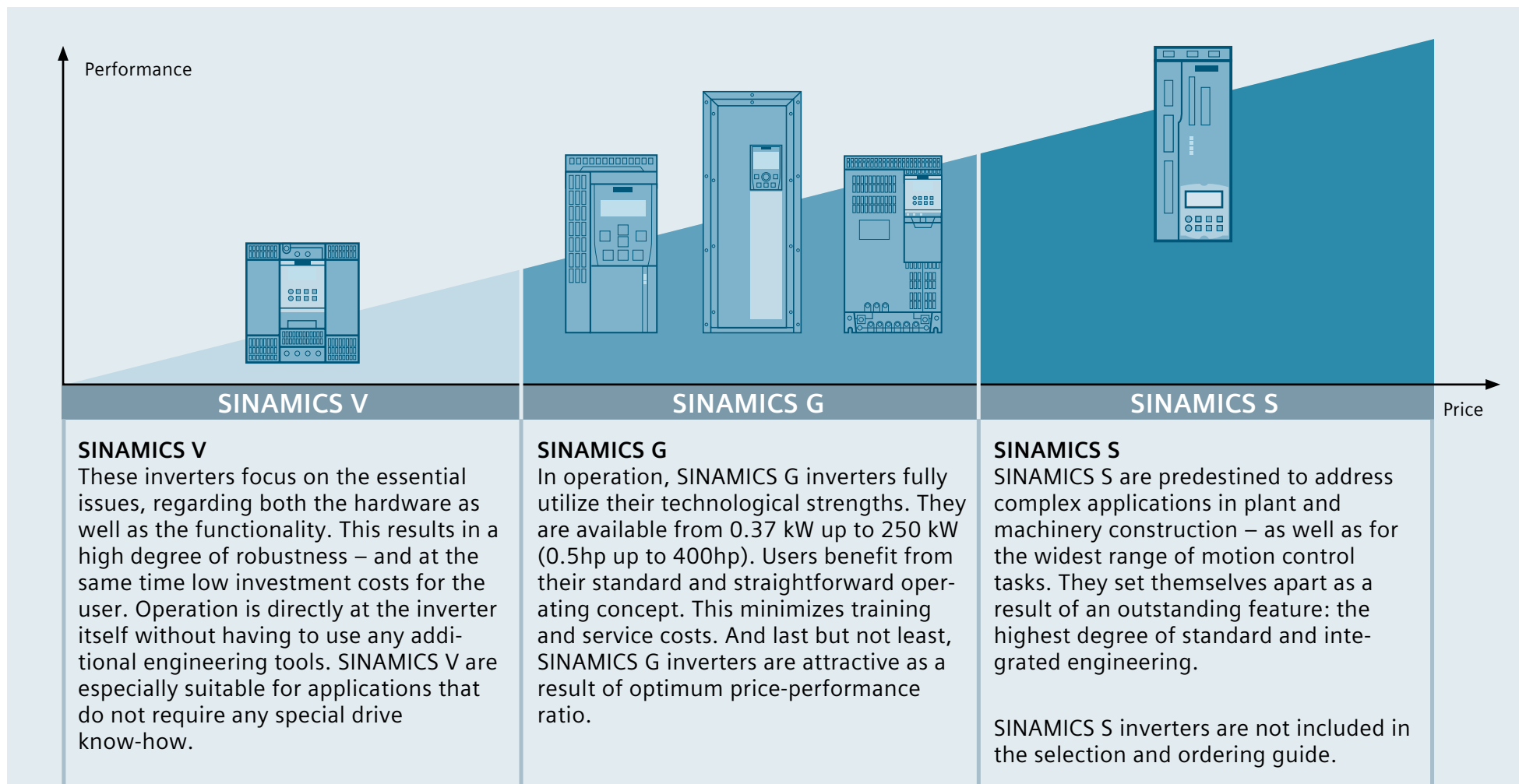
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Overview of the low-voltage inverters

SINAMICS V, SINAMICS G and SINAMICS S are the low-voltage inverters from Siemens.



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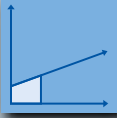
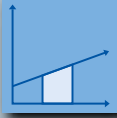
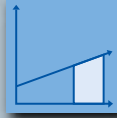

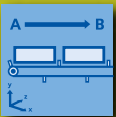


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SINAMICS – general selection guide for continuous motion

Simply select your application, and you will immediately see which SINAMICS inverter is the best choice – for every application, power rating and performance level.

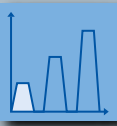
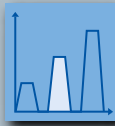
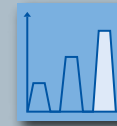

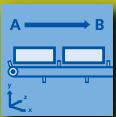


| Quality ¹⁾ Use | Continuous motion | | | | | | |
|--|---|--|---|--|--|---|--|
| |  Basic |  Medium | |  High | | | |
|  Pumping/ventilating/compressing | Centrifugal pumps Radial/axial fans Compressors | V20 G120C G180 ²⁾ /G130/G150 GL/GM150 | Centrifugal pumps Radial/axial fans Compressors | G120P G120C G120 G180 ²⁾ /G130/G150 GL/GM150 | Eccentric screw pumps | S120 | |
|  Moving | Conveyor belts Roller conveyors Chain conveyors | V20 G110D G120C G130/G150 GM150 | Conveyor belts Roller conveyors Chain conveyors Vertical material handling | Elevators Escalators Gantry cranes Ship's drives Cable railways | G120D G120C G120 G180 ²⁾ /G130/G150 DCM S120/S150 GM/GL/SM150 | Elevators Container cranes Mine hoists Open-cast mine excavators Test stands | S120 S150 SM/SL150 GM150 DCM |
|  Processing | Mills Mixers Kneaders Crushers Agitators Centrifuges | V20 G120C G130/G150 GM150 | Mills Mixes Kneaders Crushers | Agitators Centrifuges Extruders Rotary furnaces | G120C G120 G180 ²⁾ /G130/G150 S150 GM/GL150 DCM | Extruders Winders/unwinders Leading/following drives Calenders Main press drives Printing machines | S120 S150 DCM |
|  Machining | Main drives for • Turning • Milling • Drilling | S110 | Main drives for • Drilling • Sawing | | S110 S120 | Main drives for • Turning • Milling • Drilling • Gear cutting • Grinding | S120 |

¹⁾ Requirements placed on the torque accuracy/speed accuracy/positioning accuracy/axis coordination/functionality

²⁾ Sector-specific inverters

SINAMICS – general selection guide for discontinuous motion

Simply select your application, and you will immediately see which SINAMICS inverter is the best choice – for every application, power rating and performance level.

| Quality ¹⁾ Use | Discontinuous motion | | | | | |
|--|---|----------------------|--|---------------------|---|-------------------------|
| |  Basic | |  Medium | |  High | |
|  Pumping/ventilating/compressing | Hydraulic pumps Dosing pumps | G120 | | S110 S120 | Descaling pumps Hydraulic pumps | S120 GM150 |
|  Moving | Accelerating conveyors Rack feeders | G110D G120 | Accelerating conveyors Rack feeders Cross cutters Roll changers | S110 S120 DCM | Rack feeders Robotics Pick & place Indexing tables Crosscutters Roller feeds Engaging/disengaging | S120 DCM |
|  Processing | Tubular bagging machines Single-axis motion control such as • Positioning profiles • Path profiles | G120 | | S110 S120 | Servopresses Rolling mill drives Multi-axis motion control, such as • Multi-axis positioning • Cam discs • Interpolation | S120 SM/SL150 DCM |
|  Machining | Axis drives for • Turning • Milling • Drilling | S110 | Axis drives for • Drilling • Sawing | S110 S120 | Axis drives for • Turning • Milling • Drilling • Laser • Gear cutting machining • Nibbling and • Grinding punching | S120 |

¹⁾ Requirements placed on the torque accuracy/speed accuracy/positioning accuracy/axis coordination/functionality

Product overview



SINAMICS V20 – the versatile inverter for basic applications

The compact SINAMICS V20 basic performance inverter is a cost-effective drive solution, which sets itself apart as a result of its simple installation and handling. With the V20, you can depend on fast commissioning and extremely simple operation – this also applies to the robustness and cost efficiency.

Voltage and power range:

1 AC 200 to 240 V, 0.12 to 3 kW (0.16 hp to 4 hp), IP20
3 AC 380 to 480 V, 0.37 to 15 kW (0.5 hp to 20 hp), IP20



SINAMICS G120C – the compact single drive with a low power rating and the appropriate functionality

SINAMICS G120C offers a well-balanced combination of features to address general applications. Its compact design and high power density facilitates extremely space-saving installation in machine control enclosures and control cabinets. These drives can be directly lined up next to one another without requiring derating, and they have as standard the STO (Safe Torque Off) safety function for safely

stopping drives. As a consequence, current machinery directives can be complied with simply and with minimized costs.

Voltage and power range:

3 AC 380 to 480 V, 0.55 to 18.5 kW (0.75 hp to 25 hp), IP20



SINAMICS G120 – modular, safe and rugged

Modular SINAMICS G120 inverters are designed for the precise and cost-effective speed / torque control of three-phase motors. With their different device versions, they are suitable to address a whole range of drive solutions. The highest degree of service friendliness and flexibility is ensured as the various components can be simply replaced.

It is also far simpler to integrate these drives into safety-relevant machines or systems, thanks to their integrated safety functionality.

Voltage and power range:

3 AC 380 to 480 V, 0.37 to 250 kW (0.5 hp to 400 hp), IP20



SINAMICS G120P – the specialist for pumps, fans and compressors

SINAMICS G120P are innovative, operator-friendly inverters specifically designed for pump, fan and compressor applications in industrial environments – as well as tasks in building automation. It has a high degree of protection (IP55) for wall mounting and offers innovative hardware and software functions that play a decisive role in reducing energy usage. Not only this, SINAMICS G120P is extremely

line-friendly as the inverter topology ensures that harmonic currents are reduced. Line reactors at the line input are not required.

Voltage and power range:

3 AC 380 to 480 V, 0.37 to 90 kW (0.5 hp to 125 hp), IP55

Product comparison



| | SINAMICS V20 | SINAMICS G120C | SINAMICS G120 | SINAMICS G120P |
|--|--|--|---|--|
| Catalog | Selection catalog, distributors (from October 2013) | Selection catalog, distributors | Selection catalog for distributors | Selection catalog for distributors |
| Brief description | The cost-effective, reliable user-friendly inverter for basic applications | Compact design, optimum functionality | Modular inverters – energy-efficient, safe and rugged | The specialist for pump, fan and compressor applications |
| Degree of protection | IP20 | IP20 | IP20 | IP55 |
| Line voltage | 1 AC 200 to 240 V 3 AC 380 to 480 V | 3 AC 380 to 480 V | 3 AC 380 to 480 V | 3 AC 380 to 480 V |
| Power | 0.12 to 15 kW (0.16 to 20 hp) | 0.55 to 18.5 kW (0.75 to 25 hp) | 0.37 to 250 kW (0.5 to 400 hp) | 0.37 to 90 kW (0.5 to 125 hp) |
| Open-loop and closed-loop control modes | V/f (linear, square-law, FCC, ECO) | V/f (linear, square-law, FCC, ECO), sensorless vector control (SLVC) | V/f (linear, square-law, FCC, ECO), vector control with/without encoder (VC/SLVC) | V/f (linear, square-law, FCC, ECO), sensorless vector control (SLVC) |
| Motors that can be connected | Induction motors | Induction motors | Induction motors | Induction motors |
| Communication | USS/Modbus RTU | USS/Modbus RTU, PROFIBUS DP, PROFINET, CANopen | USS/Modbus RTU, PROFIBUS DP, PROFINET, PROFIsafe, CANopen | USS/Modbus RTU, PROFIBUS DP, PROFINET, BACnet MS/TP, CANopen, SIEMENS FLN P1 |
| Integrated safety functions | – | STO | STO, SS1, SBC, SLS, SDI, SSM | – |
| TIA integration | – | Yes | Yes | Yes |

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Overload capability

1



SINAMICS V20

Overload (LO = HO):
150 % for 60 sec. within a 300 sec. load cycle

2



SINAMICS G120C

Low Overload (LO):
150 % for 3 sec. plus 110 % for 57 sec., within a 300 sec. load cycle
High Overload (HO):
200 % for 3 sec. plus 150 % for 57 sec., within a 300 sec. load cycle

3



SINAMICS G120

Low Overload (LO): 150 % for 3 sec. plus 110 % for 57 sec. within a 300 sec. load cycle¹⁾
High Overload (HO): 200 % for 3 sec. plus 150 % for 57 sec. within a 300 sec. load cycle¹⁾²⁾

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SINAMICS G120P

Low Overload (LO) for FSA – FSC: 150 % for 3 sec. plus 110 % for 57 sec. within a 300 sec. load cycle¹⁾
Low Overload (LO) for FSD – FSF: 110 % for 60 sec. within a 300 sec. load cycle¹⁾
High Overload (HO) for FSA – FSC: 200 % for 3 sec. plus 150 % for 57 sec. within a 300 sec. load cycle¹⁾
High Overload (HO) for FSD – FSF: 150 % for 60 sec. within a 300 sec. load cycle¹⁾

¹⁾ When using the overload capability, the continuous output current is not reduced
²⁾ Lower overload cycle PM240 90 kW up to 200 kW (HO): 160 % for 3 sec., 136 % for 60 sec. every 300 sec.

Easy and compact inverters

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Easy and compact inverters

SINAMICS V20 is a cost-effective drive solution, which sets itself apart as a result of the straightforward installation and handling. With this inverter, you can depend on task commissioning and extremely simple operation – as well as robustness and cost efficiency.



**SINAMICS V20 –
versatile inverter for basic
applications**

SINAMICS G120C is a general-purpose inverter that can address the widest range of different applications. It defines new standards in its class regarding its small size, high level of service friendliness and integrated functionality. It essentially differs from the SINAMICS V20 as a result of the integrated communication interfaces – such as PROFIBUS DP/PROFINET –, the integrated vector control without encoder and the Safety Integrated system.



**SINAMICS G120C –
compact single drive with a
low power rating and appro-
priate functionality**

The compact SINAMICS V20 and SINAMICS G120C inverters combine the Control Unit and the Power Module in one and the same device – and therefore only have one order number.

They are predestined for applications in the areas of pumping, ventilating, conveying and moving.

As a result of the compact design, they are perfectly suited for space-saving side-by-side mounting in a control cabinet.

SINAMICS V20

The cost-effective, reliable and easy-to-use inverter for basic applications

0.12 to 15 kW (0.16 to 20 hp)



SINAMICS V20 is a compact inverter with an IP20 degree of protection, the Control Unit (CU) and Power Module (PM) function units are combined in one device with integrated operator panel.

! Therefore, the device has one order number plus additional ones for the optional accessories.

Technical data

Voltage: 1AC 200 to 240 V (+/-10%);
3AC 380 to 480 V (+10% to -15%)

Power range: 0.12 to 15 kW (0.16 to 20 hp)

Degree of protection: IP20

Control modes: V/f (linear, square-law, FCC, ECO)

I/O: 4 DI/2 DO/2 AI/1AO

Highlights

Easy to install

Push-through and wall mounting – side-by-side mounting possible for both

Integrated USS and Modbus RTU interfaces

Integrated braking chopper for 7.5 up to 15 kW

Easy to use

Parameters can be read out and cloned without the power supply

Integrated application and connection macros

Keep Running Mode for uninterrupted operation

Wide voltage range, advanced cooling design and coated PCBs increase robustness

Easy to save money





ECO mode for V/f, V²/f

Integrated hibernation mode in the quiescent state

DC link coupling

SINAMICS V20 – applications

0.12 to 15 kW (0.16 to 20 hp)

| Quality ¹⁾ Use | Continuous motion | | |
|--|--|--|--|
| | Basic | Medium | High |
|  Pumping/ ventilating/ compressing | Centrifugal pumps Radial/axial fans Compressors | | Eccentric screw pumps |
|  Moving | Conveyor belts Roller conveyors Chain conveyors | SINAMICS V20 Conveyor belts Roller conveyors Chain conveyors Vert. material handling Elevators Escalators Gantry cranes Ship's drives Cable railways | Elevators Container cranes Mine hoists Open-cast mining excavators Test stands |
|  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 |
|  Machining | Main drives for <ul style="list-style-type: none"> • Turning • Milling • Drilling | Main drives for <ul style="list-style-type: none"> • Drilling • Sawing | Main drives for <ul style="list-style-type: none"> • Turning • Milling • Drilling • Gear cutting • Grinding |

Today, in an increasing number of applications in plant and machinery construction, individual automation and drive solutions are demanded that automate simple motion sequences with low associated requirements. With its compact SINAMICS V20 inverter, Siemens offers a simple and cost-effective drive solution for these applications. It is optimally suited to address basic pump, fan and conveyor applications.

¹⁾ Requirements placed on the torque accuracy / speed accuracy / positioning accuracy / axis coordination / functionality

SINAMICS V20 – customer benefits

0.12 to 15 kW (0.16 to 20 hp)



Easy to install

- Compact design allows smaller cabinets to be used
- Push-through mounting allows the cabinet to be cooled more easily
- Can be run “out-of-the-box” without other options
- Basic operator actions at a built-in Basic Operator Panel
- Easy integration into micro-automation systems, e. g. SIMATIC S7-1200



Easy to use

- Parameter cloning: end users receive a preconfigured device
- Keep Running Mode: higher productivity by avoiding production interruptions
- Robustness: operation is even possible if the line voltage fluctuates significantly



Easy to save money

- Cost-effective basic inverter
- The integrated ECO mode for V/f and V²/f control adapts the magnetic flux in the motor (ECO mode) for energy saving

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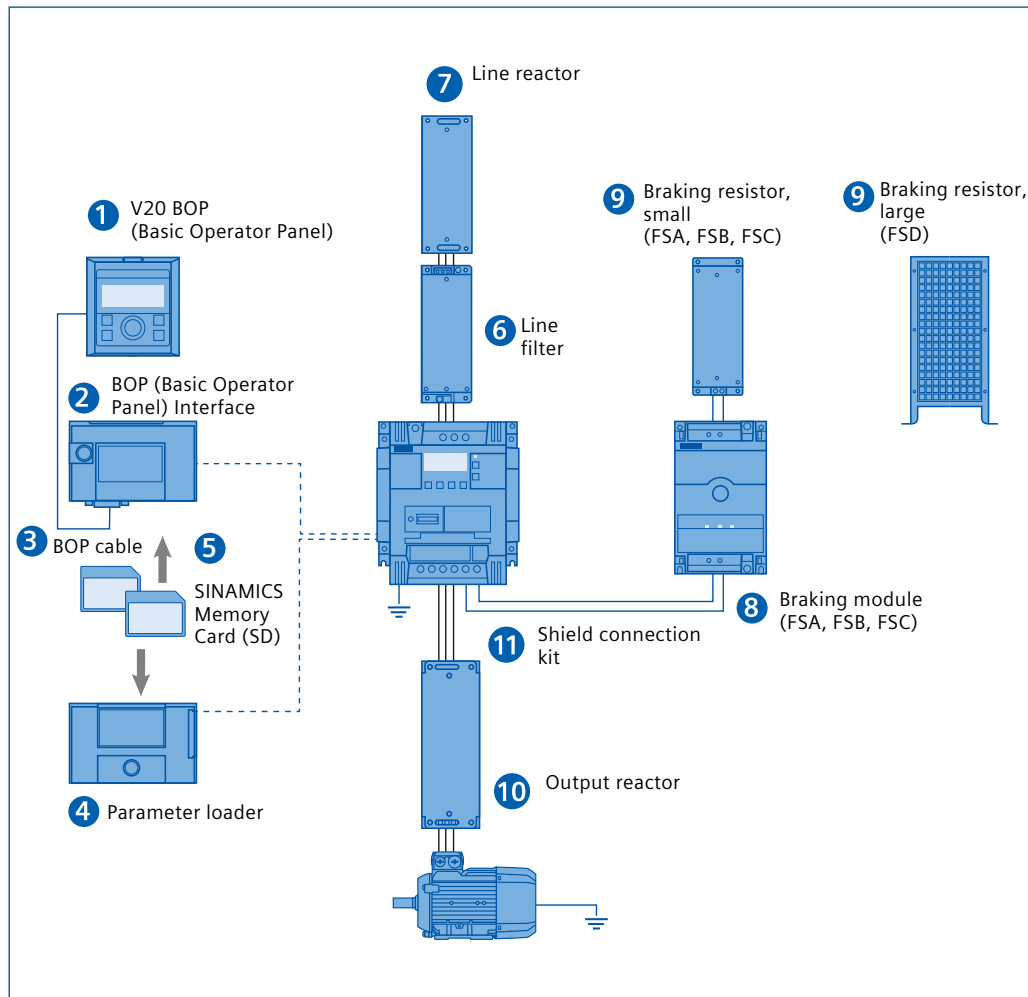
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SINAMICS V20 – design and options

0.12 to 15 kW (0.16 to 20 hp)



| Options | | |
|---------|---------------------------|---|
| 1 | V20 BOP | Same function as the integrated BOP (Basic Operator Panel), however can also be remotely used. |
| 2 | BOP interface | <ul style="list-style-type: none"> • Connection between inverter and BOP • Integrated SD/MMC card slot for parameter cloning |
| 3 | BOP cable | 3 m cable with connectors |
| 4 | Parameter loader | Up to 100 parameter sets with parameter settings can be written from the memory card to the inverter, or saved from the inverter to the memory card without connecting the inverter to the line supply. |
| 5 | SINAMICS memory card (SD) | Memory card |
| 6 | Line filter | <ul style="list-style-type: none"> • Improved EMC performance • Longer motor cables for FSA |
| 7 | Line reactor | <ul style="list-style-type: none"> • Reduces the harmonic current • Improves the power factor • Recommended if the input current (rms value) is higher than the rated inverter current |
| 8 | Braking module | <ul style="list-style-type: none"> • Shortens the deceleration ramp time • Suitable for 1AC 230 V and 3AC 400 V • FSD already has an integrated braking unit |
| 9 | Braking resistor | <ul style="list-style-type: none"> • Dissipates regenerative energy as heat • Factory setting, 5 % load cycle |
| 10 | Output reactor | Longer motor cables: <ul style="list-style-type: none"> • 3AC 400 V shielded and unshielded cable: 150 m • 1AC 230 V shielded and unshielded cable: 200 m |
| 11 | Shield connection kit | <ul style="list-style-type: none"> • Shield connection • Strain relief for cables |

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SINAMICS V20 – ordering data device/options

Rated data 1AC 230 V

0.12 to 3 kW (0.16 to 4 hp)



| Rated data | | | Order number 1AC 230 V | Fan | Frame size | Dimensions | | | Weight |
|--------------------------|--------------------------|-----------------------|---|-----|------------|------------|---------|---------|--------------------------------|
| P _{rated} kW | P _{rated} hp | I _{off} A | | | | W mm | H mm | D mm | kg |
| 0.12 | 0.16 | 0.9 | 6SL3210-5BB11-2 <input type="checkbox"/> V0 | – | FSA | 90 | 140 | 145.5 | 1.05 (FSA without fan: 1.0) |
| 0.25 | 0.33 | 1.7 | 6SL3210-5BB12-5 <input type="checkbox"/> V0 | – | | | | | |
| 0.37 | 0.5 | 2.3 | 6SL3210-5BB13-7 <input type="checkbox"/> V0 | – | | | | | |
| 0.55 | 0.75 | 3.2 | 6SL3210-5BB15-5 <input type="checkbox"/> V0 | – | | | | | |
| 0.75 | 0.75 | 3.9 | 6SL3210-5BB17-5 <input type="checkbox"/> V0 | – | | | | | |
| 0.75 | 1.0 | 4.2 | 6SL3210-5BB18-0 <input type="checkbox"/> V0 | 1 | | | | | |
| 1.1 | 1.5 | 6 | 6SL3210-5BB21-1 <input type="checkbox"/> V0 | 1 | FSB | 140 | 135 | 164.5 | 1.8 |
| 1.5 | 2.0 | 7.8 | 6SL3210-5BB21-5 <input type="checkbox"/> V0 | 1 | FSC | 184 | 140 | 169 | 2.6 |
| 2.2 | 3.0 | 11 | 6SL3210-5BB22-2 <input type="checkbox"/> V0 | 1 | | | | | |
| 3 | 4.0 | 13.6 | 6SL3210-5BB23-0 <input type="checkbox"/> V0 | 1 | | | | | |

EMC standards

| | |
|------------------------------------|----------------------------|
| With integrated Category C2 filter | <input type="checkbox"/> A |
| Without integrated filter | <input type="checkbox"/> U |

Options

| FS | P _{rated} kW 1AC 230 V | Braking resistor 6SE6400- | Line reactor 6SE6400- | Output reactor 6SE6400- | Shield connection kit 6SL3266- | Line filter ¹⁾ 6SE6400- |
|----|------------------------------------|------------------------------|--------------------------|----------------------------|-----------------------------------|---------------------------------------|
| A | 0.12 | 4BC05-0AA0 | 3CC00-4AB3 | 3TC00-4AD3 | 1AA00-0VA0 | 2FL01-0AB0 |
| | 0.25 | | | | | |
| | 0.37 | | 3CC01-0AB3 | | | |
| | 0.55 | | | | | |
| | 0.75 | | | | | |
| B | 1.1 | 4BC11-2BA0 | 3CC02-6BB3 | 3TC01-0BD3 | 1AB00-0VA0 | – |
| | 1.5 | | | | | |
| C | 2.2 | 4BC12-5CA0 | 3CC03-5CB3 | 3TC03-2CD3 | 1AC00-0VA0 | – |
| | 3 | | | | | |

¹⁾ See description of EMC standard

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SINAMICS V20 – ordering data device/options

Rated data 3AC 400 V

0.37 to 15 kW (0.5 to 20 hp)



| Rated data | | | | Order number 3AC 400 V | Fan | Frame size | Dimensions | | | Weight | |
|--------------------------|--------------------------|-----------------------------|-----------------------------|------------------------|-----|------------|------------|---------|---------|--------|-----------------------------------|
| P _{rated} kW | P _{rated} hp | I _{off} A 400 V | I _{off} A 480 V | | | | W mm | H mm | D mm | kg | |
| 0.37 | 0.5 | 1.3 | 1.3 | 6SL3210-5BE13-7 | V0 | – | FSA | 90 | 140 | 145.5 | 1.05 (FSA without fan: 1.0) |
| 0.55 | 0.75 | 1.7 | 1.7 | 6SL3210-5BE15-5 | V0 | – | | | | | |
| 0.75 | 1.0 | 2.2 | 2.2 | 6SL3210-5BE17-5 | V0 | – | | | | | |
| 1.1 | 1.5 | 3.1 | 3.1 | 6SL3210-5BE21-1 | V0 | 1 | | | | | |
| 1.5 | 2.0 | 4.1 | 4.1 | 6SL3210-5BE21-5 | V0 | 1 | | | | | |
| 2.2 | 3.0 | 5.6 | 4.8 | 6SL3210-5BE22-2 | V0 | 1 | FSB | 140 | 135 | 164.5 | 1.8 |
| 3 | 4.0 | 7.3 | 7.3 | 6SL3210-5BE23-0 | V0 | 1 | | | | | |
| 4 | 5.0 | 8.8 | 8.24 | 6SL3210-5BE24-0 | V0 | 1 | FSC | 184 | 140 | 169 | 2.6 |
| 5.5 | 7.5 | 12.5 | 11 | 6SL3210-5BE25-5 | V0 | 1 | | | | | |
| 7.5 | 10 | 16.5 | 16.5 | 6SL3210-5BE27-5 | V0 | 2 | FSD | 240 | 166 | 172.5 | 4.3 |
| 11 | 15 | 25 | 21 | 6SL3210-5BE31-1 | V0 | 2 | | | | | |
| 15 | 20 | 31 | 31 | 6SL3210-5BE31-5 | V0 | 2 | | | | | |

EMC standards

With integrated filter, category C3



Without integrated filter



Options

| FS | P _{rated} kW 3AC 400 V | Braking resistor 6SE6400- | Line reactor 6SL3203- | Output reactor 6SE6400- | Shield connection kit 6SL3266- | Line filter ¹⁾ 6SL3203- |
|-----|------------------------------------|------------------------------|--------------------------|----------------------------|-----------------------------------|---------------------------------------|
| A | 0.37 | 4BD11-0AA0 | OCE13-2AA0 | 3TC00-4AD2 | 1AA00-0VA0 | OBE17-7BA0 |
| | 0.55 | | | | | |
| | 0.75 | | | | | |
| | 1.1 | 4BD12-0BA0 | OCE21-0AA0 | 3TC01-0BD3 | | |
| | 1.5 | | | | | |
| 2.2 | 3 | 4BD16-5CA0 | OCE21-8AA0 | 3TC03-2CD3 | 1AB00-0VA0 | OBE21-8BA0 |
| 4 | | | | | | |
| D | 7.5 | 4BD21-2DA0 | OCE23-8AA0 | | 1AC00-0VA0 | OBE23-8BA0 |
| | 11 | | | | | |
| 15 | 1AD00-0VA0 | | | | | |

¹⁾ See description of the EMC standard

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SINAMICS V20 – accessories and spare parts

0.12 to 15 kW (0.16 to 20 hp)

Accessories

| | Name | Order number |
|---|--|--------------------|
|  | Parameter loader | 6SL3255-0VE00-0UA0 |
|  | BOP interface (Basic Operator Panel) | 6SL3255-0VA00-2AA0 |
|  | Braking module 1AC 230 V 8 A, 3AC 400 V 7 A | 6SL3201-2AD20-8VA0 |
|  | V20 BOP (Basic Operator Panel) | 6SL3255-0VA00-4BA0 |
| | BOP cable 3 m (Basic Operator Panel) incl. 4 mounting screws | 6SL3256-0VP00-0VA0 |
|  | SINAMICS Memory Card (SD) | 6SL3054-4AG00-2AA0 |
| | RS485 terminators (content 50 pieces) | 6SL3255-0VC00-0HA0 |

Spare parts

| | Frame size | Order number |
|---|------------|--------------------|
| Replacement fan | | |
|  | FSA | 6SL3200-0UF01-0AA0 |
|  | FSB | 6SL3200-0UF02-0AA0 |
|  | FSC | 6SL3200-0UF03-0AA0 |
|  | FSD | 6SL3200-0UF04-0AA0 |

! The accessories and spare parts are suitable for the 1AC 230 V as well as 3AC 400 V versions.

So that the SINAMICS V20 BOP can be used, please also order the BOP interface and the BOP cable.

Information on how to correctly select fuses is provided in the inverter manual.

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SINAMICS V20 – technical data

0.12 to 15 kW (0.16 to 20 hp)



| SINAMICS V20 | |
|-------------------------------------|---|
| Line voltage/ line frequency | 1AC 200 to 240 V (+/-10%); 3AC 380 to 480 V (-15% ...+10%) with 50/60 Hz |
| Rated power/frame sizes | 0.12 to 15 kW/4 frame sizes |
| Mechanical design | Compact inverters that combine the function units Control Unit (CU) and Power Module (PM) in one device + optional accessories |
| Degree of protection | IP20/UL open type |
| Operating temperature | Up to 60 °C without derating/40 up to 60 °C with derating |
| Air humidity, max. | 95 % (non condensing) |
| Overload capability | Overload: 150% for 60 sec. within a 300 sec. load cycle |
| Integrated communication interfaces | USS/Modbus RTU |
| Signal inputs/outputs (I/O) | 4 DI/2 DO/2 AI/1 AO |
| Open- and closed-loop control modes | V/f (linear, square-law, FCC, ECO) |
| Safety Integrated | – |
| Braking | Optional braking chopper for FSA, FSB, FSC (0.37 to 5.5 kW); integrated braking chopper for FSD (7.5 to 15 kW) |
| Tool interfaces | Memory card: SINAMICS memory card (SD), operator panel: parameter loader with V20 BOP |
| Standards | CE, CULus, C-tick, KC |
| Electromagnetic compatibility (EMC) | For more details, see Chapter 4: Value-added topics |
| Motor cable lengths | Unshielded cable: 50 m; shielded cable: 25 m, 10 m for FSA; longer motor cable possible with output reactor: 3AC 400 V: shielded/unshielded cable 150 m 1AC 230 V: shielded/unshielded cable 200 m |
| Energy functions | ECO mode (automatic flux reduction), energy-saving hibernation mode, energy-saving calculator |
| Functions | Fixed speed setpoint, PID controller |

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SINAMICS G120C

Compact design, optimum functionality

0.55 to 18.5 kW (0.75 to 25 hp)



SINAMICS G120C is a compact inverter with an IP20 degree of protection, where the function units Control Unit (CU) and Power Module (PM) are combined into one device.

! Therefore, the device has just one order number plus additional ones for the optional accessories.

Technical data

| | |
|------------------------------|---|
| Voltage: | 3AC 380 to 480 V (+/-10%) with 50/60 Hz (+/-5%) |
| Power range: | 0.55 to 18.5 KW (0.75 to 25 hp) |
| Degree of protection: | IP20 |
| Control modes: | V/f (linear, square-law, FCC, ECO), sensorless vector control (SLVC) |
| I/O: | 6 DI/2 DO/1AI/1AO |

Highlights

Mechanical design

High power density, low envelope dimensions

Simple commissioning and maintenance

Side-by-side mounting without derating

Pluggable terminals

Electronics

Integrated braking chopper

STO safety function

IOP, BOP-2 and USB interface

Optional interchangeable memory card (SD)

Electrically isolated inputs

Communication

PROFINET, PROFIBUS DP, CANopen, USS/Modbus RTU

Integral component of Totally Integrated Automation

Optimum interaction with SIMATIC

SINAMICS G120C – applications

0.55 to 18.5 kW (0.75 to 25 hp)

| Quality ¹⁾ | Continuous motion | | |
|---|---|---|---|
| | Basic | Medium | High |
| Use | | | |
| Pumping/ ventilating/ compressing | Centrifugal pumps Radial/axial fans Compressors | | Eccentric screw pumps |
| Moving | Conveyor belts Roller conveyors Chain conveyors | Conveyor belts Roller conveyors Chain conveyors Vert. mat. handling Elevators Escalators Gantry cranes Ship's drives Cable railways | Elevators Container cranes Mine hoists Open-cast mine excavators Test stands |
| 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 |
| Machining | Main drives for • Turning • Milling • Drilling | Main drives for • Drilling • Sawing | Main drives for • Turning • Milling • Drilling • Gear cutting • Grinding |

SINAMICS G120C

The compact SINAMICS G120C inverter with its numerous built in functions is ideally suited to control induction motors used in countless industrial areas.

It is a real all-rounder and suitable for conveyor belts, mixers, extruders, pumps, fans, compressors and basic handling machines.

¹⁾ Requirements placed on the torque accuracy/speed accuracy/positioning accuracy/axis coordination/functionality

SINAMICS G120C – customer benefits

0.55 to 18.5 kW (0.75 to 25 hp)



High degree of operator friendliness

- Simple commissioning / diagnostics and simple integration into the PC tool using the USB interface
- Pluggable terminals facilitate fast installation and replacement; prefabricated cables can be used
- Operating hours counter for “Drive on” and “Motor on”
- Integral component of Totally Integrated Automation



Extremely compact

- Side-by-side mounting allows operation in the smallest space
- High power density, low envelope dimensions
- Reduces space required in the cabinet



Leading technological functions

- Coated modules permit operation in harsh industrial environments up to an ambient temperature of 60 °C
- Automatic flux reduction with V/f ECO to save energy
- Certified safety functions without requiring any external components (STO)
- Integrated energy-saving calculator reduces and monitors energy costs
- Energy-efficient, encoderless vector control facilitates high torques for low frequency setpoints

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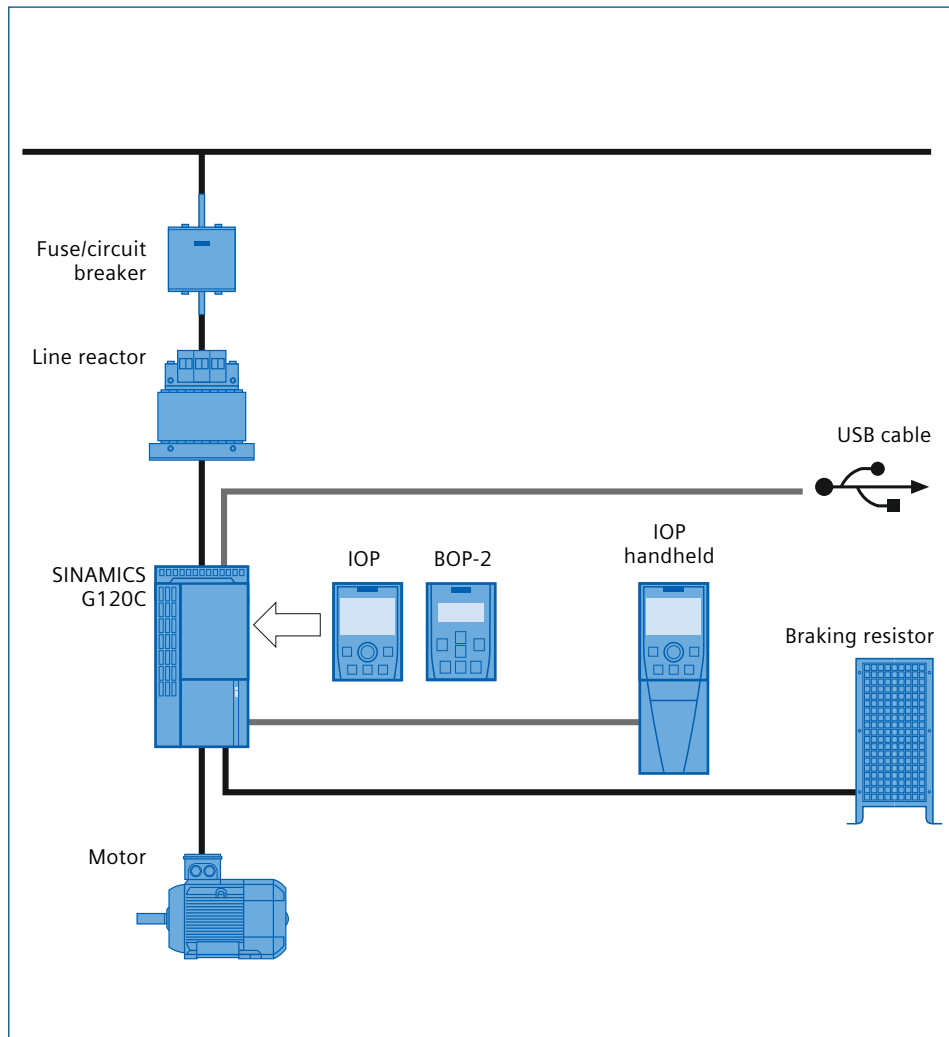
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SINAMICS G120C – design and options

0.55 to 18.5 kW (0.75 to 25 hp)



Options

| |
|--|
| Line-side components |
| Line reactors |
| A line reactor is used to smooth voltage peaks (converter protection) and to reduce commutation dips (line harmonics). |
| Recommended line-side power components |
| Standard fuses can be used for SINAMICS G120C. They should be selected and dimensioned according to local regulations. |
| DC link components |
| Braking resistors |
| Excess DC link energy is dissipated using braking resistors. SINAMICS G120C is equipped with an integrated braking chopper (electronic switch). |
| Supplementary system components |
| Intelligent Operator Panel IOP |
| Graphic, user-friendly high-performance operator panel for commissioning and diagnostics – as well as local operator control and monitoring. |
| Basic Operator Panel BOP-2 |
| A 2-line display to support drive commissioning and diagnostics. This allows the drive to be locally operated. |
| IOP handheld |
| A handheld version can be ordered so that the IOP can be used as mobile operator panel. In addition to the IOP, this includes a housing with rechargeable batteries, charging device and RS232 connecting cable. |
| Memory cards |
| An inverter parameterization can be saved on the memory card. In the case of service, e. g. after replacing an inverter and transferring the data from the memory card, the machine or system can immediately resume operation. The associated memory card holder is integrated in the inverter. |
| PC converter connecting kit 2 |
| To control and commission an inverter directly from the PC if the STARTER commissioning tool, from V4.2 and higher, has been installed on it. |

SINAMICS G120C – ordering data

0.55 to 18.5 kW (0.75 to 25 hp)



| Rated data | | | | Order number | | Dimensions | | | Weight | |
|-------------------------------|-------------------------------|--|--|-----------------|--------------------------|------------|-----|-----------------|---------------------------------|---------|
| P _{Lo} ¹⁾ | P _{Lo} ¹⁾ | I _{Lo} ¹⁾ _{out} | I _{HO} ²⁾ _{out} | | | W | H | D ³⁾ | Without filter / with filter | |
| kW | hp | A | A | | | mm | mm | mm | kg | |
| 3AC 380 to 480 V | | | | | | | | | | |
| 0.55 | 0.75 | 1.7 | 1.3 | 6SL3210-1KE11-8 | <input type="checkbox"/> | FSA | 73 | 196 | 203 (+22.4 mm with PROFINET) | 1.7/1.9 |
| 0.75 | 1.0 | 2.2 | 1.7 | 6SL3210-1KE12-3 | <input type="checkbox"/> | | | | | |
| 1.1 | 1.5 | 3.1 | 2.2 | 6SL3210-1KE13-2 | <input type="checkbox"/> | | | | | |
| 1.5 | 2.0 | 4.1 | 3.1 | 6SL3210-1KE14-3 | <input type="checkbox"/> | | | | | |
| 2.2 | 3.0 | 5.6 | 4.1 | 6SL3210-1KE15-8 | <input type="checkbox"/> | | | | | |
| 3 | 4.0 | 7.3 | 5.6 | 6SL3210-1KE17-5 | <input type="checkbox"/> | | | | | |
| 4 | 5.0 | 8.8 | 7.3 | 6SL3210-1KE18-8 | <input type="checkbox"/> | | | | | |
| 5.5 | 7.5 | 12.5 | 8.8 | 6SL3210-1KE21-3 | <input type="checkbox"/> | FSB | 100 | | 2.3/2.5 | |
| 7.5 | 10.0 | 16.5 | 12.5 | 6SL3210-1KE21-7 | <input type="checkbox"/> | | | | | |
| 11 | 15.0 | 25.0 | 16.5 | 6SL3210-1KE22-6 | <input type="checkbox"/> | FSC | 140 | 295 | | 4.4/4.7 |
| 15 | 20.0 | 31.0 | 25.0 | 6SL3210-1KE23-2 | <input type="checkbox"/> | | | | | |
| 18.5 | 24.0 | 37.0 | 31.0 | 6SL3210-1KE23-8 | <input type="checkbox"/> | | | | | |

EMC filter

Integrated EMC filter, Class A/C2⁴⁾ **A**

Unfiltered version **U**

Integrated communication interface

RS485 with USS / Modbus RTU **B** **1**

SUB-D with PROFIBUS DP **P** **1**

SUB-D with CANopen **C** **1**

PROFINET **F** **1**

¹⁾ LO = Low Overload

²⁾ HO = High Overload

³⁾ Frame sizes FSA–FSC with PROFINET; depth: additional 22.4 mm

⁴⁾ Detailed information on maintaining interference classes, refer to the product documentation

! The blanking cover is included in the scope of supply.

SINAMICS G120C – options and accessories

0.55 to 18.5 kW (0.75 to 25 hp)

Options

| Braking resistor | | | Order number |
|---|-------|----------------------------|--------------------|
|  | FSA | 0.55 to 1.5 kW | 6SL3201-0BE14-3AA0 |
| | FSA | 2.2 to 4 kW | 6SL3201-0BE21-0AA0 |
| | FSB | 5.5 to 7.5 kW | 6SL3201-0BE21-8AA0 |
| | FSC | 11 to 18.5 kW | 6SL3201-0BE23-8AA0 |
| Line reactor | | | |
|  | FSA | 0.55 to 1.1 kW | 6SL3203-0CE13-2AA0 |
| | FSA | 1.5 to 4 kW | 6SL3203-0CE21-0AA0 |
| | FSB | 5.5 to 7.5 kW | 6SL3203-0CE21-8AA0 |
| | FSC | 11 to 18.5 kW | 6SL3203-0CE23-8AA0 |
| Operator panels | | | |
|  | BOP-2 | Basic Operator Panel | 6SL3255-0AA00-4CA1 |
|  | IOP | Intelligent Operator Panel | 6SL3255-0AA00-4JA1 |

! Information on how to correctly select fuses is provided in the inverter manual.

Accessories

| Name | | Order number |
|---|--|--------------------|
|  | IOP Handheld | 6SL3255-0AA00-4HA0 |
| | IOP/BOP-2 door mounting kit | 6SL3256-0AP00-0JA0 |
|  | PC Connection Kit 2 (USB) ¹⁾ | 6SL3255-0AA00-2CA0 |
|  | SINAMICS SD memory card 512 MB | 6SL3054-4AG00-2AA0 |
|  | Starter commissioning tool (DVD) Starter software DVD | 6SL3072-0AA00-0AG0 |

¹⁾ IOP/BOP-2 door mounting kit

For mounting an operator panel in the control cabinet doors with sheets steel thicknesses of 1 to 3 m.

Included in the scope of delivery:

- Seal
- Mounting material
- Connecting cable (5 m long)

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SINAMICS G120C – spare parts

0.55 to 18.5 kW (0.75 to 25 hp)

| Overview |
|---|
| The following spare parts for SINAMICS G120C are available for service and maintenance work. |
| SINAMICS G120C shield plate |
| A set of shield plates for the motor and signal cables corresponding to the frame size of the compact SINAMICS G120C inverter is included in the scope of supply – and can be additionally ordered as spare part. |
| SINAMICS G120C spare parts kit |
| The kit comprises 5 sets of I/O terminals, 1x RS485 terminal, 2 pairs of Control Unit doors (1 x PN and 1 x remaining communication versions) and 1 blanking cover. |
| SINAMICS G120C connector |
| One set of connectors for the line feeder cable, braking resistor and motor cable corresponding to the frame size of the SINAMICS G120C compact inverter can be ordered. |
| SINAMICS G120C roof-mounted fan |
| A roof-mounted fan (upper side of the device), comprising a pre-mounted unit as holder and fan corresponding to the frame size of the compact SINAMICS G120C inverter can be ordered. |
| SINAMICS G120C fan unit |
| A replacement fan (upper side of the device; heat sink), comprising a pre-mounted unit as holder and fan corresponding to the frame size of the compact SINAMICS G120C inverter can be ordered. |

| | Frame size | Order number |
|---|------------|---------------------|
| SINAMICS G120C shield plate | | |
| | FSA | 6SL3266-1EA00-0KAA0 |
| | FSB | 6SL3266-1EB00-0KAA0 |
| | FSC | 6SL3266-1EC00-0KAA0 |
| SINAMICS G120C spare part kit | | |
| | | 6SL3200-0SK41-0AAA0 |
| SINAMICS G120C connector | | |
| | FSA | 6SL3200-0ST05-0AAA0 |
| | FSB | 6SL3200-0ST06-0AAA0 |
| | FSC | 6SL3200-0ST07-0AAA0 |
| SINAMICS G120C roof-mounted fan | | |
|  | FSA | 6SL3200-0SF40-0AAA0 |
| | FSB | 6SL3200-0SF41-0AAA0 |
| | FSC | 6SL3200-0SF42-0AAA0 |
| SINAMICS G120C fan unit | | |
|  | FSA | 6SL3200-0SF12-0AAA0 |
| | FSB | 6SL3200-0SF13-0AAA0 |
| | FSC | 6SL3200-0SF14-0AAA0 |

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SINAMICS G120C – technical data

0.55 to 18.5 kW (0.75 to 25 hp)



| SINAMICS G120C | |
|---|---|
| Line voltage/line frequency | 3AC 380 to 480 V (+10%...–20%) with 50/60 Hz +/-5% |
| Rated power/frame sizes | 0.55 to 18.5 kW/3 frame sizes |
| Design | Compact inverter, which combines the Control Unit (CU) and Power Module (PM) function units in one device + optional accessories |
| Degree of protection | IP20/UL open type |
| Operating temperature | 0 to 40 °C without derating/0 to 60 °C with derating |
| Air humidity, max. | 95 % at 140 °C (104 °F), condensation and icing not permissible |
| Overload capability | Low Overload (LO): 150% for 3 sec. plus 110% for 57 sec. within a 300 sec. load cycle High Overload (HO): 200% for 3 sec. plus 150% for 57 seconds within a 300 sec. load cycle |
| Integrated communication interfaces | PROFINET, PROFIBUS DP, CANopen, USS/Modbus RTU |
| Signal inputs/outputs (I/O) | 6 DI/2 DO/1 AI/1 AO |
| Open-loop and closed-loop control modes | V/f (linear, square-law, FCC, ECO), sensorless vector control (SLVC) |
| Integrated safety function | Safety Integrated: Safe Torque Off (STO) |
| Braking | Integrated braking chopper |
| Tool interfaces | Memory card: SD; operator panel: Basic Operator Panel (BOP-2) or Intelligent Operator Panel (IOP); PC interface: USB |
| Standards | CE, cULus, c-tick |
| Fail-safe certification | Function: Safe Torque Off (STO), SIL 2 according to IEC 61508, parts 1 to 7 (1998...2001) PL d according to EN ISO 13849 part 1 (2008) Category 3 according to EN 60204 (2007) 5 x 10 (power of –8)/T1: 20 years |
| Electromagnetic compatibility (EMC) | For more details, refer to Chapter 4: Value-added topics |
| Motor cable lengths | 50 m shielded/100 m unshielded |
| Energy functions | Energy-saving calculator, energy usage calculator, ECO mode (automatic flux reduction) |
| Functions | Fixed speed setpoint, 2-/3-wire control, PID controller, motor holding brake |

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Flexible and modular inverters

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Flexible and modular inverters

SINAMICS G120 – rugged standard drives for general applications in the industrial environment, which can even be used under extreme environmental conditions as a result of its smart cooling concept. It comprises a combination of Power Modules and Control Units that can be freely selected.



**SINAMICS G120 –
the modular inverter.**
Energy-efficient, safe and rugged.

SINAMICS G120P – operator-friendly standard drives that can be simply commissioned. They are specifically used in building technology as well as the water and process industries – for HVAC applications. As a result of its simple handling, it not only provides support when optimizing existing frequency-controlled drives, but also when modernizing fixed-speed drives and for general retrofit projects.



**SINAMICS G120P –
the specialist for pumps,
fans and compressors.**

As a result of the modular system, these flexible inverters can be simply selected in just two or three steps. This is because they essentially comprise two function units: Control Unit and Power Module.

SINAMICS G120 can be universally used, and it is especially suitable throughout the whole of industry and the trades – in the automotive, textile, printing and chemical sectors as well as for addressing general higher-level applications (e.g. in conveyor technology). SINAMICS G120P is suitable for basic speed adaptation as well as complex closed-loop control tasks in building technology as well as the water and process industries.

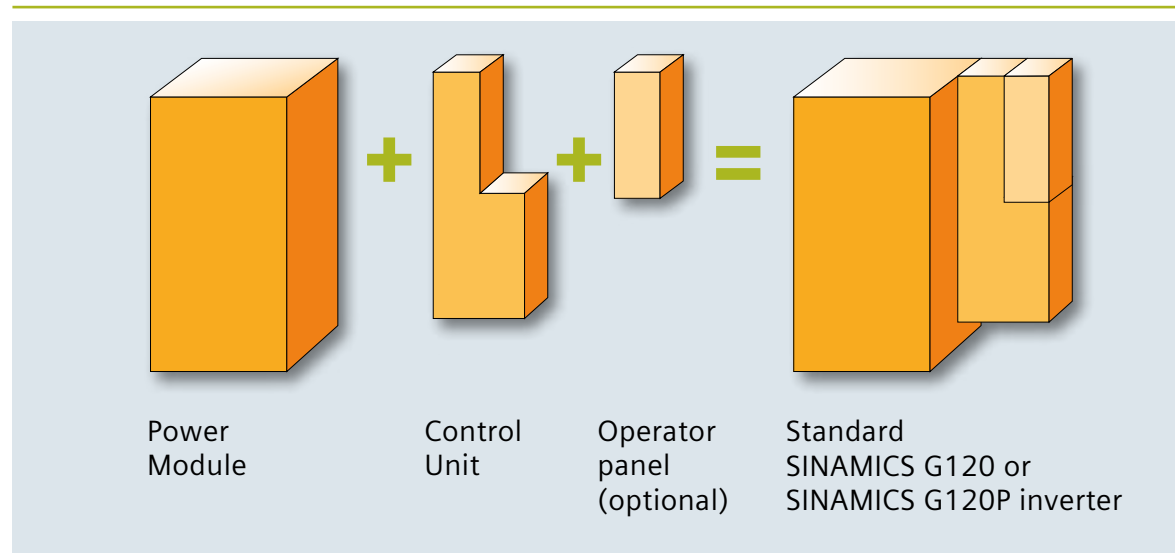
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SINAMICS G120, SINAMICS G120P – modular design



SINAMICS G120 and SINAMICS G120P inverters comprise a Control Unit (CU) and a Power Module (PM) as well as an (optional) panel.

This means that SINAMICS G120 comprises a minimum of two, and SINAMICS G120P a minimum of three order numbers plus additional ones for the optional accessories.

SINAMICS G120

The universal inverter – energy-efficient, safe and rugged

0.37 to 250 kW (0.5 to 400 hp)



SINAMICS G120 is a modular inverter system comprising the following components:

- Control Unit: CU230P-2; CU240B-2; CU240E-2, CU250S-2
- Power Module: PM240-2/PM240
- Optional operator unit or blanking cover

! Therefore, the device has a minimum of two order numbers plus additional ones for the optional accessories.

Technical data

Voltage: 3AC 380 to 480 V
Power range: 0.37 to 250 kW (0.5 to 400 hp)
Degree of protection: IP20
Control modes: V/f (linear, square-law, FCC, ECO), vector control with/without encoder (VC/SLVC)
I/O: see technical data for the Control Units (from Page 3_08 onwards)

Highlights

Mechanical design

Modular design

Innovative cooling concept for a higher degree of ruggedness

Highest degree of service friendliness as components can be easily replaced

Electronics

Energy recovery, low line harmonics, energy saving, no braking resistors

Semiconductor temperature monitoring

Safety Integrated STO, SS1, SBC, SLS, SDI, SSM, without encoder

Optional, interchangeable SD memory card

Communication

PROFINET, PROFIBUS, PROFIsafe, USS/Modbus RTU, CANopen, BacNet MS/TP

Integral component of Totally Integrated Automation

Optimum interaction with SIMATIC

SINAMICS G120 – applications

0.37 to 250 kW (0.5 to 400 hp)

| Quality ¹⁾ | Continuous motion | | | Discontinuous motion | | |
|--|---|--|---|--|---|--|
| | Basic | Medium | High | Basic | Medium | High |
| Use | | | | | | |
| Pumping/ventilating/compressing | Centrifugal pumps Radial/axial fans Compressors | Centrifugal pumps Radial/axial fans Compressors | Eccentric screw pumps | Hydraulic pumps Dosing pumps | | Descaling pumps Hydraulic pumps |
| Moving | Conveyor belts Roller conveyors Chain conveyors | Conveyor belts Roller conveyors Chain conveyors Vert. material handling Elevators Escalators Gantry cranes Ship's 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 | Rack feeders Robotics Pick & place Indexing tables Crosscutters Roller feeds Engaging/disengaging |
| 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 • Interpolation |
| 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 |

The standard SINAMICS G120 inverters are especially suitable as universal drive throughout the whole of industry and the trades. Main applications include, e.g., the automotive, textile, printing and chemical sectors as well as general higher-level applications (e.g. in conveyor technology).

¹⁾ Requirements placed on the torque accuracy/speed accuracy/positioning accuracy/axis coordination/functionality

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SINAMICS G120 – customer benefits

0.37 to 250 kW (0.5 to 400 hp)



Modularity

- Lower costs for the initial purchase, when stocking spare parts and when replacing
- Fast replacement when service is required



Leading technologies

- Vector control with and without encoder (field-oriented closed-loop control mode for sophisticated drives with closed-loop torque and speed control, for instance: positive displacement pumps and compressors, centrifuges, vertical material handling equipment, gantry cranes, extruders)
- Data sets of the drive control and motor data can be switched over to permit fast open-loop control tasks, e. g. rapid traverse-crawl switchover directly in the inverter
- PID controller with supplementary setpoint allows the control to be parameterized as a function of the speed
- Ramp-function generator with rounding allows ramp-up and ramp-down with different ramps and jerk limiting
- Can even be used in harsh climates as a result of the coated electronic modules that are especially rugged
- Perfect interaction with SIMATIC in Totally Integrated Automation (TIA) Portal (lower engineering and training costs, no multiple entries, short downtimes)



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SINAMICS G120 – design

0.37 to 250 kW (0.5 to 400 hp)



The modularity offers many advantages:

- Parts can be simply selected
- Lower costs and faster replacement of parts
- Fewer parts have to be stocked
- Can be simply expanded
- High reliability through integrated communication

Flexible combinability, high level of operator friendliness and standard and integrated software make SINAMICS G120 the user-friendly solution from the very start.

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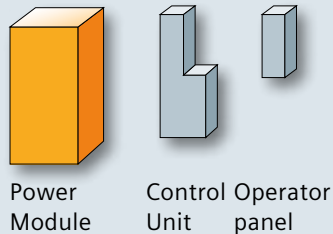
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SINAMICS G120 – ordering data for the PM240-2/PM240 Power Modules

0.37 to 250 kW (0.5 to 400 hp)



Power Modules PM240/PM240-2 – IP20 degree of protection

PM240 Power Modules have a braking chopper (four-quadrant applications) and are suitable to address a multitude of applications in general machinery construction.

¹⁾ The LO load cycle is generally used for applications with a square-law torque characteristic – as is the case for pumps, fans and compressors. The HO load cycle is used for applications with constant torque characteristics as is the case for conveyor belts.

²⁾ These current values are applicable at 400 V.

³⁾ Push-through version only filtered available.

| Rated power ¹⁾ | | Rated output current /I _N ²⁾ | Power based on the base load current ²⁾ | | Base load current/H ²⁾ | Power Modules PM240-2/PM240, IP20 degree of protection, all Control Units can be plugged in | Frame size | Dimensions (WxH ³⁾ xD) |
|---------------------------|------|--|--|------|-----------------------------------|---|-------------------|--|
| kW (LO) | hp | | kW (HO) | hp | | | | A |
| 3AC 380 to 480 V | | | | | | | | |
| 0.37 | 0.50 | 1.3 | 0.37 | 0.50 | 1.3 | 6SL321 0 -1PE11-8 <input type="checkbox"/> LO | FSA ⁵⁾ | Filtered/non-filtered: 73 x 196 x 165 |
| 0.55 | 0.75 | 1.7 | 0.55 | 0.75 | 1.7 | 6SL321 0 -1PE11-8 <input type="checkbox"/> LO | | |
| 0.75 | 1.0 | 2.2 | 0.75 | 1.0 | 2.2 | 6SL321 0 -1PE12-3 <input type="checkbox"/> LO | | |
| 1.1 | 1.5 | 3.1 | 1.1 | 1.5 | 3.1 | 6SL321 0 -1PE13-2 <input type="checkbox"/> LO | | |
| 1.5 | 2.0 | 4.1 | 1.5 | 2.0 | 4.1 | 6SL321 0 -1PE14-3 <input type="checkbox"/> LO | | |
| 2.2 | 3.0 | 5.9 | 2.2 | 3.0 | 5.9 | 6SL321 <input type="checkbox"/> -1PE16-1 <input type="checkbox"/> LO ³⁾ | | |
| 3.0 | 4.0 | 7.7 | 3.0 | 4.0 | 7.7 | 6SL321 <input type="checkbox"/> -1PE18-0 U LO | FSB | Filtered/non-filtered: 153 x 270 x 165 |
| 3.0 | 4.0 | 7.7 | 3.0 | 4.0 | 7.7 | 6SL322 4 -0BE23-0 A A0 | | |
| 4.0 | 5.0 | 10.2 | 4.0 | 5.0 | 10.2 | 6SL322 4 -0BE24-0 <input type="checkbox"/> A0 | FSC | Filtered/non-filtered: 189 x 334 x 185 |
| 7.5 | 10 | 18 | 5.5 | 7.5 | 13.2 | 6SL322 4 -0BE25-5 <input type="checkbox"/> A0 | | |
| 11.0 | 15 | 26 | 7.5 | 10 | 19 | 6SL322 4 -0BE27-5 <input type="checkbox"/> A0 | FSD | Non-filtered: 275 x 419 x 204 filtered: 275 x 512 x 204 |
| 15.0 | 20 | 32 | 11.0 | 15 | 26 | 6SL322 4 -0BE31-1 <input type="checkbox"/> A0 | | |
| 18.5 | 25 | 38 | 15.0 | 20 | 32 | 6SL322 4 -0BE31-5 <input type="checkbox"/> A0 | FSE | Non-filtered: 275 x 499 x 204 filtered: 275 x 635 x 204 |
| 22 | 30 | 45 | 18.5 | 25 | 38 | 6SL322 4 -0BE31-8 <input type="checkbox"/> A0 | | |
| 30 | 40 | 60 | 22 | 30 | 45 | 6SL322 4 -0BE32-2 <input type="checkbox"/> A0 | FSF | Non-filtered: 350 x 634 x 316 filtered: 350 x 934 x 316 |
| 37 | 50 | 75 | 30 | 40 | 60 | 6SL322 4 -0BE33-0 <input type="checkbox"/> A0 | | |
| 45 | 60 | 90 | 37 | 50 | 75 | 6SL322 4 -0BE33-7 <input type="checkbox"/> A0 | FSF | Non-filtered: 350 x 634 x 316 filtered: 350 x 934 x 316 |
| 55 | 75 | 110 | 45 | 60 | 90 | 6SL322 4 -0BE34-5 <input type="checkbox"/> A0 | | |
| 75 | 100 | 145 | 55 | 75 | 110 | 6SL322 4 -0BE35-5 <input type="checkbox"/> A0 | FSF | Non-filtered: 350 x 634 x 316 filtered: 350 x 934 x 316 |
| 90 | 125 | 178 | 75 | 100 | 145 | 6SL322 4 -0BE37-5 <input type="checkbox"/> A0 | | |
| 110 | 150 | 205 | 90 | 125 | 178 | 6SL322 4 -0BE38-8 U A0 | FSF | Non-filtered: 350 x 634 x 316 filtered: 350 x 934 x 316 |
| 132 | 200 | 250 | 110 | 150 | 205 | 6SL322 4 -0BE41-1 U A0 | | |

Heat sink versions

Standard

Push through

Integrated line filter

None (for IT systems)

Class A (for TN systems)

Class B (for TN systems)

integrated not available

⁴⁾ The depth is specified without Control Unit and panel (BOP-2/IOP).

⁵⁾ Except PM240-2 (push-through) filtered / non-filtered 26 x 238 x 171

Additional depth

CU230P-2: + 58 mm

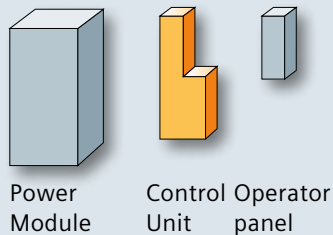
CU240x-2: + 46 mm

IOP: 25 mm

BOP-2: +15 mm

SINAMICS G120 – ordering data for the CU230P-2 / CU240B-2 / CU240E-2 / CU250S-2 Control Units

0.37 to 250 kW (0.5 to 400 hp)



Control Unit CU230P-2

The CU230P-2 Control Units are specifically designed for pump, fan and compressor applications.

CU240B-2/ CU240E-2 Control Units

The CU240B-2/ CU240E-2 Control Units are suitable for a wide range of applications in general machinery construction, such as conveyor belts, mixers and extruders.

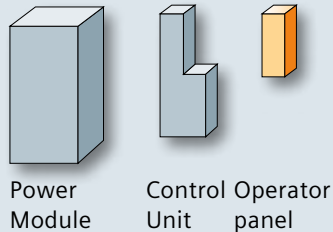
CU250S-2 Control Unit




The CU250S-2 is suitable for applications that need encoder feedback and/or need to handle basic positioning tasks.

| Inputs | Outputs | Integrated safety technology | Digital fail-safe inputs | Communication | Designation | Control Unit order number |
|---|-----------------------|------------------------------|--------------------------------------|---|---------------|--------------------------------|
| CU230P-2 series – the specialist for pumps, fans, compressors, water, buildings | | | | | | |
| 6 digital 4 analog | 3 digital 2 analog | – | – | RS485 / USS / Modbus RTU / BACnet MS / TP | CU230P-2 HVAC | 6SL3243-0BB30-1HA3 |
| | | | | PROFIBUS DP | CU230P-2 DP | 6SL3243-0BB30-1PA3 |
| | | | | PROFINET | CU230P-2 PN | 6SL3243-0BB30-1FA0 |
| | | | | CANopen | CU230P-2 CAN | 6SL3243-0BB30-1CA3 |
| CU240B-2 series – for basic applications with variable-speed drives | | | | | | |
| 4 digital 1 analog | 1 digital 1 analog | – | – | RS485 / USS / Modbus RTU | CU240B-2 | 6SL3244-0BB00-1BA1 |
| | | | | PROFIBUS DP | CU240B-2 DP | 6SL3244-0BB00-1PA1 |
| CU240E-2 series – for standard applications in general machinery construction – such as conveyor belts, mixers and extruders | | | | | | |
| 6 digital 2 analog | 3 digital 2 analog | STO | 1 F-DI (opt. 2 DI each) | RS485 / USS / Modbus RTU | CU240E-2 | 6SL3244-0BB12-1BA1 |
| | | | | PROFIBUS DP | CU240E-2 DP | 6SL3244-0BB12-1PA1 |
| | | | | PROFINET | CU240E-2 PN | 6SL3244-0BB12-1FA0 |
| | | STO, SS1, SLS, SSM, SDI | 3 F-DI (opt. 2 DI each) | RS485/USS/Modbus RTU | CU240E-2 F | 6SL3244-0BB13-1BA1 |
| | | | | PROFIBUS DP | CU240E-2 DP-F | 6SL3244-0BB13-1PA1 |
| | | | | PROFINET | CU240E-2 PN-F | 6SL3244-0BB13-1FA0 |
| CU250S-2 series – for demanding applications such as extruders and centrifuges (encoder feedback) | | | | | | |
| 11 digital 2 analog | 7 digital 2 analog | STO, SBC, SS1 | 3 F-DI (opt. 2 DI each) 1 F-DO | RS485 / USS / Modbus RTU | CU250S-2 | 6SL3246-0BA22-1BA0 |
| | | | | PROFIBUS DP | CU250S-2 DP | 6SL3246-0BA22-1PA0 |
| | | | | PROFINET | CU250S-2 PN | 6SL3246-0BA22-1FA0 |
| | | | | CANopen | CU250S-2 CAN | 6SL3246-0BA22-1CA0 |
| Optional licenses for CU250S-2 safety technology | | | | SINAMICS SD card 512 MB Extended safety license | | 6SL3054-4AG00-2AA0-Z F01 |
| Positioning capability | | | | SINAMICS SD card 512 MB Extended functions license | | 6SL3054-4AG00-2AA0-Z E01 |
| Safety technology with positioning functionality | | | | SINAMICS SD card 512 MB Extended safety plus function license | | 6SL3054-4AG00-2AA0-Z F01 + E01 |

SINAMICS G120 – ordering data for the operator panel

0.37 to 250 kW (0.5 to 400 hp)



| | Operator panel | Order number | Additional depth in mm |
|--|---|--------------------|------------------------|
|  | Operator Panel IOP ¹⁾ | 6SL3255-0AA00-4JA1 | 25 |
|  | Operator Panel IOP handheld ²⁾ | 6SL3255-0AA00-4HA0 | – |
|  | Operator Panel BOP-2 ³⁾ | 6SL3255-0AA00-4CA1 | 15 |

¹⁾**Intelligent Operator Panel IOP**

Graphic display with bar diagrams, e. g. for status values such as pressure or flow. User-friendly commissioning, diagnostics and local operating control using the large plain text display, clear menu prompting and integrated application wizards.

²⁾**Intelligent Operator Panel IOP handheld**

A handheld version can be ordered for using the IOP as mobile device.

In addition to the IOP, it includes a housing with rechargeable batteries, charging device and RS232 connecting cable.

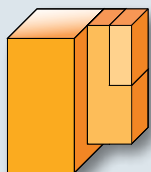
³⁾**Basic Operator Panel BOP-2**

Menu prompting and 2-line display mean that the inverters can be quickly and conveniently commissioned.

Simple, basic commissioning by simultaneously displaying parameters and parameter values as well as the option of filtering parameters.

SINAMICS G120 – ordering data for accessories

0.37 to 250 kW (0.5 to 400 hp)



SINAMICS G120

| Description | Order number |
|--|--|
| Door mounting kit¹⁾ for IOP/BOP-2 | 6SL3256-0AP00-0JA0 |
| Push-through mounting frame For Power Module PM240-2 IP20 degree of protection – push-through versions Frame size FSA Frame size FSB Frame size FSC | 6SL3260-6AA00-0DA0 6SL3260-6AB00-0DA0 6SL3260-6AC00-0DA0 |
| Memory card SINAMICS SD card 512 MB | 6SL3054-4AG00-2AA0 |
| Brake relay | 6SL3252-0BB00-0AA0 |
| Adapter for mounting on a DIN rail For Power Modules, frame size FSA For Power Modules, frame size FSB | 6SL3262-1BA00-0BA0 6SL3262-1BB00-0BA0 |
| PC inverter connection kit 2 | 6SL3255-0AA00-2CA0 |
| Shield connection kits for PM240 Power Modules Frame size FSA Frame size FSB Frame size FSC Frame sizes FSD and FSE Frame size FSF | 6SL3262-1AA00-0BA0 6SL3262-1AB00-0DA0 6SL3262-1AC00-0DA0 6SL3262-1AD00-0DA0 6SL3262-1AF00-0DA0 |
| Shield connection kits for Control Units For CU230P-2 For CU240B-2 and CU240E-2 For CU230P-2 PN, CU240E-2 PN and CU240E-2 PN-F For CU250S-2 | 6SL3264-1EA00-0FA0 6SL3264-1EA00-0HA0 6SL3264-1EA00-0HB0 6SL3264-1EA00-0LA0 |
| STARTER commissioning tool on DVD-ROM | 6SL3072-0AA00-0AGO |

! Information on how to correctly select fuses is provided in the inverter manual.

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SINAMICS G120 – technical data of the PM240 Power Modules IP20

0.37 up to 250 kW (0.5 to 400 hp)

| Mechanical data | |
|--|---|
| Degree of protection | IP20 |
| Electrical data | |
| Power HO/LO (high overload/low overload) | Unfiltered: 0.37 up to 200 kW (HO)/0.55 up to 250 kW (LO); filtered: 0.37 up to 75 kW (HO)/0.55 up to 90 kW (LO) |
| Rated output current (HO/LO) | Unfiltered: 1.3 to 370 A (HO)/1.7 to 477 A (LO); filtered: 1.3 to 145 A (HO)/1.7 to 178 A (LO) |
| Line voltage | 3AC 380 up to 480 V +/-10% |
| Line frequency | 47...63 Hz |
| Overload capability | Low Overload (LO): 150% for 3 sec. plus 110% for 57 sec. within a 300 sec. load cycle ¹⁾ High Overload (HO): 200% for 3 sec. plus 150% for 57 sec. within a 300 sec. load cycle ¹⁾²⁾ |
| Operating temperature | 0 °C to +60 °C (122 °F) for power derating |
| Relative humidity | < 95 % RH, condensation not permitted |
| Output frequency | 0...650 Hz |
| Digital /analog inputs and outputs | Details on page 3_08 |
| Communication | |
| Bus interface | PROFINET, PROFIBUS DP, CANopen, USS/Modbus RTU |
| Commissioning tools | |
| Software operating unit | STARTER for commissioning, PC interface: USB |
| Functions | |
| Open-loop/closed-loop control modes | V/f (linear, square-law, FCC, ECO), vector control with/without encoder (VC/SLVC). For more details, refer to the technical data of the Control Units |
| Protection functions | Undervoltage, overvoltage, overcontrol/overload. Ground fault, short circuit, stall protection, blocked motor protection, motor overtemperature, inverter overtemperature, parameter interlocking |
| Brake functions | Dynamic braking, DC braking, motor holding brake, compound brake |
| Motors that can be connected | Three-phase induction motors |
| Standards | |
| Conformance with standards | UL, cUL, CE, c-tick, SEMI F47 |
| Electromagnetic compatibility | Details see Chapter 4: Value-added topics |

¹⁾ When using the overload capability, the continuous output current is not reduced

²⁾ Shorter overload cycle for PM240 90 kW up to 200 kW (HO): 160% for 3 sec., 136% for 60 sec. every 300 sec.

SINAMICS G120 – technical data of the Control Units

0.37 up to 250 kW (0.5 to 400 hp)

| Control Units | CU230 optimized for pumps, fans, compressors | CU240 optimized for general applications in machinery construction, such as conveyor belts and mixers | | CU250 for demanding applications in the area of standard drives, e. g. extruders, centrifuges |
|---|--|---|--|---|
| Architecture | Application-optimized number of I/O | Basic number of I/O | Standard number of I/O with integrated safety technology | Higher number of I/O with integrated safety technology |
| Mounting dimensions in mm (W x H x D) | 73 x 199 x 65.5 | 73 x 199 x 46 | 73 x 199 x 46 | 73 x 199 x 65.5 |
| Weight in kg | 0.61 | 0.49 | | 0.61 |
| Encoder input | – | – | – | Yes |
| Communication functions | | | | |
| PROFINET | CU230P-2 PN | – | CU240E-2 PN, CU240E-2 PN-F | CU250S-2 PN |
| PROFIBUS | CU230P-2 DP | CU240B-2 DP | CU240E-2 DP, CU240E-2 DP-F | CU250S-2 DP |
| 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 SIL 2 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, SS2, SOS, SLS, SSM, SDI | – | – | – | CU250S-2, DP/PN/CAN with safety license |

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SINAMICS G120 – technical data of the Control Units

0.37 up to 250 kW (0.5 to 400 hp)

| Control Units | CU230 optimized for pumps, fans, compressors | CU240 optimized for general applications in machinery construction, such as conveyor belts and mixers | CU240E optimized for general applications in machinery construction, such as conveyor belts and mixers | CU250 for demanding applications in areas of standard drives, e. g. extruders, centrifuges |
|--|---|---|--|--|
| Electrical data | | | | |
| Supply voltage | 24 V DC (via Power Module or externally) | | | |
| Digital inputs | 6 | 4 | 6 | 11 |
| Digital inputs, fail-safe | – | – | CU240E-2, CU240E-2 DP: 1 CU240E-2 DP-F: 3 | 3 |
| Analog inputs, parameterizable | 2 x (–10 to +10 V, 0/4 to 20 mA) 1 x (0/4 to 20 mA, NI1000/PT1000) 1 x (NI1000/PT1000) | 1 x (–10 to +10 V, 0/4 to 20 mA) | 2 x (–10 to +10 V, 0/4 to 20 mA) | 2 x (–10 to +10 V, 0/4 to 20 mA) |
| Digital outputs | 2 x (relay NO/NC, AC 250 V, 2 A, 30 V DC, 5 A) 1 x (relay NO, 30 V DC, 0...5 A) | 1 x (transistor, 30 V DC, 0.5 A) | 1 x (transistor, 30 V DC, 0.5 A) 2 x (relay NO/NC, 30 V, 0.5 A) | 4 x (transistor, 30 V DC, 0.5 A) can be optionally used as digital inputs |
| Analog outputs | 2 x (0 to 10 V, 0/4 to 20 mA) | 1 x (0 to 10 V, 0/4 to 20 mA) | 1 x (0...10 V, 0/4...20 mA) 1 x (0...10 V, 0...20 mA) | 2 x (0 to 10 V, 0/4 to 20 mA) |
| Functions | | | | |
| Open-loop/closed-loop control modes | V/f (linear, square-law, free, FFC, ECO), field-oriented closed-loop speed and torque control without encoder | | | Field-oriented closed-loop speed and torque control with encoder |

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SINAMICS G120P

The specialist for pumps, fans and compressors

0.37 to 90 kW (0.5 to 125 hp)



SINAMICS G120P is a modular inverter system, comprising the following components:

- Control Unit CU230P-2
- Power Module PM230 IP55
- Operator panel (IOP/BOP-2) or a blanking cover

! The device therefore has three order numbers plus additional ones for the optional accessories.

Technical data

Voltage: 3AC 380 to 480 V +/- 10 %
Power range: 0.37 to 90 kW (0.5 to 125 hp)
Degree of protection: IP55
Closed-loop control modes: V/f (linear, square-law, FCC, ECO), encoderless vector control (SLVC)
I/O: 6 DI/3 DO/4 AI/2 AO

Highlights

Mechanical data

High degree of protection, modular design

Rugged design for demanding environmental conditions

Very simple and user-friendly handling

Electronics

Automatic changeover to line operation at rated speed

Hibernation (sleep mode) depending on the setpoints, auto-ramping function for current limiting

Comprehensive functions for pumps, fans, compressors and building automation (HVAC)


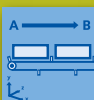


Energy efficiency

Energy-efficient through minimum apparent power losses, automatic adaptation of the motor current to the actual load relationships using the ECO mode

Energy saving using innovative technology

SINAMICS G120P – applications

0.37 to 90 kW (0.5 to 125 hp)

| Quality ¹⁾ Use | Continuous motion | | |
|--|--|---|--|
| | Basic | Medium | High |
|  Pumping/ventilating/compressing | Centrifugal pumps Radial/axial fans Compressors | | Eccentric screw pumps |
|  Moving | Conveyor belts Roller conveyors Chain conveyors | Conveyor belts Roller conveyors Chain conveyors Vert. material handling Elevators Escalators Gantry cranes Ship's drives Cable railways | Elevators Container cranes Mine hoists Open-cast mine excavators Test stands |
|  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 |
|  Machining | Main drives for <ul style="list-style-type: none"> • Turning • Milling • Drilling | Main drives for <ul style="list-style-type: none"> • Drilling • Sawing | Main drives for <ul style="list-style-type: none"> • Turning • Milling • Drilling • Gear cutting • Grinding |

SINAMICS G120P are ideal for pump, fan and compressor applications in the industrial environment, in the process industry, water industry and for applications in building automation.

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¹⁾ Requirements placed on the torque accuracy / speed accuracy / positioning accuracy / axis coordination / functionality

SINAMICS G120P – customer benefits

0.37 to 90 kW (0.5 to 125 hp)



Ruggedness

- Specialist for pumps, fans and compressors – increased ruggedness in harsh environments (dust, humidity) as a result of the high degree of protection
- Automatic acknowledgment of the fault after a power failure and automatic restart

Functionality and user friendliness

- Fast commissioning without expert knowledge
- Can be simply connected to building supervisory control systems, process control systems and automation systems as a result of the various communication interfaces such as PROFINET and PROFIBUS
- Automatic switchover to line operation when faults occur – or if the rated speed is reached (bypass function)
- Inverter is shut down if the process does not require it (hibernation mode)
- Especially line-friendly, i. e. the inverter topology ensures lower harmonic currents
- Distributed control of throttle, heating and cooling valves without requiring any additional control as a result of the three additional integrated, freely programmable PID controllers

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SINAMICS G120P – design

0.37 to 90 kW (0.5 to 125 hp)



Modular design

SINAMICS G120P is a modular inverter system, which comprises the following components:

- Control Unit CU230P-2
- Power Module PM230 IP55
- Operator panel or blanking cover

! The device therefore has three order numbers as well as those for the optional accessories.

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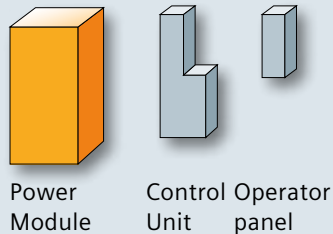
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SINAMICS G120P – ordering data for Power Modules

0.37 to 90 kW (0.5 to 125 hp)



¹⁾ Rated power based on the rated output current I_N . The rated output current I_N is based on the load cycle for low overload (LO).

²⁾ The rated output current I_N is based on the load cycle for low overload (LO). These current values are valid for 400 V and are stamped on the Power Module rating plate.

³⁾ The base load current I_H is based on the load cycle for high overload (HO).

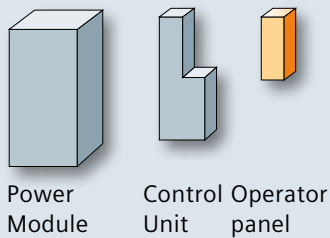
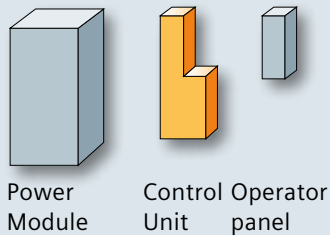
| Rated power ¹⁾ | | Rated output current I_N ²⁾ | Power based on the base load current ³⁾ | | Base load current I_H ³⁾ | PM230 Power Module Degr. of prot. IP55/UL Type 12 with integrated line filter | Frame size | Dimensions G120P Degree of protection IP55 W x H x D ⁴⁾ in mm | |
|---------------------------|------|--|--|------|---------------------------------------|---|----------------------------|--|--------------|
| kW | hp | | kW | hp | | | | | Order number |
| 3 AC 380 to 480 V | | | | | | | | | |
| 0.37 | 0.50 | 1.3 | 0.25 | 0.33 | 0.9 | 6SL3223-ODE13-7 <input type="checkbox"/> A0 | FSA | 154 x 460 x 264 | |
| 0.55 | 0.75 | 1.7 | 0.37 | 0.5 | 1.3 | 6SL3223-ODE15-5 <input type="checkbox"/> A0 | | | |
| 0.75 | 1.0 | 2.2 | 0.55 | 0.75 | 1.7 | 6SL3223-ODE17-5 <input type="checkbox"/> A0 | | | |
| 1.1 | 1.5 | 3.1 | 0.75 | 1.0 | 2.2 | 6SL3223-ODE21-1 <input type="checkbox"/> A0 | | | |
| 1.5 | 2.0 | 4.1 | 1.1 | 1.5 | 3.1 | 6SL3223-ODE21-5 <input type="checkbox"/> A0 | | | |
| 2.2 | 3.0 | 5.9 | 1.5 | 2.0 | 4.1 | 6SL3223-ODE22-2 <input type="checkbox"/> A0 | | | |
| 3.0 | 4.0 | 7.7 | 2.2 | 3.0 | 5.9 | 6SL3223-ODE23-0 <input type="checkbox"/> A0 | | | |
| 4.0 | 5.0 | 10.2 | 3.0 | 4.0 | 7.7 | 6SL3223-ODE24-0 <input type="checkbox"/> A0 | FSB | 180 x 540 x 264 | |
| 5.5 | 7.5 | 13.2 | 4.0 | 5.0 | 10.2 | 6SL3223-ODE25-5 <input type="checkbox"/> A0 | | | |
| 7.5 | 10 | 18 | 5.5 | 7.5 | 13.2 | 6SL3223-ODE27-5 <input type="checkbox"/> A0 | | | |
| 11.0 | 15 | 26 | 7.5 | 10 | 18 | 6SL3223-ODE31-1 <input type="checkbox"/> A0 | FSC | 230 x 620 x 264 | |
| 15.0 | 20 | 32 | 11.0 | 15 | 26 | 6SL3223-ODE31-5 <input type="checkbox"/> A0 | | | |
| 18.5 | 25 | 38 | 15.0 | 20 | 32 | 6SL3223-ODE31-8 <input type="checkbox"/> A A0 | FSD | 320 x 640 x 344 | |
| | | | | | | 6SL3223-ODE31-8 <input type="checkbox"/> B A0 | | | |
| 22 | 30 | 45 | 18.5 | 25 | 38 | 6SL3223-ODE32-2 <input type="checkbox"/> A0 | FSE | 320 x 751 x 344 | |
| 30 | 40 | 60 | 22 | 30 | 45 | 6SL3223-ODE33-0 <input type="checkbox"/> A0 | | | |
| 37 | 50 | 75 | 30 | 40 | 60 | 6SL3223-ODE33-7 <input type="checkbox"/> A0 | FSF | 410 x 915 x 431 | |
| 45 | 60 | 90 | 37 | 50 | 75 | 6SL3223-ODE34-5 <input type="checkbox"/> A0 | | | |
| 55 | 75 | 110 | 45 | 60 | 90 | 6SL3223-ODE35-5 <input type="checkbox"/> A0 | FSF | 410 x 915 x 431 | |
| 75 | 100 | 145 | 55 | 75 | 110 | 6SL3223-ODE37-5 <input type="checkbox"/> A0 | | | |
| 90 | 125 | 178 | 75 | 100 | 145 | 6SL3223-ODE38-8 <input type="checkbox"/> A0 | | | |
| Integrated line filter | | | | | | | | | |
| Class A | | | | | | | <input type="checkbox"/> A | | |
| Class B | | | | | | | <input type="checkbox"/> B | | |

It is absolutely necessary that an operator panel or blanking cover is plugged-on to achieve IP54/IP55/UL Type 12 degree of protection.

⁴⁾ The depth is specified with CU and IOP.

SINAMICS G120P – ordering data for the Control Unit and operator panel

0.37 to 90 kW (0.5 to 125 hp)

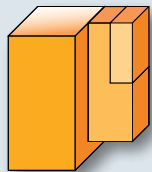


| Control Units | | | | |
|---------------|-------------------|--|--------------------|--------------|
| | Brief designation | Communication | Order number | Weight in kg |
| | CU230P-2 HVAC | RS485 / USS / Modbus RTU / BACnet MS / TP / Siemens FLN P1 | 6SL3243-0BB30-1HA3 | 0.61 |
| | CU230P-2 DP | PROFIBUS DP | 6SL3243-0BB30-1PA3 | |
| | CU230P-2 PN | PROFINET | 6SL3243-0BB30-1FA0 | |
| | CU230P-2 CAN | CANopen | 6SL3243-0BB30-1CA3 | |





| | Operator panel | Order number | Depth in mm |
|--|----------------|--------------------|-------------|
| | BOP-2 | 6SL3255-0AA00-4CA1 | 12 |
| | IOP | 6SL3255-0AA00-4JA1 | 25 |
| | IOP handheld | 6SL3255-0AA00-4HA0 | – |

SINAMICS G120P – ordering data for accessories

0.37 to 90 kW (0.5 to 125 hp)



SINAMICS G120P

| | Accessories | Order number |
|--|--|--------------------|
|  | Blanking cover IP55 | 6SL3256-1BA00-0AA0 |
|  | PC connection kit 2 (USB) | 6SL3255-0AA00-2CA0 |
| | Shield connection kit 1 CU230P-2 HVAC/DP/CAN | 6SL3264-1EA00-0FA0 |
| | Shield connection kit 2 CU230P-2 PN | 6SL3264-1EA00-0HB0 |
|  | SINAMICS SD card 512 MB | 6SL3054-4AG00-2AA0 |
| | SINAMICS documentation DVD | 6SL3097-4CA00-0YGO |
| | IOP/BOP-2 door mounting kit | 6SL3256-0AP00-0JA0 |
|  | Commissioning tool Starter DVD | 6SL3072-0AA00-0AGO |

! Line reactors are not required, and must also not be used.

Instead of an operator panel, a blanking cover can be optionally ordered for the PM230 Power Module. Degree of protection IP55/UL Type 12 is achieved with a blanking cover or a BOP-2 operator panel. Degree of protection IP54 is achieved with an IOP operator panel.

Information on how to correctly select fuses is provided in the inverter manual.

SINAMICS G120P – spare parts

0.37 to 90 kW (0.5 to 125 hp)



Overview

The fans of the Power Modules are designed for an extra long service life. Replacement fans, which can be easily and quickly exchanged, are available to address special requirements. The following diagrams show, as example, the mounting location of external or internal fan units:

| | |
|--|---|
| | <p>PM230 Power Module, degree of protection IP55 / UL Type 12, frame size FSC with external fan unit in the heat sink</p> |
| | <p>PM230 Power Module, degree of protection IP55 / UL, Type 12, frame size FSC with internal fan unit above the CU230P-2 Control Unit</p> |

| Rated power (LO) | | PM230 Power Module Degree of protection IP55/UL Type 12 | Frame size | External fan unit | Internal fan unit |
|------------------------|------|---|------------|--------------------|--------------------|
| kW | hp | Type 6SL3223- ... | | Order number | Order number |
| 3AC 380 to 480 V ±10% | | | | | |
| 0.37 | 0.50 | ODE13-7 <input type="checkbox"/> A0 | FSA | 6SL3200-OSF21-0AA0 | 6SL3200-OSF31-0AA0 |
| 0.55 | 0.75 | ODE15-5 <input type="checkbox"/> A0 | | | |
| 0.75 | 1.0 | ODE17-5 <input type="checkbox"/> A0 | | | |
| 1.1 | 1.5 | ODE21-1 <input type="checkbox"/> A0 | | | |
| 1.5 | 2.0 | ODE21-5 <input type="checkbox"/> A0 | | | |
| 2.2 | 3.0 | ODE22-2 <input type="checkbox"/> A0 | | | |
| 3.0 | 4.0 | ODE23-0 <input type="checkbox"/> A0 | FSB | 6SL3200-OSF22-0AA0 | |
| 4.0 | 5.0 | ODE24-0 <input type="checkbox"/> A0 | | | |
| 5.5 | 7.5 | ODE25-5 <input type="checkbox"/> A0 | | | |
| 7.5 | 10 | ODE27-5 <input type="checkbox"/> A0 | FSC | 6SL3200-OSF23-0AA0 | |
| 11.0 | 15 | ODE31-1 <input type="checkbox"/> A0 | | | |
| 15.0 | 20 | ODE31-5 <input type="checkbox"/> A0 | | | |
| 18.5 | 25 | ODE31-8 <input type="checkbox"/> A A0 | | | |
| 18.5 | 25 | ODE31-8 <input type="checkbox"/> B A0 | FSD | 6SL3200-OSF24-0AA0 | 6SL3200-OSF32-0AA0 |
| 22 | 30 | ODE32-2 <input type="checkbox"/> A0 | | | |
| 30 | 40 | ODE33-0 <input type="checkbox"/> A0 | | | |
| 37 | 50 | ODE33-7 <input type="checkbox"/> A0 | FSE | | |
| 45 | 60 | ODE34-5 <input type="checkbox"/> A0 | | | |
| 55 | 75 | ODE35-5 <input type="checkbox"/> A0 | FSF | 6SL3200-OSF26-0AA0 | |
| 75 | 100 | ODE37-5 <input type="checkbox"/> A0 | | | |
| 90 | 125 | ODE38-8 <input type="checkbox"/> A0 | | | |
| Integrated line filter | | | | | |
| Class A | | <input type="checkbox"/> A | | | |
| Class B | | <input type="checkbox"/> B | | | |

SINAMICS G120P – technical data of the PM230 IP55 Power Modules

0.37 to 90 kW (0.5 to 125 hp)



| Mechanical data | |
|---|--|
| Degree of protection | Max. IP55/UL Type 12 |
| Electrical data | |
| Power rating (low overload LO) Rated output current (low overload LO) | 0.37 to 90 kW 1.3 to 178 A |
| Line voltage | 3AC 380 to 480 V ±10 % |
| Line frequency | 47 to 63 Hz |
| Overload capability (low overload LO/ high overload HO) | Low Overload (LO) for FSA – FSC: 150 % for 3 sec. plus 110 % for 57 sec. within a 300 sec. load cycle ¹⁾ Low Overload (LO) for FSD – FSF: 110 % for 60 sec. within a 300 sec. load cycle ¹⁾ High Overload (HO) for FSA – FSC: 200 % for 3 sec. plus 150 % for 57 sec. within a 300 sec. load cycle ¹⁾ High Overload (HO) for FSD – FSF: 150 % for 60 sec. within a 300 sec. load cycle ¹⁾ |
| Operating temperature | 0 °C to +60 °C (122 °F) for power derating |
| Relative humidity | < 95 % RH, condensation not permissible |
| Output frequency | 0...650 Hz |
| Digital/analog inputs and outputs | 6 DI/3 DO/4 AI/2 AO |
| Communication | |
| Bus interface | PROFINET, PROFIBUS DP, USS/Modbus RTU, BACnet MS/TP, Siemens FLN P1, CANopen |
| Commissioning tools | |
| Software operator unit | STARTER for commissioning, PC interface (USB) |
| Functions | |
| Open-loop/closed-loop control modes | V/f (linear, square-law, FCC, ECO), sensorless vector control (SLVC) |
| Protection functions | Motor temperature monitoring with and without temperature sensor (via PTC, KTY and ThermoClick sensor) • Overcurrent protection • Torque monitoring • Overvoltage protection (Vdc_max controller) |
| Brake functions | DC brake |
| Motors that can be connected | 3-phase induction motors |
| Standards | |
| Conformance with standards | UL, CE, c-tick |
| Electromagnetic compatibility | For more details, see Chapter 4: Value-added topics |

¹⁾ When using the overload capability, the continuous output current is not reduced

SINAMICS G120P – technical data of the CU230P-2

0.37 up to 90 kW (0.5 to 125 hp)



| Control modules | CU230 optimized for pumps, fans, compressors |
|--|--|
| Architecture | Application-optimized number of I/O |
| Mounting dimensions in mm (W x H x D) | 73 x 199 x 65.5 |
| Weight in kg | 0.61 |
| Encoder input | – |
| Communication functions | |
| PROFINET | CU230P-2 PN |
| PROFIBUS | CU230P-2 DP |
| Modbus RTU and USS | CU230P-2 HVAC |
| BACnet MS/TP | CU230P-2 HVAC |
| CANopen | CU230P-2 CAN |
| USB interface | 1 |
| Safety functions according to Category 3 of EN 954-1 or according to SIL 2 of IEC 61508 | |
| Integrated safety function STO | – |
| STO, SS1, SLS, SDI, SSM | – |
| STO, SBC, SS1 | – |
| STO, SBC, SS1, SS2, SOS, SLS, SSM, SDI | – |

| Control Units | CU230 optimized for pumps, fans, compressors |
|-------------------------------------|---|
| Electrical data | |
| Supply voltage | 24 V DC (via Power Module or external) |
| Digital inputs | 6 |
| Digital inputs, fail-safe | – |
| Analog inputs, parameterizable | 2 x (–10 to +10 V, 0/4 to 20 mA) 1 x (0/4 to 20 mA, NI1000/PT1000) 1 x (NI1000/PT1000) |
| Digital outputs | 2 x (relay NO/NC, AC 250 V, 2 A, 30 V DC, 5 A) 1 x (relay NO, 30 V DC, 0.5 A) |
| Analog outputs | 2 x (0 to 10 V, 0/4 to 20 mA) |
| Functions | |
| Open-loop/closed-loop control modes | V/f (linear, square-law, free, FFC, ECO), field-oriented closed-loop speed and torque control without encoder |

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Value-added topics

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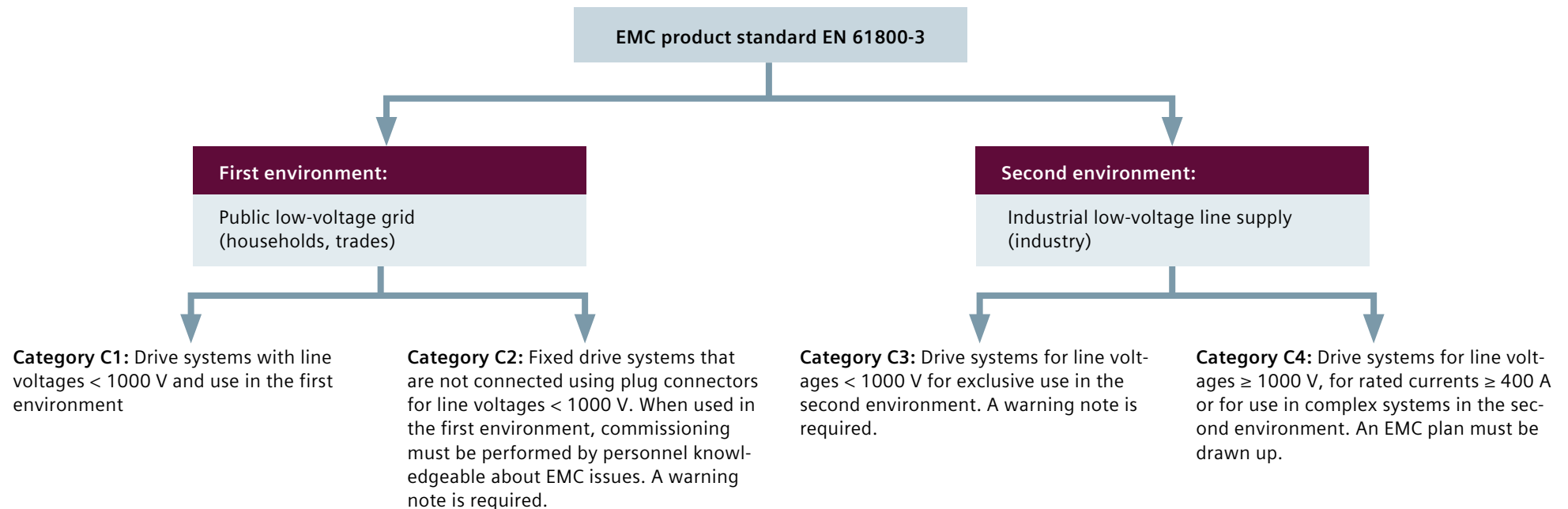
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▶ 4

EMC filters for inverters

EN 61800-3



EMC filters for the second environment:

This filter complies with standard EN 61800-3 for using the inverter in the second environment. In practice, this means that the device can be used in industrial low-voltage line supplies without using an external EMC filter. Shielded motor

power cables must always be used in order to comply with the EMC product standard.

Note: The EMC product standard EN 61800-3 does not refer directly to an inverter, but to a PDS (Power Drive System); in addition to the inverter, it includes the complete circuit as well as motor and cables.

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Electromagnetic compatibility (EMC)

| | |
|---|--|
| SINAMICS V20 1AC 200 to 240 V | |
| Inverters with a Class A filter | <ul style="list-style-type: none"> The device is in compliance with EN 61800-3 Category C2 (first environment) |
| SINAMICS V20 3AC 380 to 480 V | |
| Inverters with Class A filter | <ul style="list-style-type: none"> The device is in compliance with EN 61800-3 Category C3 (second environment) |
| Inverters with external filter | <ul style="list-style-type: none"> The device complies with the limit values for cable-conducted and radiated interference voltages according to EN 61800-3 Category C2 (first environment) |
| SINAMICS G120C 3AC 380 to 480 V | |
| Inverters with Class A filter | <ul style="list-style-type: none"> The device is in compliance with EN 61800-3 Category C3 (second environment) The device complies with the limit values for cable-conducted and radiated interference voltages according to EN 61800-3 Category C2 (first environment) |
| SINAMICS G120 PM240 3AC 380 to 480 V | |
| Inverters with Class A filter | <ul style="list-style-type: none"> The device is in compliance with EN 61800-3 Category C3 (second environment) The device complies with the limit values for cable-conducted and radiated interference voltages according to EN 61800-3 Category C2 (first environment) |
| Inverters with Class B filter | <ul style="list-style-type: none"> The device is in compliance with the limit values of cable-conducted interference voltages according to EN 61800-3 Category C1 (first environment) |
| SINAMICS G120P PM230 IP55 3AC 380 to 480 V | |
| Inverters with Class A filter | <ul style="list-style-type: none"> The device is in compliance with EN 61800-3 Category C2 (first environment) |
| Inverters with Class B filter | <ul style="list-style-type: none"> The device complies with the limit values for low-frequency line harmonics and the cable-conducted interference voltages according to EN 61800-3 Category C1 (first environment) |

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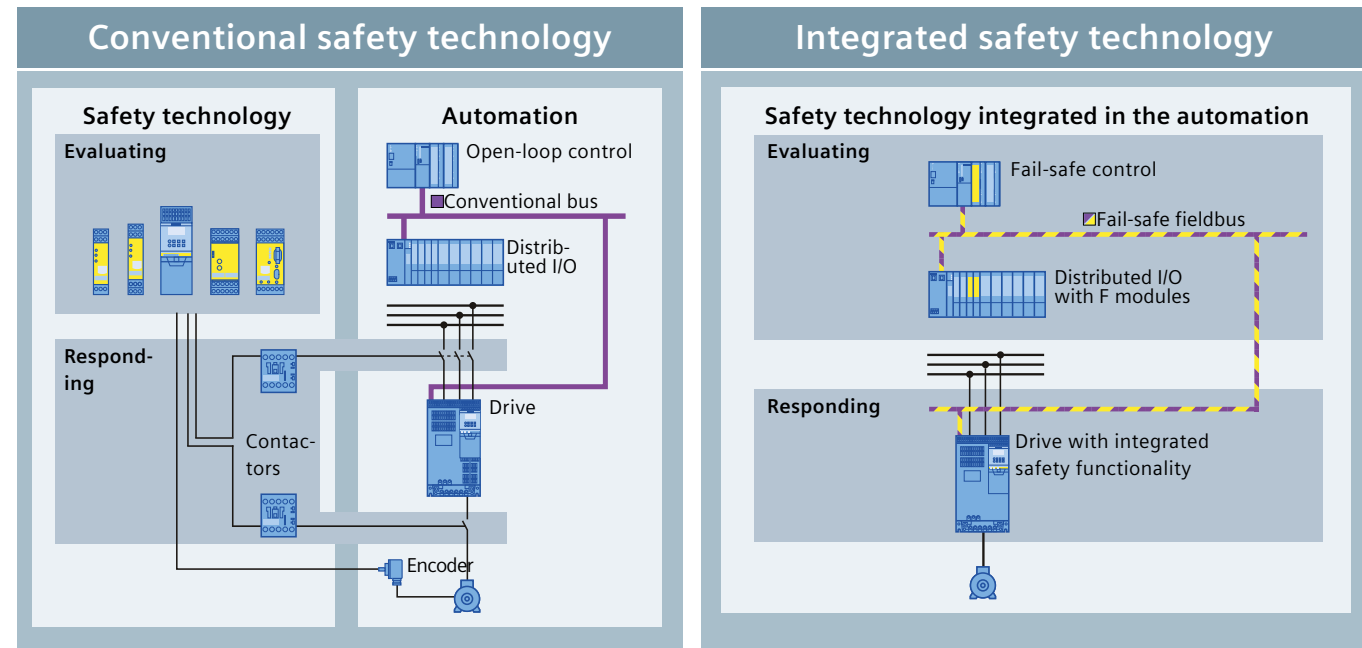
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System-based industrial safety: Safety Integrated

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

Werner von Siemens, 1880



Based on Safety Integrated, we provide an intelligent response to continuously increasing requirements regarding the functional safety of plants and machines and operators. Our comprehensive and integrated solutions for the production and process industries reliably protect man, machine and the environment – and fulfill demands relating to cost effectiveness and flexibility – both now, and in the future.



Integrated safety technology reduces the number of components and wiring costs

www.siemens.com/safety

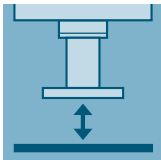
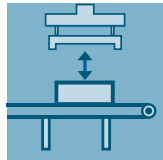
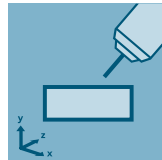
Safety functions integrated in SINAMICS inverters

| Drives | Integrated safety function | Subdivided into two classes | Description |
|---|----------------------------|--|--|
| SINAMICS V20 | None | – | – |
| SINAMICS G120C  | STO | Function to safely stop a drive | Safe Torque Off (STO). This function safely ensures that torque can no longer be generated at the motor shaft. |
| SINAMICS G120  | STO | Function to safely stop a drive | Safe Torque Off (STO). This function safely ensures that torque can no longer be generated at the motor shaft. |
| | SS1 | | Safe Stop 1 (SS1). The function actively brakes a drive before the STO function is activated. Using this function, drives with a high level of kinetic energy can be brought to a standstill as quickly as possible when a dangerous situation develops. |
| | SBC | Safe Brake Control (SBC) | After STO, Safe Brake Control activates a holding brake so that drives can no longer move, e. g. due to the force of gravity. |
| | SLS | Functions to safely monitor the speed of a drive | Safely Limited Speed (SLS). The SLS function monitors the drive to ensure that a preset speed/velocity limit is not exceeded. |
| | SSM | | Safe Speed Monitor (SSM). This function signals if a specific speed is fallen below. There is no drive-based response. |
| | SDI | | Safe Direction (SDI). This function monitors that the selected direction of rotation is maintained. |
| SINAMICS G120P | None | – | – |

SINAMICS G120 safety functions

| | Safe Torque Off (STO) | Safe Stop 1 (SS1) | Safe Brake Control (SBC) with CU250S-2 |
|---------------------|---|---|---|
| | | | |
| Benefits | <ul style="list-style-type: none"> Prevents the drive from inadvertently starting Drive is safely switched into a no-torque condition; travel can be quickly resumed as there is no pre-charging time | <ul style="list-style-type: none"> Fast and safely monitored stopping of the drive, especially for high moments of inertia An encoder is not required | <ul style="list-style-type: none"> Safe control of holding brakes, which are active in a no-current state Prevents suspended/pulling loads from sagging |
| | <ul style="list-style-type: none"> e. g. baggage / package handling/ transport, supplying, removing | <ul style="list-style-type: none"> e. g. saws, unwinders, extruders, centrifuges, stacker cranes | <ul style="list-style-type: none"> e. g. cranes, winders |
| Applications | <p>Conveyor belt</p> | <p>Saw</p> | <p>Crane</p> |

SINAMICS G120 safety functions

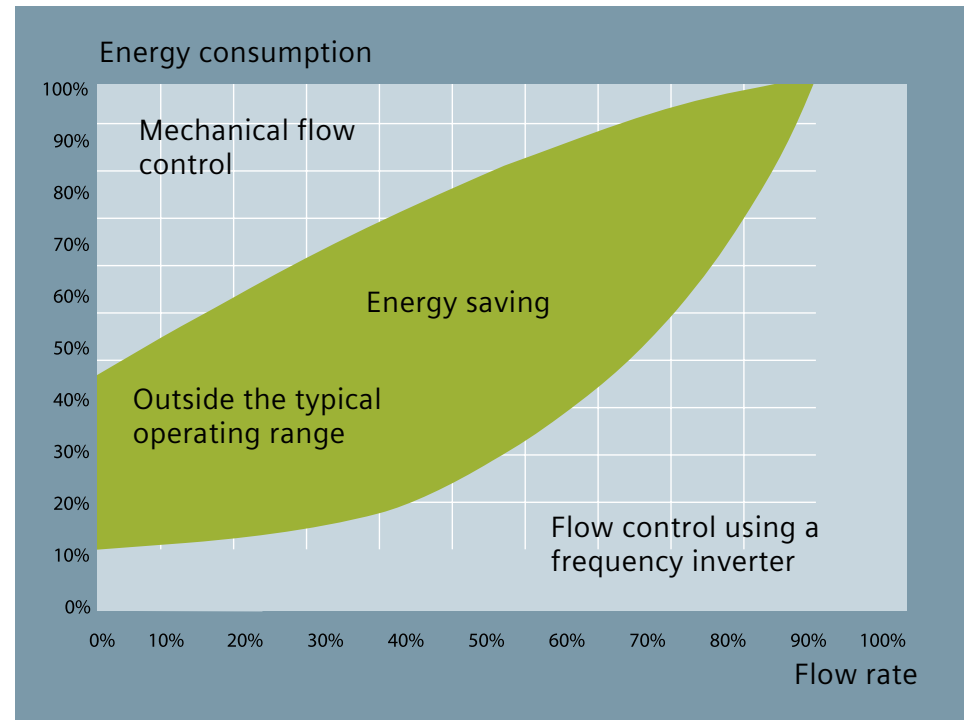
| | Safely Limited Speed (SLS) | Safe Direction (SDI) | Safe Speed Monitor (SSM) |
|---------------------|--|---|--|
| Benefits | <ul style="list-style-type: none"> Reduction and continuous monitoring of the drive speed to directly work at the machine while it is operational An encoder is not required | <ul style="list-style-type: none"> The function ensures that the drive can only rotate in the selected direction | <ul style="list-style-type: none"> The function provides a safe output signal if the drive falls below a specific speed limit |
| Applications | <p>Press</p>  | <p>Loading gantry</p>  | <p>Milling tool</p>  |
| | <ul style="list-style-type: none"> e. g. presses, punches, winders, conveyors, grinding machines | <ul style="list-style-type: none"> e. g. stacker cranes, presses, unwinders | <ul style="list-style-type: none"> e. g. grinding machines, strip lines, drills, milling tools, packaging machines |

Energy efficiency

Leverage energy-saving potential and optimize energy usage: SINAMICS inverters with intelligent functions make it possible.

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

! Note: Using SinaSave, you can calculate the energy saving of your SINAMICS drive over its complete life cycle: www.siemens.com/sinasave



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Energy-saving functions

Examples

ECO mode

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

Hibernation mode

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

Bypass mode

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

Motor staging

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

Energy consumption values/energy-saving counter

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

PROFenergy for sustainability

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

www.siemens.com/energy-efficiency-production

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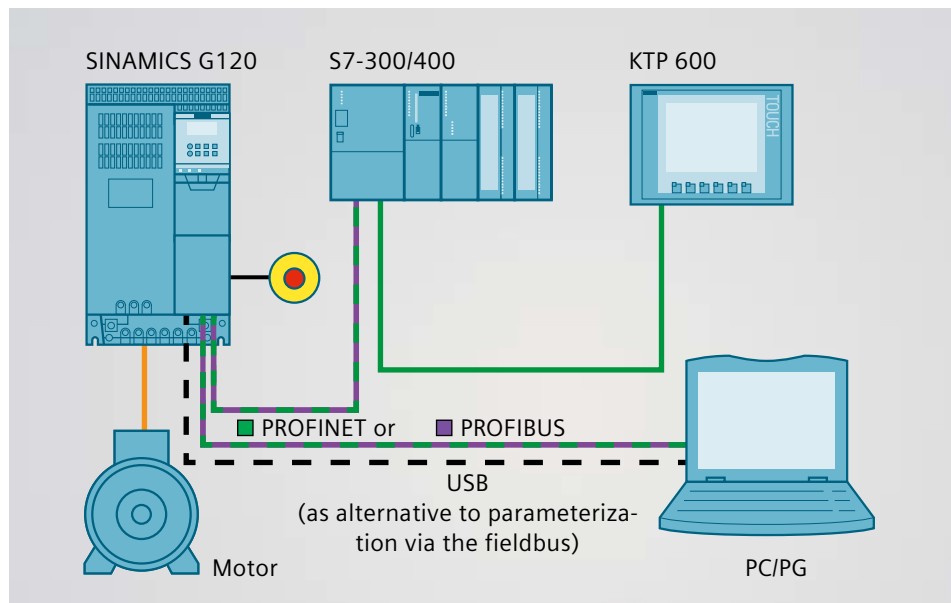
TIA applications

It is great when skill sets complement one another

We can provide you with efficient system strategies, especially as a result of the optimum interaction between SIMATIC control systems and SINAMICS drive technology.

Here you can find examples for connecting SINAMICS drives to SIMATIC control systems:

www.siemens.com/sinamics-applications



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- Commissioning times are significantly reduced
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