

SIEMENS

Ingenuity for life



SINAMICS G120C

The compact and versatile converter
with optimum functionality

[siemens.com/sinamics-g120c](https://www.siemens.com/sinamics-g120c)

The compact converter series

Packed with powerful functions

A wealth of compelling advantages

The SINAMICS G120C converter is especially compact, delivering high power density: With seven frame sizes, it covers a range of power ratings from 0.55 kW to 132 kW (0.75 hp up to 150 hp).

As true all-rounder, the compact SINAMICS G120C converter can address a wide range of applications – e.g. conveyor belts, mixers, agitators, extruders, pumps, fans, compressors and basic machine handling.

Strong member of the SINAMICS family

The SINAMICS G120C belongs to the SINAMIC family. It offers the ideal drive for every application, which can be intuitively commissioned using standard tools and operated.

Highlights

Compact > for simple installation in the smallest space

Simple commissioning and operation > completely intuitive

Perfect integration > in the automation environment

Leading-edge technology > for higher energy efficiency and safety

Reliable communication > all common bus systems can be used

Power range: 0.55 kW to 132 kW (0.75 hp up to 150 hp)

Voltage range: 3AC 380 V ... 480 V (–20 % / +10 %) with 50/60 Hz +/- 5 %

Control modes: V/f (linear, square law, FCC, ECO), vector control without encoder (SLVC)

Communication: PROFINET, EtherNet/IP, PROFIBUS, USS/Modbus RTU

SINAMICS G120C – new frame sizes open up even more possibilities. Compact, versatile and packed with functions. Available over the complete power range from 0.55 kW to 132 kW.



Frame size FSAA
0.55 kW to 2.2 kW



Frame size FSA
3 kW to 4 kW



Frame size FSB
5.5 kW to 7.5 kW



Frame size FSC
11 kW to 18.5 kW



Frame size FSD
22 kW to 45 kW



Frame size FSE
55 kW



Frame size FSF
75 kW to 132 kW

The perfect solution to address countless applications

For a wide range of applications

Much more than compact

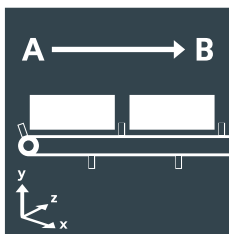
SINAMICS G120C is a true all-rounder, combining compactness, high power density and a wide variety of functions to address many applications. Suitable for continuous motion with mid-range performance relating to precisely controlling torque and speed.

Applications at a glance



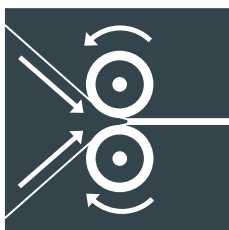
Pumping, ventilating and compressing

- Centrifugal pumps
- Radial/axial fans
- Compressors



Moving

- Belt conveyors
- Roller conveyors
- Chain conveyors
- Treadmills
- Bucket conveyors



Processing

- Mills
- Mixers
- Kneaders
- Crushers
- Agitators
- Centrifuges
- Extruders
- Rotary furnaces

	Features	Benefits
Compact	<ul style="list-style-type: none"> • Frame size FSAA needs up to 30 % less space than equivalent converters • Frame size FSD to FSF: especially compact with integrated DC reactor • High power density, smaller envelope dimensions • Side-by-side mounting without derating 	<ul style="list-style-type: none"> • Compact design that requires little space in the cabinet and reduces the cost for the electrical cabinet • Can be used in small control cabinets, close to the machine • SINAMICS G120C devices can be mounted next to one another without derating. This saves additional space. • Long service life, high reliability • Frame sizes FSD to FSF have an integrated DC reactor so that an input reactor is not required
Simple commissioning and operation	<ul style="list-style-type: none"> • Cloning function using BOP-2, IOP or SD card • Optimized parameter set • Optimized commissioning • Integrated USB port • Easy configuration 	<ul style="list-style-type: none"> • Standard applications can be easily set up with the IOP (Intelligent Operator Panel) using application-specific wizards • Intuitive series commissioning, which reduces cost and saves time • Simple and fast software settings • Simple handling during commissioning and in operation • Simplified commissioning with a common hardware configuration for all components. The converter automatically goes online, even beyond network boundaries (routing/remote maintenance).
Perfect integration	<ul style="list-style-type: none"> • Fully integrated into the TIA Portal system diagnostics • SINAMICS Startdrive – Intuitive converter engineering and perfect interaction with SIMATIC in the Totally Integrated Automation Portal • TIA Portal library concept 	<ul style="list-style-type: none"> • Shared data management • Uniform, end-to-end operating concept • Engineering efficiency • Consistent, end-to-end control of the drives • Coordinated portfolio • Integrated safety technology • Reliable system diagnostics
Leading-edge technology	<ul style="list-style-type: none"> • Integrated standard safety feature STO (Safe Torque Off): Prevents the motor from moving unexpectedly and complies with safety standard SIL 2 according to EN 61508 respectively PL d, Cat 3 according to EN ISO 13849. • Energy-efficient, encoderless vector control - automatic flux reduction with V/F ECO 	<ul style="list-style-type: none"> • No external components required – including PROFIsafe – thanks to certified Safe Torque Off safety function (STO) • Fully integrated as standard in the converter
Reliable communication	<ul style="list-style-type: none"> • Frame size FSAA to FSC: PROFINET (PROFIenergy / PROFISafe), PROFIBUS, USS Modbus RTU, EtherNet/IP • Frame size FSD to FSF: PROFINET (PROFIenergy / PROFISafe / PROFIdrive), EtherNet/IP 	<ul style="list-style-type: none"> • Uses all of the common bus systems • Flexible use and simple plug in • Uninterruptible thanks to the optional 24V power supply • Increased performance with PROFINET • PROFINET profile PROFIsafe: Safety-related communication – open, integrated and proven • PROFINET profile PROFIenergy: Communication with energy saving potentials • PROFIdrive: Rapid and easy implementation of drive concepts

A customized solution is simply integrated – thanks to intelligent software

Supported by powerful software tools

SINAMICS G120C converters can be optimally integrated into the existing automation environment. Innovative

software tools help to make the selection, commissioning, and operation as easy and reliable as possible.

Selection

DT Configurator

- Fast product selection and ordering
- The optimum SINAMICS converter is selected to address the specific requirements of the application
- 2D/3D models, operating, instructions, data sheets

siemens.com/dt-configurator



SINAMICS SELECTOR App

- Fast and easy converter selection tool for mobile devices
- Conveniently provides the correct article numbers

siemens.com/sinamics-selector



Commissioning, diagnostics & service

SINAMICS StartDrive / STARTER commissioning software

- Integrated and seamless engineering platform for automation and drive technology
- Intuitive converter engineering and seamless interaction with SIMATIC in the Totally Integrated Automation Portal

siemens.com/startdrive



Panels

- Commissioning and diagnostics directly at the drive
- Using BOP-2, IOP or SD card

SINAMICS ASSISTANT App

- Converts converter frequency (Hz) to the motor speed as setpoint (rpm)
- Fault code analysis (offline)
- Support function

siemens.com/sinamics-assistant



Optimally integrated in the automation

Complete motion control solutions

Complete and optimized

With SINAMICS G120C and SIMATIC, Siemens offers comprehensive solutions from a single source for general motion control applications. Through the seamless interaction between SIMATIC controllers and SINAMICS drive technology we can provide you with highly efficient systems.

siemens.com/sinamics-applications

Example for SINAMICS G

Speed control of a G120C (StartDrive) with S7-1200 (TIA Portal) via PROFINET/PROFIBUS DP with Safety Integrated (via terminal) and HMI.

The task:

A SIMATIC S7-1200 (TIA Portal) is to cyclically read/write access SINAMICS G120C process/control data via PROFINET/PROFIBUS; data transfer is supported by standard function blocks.

Implement a speed-controlled machine axis.

Our solution:

This example shows a SINAMICS G120C PN/G120C DP connected to a SIMATIC S7-1212C. The StartDrive option package is used to configure and integrate the drive into STEP 7.

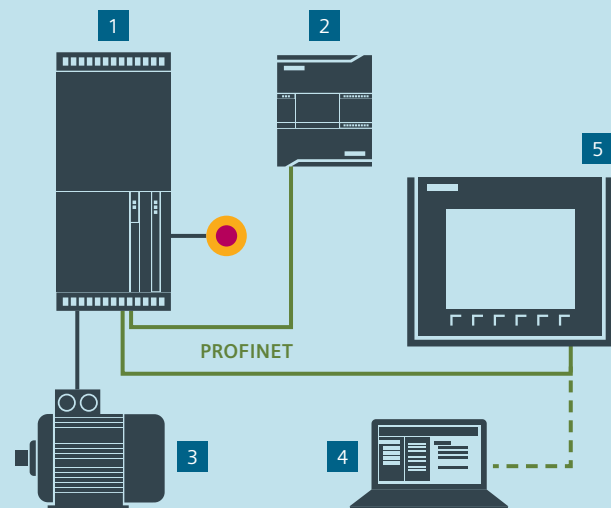
The configuration is uploaded to the drive via EtherNet/IP for the PROFINET version, and via USB for the PROFIBUS version.

With the function blocks used, you can ...

- Operate the drive using its control word and define a speed setpoint
- Read the drive status word and the actual speed, current, torque, fault and alarm values
- Read and write ramp-up and ramp-down time drive parameters (for example)
- Read the fault buffer

Customer benefits:

The controller and drive can be intuitively programmed in the standard way using the TIA Portal.



1 SINAMICS G120C with PROFINET

2 SIMATIC S7-1200 CPU 121xC

3 SIMOTICS 1LE standard induction motor

4 TIA Portal (PG/PC)

5 SIMATIC HMI KTP600 Basic Panel

Teamwork for perfect integration

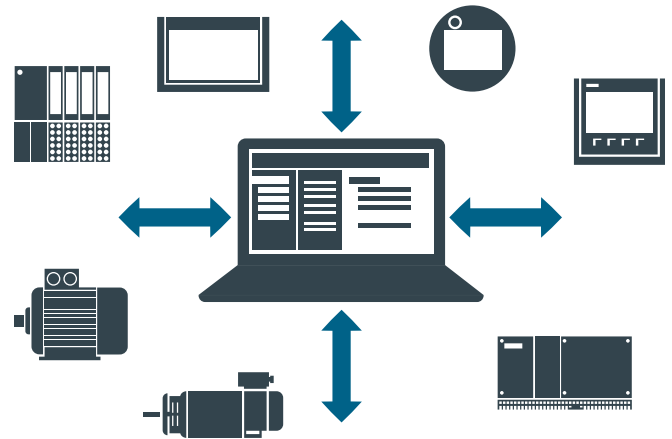
SINAMICS G120C and TIA

One operating concept and many benefits

The Totally Integrated Automation Portal (TIA Portal) enables digitalized automation to be fully accessed – from digital planning and integrated engineering up to transparent operation.

The TIA Portal can also be used to intuitively integrate SINAMICS G120C drives into the automation and commissioned them – a process that is especially fast, convenient, and efficient. This is achieved by using the same operating concepts, and a high degree of user friendliness.

siemens.com/tia
siemens.com/startdrive



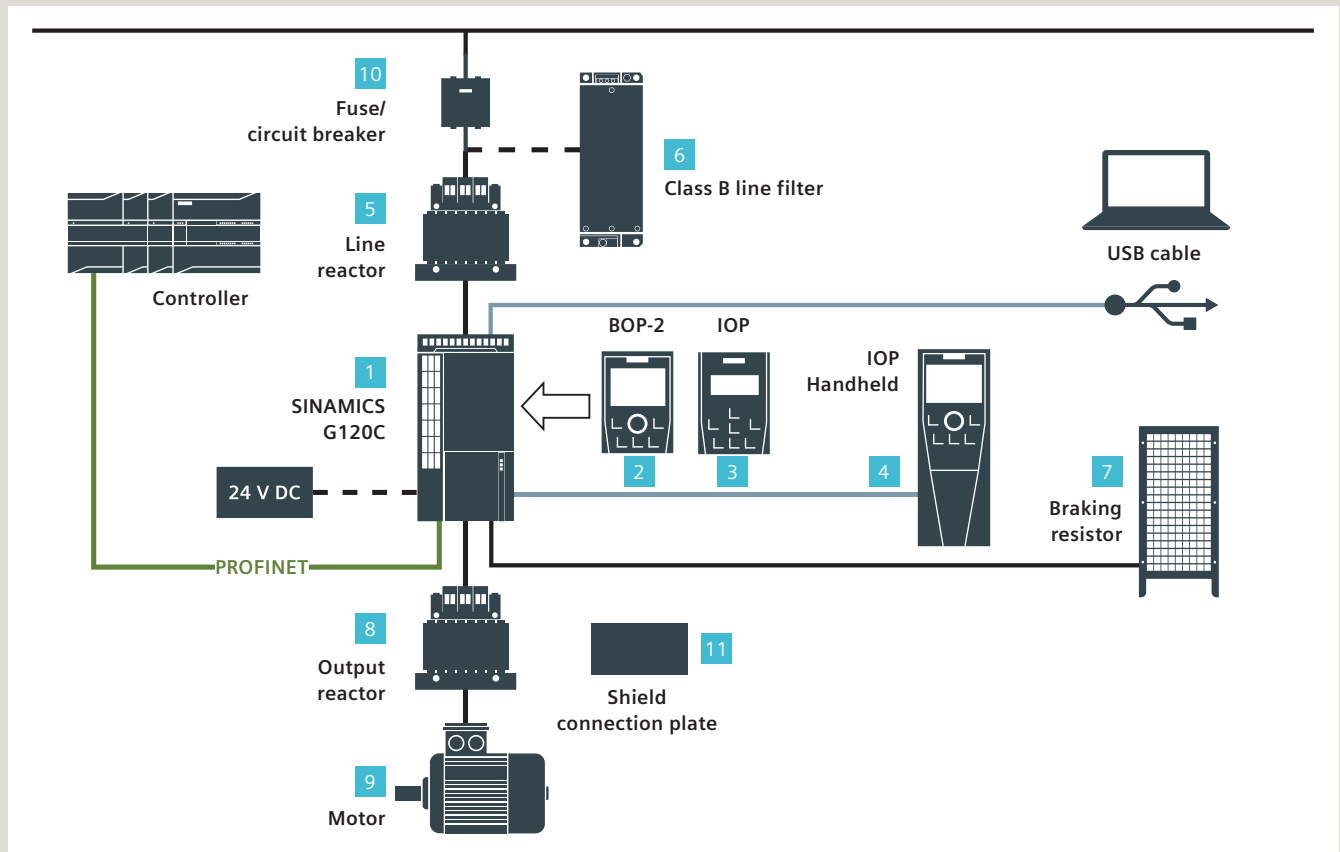
Feature	Benefit
<ul style="list-style-type: none"> Control <ul style="list-style-type: none"> > SIMATIC technology objects including online synchronization > DriveLib communication modules > Safety Integrated communication module > User-defined control via UDTs and F-UDTs 	<ul style="list-style-type: none"> Efficient engineering by simply controlling the drives – as well as freely selecting the control type
<ul style="list-style-type: none"> Drives are fully integrated into the TIA Portal system diagnostics 	<ul style="list-style-type: none"> Drive messages in plain text without requiring any engineering are automatically available in the TIA Portal, control, web server and HMI
<ul style="list-style-type: none"> Routing across network boundaries 	<ul style="list-style-type: none"> Time-saving as the device can be simply and centrally accessed – remote maintenance
<ul style="list-style-type: none"> Parameter download via data block 	<ul style="list-style-type: none"> Simplified series commissioning and replacement of parts
<ul style="list-style-type: none"> GSD script already included in STARTER V4.5 	<ul style="list-style-type: none"> Simple and synchronized telegram configuration between STARTER and the TIA Portal
<ul style="list-style-type: none"> Use of the TIA Portal library concept 	<ul style="list-style-type: none"> The library concept guarantees simple reusability of the converter, including parameter settings and hardware components
<ul style="list-style-type: none"> The SIMATIC Energy Suite - an integrated option for TIA Portal 	<ul style="list-style-type: none"> Energy management efficiently combined with the automation to increase energy transparency in production

The TIA Portal Info Service

Our TIA Portal Tutorial Center offers a wide range of valuable and detailed information. In addition, we have compiled numerous videos that offer a complete overview of

the general functions and tools of the TIA Portal.
siemens.com/tia-portal-tutorial-center

Full range of options




- 1 SINAMICS G120C (with / without Class A line filter)
- 2 Basic Operator Panel (BOP): user-friendly menu navigation and two-line display. Standard commissioning using the cloning function
- 3 Intelligent Operator Panel (IOP): user-friendly and high-performance operator panel. Simple commissioning of standard applications using application-specific wizards
- 4 IOP Handheld: simple local commissioning using the handheld version of the Intelligent Operator Panel (IOP)
- 5 Line reactor: smoothes the current drawn by the converter and thus reduces harmonic components in the line current
- 6 Class B line filter to obtain a higher radio interference class
- 7 Braking resistor converts the braking energy into heat
- 8 Output reactor reduces the rate of voltage rise (dv/dt) and the current amplitude
- 9 Standard induction motor for general applications
- 10 Fuse / circuit breaker: overcurrent protection
- 11 Shield connection plate makes it easier to connect the shields of supply and control cables. Provides mechanical strain relief and ensures an optimum EMC level

Technical data	
Voltage/frequency	3 AC 380 – 480 V –20 % +10 % with 47/63 Hz +/-5 %
Power range	0.55 – 132 kW/ 0.75 – 150 hp
Overload power	For I _{LO_out} (LO ¹): 150 % for 3 sec., plus 110 % for 57 sec. within a 300 sec. load cycle For I _{HO_out} (HO ²): 200 % for 3 sec., plus 150 % for 57 sec. within a 300 sec. load cycle ³
Degree of protection	IP20/UL open type
Ambient temperature	-10° to 40 °C without derating/up to 60 °C with derating
EMC with Class A filter	Device fulfills the requirements according to EN 61800-3 Category C3 (industrial low-voltage line supplies) Device complies with the limit values of cable-conducted and radiated interference voltages according to EN 61800-3 Category C2 (public low-voltage grid)
Motor cable lengths	Frame size FSAA: 50 m shielded/100 m unshielded Frame size FSA-FSC: 150 m shielded/150 m unshielded Frame size FSD-FSE: 200 m shielded/300 m unshielded Frame size FSF: 300 m shielded/450 m unshielded
Signal inputs/outputs	6 DI/ 2 DO/ 1 AI/ 1 AO
Safety technology	SIL 2 acc. EN 61508, PL d acc. EN ISO 13849, class 3 acc. EN 60204
Control modes	Vector, V/f, V/f ECO
Energy functions	Energy-saving calculator, energy consumption calculator, automatic flux reduction
Function	Fixed speed setpoint, PID controller, motor holding brake control, free functions blocks
Braking	Integrated braking chopper
Communication	FSAA to FSC available with PROFINET, PROFIBUS, EtherNet/IP, USS/Modbus RTU. FSD to FSF available with PROFINET

Dimensions

kW	Frame size	W (mm)	H (mm)	D (mm)
0.55 0.75 1.1 1.5 2.2	FSAA	73	173	155
3 4	FSA		196	
5.5 7.5	FSB	100		203
11 15 18.5	FSC	140	295	
22 30 37 45	FSD	200	472	237
55	FSE	275	551	237
75 90 110 132	FSF	305	708	357



¹ LO = Low Overload (continuous duty)

² HO = High Overload (cyclic duty)

³ The continuous output current is not reduced when using the overload capability

SINAMICS G120C – converter 3-phase supply voltage 380 - 480 V						
Rated power P_{LO}^1 (kW)	Rated power P_{LO}^1 (hp)	Output current $I_{LO_out}^1$ (A)	Output current $I_{HO^2_out}^5$ (A)	Frame size	Article number Unfiltered Power Modules	Article number Power Modules with integrated Class A line filter ⁴
0.55	0.75	1.7	1.3	FSAA	6SL3210-1KE11-8U 2	6SL3210-1KE11-8A 2
0.75	1	2.2	1.7	FSAA	6SL3210-1KE12-3U 2	6SL3210-1KE12-3A 2
1.1	1.5	3.1	2.2	FSAA	6SL3210-1KE13-2U 2	6SL3210-1KE13-2A 2
1.5	2	4.1	3.1	FSAA	6SL3210-1KE14-3U 2	6SL3210-1KE14-3A 2
2.2	3	5.6	4.1	FSAA	6SL3210-1KE15-8U 2	6SL3210-1KE15-8A 2
3	4	7.3	5.6	FSA	6SL3210-1KE17-5U 1	6SL3210-1KE17-5A 1
4	5	8.8	7.3	FSA	6SL3210-1KE18-8U 1	6SL3210-1KE18-8A 1
5.5	7.5	12.5	8.8	FSB	6SL3210-1KE21-3U 1	6SL3210-1KE21-3A 1
7.5	10	16.5	12.5	FSB	6SL3210-1KE21-7U 1	6SL3210-1KE21-7A 1
11	15	25	16.5	FSC	6SL3210-1KE22-6U 1	6SL3210-1KE22-6A 1
15	20	31	25	FSC	6SL3210-1KE23-2U 1	6SL3210-1KE23-2A 1
18.5	25	37	31	FSC	6SL3210-1KE23-8U 1	6SL3210-1KE23-8A 1
22	25	43	37	FSD New ⁶	6SL3210-1KE24-4UF 1	6SL3210-1KE24-4AF 1
30	30	58	43	FSD New ⁶	6SL3210-1KE26-0UF 1	6SL3210-1KE26-0AF 1
37	40	68	58	FSD New ⁶	6SL3210-1KE27-0UF 1	6SL3210-1KE27-0AF 1
45	50	82.5	68	FSD New ⁶	6SL3210-1KE28-4UF 1	6SL3210-1KE28-4AF 1
55	60	103	83	FSE New ⁶	6SL3210-1KE31-1UF 1	6SL3210-1KE31-1AF 1
75	75	136	103	FSF New ⁶	6SL3210-1KE31-4UF 1	6SL3210-1KE31-4AF 1
90	100	164	136	FSF New ⁶	6SL3210-1KE31-7UF 1	6SL3210-1KE31-7AF 1
110	110	201	164	FSF New ⁶	6SL3210-1KE32-1UF 1	6SL3210-1KE32-1AF 1
132	150	237	201	FSF New ⁶	6SL3210-1KE32-4UF 1	6SL3210-1KE32-4AF 1
					RS485 with USS/Modbus RTU ³	B B
					SUB-D with PROFIBUS DP ³	P P
					PROFINET; EtherNet/IP ³	F F

SINAMICS G120C – options	
Article number Class B line filter (footprint) ⁷	Article number Line reactor 3AC side-mounted
6SL3203-0BE17-7BA0	6SL3203-0CE13-2AA0
6SL3203-0BE17-7BA0	6SL3203-0CE13-2AA0
6SL3203-0BE17-7BA0	6SL3203-0CE13-2AA0
6SL3203-0BE17-7BA0	6SL3203-0CE21-0AA0
6SL3203-0BE17-7BA0	6SL3203-0CE21-0AA0
6SL3203-0BE17-7BA0	6SL3203-0CE21-0AA0
6SL3203-0BE17-7BA0	6SL3203-0CE21-0AA0
6SL3203-0BE21-8BA0	6SL3203-0CE21-8AA0
6SL3203-0BE21-8BA0	6SL3203-0CE21-8AA0
6SL3203-0BE23-8BA0	6SL3203-0CE23-8AA0
6SL3203-0BE23-8BA0	6SL3203-0CE23-8AA0
	integrated DC choke
	integrated DC choke
	integrated DC choke
	integrated DC choke
	integrated DC choke
	integrated DC choke
	integrated DC choke
	integrated DC choke

Selecting SIMATIC S7-1200 controllers for SINAMICS G120C			
CPU		Article number	
CPU 1211C	1211 CPU AC/DC/Rly	6ES7 211-1BE40-0XB0	The selected SIMATIC CPU is only a suggestion. For more information please refer to the SIMATIC S7-1200 brochure, catalog or web page: siemens.com/simatic-s7-1200
	1211 CPU DC/DC/DC	6ES7 211-1AE40-0XB0	
	1211 CPU DC/DC/Rly	6ES7 211-1HE40-0XB0	
CPU 1212C	1212 CPU AC/DC/Rly	6ES7 212-1BE40-0XB0	
	1212 CPU DC/DC/DC	6ES7 212-1AE40-0XB0	
	1212 CPU DC/DC/Rly	6ES7 212-1HE40-0XB0	
CPU 1214C	1214 CPU AC/DC/Rly	6ES7 214-1BG40-0XB0	
	1214 CPU DC/DC/DC	6ES7 214-1AG40-0XB0	
	1214 CPU DC/DC/Rly	6ES7 214-1HG40-0XB0	
CPU 1215C	1215 CPU AC/DC/Rly	6ES7 215-1BG40-0XB0	
	1215 CPU DC/DC/DC	6ES7 215-1AG40-0XB0	
	1215 CPU DC/DC/Rly	6ES7 215-1HG40-0XB0	
CPU 1217C	1217 CPU DC/DC/DC	6ES7 217-1AG40-0XB0	

Article number	Article number	Article number	Article number	Article number	Article number	Shield plate for Power Modules
Footprint line reactor	Braking resistor side-mounted	Footprint braking resistor	Output reactor side-mounted	Footprint output reactor	Sine-wave filters	
6SE6400-3CC00-2AD3	6SL3201-0BE14-3AA0	6SE6400-4BD11-0AA0	6SL3202-0AE16-1CA0	6SE6400-3TC00-4AD2	6SE6400-3TD00-4AD0	included
6SE6400-3CC00-4AD3	6SL3201-0BE14-3AA0	6SE6400-4BD11-0AA0	6SL3202-0AE16-1CA0	6SE6400-3TC00-4AD2	6SE6400-3TD00-4AD0	included
6SE6400-3CC00-4AD3	6SL3201-0BE14-3AA0	6SE6400-4BD11-0AA0	6SL3202-0AE16-1CA0	6SE6400-3TC00-4AD2	6SE6400-3TD00-4AD0	included
6SE6400-3CC00-6AD3	6SL3201-0BE14-3AA0	6SE6400-4BD11-0AA0	6SL3202-0AE16-1CA0	6SE6400-3TC00-4AD2	6SE6400-3TD00-4AD0	included
Drives Options Partner ⁸	6SL3201-0BE21-0AA0	Drives Options Partner ⁸	6SL3202-0AE16-1CA0			included
Drives Options Partner ⁸	6SL3201-0BE21-0AA0	Drives Options Partner ⁸	6SL3202-0AE18-8CA0			included
Drives Options Partner ⁸	6SL3201-0BE21-0AA0	Drives Options Partner ⁸	6SL3202-0AE18-8CA0			included
Drives Options Partner ⁸	6SL3201-0BE21-8AA0	Drives Options Partner ⁸	6SL3202-0AE21-8CA0			included
Drives Options Partner ⁸	6SL3201-0BE21-8AA0	Drives Options Partner ⁸	6SL3202-0AE21-8CA0			included
Drives Options Partner ⁸	6SL3201-0BE23-8AA0		6SL3202-0AE23-8CA0			included
Drives Options Partner ⁸	6SL3201-0BE23-8AA0		6SL3202-0AE23-8CA0			included
Drives Options Partner ⁸	6SL3201-0BE23-8AA0		6SL3202-0AE23-8CA0			included
	JJY: 023422620001		6SE6400-3TC07-5EDO			included
	JJY: 023424020001		6SE6400-3TC07-5EDO			included
	JJY: 023424020001		6SE6400-3TC07-5EDO			included
	JJY: 023434020001		6SE6400-3TC14-5FDO			included
	JJY: 023434020001		6SE6400-3TC14-5FDO			included
	JJY: 023454020001		6SE6400-3TC14-5FDO			included
	JJY: 023454020001		6SE6400-3TC14-5FDO			included
	JJY: 023464020001		6SL3000-2BE32-1AA0			included
	JJY: 023464020001		6SL3000-2BE32-6AA0			included

Accessories				
Operator panels		Article number	Training	Article number
BOP-2	Basic Operator Panel	6SL3255-0AA00-4CA1	Training case SINAMICS G120C PN FSA with motor and panels	6AG1067-2AA00-0AA0
IOP	Intelligent Operator Panel	6SL3255-0AA00-4JA1	Starter kits SINAMICS G120C quick and convenient implementation of drive tasks on TIA Portal (PROFINET; 0,55 kW; frame size FSAA) including control panel BOP-2 siemens.com/sinamics-starter-kits	6SL3200-0AE31-0AA0 (without filter) 6SL3200-0AE30-0AA0 (with Class A line filter)

¹ LO = Low Overload (continuous operation)

² HO = High Overload (cyclic duty)

³ FSAA to FSC available with PROFINET, PROFIBUS, EtherNet/IP, USS/Modbus RTU
FSD to FSF available with PROFINET and EtherNet/IP
B = RS485 with USS/Modbus RTU
P = SUB-D with PROFIBUS DB
F = PROFINET; EtherNet/IP

⁴ For detailed information on maintaining interference classes, refer to the product documentation

⁵ The continuous output current is not reduced when using the overload capability

⁶ Available in the 1st half of 2017

⁷ An unfiltered power module is required for use of the external Class B line filter

⁸ For detailed information please refer to siemens.com/drives-options-partner

For detailed and further information about SINAMICS G120C converter please refer to Catalog D31 or the Siemens Industry Mall web page: mall.industry.siemens.com

There 's more to it:

siemens.com/ids

Discover in detail how
Integrated Drive Systems boost
your competitive edge and
improve your time to profit.

Integrated
Drive Systems
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The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered.

For more information about industrial security, visit
<http://www.siemens.com/industrialsecurity>

Contact person