SIEMENS

Ingenuity for life

SINAMICS G120C

The compact and versatile drive with optimum functionality

usa.siemens.com/sinamics-g120

The compact drive series

Packed with powerful functions

A wealth of compelling advantages

The SINAMICS G120C drive 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 to 150 hp).

This versatile, compact drive, addresses 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 SINAMICS family. It offers the ideal drive for every application, which can be intuitively commissioned using standard tools.

Highlights
▪ **Compact** for simple installation even in the smallest spaces
▪ **Simple commissioning and operation** that's completely intuitive
▪ **Perfect integration** in the automation environment
▪ **Leading-edge technology** for higher energy-efficiency and safety
▪ **Reliable communication** so all common bus systems can be used

Technical data	
Power range	0.55 kW to 132 kW (0.75 hp to 150 hp)
Voltage range	3AC 380V ... 480V (–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—frame size (FS)/power range						
FSAA	**FSA**	**FSB**	**FSC**	**FSD**	**FSE**	**FSF**
0.55 kW to 2.2 kW (.75–3 hp)	3 kW to 4 kW (4–5 hp)	5.5 kW to 7.5 kW (7.5–10 hp)	11 kW to 18.5 kW (15–25 hp)	22 kW to 45 kW (30–60 hp)	55 kW (75 hp)	75 kW to 132 kW (100–150 hp)

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 (.75–150 hp).

FSAA **FSA** **FSB** **FSC** **FSD** **FSE** **FSF**

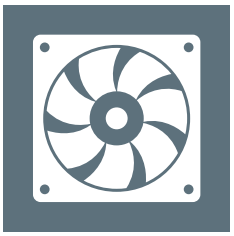
The perfect solution

For a countless number of applications

It's much more than compact

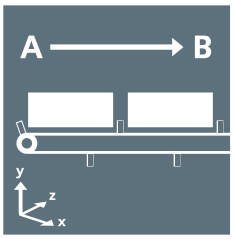
SINAMICS G120C is exceptional at combining compactness, high power density and a wide variety of functions to address many applications—suitable for continuous motion with mid-range performance providing more precise control of torque and speed.

Applications at a glance



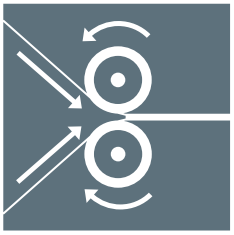
Pumping, ventilating and compressing

- 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	■ Frame size FSAA uses up to 30% less space than equivalent drives ■ Frame size FSD to FSF — especially compact with integrated DC reactor ■ High power density, smaller envelope dimensions ■ Side-by-side mounting without derating	■ Compact design that requires little space in the cabinet and reduces cost ■ Can be used in small control cabinets, close to the machine ■ SINAMICS G120C can be mounted next to one another without derating saving additional space ■ Long service life, high reliability ■ Frame sizes FSD to FSF have an integrated DC reactor so that an input reactor is not needed
Simple commissioning and operation	■ Cloning function using BOP-2, IOP or SD card ■ Optimized parameter set ■ Optimized commissioning ■ Integrated USB port ■ Easy configuration	■ Standard applications can be easily set-up with the IOP (Intelligent Operator Panel) using application-specific wizards ■ Intuitive serial commissioning, which reduces cost and saves time ■ Simple and fast software settings ■ Simple handling during commissioning and operation ■ Simplified commissioning with a common hardware configuration for all components. The drive automatically goes online, even beyond network boundaries (routing/ remote maintenance).
Perfect integration	■ Fully integrated into the TIA Portal's system diagnostics ■ SINAMICS Startdrive — intuitive drive engineering and perfect interaction with SIMATIC PLC in the Totally Integrated Automation Portal ■ TIA Portal libary concept	■ 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	■ 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	■ No external components required including PROFIsafe, thanks to certified Safe Torque Off safety function (STO) ■ Fully integrated as standard
Reliable communication	■ 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	■ Uses all of the common bus systems ■ Flexible use and simple plug-in ■ Uninterruptible control thanks to the optional 24V power supply ■ Increased performance ■ 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 drives can be integrated quickly and easily into existing automation environments. Innovative software tools help to make selection, commissioning and operation as easy and reliable as possible.

Selection

DT Configurator

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

usa.siemens.com/dt-configurator

SINAMICS SELECTOR App

- Fast and easy drive selection tool for use with mobile devices
- Conveniently provides the correct part numbers

usa.siemens.com/sinamics-selector

Commissioning, diagnostics and service

SINAMICS StartDrive / STARTER commissioning software

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

usa.siemens.com/startdrive

Operator panels

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

SINAMICS ASSISTANT app

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

usa.siemens.com/sinamics-assistant

Complete motion control solutions

Optimally integrated in the automation

Complete and optimized

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

usa.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 PLC (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.

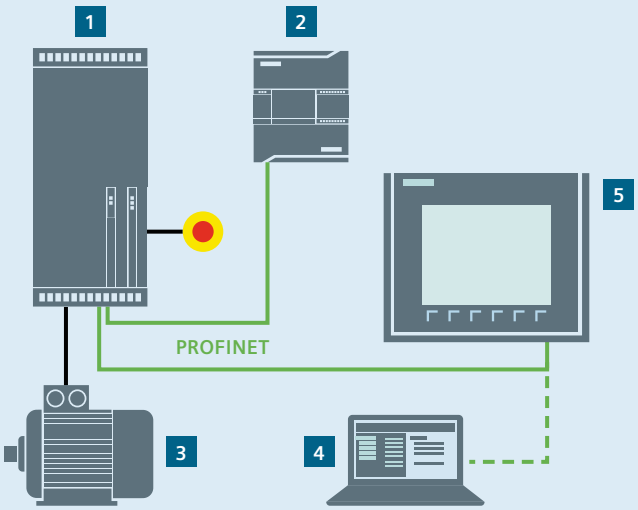
The configuration is uploaded to the drive via an EtherNet / IP connection for the PROFINET version, and via USB for the PROFIBUS version.

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 d rive 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, 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.

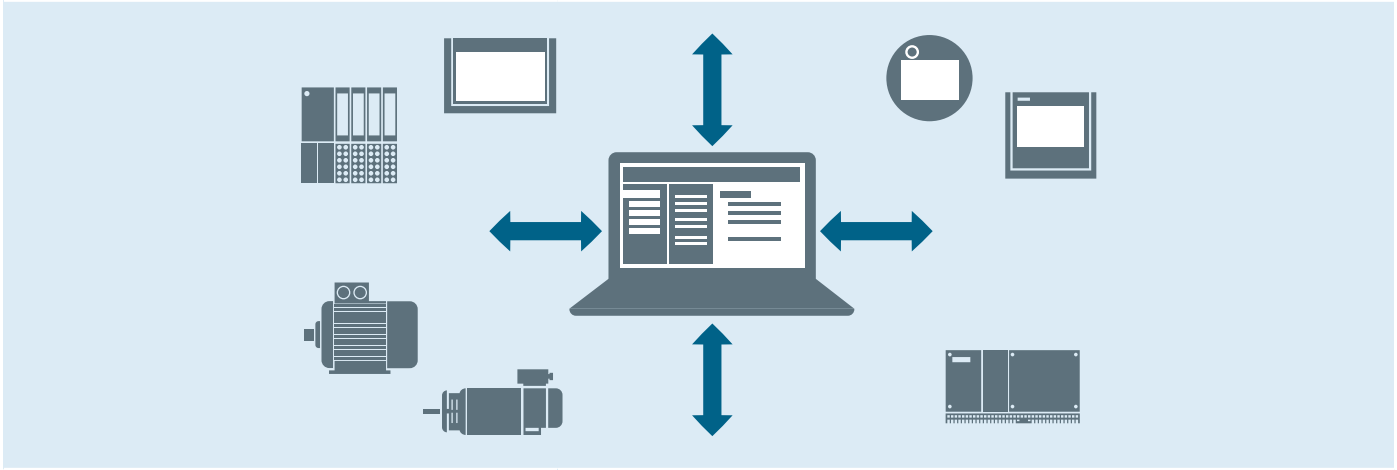
TIA Portal can also be used to integrate SINAMICS G120C drives into the automation system and commission them quickly and easily. This is achieved by using the same operating concepts and a high degree of user friendliness.

usa.siemens.com/tia usa.siemens.com/startdrive

The TIA Portal Info Service

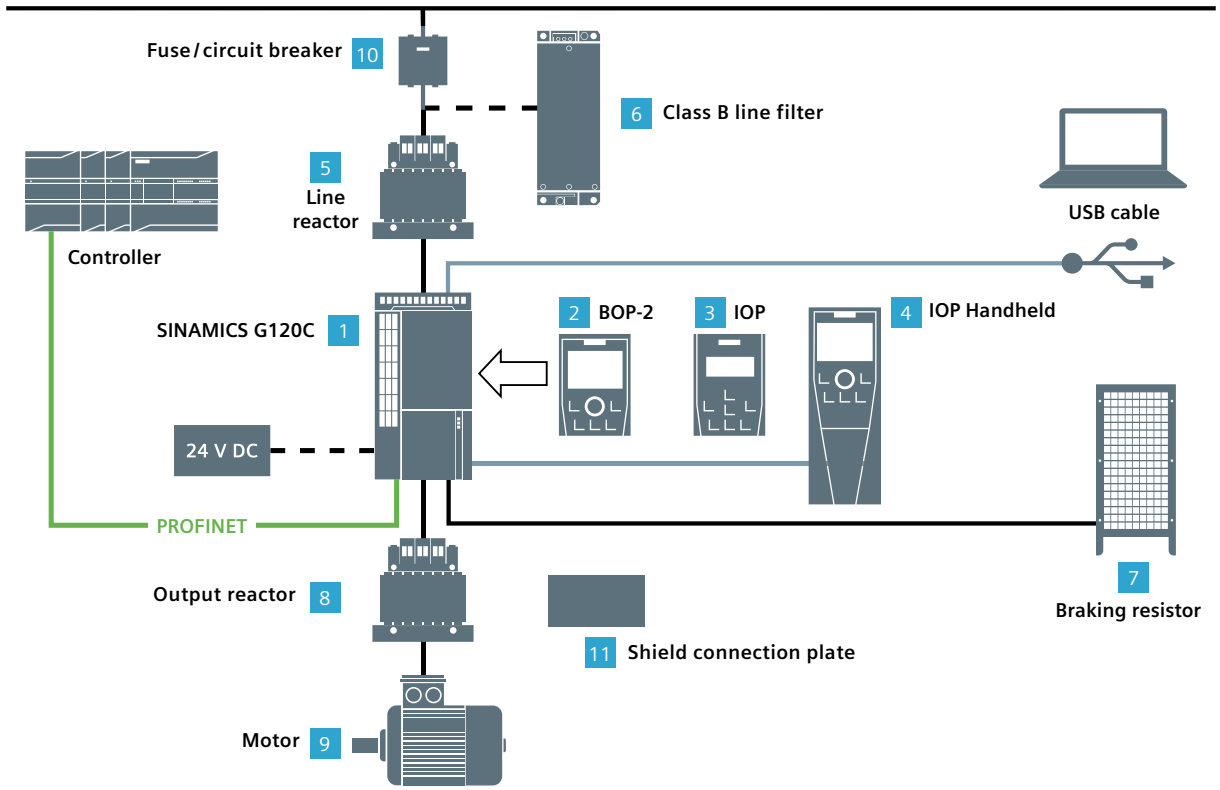
Our TIA Portal Tutorial Center offers a wide range of valuable and detailed information. In addition, we have compiled numerous videos that offer a complete overview of the general functions and tools of the TIA Portal.

siemens.com/tia-portal-tutorial-center



Feature	Benefit
Control ■ SIMATIC technology objects including online synchronization ■ DriveLib communication modules ■ Safety Integrated communication module ■ User-defined control via UDTs and F-UDTs	■ Efficient engineering by simply controlling the drives—as well as freely selecting the control type
Drives are fully integrated into the TIA Portal system diagnostics	■ Drive messages in plain text without requiring any engineering are automatically available in the TIA Portal, control, web server and HMI
Routing across network boundaries	■ Time-saving as the device can be simply and centrally accessed—remote maintenance
Parameter download via data block	■ Simplified serial commissioning and replacement of parts
GSD script already included in STARTER V4.5	■ Simple and synchronized telegram configuration between STARTER and the TIA Portal
Use of the TIA Portal library concept	■ The library concept guarantees simple reusability of the drive, including parameter settings and hardware components
The SIMATIC Energy Suite—an integrated option for TIA Portal	■ Energy management efficiently combined with the automation to increase energy transparency in production

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 hand-held version of the Intelligent Operator Panel (IOP)

5 Line reactor: smoothes the current drawn by the drive 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 for longer motor distance

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 information		
Voltage/frequency	3AC 380–480V –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 **EMC with Class A filter**	–10° to 40° C (14° to 104° F) without derating / up to 60° C with derating 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 (165 ft.) shielded/100 m (330 ft.) unshielded
	Frame size FSA-FSC	150 m (495ft.) shielded/150 m (495 ft.) unshielded
	Frame size FSD-FSE	200 m (660 ft.) shielded/300 m (990 ft.) unshielded
	Frame size FSF	300 m (990 ft.) shielded/450 m (1485 ft.) unshielded
Signal inputs / outputs **Safety technology**	6 DI/ 2 DO/ 1 AI/ 1 AO 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	

[1] LO = Low Overload (continous duty) [2] HO = High Overload (cyclic duty) [3] The continuous output current is not reduced when using the overload capability

Dimensions

kW	hp	Frame size	W	H	D
0.55 0.75 1.1 1.5 2.2	0.75 1 1.5 2 3	FSAA	73 mm (2.87 in.)	173 mm (6.81 in.)	155 mm (6.10 in.)
3 4	4 5	FSA		196 mm (7.92 in.)	203 mm (7.99 in.)
5.5 7.5	7.5 10	FSB	100 mm (3.94 in.)		
11 15 18.5	15 20 25	FSC	140 mm (5.51 in.)	295 mm (11.61 in.)	
22 30 37 45	25 30 40 50	FSD	200 mm (7.87 in.)	472 mm (18.58 in.)	237 mm (9.33 in.)
55	60	FSE	275 mm (10.83 in.)	551 mm (21.69 in.)	237 mm (9.33 in.)
75 90 110 132	75 100 125 150	FSF	305 mm (12.01 in.)	708 mm (27.87 in.)	357 mm (14.06 in.)

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_out}[2][5] (A)	Frame size	Part number Unfiltered Power Modules			Part 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		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[6] New	6SL3210-1KE24-4U	F	1	6SL3210-1KE24-4A	F	1
30	30	58	43	FSD[6] New	6SL3210-1KE26-0U	F	1	6SL3210-1KE26-0A	F	1
37	40	68	58	FSD[6] New	6SL3210-1KE27-0U	F	1	6SL3210-1KE27-0A	F	1
45	50	82.5	68	FSD New	6SL3210-1KE28-4U	F	1	6SL3210-1KE28-4A	F	1
55	60	103	83	FSE[6] New	6SL3210-1KE31-1U	F	1	6SL3210-1KE31-1A	F	1
75	75	136	103	FSF[6] New	6SL3210-1KE31-4U	F	1	6SL3210-1KE31-4A	F	1
90	100	164	136	FSF[6] New	6SL3210-1KE31-7U	F	1	6SL3210-1KE31-7A	F	1
110	110	201	164	FSF[6] New	6SL3210-1KE32-1U	F	1	6SL3210-1KE32-1A	F	1
132	150	237	201	FSF[6] New	6SL3210-1KE32-4U	F	1	6SL3210-1KE32-4A	F	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

Part number Class B line filter (footprint)[7]	Part 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
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
	integrated DC choke

Selecting SIMATIC S7-1200 controllers for SINAMICS G120C

CPU		Part number
CPU 1211C	1211 CPU AC/DC/Rly	6ES7 211-1BE40-0XB0
	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

The selected SIMATIC CPU is only a suggestion.
For more information please referto the SIMATIC S7-1200 brochure, catalog or webpage:

usa.siemens.com/simatic-s7-1200

Part number Footprint line reactor	Part number Braking resistor side-mounted	Part number Footprint braking resistor	Part number Output reactor side-mounted	Part number Footprint output reactor	Part number Sine-wave filters	Shield plate for Power Modules
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		6SE6400-3TC07-5ED0			included
	JJY: 023424020001		6SE6400-3TC07-5ED0			included
	JJY: 023424020001		6SE6400-3TC07-5ED0			included
	JJY: 023434020001		6SE6400-3TC14-5FD0			included
	JJY: 023434020001		6SE6400-3TC14-5FD0			included
	JJY: 023454020001		6SE6400-3TC14-5FD0			included
	JJY: 023454020001		6SE6400-3TC14-5FD0			included
	JJY: 023464020001		6SL3000-2BE32-1AA0			included
	JJY: 023464020001		6SL3000-2BE32-6AA0			included

Accessories

Operator panels	Part number	Training	Part 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 implemantation 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 first 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 drive, please refer to Catalog D31 or the Siemens Industry Mall web page: **mall.industry.siemens.com**

There’s more to it.

usa.siemens.com/sinamics

Everything about our drive family can be found online.

SINAMICS — one family, one source, all applications

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