SINAMICS G120P

The energy-efficient, user-friendly frequency inverter for pumps, fans, and compressors

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SINAMICS Drives

Answers for industry.

SIEMENS

SINAMICS G120P

The modular frequency inverter for pumps, fans, and compressors

Ideal for building automation, water and process industries

The SINAMICS G120P frequency inverter is a cost-effective, efficient, and easy-to-operate pump, fan, and compressor drive featuring a wide range of functions.

It has been specially designed for the industrial environment as well as for applications in heating, ventilation, and air-conditioning.

The new SINAMICS G120P frequency inverter is the perfect solution for applications, such as closed-loop speed control for ventilation fans, circulating pumps for heating and cooling systems, booster pumps, or pumps for level control.

SINAMICS G120P offers a high degree of user-friendliness:
• Integrated application-specific wizards and macros for simple commissioning
• USB port and IOP operator panel with clear-text display (IOP = Intelligent Operator Panel)
• Modular design comprising of a Control Unit, Power Module, and operator panel or blanking plate

SINAMICS G120P supports functions for leveraging energy efficiency across the entire process chain:
• Minimum apparent power loss thanks to efficient technology
• Automatic adaptation of the motor current to prevailing load conditions with ECO mode
• Hibernation (sleep mode) as a function of the setpoints
• Automatic switchover to mains operation at rated speed
• Auto-ramping function for current limitation purposes

The technology reduces line harmonic distortions and ensures compliance with the relevant standards without the need for additional components.

Highlights

Mechanical system
■ High degree of protection IP55/UL type 12
■ Efficient, modular frequency inverter
■ Reliable operation in harsh environments, e.g. suitable for ambient temperatures up to +60 °C

Electronics
■ Wide range of PFC functions integrated
■ Comprehensive monitoring functions
■ PLC functions for local control tasks
■ Reduced line harmonic distortions and compliance with relevant standards
■ Energy savings across the entire process chain
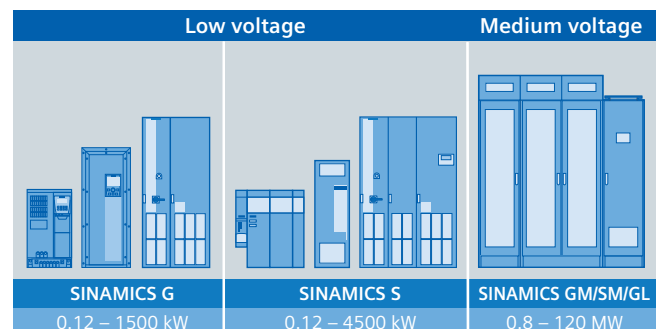■ Easy-to-operate via wizards

Integrated communication
■ USS, Modbus RTU, BacNet MS/TP, PROFIBUS DP, CANopen

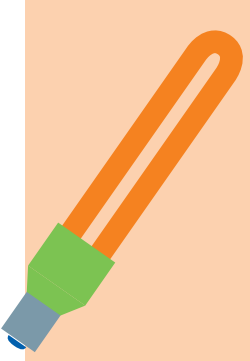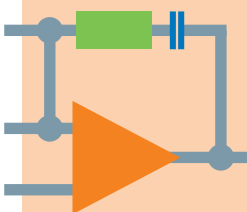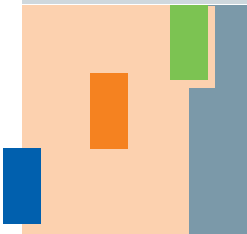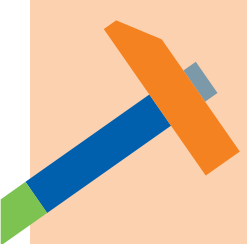**SINAMICS G120P belongs to the SINAMICS drive family of innovative, future-oriented drive solutions**
• Broad range of power ratings from 0.12 kW to 120 MW
• Low-voltage and medium-voltage versions available
• Seamless, integrated functionality by using common hardware and software platforms
• Common engineering and configuration tools
  - SIZER for engineering
  - STARTER for configuration and commissioning
• High degree of flexibility and ability to be combined

Whatever the drive task, SINAMICS has the optimum drive – and they can all be engineered, parameterized, commissioned, and operated in the same way.

Low voltage		Medium voltage
SINAMICS G	SINAMICS S	SINAMICS GM/SM/GL
0.12 – 1500 kW	0.12 – 4500 kW	0.8 – 120 MW

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Innovation for drive technology

Function	Benefits
Optimum energy management through innovative technology	
Optimized architecture	Limits for harmonic currents and THD compliant with IEC/EN 61000-3-12 without the need for additional measures ($R_{sce} \geq 120$) Reduced line harmonic distortions No reactors ➜ Compact design Lower apparent power ➜ Smaller cable cross-sections
Dual rating (LO/HO)	Optimum load factor for pump/fan/compressor applications
V/f (ECO) motor control	Energy-saving capability through automatic adaptation of the motor current to prevailing load conditions (lower motor losses under partial load conditions)
Hibernation mode	Energy-saving capability because the drive is started/stopped in line with the current setpoints, thereby avoiding excessive mechanical loads
Straightforward, application-specific commissioning and operation	
Unique: Micro-Memory-Card (MMC) for pre-parameterization of entire inverter series	Local operation without inverter knowledge and data-back-up for easy replacement
Integrated USB port	Simple commissioning/diagnostics with PC tools
IOP interface (Intelligent Operator Panel)	Wizard-based, user-friendly operator panel
Remote maintenance/diagnostics and parameterization	Simplified, central commissioning/maintenance Reduced costs as service personnel assignments are no longer required
Flexible deployment of integrated functions	
PLC functions for local control tasks	Flexible deployment of integrated functions ➜ No need for additional, external components
4 integrated, freely-programmable PID controllers	Distributed closed-loop control for motor-independent process control without PLC
3 freely-programmable digital time switches	Control for freely-selectable daily and weekly programs
Flexible deployment across a wide range of applications	
Isolated digital inputs with separate voltage classification Insulated analog inputs	Protection against erroneous voltage EMC-compliant design without the need for additional components in line with process industry requirements
NI1000/PT1000 temperature sensor interface	Direct connection of temperature sensors without external interface
230 V relay	Direct control for auxiliary equipment, e.g. shut-off or valve actuators
Flexible, modular system for challenging environmental conditions	
Can be deployed at ambient temperatures from 0 °C to +60 °C (32 to 140 °F) thanks to sophisticated ventilation system	Suitable for use in harsh environments
Removable operator panel	Protection against unauthorized access Degree of protection IP54/UL type 12 with operator panel Degree of protection IP55/UL type 12 with blanking plate
Modular design of power and control electronics	Power range can be easily extended Fast replacement of power units Individual components can be replaced without reinstallation

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Technical data

Mechanical data

Mounting dimensions	(W x H x D)
• Size FSA	154 x 460 x 264 mm (6.06 x 18.11 x 10.39 in) (0.37 ... 3 kW; 0.5 ... 4 HP)
• Size FSB	180 x 540 x 264 mm (7.09 x 21.26 x 10.39 in) (4 ... 7.5 kW; 5.4 ... 10.1 HP)
• Size FSC	230 x 620 x 264 mm (9.06 x 24.41 x 10.39 in) (11 ... 18.5 kW; 14.8 ... 24.8 HP)
• Size FSD	320 x 640 x 344 mm (12.6 x 25.20 x 13.54 in) (22 ... 30 kW; 29.5 ... 40.2 HP)
• Size FSE	320 x 751 x 344 mm (12.6 x 29.57 x 13.54 in) (37 ... 45 kW; 49.6 ... 60.4 HP)
• Size FSF	410 x 915 x 431 mm (16.14 x 36.02 x 16.97 in) (55 ... 90 kW; 73.8 ... 120.7 HP)
Degree of protection	IP54/UL type 12 with operator panel IP55/UL type 12 with blanking plate

Electrical data

Power rating (low overload LO)	0.37 ... 90 kW (0.5 ... 120.7 HP)
Line supply voltage	380 ... 480 V 3 AC ±10 %
Line frequency	47 ... 63 Hz
Overload capability (low overload LO)	• 1.5 x rated output current (150 %) for 3 s every 300 s • 1.1 x rated output current (110 %) for 57 s every 300 s
Rated input current (LO: at 40 °C (104 °F))	1.7 ... 135 A
Rated output current (HO: at 40 °C (104 °F))	1.3 ... 181 A
Operating temperature	0 °C to +60 °C (32 to 140 °F) with derating
Relative humidity	< 95 % RH, non-condensing
Output frequency	0 ... 650 Hz
Pulse frequency	4 kHz (default) The pulse frequency can be changed manually in 2 kHz steps.
Skip frequency range	4, parameterizable
Fixed frequencies	16, programmable
Digital inputs and outputs	• 6 DI, 3 DO, 4 AI, 2 AO • 1 x KTY/PTC/ThermoClick sensor • 2 x PSU-out (10 V DC, 24 V DC) • 1 x PSU-in (24 V DC)

Communication

Bus interface	Control Unit CU230P-2 supports a wide range of communications protocols, e.g. USS, Modbus RTU, BacNet MS/TP, PROFIBUS DP, CANopen

Technology functions

Open-loop/ closed-loop control technique	• V/f (linear, square-law, FCC, ECO) • Vector control without encoder (SLVC)
Operating functions	• Automatic restart (after power failure) • Energy saving mode (ECO mode) • Hibernation (sleep mode, to start and stop the motor depending on demand) • Flying restart (switch on inverter when motor is turning) • Motor staging (for applications that require 1-4 motors depending on the flow rate, for example) • 4 PID technology controllers (e.g. to control pressure, level, flow rates) • Logical and arithmetic functions that use function blocks • Emergency operation/Essential services mode (to operate the motor as long as possible in the event of an emergency) • Multi-zone controller (to control the temperature in several rooms simultaneously using setpoint/actual value comparisons) • Bypass
Protective functions	Motor temperature monitoring with and without temperature sensor (via PTC, KTY and ThermoClick sensor) • Overcurrent protection • Load torque monitoring • Overvoltage protection (Vdc_max controller)
Braking functions	DC braking
Motors, connectable	3-phase induction motors

Standards

Standards conformance	UL, CE, c-tick
Electromagnetic compatibility	Integrated line filter for installation to EN 61800-3 C2 (class A) and EN 61800-3 C1 table 14 (class B)

Software

Commissioning tool	• STARTER for commissioning via PC • IOP (Intelligent Operator Panel)

Accessories

	• Blanking plate (if no panel is required) • MMC for Control Unit • PC connecting cable RS232 and USB • Mounting kit