SINAMICS G120/SINAMICS G120D:

The modular single-motor drives for small and medium power ratings in a central or distributed design

The SINAMICS G120 / SINAMICS G120D drive inverters distinguish themselves a result of their modular design (Power Module and Control Unit) as well as numerous innovative functions that they have in common – such as for safety technology (Safety Integrated), energy recovery and communication capability. With a wide range of versions in the power range 0.37–90 kW (0.5–120 HP) for G120 they are suitable for a broad range of drive solutions.
The decisive difference: G120 operates as IP20 unit centrally in a cabinet; on the other hand, G120D is designed for IP65 drives in a distributed architecture.

Applications:

SINAMICS G120 and G120D are especially suitable for the following applications:

- As universal drive in the complete industrial environment
- In the automobile, textile, printing and chemical sectors
- For applications in the conveyor technology area.

SINAMICS G120 and G120D: Benefits for you

- **Integrated and modular:** For drive concepts that can be expanded and are fit for the future. With an exceptionally high degree of service and operator friendliness.
- **With integrated Safety functions:** Unique worldwide with the functions STO, SS1 and SLS, sensorless. Lower costs when constructing drives in a safety-relevant, seamless, integrated automation and drive environment.
- **Communication via PROFIBUS and PROFINET:** The drive converter is directly integrated into Totally Integrated Automation for lower interface costs, plant-wide engineering.
- **Energy saving through energy recovery:** Energy-saving, space-saving, braking without resistor and braking chopper. A line reactor is not required. There are hardly any harmonics fed back into the line supply and low power loss in the form of heat. These drive inverters draw up to 80% less line current than comparable drive inverters.
- **High mechanical and electrical ruggedness:** High service lifetime thanks to extensive protective concepts: Innovative cooling of the power electronics (G120) or completely metal enclosure (G120D).
- **Globally certified:** In conformance with UL and CE, Safety Integrated (IEC 61508/SIL 2).

SINAMICS G120

SINAMICS G120 is a distributed drive inverter for installation in cabinets with degree of protection IP20. It is available in a range of power ratings from 0.37–90 kW (0.5–120 HP) for frame sizes A–F and distinguishes itself as a result of the modularity of the Power Module plus Control Unit and BOP. In addition to the functions that its has in common with G120D, SINAMICS G120, it is convincing in it use in central applications using a sophisticated cooling concept: The power electronics are cooled using an external heat sink and the electronic modules are consequentially cooled by convection. This means that SINAMICS G120 can be used in applications with high climatic stressing – and is perfectly suited for a wide range of central drive solutions. The G120 is also predestined for applications in the chemical industry as it is also available in a 690-V version.

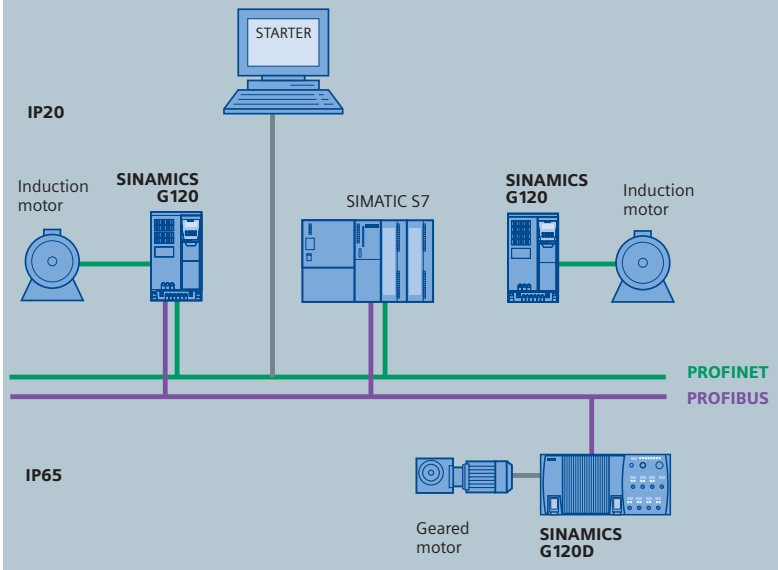
SINAMICS G120D

On the other hand, SINAMICS G120D is the distributed version for installation in the field, in degrees of protection up to IP65. Its power ratings are from 0.75 up to 7.5 kW (1 up to 10 HP) for frame sizes from A to C. The SINAMICS G120D also has a modular design comprising Power Module and Control Unit. In addition to the features that it has in common with the G120 (Safety Integrated, energy recovery, communication interfaces etc.), it especially distinguishes itself as a result of its design that is optimized for the target applications: A standard drilling template across all power ratings and a low-profile design. This means that it takes up little space, can be easily exchanged (also by drives with other power ratings), and plants and systems are easier to engineer. Further, as a result of its completely metal housing, it is extremely rugged therefore guaranteeing a high load capability and durability even in tough environmental conditions.

Structure

SINAMICS G120 and G120D are modular standard drive inverters that always comprise two operative units: A Power Module (PM) as well as a Control Unit (CU). There is an operator section BOP (Basic Operator Panel from G120) or the STARTER commissioning software to parameterize, operate and visualize these drives. The perfect combination of operative units (Control Units and Power Modules) permits drive solutions that are optimized both regarding the application and costs.
When used with Safety Control Units, all power sections are suitable for use in safety-relevant applications.

SINAMICS G120 configuration example:
PROFIBUS and PROFINET versions, together with SIMATIC S7 and SCALANCE wireless communication.
Control and parameterization using STARTER software.



Technical data

Electrical data	G120	G120D
Line voltages; power ranges	3-ph. 380 ... 480 V AC, ± 10%; 0.37 ... 90 kW (0.5 ... 120 HP)	3-ph. 380 ... 480 V AC, ± 10%; 0.75 ... 7.5 kW (1 ... 10 HP)
Line types	IT, TN, TT	IT, TN,TT
Line frequency	47–63 Hz	
Output frequency	0 ... 650 Hz	0 ... 650 Hz
Control techniques	*V/f* control, linear (M~n), *V/f* control, square-law (M~n^2) and parameterizable sensorless vector control Vector control with encoder (control loop) Closed-loop torque control	
Fixed frequencies	16, can be parameterized	
Digital inputs	Up to 9 digital inputs, depending on the Control Unit, 24 V DC	Up to 6 digital inputs, depending on the Control Unit, 24 V DC
Analog inputs	Up to 2 analog inputs (0–10 V)	
Digital outputs	3 digital outputs	2 digital outputs
Communication interfaces	RS 485/USS; PROFIBUS, PROFINET	PROFIBUS, PROFINET
Functions		
Software functions	Parameterizable ramp-up times 0 ... 650 s, ramp smoothing Automatic restart after operational interruptions due to line failure Flying restart Signals are locally pre-processed in the drive using free function blocks 3 motor data sets that can be toggled between Simple process control using a high-quality internal PID controller Positioning down ramp Kinetic buffering	
Protective functions	Motor overtemperature (PTC/KTY, I^2t), power unit and load duty cycle monitoring, overvoltage and undervoltage, ground fault, anti-stall protection, plant/system protective functions	
Safety Integrated functions	STO, SS1, SLS, SBC Control via PROFIsafe or terminal	STO, SS1, SLS Control via PROFIsafe
Motors that can be connected	Induction motors	
Mechanical data		
Degree of protection	IP20	IP65
Cooling type	Innovative cooling concept; the power electronics are cooled using a heat sink with external fan; open-loop and closed-loop control electronics are cooled by convection	Convection cooling, for high power ratings with fan
Standards		
In conformance with the standards	CE, UL, cUL, C-tick, Safety Integrated IEC 61508/SIL 2	

SINAMICS G130/SINAMICS G150:

The universal drive solution for high-rating single-motor drives

SINAMICS G130 chassis units and SINAMICS G150 cabinet units have been designed for variable-speed drives in the machine and plant construction sectors. They have been specifically designed to address the requirements of single-motor drives with square-law and constant load characteristic without regenerative feedback into the line supply. Both drive units offer a cost-effective drive solution that, based on a wide range of available components and options, can be adapted to specific customer demands.

Applications

SINAMICS G130 and G150 can be recommended wherever solid, liquid or gaseous substances have to be moved, transported, pumped or compressed – wherever variable-speed drives pay for themselves. This essentially involves the following applications

- Pumps and fans
- Compressors
- Extruders and mixers
- Crushers

Benefits for you

- Especially quiet and compact as they use state-of-the-art IGBT power semiconductors and have an innovative cooling concept
- They can be easily integrated into automation solutions using the standard PROFIBUS interface, PROFINET or analog and digital interfaces
- Higher plant availability by being able to quickly and simply replace individual modules and power components
- Simple commissioning and parameterization – menu-prompted on the user-friendly AOP30 panel with graphics-capable LCD and plain text display

SINAMICS G130

With the SINAMICS G130 OEMs and plant builders have a modular drive system at their fingertips. This allows them to implement drive solutions perfectly tailored to the particular application. SINAMICS G130 comprises two modular, autonomous components: Power Module and Control Unit. These units can either be mounted separately from one another or together as unit.

The Power Module has a slot for the Control Unit. The user-friendly AOP30 panel is available for commissioning and local operator control. Pre-defined interfaces using terminals or PROFIBUS simplify commissioning and controlling the drive. The interfaces of the control unit can be supplemented by additional modules. SINAMICS G130 chassis units are available for power ratings extending from 315 kW up to 800 kW (400 up to 1000 HP).

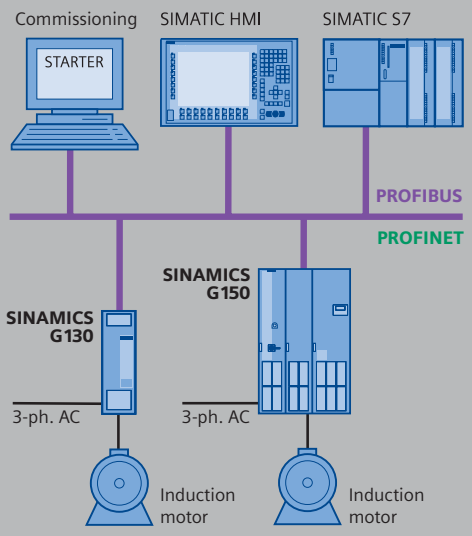
SINAMICS G150

SINAMICS G150 units are AC/AC drive converters that are accommodated in a standard cabinet and are ready to be connected up. With their standard design and dimensions these cabinets seamlessly fit into each and every plant or system. They have been optimized for low maintenance and compact dimensions. Further, they can be simply and quickly installed and commissioned.
The drive units can be adapted to the particular requirements using an extensive range of options. They are available with cabinet widths starting at 400 mm increasing in steps of 200 mm and can be supplied in various degrees of protection up to IP54 – in two different versions.

Version A
This offers adequate mounting space for all of the available options. The different versions allow the line supply and motor to either be connected at the top or at the bottom. This results in a high degree of flexibility regarding the mounting & installation in the plant.

Version C
This especially space-saving version is intended for situations where the line connection components must be accommodated in a central low-voltage distribution – and therefore not installed in the cabinet.
The user-friendly AOP30 panel is standard for both versions and mounted in the cabinet door. These drive converter cabinet units are available for a range of power ratings from 75 kW up to 1500 kW (100 up to 2000 HP).

SINAMICS G130 and SINAMICS G150 configuration example with SIMATIC S7



Technical data

Electrical data	SINAMICS G130	SINAMICS G150
Line voltages; power ranges		
• 3-ph. 380 ... 480 V AC, ± 10% (–15% < 1 min)	315 ... 560 kW (400 ... 750 HP)	110 ... 900 kW (150 ... 1200 HP)
• 3-ph. 500 ... 600 V AC, ± 10% (–15% < 1 min)	315 ... 560 kW (400 ... 750 HP)	110 ... 1000 kW (150 ...1300 HP)
• 3-ph. 660 ... 690 V AC, ± 10% (–15% < 1 min)	315 ... 800 kW (400 ... 1000 HP)	75 ... 1500 kW (100 ... 2000 HP)
Line types	TN/TT or IT line supplies	TN/TT or IT line supplies
Line frequency	47 ... 63 Hz	47 ... 63 Hz
Output frequency	0 ... 300 Hz	0 ... 300 Hz
Control techniques	Vector control with or without speed encoder as well as *V/f* control	
Fixed speeds	15 fixed plus 1 base speed, parameterizable	
Speed ranges that can be skipped	4, parameterizable	4, parameterizable
Customer terminal strip	Digital inputs/outputs, analog inputs/outputs, inputs for motor temperature evaluation, number is variable	
Communication interface	PROFIBUS DP as standard optional: PROFINET, CANopen	PROFIBUS DP as standard optional: PROFINET, CANopen
Braking operation	With the Braking Module system component	Optional: Braking Module
Functions		
Software functions	Automatic restart after an operational interruption due to line failure, the drive converter can be bumplessly connected to a rotating motor, kinetic buffering, automatic motor identification to optimize the control, parameterizable ramp-up/ramp-down times, ramp smoothing	
Protective functions	Thermal monitoring of the motor and power units Overvoltage, undervoltage, ground fault, short circuit, stall protection	
Motors that can be connected	Induction motors and synchronous motors	
Mechanical data		
Degree of protection	IP00/IP20	IP20, optional: IP21/IP23/IP54
Cooling type	Integral fan (forced air cooling)	
Sound pressure level	≤ 72 dB (A) at a 50-Hz line supply frequency	
Cabinet system	–	Rittal TS 8
Standards		
In conformance with the following standards	CE, cUL	CE