Circle of experts…

…for all drive tasks

sinamics drives

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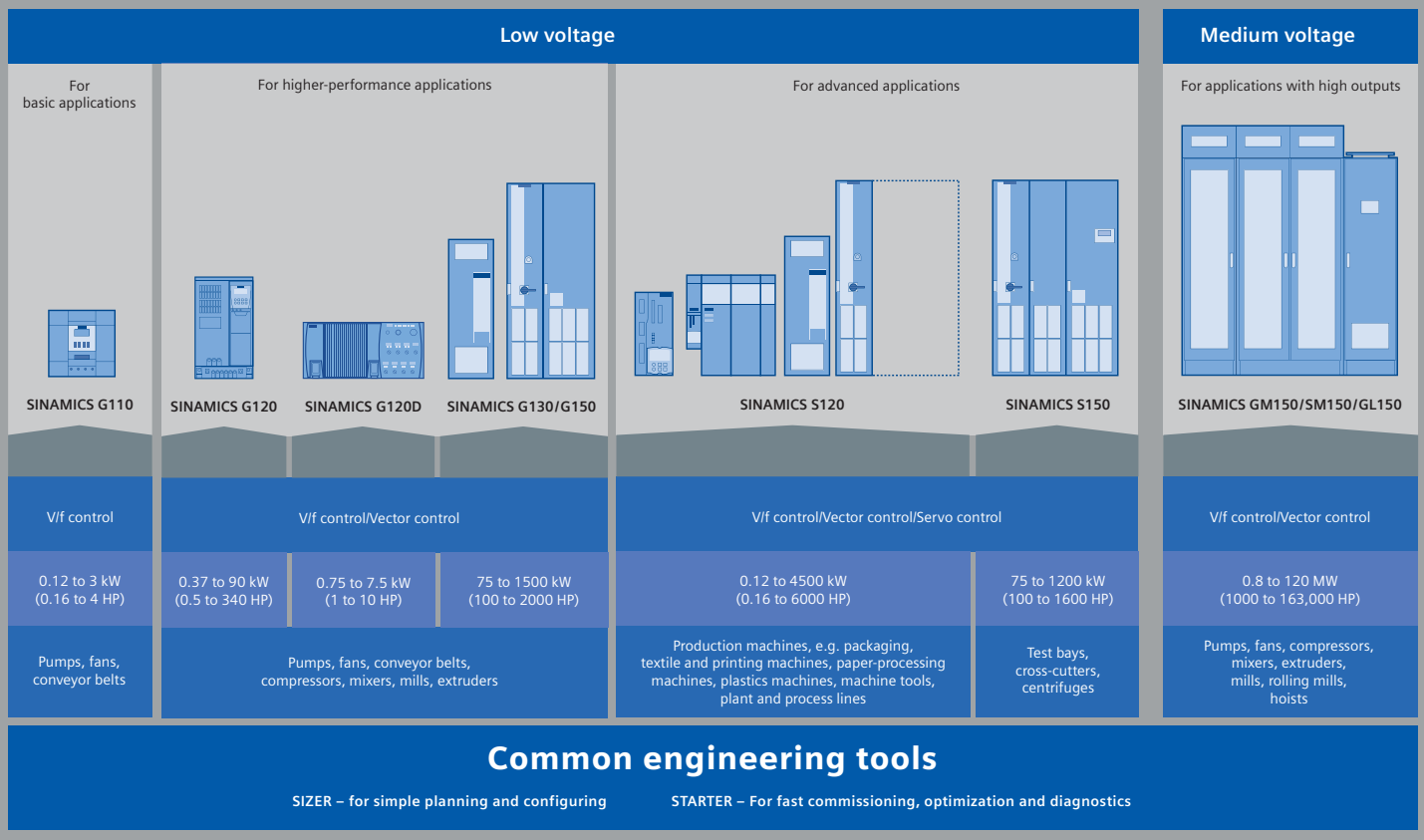
SIEMENS

Determined,

when it comes to addressing the increasing demands in drive technology

There are two significant trends in drive technology: On one hand, the range of different versions in machinery and plant construction is continually increasing – this is the reason that drive solutions must be highly flexible and scalable. On the other hand, customers from all sectors of industry are demanding solutions that are perfectly tailored to their requirements and easily handled.



SINAMICS: The No. 1 for drive tasks

Siemens offers a platform that allows all of these requirements and demands to be perfectly fulfilled: SINAMICS, a complete and integrated family of drives that covers all performance levels. And not only this, distinguishes itself as a result of the highest degree of flexibility, functionality and engineering efficiency.
SINAMICS is setting new standards in drive technology and offering a whole raft of advantages that the machinery and plant construction sectors can benefit from – which also goes for the process industry and building technology.

At home in all sectors
From the basic single-motor drive through coordinated drives up to multi-axis and motion control drives for sophisticated tasks: SINAMICS offers the optimum drive for each and every application. They all have a modular, scalable design and a standard look & feel which makes them so unique. This is the reason that it is not surprising that SINAMICS has proven itself in all industry sectors.

Tailored solutions
Whether for single or multi-axis applications, simple open-loop speed control or closed-loop servo control with a high dynamic performance: In order to cost-effectively address tailored drive solutions, a well-conceived system is demanded – a system that ensures that only those components and functions that are required by the specific application are used.

Minimizing costs
Costs for engineering and commissioning drive solutions must be kept as low as possible. This is why standard tools are required to select, engineer and commission drives – therefore permitting fast, simple and favorably-priced engineering.

Innovative concepts
For both small and large applications – innovative concepts create the prerequisites for distributed, intelligent drive technology and therefore open up completely new perspectives in machinery and plant construction.

At home in all sectors

- Mixers/crushers
- Pumps/fans/compressors
- Conveyor technology
- Extrusion
- Textiles
- Metal forming technology
- Woodworking
- Packaging
- Machine tools
- Printing and paper machines

Infinity

Almost unlimited application possibilities as a result of the modular system

The individual SINAMICS versions are based on a common platform concept: The same software and hardware components are used for the same functions over a wide spectrum. Functions such as drive control, operator control, diagnostics and communication with higher-level controllers are implemented in a standard fashion across the whole of the SINAMICS family. This makes it easier to handle the drive technology and ensures valuable synergies within the overall SINAMICS portfolio: The time and resources required for training are reduced. Not only this, support, service & maintenance and spare parts management are also simplified.

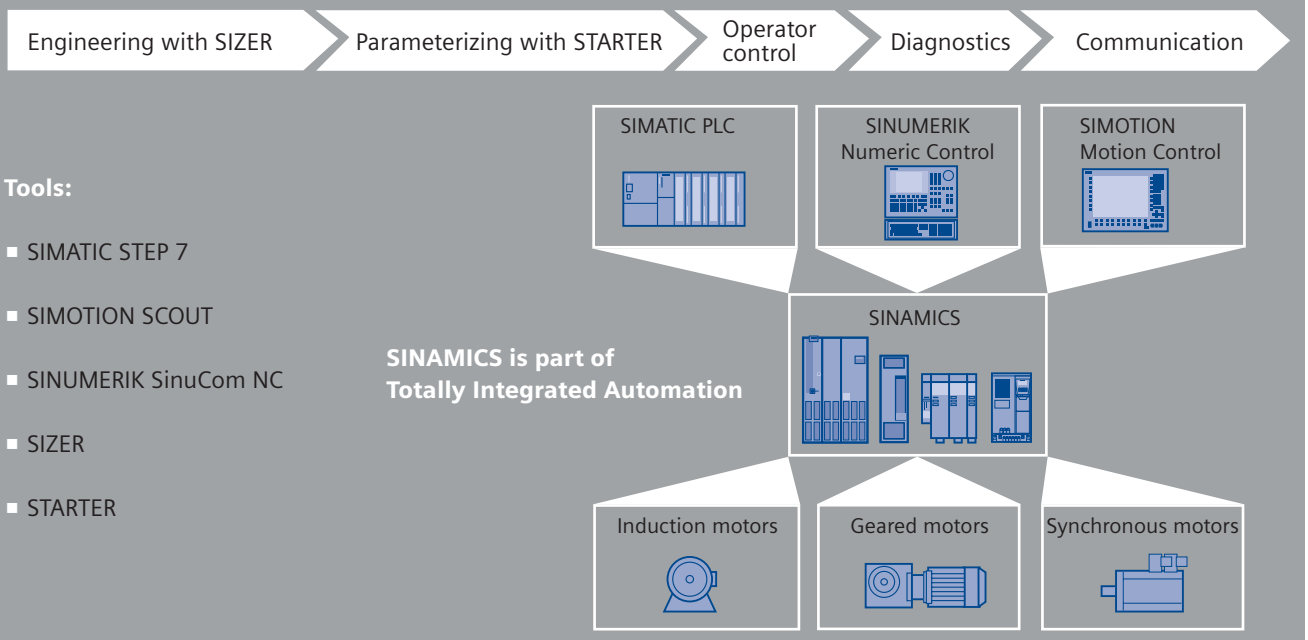
Standard engineering
The SINAMICS product range is characterized by a unique level of standardization – and by the highest degree of simplicity when it comes to engineering. The standard SIZER engineering tool supports users when selecting and dimensioning the drive components. The STARTER tool provides support when commissioning and troubleshooting the drives. This generates synergies that secure efficiency when it comes to engineering, parameterization and service that until now have been unknown. And this across the widest range of family members – permitting machines and plants to be implemented faster and more cost-effectively.

Highest degree of flexibility and combination capability
On one hand, SINAMICS covers a wide range of applications, and on the other hand, stands for the highest degree of standardization regarding functionality and engineering. This makes SINAMICS a unique universal platform for drive-related tasks. Depending on the particular task, components from different family members can be flexibly combined with one another to create the optimum drive solution.

Broad performance spectrum
SINAMICS covers a broad performance spectrum. Components that are finely graduated with respect to one another permit drive solutions that are perfectly tailored to the particular application to be cost-effectively and efficiently realized.

Designed for global use
With its different voltages, the SINAMICS product range is suitable for all of the different line supply types encountered around the world. The range also fulfills international standards and regulations, which means that the drive units do not have to be re-certified when they are exported. A global network of regional Siemens offices and service partners is available to provide high performance support.

SINAMICS – fully integrated:



Tools:

- SIMATIC STEP 7
- SIMOTION SCOUT
- SINUMERIK SinuCom NC
- SIZER
- STARTER

SINAMICS is part of Totally Integrated Automation

SINAMICS Safety Integrated
Safety functions integrated in the drive are offered within the SINAMICS family – representing a real milestone. In addition to "Safe Standstill" (SH), most drive versions also have "Safe Brake Control" (SBC) integrated in the power unit – as well as other safety functions. Safety concepts – as are required in practice – can be implemented using this integrated safety technology. The installation technology is also simplified at the same time. All of the safety functions are certified to international standards (IEC 61508, EN 954-1).

Higher cost-effectiveness and efficiency
SINAMICS-based drive solutions provide a platform for a higher degree of cost-effectiveness and competitiveness – for machinery and plant construction companies as well as for end users

- Solutions optimally tailored to the application by using different drive versions
- Shorter project times/order administration using user-friendly and standard engineering and commissioning
- Maintenance-friendly machines and plants with a high degree of availability through standard, powerful diagnostic functions
- Lower spare parts inventory through the optimized range of components

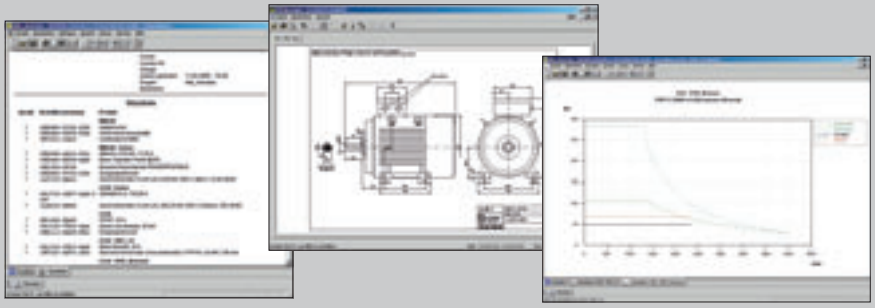
Numerous interfacing possibilities
SINAMICS offers more possibilities when it comes to interfacing to higher-level control systems. These possibilities include: Coupling via digital or analog interface to conventional control systems or via PROFIBUS DP or PROFINET to SIMATIC, SINUMERIK and SIMOTION from Siemens.

Totally Integrated Automation
SINAMICS is part of Totally Integrated Automation – the extensive and integrated range of products and systems from Siemens. Thanks to its integration when it comes to engineering, data management and communication to the automation level, SINAMICS allows highly efficient solutions to be created in conjunction with SIMATIC, SINUMERIK and SIMOTION.

Engineering with SIZER

Dimensioning the optimum components in steps guided by the program

Result of the engineering e.g. parts list, characteristics and dimension drawings



Standard engineering

An essential feature of SINAMICS is the highest degree of standardization when it comes to engineering. Powerful and standard tools support users in all project phases. This starts with the dimensioning of the drive components.

SIZER engineering software
The SIZER engineering software helps when engineering a complete drive system and allows single-motor drives up to complex multi-axis drives to be simply handled. The Workflow Wizard intuitively guides application engineers in a user-friendly way through the individual engineering phases – step-for-step. SIZER is available in German and English.

SIZER helps you to
- Calculate loads
- Select and dimension motor and power components
- Configure additional system components

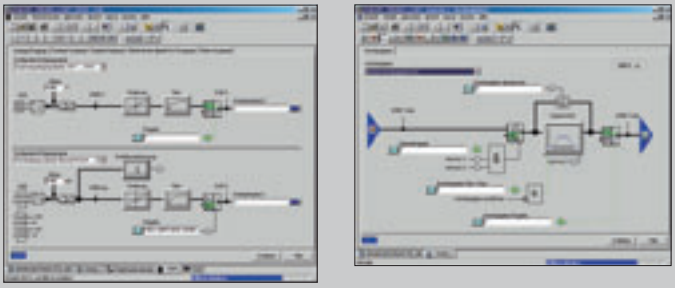
SIZER provides
- Engineering results: Characteristics, technical data, mounting drawings and dimension drawings
- Parts list with the associated ordering data

Further, SIZER provides support when electronically ordering the components, including a link to SAP systems through its integrated EDP interface.

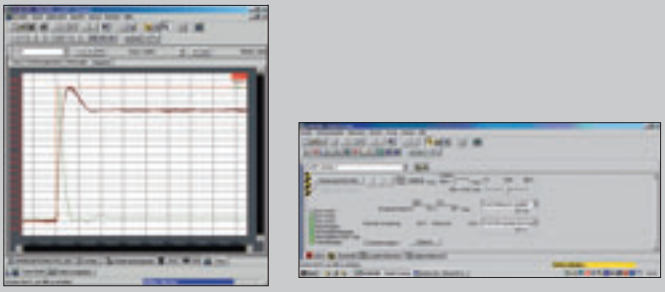
Enhanced engineering security
A guided tour makes it easier for entry-level personnel to get to know SIZER. The help functions integrated in SIZER competently support you during the complete engineering phase and provide extensive physical and technical background knowledge. All of this helps prevent users from selecting incorrect combinations and ordering the wrong components.

Commissioning with STARTER

Graphic screen forms to configure and commission the drive



The logging function records set point and actual value curves



STARTER commissioning software
The STARTER tool can be used to commission the complete range of SINAMICS drives. The intelligent tool allows the drive components to be simply configured and commissioned – using user-friendly menus and graphics.
What is especially helpful is that STARTER allows all of the relevant data to be imported from the electronic type plates of the drive components. For the user this means that the associated time and costs are significantly reduced. It also speeds up the parameterization process and reduces the risk of incorrect data being entered.
Integrated test functions can be used to check the entries being made and optimize the parameters. Velocity characteristics as well as set point and actual value curves can also be logged over time. Clearly structured graphics enable users to carry out diagnostics and find their way around the system quickly and easily.

STARTER is available in German, English, French and Italian.

Even stronger as a team
SIZER and STARTER can run as dedicated Windows applications. They are linked to the drives via the serial interface or via PROFIBUS DP.

In conjunction with SIMOTION, STARTER can be integrated in SCOUT, the engineering system of the motion control system. The same is true when the drives are operated in conjunction with the SIMATIC industry automation system. STARTER is embedded in the STEP 7 engineering software, which means that the drive technology is fully integrated into the PLC environment.

Completely integrated automation solutions are obtained by linking SINAMICS with SIMOTION, SIMATIC and SINUMERIK. Solutions from a single source that can be engineered, parameterized and commissioned using one central engineering software. This well thought-out concept is also reflected in the service functionality, as diagnostics and troubleshooting are simple – whether carried out locally on-site or via teleservice.

SINAMICS G110:

The versatile single-motor drive for low power ratings

SINAMICS G110 is perfectly suited for a wide range of variable-speed industrial applications. The especially compact drive inverter operates with voltage – frequency control (V/f) and is the ideal solution from the SINAMICS product family in the lower power and performance ranges. SINAMICS G110 is available in three frame sizes. It covers a range of power ratings from 0.12 kW up to 3.0 kW (0.16 up to 4 HP) for connection to single-phase line supplies (200 V to 240 V).

Applications

SINAMICS G110 is especially suitable for the following applications:

- As drive in industry and the trades
- In different sectors, e.g. food & beverage, textiles, packaging
- In conveyor system applications
- For applications with pumps and fans
- For factory gate/garage door operating mechanisms and barriers
- As drive for scrolling advertising billboards

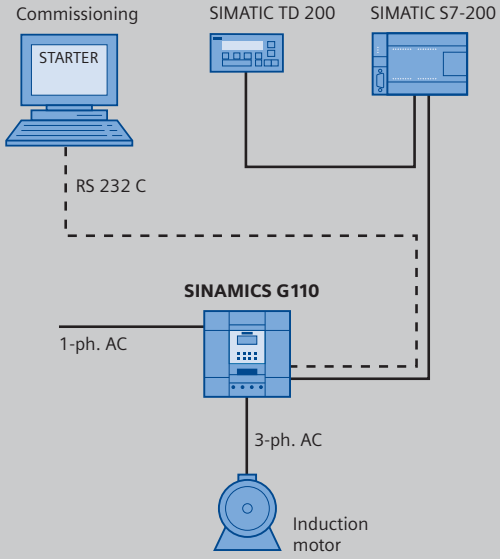
Benefits for you

- Can be flexibly used thanks to the extensive parameterizing functions and various interfaces (analog and USS versions)
- Simple installation, parameterization and commissioning
- Powerful diagnostic functions with optional operator panel
- Fast series commissioning by copying parameters using the optional operator panel
- Low-noise motor operation as a result of the high pulse frequency
- Low mechanical wear through
  - frequency bands that can be skipped if resonance occurs
  - parameterizable ramp-up/ramp-down times
  - ramp smoothing
  - being able to connect the drive inverter to a rotating motor (flying restart)
- Increased plant availability thanks to the automatic restart after a power failure or operational fault
- Fast current limiting for disturbance-free operation in the event of sudden load surges
- Versions with integrated EMC filter for industrial and public line supplies
- DIP switch to quickly adjust to 50-Hz or 60-Hz applications
- DIP switch for simple bus termination for the USS version (RS 485)

Structure

SINAMICS G110 drive units are especially compact and supplied so that they can be immediately connected up. They all have state-of-the-art IGBT technology in the power unit as well as digital microprocessor-based technology. Further, they can be quickly installed and simply connected up.
There is a version with a non-ribbed heat sink for mounting in low-profile cabinets. Versions with analog input or with an RS 485 communication interface (USS) are also available. The digital inputs can be freely parameterized and flexibly adapted to the widest range of applications.
SINAMICS G110 is either parameterized using the PC-based STARTER tool or an optional operator panel (Basic Operator Panel). The settings entered at the operator panel can be saved and then simply transferred to every additional drive inverter if several drive inverters are to be commissioned with the same parameters – i.e. for series machines.

SINAMICS G110 configuration example:
USS version together with SIMATIC S7-200,
PC-drive inverter connection using the optional PC connecting kit



Technical data	
Electrical data	
Line voltages; power ranges	1-ph. 200 ... 240 V AC, ± 10%; 0.12 ... 3.0 kW (0.16 ... 4 HP)
Line types	IT, TN, TT
Line frequency	50 Hz/60 Hz
Output frequency	0 ... 650 Hz
Control techniques	*V/f* control, linear (M~n) *V/f* control, square-law (M~n^2) *V/f* control, can be parameterized
Fixed frequencies	3, can be parameterized
Frequency bands that can be skipped	1, can be parameterized
Digital inputs	3 parameterizable 24 V DC digital inputs
Analog version: Analog input	1 analog input for a set point from 0 ...10 V scalable or can be used as 4th digital input
Digital output	1 24 V DC digital output
Communication interface	USS version: Serial RS 485 interface for operation with the USS protocol
Functions	
Software functions	Automatic restart following interruption due to line supply failure, drive inverter can be bumplessly connected to a rotating motor, parameterizable ramp-up/ramp-down times, ramp smoothing
Protective functions	Undervoltage, overvoltage, ground fault, short circuit, stall protection, thermal motor protection I^2t, drive inverter overtemperature, motor overtemperature
Motors that can be connected	Induction motors
Mechanical data	
Degree of protection	IP20
Cooling type	≤ 0.75 kW (≤ 1 HP): Convection cooling, version with low-profile heat sink > 0.75 kW (> 1 HP): Internal air cooling (integral fan)
Standards	
In conformance with the following standards	CE, UL, cUL, c-tick

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.

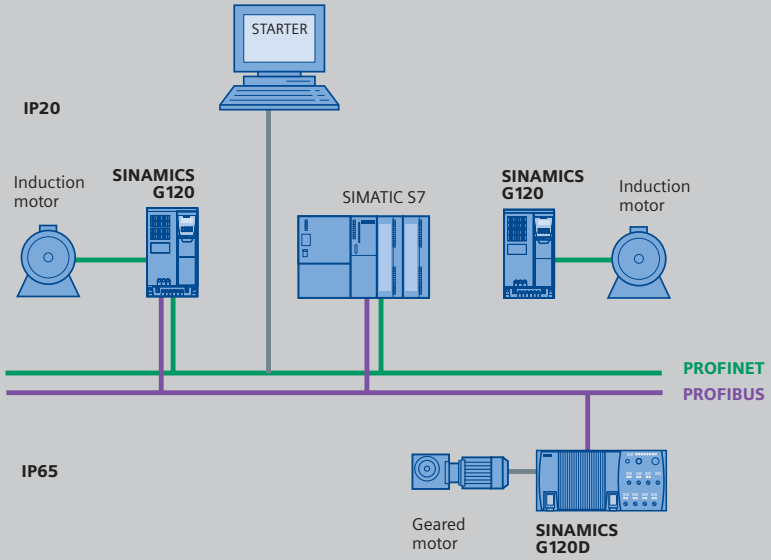
SINAMICS G120D

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).

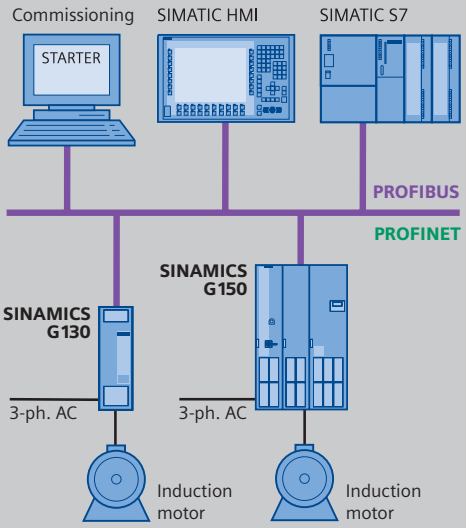
SINAMICS G150

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

SINAMICS S120:

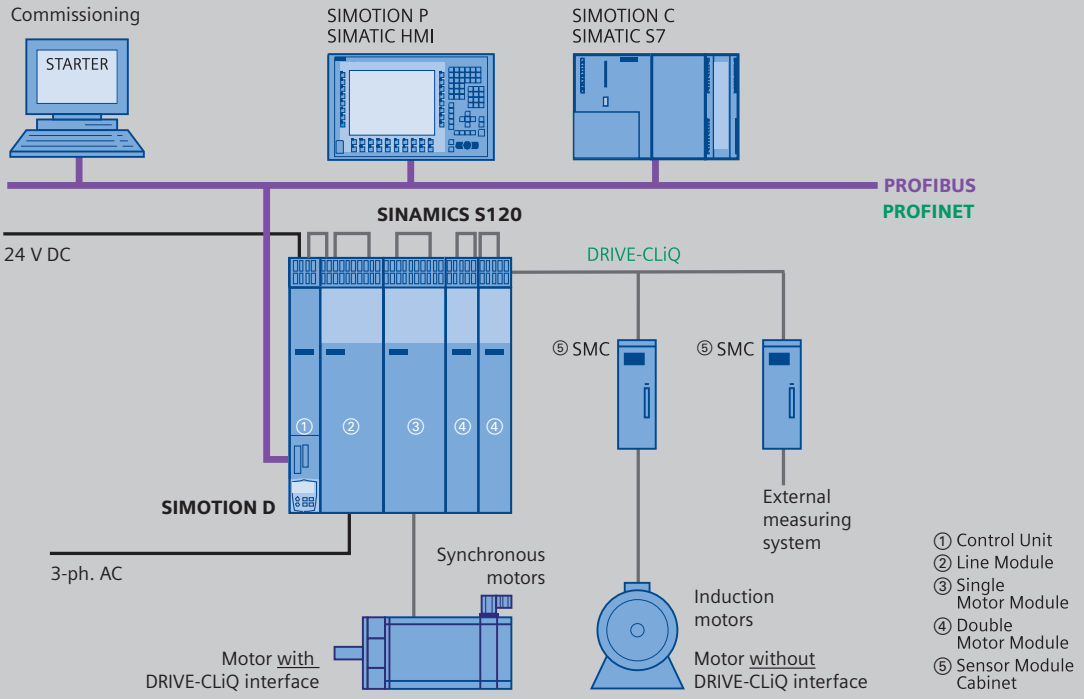
The flexible, modular drive system for sophisticated tasks

SINAMICS S120 is the modular drive system with servo and vector control for sophisticated drive tasks in machinery and plant construction. Versions are available both for single- as well as multi-axis applications.
SINAMICS S120 covers a range of power ratings from 0.12 kW up to 4500 kW (0.16 up to 6000 HP) and various control modules with graduated functionality. A precisely tailored drive configuration can be engineered quickly and simply from the modular SINAMICS S120 system – for almost any high-performance drive application.
SINAMICS S120 control modules (Control Units) have extensive onboard drive intelligence even in the basic version: Servo, and vector control, *V/f* control, positioning and safety functions, as well as many other functions that are useful in achieving reliable operation.

Integrated PROFIBUS DP interfaces allow the drives to be simply integrated into overall automation solutions. Among others, PROFINET is supported as an additional fieldbus interface. Seamless classic automation and drive solutions based on SINAMICS S120 can be implemented, especially in conjunction with SIMATIC, the Siemens automation system. When used with SIMOTION D or SINUMERIK 840 solution line Control Units, even complete motion control and machine tool solutions can be realized integrated in the drive.
SINAMICS S120 Cabinet Modules are available as cabinet system specifically for use in plant construction. These can be combined to form a cabinet lineup with a total power rating of up to 4500 kW (6000 HP). Using standard interfaces, the modules can be quickly interlinked to form a ready-to-connect drive solution for multi-motor applications.

Cabinet Modules – the modular cabinet system for power ratings up to 4500 kW (6000 HP)

Configuration example
SINAMICS S120 booksize system with SIMOTION D



Applications

As a result of its various features, SINAMICS S120 is predestined for use in production and machine tools as well as in plant construction – for example in:

- Packaging machines
- Machines in the food and beverage industries
- Plastics machines
- Textile machines
- Presses, punches, printing and paper machines
- Machines in the woodworking, glass and ceramic sectors
- Assembly and automatic testing machines
- Handling devices, cranes
- Lathes, milling and grinding machines
- Rolling mill drives
- Vehicle and gearbox test stands

Benefits for you

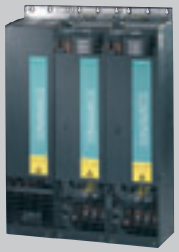
SINAMICS S120 distinguishes itself through the following features:

- Can be universally used in high-performance single- and multi-axis applications
- Can be freely combined to create tailored solutions
- Wide range of power ratings
- Wide functional scope
- SINAMICS Safety Integrated functions
- Various cooling types are supported
- Various infeed concepts are supported
- Can be simply integrated into higher-level automation and IT environments
- Simple to handle
- Simple mounting and installation
- Practical connection system

Structure

SINAMICS S120 drive units are available as single-axis as well as multi-axis drive systems.

SINAMICS S120:
The modular drive system for sophisticated single- and multi-axis applications



AC/AC units for single-axis applications		DC/AC units for multi-axis applications		
Blocksize format	**Chassis format**	**Booksize format**	**Chassis format**	**Cabinet Modules**
IP20	IP20	IP20	IP00/IP20	IP20 (IP21/IP23/IP54)
0.12 kW to 90 kW (0.16 to 120 HP)	110 kW to 250 kW (150 to 340 HP)	1.6 kW to 107 kW (2 to 145 HP)	75 kW to 1200 kW (100 to 1600 HP)	1.6 kW to 4500 kW (2 to 6000 HP)

SINAMICS S120 AC Drives for high-performance single-motor drives

The SINAMICS S120 AC Drives series was specifically designed for single-motor drives. This series has a modular design and comprises a Power Module in which the infeed and power units are integrated. Power Modules are available for power ratings from 0.12 kW to 250 kW (0.16 to 340 HP). The Control Unit, in which all of the closed-loop control intelligence is concentrated, is plugged onto the Power Module. These control modules include all of the drive interfaces – for communication and to connect expansion components.

SINAMICS S120 DC/AC drive units for multi-axis applications

With SINAMICS S120, we are offering multi-axis units with central line supply infeed and DC current link – optimized for use in multi-axis applications. They also have a modular design – comprising Control Unit, Line Module and Control Modules.

Control Unit
The closed-loop control intelligence for all of the drive axes integrated in the multi-axis group is combined in the Control Unit. Control Units also include the drive-related I/Os and interfaces to communicate with higher-level control systems. Control Units are available with different functional scopes and performance levels.

Line Module
The Line Module includes the central line supply infeed for the DC link. Different versions are available depending on the particular type of application: from the non-regulated infeed unit for motoring operation up to the regulated infeed/regenerative feedback unit. Even when the line supply voltage fluctuates, these units ensure a higher degree of security against failure by maintaining the DC link voltage at a constant level. They regenerate excess energy back into the line supply in a line-friendly fashion. Line Modules are available for power ratings from 5 kW to 6000 kW (7 to 8000 HP).

Motor Modules
One or several Motor Modules are supplied with energy for the motors from the DC link. Both synchronous as well as induction motors can be connected. Motor modules are available for rated powers extending from 1.6 kW up to 1200 kW (2 up tp 1600 HP).

Additional modules and components
There are a whole series of supplementary modules and components to connect various position measuring and encoder systems as well as to expand the drive system by adding drive-related I/Os:

- **Terminal Modules, Terminal Boards:**
  To expand the drive system by adding drive-related I/Os.
- **Sensor Modules:**
  To connect position measuring encoders to the drive system
- **Communication Boards:**
  These provide the Control Unit with an additional communication port

System interface DRIVE-CLiQ
All of the SINAMICS S120 components are equipped with the high-performance DRIVE-CLiQ system interface. Line and Motor Modules are connected to the Control Unit and Terminal and Sensor Modules are connected to the drive system via DRIVE-CLiQ – it is both simple and efficient. Motors that have this leading-edge interface can also be directly connected to the drive system.

Different frame sizes – can be flexibly combined
SINAMICS S120 is available in different frame sizes:

- SINAMICS S120 AC Drives
  - compact blocksize format for power ratings from 0.12 kW to 90 kW (0.16 to 120 HP)
  - chassis format for power ratings from 110 kW to 250 kW (150 to 340 HP)

- SINAMICS S120 multi-axis units
  - booksize format for power ratings from 1.6 kW to 107 kW (2 to 145 HP) – also available with external air cooling and in a Cold Plate version
  - chassis format for power ratings from 75 kW to 1200 kW (100 to 1600 HP) – these are also available with liquid cooling, for example for applications in dusty, aggressive or salt-laden environments – or when space is restricted
  - Cabinet Modules up to 4500 kW (6000 HP)

All of these formats and frame sizes support internal air cooling and can be extremely flexibly combined with one another. Even S120 AC Drives can be combined via the DRIVE-CLiQ interface to create multi-axis applications.

Auto-configuration using an electronic type plate
All SINAMICS S120 components have a digital type plate that contains all of the relevant technical data. For instance, for motors this includes the parameters of the electronic equivalent circuit diagram and the characteristic values of the integrated motor encoder. This data is automatically sensed from the control module via DRIVE-CLiQ and doesn't have to be entered again when commissioning the drive or replacing components.

In addition to technical data, the digital type plate also includes logistical data – for instance, the manufacturer's ID, Order No. and the globally unique identification number. These values can be electronically called up locally on-site as well as via remote diagnostics. This allows all of the components used in a machine to be uniquely identified – and that, at any time. This correspondingly simplifies service.

Technical data

Electrical data

Line voltages	1-ph. 200 ... 240 V AC, ± 10% 3-ph. 380 ... 480 V AC, ± 10% 3-ph. 660 ... 690 V AC, ± 10%
Power range	0.12 ... 1200 kW (0.16 ... 1600 HP) (4500 kW [6000 HP] Cabinet Modules)
Line types supported	IT, TN, TT
Line frequency	50 Hz/60 Hz
Open-loop/ closed-loop control techniques	*V/f* Control, Vector Control, Servo Control Dynamic Servo Control (DSC)
Digital inputs/outputs	Yes, number can be scaled
Analog inputs/outputs	Yes, number can be scaled
Communication interfaces	Digital I/O, 24 V DC Analog inputs/outputs PROFIBUS DP PROFINET CANopen

Functions

Technological functions	Several command/drive data sets Free interconnectability using BICO technology, using graphic configuring, freely interconnectable logic/control/arithmetic blocks (Drive Control Chart) Flying measurement, flying restart, kinetic buffering, Motion control in conjunction with SIMOTION D, Numerical control in conjunction with SINUMERIK 840 solution line, Technological controller (PID), integrated positioning functions
Safety functions (Safety Integrated)[1)]	Safe Torque Off (STO) Safe Stop 1, Safe Stop 2 (SS1, SS2) Safely Limited Speed (SLS) Safe Speed Monitor (SSM) Safe Brake Control (SBC)

Functions (continued)

Limits	Torque limiting/current limiting Power limiting Speed limiting
Protective functions (excerpt)	Thermal monitoring of the motor and power units Overcurrent, overvoltage and undervoltage Anti-stall protection Overspeed, zero speed Short and ground-fault strength
Set point conditioning	Direction of rotation reversal 4 skip bands Basic ramp-function generator without smoothing, with a special fast stop ramp Expanded ramp-function generator with smoothing and setting function Speed set point filter
Motors that can be connected	Induction motors Synchronous motors Torque motors Linear motors
Supported encoders	Resolvers Absolute encoders Incremental encoders sin/cos 1 V_{pp} Incremental encoders TTL signal, RS 422 Incremental encoders HTL

Mechanical data

Degree of protection	IP00/IP20, optionally up to IP54
Cooling types	Internal or external air cooling, liquid cooling, Cold Plate cooling

Standards

In conformance with the following standards	CE, UL, cUL, Safety Integrated IEC 61508/SIL 2

1) availability dependent on the frame size

SINAMICS S150:

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

SINAMICS S150 cabinet units are designed for variable-speed drives in the machinery construction and plant building sectors. They are especially suitable when it comes to high requirements placed on the dynamic performance and speed accuracy – as well as frequent braking cycles with high levels of braking energy and 4-quadrant operation. The drive converter cabinet units provide high-performance closed-loop speed control with high precision and dynamic performance – and are available for a range of power ratings from 75 up to 1200 kW (100 up to 1600 HP).

Applications

SINAMICS S150 is predestined for use in all applications that place the highest demands on processes with dynamic and reproducible operations. These include:

- Test stand drives
- Centrifuges
- Elevator and crane systems
- Cross-cutters and shears
- Conveyor belts
- Presses
- Cable winches

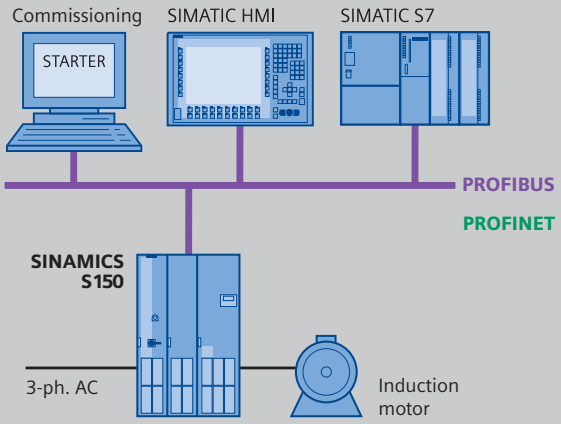
Benefits for you

- Regenerative feedback into the line supply as standard – permits unrestricted 4-Q operation
- Significant energy saving – especially when there are frequent braking cycles
- High accuracy and high dynamic line supply infeed by using IGBTs (insensitive to line supply voltage fluctuations)
- Almost perfectly sinusoidal line currents are impressed as a result of the fast closed-loop current control
- Innovative Clean Power Filter ensures low-frequency harmonics that are fed back into the line supply that can be almost neglected; the stringent THD limit values according to IEEE 519 are significantly over-fulfilled – this therefore avoids losses, in the low-voltage distribution and/or line supply transformer and in the line supply feeder cable caused by the harmonic currents
- Possibility of reactive power compensation (inductive or capacitive)
- Can be simply integrated into automation solutions using the standard PROFIBUS interface as well as various analog and digital interfaces
- Increased plant availability by being able to simply and quickly replace individual modules and power components
- Simple commissioning and parameterization – menu-prompted on the user-friendly AOP30 panel with graphics-capable LCD display and plain text display

Structure

SINAMICS S150 units are drive converters in a standard cabinet that are ready to be connected up. They can be perfectly adapted to the particular application as a result of an extensive range of options. Different versions allow the line supply and motor to either be connected at the top or bottom. This ensures a high degree of flexibility regarding mounting and installation. The drive units are available with cabinet widths starting at 1400 mm – increasing in steps of 200 mm. The standard degree of protection of the cabinets is IP20, but this can be optionally extended up to IP54. The user-friendly AOP30 panel is mounted in the door as standard.

Configuration example SINAMICS S150 with SIMATIC S7



Technical data	
Electrical data	
Line voltages; power ranges	• 3-ph. 380 ... 480 V AC, ± 10% (–15% < 1 min) 110 ... 800 kW (150 ... 1000 HP) • 3-ph. 660 ... 690 V AC, ± 10% (–15% < 1 min) 75 ... 1200 kW (100 ... 1600 HP)
Line types	TN/TT or IT line supplies
Line frequency	47 ... 63 Hz
Output frequency	0 ... 300 Hz
Control techniques	Vector control with and without encoder or *V/f* control
Fixed speeds	15 fixed plus 1 base speed, can be parameterized
Speed ranges that can be skipped	4, parameterizable
Customer terminal strip	Digital inputs/outputs, analog inputs/outputs, inputs for motor temperature evaluation, the number is variable
Communication interface	PROFIBUS DP as standard/optional: PROFINET, CANopen
Braking operation	4-Q operation is possible as standard
Functions	
Software functions	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	Undervoltage, overvoltage, ground fault, short circuit, stall protection, thermal motor protection, thermal drive converter protection
Motors than can be connected	Induction motors and synchronous motors
Mechanical data	
Degree of protection	IP20, optional: IP21/IP23/IP54
Cooling type	Integral fan (forced air cooling)
Sound pressure level	≤ 78 dB (A) for 50-Hz line supply frequency
Cabinet system	Rittal TS 8
Standards	
In conformance with the standards	CE

SINAMICS GM150/SINAMICS SM150:

The SINAMICS solutions for the medium-voltage range

SINAMICS GM150

SINAMICS GM150 is designed for medium-voltage drives without regenerative feedback into the line supply – for example for large pumps, fans, extruders, mixers and crushers. This means that it continues the range of functions and applications of the SINAMICS G150 up into the medium-voltage range. Reliable power components and protective measures against environmental effects, insensitive control modules and redundant fans and pumps in the cooling system guarantee smooth, disturbance-free operation – and more specifically, even under the toughest of conditions. Up to approx. 8.5 MW (11,557 HP), the drive units are equipped with the second generation of reliable HV-IGBT power semiconductors that are now also available for 6.5 kV. Well-proven IGCT technology is used for even higher power ratings up into the double-digit megawatt range.

Well thought out in detail
Engineering, commissioning and operation are simple and standard – just the same as for the low-voltage drive units. Operator control is menu-prompted from the user-friendly AOP30 panel with plain text display. The space-saving design, the availability of all voltage classes, either air or water cooling, connections that are prepared at either the top or bottom of the unit as well as the seamless integration into higher-level automation systems make integration into the plant or system straightforward.

Intelligent maintenance functions
Using the intelligent maintenance functions the components automatically issue a signal if maintenance is required. For example, a differential pressure technique determines how dirty the dust filter is. For water-cooled versions, the analog conductivity measurement continually monitors the mode of operation of the ion exchanger and provides a signal well in advance if its ion exchanging capability diminishes too much. This ensures that components are replaced or other maintenance work is carried out at the optimum time – for instance as part of a routine inspection. When service is required, all of the essential components are accessible from the front. Components can be replaced with just a few manual operations as a result of the well thought-out arrangement.

SINAMICS GL150

SINAMICS GL150 is the rugged single-motor drive for synchronous motors up to 120 MW (163,000 HP). The number of components has been reduced to a minimum by using thyristors. The simple design makes SINAMICS GL150 extremely reliable in operation, almost maintenance-free and compact. SINAMICS GL150 is designed as single-motor drive for applications with square-law and constant load characteristics. From its circuit principle, it is suitable for four-quadrant operation – i.e. driving and braking in both directions of operation – without any additional equipment. Typical applications include: Pumps, fans, compressors, extruders and kneaders in the double-digit Megawatt range – such as those used in the oil & gas, petrochemical and chemical sectors – as well as large ships' drives.

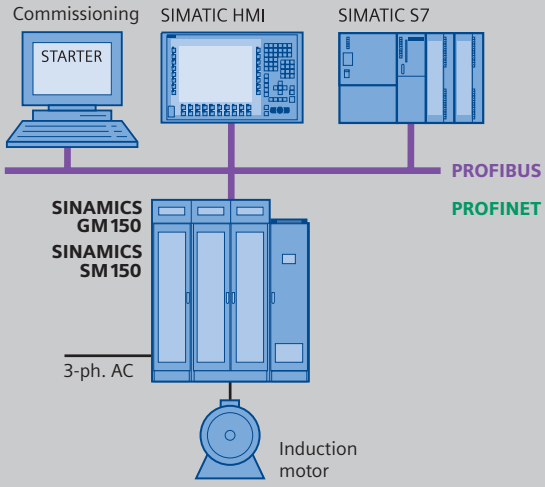
SINAMICS SM150

SINAMICS SM150 is the medium-voltage drive converter for sophisticated drive tasks with regenerative feedback into the line supply. It is suitable both for single-motor as well as multi-motor drives and continues the range of functions and applications of SINAMICS S150 and SINAMICS S120 cabinet modules up into the high-performance range. Rolling mills and elevator cabins in mining are just some typical applications. Thanks to their features, the drive units are tailored to these types of high-dynamic applications with regenerative feedback into the line supply.

Transvector control for a high efficiency and long service life
The Transvector control with optimized pulsed patterns offers a whole raft of advantages: Maximum dynamic performance, minimum torque ripple, high overload capacity, insensitivity to critical operating situations and low noise. The extended Transvector control with ROTOS (Reduced Optimized Task Oriented Switching) is the technical highlight of SINAMICS SM150. This control technique with a high dynamic performance and with optimized pulse patterns guarantees sinusoidal currents and optimum voltage utilization – but at the same time with low switching frequencies. The result: High efficiency and low stressing on the motor.

4-Q operation and Active Infeed
SINAMICS SM150 can handle 4-Q operation without any restrictions. The Active Infeed technology makes this drive unit ideal for transferring power between regenerating and motoring applications. For multi-motor drives, this is realized using a common DC bus. Further, Active Infeed can supply capacitive reactive power to compensate other drive converters. The power factor $\cos\varphi$ can be set. Further, the Active Infeed minimizes harmonics and makes the SINAMICS SM150 especially line-friendly.

Configuration example SINAMICS GM150 and SINAMICS SM150 with SIMATIC S7



Technical data

Electrical data	SINAMICS GM150	SINAMICS GL150	SINAMICS SM150
Line voltages; power ranges 3 AC 2,3 ... 36 kV, ± 10% (–15% < 1 min)	800 ... 25,000 kW (1000 ... 33,500 HP) (with induction motor)	6000 ... 120,000 kW (8000 ... 163,000 HP)	5000 ... 28,000 kW (6700 ... 37,500 HP) (with synchronous motor)
Motor voltage	2.3 ... 7.2 kV	1.8 ... 12.0 kV	3.3 kV
Line types	IT line supplies	IT line supplies	IT line supplies
Line frequency	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
Output frequency	0 ... 250 Hz	0 ... 120 Hz	0 ... 250 Hz
Control technique	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	4, parameterizable
Customer terminal strip	Digital inputs/outputs, analog inputs/outputs, inputs for motor temperature evaluation, variable number		
Communication interface	PROFIBUS DP as standard optional: PROFINET	PROFIBUS DP as standard optional: PROFINET	PROFIBUS DP as standard optional: PROFINET
Braking operation	Braking Module optional	4-Q operation possible as standard	4-Q operation possible as standard
Functions			
Software functions	Automatic restart after operational interruption due to line failure, the drive converter is bumplessly connected to the rotating motor, kinetic buffering, automatic parameterizable ramp-up/ramp-down times, ramp smoothing Synchronization to the line supply		
Protective functions	Undervoltage, overvoltage, ground fault, short circuit protection, stall protection, thermal motor protection, thermal drive converter protection		
Motors that can be connected	Induction motors and synchronous motors	Synchronous motors	Induction motors and synchronous motors
Mechanical data			
Degree of protection	Air-cooled IP22, optional IP42, liquid-cooled IP43, optional IP54	Air-cooled IP20, optional IP41 liquid-cooled IP41, optional IP54	IP43, optional IP54
Cooling type	Top-mounted fan or liquid cooling		Liquid cooling
Sound pressure level	≤ 80 dB (A)	≤ 80 dB (A)	≤ 80 dB (A)
Standards			
In conformance with the following standards	IEC, EN, UL, cUL	IEC, EN	IEC, EN

In comparison:

Technical data of the SINAMICS family

	SINAMICS G110	SINAMICS G120	SINAMICS G120D	SINAMICS G130	SINAMICS G150
Degree of protection					
	IP20	IP20	IP65	IP00/IP20	IP20 optional: IP21/IP23/IP54
Line supply voltages					
1-ph. 200 ... 240 V AC	0.12 ... 3 kW (0.14 ... 4 HP)	–	–	–	–
3-ph. 380 ... 480 V AC	–	0.37 ... 90 kW (0.5 ... 120 HP)	0.75 ... 7.5 kW (1 ... 10 HP)	315 ... 560 kW (400 ... 750 HP)	110 ... 900 kW (150 ... 1200 HP)
3-ph. 500 ... 600 V AC	–	–	–	315 ... 560 kW (400 ... 750 HP)	110 ... 1000 kW (150 ... 1300 HP)
3-ph. 660 ... 690 V AC	–	–	–	315 ... 800 kW (400 ... 1000 HP)	75 ... 1500 kW (100 ... 2000 HP)
3-ph. 2.3 ... 36 kV AC	–	–	–	–	–
Open/closed-loop control technique					
V/f control	Yes	Yes	Yes	Yes	Yes
FCC	–	Yes	Yes	–	–
Vector control without encoder	–	Yes	Yes	Yes	Yes
Vector control with encoder	–	Yes	Yes	Yes	Yes
Servo control	–	–	–	–	–
Dynamic servo control	–	–	–	–	–
Motors					
Induction motors	Yes	Yes	Yes	Yes	Yes
Synchronous motors	–	–	–	Yes	Yes
Torque motors	–	–	–	Yes	Yes
Linear motors	–	–	–	–	–
Functions					
Speed control	Yes	Yes	Yes	Yes	Yes
Torque control	–	Yes	Yes	Yes	Yes
Positioning	–	–	–	–	–
Synchronous operation	–	–	–	–	–
Axis synchronization	–	–	–	–	–
Safety Integrated	–	Yes	Yes	Yes	Yes
Communication interfaces					
Digital/analog	Yes	Yes	Yes	Yes	Yes
Serial	Yes	Yes	–	Yes	Yes
PROFIBUS DP	–	Yes	Yes	Yes	Yes
PROFINET	–	Yes [4]	Yes [4]	Yes [4]	Yes [4]
CANopen	–	–	–	Yes	Yes
Commissioning, parameterizing, diagnostics					
Using the operator panel	Yes	Yes	–	Yes	Yes
With PG/PC (STARTER))	Yes	Yes	Yes	Yes	Yes
MMC-Card/CF-Card	–	Yes	Yes	Yes	Yes
Additional information					
Catalog	D 11.1	D 11.1	D 11.1	D 11	D 11

1) Motor voltages 2.3 ... 7.2 kV for induction motors
2) Motor voltage 3.3 kV for synchronous motors
3) In conjunction with SIMOTION D
4) Being prepared

SINAMICS S120 AC Drives	SINAMICS S120 DC/AC Drives	SINAMICS S120 Cabinet Modules	SINAMICS S150	SINAMICS GL150	SINAMICS GM150	SINAMICS SM150
IP00/IP20	IP00/IP20	IP21/IP23/IP54	IP20 optional: IP21/IP23/IP54	Air cooling: IP20 optional: IP41 Liquid cooling: IP41 optional: IP54	Air cooling: IP22 optional: IP42 Liquid cooling: IP43 optional: IP54	IP43 optional: IP54
0.12 ... 0.75 kW (0.16 ... 1 HP)	–	–	–	–	–	–
0.37 ... 250 kW (0.5 ... 340 HP)	1.6 ... 800 kW (2 ... 1000 HP)	1.6 ... 300 kW (2 ... 400 HP)	110 ... 800 kW (150 ... 1000 HP)	–	–	–
–	–	–	–	–	–	–
–	75 ... 1200 kW (100 ... 1600 HP)	75 ... 4500 kW (100 ... 6000 HP)	75 ... 1200 kW (100 ... 1600 HP)	–	–	–
–	–	–	–	6 ... 120 MW (8000 ... 163,000 HP)	0.8 ... 25 MW [1] (1000 ... 33,500 HP)	5 ... 28 MW [2] (6700 ... 37,500 HP)
Yes	Yes	Yes	Yes	–	Yes	Yes
Yes	Yes	Yes	–	–	–	–
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	–	–	–	–
Yes	Yes	Yes	–	–	–	–
Yes	Yes	Yes	Yes	–	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	–	–	–
Yes	Yes	Yes	–	–	–	–
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	–	–	–	–
Yes [3]	Yes [3]	Yes [3]	–	–	–	–
Yes [3]	Yes [3]	Yes [3]	–	–	–	–
Yes	Yes	Yes	Yes	–	–	
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes [4]	Yes	Yes [4]	Yes [4]
–	Yes	–	Yes	–	–	–
Yes [4]	Yes [4]	Yes [4]	Yes	–	–	–
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
D 21.1	D 21.1, D 21.3	D 21.3	D 21.3	–	D 12	D 12

An overview:

The SINAMICS family members

By themselves – strong.

Together – unbeatable.

SINAMICS low-voltage drive converters

SINAMICS G110

The versatile single-motor drive for low power ratings

Main applications

Machines and plants in industry and the trades

Application examples

- Pumps and fans
- Auxiliary drives
- Conveyor technology
- Advertising boards
- Gate drives
- Centrifuges

Advantages

- Compact
- Can be flexibly adapted to different applications
- Simple and fast commissioning
- Ready to run
- Transparent connecting terminals
- Optimum interaction with SIMATIC and LOGO!

SINAMICS G120

The modular single-motor drive for small up to average power ratings

Main applications

Machines and plants in industry and the trades (machinery construction, automobile, textiles, chemical, printing, steel)

Application examples

- Pumps and fans
- Compressors
- Conveyor systems

Advantages

- Modular
- Can be flexibly expanded
- Simple and fast commissioning
- Regenerative feedback
- Optimum interaction with SIMOTION and SIMATIC
- SINAMICS Safety Integrated
- Innovative cooling concept

SINAMICS G120D

The modular distributed drive inverter with a high degree of protection

Main applications

Machines and equipment in the industrial environment, especially automotive, but also in airports, in dry areas of the food & beverage industry and in distribution logistics (e.g. suspended electric monorails)

Application examples

- Conveyor technology, especially for high-performance solutions

Advantages

- Distributed, high degree of protection up to 7.5 kW (10 HP)
- Low-profile design
- Standard drilling template for all power ratings
- High degree of ruggedness
- Scalable in power, function and performance
- Simple and fast commissioning
- Innovative system architecture fit-for-the-future
- Energy recovery helps save energy and costs (less components are required)
- Optimum interaction with SIMATIC, SIRIUS, etc.
- SINAMICS Safety Integrated

SINAMICS low-voltage drive converters

SINAMICS G130/G150

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

Main applications

Machines and plants in the process and production industries – for the following sectors: Water/wastewater, power stations, oil & gas, petrochemical, basic materials chemistry, paper, cement, stone, steel

Application examples

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

Advantages

- Space-saving
- Low noise
- Simple and fast commissioning
- G130: Modular components
- G150: Ready-to-connect cabinet unit
- Optimum interaction with SIMATIC

SINAMICS S120

The flexible, modular drive system for sophisticated tasks

Main applications

Machines and plants in the industrial sector: Packaging, plastics, textiles, printing, woodworking, glass, ceramics, presses, paper, cranes, semiconductors, automatic assembly and testing machines, handling, machine tools ...

Application examples

- Motion control applications (positioning, synchronous operation)
- Numerical control, interpolating motion control
- Converting
- Technological applications

Advantages

- Can be universally used
- Flexible, modular
- Scalable in power, function, number of axes, performance
- Simple and fast commissioning (auto-configuring)
- Innovative system architecture that is fit for the future
- Graduated infeed/regenerative feedback concept
- Wide range of motors
- Optimum interaction with SIMOTION, SIMATIC and SINUMERIK
- SINAMICS Safety Integrated

SINAMICS S150

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

Main applications

Machines and plants in the process and production industry – for the following sectors: Food & beverage, automobile and steel, mining/open-cast mining, shipbuilding, cranes, conveyor technology

Application examples

- Test stand drives
- Centrifuges
- Elevator and crane systems
- Cross-cutters and shears
- Conveyor belts
- Presses
- Cable winches

Advantages

- 4-Q operation as standard
- High control accuracy and dynamic performance
- Almost no harmonics fed back into the line supply, THD that significantly over-fulfills IEEE 519
- Tolerance with respect to line voltage fluctuations
- Reactive power compensation possible
- Simple and fast commissioning
- Ready-to-connect cabinet unit
- Optimum interaction with SIMATIC

SINAMICS medium-voltage drive converters

SINAMICS GM150

The drive solution for variable-speed drives

Main applications

Machines and plants in the process industry

Application examples

- Pumps and fans
- Compressors
- Extruders and mixers
- Crushers
- Ships' drives

Advantages

- Space-saving
- Simple and fast commissioning
- Ready-to-connect cabinet unit
- Optimum interaction with SIMATIC

SINAMICS GL150

The drive solution for synchronous motors up to 120 MW (163,000 HP)

Main applications

Machines and plants in the process industry, especially in the oil, gas and petrochemical sectors

Application examples

- Compressors
- Pumps and fans
- Extruders and kneaders
- Ships' drives
- Blast furnace blowers

Advantages

- Compact design and high power density
- Simple integration into the plant
- Simple operator control and monitoring
- Extremely reliable in operation and almost maintenance-free
- Fully digital Transvektor control
- Two directions of rotation by changing over the rotating field
- Can be seamlessly integrated into higher-level automation systems

SINAMICS SM150

The drive solution for sophisticated variable-speed single- and multi-motor drives

Main applications

Machines and plants among others in the production of steel and in mining

Application examples

- Rolling mills
- Elevator/hoist cabins
- Test stand drives
- Conveyor belts

Advantages

- 4-Q operation as standard
- High efficiency operation with low stressing on the motor
- High control accuracy and dynamic performance
- Almost no harmonics are fed back into the line supply
- Reactive power compensation possible
- Simple and fast commissioning
- Cabinet unit ready to be connected up
- Optimum interaction with SIMATIC

Additional information on SINAMICS is provided under
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