For every destination, the optimum drive

SINAMICS — the seamless and integrated drives family for every application

siemens.com/sinamics
SINAMICS — for every application, power rating, performance level

**Requirements regarding torque precision/speed precision/positioning precision/axis coordination/functionality**

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<th>Radial/axial fans</th>
<th>Compressors</th>
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<td>Turning</td>
<td>Milling</td>
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</tbody>
</table>

* Requirements regarding torque precision/speed precision/positioning precision/axis coordination/functionality
SINAMICS is the most comprehensive drive family available today. It is based on a simple, integrated engineering concept, inherently providing innovative, energy-efficient solutions for the future. No matter which direction you wish to go, Siemens offers you the optimum drive — from one source for every application.

Solutions for your specific application
With SINAMICS, you always achieve your objectives. No matter whether it involves flow control applications such as pumps, fans and compressors, or processing applications such as extruding and crushing; from lifting and moving applications such as conveyors and elevators to complex motion control applications such as milling, turning and machining — Siemens SINAMICS drives offer you a unique range of power and performance.

Minimize your costs
The engineering costs for configuring and commissioning drive solutions must be kept as low as possible. Using SINAMICS, you minimize your costs — with integrated and standard tools for selecting, configuring and commissioning — permitting fast, straightforward engineering at a favorable cost.
The entire family at a glance

With SINAMICS, Siemens offers you a platform that optimally complies with the high requirements in the low-voltage, medium-voltage and DC-voltage ranges. The complete and integrated drive family addresses all of the performance levels and sets itself apart as a result of the highest degree of flexibility, functionality and efficiency.

Today, machinery and plant construction is demanding automation and drive solutions that must be highly flexible and scalable. In all industrial sectors, there is a demand for individual solutions which are extremely easy to use, have a high efficiency and have integrated safety technology.

Customized solutions
Whether single- or multi-axis applications, basic open-loop speed control or servo control with a high dynamic performance — in order to be able to implement tailored drive solutions at optimum costs, a well-conceived system is required — a system that allows only the components and functions to be used that are actually required for a specific application.
A very innovative platform concept
Regardless of the power and performance requirement, every SINAMICS drive is based upon the same hardware and software platform. This development strategy — that has been established for several years now — offers you some unique advantages: standard operation, the same selection and commissioning tools, identical options and minimum training costs. This innovative platform approach allows the optimum drive to be designed to address the widest range of target markets and combines this with the advantages of the world’s largest series of drives.

<table>
<thead>
<tr>
<th>DC</th>
<th>Medium voltage</th>
<th>AC</th>
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</thead>
<tbody>
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<td>For sophisticated applications</td>
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<tr>
<td>SINAMICS S120</td>
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<tr>
<td>SINAMICS DCM</td>
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</tbody>
</table>

For sophisticated applications:
- 0.12 – 4500 kW
- Production machines (packaging machines, textile and printing machines, machine tools, plants, process lines and rolling mills)
- v/f control/vector control/servo control

For basic and sophisticated applications:
- 75 – 1200 kW
- Test stands, crosscutters, centrifuges
- Closed-loop speed/torque control

For applications with high power ratings:
- 6 kW – 30 MW
- Rolling mill drives, wire-drawing machines, extruders and kneaders, cable railways and lifts, test stand drives
- V/f control/vector control

Pumps, fans, compressors, mixers, extruders, crushers, rolling mill lines, mine hoist drives, excavators, test stands, ship’s drives, conveyor belts, blast furnace blowers

engineering tools
STARTER — for fast commissioning, optimizing and diagnostics
Whenever your application involves pumps, fans or compressors, in the SINAMICS portfolio, you will find a solution for the simplest and the most complex application. Centrifugal pumps and gas compressors are just two examples from the wide range of applications covered by SINAMICS drives.

### Centrifugal pumps

Using our SINAMICS G-series drives, beginning with the G110 at 0.12 kW up to the GL150 at 120 MW, every conceivable centrifugal pump size in every type of pump application — from supplying water to cooling buildings and other types of flow control applications in the process industry. Energy consumption can be slashed by up to 70 % by operating pumps at a variable speed.

#### Continuous motion

**Use**
- Centrifugal pump

**Supply voltages**
- 1AC 200–240 V/3AC 380–690 V/3AC 2.3–13.4 kV

**Power**
- 0.12 kW – 120 MW

**Degree of protection**
- IP00–IP55

**SINAMICS platform**
- SINAMICS G110
- SINAMICS G120C
- SINAMICS G130
- SINAMICS G150
- SINAMICS GM/GL150

**Performance**

- Basic
- Medium

**Additional advantages:**

- More precise flow control with shorter response times
- No pressure surges in piping systems
- Damaging vibration and cavitation are avoided
- Integrated pump-specific functions

### Gas compressors

SINAMICS drives provide solutions for gas compressors in every industry and power range extending from 0.12 kW up to 120 MW. With SINAMICS, every conceivable compressor application can be implemented. SINAMICS offers a more flexible, more reliable and quieter solution versus gas turbine compression — all with significantly lower maintenance costs.

#### Continuous motion

**Use**
- Turbo compressor; reciprocating compressor

**Supply voltages**
- 1AC 200–240 V/3AC 380–690 V/3AC 2.3–13.4 kV

**Power**
- 0.12 kW – 120 MW

**Degree of protection**
- IP00–IP55

**SINAMICS platform**
- SINAMICS G110
- SINAMICS G120C
- SINAMICS G130
- SINAMICS G150
- SINAMICS GM/GL150

**Performance**

- Basic
- Medium

**Additional advantages:**

- Energy usage can be slashed by up to 70 % as a result of variable-speed compressor operation
- More precise flow rate control with shorter response times
- No ultrasonic compression surges
SINAMICS moves continuously running or high-dynamic elevators, roller feeds and many other applications extending from basic up to complex versions in conveyor technology, in material handling and in many other areas. The examples presented below for rack feeders and large conveyor belts are just two examples from the wide range of applications.

Rack feeders
SINAMICS S110 and S120 with power ratings from 0.12 up to 107 kW are admirably suited for motion control systems for synchronous and induction motors in rack feeders. Depending on the precise requirement, you can select between a solution based on the drive-integrated positioning functions Epos, a solution based on the SIMOTION motion control system or a SIMATIC-based motion control solution.

**Performance**

<table>
<thead>
<tr>
<th>Use</th>
<th>Discontinuous motion</th>
<th>Continuous motion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moving</td>
<td>Basic</td>
<td>Basic</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

**Additional advantages:**
- Precise positioning functions
- High degree of flexibility, also for multi-axis groups and for 3-dimensional motion sequences
- Energy-efficient through energy recovery
- Can be controlled with SIMOTION or SIMATIC

**Use**
- Travel drive; hoist/lowering drive; telescopic conveyor
- Conveyor systems; chain conveyor; roller conveyor

**Supply voltages**
- 3AC 380–690 V
- 3AC 380–690 V/3AC 2.3–4.16 kV

**Power**
- 0.12–107 kW
- 200 kW–5 MW (per motor)

**Degree of protection**
- IP20
- IP00–IP55

**SINAMICS platform**
- SINAMICS S110
- SINAMICS S120
- SINAMICS G130
- SINAMICS G150
- SINAMICS S120 CM
- SINAMICS S150
- SINAMICS GM150
- SINAMICS SM150

**) The requirements on torque precision/speed precision/positioning precision/axis coordination/functionalit

Large conveyor systems
Drive solutions with any power rating — with or without energy recovery — are available for conveyor systems in the cement and mining industries. With individual motor ratings extending from 200 kW up to 5 MW, every conceivable conveyor application can be implemented.

**Performance**

<table>
<thead>
<tr>
<th>Use</th>
<th>Continuous motion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moving</td>
<td>Basic</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
</tr>
</tbody>
</table>

**Additional advantages:**
- Energy consumption reduced by up to 20 % using variable-speed conveyor belt operation
- Power is exchanged between motors regenerating and motoring
- Soft, jerk-free acceleration reduces the stress on the gear units, bearings, drums and rollers
- Belt vibration and breakage are avoided

**Use**
- Conveyor systems; chain conveyor; roller conveyor

**Supply voltages**
- 3AC 380–690 V
- 3AC 380–690 V/3AC 2.3–4.16 kV

**Power**
- 200 kW–5 MW (per motor)

**Degree of protection**
- IP00–IP55

**SINAMICS platform**
- SINAMICS G130
- SINAMICS G150
- SINAMICS S120 CM
- SINAMICS S150
- SINAMICS GM150
- SINAMICS SM150

**) Requirements on the torque precision/speed precision/positioning precision/axes coordination/functionalit
Process better

For continuously running or high-dynamic extruders, centrifuges, agitators or production machines, SINAMICS drive solutions can be implemented — from the most basic application to the most complex. Thanks to pre-configured function modules, drives can shorten commissioning and start-up times, as well as reduce costs. Below are just two examples — foil stretching and injection molding — that show the capabilities of SINAMICS drives.

**Foil stretching machine**
When implementing multi-motor drives, for instance in a master-slave configuration on a foil stretching machine, the SINAMICS S120 greatly increases the productivity versus conventional drive installations.

**Injection molding machine**
By using SINAMICS S110 and S120 drives for single-axis motion control in injection molding machines, energy usage can be reduced by 50% when compared to hydraulic machines.
Machine more efficiently

SINAMICS offers the optimum drive for every machining application. Whether it involves continuous or high-dynamic spindles, or feed and auxiliary axes in machine tools for turning, milling, drilling and sawing. This includes basic or complex versions up to special machines, for example, bending or deburring machines.

Drilling machine in metal cutting
With torques of between 0.18 and 1145 Nm, SINAMICS S110 offers the highest degree of stability at high as well as at low drive speeds. Thanks to its modularity, it can be simply adapted to a wide range of performance requirements.

<table>
<thead>
<tr>
<th>Use</th>
<th>Continuous motion</th>
<th>Discontinuous motion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining</td>
<td>Drilling spindle</td>
<td>Spindle feed</td>
</tr>
<tr>
<td>Supply voltages</td>
<td>3AC 380–690V</td>
<td>3AC 380–690V</td>
</tr>
<tr>
<td>Torque</td>
<td>24 – 1145 Nm</td>
<td>0.18 – 48 Nm</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP20</td>
<td>IP20</td>
</tr>
<tr>
<td>SINAMICS platform</td>
<td>SINAMICS S110</td>
<td>SINAMICS S110</td>
</tr>
</tbody>
</table>

Additional advantages:
- High productivity through fast workpiece loading
- Fast change and simple management of programs
- Simple automation thanks to Totally Integrated Automation
- Controlled with SIMATIC

Woodworking machine
For CNC-controlled spindles and feeds in a 5D wood machining center, SINAMICS S120 drives ensure high dynamic performance with torques between 0.08 and 2602 Nm.

<table>
<thead>
<tr>
<th>Use</th>
<th>Continuous motion</th>
<th>Discontinuous motion</th>
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</thead>
<tbody>
<tr>
<td>Machining</td>
<td>Milling spindle</td>
<td>XY/yz axis adjustment; turning/swiveling milling spindle</td>
</tr>
<tr>
<td>Supply voltages</td>
<td>3AC 380–690V</td>
<td>3AC 380–690V</td>
</tr>
<tr>
<td>Torque</td>
<td>10–2602 Nm</td>
<td>0.08–1651 Nm</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP20</td>
<td>IP20</td>
</tr>
<tr>
<td>SINAMICS platform</td>
<td>SINAMICS S120</td>
<td>SINAMICS S120</td>
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</tbody>
</table>

Additional advantages:
- High performance even for low unit quantities through minimum equipping times
- High production rate for repeated parts
- Modular and scalable in performance and axis number
- Suitable for use in harsh industrial environments
- Controlled with SINUMERIK
Simple entry using the DT Configurator

The Drive Technology Configurator was developed to optimally support you when selecting products for your drive train. With its help, not only will you find the optimum drive solution from the wide range of products available, but you will also be provided with the correct order number and the associated documentation. With the pre-selection, you can also restrict the product range and determine the best product series for you. As a result, you can select your drive to precisely address the requirements of your application.

The DT Configurator supports you with:
- Selecting the drive based on the application
- The subsequent ordering process

DT Configurator supplies you with:
- A drive that is optimally tailored to your requirements
- 2D/3D models
- Operating instructions
- Data sheets

You can directly order the selected components through the Industry Mall — the Siemens e-commerce website — and without having to duplicate entries. In order to avoid making ordering mistakes, the order number is checked to ensure that it is correct.

www.siemens.com/dt-configurator
The SIZER engineering software supports you when engineering a complete drive system. Not only this, it also allows you to handle single-motor drives up to complex multi-axes drives. The workflow wizard navigates you intuitively and in a user-friendly manner through the individual engineering phases, step by step.

SIZER supports you when
- Defining the mechanical system
- Dimensioning the drive, motor and gear unit
- Configuring additional system components
- Configuring the open-loop/closed-loop control

SIZER supplies you with
- Engineering results: characteristics, technical data, layout drawings and dimension drawings
- Calculation of the load-dependent energy demand
- Calculation of the performance
- Calculation of the harmonics
- Part lists with the associated ordering data

In addition, using an integrated EDP interface, SIZER allows components to be electronically ordered, even through SAP-based systems.

Enhanced engineering reliability
A guided tour makes it easier for first-time users to get to know SIZER. The help functions integrated in SIZER support you during the complete engineering phase and provide comprehensive physical and technical background knowledge. All of this prevents possible errors when combining components — including any incorrect orders that may result.

In fact, with the latest version of SIZER, you can even optimize your energy balance. In addition to providing a load-dependent energy usage calculation, SIZER also includes a drive conversion function, which automatically selects the drive versions — and with the most favorable energy efficiency.

www.siemens.com/sizer
... commissioning drives with STARTER

STARTER is an intelligent tool that can be used for all SINAMICS drives. It allows you to simply configure and commission the drive components. More specifically, STARTER is menu-prompted and graphically supported.

STARTER commissioning software
STARTER is especially helpful in importing all of the relevant data from the electronic type plates of the drive components. This speeds up parameterization, prevents possible incorrect entries and, therefore, significantly reduces your costs.

Using integrated test functions, you can check your entries and optimize parameters. Velocity characteristics, as well as setpoint and actual value curves, are logged over time and are processed to create transparent graphics for clear diagnostics and fast orientation.

Even stronger in a team
STARTER and SIZER can run as dedicated Windows applications. They are linked to the drives via USB, serial interface, PROFIBUS DP or Ethernet/PROFINET. STARTER can also be integrated into SIMOTION SCOUT, the engineering system for the SIMOTION motion control system.

The same applies when operating the drives in conjunction with the SIMATIC industrial automation system. Embedded in STEP 7, the drive technology is completely integrated into the PLC environment.

Linking SINAMICS with SIMOTION, SIMATIC or the SINUMERIK machine tool CNC system allows completely integrated automation solutions to be created. STARTER provides configuration, parameterization and commissioning solutions from a single, central engineering software. This concept also pays off when it comes to service, as it facilitates simple diagnostics and troubleshooting on site or through tele-service.

Both SIZER and STARTER are available in English, French, German, Italian and Spanish.

www.siemens.com/starter
**Optimally integrated in the automation**

SINAMICS is an integral component of “Totally Integrated Automation”, the comprehensive and seamless product and system portfolio from Siemens.

**Totally Integrated Automation**

The integration of SINAMICS regarding engineering, data management and communication to the automation level guarantees low-cost, highly efficient solutions in conjunction with the SIMATIC, SIMOTION and SINUMERIK control systems.

**Communication**

Depending on the particular application, the optimum variable frequency drive can be selected and integrated into the automation concept. This is the reason that the drives are transparently classified according to various application types. Depending on the particular drive, a wide range of communication protocols is available:

- PROFINET
- PROFIBUS
- AS-Interface
- USS
- CANopen
- Modbus RTU
- BacNet MS/TP

SINAMICS is part of TIA, and in conjunction with the SIMATIC, SINUMERIK and SIMOTION automation systems, ensures that the performance of your plant or system is increased — from the field devices, through the controllers up to the management level.
The drive to optimize your energy efficiency

Electric drives use about two-thirds of all of the industrial power consumed. Variable frequency drives offer one of the single largest opportunities for you to reduce your facility's energy consumption. Consequently, installing drives greatly increases plant up-time while providing you with optimum process reliability. SINAMICS drives from Siemens offer you energy-efficient solutions with which you can significantly reduce your energy costs.

Slash your energy usage by up to 70% with variable-speed operation

With SINAMICS, considerable cost-saving potential can be tapped into by controlling the motor speed. There is an especially huge energy saving potential for pumps, fans and compressors that are operated with mechanical throttles and valves. Here, the conversion to variable frequency drives offers enormous economic benefits: Contrary to mechanical controls, the power drawn in the partial load operating range is always immediately adapted to the actual demand. As a consequence, energy is no longer simply wasted, which allows cost savings of up to 60% to be achieved, and in extreme cases, even up to 70%.

When compared to mechanical controls, variable-speed drives offer some significant service and maintenance advantages. Torque and current surges are greatly reduced when using drives, providing stability for your facility's power grid. Additionally, pressure surges in piping systems that cause damaging cavitation and vibration are virtually eliminated with the soft starting and stopping features of drives. This all results in a significantly longer service life of the complete drive train.

Energy recovery when braking

In conventional drive systems, the braking energy is simply dissipated in the braking resistors. The SINAMICS G and S drives are capable of energy recovery and do not require any braking resistors — they feed the braking energy back into the line supply. For example, in hoisting applications, this means that energy usage can be slashed by up to 60% — energy that you can use at another location within your plant or system. Consequently, this reduced power loss simplifies system cooling and facilitates a more compact design.

Energy management process

Efficient energy management consulting services identify the energy flows, determine the cost-saving potential and realize this by applying specific measures.
Energy equalization in the DC link
By using inverters, e.g. SINAMICS S120, for coupled drives, energy is exchanged along the common DC link bus. This direct energy exchange from inverter to inverter minimizes the power loss in the overall system, so that the power rating and/or size of the infeed can be dimensioned a lot smaller than the total power of the connected inverters.

Storing excess energy
Dynamic power peaks — caused by reversing operations for example — can be covered, and flicker can be avoided by using additional capacitors in the DC link. As a result, regenerative energy is stored rather than wasted in the form of heat.

Energy transparency in all engineering phases
Already in the engineering phase, the SIZER engineering software provides you with information about your specific energy demand. The energy consumption in the complete drive train is visualized and compared with different plant and system concepts.

SINAMICS in combination with energy-saving motors
The standard engineering extends beyond the SINAMICS drive family to the higher-level automation system as well as to a broad range of energy-efficient motors with the widest range of power classes. These motors, when compared to previous motors, have an efficiency that is up to 10% higher.

Determining the energy-saving potential with SinaSave
Using SinaSave, you can determine the cost-saving potential when using SINAMICS over the complete life cycle. This intelligent software takes into account all of the necessary plant-specific parameters as well as the values required for the process. Based on the number of work days, operating shifts and the pumping profile, SinaSave selects the optimum drive system for you. Not only this. It calculates the price of the drive system and compares its energy consumption with all of the other alternative concepts that could be considered. In addition to the specific energy-saving potential as a result of energy-efficient drive solutions based on SINAMICS, SinaSave also provides you with the payback time of the corresponding units — which is frequently just a few months.

You can now use SinaSave online — free of charge.
Visit www.siemens.com/sinasave
It is safe to say that SINAMICS Safety Integrated responds more quickly

There is an increased risk of injury wherever rotating units such as saws, rollers and spindles are used, but also where handling axes and machine slides are often moved with a high linear velocity. Safety Integrated for SINAMICS reliably masters specific hazardous situations. It has a significantly faster response time and a higher degree of functionality with generally unchanged and occasionally even increased productivity.

Lower costs, increased safety
While conventional safety technology always requires additional contactors, safety relays and interlocking circuits, for the integrated safety technology from Siemens, all of these additional electromechanical components are eliminated from the very start.

However, there is more to come: as the safety-relevant signals can be transferred via standard fieldbuses, the complexity and therefore wiring costs are reduced. As a consequence, the high requirements of the safety standards can be far more simply implemented. And not only this, as a result of the lower number of components, machine availability is increased.

Safety Integrated for SINAMICS
Almost all members of the SINAMICS family have safety functions integrated in the drive — and in many instances, an encoder is not required. These are certified according to IEC 61508/SIL 2, EN ISO 13849-1 Cat. 3 and PL d.

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**Conventional safety technology**

- Safety technology
  - Evaluate
  - Respond
- Automation
  - Control
  - Conventional bus
- Distributed I/O
- Drive
- Encoder
- Contactors

**Integrated safety technology**

- Safety technology integrated in the automation
  - Evaluate
  - Fail-safe control
  - Fail-safe fieldbus
- Distributed I/O with F modules
- SINAMICS drive with integrated safety

*Integrated safety technology reduces the number components and wiring costs*
For SINAMICS, the safety functions integrated in the drive can be roughly subdivided into two classes:

**Functions to safely stop the drive without the necessity of disconnecting the power connection to the line supply:**

**Safe Torque Off (STO)**
“Safe Torque Off” ensures that torque is no longer output at the motor shaft.

**Safe Stop (SS1) with/without encoder**
“Safe Stop 1” safely brakes drives with a high kinetic energy before STO is activated.

**Safe Stop (SS2) with encoder**
“Safe Stop 2” safely brakes drives with a high kinetic energy and activates SOS.

**Safe Operating Stop (SOS) with encoder**
“Safe operating stop” (as alternative to STO) brings the drive into closed-loop position control, maintains its position and monitors standstill.

**Safe Brake Control (SBC)**
After STO, “Safe Brake Control” activates a holding brake so that the drives can no longer move, e.g. as a result of gravity.

**Functions to safely monitor the speed of a drive:**

**Safely Limited Speed (SLS) with/without encoder**
“Safely Limited Speed” prevents specified maximum speeds from being exceeded.

**Safe Direction (SDI) with/without encoder**
“Safe Direction Monitoring” ensures that the selected direction of rotation is maintained.

**Safe Speed Monitor (SSM) with/without encoder**
“Safe Speed Monitor” signals when a specified speed is fallen below.

<table>
<thead>
<tr>
<th>Drive</th>
<th>Currently available integrated safety functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINAMICS G120C</td>
<td>STO</td>
</tr>
<tr>
<td>SINAMICS G120</td>
<td>STO, SS1, SLS, SDI, SSM</td>
</tr>
<tr>
<td>SINAMICS G120D</td>
<td>STO, SS1, SLS</td>
</tr>
<tr>
<td>SINAMICS G130/150</td>
<td>STO, SS1</td>
</tr>
<tr>
<td>SINAMICS S110</td>
<td>STO, SS1, SS2, SOS, SBC, SLS, SDI, SSM</td>
</tr>
<tr>
<td>SINAMICS S120 Booksize and Blocksize</td>
<td>STO, SS1, SS2, SOS, SBC, SLS, SDI, SSM</td>
</tr>
<tr>
<td>SINAMICS S120 Chassis and Cabinet Modules</td>
<td>STO, SS1, SS2, SOS, SLS, SSM</td>
</tr>
<tr>
<td>SINAMICS S150</td>
<td>STO, SS1, SS2, SOS, SLS, SSM</td>
</tr>
<tr>
<td>SINAMICS SM150</td>
<td>STO</td>
</tr>
</tbody>
</table>

“Avoiding accidents should not be considered as a legal obligation, but as a human responsibility and economic common sense.”

Werner von Siemens, 1880
SINAMICS G110
The versatile single-motor drive for low power ratings
The compact variable frequency drive for centrifugal pumps, radial/axial fans and compressors as well as conveyor belts, roller and chain conveyors with only three frame sizes and freely parameterizable digital inputs offers the highest possible degree of flexibility.

- Power range: 0.12–3 kW
- Simple installation and mounting
- Fast and straightforward commissioning using an optional operator panel or software engineering tool
- For variable-speed drives (V/f) connected to single-phase 200 V to 240 V line supplies
- Ideal for use with LOGO! and SIMATIC S7-200 control systems

SINAMICS G110D
The distributed single-motor drive for basic solutions
This low-profile solution with degree of protection IP65 for basic drive tasks in conveyor technology combines the Control Unit (CU) and Power Module (PM) function units.

- Continuous speed control of three-phase induction motors
- Fulfills all of the requirements of conveyor-related applications with frequency control
- Distributed topology — ideal for applications dispersed over wide areas
- Integrated into TIA via AS-Interface
- Wide power range from 0.75–7.5 kW

SINAMICS G120P
The specialist for pumps, fans and compressors
The easy-to-use standard drive that is simple to commission is especially used in building technology, the water industry and process industry for heating, ventilation and air-conditioning.

- SB interface, IOP operator unit
- Energy-efficient through minimum apparent power losses, automatic adaptation of the motor current to the actual load relationships using the ECO mode
- Automatic changeover to line operation at rated speed
- Hibernation (sleep mode) depending on the setpoint, auto-ramping function for current limiting
- Communication: USS, Modbus RTU, BacNet MS/TP, PROFINET DP, CANopen

SINAMICS G120D
The distributed single drive for high-performance solutions
The distributed, interchangeable variable frequency drive in a high degree of protection (IP65) has a low profile, is compact and thanks to its metal housing, extremely rugged; ideal for demanding conveyor-related applications in the industrial environment.

- Power range from 0.75–7.5 kW
- High efficiency thanks to energy recovery and low line harmonics
- Safety Integrated: STO, SS1 and SLS encoderless
- As a result of the modularity, low stocking costs of electronics
- Interchangeable memory card MMC
- Communication via PROFINET, PROFINET, PROFIsafe
- Part of Totally Integrated Automation
SINAMICS G120C

The compact, single-motor drive with small power rating and suitable functionality
The rugged standard drive defines new standards in its class regarding small size, fast commissioning times, extremely simple operator control, high degree of service-friendliness and integrated functionality. For example, for belt conveyors, mixers, extruders, pumps, fans, compressors and simple handling machines.

- Compact device
- Highest power density of its class
- Power range: 0.55–18.5 kW
- Simple commissioning and maintenance
- With BOP-2 or IOP operator panel
- Safety Integrated: STO
- Communication options: DP, CANopen, USS, Modbus RTU

SINAMICS G120

The modular single-motor drive for small up to medium power ratings
The rugged standard drive for universal applications in the industrial environment can even be used under extreme environmental conditions thanks to its clever cooling concept. Power modules capable of energy recovery and Control Units can be freely combined.

- Power range: 0.37–250 kW
- Safety Integrated: STO, SS1, SLS and SBC (without encoder) up to SIL2 according to IEC 61508 and up to Category 3 according to EN 954-1; in compliance with IEC 61800-5-2
- Communication via PROFIBUS, PROFINET, RS 485, USS, Modbus RTU, CANopen
- Energy-efficient thanks to energy recovery and low harmonics
- Parameter copy function for series commissioning

SINAMICS G130 / G150

The universal variable frequency drive for high-rating single-motor drives
The quiet and compact drive for single-motor applications, which do not require energy recovery, e.g. pumps, fans, compressors, extruders, mixers and crushers.

- V/f control and vector control with or without encoder
- Power range from 75 up to 2700 kW
- Simple commissioning and operator control
- Available as standard cabinet or as chassis modules
- Service-friendly thanks to easily accessible device modules
- Communication via PROFIBUS, PROFINET and other interfaces
- Energy-efficient through variable-speed operation
- Safety Integrated
- 100% line supply voltage at the motor without any secondary effects
- When required, with integrated line harmonics filter and dv/dt filter

SINAMICS S110

The specialist for basic positioning tasks
The AC/AC unit for basic positioning of single axes with synchronous or induction motors.

- Servo control
- Power ratings from 0.12–90 kW
- Safety Integrated
- Integrated positioning functions
- Simple system connection to higher-level controls (e.g. PLCs) with PROFIBUS, PROFINET, CANopen
**SINAMICS S150**

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

The ready-to-connect drive cabinet for applications requiring energy recovery, e.g. test stands, elevators, cranes, conveyor belts, presses, cable winches, centrifuges, crosscutters and shears.

- 4Q operation with energy recovery as standard
- Power range: 75–1200 kW
- Significant energy saving, especially for frequent braking cycles
- V/f control and vector control with or without encoder
- Rugged with respect to line voltage fluctuations, reactive power can be compensated
- Communication via PROFIBUS, PROFINET as well as additional interfaces
- Integrated safety functions

**SINAMICS S120**

The flexible, modular drive system for sophisticated tasks

The modular drive system in different formats for high-performance and motion control applications in single- and multi-axis configurations for synchronous and induction motors.

- Power range: 0.12–4500 kW
- Servo/vector control, V/f control
- Integrated safety and positioning functions
- Freely configurable logic and closed-loop control functions
- Additional motion control functions in conjunction with SIMOTION or SINUMERIK
- High degree of scalability, flexibility, combinability
- Energy-efficient as a result of energy recovery or DC link
- PROFIBUS/PROFINET/CANopen interface
- Different cooling types: air, liquid, cold plate cooling

**SINAMICS DCM**

The scalable DC drive for basic and demanding applications

Suitable for DC applications in all sectors, for instance, rolling mills, wire-drawing machines, extruders and kneaders, cable railways and elevators as well as test stands.

- Highest degree of scalability by being able to select between a Standard Control Unit and an Advanced Control Unit or a combination of both
- Power range: 6 kW–30 MW
- Maximum degree of flexibility for specific plant and system requirements
- Compatible to the predecessor product
- High plant availability through maximum reliability, service-friendly design and redundant concepts
- Simple and fast commissioning
- Communication via PROFIBUS, optionally PROFINET
- As ready-to-connect drive unit or Control Modules for retrofit projects
### SINAMICS GL150

**Rugged single-motor drive for high-rating synchronous motors in the medium-voltage range**

The single-motor drive that has an extremely high operational reliability is almost maintenance-free in a compact design with high power density for pumps, fans, compressors, extruders and kneaders in the double-digit Megawatt range.

- Minimized number of components through the thyristor-based design
- Power range: 2.8–120 MW
- Communication via PROFIBUS, optionally PROFINET
- Simple installation, integration and operator control

### SINAMICS GM150

**The universal drive solution for medium-voltage single drives**

For single-motor high-rating drives that do not require energy recovery, e.g. pumps, fans, compressors, extruders, mixers, crushers and main ship’s drives.

- V/f control and vector control with or without encoder
- Power range: 820 kW–17 MW
- Simple integration and installation
- Straightforward operator control
- Communication via PROFIBUS, optionally PROFINET
- Intelligent maintenance functions

### SINAMICS SM150

**The sophisticated medium-voltage drive solution for single- and multi-motor drives**

For single- and multi-motor drives with a high dynamic performance especially in rolling mills and in mining, which must be capable of energy recovery.

- 4Q operation with energy recovery as standard
- Power range: 2.8–31.5 MW
- Ideal for power exchange between regenerating and motoring applications
- High drive quality and availability
- Simple integration and installation
- Straightforward operator control
- Communication via PROFIBUS, optionally PROFINET
- Intelligent maintenance functions

### SINAMICS SL150

**The medium-voltage cycloconverter for slow-running synchronous and induction motors with a high torque**

For rolling mills, mine hoists, ore crushers and cement mills as well as open-cast mining excavators.

- 4Q operation with energy recovery as standard
- Power range 3–36 MW
- Simple design with three-phase thyristor bridges permits a high efficiency and high reliability
- Communication via PROFIBUS
- High short-time overload capability
The ideal motor for every application

A wide range of energy-efficient, low-voltage, geared, explosion-protected and high-voltage motors is available for use with SINAMICS drives.

<table>
<thead>
<tr>
<th>Low-voltage motors</th>
<th>Induction</th>
<th>Synchronous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low dynamic performance</td>
<td>Average up to high dynamic performance</td>
<td>Avg. up to very high dynamic performance</td>
</tr>
<tr>
<td>Induction motors for line and drive operation</td>
<td>Induction/synchronous; servo and main motors</td>
<td>Permanent magnet direct drives for rotary axes/linear axes</td>
</tr>
</tbody>
</table>

| Maximum speed | Drive operation: up to 12,000 rpm | Up to 20,000 rpm | Up to 1700 rpm; up to 836 m/min |
| Rated power | IEC: 0.09 ... 4000 kW NEMA: 1 ... 400 HP | 0.05 ... 1340 kW | 3.1 ... 2150 kW (4.22 ... 2924 HP) |
| Rated torque, rated force | IEC: 0.61 ... 38,000 Nm NEMA: 1.5 ... 1772 lb-ft | 0.08 ... 12,415 Nm | 100 ... 42,000 Nm |
| EX protection | Optional: IEC: Ex nAII T3 (Zone 2) or dust-Ex (Zone 21,22) Zone 1: IEC: Ex e II, Ex de IIC, Ex d IEC, Ex de I, Ex d I, Ex p I and double protection Ex d plus Ex e NEMA: Class I, Group D, Class II, Groups F&G, Division 1, Class I, Groups C&D, Division 1 | Optional: Zone 2,22 IEC: (E) Exn (Zone 2) or dust-Ex (Zone 22) | – |
| SINAMICS | SINAMICS G110, G120, S110, S120, G130, G150, S150 | SINAMICS G120\(^1\), G130\(^1\), G150\(^1\), S110, S120, S150 | SINAMICS S120, G130\(^1\), G150\(^1\), S150 |
| Typical applications | Pumps, fans, compressors, conveyor technology with special requirements regarding low weight and the highest possible efficiency, marine applications, offshore, mixers, crushers, extruders, rolling with special requirements on the ruggedness especially in the chemical and petrochemical industry | High up to the highest dynamic applications and applications with higher power ratings demanding a high-dynamic performance and compact design, e.g. printing machines, extruders, main spindle drives in machine tools, robots and handling systems, wood, glass, ceramic and stone processing, packaging, plastics and textile machines and in the machine tool area | Extruders, swiveling axes, rotary and rotary indexing tables, tool magazines, revolver and drum indexing, rotary spindles, rolling drives with high requirements on the dynamic performance and precision for linear motion, e.g. machining centers, turning, grinding, laser machining, handling and in the machine tool area |

\(^1\) only induction motors  
\(^2\) Synchronous motors only without encoder
**SINAMICS** can be combined with a wide range of energy-efficient synchronous or induction motors. No matter where you want to go or what you are trying to achieve, you’ll always reach your objective with an ideal, integrated solution from Siemens.

<table>
<thead>
<tr>
<th>Geared motors</th>
<th>DC motors</th>
<th>High-voltage motors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induction</td>
<td>Synchronous</td>
<td>Induction/synchronous</td>
</tr>
<tr>
<td>Low dynamic performance</td>
<td>High dynamic performance</td>
<td>Medium dynamic performance</td>
</tr>
<tr>
<td>Geared motors for line and converter operation</td>
<td>Geared servomotors with coaxial planetary gear</td>
<td>DC motors for variable-speed operation</td>
</tr>
<tr>
<td>Up to 1088 rpm</td>
<td>Up to 1500 rpm</td>
<td>Converter operation: up to 15,000 rpm</td>
</tr>
<tr>
<td>0.09 ... 200 kW (0.12 ... 272 HP)</td>
<td>0.3 ... 57 kW (0.41 ... 77.52 HP)</td>
<td>Up to 1610 kW (2189.6 HP)</td>
</tr>
<tr>
<td>40 ... 360,000 Nm</td>
<td>2 ... 3400 Nm</td>
<td>Up to 44,500 Nm</td>
</tr>
<tr>
<td>IP55, IP56, IP65</td>
<td>IP64, IP65</td>
<td>IP23, IP54</td>
</tr>
<tr>
<td>Optional: Zone 1, 2, 21, 22</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SINAMICS G110, G120, S110, S120</td>
<td>SINAMICS S110, S120,</td>
<td>SINAMICS DCM</td>
</tr>
<tr>
<td>Simple positioning tasks and continuously running auxiliary drives with servo quality (production machines, high bay racking units, filling plants, transport conveyors, positioning tasks in machine tools, production machines, robots and handling systems, auxiliary axes, conveyor technology, cooling tower drives, agitators, pumps and mixers, crane systems, washing lines, food industry, solar technology, elevators, escalators, theater drives, presses, heavy load applications e.g. in the area of steelworks and power stations</td>
<td>Motors for standard drive applications in all industry sectors and in the infrastructure, especially rolling mill drives, wire-drawing machines, extruders and kneaders, cable railways and lifts, test stand drives</td>
<td>Medium- and high-voltage drive applications, especially pumps, compressors, blowers, extruders, mixers, crushers, conveyor belt systems, ship’s propulsion systems, compressors, blast furnace blowers, refiners</td>
</tr>
<tr>
<td>Customer-specific motors and drive solutions — Together with customers, we design individual motors up to integrated mechatronic drive solutions that go far beyond the range shown here</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Technical data

<table>
<thead>
<tr>
<th>Designation</th>
<th>SINAMICS G110</th>
<th>SINAMICS G110D</th>
<th>SINAMICS G120P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Continuous motion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pumping, ventilating, compressing</td>
<td>Basic</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Moving</td>
<td>Basic</td>
<td>Basic</td>
<td></td>
</tr>
<tr>
<td>Processing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machining</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Discontinuous motion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pumping, ventilating, compressing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moving</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machining</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type of construction</strong></td>
<td>Blocksize unit</td>
<td>Blocksize unit</td>
<td>Blocksize unit</td>
</tr>
<tr>
<td><strong>Drive type</strong></td>
<td>AC/AC unit ready to be connected</td>
<td>AC/AC unit ready to be connected</td>
<td>AC/AC unit, modular</td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
<td>IP20</td>
<td>IP65</td>
<td>• With operator unit: IP54/UL Type 12</td>
</tr>
<tr>
<td>• With blanking cover: IP55/UL Type 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Line voltage $V_{bus}$/power ranges</strong></td>
<td>0.12 ... 3 kW</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>1AC 200 ... 240 V</td>
<td>0.12 ... 3 kW</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3AC 380 ... 480 V</td>
<td>–</td>
<td>0.75 ... 7.5 kW ±10 %</td>
<td>–</td>
</tr>
<tr>
<td>3AC 500 ... 600 V</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3AC 500 ... 690 V</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3AC 660 ... 690 V</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>1AC 85 ... 3AC 950 V</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3AC 2.3 ... 36 kW motor voltage 1.5 ... 13.4 kV</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Current infeed</strong></td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
</tr>
<tr>
<td><strong>Energy recovery</strong></td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Output frequency</strong></td>
<td>0 ... 650 Hz</td>
<td>0 ... 200 Hz (U/f)</td>
<td>0 ... 200 Hz (U/f)</td>
</tr>
<tr>
<td><strong>Closed-loop control mode</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$U/f$ control</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Vector control with / without encoder</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Servo control with / without encoder</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Closed-loop speed/torque control</td>
<td>Yes</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Motors</strong></td>
<td>Induction motors</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Synchronous motors</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Torque motors</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Linear motors</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Control dynamic performance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vector control (SINAMICS DCM: V/I control)</td>
<td>Rise time, speed control</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Servo control</td>
<td>Rise time, speed control</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Rise time torque control</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Technological functions</strong></td>
<td>Flying restart, automatic restart, compound braking (2- or 3-wire control), DC braking</td>
<td>Flying restart, automatic restart, BICO technology, technology controller, free function blocks, compound braking, DC braking, dynamic braking</td>
<td>Automatic restart, energy-saving mode, hibernation, flying restart, motor staging, 4 PID technology controllers, logical and arithmetic functions, extended emergency service operation, multi-zone controller, bypass</td>
</tr>
<tr>
<td><strong>Safety functions</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Communication profiles</strong></td>
<td>RS 485</td>
<td>RS 232, AS-Interface</td>
<td>USS, Modbus RTU, BacNet MS/TP, PROFIBUS DP, CANopen</td>
</tr>
<tr>
<td><strong>Catalog</strong></td>
<td>D11.1</td>
<td>D11.1</td>
<td>D11.1</td>
</tr>
</tbody>
</table>

1) Being prepared  
2) For 4 kHz pulse frequency  
3) For 2 kHz pulse frequency (others on request)  
4) Max. output voltage in individual cases depends on the motor packaging.
<table>
<thead>
<tr>
<th>SINAMICS G120D</th>
<th>SINAMICS G120C</th>
<th>SINAMICS G120</th>
<th>SINAMICS G130</th>
<th>SINAMICS G150</th>
<th>SINAMICS S110</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic/medium</td>
<td>Medium</td>
<td>Basic/medium</td>
<td>Basic/medium</td>
<td>Basic/medium</td>
<td>Basic/medium</td>
</tr>
<tr>
<td>Medium</td>
<td>Basic/medium</td>
<td>Medium</td>
<td>Basic/medium</td>
<td>Basic/medium</td>
<td>Basic/medium</td>
</tr>
<tr>
<td>Basic/medium</td>
<td>Basic/medium</td>
<td>Basic/medium</td>
<td>Basic/medium</td>
<td>Basic/medium</td>
<td>Basic/medium</td>
</tr>
<tr>
<td>Technological functions</td>
<td>Flying restart, automatic restart, kinetic buffering, BICO technology, technology controller, free function blocks, compound braking, DC braking, dynamic braking</td>
<td>Frequency converter for variable-speed single drives</td>
<td>Frequency converter for variable-speed single drives</td>
<td>Frequency converter for variable-speed single drives</td>
<td>Single-axis positioning drive</td>
</tr>
<tr>
<td>Blocksize unit</td>
<td>Blocksize unit</td>
<td>Blocksize unit</td>
<td>Chassis unit</td>
<td>Converter cabinet unit</td>
<td>Blocksize unit</td>
</tr>
<tr>
<td>AC/AC unit, modular</td>
<td>AC/AC unit, compact</td>
<td>AC/AC unit, modular</td>
<td>AC/AC unit, modular</td>
<td>AC/AC unit ready to be connected up</td>
<td>AC/AC unit, modular</td>
</tr>
<tr>
<td>IP65</td>
<td>IP20</td>
<td>IP20</td>
<td>IP00/IP20</td>
<td>IP20 (IP21/IP23/IP43/ IP54)</td>
<td>IP20</td>
</tr>
<tr>
<td>0.75 ... 7.5 kW</td>
<td>0.55 ... 18.5 kW</td>
<td>0.37 ... 250 kW</td>
<td>110 ... 560 kW</td>
<td>110 ... 900 kW</td>
<td>0.37 ... 90 kW</td>
</tr>
<tr>
<td>0 ... 650 Hz</td>
<td>0 ... 650 Hz</td>
<td>0 ... 650 Hz (V/f)</td>
<td>0 ... 300 Hz</td>
<td>0 ... 300 Hz</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>35 ... 40 ms</td>
<td>35 ... 40 ms</td>
<td>11 ... 15 ms</td>
<td>11 ... 15 ms</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>approx. 3 ms</td>
<td>approx. 3 ms</td>
<td>2 ... 3 ms</td>
<td>2 ... 3 ms</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>5 ... 7 ms/²</td>
<td>1 ... 2 ms/²</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Flying restart, automatic restart, kinetic buffering, BICO technology, technology controller, free function blocks, compound braking, DC braking, dynamic braking</td>
<td>Flying restart, automatic restart, kinetic buffering, BICO technology, technology controller, Drive Control Chart</td>
<td>Basic positioner, BICO technology, technology controller, controller optimization using auto-tuning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STO, SS1, SLS</td>
<td>STO, SS1, SLS, SDI, SSM SBC</td>
<td>STO, SS1</td>
<td>STO, SS1</td>
<td>STO, SOS, SBC, SS1, SS2, SDI, SSM SBC</td>
<td></td>
</tr>
<tr>
<td>PROFIBUS and PROFINET, also with PROFIDrive profile 4 with PROFIsafe</td>
<td>PROFIBUS DP, CAN, USS, Modbus RTU</td>
<td>RS 232, RS 485, PROFIBUS and PROFINET, also with PROFIDrive profile 4 with NAMUR, with PROFI safe; Modbus RTU, CANopen</td>
<td>RS 232, RS 485, PROFIBUS DP, CANopen, PROFINET (PROFIDrive profile 4 with NAMUR), PROFI safe</td>
<td>PROFIBUS DP, PROFINET®, CANopen, pulses/direction interface, USS protocol</td>
<td></td>
</tr>
<tr>
<td>D11.1</td>
<td>D11.1</td>
<td>D11.1</td>
<td>D11</td>
<td>PM22</td>
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</table>

5) In conjunction with SINUMERIK up to 1300 Hz
### SINAMICS S120

<table>
<thead>
<tr>
<th>Blocksize unit</th>
<th>Chassis unit</th>
<th>Booksize unit</th>
<th>Chassis unit</th>
<th>Cabinet Modules</th>
<th>Converter cabinet unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC/AC unit, modular</td>
<td>AC/AC unit, modular</td>
<td>DC/AC unit, modular</td>
<td>AC/AC unit, modular</td>
<td>IP20</td>
<td>AC/AC unit ready to be connected up</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power range</th>
<th>Uncontrolled</th>
<th>Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.12 ... 0.75 kW</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>0.37 ... 90 kW</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>110 ... 250 kW</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1.6 ... 107 kW</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>110 ... 3000 kW</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1.6 ... 3000 kW</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>110 ... 800 kW</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>75 ... 4500 kW</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>75 ... 1200 kW</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor type</th>
<th>0.12 ... 0.75 kW</th>
<th>0.37 ... 90 kW</th>
<th>110 ... 250 kW</th>
<th>1.6 ... 107 kW</th>
<th>110 ... 3000 kW</th>
<th>1.6 ... 3000 kW</th>
<th>110 ... 800 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</table>

<table>
<thead>
<tr>
<th>Motor type</th>
<th>200 Hz</th>
<th>160 Hz</th>
<th>300 Hz</th>
<th>0 ... 400 Hz</th>
<th>0 ... 200 Hz</th>
<th>0 ... 160 Hz</th>
<th>0 ... 300 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor type</th>
<th>8 ... 10 ms²</th>
<th>11 ... 15 ms²</th>
<th>11 ... 15 ms²</th>
<th>11 ... 15 ms²</th>
<th>11 ... 15 ms²</th>
<th>11 ... 15 ms²</th>
<th>11 ... 15 ms²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</table>

### SINAMICS S150

<table>
<thead>
<tr>
<th>Blocksize unit</th>
<th>Chassis unit</th>
<th>Booksize unit</th>
<th>Chassis unit</th>
<th>Cabinet Modules</th>
<th>Converter cabinet unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC/AC unit, modular</td>
<td>AC/AC unit, modular</td>
<td>DC/AC unit, modular</td>
<td>AC/AC unit, modular</td>
<td>IP20</td>
<td>AC/AC unit ready to be connected up</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power range</th>
<th>Uncontrolled</th>
<th>Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Medium/high</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Low</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor type</th>
<th>0.12 ... 0.75 kW</th>
<th>0.37 ... 90 kW</th>
<th>110 ... 250 kW</th>
<th>1.6 ... 107 kW</th>
<th>110 ... 3000 kW</th>
<th>1.6 ... 3000 kW</th>
<th>110 ... 800 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor type</th>
<th>200 Hz</th>
<th>160 Hz</th>
<th>300 Hz</th>
<th>0 ... 400 Hz</th>
<th>0 ... 200 Hz</th>
<th>0 ... 160 Hz</th>
<th>0 ... 300 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor type</th>
<th>8 ... 10 ms²</th>
<th>11 ... 15 ms²</th>
<th>11 ... 15 ms²</th>
<th>11 ... 15 ms²</th>
<th>11 ... 15 ms²</th>
<th>11 ... 15 ms²</th>
<th>11 ... 15 ms²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

RS 232, RS 485, PROFIBUS DP, PROFINET, PROFIsafe, CANopen (in conjunction with CU320)
### Communication profiles

- STO
- SS1
- SLS
- SDI
- SSM
- SBC

### Safety functions

- Flying restart, automatic
- Compound braking
- Dynamic braking
- Brake resistor

### Technological functions

- V/I control
- Vector control

### Motors

<table>
<thead>
<tr>
<th>SINAMICS DCM</th>
<th>SINAMICS GL150</th>
<th>SINAMICS GM150</th>
<th>SINAMICS SM150</th>
<th>SINAMICS SL150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency converter for synchronous motors with the highest power rating</td>
<td>Frequency converter for medium-voltage variable-speed drives</td>
<td>Frequency converter for demanding single- and multi-axis applications in the medium-voltage range</td>
<td>Cycloconverter for slow-speed synchronous and induction motors with a high torque</td>
<td></td>
</tr>
<tr>
<td>DC converter unit</td>
<td>Converter cabinet unit</td>
<td>Converter cabinet unit</td>
<td>Converter cabinet unit</td>
<td>Converter cabinet unit</td>
</tr>
<tr>
<td>AC/DC unit, compact</td>
<td>AC/DC unit ready to be connected up</td>
<td>AC/DC units are ready to be connected up</td>
<td>AC/DC unit, ready to connect up, DC bus system for several motors connected to a common DC bus</td>
<td>AC/DC unit ready to be connected up</td>
</tr>
<tr>
<td>IP00/IP20</td>
<td>Air-cooled IP20 (opt. IP42), liquid-cooled IP41 (opt. IP54)</td>
<td>Air-cooled IP22 (opt. IP42), liquid-cooled IP43 (opt. IP54)</td>
<td>IP43 (opt. IP54)</td>
<td>Control section: IP20 Power unit: IP41, optional IP54</td>
</tr>
<tr>
<td>–</td>
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<td>–</td>
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<tr>
<td>–</td>
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<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>6 ... 2508 kW (parallel connection up to 30 MW)</td>
<td>2.8 ... 120 MW</td>
<td>820 ... 17,000 kW (for induction motors)</td>
<td>2800 ... 31,500 kW</td>
<td>3000 ... 36,000 kW</td>
</tr>
<tr>
<td>–</td>
<td>Controlled</td>
<td>Uncontrolled</td>
<td>Controlled</td>
<td>Controlled</td>
</tr>
<tr>
<td>Yes, with the appropriate version</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>0 ... 125 Hz</td>
<td>0 ... 250 Hz</td>
<td>0 ... 30 Hz</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
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<td>–</td>
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<tr>
<td>–</td>
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</tr>
</tbody>
</table>

### Drive Control Chart

- Flying restart, automatic restart, kinetic buffering, Drive Control Chart, BICO technology
- Flying restart, automatic restart, Drive Control Chart, BICO technology

### RS 232, RS 485, PROFIBUS DP, PROFINET

- RS 232, RS 485, PROFIBUS DP, PROFINET
- RS 232, RS 485, PROFIBUS DP, PROFINET
- PROFIBUS DP

### Breakdown

- D11
- D12
- D21
- D21.3
- D22
- D23.1

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**Notes:**
- LS: Safely Limited Speed
- SSM: Safe Speed Monitor
- High
- Medium/high
- High
- Medium/high
- High
- Medium/high
- High
- Medium/high
- High
- Medium/high
- High
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