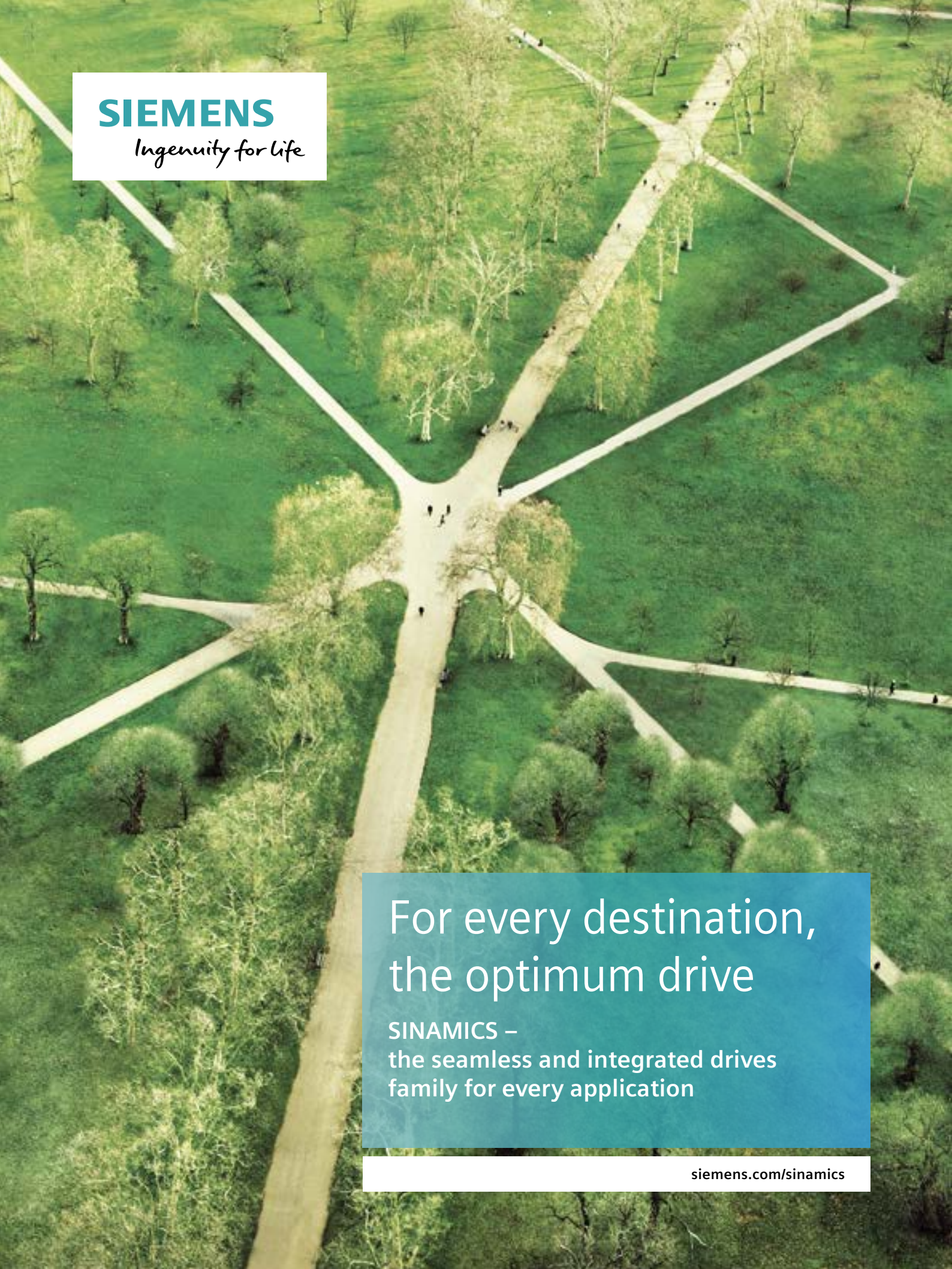

SIEMENS
Ingenuity for life
For every destination, the optimum drive
SINAMICS –
the seamless and integrated drives family for every application
siemens.com/sinamics

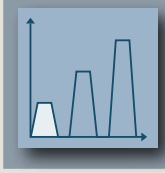
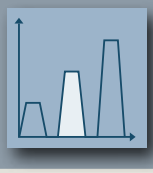
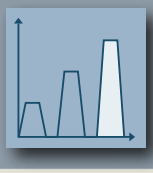
SINAMICS – for every application, power and performance

Use \ Performance*)	Continuous motion – Basic	Continuous motion – Medium	Continuous motion – High
Pumping/ ventilating/ compressing	Centrifrugal pumps Radial/axial fans Compressors		Excentric worm pumps
Moving	Belt conveyors Roller conveyors Chain conveyors	Conveyor belts Roller conveyors Chain conveyors Vertical material handling Elevators Escalators Gantry cranes Marine drives Cable railways	Elevators Container cranes Mine hoists Opencast mine excavators Test stands
Processing	Mills Mixers Kneaders Crushers Agitators Centrifuges	Mills Mixers Kneaders Crushers Agitators Centrifuges Extruders Rotary furnaces	Extruders Winders/unwinders Leading/following drives Calenders Main press drives Printing machines
Machining	Main drives for • Turning • Milling • Drilling	Main drives for • Drilling • Sawing	Main drives for • Turning • Milling • Drilling • Gear cutting • Grinding

*) Requirements regarding torque accuracy/speed accuracy/positioning accuracy/axis coordination/functionality

Scan in the QR code and look at the SINAMICS application video

SINAMICS is the most comprehensive drive family available today. It is based on a straightforward, standard engineering, is energy-efficient and so future-proof that it can keep up with every innovation step. Whatever direction you take, Siemens can offer you the optimum drive for it. Select your application, find your converter – power and performance for each and every application. SINAMICS – the powerful name in drive technology.

Discontinuous motion		
 Basic	 Medium	 High
Hydraulic pumps Dosing pumps		Descaling pumps Hydraulic pumps
Accelerating conveyors Storage and retrieval machines	Accelerating conveyors Storage and retrieval machines Cross cutters Roll changers	Storage and retrieval machines Robotics Pick & place Rotary indexing machines Cross cutters Roll feeds Engaging/ disengaging function
Tubular bagging machines Single-axis motion control such as • Position profiles • Path profiles		Servo presses Rolling mill drives Multi-axis motion control • Multi-axis positioning • Cam discs • Interpolations
Axis drives for • Turning • Milling • Drilling	Axis drives for • Drilling • Sawing	Axis drives for • Turning • Milling • Drilling • Lasering • Gear cutting • Grinding • Nibbling and punching

At home in your sector
No matter whether it involves the operation of pumps, fans, compressors or moving conveyor belts or elevators, whether processing in mills or extruders, whether milling, turning, drilling or sawing – with SINAMICS, you always achieve your goals. Pumping, ventilating and compressing as well as moving, processing and machining – these are all applications, where Siemens can 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. You can minimize your costs with SINAMICS – with seamless and integrated tools for selecting, engineering and commissioning, which facilitate fast, straightforward engineering at a favorable price.

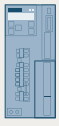
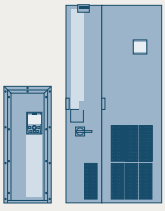
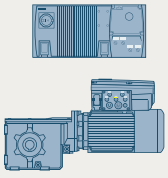
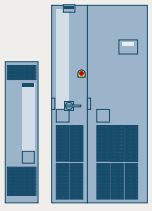
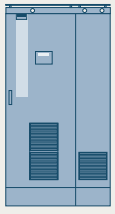
Perfect interaction based on Integrated Drive Systems (IDS)
Siemens Integrated Drive Systems (IDS) are the only real complete solution for complete drive trains worldwide. IDS guarantee that all of the drive components seamlessly operate with one another. Converters and motors as well as couplings and gearboxes are perfectly coordinated and harmonized with one another. This means that you profit from maximum productivity, highest energy efficiency and reliability. The extensive range of SINAMICS converters means that we have the optimum product for every conceivable drive solution – guaranteeing seamless integration with all of the other components of Integrated Drive Systems.

The entire family at a glance

With SINAMICS, Siemens is providing a platform, that satisfies the high requirements in the low-voltage, DC voltage and the medium-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, plant and machinery 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 that are extremely easy to use, have a high efficiency and have integrated safety technology.

Low voltage AC

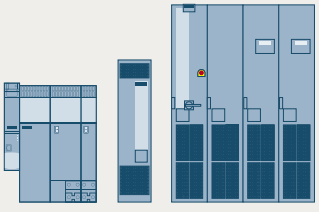
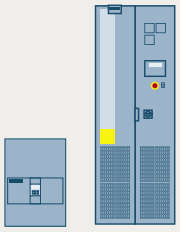
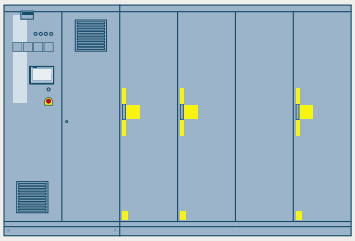
Basic Performance		General Performance					
							
SINAMICS V20	SINAMICS V90	SINAMICS G120C	SINAMICS G120P / G120P Cabinet	SINAMICS G120	SINAMICS G110D / G120D / G110M	SINAMICS G130 / G150	SINAMICS G180
V/f control	Servo control (speed and torque) with encoder	V/f control, vector control without encoder		V/f control, vector control with/ without encoder	V/f control (G110D), sensorless vector control (G120D / G110M)	V/f control, vector control with/ without encoder	V/f control, vector control with encoder
0.12 – 30 kW	0.05 – 7 kW	0.55 – 18.5 kW	0.37 – 630 kW	0.55 – 250 kW	0.37 – 7.5 kW	75 – 2,700 kW	2.2 – 6,600 kW
Pumps, fans, compressors, conveyor belts, mixers, mills, spinning machines, textile machines	Handling machines, packaging machines, automatic assembly machines, metal-forming machines, printing machines, winders and unwinders	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders	Pumps, fans, compressors, building technology, process industry, HVAC	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders, single-axis positioning applications in plant and machinery construction	Conveyor technology, single-axis positioning applications (G120D)	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders	Sector-specific for pumps, fans, compressors, conveyor belts, extruders, mixers, mills, kneaders, centrifuges, separators
Engineering tools:							

*Exceptions:
V20: needs no tool; V90: Commissioning tool SINAMICS V-ASSISTANT; G180: Commissioning software IMS (Inverter Management Software)

Customized solutions
Whether single- or multi-axis applications, basic speed control or closed-loop servo control with a high dynamic performance: In order to cost-effectively address customized 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 actually used.

Innovative platform concept
Independent of the power and performance, all of the products of the family are based on the same hardware and software platform. This established development strategy 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.

IDS – perfect integration
Siemens Integrated Drive Systems (IDS) provide you with perfectly harmonized and coordinated drive components with which you can address your requirements. As Integrated Drive System, the drive components can fully leverage their strengths, from engineering, through commissioning up to operation. The DT-Configurator seamlessly configures the overall system. Simply select a motor and converter, and dimension them using the SIZER engineering tool. The STARTER commissioning tool integrates the motor data at the same time and ensures that you can efficiently commission your drive system. Integrated Drive Systems are embedded in the TIA Portal – this simplifies engineering, commissioning and diagnostics.

			DC voltage DC	Medium voltage AC		
	High Performance		For basic applications and demanding applications	For demanding applications with high power ratings		
						
SINAMICS S110	SINAMICS S120/S120M	SINAMICS S150	SINAMICS DCM	SINAMICS GL150/SL150	SINAMICS SM120 CM/ SM150/GM150	SINAMICS GH150/GH180 (cell-based)
Servo control	V/f control, vector control with/without encoder, servo control with/without encoder		Speed control, torque control	V/f control, vector control		
0.55–132 kW	0.55 – 5,700 kW	75 – 1,200 kW	6 kW – 30 MW	2.8 – 85 MW	0.8 – 31.5 MW	0.15 – 28.5 MW
Single-axis positioning applications in plant and machinery construction	Production machines (packaging, textile and printing machines, paper machines, plastics machines), machine tools, plants, process lines and rolling mills, marine and test stands	Test stands, cross cutters, centrifuges	Rolling mill drives, wire drawing machines, extruders and kneaders, cable railways and lifts, test stand drives	Pumps, fans, compressors, mixers, extruders, mills, rolling lines, mine hoist drives, excavators, test stands, ships' drives, conveyor belts, blast furnace blowers	Pumps, fans, test stands, ore conveying systems, ore mills, compressors, excavators, marine drives	Pumps, fans, compressors, mills, crushers, conveyor systems, retrofit projects

Drive Technology Configurator – selection and configuration
SIZER – simple planning and engineering
STARTER and SINAMICS Startdrive – for fast commissioning*, optimizing and diagnostics

Pumping, ventilating and compressing

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

With SINAMICS V20 up to SINAMICS GL150 – from 0.12 kW up to 85 MW – every conceivable centrifugal pump drive can be implemented for building technology, water supply and the process industry.
Energy consumption can be slashed by up to 70% by operating pumps at a variable speed.

Performance*) / Use	Continuous motion	
	Basic	Medium
Pumping/ventilating/ compressing	Centrifugal pump	
Supply voltages	1AC 200–240 V / 3AC 380–690 V / 3AC 2.3–12 kV	
Power	0.12 kW–85 MW	
Degree of protection	IP00–IP55	
SINAMICS platform	SINAMICS V20 SINAMICS G120P SINAMICS G120C SINAMICS GM / GL150 SINAMICS GH180	SINAMICS G120P SINAMICS G130 / G150 SINAMICS G180 SINAMICS GM / GL150 SINAMICS GH180 SINAMICS GH150

*) Requirements relating to torque / speed / functionality

Further advantages:

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

Gas compressors

Drive solutions for gas compressors in all sectors and power classes from 0.12 kW to 85 MW. With SINAMICS, every conceivable compressor application can be implemented – when compared to gas turbine concepts, significantly more flexible, efficient, quiet and reliable. With significantly lower maintenance costs.

Performance*) / Use	Continuous motion	
	Basic	Medium
Pumping/ventilating/ compressing	Turbo compressor; reciprocating compressor	
Supply voltages	1AC 200–240 V / 3AC 380–690 V / 3AC 2.3–12 kV	
Power	0.12 kW–85 MW	
Degree of protection	IP00–IP55	
SINAMICS platform	SINAMICS V20 SINAMICS G120P SINAMICS G120C SINAMICS GM / GL150 SINAMICS GH180 SINAMICS GH150	SINAMICS G120P SINAMICS G130 / G150 SINAMICS G180 SINAMICS GM / GL150 SINAMICS GH150 SINAMICS GH180

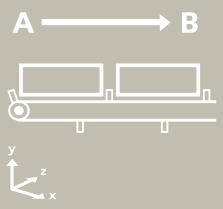
*) Requirements relating to torque / speed / functionality

Further advantages:

- Up to 70% lower energy demand for variable-speed compressor operation
- More precise flow rate control with shorter response times
- No ultrasonic compression surges

Move more

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 storage and retrieval machines and large conveyor belts are just two examples from the wide range of applications.



Storage and retrieval machines

SINAMICS S110 and S120, with power ratings from 0.12 kW up to 107 kW, are predestined for controlling the motion of synchronous and induction motors in storage and retrieval machines. Depending on the specific requirement, you can select between a solution based on the drive-integrated positioning Epos function, a solution based on the SIMOTION motion control system or a SIMATIC-based motion control solution.

Performance*) / Use	Discontinuous motion		
	Basic	Medium	High
Moving	Travel drive; hoist/lowering drive; telescopic conveyor		
Supply voltages	3AC 380–480 V		
Power	0.37–132 kW		
Degree of protection	IP20		
SINAMICS platform	SINAMICS G110M SINAMICS V90	SINAMICS G120D SINAMICS S110	SINAMICS S120

*) Requirements regarding torque accuracy / speed accuracy / positioning accuracy / axis coordination / functionality

Further advantages:

- Precise positioning functions
- High degree of flexibility, also for multi-axis groups and for 3-dimensional motion sequences
- Energy-efficient as a result of its energy recovery capability
- Can be controlled with SIMATIC or SIMOTION

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*) / Use	Continuous motion	
	Basic	Medium
Moving	Conveyor systems; chain conveyors; roller conveyors	
Supply voltages	3AC 380–690 V / 3AC 2.3–4.16 kV	
Power	200 kW–40 MW	
Degree of protection	IP00–IP55	
SINAMICS platform	SINAMICS G130 / G150 SINAMICS G180 SINAMICS GM150 / SL150 SINAMICS SM150 SINAMICS SM120 CM SINAMICS S120	

*) Requirements placed on the torque accuracy / speed accuracy / positioning accuracy / axis coordination / functionality

Further advantages:

- Energy consumption slashed by up to 20% when using variable-speed conveyor belt operation
- Power is exchanged between regenerating and motoring motors
- Soft, jerk-free acceleration reduces the stress on gearboxes, bearings, drums and rollers
- Belt vibration and breakage are avoided

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. Preconfigured function modules result in significantly lower costs and shorter time. Foil stretching and injection molding machines are two examples.

Foil stretching machine

When implementing multi-motor drives, for instance in a master-slave on a foil stretching machine, the SINAMICS S120 greatly increases the productivity when compared to conventional drive concepts.

Performance*) / Use	Continuous motion
	High
Processing	Extruder; casting roll; take-off roll; longitudinal stretcher; transverse stretcher; take-off roll; film handling; suction roll; winder
Supply voltages	3AC 380–690 V
Power	0.55–5,700 kW
Degree of protection	IP20
SINAMICS platform	SINAMICS S120

*) Requirements regarding torque accuracy / speed accuracy / functionality

Additional advantages:

- Individual closed-loop control of each drive location
- High degree of flexibility through fast, simple reequipping
- Overview of the complete plant or system, production and possible faults using a seamlessly integrated automation concept

Injection molding machine

By using SINAMICS S110 and S120 drives for single-axis motion control in injection molding machines, energy usage can be slashed by 50% when compared to hydraulic machines.

Performance*) / Use	Discontinuous motion	
	Medium	High
Processing	Dosing; injection; close tool; ejector; carrier	
Supply voltages	3AC 380–480 V	
Power	0.55–250 kW	
Degree of protection	IP20	IP20
SINAMICS platform	SINAMICS S110 SINAMICS V90	SINAMICS S120

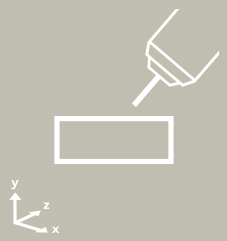
*) Requirements regarding torque accuracy / speed accuracy / positioning accuracy / axis coordination / functionality

Additional advantages:

- Faster tool change based on standard components
- Highest degree of flexibility thanks to a scalable solution
- Low environmental stress and noise by using water cooling
- Individually adaptable application solution

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 and complex versions up to special machines, for example, bending or deburring machines.



Drilling machine for metal processing

With torques of between 0.18 and 1,145 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 address a wide range of performance requirements.

Performance*) / Use	Continuous motion	Discontinuous motion
	Medium	Medium
Machining	Drilling spindle	Spindle feed
Supply voltages	3AC 380–690 V	3AC 380–690 V
Torque	24–1,145 Nm	0.18–48 Nm
Degree of protection	IP20	IP20
SINAMICS platform	SINAMICS S110	SINAMICS S110

*) Requirements regarding torque accuracy / speed accuracy / positioning accuracy / axis coordination / functionality

Additional advantages:

- High degree of productivity through fast retooling
- 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 2,602 Nm.

Performance*) / Use	Continuous motion	Discontinuous motion
	High	High
Machining	Milling spindle	X/Y/Z axes adjustment; turning / swiveling milling spindle
Supply voltages	3AC 380–690 V	3AC 380–690 V
Torque	10–2,602 Nm	0.08–1,651 Nm
Degree of protection	IP20	IP20
SINAMICS platform	SINAMICS S120	SINAMICS S120

*) Requirements regarding torque accuracy / speed accuracy / positioning accuracy / axis coordination / functionality

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

Tools for efficient engineering

Siemens supports you when identifying energy-saving potential and allows the energy efficiency of products and applications to be analyzed. We offer a professional portfolio of tools, from configuring basic drive components up to engineering and ordering complex drive systems and solutions. Siemens also provides you with the optimum solution when it comes to commissioning and integrating into the automation landscape.

Simple entry using the DT Configurator

Irrespective of which direction you take or your particular application – SINAMICS has the optimum converter to take you forward. The DT Configurator supports you, to select the optimum drive solution for your particular application.

The Drive Technology Configurator (DT Configurator) supports you when configuring the optimum drive products for your application – from gearboxes, motors, converters and the associated options and components up to control systems, software licenses and connection systems. Whether with detailed product knowledge or just a little: You can easily and quickly configure your particular drive using product group pre-selectors, by specifically navigating through selection menus or by entering article numbers directly to select the products.

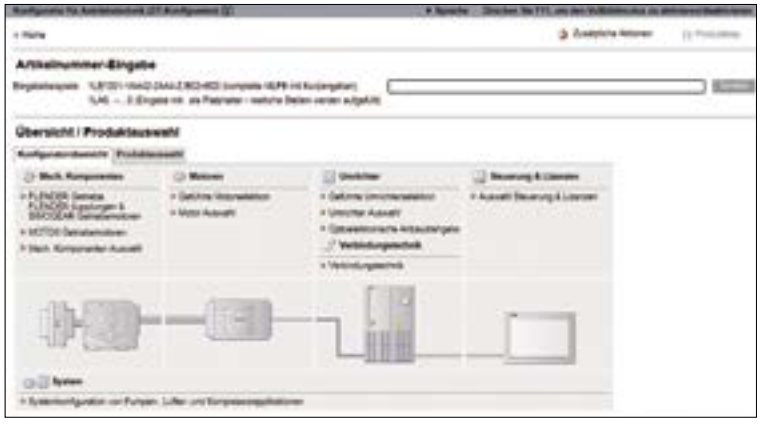
DT Configurator supports you

- when selecting the appropriate converter – expert knowledge is not required
- with the subsequent ordering process through the Industry Mall

DT Configurator supplies you with

- CAD files
- Operating instructions
- 2-D/3-D dimension drawings
- Certificates
- EPLAN macros in the edz format
- Technical data sheets
- Product images

By transferring the parts list into the Industry Mall shopping cart, products can be immediately ordered without having to be entered twice.
In order to avoid making ordering mistakes, the article number is checked to ensure that it is correct.



Simple product configuration using the DT Configurator

siemens.com/dt-configurator

Engineering with SIZER ...

SINAMICS sets itself apart as a result of its seamless and integrated engineering. Once you know one converter, then in principle you know them all. This makes it easier for you, especially when it comes to implementing complex plants and systems with several drives – or subsequently expanding them. SIZER is available to help engineer all of the drives in the same standard fashion.

SIZER engineering software

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-axis 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 gearbox
- configuring additional system components
- configuring the open-loop/closed-loop control

SIZER supplies you with

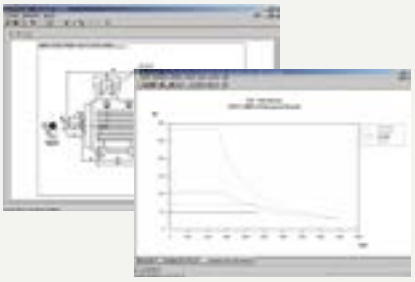
- engineering results: characteristics, technical data, layout drawings and dimension drawings
- calculating the load-dependent energy demand
- calculating the performance
- calculating the line harmonics
- part lists with the associated ordering data

In addition, using an integrated EDP interface, SIZER allows a parts list to be exported to an ordering system (e.g. SAP).

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 with the most favorable energy efficiency.

Engineering with SIZER



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

siemens.com/sizer

... commissioning with STARTER

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

STARTER commissioning software

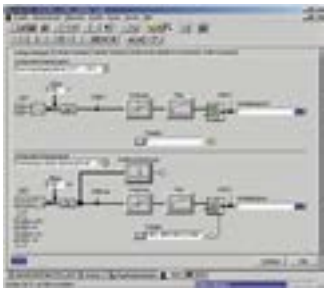
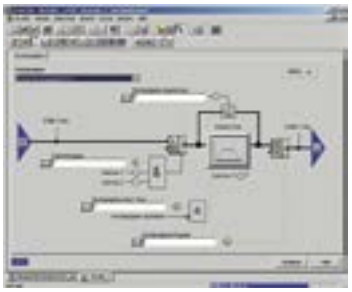
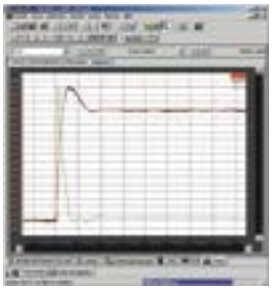
STARTER is especially helpful in importing all of the relevant data from the electronic type plates of the drive components. This speeds up parameterization, prevents possible incorrect entries and therefore significantly reduces your costs.
Using integrated test functions, you can check your entries and optimize parameters. Velocity characteristics, as well as setpoint and actual value curves, are logged over time and 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 port, serial interface, via PROFIBUS DP or via Ethernet / PROFINET. STARTER can also be integrated into SIMOTION SCOUT, the engineering system of the SIMOTION motion control system.

The same applies when operating the drives in conjunction with the SIMATIC automation system. Embedded in STEP 7, the drive technology is completely integrated into the PLC environment. Completely integrated automation solutions are obtained by linking SINAMICS with SIMOTION, SIMATIC or SINUMERIK machine tool control solutions. These solutions are from a single source that can be engineered, parameterized and commissioned using one central engineering software. This concept also pays off when it comes to service, as it facilitates simple diagnostics and troubleshooting on site or through teleservice.

STARTER and SIZER are available in German, English, French and Italian, STARTER is additionally available in Spanish. Further, for SIZER we provide an online help in Japanese and Chinese.


siemens.com/starter

Optimally integrated in the automation

Using the SINAMICS Startdrive engineering tool, SINAMICS G120 converters are already completely integrated in the Totally Integrated Automation Portal (TIA Portal).

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.

One engineering tool for drives and controllers

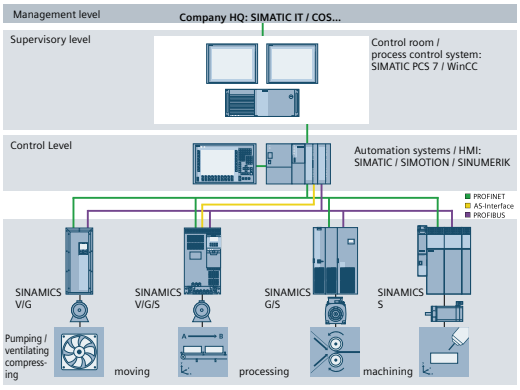
With SINAMICS Startdrive, SINAMICS G120 drives are seamlessly integrated into SIMATIC automation solutions and can easily be parameterized, commissioned, and diagnosed. This saves time, reduces engineering errors and training costs.

Standard drive and control engineering

- Automatic synchronization of bus address and telegram settings between controller and converter
- Perfect interaction of both safety programs through PROFIsafe
- Simplified series commissioning using a copy function and automatic parameter download from the controller to the drive
- Remote maintenance using routing to the drive beyond network boundaries
- Converter diagnostics information is available without requiring any PLC programming
- Direct connection to SIMATIC S7 motion programming
- Identical trace function for converter and control

Quick familiarization and high user-friendliness

- Full support of the TIA Portal features such as drag & drop, libraries and graphic network configuration
- Workflow-oriented user navigation
- Set-up wizards and optimized interfaces for experts and beginners



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.

siemens.com/tia-portal

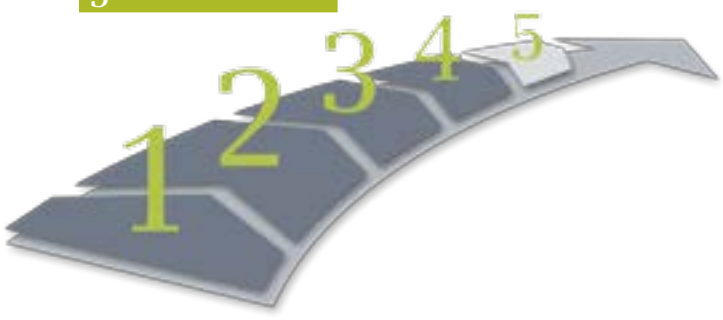
The drive that optimizes your energy efficiency

UP TO
60%
ENERGY SAVINGS

Electric drives use about two thirds of all industrial electric power. This is why it is decisive that drive technology is used from the word go so that already in the engineering phase, future energy consumption can be effectively reduced – thus optimizing plant/system availability and process reliability.

Completely leverage the energy efficiency potential in your production environment with our comprehensive portfolio. This addresses complete product development and production: from the product design through production planning and engineering up to actual production and services. With SINAMICS, we can offer you a seamless and integrated range of energy efficient drive solutions to sustainably secure higher energy efficiency, productivity and competitiveness.

1 Product design
2 Production planning
3 Production engineering
4 Production
5 Service



Energy transparency in all engineering phases

Already in the engineering phase, the SIZER engineering software provides you with information about your specific energy demand. It visualizes the energy consumption in the complete drive train, and compares this with different system concepts.

High energy-saving potential through variable-speed operation

Controlling the motor speed as a function of the demand using SINAMICS leverages enormous energy-saving potential, especially when it comes to pumps, fans and compressors. Here, energy savings of up to 60% are possible, in individual cases even up to 70%. This is because the power drawn in partial load operation is always adapted to the actual demand.

SINAMICS in combination with SIMOTICS

The seamless and integrated engineering goes far beyond just SINAMICS – up to a higher-level automation system and a wide range of energy-efficient SIMOTICS low-voltage motors with a wide spectrum of power and performance classes. When compared to conventional motors, these have an efficiency that is up to 10% higher.

Determining cost-saving potential with SinaSave

Using SinaSave, the energy-saving potential when using SINAMICS converters can be estimated. To do this, the web-based tool takes into account all of the relevant variables, such as the power and load data of the application, control mode and operating profile. In addition to the energy-saving potential in a specific case, you can also obtain a financial assessment as well as the expected payback time.

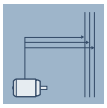
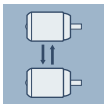
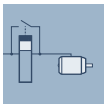
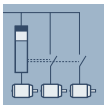
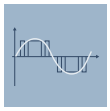
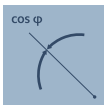
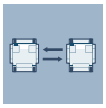
siemens.com/sinasave

Intuitively configuring the measuring components

Ready for SIMATIC Energy Suite

SIMATIC Energy Suite – as integrated option for the TIA Portal – efficiently links energy management with the automation, making energy usage in your production transparent. Further, as a result of the simplified configuration of the energy measuring components, e.g. the SINAMICS G converter series, engineering costs are significantly reduced. Based on the standard and integrated connection to higher-level energy management systems or cloud-based services, you can seamlessly expand the energy data that has been acquired to create an energy management system spanning several locations of facilities.

siemens.com/energysuite

Integrated energy-saving functions		
Recovering braking energy		Energy savings of up to 70% can be obtained by recovering the braking energy. It simplifies system cooling and allows a more compact design.
Energy balancing in the DC link		For coupled drives, the power loss in the overall system can be minimized using energy balancing along the common DC bus.
Storing excess energy		Transient power peaks can be covered and flicker avoided by using additional capacitors in the DC link. As a result, regenerative energy is stored rather than wasted in the form of heat.
Automatic adaptation of the operating point		In the ECO mode, the motor operating point in the partial load range is automatically adapted and optimized. This allows motor losses to be reduced.
Energy-saving when idle		If variable-speed drives are only temporarily used, then they can be switched into the hibernation mode. Depending on the demand, the drive is automatically reactivated.
Reducing the power loss		In the bypass mode, the converter can be electrically bypassed as soon as the motor is frequently operating in the range of its rated speed. This means that converter losses can be avoided and the overall efficiency increased.
Cascading drives		If, in applications, the power demand is distributed over several motors, the energy demand can be optimized by switching-in and switching-out these motors in stages using partially or fully controlled cascades in conjunction with converters and motor starters.
Optimized pulse pattern		As a result of the optimized clock frequency and pulse pattern, SINAMICS G and S converters are perfectly harmonized and coordinated with SIMOTICS motors. The advantages: optimized operating response and system efficiency, lower system losses as well as lower temperature rise and noise.
Reactive power compensation		The capacitive and/or inductive reactive power in the machine is reduced by using SINAMICS converters with Active Line Modules. This means that expensive reactive power compensation systems can be eliminated.
Energy-saving meter/ energy usage meter		The energy usage in operation is measured. Using the energy-saving meter, the energy saved is cumulated over the operating hours and output in comparison to a fixed-speed application.
DC link coupling with SINAMICS V20		Applications that use SINAMICS V20 drives with the same power rating can share a common DC bus to reuse the regenerative energy.

It is safe to say that SINAMICS Safety Integrated responds more quickly

There is an increased risk of injury to personnel and damage to the machine wherever there are rotating units – such as saws, rolls and spindles. This is also the case for linear handling axes and machine slides, frequently with high velocities. Safety Integrated is the safety concept that reliably masters specific dangerous 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

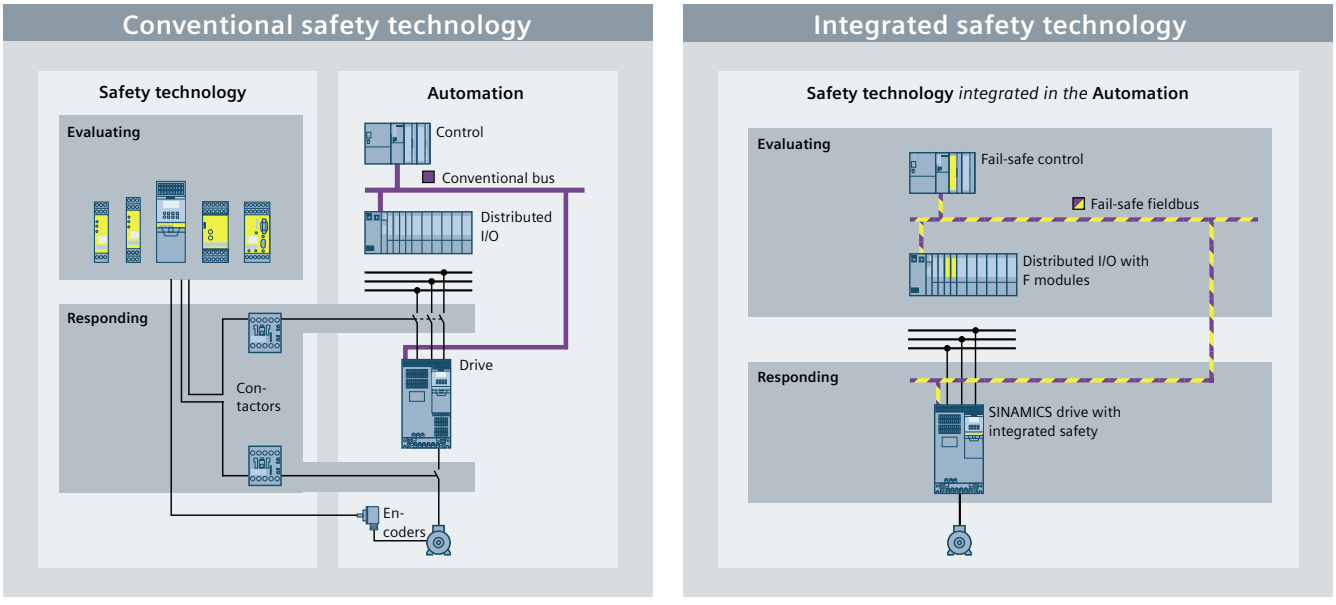
While conventional safety technology always requires additional contactors, safety relays and interlocking circuits, for the integrated safety technology from Siemens, all of these additional electromechanical components are eliminated from the very start.

And even more: 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.

siemens.com/safety-drives



Integrated safety technology reduces the number of components and wiring costs

"The prevention of accidents should not be regarded as a requirement of the law, but rather as an act of human obligation and economic sense."

Werner von Siemens, 1880

For SINAMICS, the safety functions integrated in the drive can be roughly sub-divided into two classes:

Functions to safely stop the drive:

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 Speed Monitor (SSM) with/without encoder
"Safe Speed Monitor" signals once a specified speed has been fallen below.

Safe Direction (SDI) with/without encoder
"Safe monitoring of motion/direction of rotation" ensures that the selected direction of rotation is maintained.

Safely Limited Position (SLP) with encoder
"Safely Limited Position" prevents a specified position from being exceeded.

Safe Position (SP)
"Safe Position" transfers the position values, safely determined in the drive, to a safety-related control system via safe PROFIsafe communication.

Safe Brake Test (SBT)
"Safe Brake Test" checks the specified holding torque of a brake.

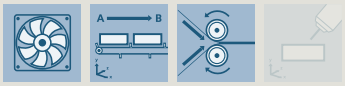
Drive	Currently available integrated safety functions										
	STO	SS1	SS2	SOS	SBC	SLS	SSM	SDI	SLP	SP	SBT
SINAMICS V90	✔										
SINAMICS G120C	✔										
SINAMICS G120	✔	✔			✔	✔	✔	✔			
SINAMICS G120D / G110M*	✔	✔				✔	✔	✔			
SINAMICS G130 / G150 / G180**	✔	✔			✔	✔	✔	✔			
SINAMICS S110	✔	✔	✔	✔	✔	✔	✔	✔			
SINAMICS S120 Booksize and Blocksize	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
SINAMICS S120 Chassis and Cabinet Modules	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
SINAMICS S150	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
SINAMICS SM150	✔										

*G110M only STO **G180 only STO

SINAMICS V20

The cost-effective and reliable converter for basic applications

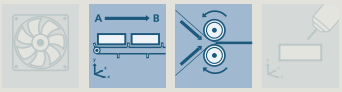
- Suitable for pump, fan, compressor and conveyor drives as well as for basic drive applications
- Integrated energy-saving mode in the idle state



SINAMICS V90

The performance-optimized servo drive system that is simple to operate

- Reliable combination comprising SINAMICS V90 servo converter (as 200 V or 400 V version in four frame sizes) and SIMOTICS S-1FL6 servomotor as Low Inertia (shaft heights 20, 30, 40, 50) or High Inertia version (shaft heights 45, 65, 90)

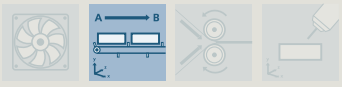


SINAMICS G110D / G120D / G110M

The distributed converter for basic up to high performance solutions

The easy-to-replace converters have a low profile, are compact and extremely rugged as a result of the metal housing.

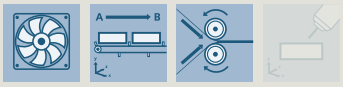
- **G110D:** for basic conveyor-related applications
- **G120D:** for demanding drive applications in conveyor technology
- **G110M:** distributed converters for SIMOGEAR geared motors and SIMOTICS motors



SINAMICS G120C

The compact and versatile converter with optimum functionality

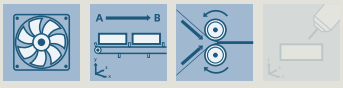
- Compact standard drive
- Highest power density in its class
- With BOP-2 or IOP operator panel
- STO safety function integrated as standard



SINAMICS G120

The modular converter – space-saving, safe and rugged

- Standard drive for universal applications, with a higher power density in a space-saving design
- Low line harmonics
- Parameter copy function for series commissioning
- Available in voltage versions from 200 up to 690 V
- Integrated comprehensive safety concept up to PL e / SIL 3



SINAMICS G120P / G120P Cabinet

The specialist for pumps, fans and compressors

- Applications: basic speed adaptation as well as complex closed-loop control tasks in building technology, water and process industries
- USB interface, IOP operator panel
- High energy efficiency based on optimized power units, flux reduction

SINAMICS G130/G150

The universal converters for high power ratings

- Quiet and compact
- Applications: pumps, fans, compressors, extruders, mixers, mills etc.
- Service-friendly thanks to device modules that are easy to access
- 100% line supply voltage at the motor without any secondary effects
- When required, with integrated line harmonics filter and dv/dt filter

SINAMICS G180

The specific converter for the oil & gas, chemical and process industries

- Sector-specific features such as dv/dt filter and PTC evaluation
- Applications: pumps, fans, extruders, compressors – also in hazardous zones
- Voltage levels: 400 V / 500 V / 690 V
- Line side: 6 to 24 pulse or LHF (Line Filter)
- From 200 kW, air- or liquid-cooled
- ATEX-certified motors for hazardous zones

SINAMICS S110

The specialist for simple positioning tasks

- Applications: basic positioning of individual axes with synchronous or induction motors
- Servo control

SINAMICS S120

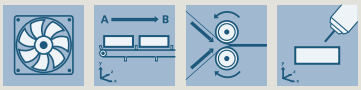
The flexible, modular drive system for sophisticated and demanding single-axis/multi-axis applications

- Servo / vector control, V/f control
- Freely configurable logic and closed-loop control functions
- High degree of scalability, flexibility, combinability
- Energy-efficient as a result of energy recovery and/or DC link
- Air-cooled or liquid-cooled version (dependent on the format)

- AC/AC drives for single-axis applications
  – Can be combined as required with other formats

- DC/AC devices for multi-axis applications
  – Up to 5,700 kW in a liquid-cooled version
  – Energy recovery possible, a controlled DC link as well as lower line harmonics depending on the Line Module selected
  – Highly compact using double-axis modules

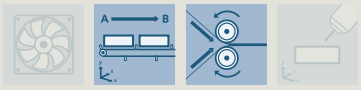
- Cabinet Modules specifically for multi-axis applications in plant construction
  – Preconfigured cabinet elements
  – Also available in air-cooled and liquid-cooled versions



SINAMICS S150

The converter for demanding applications in the high power range

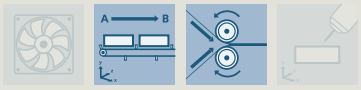
- Applications: test stands, elevators, cranes, conveyor belts, presses, cable winches, centrifuges, cross conductors, cross shears etc.
- 4Q operation
- Rugged with respect to line voltage fluctuations, reactive power can be compensated



SINAMICS DCM

The scalable converter for basic and demanding applications

- Applications: DC applications in all sectors, such as rolling mills, wire-drawing machines, extruders, kneaders, cable railways, lifts, test stands etc.
- Maximum degree of scalability: Standard or Advanced Control Unit – or a combination of both
- Highest degree of flexibility to adapt to plant/system-specific requirements
- High plant availability through maximum reliability, service-friendly design and redundant concepts
- As ready-to-connect converter device or Control Modules for retrofit projects

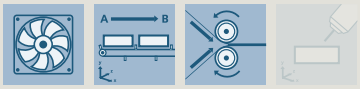


SINAMICS GL150/SL150

The cycloconverter for synchronous and induction motors

Extremely reliable and almost maintenance-free, in a compact design with a high power density

- **GL150 – for synchronous motors with the highest power density**
  - Minimum number of components as a result of the thyristor-based design
- **SL150 – for slow synchronous and induction motors with high torques**
  - 4Q as standard with energy recovery
  - Simple design with three-phase thyristor bridges permits a high efficiency and high reliability
  - High short-time overload capability

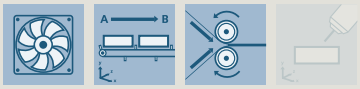


SINAMICS GH180/GH150

The converter for medium-voltage systems with single-axis or multi-axis configurations

A converter comprising a series of low-voltage power cells, which reliably and efficiently generates the required medium voltage at its output.

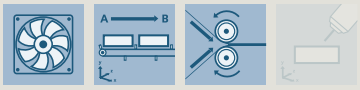
- Applications: pumps, fans, compressors, crushers, mills, retrofit projects etc.
- Very small footprint
- Output transformer, line filter and reactive power compensation not required



SINAMICS GM150/SM150/SM120 CM

The universal drive solution for single- and multi-motor drives

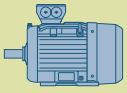
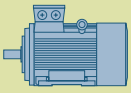
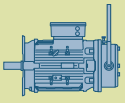
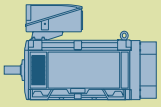
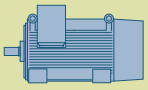
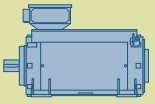
- **GM150 – for high rating single-motor drives, which do not require energy recovery**
  - Applications: pumps, fans, compressors, extruders, mixers, mills, main ship drives etc.
  - V/f control and vector control with or without encoder
- **SM150 – for single- and multi-motor drives with a high dynamic performance, which must be capable of energy recovery**
  - Main applications: rolling mill and mining
  - Ideal for direct energy exchange between motoring and regenerating applications
- **SM120 CM – customer-specific drive systems for special requirements**
  - Applications: test stands, energy, marine / offshore, mining
  - 4-quadrant operation
  - Rugged and reliable
  - Motor- and line-friendly, long cables lengths possible



SINAMICS and SIMOTICS – a powerful team

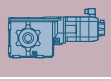
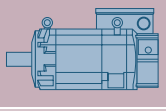
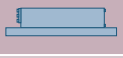
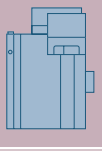
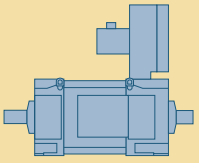
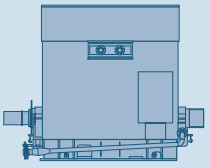
No converter runs without a motor. A wide range of high efficiency low-voltage, high-voltage and motion control motors – as well as geared motors – are available to be teamed up with SINAMICS.

SIMOTICS

	Low-voltage motors for line and converter operation						
	General Purpose **SIMOTICS GP**	Severe Duty **SIMOTICS SD**	Explosion protected **SIMOTICS XP**	Definite Purpose **SIMOTICS DP**	Flexible Duty **SIMOTICS FD**	Transstandard **SIMOTICS TN**	High Torque **SIMOTICS HT**
							
Power							
IEC:	0.09 – 45 kW	0.09 –315 kW	0.09 – 1,000 kW	0.09–315 kW	200 – 1,800 kW	200 – 5,000 kW	150 – 2,100 kW
NEMA:	1–20 HP	1 – 400 HP	1–300 HP	3–250 HP		200–800 HP	
Torque							
IEC:	2.5–293.8 Nm	1–2,070 Nm	0.61 – 8,090 Nm	2.5–2,135 Nm	500 –11,400 Nm	800–22,500 Nm	6,000 – 42,000 Nm
NEMA:	1,5–883 lb-ft	1.5 – 1,776 lb-ft	1,5–882 lb-ft				
Speed	750 – 3,600 min^{-1}	750–3,600 min^{-1}	750 – 3,600 min^{-1}	750 – 3,600 min^{-1}	750 – 3,600 min^{-1}	750–5,000 min^{-1}	0 – 800 min^{-1}
Applications	Pumps, fans and compressors with special demands regarding low weight	Pumps, fans, compressors, mixers, mills/ crushers, extruders, rolls with special requirements regarding the ruggedness – especially in the chemical and petrochemical industries	General industrial applications with special requirements relating to explosion protection for use in Zones 1, 2, 21 and 22 e.g. in the process industry	Marine, working and transport roller tables, harbor cranes, tunnels and shopping malls – as well as customized motors, adapted to address a specific application	Pumps, fans, compressors and conveyor systems with a high power rating as well as cranes, extruders, bow thruster in sectors such as water/wastewater, metals, chemical, paper, oil & gas, marine, cement, mining and energy	Pumps, fans, compressors, mixers, extruders in the chemical and petrochemical industry, in paper machines, in mining, in the cement industry, in the steel industry and marine applications	Paper machines, slow running pumps, mills, steel shears, bow thrusters, winches and main drives onboard ships
SINAMICS Converters	V20, G series, S series	V20, G series, S series	V20, G series, S120, S150	G series, S series	G series, S series	G series, S series	S150, S120

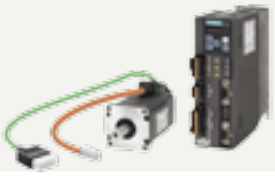
siemens.com/simotics

SINAMICS can be combined with a whole range of energy-efficient synchronous and induction motors. Motors that have been specifically optimized for converter operation are available in order to achieve the highest possible system utilization – a perfectly harmonized drive system that leverages its strengths from engineering through commissioning up to efficient operation.

Motion control motors					DC motors	High-voltage motors
Servomotors **SIMOTICS S**		Main motors **SIMOTICS M**	Linear motors **SIMOTICS L**	Torque motors **SIMOTICS T**	**SIMOTICS DC**	**SIMOTICS HV**
Servomotors	Servo geared motors					
						
0.05 – 34.2 kW	0.5 – 7 kW	2.8 – 1,340 kW	1.7 – 81.9 kW	1.7 – 380 kW	up to 1,610 kW	150 kW – 100 MW and higher
						200–135,000 HP and higher
0.08 – 170 Nm	14 – 8,100 Nm	13 – 12,435 Nm	150 – 10,375 Nm	10 – 7,000 Nm	up to 44,500 Nm	up to 2,500,000 Nm
up to 10,000 min^{-1}	up to 1,300 min^{-1}	up to 40,000 min^{-1}	up to 836 m/min	up to 1,200 min^{-1}	up to 3,600 min^{-1}	7 – 15,900 min^{-1}
High-dynamic performance with high precision applications, for example, handling systems, storage and retrieval machines, wood, glass, ceramic and stone processing, packaging, plastics and textile machines, machine tools		Precisely rotating, rotary drives with a high dynamic performance, e.g. main drives in presses, printing machines, rolling mill drives and winders in foil machines and other converting applications, main spindle drives in machine tools	Applications with the highest requirements regarding dynamic performance and precision for linear motion, e.g. machining centers, turning, grinding, laser machining, handling and in the machine tool domain	Rotary axis applications with the highest requirements regarding precision and force, e.g. extruders, winders, rolling mill drives, rotary axes in machine tools, rotary indexing tables, tool magazines	Standard drive applications in all industrial areas and in the infrastructure	Pumps, fans, compressors, extruders, mills/crushers, conveyor belts, refiners, open cast mine excavators, main propulsion drives for ships, main rolling mill drives
S110, S120 V90 only in combination with SIMOTICS S-1FL6		G120, S110, S120, S150	S120	S120	DCM	GM150, SM150, SL150, GL150, SM120, GH180, GH150

SIMOGEAR geared motors
When using geared motors, we recommend the range of SIMOGEAR geared motors from Siemens to achieve an optimum interaction with SINAMICS converters.
siemens.com/simogear

Technical data



Designation	SINAMICS V20	SINAMICS V90	SINAMICS G120C
Use			
Continuous motion type (see selection tool P. 2-3)			
Pumping, ventilating, compressing	Basic		Basic
Moving	Basic		Basic
Processing	Basic		Basic
Machining			
Discontinuous motion type (see selection tool P. 2-3)			
Pumping, ventilating, compressing			
Moving		Basic	
Processing		Basic	
Machining			
Description	The cost-effective and reliable converter for basic applications	The performance-optimized servo drive system that is simple to operate	The compact and versatile converter with optimum functionality
Format	Blocksize device	Blocksize device	Blocksize device
Drive type	Ready-to-connect AC/AC device	Ready-to-connect AC/AC device	Compact AC/AC device
Degree of protection	IP20	Converters: IP20 motor: IP65	IP20
Supply voltage / power ranges			
1AC 200–240 V	0.12–3 kW	0.05–0.75 kW	–
3AC 200–240 V	–	0.05–2 kW	–
3AC 380–480 V	0.37–30 kW	0.4–7 kW	0.55–18.5 kW
3AC 500–600 V	–	–	–
3AC 500–690 V	–	–	–
3AC 660–690 V	–	–	–
1AC 85 V–3AC 950 V	–	–	–
3AC 2.3–11 kV	–	–	–
Energy recovery	–	–	–
Closed-loop control modes			
V/f control	yes	–	yes
Vector control with/without encoder	–	–	yes, without encoder
Servo control with/without encoder	–	yes	–
Motors – Induction motors	yes	–	yes
Synchronous motors	–	yes	–
Torque motors	–	–	–
Linear motors	–	–	–
Technological functions	Integrated braking chopper for 7.5 kW to 30 kW, parameter cloning, integrated connection and application macros, Keep-Running mode, ECO mode, energy exchange, cascading	Auto tuning in real time, automatic suppression of machine resonance points, integrated braking resistor, integrated positioning function, switching over the open-loop control type, DI/DO parameterization	Flying restart, automatic restart, kinetic buffering, BICO technology, technology controller, free function blocks, compound braking, DC braking, dynamic braking
Safety functions	–	STO	STO
Communication profiles	USS/Modbus RTU	Pulse/direction interface, USS/Modbus RTU, PROFINET	PROFINET, PROFIBUS DP, EtherNet/IP, USS/Modbus RTU
PROFIenergy	–	–	yes
PROFIsave	–	–	yes
PROFIdrive	–	yes	yes
Additional energy-saving functions	yes	–	yes
Tools	DT Configurator	SINAMICS V-ASSISTANT, DT Configurator	STARTER, Startdrive, SIZER, DT Configurator
Catalog	V20 brochure/distribution catalog	V90 brochure	D31/distribution catalog

1) On request 2) Only DC/AC devices

					
SINAMICS G120P/G120P Cabinet	**SINAMICS G120**	**SINAMICS G110M**	**SINAMICS G110D/G120D**	**SINAMICS G130**	**SINAMICS G150**
Basic/medium				Medium	
	Medium	Basic	Basic/medium	Medium	
	Medium			Medium	
	Basic				
	Basic		–/Basic		
	Basic				
The specialist for pumps, fans and compressors	The modular converter – energy-efficient, reliable and rugged	The distributed converter for SIMOGEAR geared motors and SIMOTICS GP motors	Distributed drives from simple basic applications to demanding positioning tasks	The universal converters for high power ratings	
For wall/panel mounting, chassis devices and cabinet units	Blocksize device	Blocksize device	Separate from the motor	Chassis device	Converter cabinet unit
Modular AC/AC device Ready-to-connect AC/AC device	Modular AC/AC device	AC/AC device integrated in the motor	Ready-to-connect/modular AC/AC device	Modular AC/AC device	Ready-to-connect AC/AC device
IP20, IP55	IP20	up to IP66	IP65	IP00 / IP20	IP20–IP54
–	0.55–4 kW	–	–	–	–
–	0.55–7.5 kW	–	–	–	–
0.37–560 kW	0.55–250 kW	0.37–4 kW	0.75–7.5 kW	110–560 kW	110–900 kW
–	–	–	–	110–560 kW	110–1,000 kW
500–630 kW	11–132 kW	–	–	–	–
–	–	–	–	75–800 kW	75–2,700 kW
–	–	–	–	–	–
–	–	–	–	–	–
–	Optional	–	– / yes	–	
yes	yes	yes	yes (G110D)	yes	
yes, without encoder	yes	yes, without encoder	yes (G120D)	yes	
–	–	–	–	–	
yes	yes	yes	yes	yes	
yes[1]	yes[1]	–	–	yes, without encoder	
–	–	–	yes	yes, without encoder	
–	–	–	–	–	
Automatic restart, energy-saving mode, hibernation mode, flying restart, motor staging, 4-PID technology controllers, logic and arithmetic functions, extended emergency service mode, multi-zone controller, bypass mode	Flying restart, automatic restart, kinetic buffering, BICO technology, technology controller, free function blocks, compound braking, DC braking, dynamic braking	Stand-alone converter for customers to install/mount themselves or as complete drive unit (SIMOGEAR geared motor or SIMOTICS motor). Quick stop, limit switch function, free function blocks (PLC function), integrated braking resistor (optional), software braking technique, wall/panel mounting kit, repair switch	Flying restart, automatic restart, technology controller G110D: Quick stop, jog mode, control for motor holding and operating brake, electrical brakes G120D: BICO technology, free function blocks, motor and machine encoder evaluation, integrated positioning functionality	Flying restart, automatic restart, kinetic buffering, BICO technology, technology controller, Drive Control Chart, free function blocks	
–	STO, SS1, SBC, SLS, SDI, SSM	STO	STO (G110D), SS1, SLS, SDI, SSM	STO, SS1, SBC, SLS, SDI, SSM	
PROFINET, PROFIBUS DP, EtherNet/IP, USS/Modbus RTU, BACnet MS/TP	PROFINET, PROFIBUS DP, EtherNet/IP, USS/Modbus RTU, BACnet MS/TP, CANopen	PROFINET, PROFIBUS DP, EtherNet/IP, USS/Modbus RTU	G110D: AS-Interface G120D: PROFINET, PROFIBUS DP, EtherNet/IP	PROFINET, PROFIBUS DP, EtherNet/IP, USS, CANopen	
yes	yes	yes	– / yes	yes	
–	yes	yes	– / yes	yes	
yes	yes	yes	– / yes	yes	
yes	yes	yes	Energy usage display / yes	yes	
STARTER, Startdrive, SIZER, DT Configurator	STARTER, Startdrive, SIZER, DT Configurator	STARTER, Startdrive, SIZER, DT Configurator	STARTER, SIZER, DT Configurator; G120D: Startdrive	STARTER, SIZER, DT Configurator	
D35/in part distribution catalog	D31/in part distribution catalog	D31	D31	D31	





SINAMICS G180	SINAMICS S110	SINAMICS S120M	SINAMICS S120					SINAMICS S150
Medium			High					
Medium			High					High
Medium			High					High
	Basic/medium		Medium/high					
	Medium		High					
	Medium	Medium/high	High					
	Medium	Medium/high	High					
	Basic/medium		Medium/high					
The specific converter for the oil & gas, chemical and process industries	The specialist for simple positioning tasks	The flexible, modular drive system for sophisticated and demanding single-axis/multi-axis applications						The converter for demanding applications in the high power range
Compact device, converter cabinet unit	Blocksize device	Integrated in the motor	Blocksize device	Chassis device	Booksize device	Chassis device	Cabinet Modules	Converter cabinet unit
Ready-to-connect AC/AC device	Modular AC/AC device	Modular AC/AC device	Modular AC/AC device	Modular AC/AC device	Modular DC/AC device			Ready-to-connect AC/AC device
IP20–IP54	IP20	IP65	IP20	IP20, optional: IP43	IP20	IP00 / IP20	IP20 (IP21 / IP23 IP43 / IP54)	IP20 (IP21 / IP23 / IP43 / IP54)
–	0.55–4 kW	–	0.55–4 kW	–	–	–	–	–
–	–	–	0.55–55 kW	–	–	–	–	–
2.2–4,100 kW	0.55–132 kW	0.25–1.1 kW	0.55–132 kW	110–250 kW	1.6–107 kW	110–3,040 kW	4.8–3,040 kW	110–800 kW
2.2–5,300 kW	–	–	–	–	–	–	–	–
2.6–6,600 kW	–	–	–	–	–	90–5,700 kW	90–5,700 kW	75–1,200 kW
7.5–6,600 kW	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	yes, depending on the infeed	–		yes, depending on the infeed			yes
yes	yes	–	yes					yes
with encoder	–	–	yes					yes
–	yes	–	yes					yes
yes	yes	yes	yes					yes
yes	yes	yes	yes					yes
–	–	–	yes					yes
–	–	–	yes					–
Flying restart, kinetic buffering, automatic restart, DC current limiting, current and voltage control, line synchronization, process control, logic functions	Basic positioner, BICO technology, technology controller, controller optimization using auto tuning	Flying restart circuit, automatic restart, kinetic buffering, basic positioner, BICO technology, technology controller, Drive Control Chart, motion control in conjunction with SIMOTION, numeric control with SINUMERIK solution line						Flying restart, automatic restart, kinetic buffering, technology controller, Drive Control Chart, BICO technology
STO	STO, SOS, SBC, SS1, SS2, SLS, SDI, SSM	STO, SS1, SBC, SOS, SS2, SLS, SSM, SDI, SLP, SP, SBT	STO, SS1, SBC, SOS, SS2, SLS, SSM, SDI, SLP, SP, SBT					STO, SS1, SBC, SOS, SS2, SLS, SSM, SDI, SLP, SP, SBT
PROFIBUS DP, EtherNet/IP, Modbus TCP/IP, Modbus RTU, CANopen, on request: PROFINET	PROFINET, PROFIBUS DP, USS, pulse/direction interface	PROFINET, PROFIBUS DP, EtherNet/IP², USS, CANopen	PROFINET, PROFIBUS DP, EtherNet/IP², USS, CANopen, pulse/direction interface					PROFINET, PROFIBUS DP, EtherNet/IP, USS, CANopen
–	yes							yes
–	yes							yes
–	yes							yes
yes	–	yes						yes
IMS (Inverter Management Software), SIZER, DT Configurator	STARTER, SIZER, DT Configurator							STARTER, SIZER, DT Configurator
D18.1	PM22, D31	Siemens Mall, SIOS	PM21, D21.3, D21.4 in the process of being prepared					D21.3

STO: Safe Torque Off SOS: Safe Operating Stop SBC: Safe Brake Control SS1: Safe Stop 1 (safe stopping process, Cat 1) SS2: Safe Stop 2 (safe stopping process, Cat 2) SLS: Safely

DC voltage	Medium voltage			
				
SINAMICS DCM / Cabinet	**SINAMICS GM150**	**SINAMICS SM120 CM/SM150**	**SINAMICS GL150/SL150**	**SINAMICS GH150/GH180**
	Basic/medium			Basic/medium
High	Basic/medium/high	Medium/high	High	Basic/medium/high
High	Basic/medium			Basic/medium
	High			High
Medium/high				
High		High	High	
The scalable converter for basic and demanding applications	Converter for medium-voltage variable-speed drives	Converters for demanding single-axis and multi-axis applications in the medium-voltage range	Cycloconverter for synchronous and induction motors	Converters for medium-voltage systems with single-axis or multi-axis configurations
Converter device, converter cabinet	Converter cabinet unit	Converter cabinet unit	Converter cabinet unit	Converter cabinet unit
Compact AC/DC device	Ready-to-connect AC/AC device	Ready-to-connect AC/AC device DC bus system for several motors connected to a common DC bus	Ready-to-connect AC/AC device	Ready-to-connect AC/AC device
IP00 – IP54	Air-cooled IP22 (opt. IP42), liquid-cooled IP43 (opt. IP54)	IP43 (opt. IP54)	IP21 – IP54	Air-cooled IP21 or higher, liquid-cooled IP52
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
6–2,508 kW (parallel connection up to 30 MW)	–	–	–	–
–	820–18,000 kW (for induction motors)	2,800–31,500 kW	800 – 85,000 kW	150–28,500 kW
yes, for the corresponding version	–	yes	yes	–
–	yes		yes	yes
–	yes		yes	yes
–	–		–	–
DC motors	yes		yes	yes
	yes		yes	yes
	–		–	–
	–		–	–
BICO technology, technology controller, free function blocks, automatic restart, Drive Control Chart			Flying restart, automatic restart, kinetic buffering, technology controller, Drive Control Chart, BICO technology	Advanced cell bypass, Pro TOPs, parallel connection, automatic restart, anti-condensation heating, other options on request
–	–	STO	–	Emergency Stop Cat 0, standard for uncontrolled rundown
PROFINET, PROFIBUS DP, USS, EtherNet/IP	PROFINET, PROFIBUS DP, EtherNet/IP, additional profiles on request	PROFINET, PROFIBUS DP, EtherNet/IP, additional profiles on request	PROFINET, PROFIBUS DP, EtherNet/IP, USS	Modbus Plus, Modbus RTU, Modbus Ethernet, DeviceNet, Control Net, PROFIBUS DP
–	yes		yes	–
–	yes		yes	–
–	yes		yes	–
yes	yes, application-specific			
SIZER, DT Configurator	STARTER, SIZER, DT Configurator		STARTER, SIZER, DT Configurator	SIZER WEB ENGINEERING, DT Configurator
D23.1, D23.2	D12		EM3.5/1.2	D15.2/16.2

y Limited Speed SSM: Safe Speed Monitor SDI: Safe Direction SLP: Safely Limited Position

Find out more:
siemens.com/ids

Discover how Integrated Drive Systems boost the competitiveness of production plants and complete companies in each and every sector.

The advantages of Integrated Drive Systems at a glance

Follow us on:
www.twitter.com/siemensindustry
www.youtube.com/siemens

Publisher
Siemens AG 2016

Digital Factory
P.O. Box 31 80
91050 Erlangen, Germany

Article No.: E20001-A200-M112-V4-7600
Printed in Germany
Dispo 21500
WÜ/79848 WS 04166.0