

The SINAMICS drive family
Suitable for each and every application

SIEMENS

Performance ¹⁾	Continuous motion			Discontinuous motion		
	Basic	Medium	High	Basic	Medium	High
Purpose						
Pumping/ ventilating/ compressing	Centrifugal pumps Radial axial fans Compressors		Eccentric spiral worm screw pumps	Hydraulic pumps Dosing pumps		Descaling pumps Hydraulic pumps
Moving	Belt conveyors Roller conveyors Chain conveyors	Belt conveyors Roller conveyors Chain conveyors Vertical/horizontal material handling Crawler/trackers Gantry cranes Ship's drives Cable railways	Elevators Container cranes Mine hoists Open cast mine excavators Test stands	Accelerating conveyors Rack feeders	Accelerating conveyors Rack feeders Cross cutters Roll changers	Rack feeders Robotics Pick & Place Indexing tables Cross cutters Roller feeds Engaging/disengaging
Processing	Mills Mixers Kneaders Crushers Agitators Centrifuges	Mills Mixers Kneaders Crushers Agitators Centrifuges Extruders Rotary furnaces	Extruders Winders/unwinders Calenders Mechanical presses Printing machines	Tubular bagging machines Single axis motion control i.e. • positioning profiles • path profiles		Servo presses Rolling mill drives Coordinated multi-axis motion control i.e. • Multi-axis positioning • Cam drives • Interpolation
Machining	Main Drives i.e. • Turning • Milling • Drilling	Main Drives i.e. • Drilling • Sawing	Main Drives i.e. • Turning • Milling • Drilling • Gear cutting • Grinding	Axis Drives i.e. • Turning • Milling • Drilling	Axis Drives i.e. • Drilling • Sawing	Axis Drives i.e. • Turning • Milling • Drilling • Laser machining • Gear cutting • Grinding • Nibbling and Punching

¹⁾ Requirements regarding torque precision / speed precision / positioning precision / axis coordination / functionality
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SINAMICS application-based approach
Low-voltage product assignment

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Performance ¹⁾	Continuous motion			Discontinuous motion		
	Basic	Medium	High	Basic	Medium	High
Purpose						
Pumping/ ventilating/ compressing	V20 G120C G120P	G120P G130/G150 G180 ²⁾	S120	G120	S110	S120
Moving	V20 G110D G110M G120C	G120 G130D G130/G150 G180 ²⁾	S120 S150 DCM	V90 G120 G120D	S110 DCM	S120 DCM
Processing	V20 G120C	G120 G130/G150 G180 ²⁾	S120 S150 DCM	V90 G120	S110	S120 DCM
Machining	S110	S110 S120	S120	S110	S110 S120	S120

¹⁾ Requirements regarding torque precision / speed precision / positioning precision / axis coordination / functionality
²⁾ Industry specific drive
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The SINAMICS drive family
Complete regarding power ratings and functionality



Low voltage AC										Direct current DC	Medium voltage AC							
Basic Performance		General Performance								High Performance		For basic applications and demanding applications	For demanding applications with high power ratings					
SINAMICS V20	SINAMICS V90	SINAMICS G120C	SINAMICS G120P/G120P Cabinet	SINAMICS G120	SINAMICS G1100/G1200/G110M	SINAMICS G130/G150	SINAMICS G180	SINAMICS S110	SINAMICS S120/S120M	SINAMICS S150	SINAMICS DCM	SINAMICS GL150/GL150	SINAMICS SM120/SM150	SINAMICS SM150/SM150	SINAMICS GPH150/GPH150 (cell-based)			
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 (G1100), sensorless vector control (G1200 / G110M)	V/f control, vector control with/without encoder	V/f control, vector control with encoder	Servo control	V/f control, vector control with/without encoder, servo control with/without encoder		Speed control, torque control	V/f control, vector control						
0.12 – 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	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	
Pumps, fans, compressors, conveyor belts, mixers, mills, spinning machines, textile machines	Handling machines, packaging machines, automatic assembly machines, metal forming	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	Conveyor technology, single-axis positioning applications (G1200)	Pumps, fans, compressors, conveyor belts, extruders, mixers, mills, kneaders, centrifuges	Sector-specific for pump, fans, compressors, conveyor belts, extruders, mixers, mills, extruders	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, ships and test stands		Test stands, cross cutters, centrifuges	Rolling mill drives, wire drawing machines, extruders and kneaders, cableways and lifts, test stand drives			Pumps, fans, compressors, mixers, extruders, mine hoist drives, escalators, test stands, ship drives, conveyor belts, blast furnace blowers	Pumps, fans, test stands, ore conveying systems, one mill, compressors, excavators, marine drives	Pumps, fans, compressors, mills, crushers, conveyor systems, retrofit projects
*Exception: V20: needs no tool; V90: SINAMICS V-ASSISTANT commissioning tool; G180: IMS commissioning software (Inverter Management Software)																		
Engineering tools: Drive Technology Configurator – selection and configuration SIZER – simple planning and engineering STARTER and SINAMICS Startdrive – for fast commissioning*, optimizing and diagnostics																		

- Wide range of power ratings from 0.12 kW to 85 MW
- Available in low voltage, medium voltage as well as DC voltage versions

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SINAMICS products

Brief overview.

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[siemens.de/sinamics](https://www.siemens.de/sinamics)

The family members: SINAMICS devices are available in various formats and designs

Ready to switch on cabinets units for high power ratings

+

Flexible chassis devices for high power ratings


+

Compact blocksize devices for low and medium power ratings

+

Modular booksize devices for low and medium power ratings


+



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SINAMICS V: converters for basic performance applications

SINAMICS V20



Blocksize device

The versatile converter for basic applications


Industry, the trades

IP20

1 AC 200 ... 240 V: 0.12 – 3 kW
3 AC 380 ... 480 V: 0.37 – 30 kW

V/f control

SINAMICS V90



Blocksize device

The performance optimized servo drive system that is simple to operate

Industry, the trades

Converter IP20, motor IP65

Sinamics V90 Servosystem, Low Inertia (LI)
1AC 200 ... 240 V: 0.10 kW - 0.75 kW
3AC 200 ... 240 V: 1.00 kW - 2 kW
Sinamics V90 Servosystem, High Inertia (HI)
3AC 380 ... 480 V: 0.4 kW - 7.0 kW


Servo control




SINAMICS includes basic converters ...

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SINAMICS G: converters for General Performance applications







<div><div>SINAMICS G120</div><div>Blocksize device</div><div>Modular converters for variable-speed single-motor drives</div><div>Industrial applications</div><div>IP20</div><div>1/3A AC 200 – 240 V: 0.55 – 55 kW 3 AC 380 – 480 V: 0.55 – 250 kW 3 AC 500 – 690 V: 11 – 132 kW</div><div>V/f control, vector control with/without encoder, torque control with/without encoder</div></div>	<div><div>SINAMICS G120C</div><div>Blocksize device</div><div>Compact and versatile converter with optimum functionality</div><div>Machinery construction and distribution for e.g. conveyor belts, mixers, extruders, pumps, fans, compressors or basic handling machines</div><div>IP20</div><div>3 AC 380 – 480 V: 0.55 – 18.5 kW</div><div>V/f control, vector control without encoder</div></div>	<div><div>SINAMICS G120P/ G120P Cabinet</div><div>Blocksize and chassis devices, devices for wall/panel mounting and cabinet units</div><div>The specialist for pumps, fans and compressors</div><div>Wide range of applications in industry, water and wastewater and building systems for HVAC,</div><div>IP20, IP55</div><div>3AC 380 – 480 V: 110 bis 560 kW 3AC 500 – 690 V: 500 bis 630 kW</div><div>V/f control, vector control without encoder, torque control without encoder</div></div>
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SINAMICS includes generalists ...

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SINAMICS G: converters for General Performance applications






<div><div>SINAMICS G110D</div><div>Blocksize device</div><div>Distributed drive for basic, single-axis applications in the lower power range</div><div>Basic conveyor technology applications in airports and logistics solutions in the horizontal plane with AS-i connection and local/remote operation.</div><div>IP65</div><div>3 AC 380 – 480 V: 0.75 – 7.5 kW +/-10%</div><div>V/f control</div></div>	<div><div>SINAMICS G120D</div><div>Blocksize device</div><div>Distributed drive for complex single-axis/ multi-axis applications</div><div>Conveyor-related application, specifically for the automotive industry, as well as other high-performance applications with BUS connection</div><div>IP65</div><div>3 AC 380 – 480 V: 0.75 – 7.5 kW</div><div>V/f control, vector control with/without encoder, torque control with/without encoder</div></div>	<div><div>SINAMICS G110M</div><div>Integrated in the motor</div><div>The distributed converter for SIMOGEAR geared motors</div><div>Industrial applications</div><div>Up to IP66</div><div>3AC 380 V - 500 V -10/+6% 0.37 kW to 4 kW</div><div>V/f control, FCC (flux current control), sensorless vector control</div></div>
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SINAMICS includes generalists ...

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SINAMICS G: converters for General Performance applications

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SINAMICS G130		SINAMICS G150		SINAMICS G180	
Chassis device		Converter cabinet unit		Compact device, converter cabinet unit	
The universal drive solution for high-rating single-motor drives		The universal drive solution for high rating single-motor drives		The specific drive solution for oil & gas, chemical and process industries	
Industrial plant construction, companies operating plants.		Industrial plant construction, companies operating plants in the process and production industries		Applications in general machinery construction	
Dependent on the particular type, IP00 or IP20		IP20 – IP54		IP20 – IP54	
3 AC 380 – 480 V: 110 – 560 kW 3 AC 500 – 600 V: 110 – 560 kW 3 AC 660 – 690 V: 75 – 800 kW		3 AC 380 – 480 V: 110 – 900 kW 3 AC 500 – 600 V: 110 – 1000 kW 3 AC 660 – 690 V: 75 – 2700 kW		3 AC 380 – 480 V: 2.2 – 4100 kW 3 AC 500 – 600 V: 2.2 – 5300 kW 3 AC 500 – 690 V: 2.6 – 6600 kW 3 AC 660 – 690 V: 7.5 – 6600 kW	
V/f control, vector control with/without encoder, closed-loop speed/torque control		V/f control, vector control with/without encoder, closed-loop speed/torque control		V/f control, vector control with/without encoder, closed-loop speed/torque control	

SINAMICS includes generalists ...

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SINAMICS S: servo drives and flexible, modular drive systems


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SINAMICS S110			SINAMICS S120 AC/AC drive units	
Blocksize drive		Blocksize device		Chassis device
Single-axis positioning drive		Modular drive system for demanding single-axis applications		
Plant and machinery construction, laboratory automation, Solar systems, medical technology.		Plant and machinery construction		
IP20		IP20		IP20 (air- and liquid cooled)
1 AC, 200 – 240 V / 0.12 – 0.75 kW 3 AC, 380 – 480 V / 0.37 – 90 kW		1 AC 200 – 240 V: 0.12 – 0.75 kW 3 AC 380 – 480 V: 0.37 – 90 kW		3 AC 380 – 480 V: 110 – 250 kW
V/f control, servo control with/without encoder, closed-loop speed/torque control		V/f control, vector control with/without encoder, servo control with/without encoder, speed control/torque control		

... specialists and all-rounders ...

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SINAMICS S120: Flexible, modular drive system for demanding drive applications





<div></div> <div>SINAMICS S120 DC/AC drive units</div> <div></div>		<div></div> <div>SINAMICS S120 Cabinet Modules</div>
Booksize device	Chassis device	Modular cabinet elements
Modular drive system for demanding multi-axis applications		Modular drive system for demanding multi-axis applications
Plant and machinery construction		Plant construction
IP20	IP20 air and liquid cooled	IP20 (IP21,23, 43, 54) air cooled IP23,43,55 liquid cooled
3 AC 380 – 480 V: 1.6 – 107 kW	3 AC 380 – 480 V: 110 – 3040 kW 3 AC 500 – 690 V: 75 – 5700 kW	3 AC 380 – 480 V: 4.8 – 3000 kW 3 AC 500 – 690 V: 75 – 5700 kW
V/f control, vector control with/without encoder, servo control with/without encoder, speed control/torque control		V/f control, vector control with/without encoder, servo control with/without encoder, speed control/torque control
... all-rounders ...		

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SINAMICS S150: Applications as ready to switch on SINAMICS DCM cabinet units – the new DC drive



<div>SINAMICS S150</div> <div></div>	<div>SINAMICS DCM / Cabinet</div> <div></div>
Converter cabinet unit	Converter device, converter cabinet
Converter for demanding variable-speed single-motor drives	Scalable converter for basic and demanding applications
Industrial plant construction, companies operating plants	Rolling mill drives, wire-drawing machines, extruders and kneaders, cable railways and lifts, test stand drives, cross cutters and shears, presses, elevator and crane systems, mine hoists
IP20 (IP21, IP23, IP43, IP54)	IP00 - IP54
3 AC 380 – 480 V: 110 – 800 kW 3 AC 500 – 690 V: 75 – 1200 kW	1 AC 85 V – 3 AC 950 V: 6 – 2508 kW (parallel connection up to 30 MW)
V/f control, vector control with/without encoder, servo control with/without encoder, speed control/torque control	Speed control/torque control
... LV cabinets ready to be connected up ...	







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SINAMICS S120 - different formats optimized for single and multi-axis applications



SINAMICS S120 – description

Modular drive system for demanding single-axis and multi-axis applications

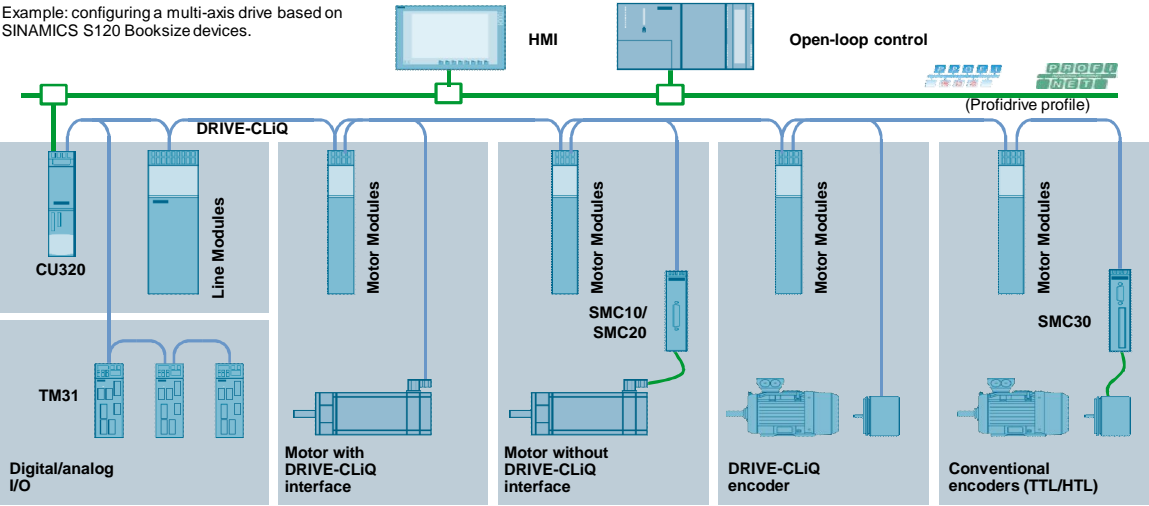
AC/DC-unit for single-axis use		DC/AC-system for multi-axis use			
Blocksize	Chassis	Booksize Compact	Booksize	Chassis	Cabinet Modules
					
0,12 – 90 kW	110 – 250 kW	0.9 – 9,7 kW	1,6 – 107 kW	75 – 5700 kW	1,6 – 5700 kW

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SINAMICS S120 - scalability through modularity



Example: configuring a multi-axis drive based on SINAMICS S120 Booksize devices.



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Conveyor technology application

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Siemens has the fitting and optimum portfolio for all conveyor-related applications

Whether it involves conveying, sorting, storing or picking & placing – in conveyor systems, across-the-board productivity defines the success of the operation. In all sectors. Whether for standard or highly complex applications.

- The optimum products and systems: As THE partner for conveyor technology, Siemens provides support with a portfolio of drive and automation components that precisely fits the application
- Competent consulting and extensive support for engineering concepts that are fit for the future.
- Service in over 130 countries around the world.

Products:

Converters, geared motors, motor starters and control systems



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Application conveyor system for bulk materials (bulk material handling)

SIEMENS

Drives for bulk material conveyor systems up to 1500 kW – for smooth and efficient transport

Our harmonized drive systems for conveyor systems for bulk materials are supplied mounted on a frame and ensure that materials are safely, reliably and efficiently transported even under the harshest of conditions – heat, cold, dust, dirt and vibration.

Perfect interaction between SINAMICS converters, SIMOTICS motors, FLENDER couplings and FLENDER gearboxes:

- The belts speed is precisely adapted to fluctuating loads on the conveyor belt
- Lower operating costs as a result of lower energy usage
- Minimum belt oscillation
- Lower brake wear
- Low maintenance overall system with long service life

Products: SINAMICS G120, G130, G150 and S120 - SIMOTICS SD, TN and FD – FLENDER couplings – FLENDER FZG and SIG gearboxes



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Pump, fan and compressor applications

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Siemens offers integrated drive solutions for pumps, fans and compressors:

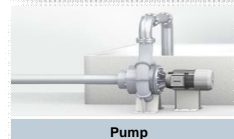
Integrated drive trains with components that are perfectly harmonized and coordinated with one another plus the corresponding automation technology – all from a single source.

To precisely dimension fluid flow machines and positive displacement pumps. With competent support when implementing future-proof concepts – for basic throttle controls as well as for soft starter-converter cascades and other complex applications.

Over the complete lifecycle of the application with comprehensive service and support.

Products:

SINAMICS G120P, SIMOTICS motors, SIRIUS switchgear



Pump



Fan



Compressor

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Segment winder as converting application

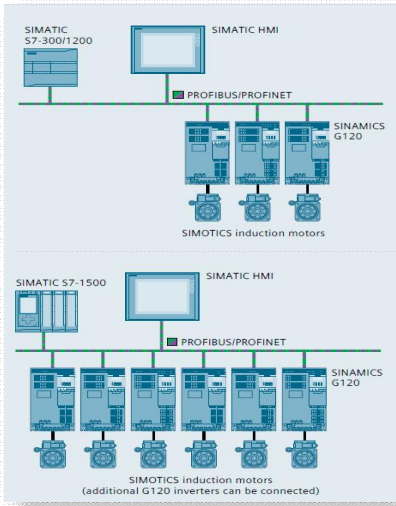
Siemens offers all of the usual control modes for winders

Winders are a fixed element of every converting machine. The application specifically developed for the purpose covers all of the usual control modes. The following modes are available:

- Dancer roll position control with speed correction
- Tension control with torque limiting
- Tension control with speed correction, and
- Open-loop torque control (indirect tension control).

This application eliminates complex work steps. The diameter is either calculated using an external sensor, from the ratio of the material web velocity and speed - or by adding the material thickness over several revolutions.

Products: SINAMICS G120, S120



Battery-based energy storage application

Siemens offers the optimum products to implement battery-based energy storage devices

- Storing energy from renewable energy sources is a significant trend for the future
- The increasing use of batteries to save energy over hours and days is being forced by renewable energies – a global mega trend
- The modular solution based on SINAMICS S120 allows the functionality to be adapted to address all applications – and also facilitates a shorter time to market.

Products: SINAMICS S120, [SINAMICS DC Power Converter](#)



Test stand application

SIEMENS

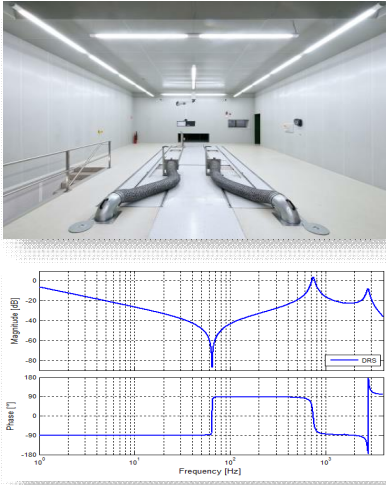
Test stands with intelligent components from Siemens

The properties and attributes of technical equipment are tested on a test stand so that they are reproducible. For example, on vehicle test stands, roller test stands, gearbox test stands, motor test stands/power test stands or special test stands

Siemens advantages:

- Torque fluctuations of internal combustion engines speed and torque stability (low ripple)
- Adaptable closed-loop control system for the highest torque quality
- SIEMENS closed-loop control system for rotating frequencies exceeding 1000 Hz
- Energy recovery when braking without any damaging current harmonics
- Energy balancing in the coupled DC link for multi-axis test stands
- Integrated safety functions, e.g. SLS for entering the test cell
- Integration of state-of-the-art simulation tools such as Matlab or Labview
- Computer coupling for long-term data acquisition (CAN, PROFINET, PROFIBUS, Ethernet, EtherNet/IP)
- High dynamic performance, e.g. for simulating internal combustion engines

Products: SINAMICS S 120, S 150 and DCM



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Coiler drive application

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Drive systems for coilers – for optimum winding and unwinding

Our harmonized drive systems for coilers in hot and cold rolling mills ensure that the strip thickness and strip surface of the wound coil always comply with specifications.

Perfect interaction between SINAMICS S120 CM and SIMOTICS FD motors:


- The **liquid-cooled version** of the drive system is especially suitable for dusty or aggressive air and high ambient temperatures
- Maximum **precision when unwinding and winding**
- **Power is exchanged** between unwinding coilers operating in the generating mode and winding coilers operating in the motoring mode
- Improved energy efficiency of the complete plant or system!

Products: Liquid-cooled SINAMICS S120 CM with water-cooled SIMOTICS FD



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Applications in hazardous zones



Drive systems for use in hazardous zones, including pumps, fans, compressors and extruders





Our harmonized and coordinated drive systems offer the necessary safety combined with the required features and attributes

Perfect interaction between SINAMICS G180 and SIMOTICS XP

The tested combination comprising SINAMICS G180 and SIMOTICS XP motor is the first choice when it comes to dusty or aggressive atmospheres as well as hazardous zones.

- **Certified safety** with EC type examination certificate for motor design and temperature evaluation
- **Long motor cables** are possible as a result of the integrated du/dt filter, also for motors with standard insulation system.
- **Better energy efficiency** of the complete system as a result of the optimized pulse pattern
- **Optimum** interaction with SIMATIC PCS7

Products: Air and liquid-cooled SINAMICS G180 with air-cooled SIMOTICS XP



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Thank you for your attention!





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