

SIEMENS



SINAMICS DCM

DC Converter, Control Module

Universal. Scalable. Rugged.



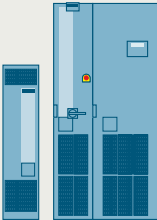
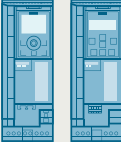
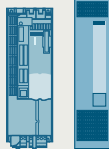

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FUTURE-PROOF DRIVE SOLUTIONS

SINAMICS—one family, one source, all applications

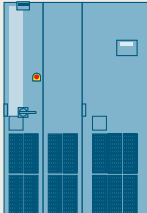

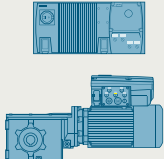





SINAMICS offers the optimum drive for every task—offering integrated and seamless engineering parameterization, commissioning and operation.

Low-voltage

Standard-performance drives				Industry-specific drives		High-performance drives		
								
V20	G120C	G120	G130 / G150	G120X	G180	S120		
0.12–30 kW 0.16–40 hp	0.55–132 kW 0.75–150 hp	0.55–250 kW 0.5–400 hp	75–2,700 kW 100–3,600 hp	0.75–630 kW 1–700 hp	2.2–6,600 kW 3–9,000 hp	0.55–6,840 kW 0.75–9,000 hp		

SINAMICS to tackle any task

- Wide range of power ratings from fractional horsepower to 85 MW
- Available in low-voltage and medium-voltage versions
- Standard and unified functionality as a result of the common hardware and software platform
- One standard engineering process using only two tools for every drive we offer: SIZER for engineering and STARTER for parameterizing and commissioning
- High degree of flexibility and combinability
- Available as chassis or cabinet units

							Medium-voltage		
		Distributed drives	Servo drives				For demanding applications with high power ratings		
									
S150	DCM (DC)	G115D / G120D	SIMATIC MICRO-DRIVE	S120	S210	S120M	GL150 / SL150	SM120 CM / SM150 / GM150	GH150 / GH180
75–1,200 kW 100–1,600 hp	6 kW–30 MW 8–40,000 hp	0.37–7.5 kW 0.5–10 hp	0.1–1 kW 0.25–1.4 hp	1.6–6,840 kW 2–9 hp	0.05–7 kW 0.06–10 hp	0.25–1.1 kW 0.3–1.5 hp	2.8–85 MW	0.8–58 MW	0.15–28.5 MW

SINAMICS DCM at a glance

- Backed by a [3-year extended warranty](#) exclusive to the US market
- Integration into the SINAMICS drive family
- Interfaces for PROFINET (optional) and PROFIBUS (as standard)
- Variance of the control units
- Field power supply in line with market requirements
- Electronics power supply for connection to 24V DC (optional) that can be used with a UPS to increase availability
- Power unit and voltage measurement from power unit insulated against ground
- Free function blocks and Drive Control Chart (DCC)
- Expandable functionality using SINAMICS components
- Single-phase operation possible
- Coated printed circuit boards (optional) and nickel-plated copper busbars (optional)
- Wide temperature range for operation in every environment

SINAMICS DCM

The scalable drive system for basic and sophisticated applications

DC drives have proven their value through daily use over many years. Thanks to its dynamic performance, ruggedness and cost-effectiveness, DC drive technology continues to be the most favorably priced drive solution for many applications today—with numerous advantages when it comes to overall reliability, ease-of-operation and system performance.

In many areas of industry, DC drives continue to make sense, both technologically and economically

- | | |
|--------------------------------------|--|
| ■ Inexpensive 4Q operation | ■ Low space requirements |
| ■ Continuous operation at low speeds | ■ Reliability |
| ■ Full torque even at low speeds | ■ Low torque ripple even at low speeds |
| ■ Wide speed control range | ■ High overload capability |



SINAMICS DC Master

The best choice for retrofit applications

With its very precise closed-loop motor speed control, the SINAMICS DC Master series of converters always ensures optimal processes and sets itself apart thanks to its highly dynamic performance. The current and torque rise times are significantly less than 10 milliseconds.

Wherever DC drives continue to be in demand, SINAMICS DC Master is your best choice.

Typical applications include

- | | | |
|----------------------------|------------------------------|------------------------|
| ■ Rolling mills | ■ Presses | ■ Test stand drives |
| ■ Cross-cutters and shears | ■ Elevator and crane systems | ■ Heating applications |
| ■ Wire-drawing machines | ■ Cableways and lifts | ■ Magnet applications |
| ■ Extruders and kneaders | ■ Mine hoists | ■ And more... |



SINAMICS DCM DC Converters

This ready-to-connect converter chassis unit is available as a two-quadrant and four-quadrant drive system with rated DC currents from 15–3,000A and rated input voltages from 3-phase 400–950V AC. Thanks to optimal current and voltage increments, overload capability, large permissible tolerances in terms of input quantities, and numerous options, users can select the perfect unit for their particular application—just like custom-made.

DC converters are available in a compact, space-saving design. They combine control, regulation and the power unit in one device.

- Integrated field power supply up to 85A
- Standard tool for commissioning
- Optimized cooling concept
- Multilevel performance structure with low variance of the control units
- 2Q field with integrated overvoltage protection (optional)

Technical data overview

Power range	6.3 kW up to 30 MW
Rated direct current	15–3,000A
Rated supply voltage	3AC 400–950V



SINAMICS DCM Control Module

Retrofitting is extremely easy. Older technology is transformed into new—quickly, easily and economically. The SINAMICS DCM Control Module is the ideal solution to retrofit and modernize existing DC drives by combining fully digital closed-loop control with all the advantages of state-of-the-art open-loop control technology. Only the closed-loop control section is replaced, whereas the motor, mechanical system and power unit remain unchanged.

As a result, users will benefit from an existing DC drive that is greatly improved with a full range of functions including:

- Strong firing pulses
- Flexible adaptation of sensors to the power unit
- Detachable housing and externally expandable firing pulse transformer
- Control of up to three power units
- Same functionality and appearance as a DC Converter

Technical data overview

Rated armature supply voltage that can be sensed	3AC 50/125/250/575/1000V
Rated supply voltage, electronics power supply	DC 24V (DC 18–30V); In=5A
Rated field supply voltage	2AC 480V (+10/-20 %)

Well-conceived down to the smallest detail

With SINAMICS DCM, DC drive technology users benefit from the perfect combination of a well-proven solution and extremely innovative highlights. This pioneering converter is remarkable for its highly developed technology and an abundance of well-conceived features.

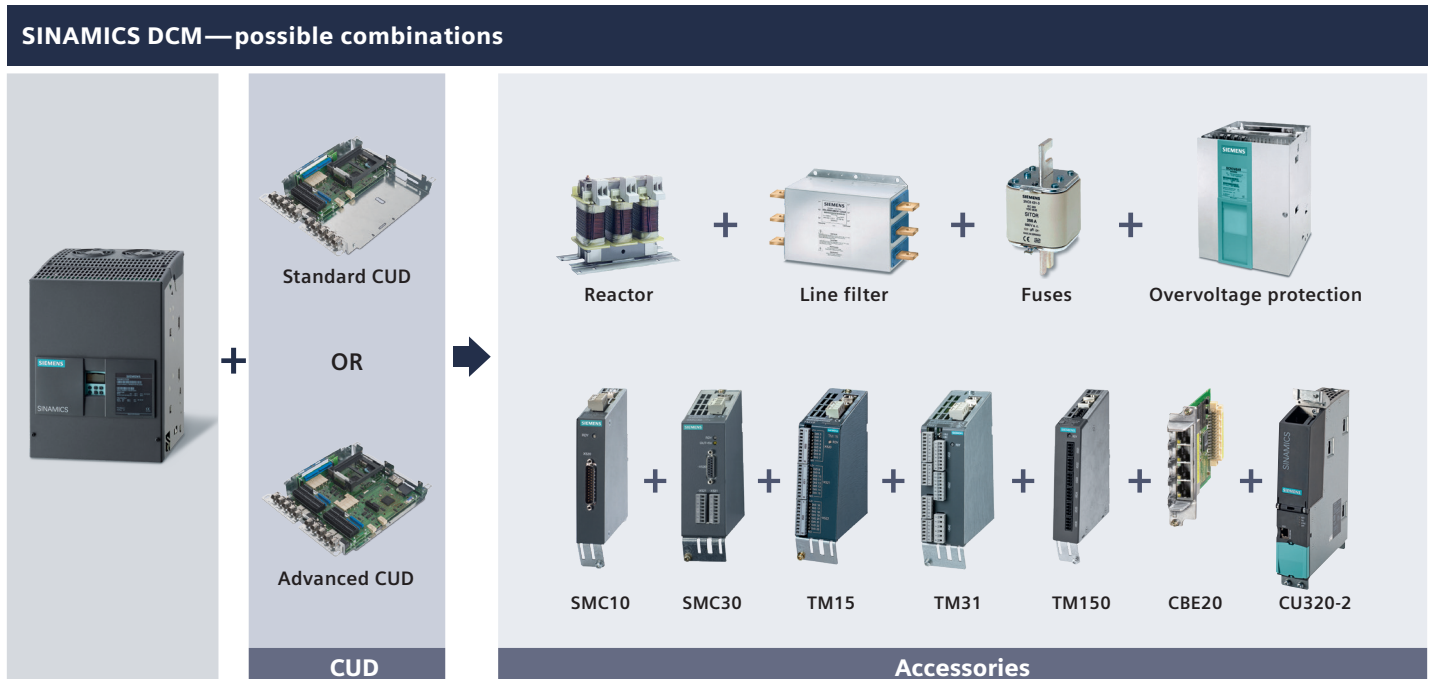
Perfectly scalable

Thanks to its scalability, our series of converters excels both in basic applications and in sophisticated and demanding tasks. For standard closed-loop control tasks, SINAMICS DC Master is equipped with a standard control unit DC (CUD).

The closed-loop control capacity can be expanded using the advanced CUD for applications that place higher demands on computational performance and interfaces. The ability to select among various options—standard CUD, advanced CUD, or a combination of the two—means that computational performance and speed can be optimally adapted to your specific requirements. Depending upon the specific application, the units are available in a two-quadrant or four-quadrant version and with an integrated field power unit. The rated DC current ranges from 15–3,000A and can be increased by connecting DC converters in parallel.

Flexibly expandable

SINAMICS DC Master can be expanded on a modular basis from the standard to a high-performance solution. The comprehensive range of products and the abundance of options allow the drive system to be optimally adapted, both technologically and economically, to specific plant or system requirements. The interfaces of the CUD and the number of digital inputs and outputs can be supplemented as needed: for example, using additional SINAMICS modules like the TM15, TM31, and TM150 terminal modules, the SMC10 and SMC30 sensor modules, the CBE20 communication board, or an additional CU320-2 control unit (see illustration below).



Technical data

DC Converters for two-quadrant operation

Armature circuit			Field circuit	
Rated supply voltage V	Rated DC voltage V	Rated DC current A	Rated supply voltage V	Rated DC current A
3AC 400	485	60	2AC 400	10
		90		10
		125		10
		210		15
		280		15
		400		25
		600		25
		850		30
		1200		40
		1600		40
		2000		40
3000	40			
3AC 480	575	60	2AC 480	10
		90		10
		125		10
		210		15
		280		15
		450		25
		600		25
		850		30
		1200		40
3AC 575	690	60	2AC 480	10
		125		10
		210		15
		400		25
		600		25
		800		30
		1100		40
		1600		40
		2000		40
		2200		40
		2800		40
3AC 690	830	720	2AC 480	30
		1000		40
		1500		40
		2000		40
		2600		40
3AC 830	1000	950	2AC 480	40
		1500		40
		1900		40
3AC 950	1140	2200	2AC 480	40

DC Converters for four-quadrant operation

Armature circuit			Field circuit				
Rated supply voltage V	Rated DC voltage V	Rated DC current A	Rated supply voltage V	Rated DC current A			
3AC 400	420	15	2AC 400	3			
		30		5			
		60		10			
		90		10			
		125		10			
		210		15			
		280		15			
		400		25			
		600		25			
		850		30			
		1200		40			
		1600		40			
		2000		40			
		3000		40			
		3AC 480		500	15	2AC 480	3
30	5						
60	10						
90	10						
125	10						
210	15						
280	15						
450	25						
600	25						
850	30						
1200	40						
3AC 575	600	60	2AC 480	10			
		125		10			
		210		15			
		400		25			
		600		25			
		850		30			
		1100		40			
		1600		40			
		2000		40			
		2200		40			
		2800		40			
3AC 690	725	760	2AC 480	30			
		1000		40			
		1500		40			
		2000		40			
		2600		40			
		3AC 830		875	950	2AC 480	40
		1500			40		
1900	40						
3AC 950	1000	2200	2AC 480	40			

SINAMICS DCM options

Additional options	Control unit	Field	Fans
<ul style="list-style-type: none"> ▪ Electronics power supply for connection to 24V DC that can be used with a UPS to increase the availability of the plant or system ▪ Armature circuit supply voltage with extra-low voltage 10–50V AC ▪ Coated printed circuit boards ▪ Nickel-plated copper busbars ▪ External sensor for the ambient or inlet temperature ▪ Terminal module cabinet 	<ul style="list-style-type: none"> ▪ Advanced control unit, left ▪ Standard control unit, right ▪ Advanced control unit, right ▪ CBE20 communication board, left ▪ CBE20 communication board, right ▪ Memory card, left ▪ Memory card, right 	<ul style="list-style-type: none"> ▪ 2Q field power unit ▪ Without field power unit ▪ 85A field power unit 	<ul style="list-style-type: none"> ▪ Fan for single-phase power supply

Functional Safety

Maximum safety

With the Functional Safety feature, SINAMICS DCM drives can now access the entire SIL 3 and PL e power range for STO (safe torque off) and SS1 (safe stop 1) with just one main contactor or circuit breaker. The operating instructions also describe the appropriate circuits for Emergency Off and Emergency Stop according to EN 60204-1. With Functional Safety, SINAMICS DCM offers a consistent, uniform solution for applications up to the safety integrity level SIL 3 and PL e. At the same time, only one main contactor or one circuit breaker is required. The application offers substantial savings in terms of space as well as investment and service costs.

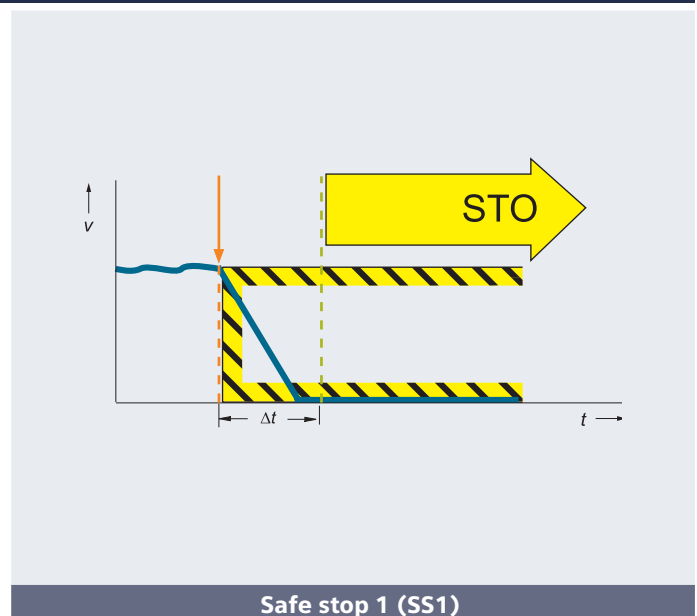
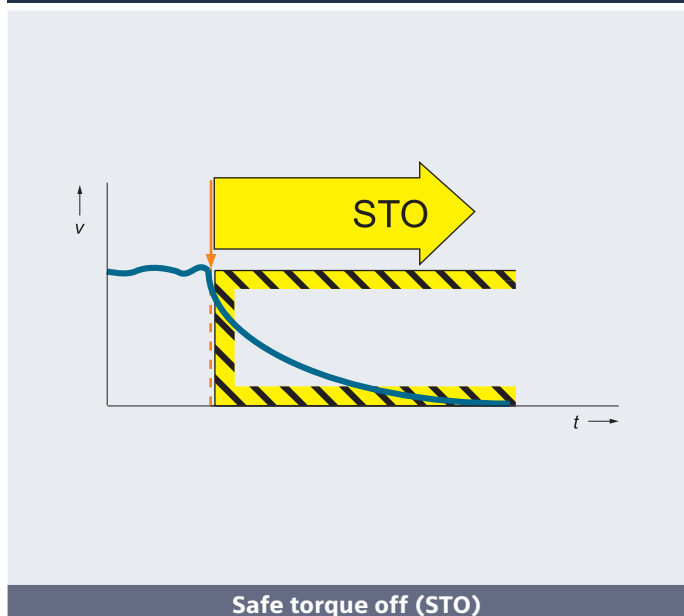
High degree of plant or system availability

SINAMICS DC Master plays a decisive role when it comes to high plant or system availability—it doesn't just happen by chance. The converter, in its entirety as well as its individual components, feature a maximum reliability—both individually and when working together. All the components are subject to exhaustive checks and tests throughout the entire production process. This guarantees high functional safety during installation, commissioning and operation. Should service become necessary, the components can be quickly and easily replaced. An additional advantage is that SINAMICS DC Master allows redundant operation. This means that in the extremely unlikely event of a master or slave unit failing, the entire system continues to function.

Quick and easy commissioning

All drives of the SINAMICS family can be quickly and easily commissioned and parameterized—either menu-assisted via the AOP30 advanced operator panel, or PC-supported using the STARTER commissioning tool. Because SINAMICS DC Master is already pre-configured from the factory, unit-specific parameters don't have to be set. Full adaptation to the current application is performed electronically through parameters. This means that the units can continue to be used whenever service is required.

Functions for safely stopping the drive



| Limitless communication

Like all SINAMICS drives, SINAMICS DCM fulfills every requirement in terms of communication options in new and retrofit business. Whether you use PROFIBUS or PROFINET, our innovative converter is equipped with every corresponding IT standard for connecting to higher-level automation systems.

PROFIBUS:

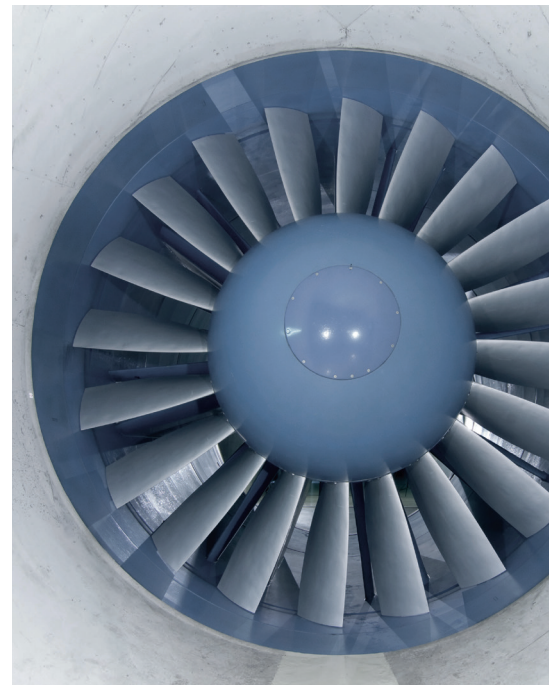
Number 1 in older industrial plants

SINAMICS DC Master supports PROFIBUS DP as standard. The standard field bus permits high-performance, end-to-end communication between all the components in an automation solution.

Ethernet / PROFINET:

For higher performance and open IT communication

SINAMICS DC Master is also available with an optional Ethernet interface. The open Industrial Ethernet standard enables a high-speed exchange of closed-loop control data. As a result, the converter can also be used in multi-axis applications that demand the highest performance. Industrial Ethernet supports PROFINET, EtherNet/IP and Modbus TCP with no restrictions, and therefore allows direct access from the management level down to the field level. Both vertical and horizontal integration are guaranteed.



Photos source: Audi, Ingolstadt/Germany

Efficient engineering across the entire lifecycle

STARTER commissioning software

STARTER is available for the commissioning of SINAMICS drives. This intelligent tool provides support when it comes to the simple configuration and commissioning of the drive components—menu-assisted and graphically-supported. What’s especially helpful is the fact that STARTER allows all the relevant data to be imported from the drive components’ electronic rating plates. This significantly reduces the associated costs, speeds up parameterization and prevents potential incorrect entries. Integrated test functions check entries and optimize parameters.

Even stronger in a team

STARTER can run as a separate Windows application and is linked to the drives via a serial interface, PROFIBUS DP or PROFINET. STARTER can be integrated into both SCOUT—the engineering system of our SIMOTION motion control system—and STEP 7—the engineering software of our SIMATIC industrial automation system. This well-conceived concept pays off when service becomes necessary because it permits simple diagnostics and troubleshooting either on-site or remotely.

Drive Control Chart

The optional SINAMICS Drive Control Chart (SINAMICS DCC) engineering tool for the STARTER commissioning software allows you to create your own and complex technology functions based upon graphical signal processing charts with inter-connected blocks. With a simple graphical configuration, the device’s functionality can be individually expanded with closed-loop control, mathematical functions and logic functions for optimal adaptation to the application.

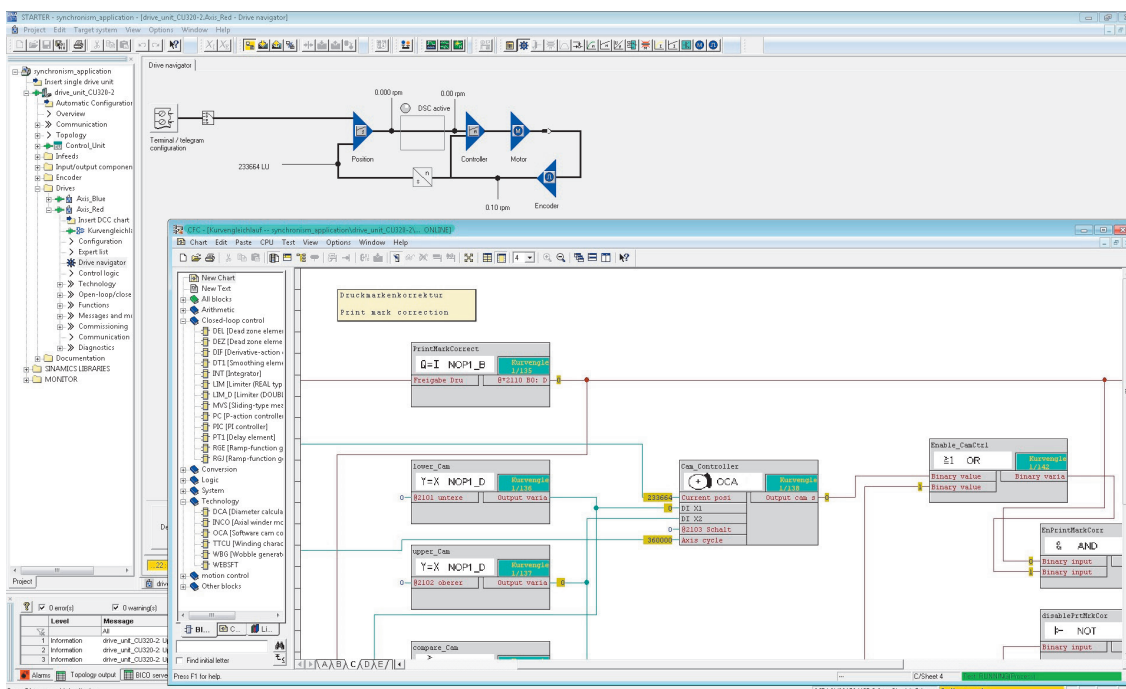
Select products using the Siemens Product Configurator

The Siemens Product Configurator helps you select the optimal SINAMICS DCM.

Efficient drive configuration:

- Quick and easy converter selection
- Optimized design based upon customer-specific duty cycle
- Comprehensive documentation
- Migration support for retrofit
- Direct ordering via the Siemens Industry Mall

To learn more, visit: siemens.com/spc



Ideal partners for SINAMICS DCM— **SIMOTICS DC motors from Siemens**

Our SIMOTICS DC line of motors prove their value every day wherever there's a demand for a high degree of availability. These motors are equipped with the high-quality DURIGNIT® insulation system, available with various degrees of protection, and optimally adapted for use with SINAMICS DCM. The right solution is always available—even for the harshest environmental conditions.

Highest power density in the smallest space

SIMOTICS DC motors allow you to implement innovative drive concepts and reduce application costs. In order to improve thermal and magnetic utilization as well as the mechanical design, these motors were developed using computer-based simulation techniques. Only materials with outstanding mechanical, magnetic and electrical properties are used in their production. The result is the highest power densities in combination with an extremely compact design with low shaft heights and minimal space requirements in your application.

Long service life with minimal maintenance costs

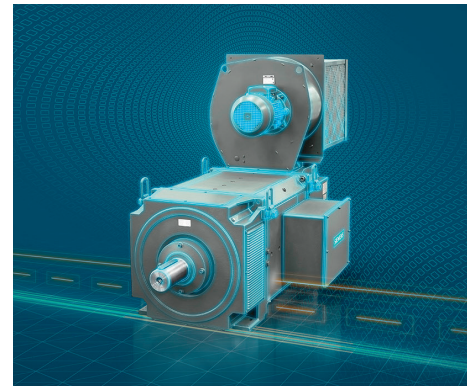
Materials specifically tailored to your application increase brush life. This facilitates an extremely smooth running quality—ensuring quiet operation, reduced stress on the motor and minimized torque ripple and vibration. Together with the sealed insulation system, this guarantees that the SIMOTICS DC motor will have a long service life with minimal maintenance costs. Even if problems occur, Siemens offers global service and support to guarantee a high degree of availability.

Extremely quiet

Noise levels were a top consideration in the design of the SIMOTICS DC motors. Take, for example, the special main pole shape and the optimized, separately driven fan. These measures in the mechanical and magnetic area, along with the optimal fan design, guarantee an especially low noise level, which is very beneficial for operating personnel and reduces costs for on-site noise insulation.

The first choice in every performance class

Our DC motors cover a range of power ratings that extends from 31.5 kW to 1,610 kW—and they come in various versions: compensated, naturally cooled or force-ventilated, with or without fans. The modular structure of our offering permits almost any combination. These DC motors can also be optimally integrated into the digital environment via interfaces on the SINAMICS DC converter—remotely, for continuous monitoring, accurate diagnostics and efficient maintenance.



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