Catalog D 12 · 2006

sinamics

SINAMICS GM150
SINAMICS SM150

Medium-Voltage Converters
0.8 MVA to 28 MVA

SIEMENS

Related catalogs

SINAMICS G110 D 11.1
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0.12 kW to 3 kW

Order No.:
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Achtung!
Breite 95 mm

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Catalog CA 01 CA 01
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Trademarks

SINAMICS GM150
SINAMICS SM150

Medium-Voltage Converters

0.8 MVA to 28 MVA

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The products and systems described in this catalog are produced/distributed in accordance with the requirements of a quality management system which has been certified to DIN EN ISO 9001 and DIN EN ISO 14001 (Certificate Registration No. 002241 QM UM). The certificate is recognized in all IQNet countries.

SIEMENS

Welcome to Automation and Drives

We would like to welcome you to Automation and Drives and our comprehensive range of products, systems, solutions and services for production and process automation and building technology worldwide.

With Totally Integrated Automation and Totally Integrated Power, we deliver solution platforms based on standards that offer you a considerable savings potential.

Discover the world of our technology now. If you need more detailed information, please contact one of your regional Siemens partners.

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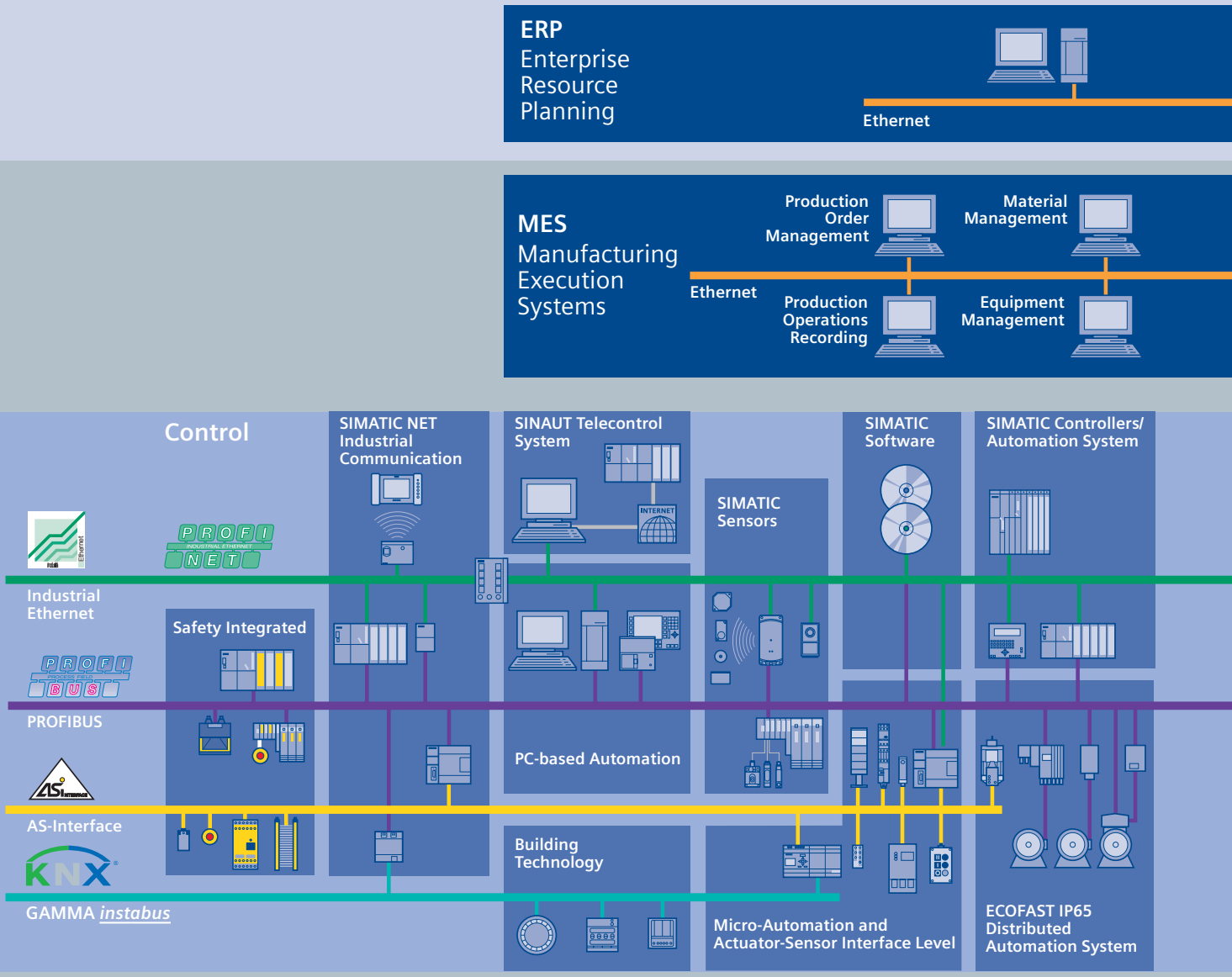
Totally Integrated Automation – innovations for more productivity

With the launch of Totally Integrated Automation, we were the first ones on the market to consistently implement the trend from equipment to an integrated automation solution, and have continuously improved the system ever since.

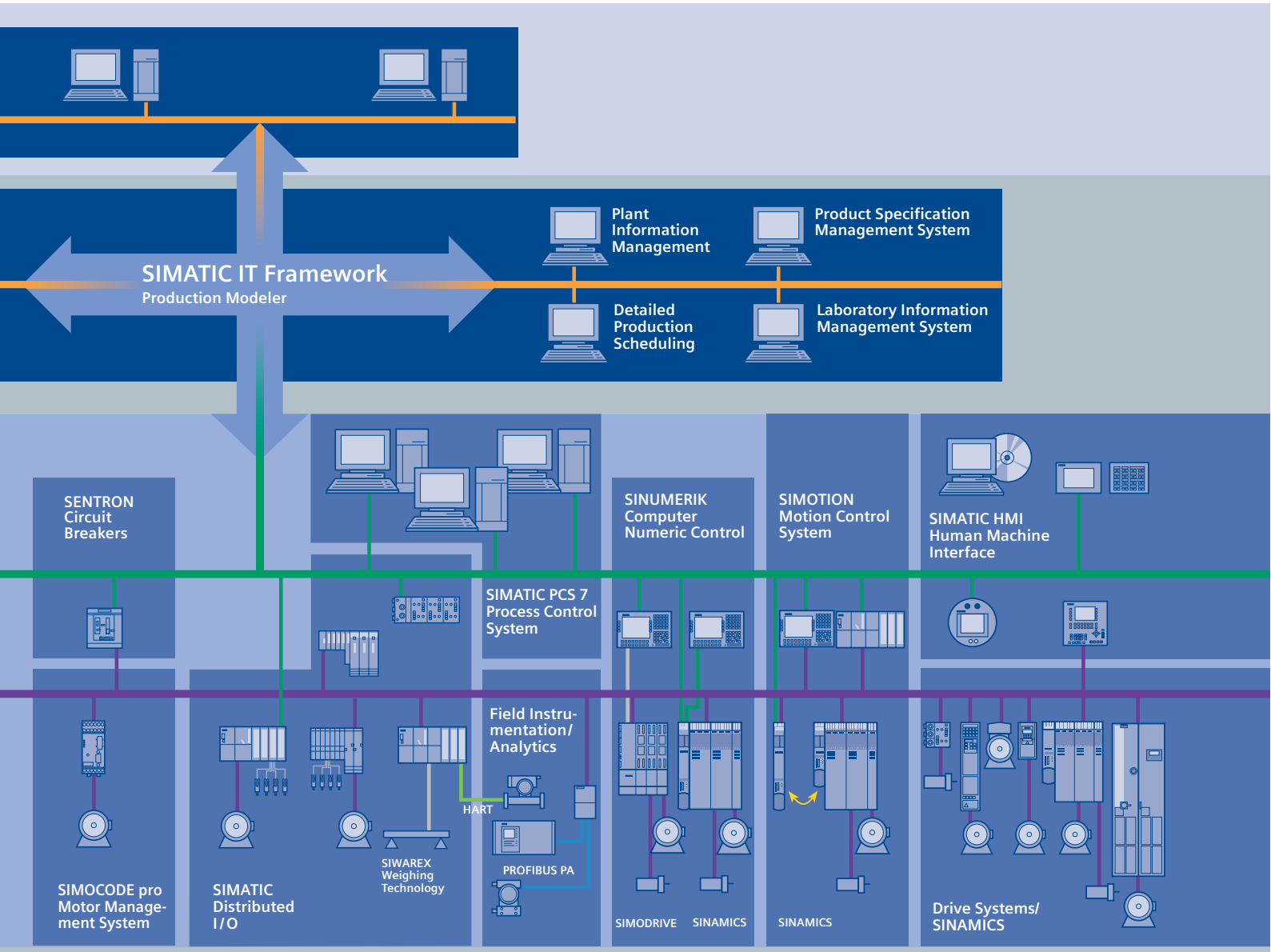
Whether your industry is process- and production-oriented or a hybrid, Totally Integrated Automation is a unique "common solution" platform that covers all the sectors.

Totally Integrated Automation is an integrated platform for the entire production line - from receiving to technical processing

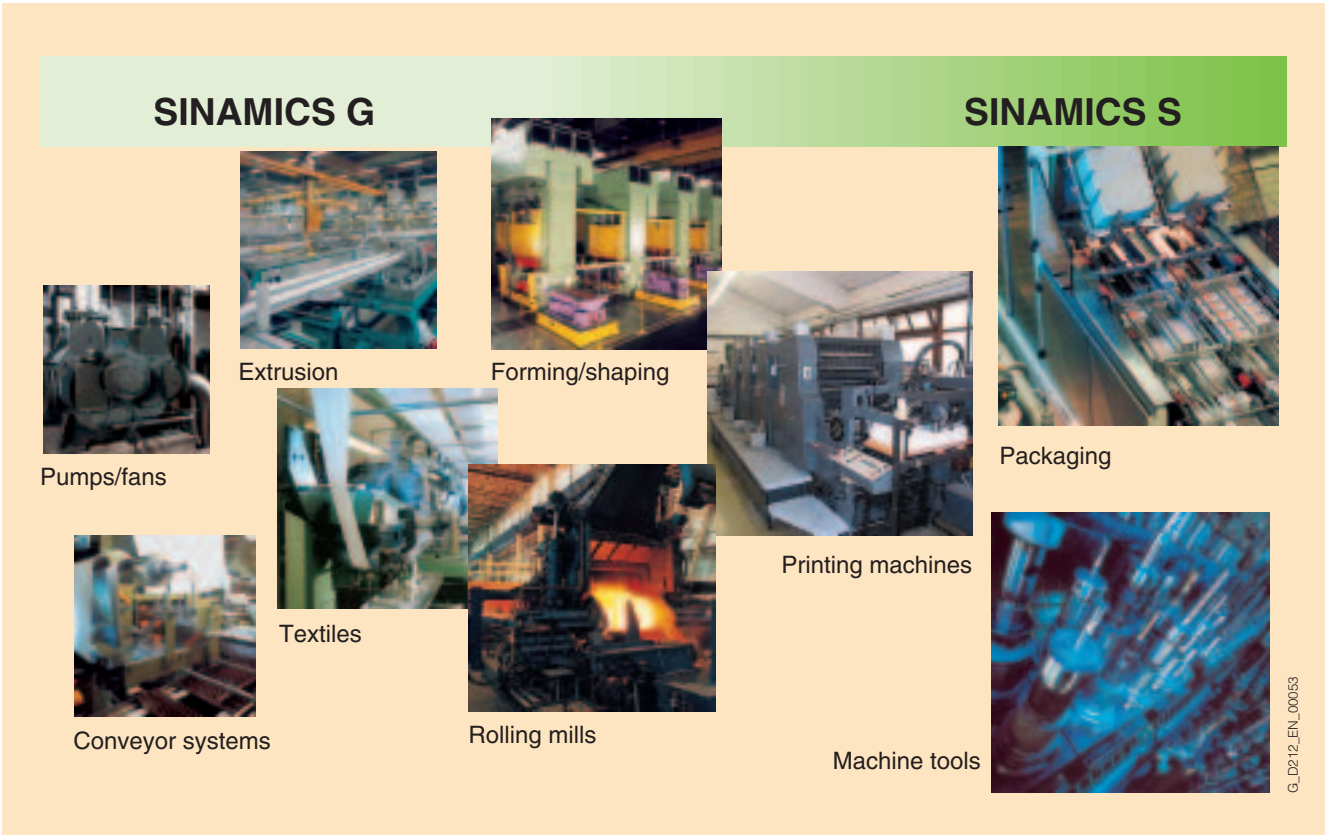


and production areas to shipping. Thanks to the system-oriented engineering environment, integrated, open communications as well as intelligent diagnostics options, your plant now benefits in every phase of the life cycle.

In fact, to this day we are the only company worldwide that can offer a control system based on an integrated platform for both the production and process industry.



The SINAMICS drive family



Applications of the SINAMICS drive family

Applications

SINAMICS is the new family of Siemens drives designed for machine and plant engineering applications. SINAMICS offers solutions for all drive tasks:

- Simple pump and fan applications in the process industry.
- Complex individual drives in centrifuges, presses, extruders, elevators, as well as conveyor and transport systems.
- Drive line-ups in textile, plastic film and paper machines, as well as in rolling mill plants.
- Highly dynamic servo drives for machine tools, as well as packaging and printing machines.

Versions

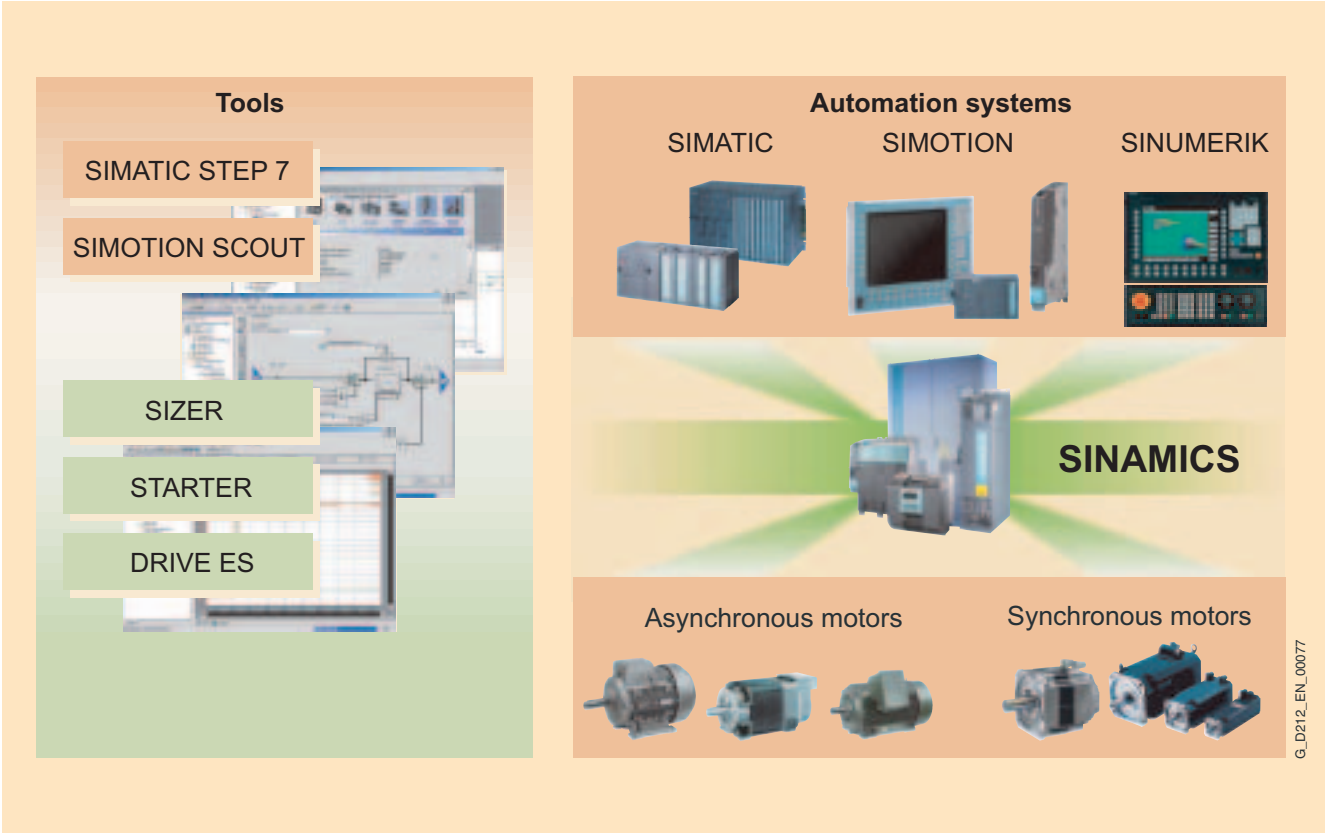
Depending on the application, the SINAMICS range offers the ideal version for any drive task.

- SINAMICS G is designed for standard applications with asynchronous motors. These applications have less stringent requirements regarding the dynamics and accuracy of the motor speed.
- SINAMICS S handles complex drive tasks with synchronous/asynchronous motors and fulfills stringent requirements regarding:
  - dynamics and accuracy
  - integration of extensive technological functions in the drive control system

Platform concept and Totally Integrated Automation

All SINAMICS versions are based on a platform concept. Joint hardware and software components, as well as standardized tools for design, configuration and commissioning tasks, ensure high-level integration across all components. SINAMICS handles a wide variety of drive tasks with no system gaps. The different SINAMICS versions can be easily combined with each other.

SINAMICS is part of the Siemens “Totally Integrated Automation” concept. Integrated SINAMICS systems covering configuration, data storage and communication at automation level, ensure low-maintenance solutions with the SIMATIC and SIMOTION control system.



SINAMICS as part of the Siemens modular automation system

Quality in accordance with DIN EN ISO 9001

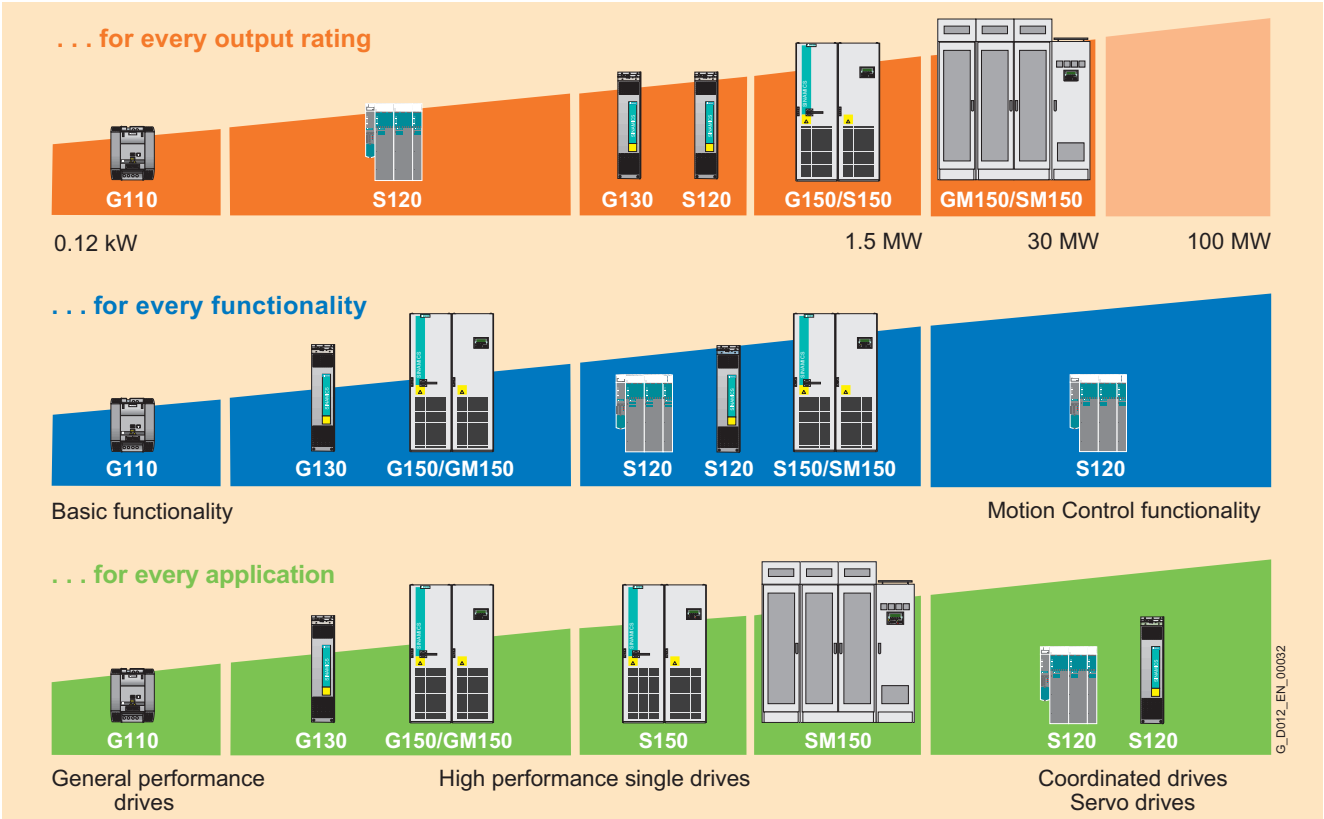
SINAMICS conforms with the most exacting quality requirements. Comprehensive quality assurance measures in all development and production processes, ensure a consistently high level of quality.

Of course, our quality assurance system is certified by an independent authority in accordance with DIN EN ISO 9001.

Overview

The SINAMICS drive family

SINAMICS . . .



Tailored to the respective areas of application, SINAMICS is divided into the family members:

- **SINAMICS G110** – the versatile drive for low power ranges
- **SINAMICS G130** and **SINAMICS G150** – the universal drive solution for high-performance single drives
- **SINAMICS S120** – the flexible, modular drive system for demanding tasks
- **SINAMICS S150** – the advanced drive solution for high-performance single drives.

The SINAMICS range is characterized by the following system properties:

- uniform functionality based on platform concept
- uniform engineering
- high degree of flexibility and combination
- wide range of performance
- designed for global use
- SINAMICS Safety Integrated
- increased economy and effectivity
- versatile interfacing facilities to host controllers
- Totally Integrated Automation

Overview

The SINAMICS GM150 and SINAMICS SM150 converters are the expansion of the SINAMICS drive family in the medium voltage range. They are supplied as ready-to-connect cabinet units.

SINAMICS GM150

Die Umrichter SINAMICS GM150 sind als Einzelantrieb für Anwendungen mit quadratischer und konstanter Lastkennlinie ohne Netzrückspeisung konzipiert.

Typical applications:

- Pumps and fans
- Compressors
- Extruders and mixers
- Mills
- Marine drives

The inverters on the motor side (Motor Modules) have IGBT power semiconductors in the lower performance range to 10 MVA and IGCT power semiconductors in the upper performance range from 10 MVA to 28 MVA.

SINAMICS SM150

SINAMICS SM150 converters are designed for demanding single and multi-motor applications and meet the following requirements:

- High dynamic response
- Operation at low frequency
- Four-quadrant operation

Typical applications:

- Roller drives (cold, hot)
- Hoisting drives
- Test stands
- Belt systems

Both the feed/feedback units on the mains side (Active Line Modules) and the inverters on the motor side are equipped with IGCT power semiconductors.

	SINAMICS GM150 IGBT	SINAMICS GM150 IGCT	SINAMICS SM150 IGCT
Line Module (rectifier on mains side)			
• Basic Line Module, 12-pulse (two-quadrant operation)	Standard	Standard	–
• Basic Line Module, 24-pulse (two-quadrant operation)	Option for 2.3 kV to 4.16 kV Standard for 6 kV and 6.6 kV and parallel connection	Option	–
• Active Line Module (four-quadrant operation)	–	–	Standard
Motor Module (rectifier on motor side)			
Voltage range	2.3 kV to 6.6 kV	3.3 kV	3.3 kV
Performance range (typ.)	0.8 MVA to 10 MVA	10 MVA to 28 MVA	5 MVA to 28 MVA
Cooling method			
• Air cooling	Standard	–	–
• Water cooling	Standard	Standard	Standard
Control modes			
• Asynchronous motor	Standard	Standard	Standard
• Synchronous motor, separately excited	Option	Option	Option
• Synchronous motor, permanently excited	–	Option	Option
Sinusoidal filter	Option	–	–
DC bus configuration with several Motor Modules on one common DC bus	–	–	Standard

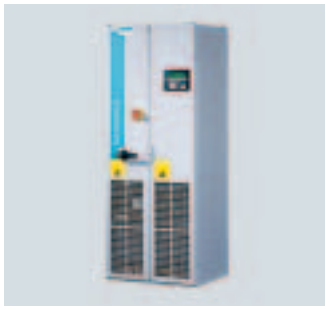
Benefits

- Low-cost: all the way from planning to service
- Simple and uncomplicated in every regard: engineering, integration, operation and diagnosis
- High availability: robust and reliable components, easy assembly, high service-friendliness

Overview

Further members of the SINAMICS drive family

Overview

SINAMICS G110	SINAMICS G130/G150	SINAMICS S120	SINAMICS S150
			
The versatile drive for low power ranges	***The universal drive solution for high-performance single drives***	***The flexible, modular drive system for complex drive tasks***	***The advanced drive solution for high-performance single drives***
Main applications			
• Plant and machines for industrial and commercial applications	• Plant and machines in the process and production industry, water/waste, power stations, oil and gas, petrochemicals, chemical raw materials, paper, cement, stone, steel	• Plant and machines for industrial applications (packaging, plastics, textile, printing, wood, glass, ceramics, presses, paper, lifting equipment, semiconductors, automated assembly and testing equipment, handling)	• Plant and machines in the process and production industry, food, beverages and tobacco, automotive and steel industry, mining/opencast mining, shipbuilding, lifting equipment/conveyors
Application examples			
• Pumps and fans • Auxiliary drives • Conveyor belts • Billboards • Door/gate operating mechanisms • Centrifuges	• Pumps and fans • Compressors • Extruders and mixers • Mills	• Motion Control applications (e.g. positioning, synchronous operation, …) • Technological applications	• Test bay drives • Centrifuges • Elevators and cranes • Cross cutters and shears • Conveyor belts • Presses • Cable winches
Highlights			
• Compact • Flexible adaptation to different applications • Simple, fast commissioning • Clear terminal layout • Optimum interaction with SIMATIC and LOGO!	• Space-saving • Low-noise • Simple, fast commissioning • SINAMICS G130: modular components • SINAMICS G150: ready-to-connect cabinet unit • Optimum interaction with SIMATIC	• For universal use • Flexible and modular • Scalable in terms of power, function, number of axes, performance • Simple, fast commissioning, auto-configuration • Innovative system architecture • Wide range of motors • Optimum interaction with SIMOTION and SIMATIC • SINAMICS Safety Integrated	• Four-quadrant operation as standard • High control accuracy and dynamic response • Almost no system perturbation • Tolerant to fluctuations in line voltage • Option of power factor compensation • Simple, fast commissioning • Ready-to-connect cabinet unit • Optimum interaction with SIMATIC

SINAMICS GM150 as IGBT version

2

2

IGBT version

Overview

SINAMICS GM150 as IGBT version (air-cooled)

SINAMICS GM150 converters as IGBT version can be optimally combined with Siemens converter motors. Sinusoidal filters are not required in this case. This ensures that the drive solution is particularly cost-effective, compact and efficient.

With the sinusoidal filter available as an optional extra, the converters offer the best conditions on the market for the operation of line motors. This makes them ideally suited for the retrofitting of existing systems from fixed-speed drives to speed-controlled drives.

SINAMICS GM150 converters as IGBT version offer economic drive solutions that can be matched to customers' specific requirements by adding from the wide range of available components and options.

IGBT converters are available for the following voltages and outputs:

Rated output voltage	Performance with air cooling	with water cooling
kV	MVA	MVA
2.3	1.0 to 2.4	2.0 to 3.2
3.3	1.0 to 6.3	2.0 to 8.0
4.16	1.3 to 7.9	2.0 to 10.1
6.0	0.8 to 5.0	1.8 to 7.3
6.6	0.9 to 5.5	1.9 to 8.0
7.2	1.0 to 6.0	2.1 to 8.7

Global use

SINAMICS GM150 converters as IGBT version are manufactured to international standards and regulations, making them ideally suited for global use. These converters are also available in a UL-listed version and in a ship-going fom (meeting the requirements of all major classification organizations).

Benefits

- Compact design and high flexibility in configuration ensures easy plant integration
- Easy operation and observation on the convenient operator panel
- Easy and reliable operation through integrated maintenance functions: the converter signals early and automatically if maintenance is required or components need to be exchanged
- High robustness and reliability thanks to the use of HV IGBT technology and fuseless assembly combined with intelligent reaction to external interference
- Can be easily integrated into automation solutions due to PROFIBUS interface supplied as standard and analog and digital interfaces
- High level of service-friendliness through innovative power unit design with plug-in Powercards and easy access to all components

Design

SINAMICS GM150 converters as IGBT version are available with a 12-pulse or 24-pulse Basic Line Module.

The 12-pulse version is standard for smaller output ratings with voltages of 2.3 kV, 3.3 kV and 4.16 kV.

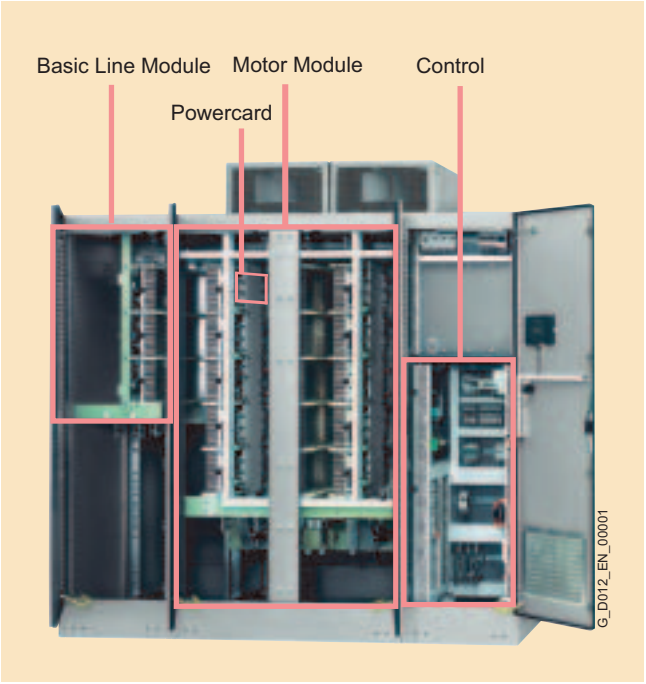
For greater output ratings and for voltages of 6.0 kV, 6.6 kV and 7.2 kV, two Basic Line Modules and two Motor Modules are connected in parallel with a common DC link or two Line Modules are connected in series (24-pulse Basic Line Modules).

The 24-pulse Basic Line Module is optionally available for smaller output ratings with voltages of 2.3 kV, 3.3 kV and 4.16 kV.

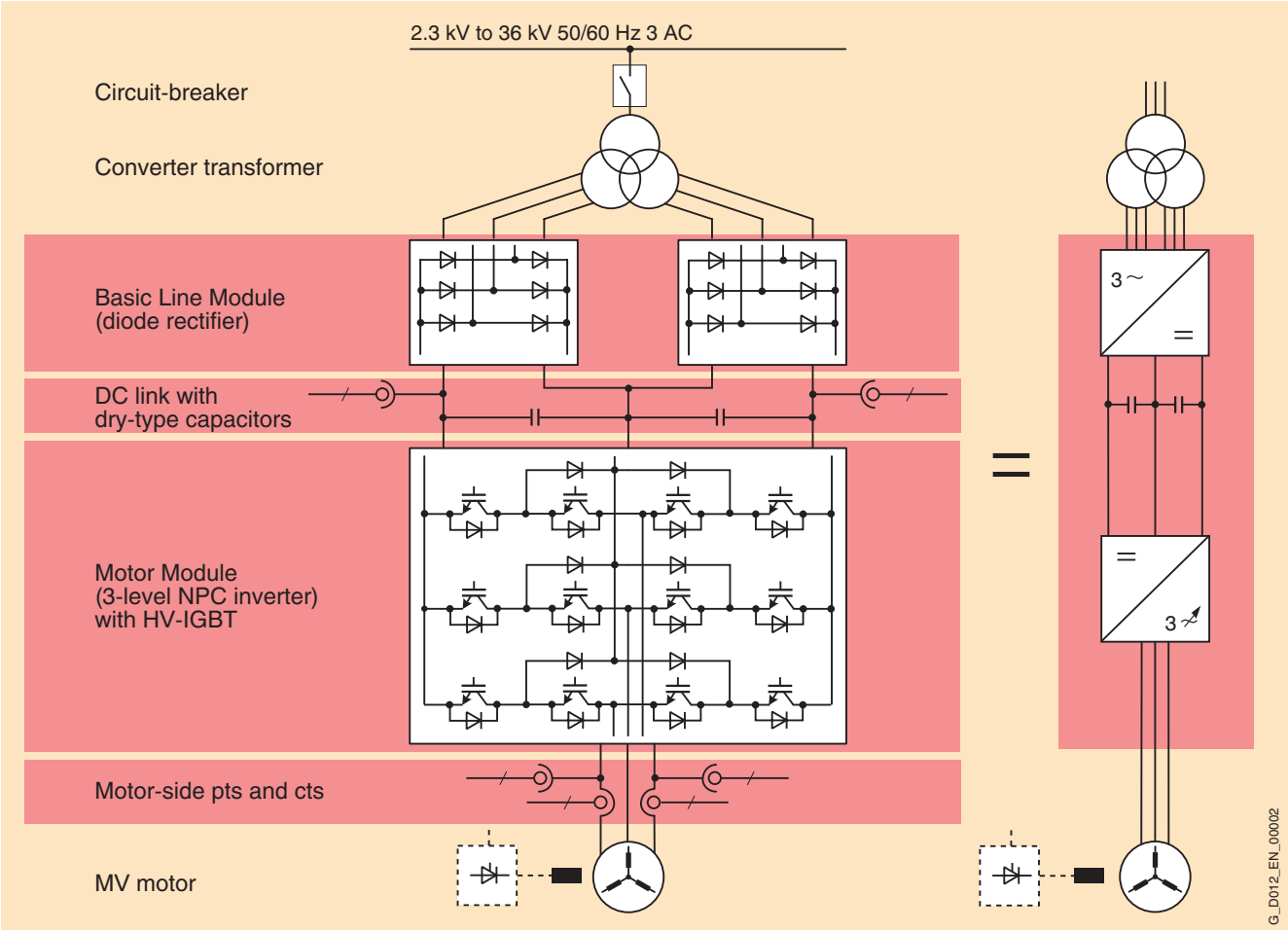
HV IGBT power semiconductors mounted on plug-in, easy to change Powercards are used in the Motor Modules.

Both line and motor connections can be optionally realized from underneath or above.

The converter cabinet unit consists of a section for the Basic Line Module, a section for the Motor Module and the control section.



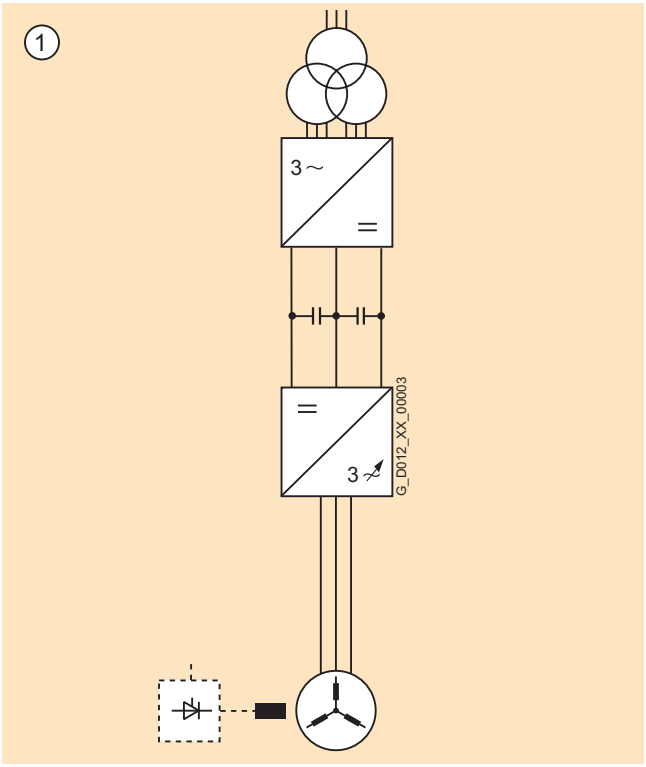
SINAMICS GM150 as air-cooled IGBT version, internal configuration



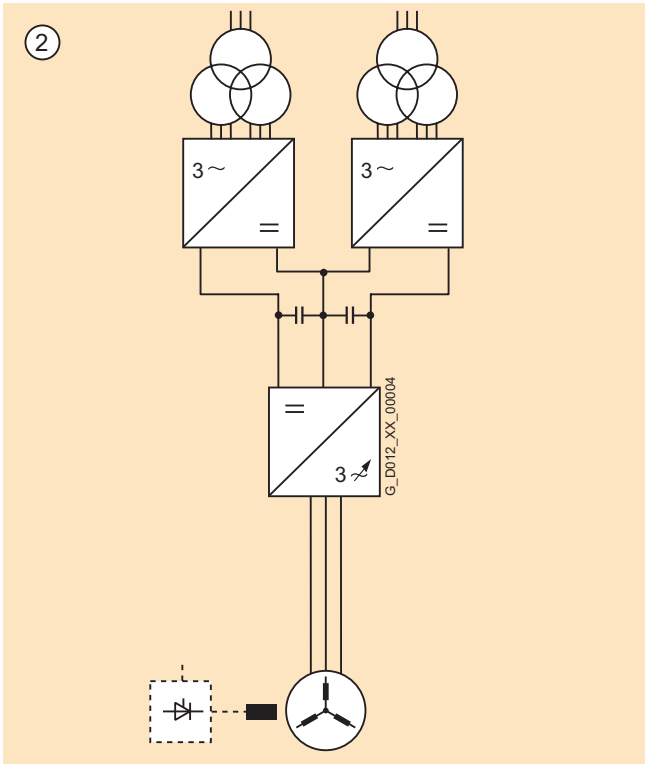
Block diagram

Design (continued)

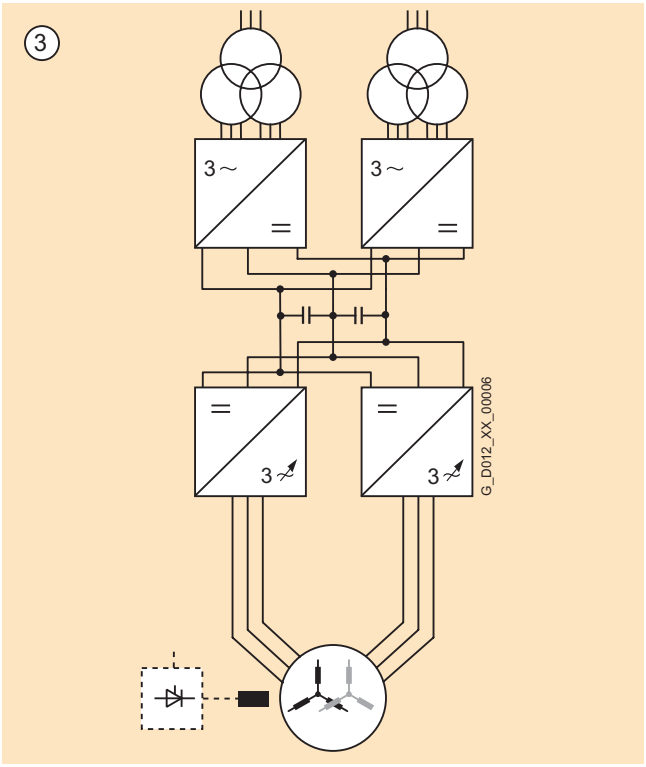
The following wiring versions are available for SINAMICS GM150 as IGBT version.



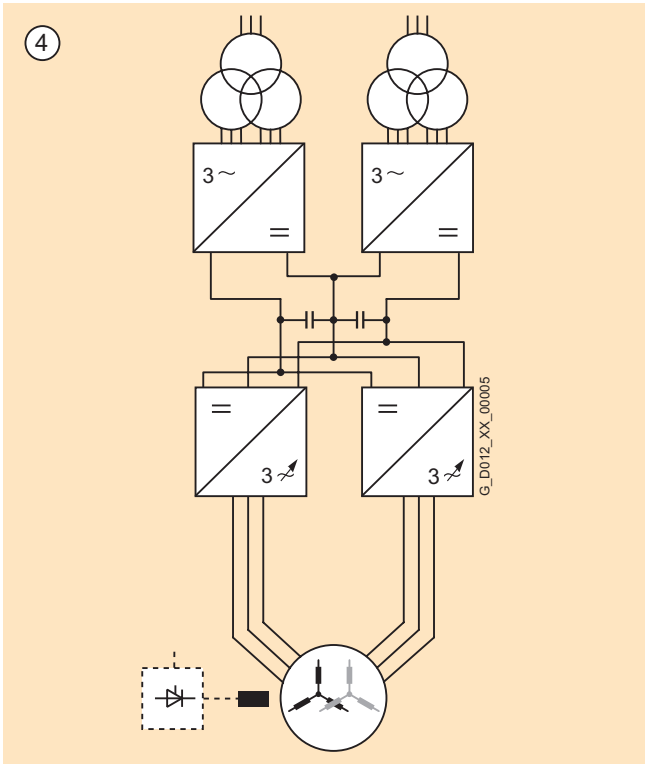
Basic circuit, 12-pulse infeed



24-pulse infeed through series connection of two Basic Line Modules: option **N15**, standard for 6.0 kV to 7.2 kV



Output increased by parallel connection of Basic Line Modules and Motor Modules on the common DC bus for 2.3 kV to 4.16 kV (24-pulse infeed as standard)



Output increased by parallel connection of Motor Modules on the common DC bus for 6.0 kV to 7.2 kV (24-pulse infeed as standard)

Design (standard)

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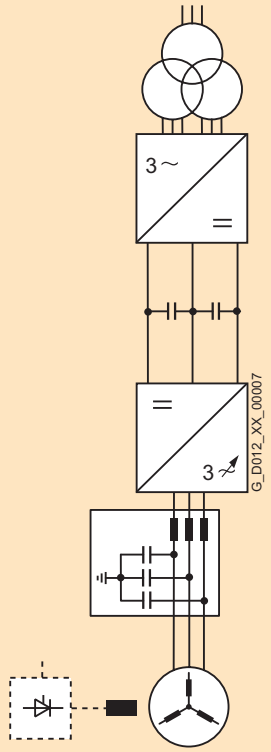
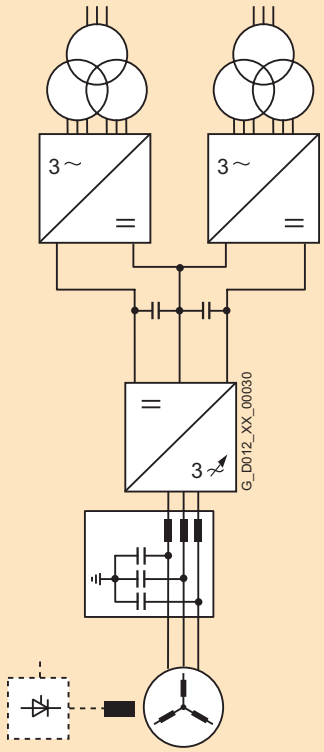


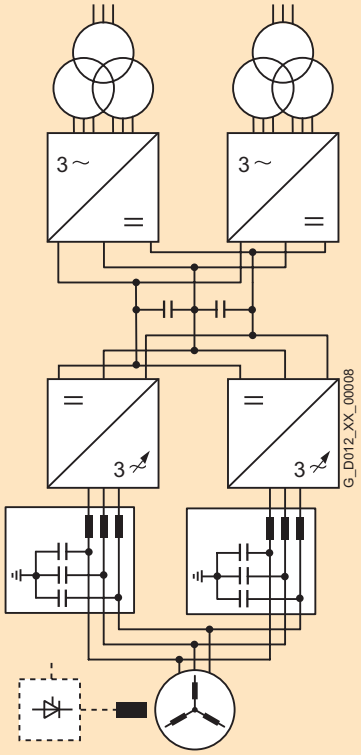
Basic circuit with sinusoidal filter for operating line motors
(option **Y15**)

6



24-pulse infeed through series connection of two Basic Line Modules:
option **N15**, standard for 6.0 kV to 7.2 kV
in this case with sinusoidal filter for operating line motors (option **Y15**)

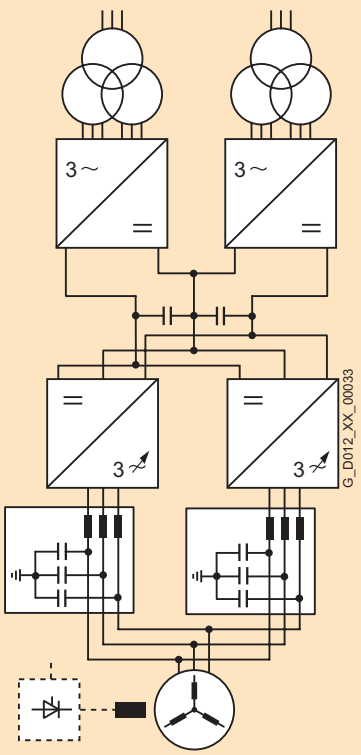
7



Parallel connection with sinusoidal filter for operating line motors
for 2.3 kV to 4.16 kV (option **Y15**)

Note: The motor cables are combined in the motor terminal box.

8



Parallel connection with sinusoidal filter for operating line motors
for 6.0 kV to 7.2 kV (option **Y15**)

Note: The motor cables are combined in the motor terminal box.

IGBT version

Function

Characteristic features

SINAMICS GM150 as IGBT version	
Line Module (rectifier on mains side)	
• Basic Line Module, 12-pulse (two-quadrant operation)	Standard
• Basic Line Module, 24-pulse (two-quadrant operation)	Option for 2.3 kV to 4.16 kV Standard for 6 kV to 7.2 kV and parallel connection
Motor Module (rectifier on motor side)	
Voltage range	2.3 kV to 7.2 kV
Performance range (typ.)	0.8 MVA to 10 MVA
Cooling method	
• Air cooling	Standard
• Water cooling	Standard
Control modes	
• Asynchronous motor	Standard
• Synchronous motor, separately excited	Option
Sinusoidal filter	Option

Software and protection functions

SINAMICS GM150 as IGBT version	Description
Closed-loop control	The machine-side closed-loop control has been expanded as a field-oriented transvector closed-loop control which can be operated as a speed or torque control as required. The transvector closed-loop control achieves the dynamics of a DC drive. This is made possible by the fact that the current components forming the torque and flux can be controlled precisely independently of each other. Prescribed torques can thus be observed and limited accurately. In the speed range from 1:10, the field-oriented closed-loop control does not require an actual speed value encoder. An actual speed value encoder is required in the following scenarios: • High dynamics requirements • Torque control/constant torque drives with setting range > 1:10 • Very low speeds • Very high speed accuracy
Setpoint input	The setpoint can be defined internally or externally; internally as a fixed, motorized potentiometer or jog setpoint, externally via the PROFIBUS interface or an analog input of the customer terminal block. The internal fixed setpoints and the motorized potentiometer setpoint can be switched over or altered using control commands from all interfaces.
Ramp-function generator	A user-friendly ramp-function generator with separately adjustable ramp-up and ramp-down times, together with variable smoothing times in the lower and upper speed ranges, improves the control response and therefore prevents mechanical overloading of the drive train. The ramp-down ramps can be parameterized separately for emergency stop.
$V_{dc\ max}$ controller	The $V_{dc\ max}$ controller automatically prevents overvoltages in the DC link if the set ramp-down ramp is too short, for example. This can also extend the set ramp-down time.
Kinetic buffering (KIP)	Power supply failures are bridged to the extent permitted by the kinetic energy of the drive train. The speed drops depending on the moment of inertia and the load torque. The current speed setpoint is resumed when the power supply returns.
Automatic restart (option)	The automatic restart switches the drive on again when the power is restored after a power failure or a general fault, and ramps up to the current speed setpoint.
Flying restart	The flying restart function permits smooth connection of the converter to a rotating motor.
Diagnostics functions	• Self-diagnosis of control hardware • Non-volatile memory for reliable diagnosis when the power supply fails • Monitoring of HV IGBTs with individual messages for each slot • User-friendly on-site operator panel with plain text messages
Operating hours and switching cycle counter	The operating hours of the fans are recorded and logged so that preventive maintenance or replacements can be performed. The switching cycles of the circuit-breaker are recorded and added together, to form the basis of preventive maintenance work.
Detecting the actual motor speed (option)	The SMC30 encoder module can be used to record the actual motor speed. The signals from the rotary pulse encoder are converted here and made available for evaluation via the DRIVE-CLiQ interface of the controller.
Operator protection	The cabinet doors of the power sections are fitted with an electromagnetic lock. This prevents the cabinet doors being opened while hazardous voltages are connected inside the cabinet.

Function (continued)

Software and protection functions

SINAMICS GM150 as IGBT version	Description
EMERGENCY-STOP button	The converters are equipped as standard with an EMERGENCY-STOP button with protective collar which is fitted in the cabinet door. The contacts of the pushbutton are connected in parallel to the terminal block so they can can be integrated in a protection concept on the installation side. EMERGENCY STOP category 0 is set as standard for an uncontrolled shutdown (DIN EN 60204-1/VDE 0113-1 (IEC 60204-1)). The function includes voltage disconnection of the converter output through the circuit-breaker. The motor coasts in the process. EMERGENCY STOP category 1 is optionally available for a controlled shutdown.
Insulation monitoring	The converters feature insulation monitoring of the whole galvanic network from the secondary side of the transformer to the stator windings of the motor.
Monitoring of the peripherals	An extensive package of options for monitoring the peripherals (from the transformer and the motor through to the auxiliaries) is available. In addition it is possible to monitor the temperature by means of thermocouples or PT100 resistors.
Thermal overload protection	A warning message is issued first when the overtemperature threshold responds. If the temperature rises further, either a shutdown is carried out or automatic influencing of the output current so that a reduction in the thermal load is achieved. Following elimination of the cause of the fault (e.g. improvement in the ventilation), the original operating values are automatically resumed. If air-cooled converters and filter mats are used, for example, the contamination of the filter mats is monitored and reported by means of measurements of differential pressures. In the case of water-cooled converters, the water temperature and flow rate are recorded at several points in the cooling circuit and evaluated. An extensive self-diagnosis protects the converter and reports faults.
Grounding switch (option)	If grounding on the infeed or motor side is required for safety and protection reasons, a motorized grounding switch can be ordered. For safety reasons, the converter controller locks these grounding switches against activation while voltage is still present. The control is integrated into the protection and monitoring chain of the converter. The grounding switches are inserted automatically when the standard grounding switches of the DC link are inserted.
Capacitor trip device	For applications in which the exiting circuit-breaker has no low-voltage coil and cannot be retrofitted there are capacitor trip devices for 110 to 120 V DC and for 230 V DC. They ensure that the circuit-breaker on the installation side can still be safely disconnected even if there is a power failure or the normal OFF command is not effective, e.g. because of a wire break.

AOP30 operator panel

The AOP30 operator panel is fitted into the cabinet door of the SINAMICS GM150 to enable operation, monitoring and commissioning.

It has the following features and characteristics:

- Graphical LCD display with backlighting for plain-text display and a bar display of process variables
- LEDs for displaying the operational status
- Help function describing causes of and remedies for faults and alarms
- Membrane keyboard with keypad for operational control of a drive
- Local/remote switchover for selecting the input point (priority assigned to operator panel or customer's terminal block / PROFIBUS)
- Numeric keypad for input of setpoint or parameter values
- Function keys for prompted navigation in the menu
- Two-stage safety strategy to protect against accidental or unauthorized changes to settings. The keyboard lock disables operation of the drive from the operator panel, so that only parameter values and process variables can be displayed. A password can be used to prevent the unauthorized modification of converter parameters.

The operator panel languages - English, German, Spanish and Chinese - are stored on the CompactFlash Card of the Control Unit.

IGBT version

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Selection and ordering data

Type rating	Shaft output		Rated output current	SINAMICS GM150 as IGBT version, air cooling, without sinusoidal filter	Circuit versions (page 2/4)
kVA	kW	hp	A	Order No.	Fig. No.
Output voltage 2.3 kV					
1000	820	1000	250	**6SL3810-2LM32-5AA0**	①
1200	1000	1250	300	**6SL3810-2LM33-0AA0**	①
1400	1150	1500	350	**6SL3810-2LM33-5AA0**	①
1600	1300	1750	400	**6SL3810-2LM34-0AA0**	①
1800	1500	2000	450	**6SL3810-2LM34-5AA0**	①
2000	1650	2250	500	**6SL3810-2LM35-0AA0**	①
2200	1800	2500	550	**6SL3810-2LM35-5AA0**	①
2400	2000	2750	600	**6SL3810-2LM36-0AA0**	①
Output voltage 3.3 kV					
1000	850	1000	180	**6SL3810-2LN31-8AA0**	①
1300	1050	1250	220	**6SL3810-2LN32-2AA0**	①
1500	1250	1500	260	**6SL3810-2LN32-6AA0**	①
1700	1400	2000	300	**6SL3810-2LN33-0AA0**	①
2000	1650	2250	350	**6SL3810-2LN33-5AA0**	①
2300	1900	2500	400	**6SL3810-2LN34-0AA0**	①
2600	2150	3000	450	**6SL3810-2LN34-5AA0**	①
2900	2400	3250	500	**6SL3810-2LN35-0AA0**	①
3100	2650	3500	550	**6SL3810-2LN35-5AA0**	①
3400	2850	3750	600	**6SL3810-2LN36-0AA0**	①
3800	3100	4000	2 × 330	**6SL3810-2LN36-6AA0**	③
4100	3400	4500	2 × 360	**6SL3810-2LN37-2AA0**	③
4600	3900	5000	2 × 405	**6SL3810-2LN38-1AA0**	③
5100	4300	6000	2 × 450	**6SL3810-2LN38-8AA0**	③
5700	4800	6500	2 × 500	**6SL3810-2LN41-0AA0**	③
6300	5300	7000	2 × 550	**6SL3810-2LN41-1AA0**	③
Output voltage 4.16 kV					
1300	1000	1500	180	**6SL3810-2LP31-8AA0**	①
1600	1300	1750	220	**6SL3810-2LP32-2AA0**	①
1900	1550	2000	260	**6SL3810-2LP32-6AA0**	①
2200	1800	2500	300	**6SL3810-2LP33-0AA0**	①
2500	2100	3000	350	**6SL3810-2LP33-5AA0**	①
2900	2400	3250	400	**6SL3810-2LP34-0AA0**	①
3200	2700	3500	450	**6SL3810-2LP34-5AA0**	①
3600	3000	4000	500	**6SL3810-2LP35-0AA0**	①
4000	3300	4500	550	**6SL3810-2LP35-5AA0**	①
4300	3600	5000	600	**6SL3810-2LP36-0AA0**	①
4800	4000	5500	2 × 330	**6SL3810-2LP36-6AA0**	③
5200	4300	6000	2 × 360	**6SL3810-2LP37-2AA0**	③
5800	4900	6500	2 × 405	**6SL3810-2LP38-1AA0**	③
6500	5400	7000	2 × 450	**6SL3810-2LP38-8AA0**	③
7200	6000	8000	2 × 500	**6SL3810-2LP41-0AA0**	③
7900	6600	9000	2 × 550	**6SL3810-2LP41-1AA0**	③

Type rating	Shaft output		Rated output current	SINAMICS GM150 as IGBT version, air cooling, without sinusoidal filter	Circuit versions (page 2/4)
kVA	kW	hp	A	Order No.	Fig. No.
Output voltage 6.0 kV					
800	700	900	80	**6SL3810-2LQ30-8AA0**	②
1000	850	1250	100	**6SL3810-2LQ31-0AA0**	②
1200	1050	1500	120	**6SL3810-2LQ31-2AA0**	②
1600	1300	1750	150	**6SL3810-2LQ31-5AA0**	②
1900	1550	2000	180	**6SL3810-2LQ31-8AA0**	②
2100	1750	2250	200	**6SL3810-2LQ32-0AA0**	②
2300	1950	2500	225	**6SL3810-2LQ32-2AA0**	②
2500	2100	2750	245	**6SL3810-2LQ32-4AA0**	②
2800	2350	3000	270	**6SL3810-2LQ32-7AA0**	②
3100	2550	3500	2 × 148	**6SL3810-2LQ33-0AA0**	④
3400	2800	3750	2 × 163	**6SL3810-2LQ33-2AA0**	④
3800	3200	4000	2 × 183	**6SL3810-2LQ33-6AA0**	④
4200	3500	4500	2 × 203	**6SL3810-2LQ34-0AA0**	④
4600	3900	5000	2 × 223	**6SL3810-2LQ34-4AA0**	④
5000	4200	5500	2 × 240	**6SL3810-2LQ34-8AA0**	④
Output voltage 6.6 kV					
900	750	1000	80	**6SL3810-2LR30-8AA0**	②
1100	950	1250	100	**6SL3810-2LR31-0AA0**	②
1400	1150	1500	120	**6SL3810-2LR31-2AA0**	②
1700	1400	2000	150	**6SL3810-2LR31-5AA0**	②
2100	1700	2250	180	**6SL3810-2LR31-8AA0**	②
2300	1900	2500	200	**6SL3810-2LR32-0AA0**	②
2600	2150	2750	225	**6SL3810-2LR32-2AA0**	②
2800	2300	3000	245	**6SL3810-2LR32-4AA0**	②
3100	2600	3500	270	**6SL3810-2LR32-7AA0**	②
3400	2800	3750	2 × 148	**6SL3810-2LR33-0AA0**	④
3700	3100	4000	2 × 163	**6SL3810-2LR33-2AA0**	④
4200	3500	4500	2 × 183	**6SL3810-2LR33-6AA0**	④
4600	3900	5000	2 × 203	**6SL3810-2LR34-0AA0**	④
5100	4200	5500	2 × 223	**6SL3810-2LR34-4AA0**	④
5500	4600	6000	2 × 240	**6SL3810-2LR34-8AA0**	④
Output voltage 7.2 kV					
1000	840	1000	80	**6SL3810-2LS30-8AA0**	②
1200	1050	1250	100	**6SL3810-2LS31-0AA0**	②
1500	1250	1500	120	**6SL3810-2LS31-2AA0**	②
1900	1550	2000	150	**6SL3810-2LS31-5AA0**	②
2200	1850	2500	180	**6SL3810-2LS31-8AA0**	②
2500	2100	2750	200	**6SL3810-2LS32-0AA0**	②
2800	2300	3000	225	**6SL3810-2LS32-2AA0**	②
3100	2500	3250	245	**6SL3810-2LS32-4AA0**	②
3400	2800	3500	270	**6SL3810-2LS32-7AA0**	②
3700	3100	4000	2 × 148	**6SL3810-2LS33-0AA0**	④
4100	3400	4500	2 × 163	**6SL3810-2LS33-2AA0**	④
4600	3800	5000	2 × 183	**6SL3810-2LS33-6AA0**	④
5100	4200	5500	2 × 203	**6SL3810-2LS34-0AA0**	④
5500	4600	6000	2 × 223	**6SL3810-2LS34-4AA0**	④
6000	5000	6500	2 × 240	**6SL3810-2LS34-8AA0**	④

Selection and ordering data (continued)

Type rating	Shaft output		Rated output current	SINAMICS GM150 as IGBT version, air cooling, with sinusoidal filter	Circuit versions (page 2/5)
kVA	kW	hp	A	Order No.	Fig. No.
Output voltage 2.3 kV					
850	700	900	210	**6SL3810-2LM32-5AA0–Z Y15**	⑤
1000	800	1000	250	**6SL3810-2LM33-0AA0–Z Y15**	⑤
1150	950	1250	290	**6SL3810-2LM33-5AA0–Z Y15**	⑤
1300	1100	1500	330	**6SL3810-2LM34-0AA0–Z Y15**	⑤
1450	1200	1600	370	**6SL3810-2LM34-5AA0–Z Y15**	⑤
1650	1400	1750	420	**6SL3810-2LM35-0AA0–Z Y15**	⑤
1850	1500	2000	460	**6SL3810-2LM35-5AA0–Z Y15**	⑤
2000	1650	2250	500	**6SL3810-2LM36-0AA0–Z Y15**	⑤
Output voltage 3.3 kV					
850	700	900	150	**6SL3810-2LN31-8AA0–Z Y15**	⑤
1100	900	1000	190	**6SL3810-2LN32-2AA0–Z Y15**	⑤
1250	1050	1250	220	**6SL3810-2LN32-6AA0–Z Y15**	⑤
1450	1200	1500	250	**6SL3810-2LN33-0AA0–Z Y15**	⑤
1700	1400	1750	300	**6SL3810-2LN33-5AA0–Z Y15**	⑤
1950	1600	2000	340	**6SL3810-2LN34-0AA0–Z Y15**	⑤
2250	1850	2500	390	**6SL3810-2LN34-5AA0–Z Y15**	⑤
2450	2000	2750	430	**6SL3810-2LN35-0AA0–Z Y15**	⑤
2650	2200	3000	460	**6SL3810-2LN35-5AA0–Z Y15**	⑤
2900	2450	3250	510	**6SL3810-2LN36-0AA0–Z Y15**	⑤
3250	2750	3500	570	**6SL3810-2LN36-6AA0–Z Y15**	⑦
3500	2900	4000	610	**6SL3810-2LN37-2AA0–Z Y15**	⑦
3900	3200	4500	680	**6SL3810-2LN38-1AA0–Z Y15**	⑦
4350	3600	5000	760	**6SL3810-2LN38-8AA0–Z Y15**	⑦
4850	4100	5500	850	**6SL3810-2LN41-0AA0–Z Y15**	⑦
5350	4500	6000	940	**6SL3810-2LN41-1AA0–Z Y15**	⑦
Output voltage 4.16 kV					
1100	900	1250	150	**6SL3810-2LP31-8AA0–Z Y15**	⑤
1350	1150	1500	190	**6SL3810-2LP32-2AA0–Z Y15**	⑤
1600	1300	1750	220	**6SL3810-2LP32-6AA0–Z Y15**	⑤
1850	1550	2000	260	**6SL3810-2LP33-0AA0–Z Y15**	⑤
2100	1750	2250	290	**6SL3810-2LP33-5AA0–Z Y15**	⑤
2450	2000	2750	340	**6SL3810-2LP34-0AA0–Z Y15**	⑤
2650	2200	3000	370	**6SL3810-2LP34-5AA0–Z Y15**	⑤
3050	2500	3500	420	**6SL3810-2LP35-0AA0–Z Y15**	⑤
3400	2750	3750	470	**6SL3810-2LP35-5AA0–Z Y15**	⑤
3600	3000	4000	500	**6SL3810-2LP36-0AA0–Z Y15**	⑤
4050	3300	4500	560	**6SL3810-2LP36-6AA0–Z Y15**	⑦
4400	3600	5000	610	**6SL3810-2LP37-2AA0–Z Y15**	⑦
4900	4000	5500	680	**6SL3810-2LP38-1AA0–Z Y15**	⑦
5500	4500	6000	760	**6SL3810-2LP38-8AA0–Z Y15**	⑦
6050	5000	6750	840	**6SL3810-2LP41-0AA0–Z Y15**	⑦
6650	5500	7500	920	**6SL3810-2LP41-1AA0–Z Y15**	⑦

Special version **"–Z"**

The order code **Y15** (sinusoidal filter) must be quoted in addition and requires plain text (see option descriptions, page 5/18).

Type rating	Shaft output		Rated output current	SINAMICS GM150 as IGBT version, air cooling, with sinusoidal filter	Circuit versions (page 2/5)
kVA	kW	hp	A	Order No.	Fig. No.
Output voltage 6.0 kV					
650	550	700	64	**6SL3810-2LQ30-8AA0–Z Y15**	⑥
850	700	900	80	**6SL3810-2LQ31-0AA0–Z Y15**	⑥
1000	800	1000	96	**6SL3810-2LQ31-2AA0–Z Y15**	⑥
1250	1050	1250	120	**6SL3810-2LQ31-5AA0–Z Y15**	⑥
1500	1250	1500	144	**6SL3810-2LQ31-8AA0–Z Y15**	⑥
1650	1400	1750	160	**6SL3810-2LQ32-0AA0–Z Y15**	⑥
1850	1550	2000	180	**6SL3810-2LQ32-2AA0–Z Y15**	⑥
2050	1700	2250	196	**6SL3810-2LQ32-4AA0–Z Y15**	⑥
2250	1850	2500	216	**6SL3810-2LQ32-7AA0–Z Y15**	⑥
2450	2000	2750	236	**6SL3810-2LQ33-0AA0–Z Y15**	⑧
2700	2250	3000	260	**6SL3810-2LQ33-2AA0–Z Y15**	⑧
3050	2500	3250	292	**6SL3810-2LQ33-6AA0–Z Y15**	⑧
3350	2800	3750	324	**6SL3810-2LQ34-0AA0–Z Y15**	⑧
3700	3000	4000	356	**6SL3810-2LQ34-4AA0–Z Y15**	⑧
4000	3300	4500	384	**6SL3810-2LQ34-8AA0–Z Y15**	⑧
Output voltage 6.6 kV					
700	550	700	60	**6SL3810-2LR30-8AA0–Z Y15**	⑥
850	700	900	75	**6SL3810-2LR31-0AA0–Z Y15**	⑥
1050	850	1000	90	**6SL3810-2LR31-2AA0–Z Y15**	⑥
1300	1050	1250	113	**6SL3810-2LR31-5AA0–Z Y15**	⑥
1550	1300	1500	135	**6SL3810-2LR31-8AA0–Z Y15**	⑥
1700	1400	1750	150	**6SL3810-2LR32-0AA0–Z Y15**	⑥
1950	1600	2000	169	**6SL3810-2LR32-2AA0–Z Y15**	⑥
2100	1750	2250	184	**6SL3810-2LR32-4AA0–Z Y15**	⑥
2300	1900	2500	203	**6SL3810-2LR32-7AA0–Z Y15**	⑥
2550	2100	2750	221	**6SL3810-2LR33-0AA0–Z Y15**	⑧
2800	2400	3000	244	**6SL3810-2LR33-2AA0–Z Y15**	⑧
3150	2600	3500	274	**6SL3810-2LR33-6AA0–Z Y15**	⑧
3500	2800	4000	304	**6SL3810-2LR34-0AA0–Z Y15**	⑧
3800	3200	4250	334	**6SL3810-2LR34-4AA0–Z Y15**	⑧
4200	3500	4500	368	**6SL3810-2LR34-8AA0–Z Y15**	⑧
Output voltage 7.2 kV					
700	550	700	56	**6SL3810-2LS30-8AA0–Z Y15**	⑥
850	700	900	70	**6SL3810-2LS31-0AA0–Z Y15**	⑥
1050	850	1000	84	**6SL3810-2LS31-2AA0–Z Y15**	⑥
1300	1100	1250	105	**6SL3810-2LS31-5AA0–Z Y15**	⑥
1550	1300	1500	126	**6SL3810-2LS31-8AA0–Z Y15**	⑥
1750	1450	1750	140	**6SL3810-2LS32-0AA0–Z Y15**	⑥
1950	1650	2000	158	**6SL3810-2LS32-2AA0–Z Y15**	⑥
2150	1800	2250	172	**6SL3810-2LS32-4AA0–Z Y15**	⑥
2350	1950	2500	189	**6SL3810-2LS32-7AA0–Z Y15**	⑥
2600	2100	2750	207	**6SL3810-2LS33-0AA0–Z Y15**	⑧
2850	2300	3000	228	**6SL3810-2LS33-2AA0–Z Y15**	⑧
3200	2600	3500	256	**6SL3810-2LS33-6AA0–Z Y15**	⑧
3550	2900	4000	284	**6SL3810-2LS34-0AA0–Z Y15**	⑧
3900	3200	4500	312	**6SL3810-2LS34-4AA0–Z Y15**	⑧
4300	3500	4750	343	**6SL3810-2LS34-8AA0–Z Y15**	⑧

IGBT version

2

Selection and ordering data (continued)

Type rating	Shaft output		Rated output current	SINAMICS GM150 as IGBT version, water cooling, without sinusoidal filter	Circuit versions (page 2/4)
kVA	kW	hp	A	Order No.	Fig. No.
Output voltage 2.3 kV					
2000	1650	2250	500	**6SL3815-2LM35-0AA0**	①
2200	1800	2500	550	**6SL3815-2LM35-5AA0**	①
2400	2000	2750	610	**6SL3815-2LM36-1AA0**	①
2700	2250	3000	675	**6SL3815-2LM36-7AA0**	①
2900	2450	3250	740	**6SL3815-2LM37-4AA0**	①
3200	2650	3500	800	**6SL3815-2LM38-0AA0**	①
Output voltage 3.3 kV					
2000	1650	2250	350	**6SL3815-2LN33-5AA0**	①
2300	1900	2500	400	**6SL3815-2LN34-0AA0**	①
2600	2150	3000	450	**6SL3815-2LN34-5AA0**	①
2900	2400	3250	500	**6SL3815-2LN35-0AA0**	①
3100	2650	3500	550	**6SL3815-2LN35-5AA0**	①
3500	2900	4000	610	**6SL3815-2LN36-1AA0**	①
3900	3200	4250	675	**6SL3815-2LN36-7AA0**	①
4200	3500	4500	740	**6SL3815-2LN37-4AA0**	①
4600	3800	5000	800	**6SL3815-2LN38-0AA0**	①
5100	4250	6000	2 × 445	**6SL3815-2LN38-8AA0**	③
5700	4750	6500	2 × 495	**6SL3815-2LN41-0AA0**	③
6300	5300	7000	2 × 550	**6SL3815-2LN41-1AA0**	③
6900	5700	7500	2 × 600	**6SL3815-2LN41-2AA0**	③
7400	6200	8000	2 × 650	**6SL3815-2LN41-3AA0**	③
8000	6700	9000	2 × 700	**6SL3815-2LN41-4AA0**	③
Output voltage 4.16 kV					
2000	1700	2250	280	**6SL3815-2LP32-8AA0**	①
2200	1850	2500	310	**6SL3815-2LP33-1AA0**	①
2500	2100	2750	350	**6SL3815-2LP33-5AA0**	①
2900	2400	3000	400	**6SL3815-2LP34-0AA0**	①
3200	2700	3500	450	**6SL3815-2LP34-5AA0**	①
3600	3000	4000	500	**6SL3815-2LP35-0AA0**	①
4000	3300	4500	550	**6SL3815-2LP35-5AA0**	①
4400	3700	5000	610	**6SL3815-2LP36-1AA0**	①
4900	4100	5500	675	**6SL3815-2LP36-7AA0**	①
5300	4500	6000	740	**6SL3815-2LP37-4AA0**	①
5800	4800	6500	800	**6SL3815-2LP38-0AA0**	①
6400	5400	7000	2 × 445	**6SL3815-2LP38-8AA0**	③
7100	6000	8000	2 × 495	**6SL3815-2LP41-0AA0**	③
7900	6600	9000	2 × 550	**6SL3815-2LP41-1AA0**	③
8600	7300	9500	2 × 600	**6SL3815-2LP41-2AA0**	③
9400	7900	10000	2 × 650	**6SL3815-2LP41-3AA0**	③
10100	8500	11000	2 × 700	**6SL3815-2LP41-4AA0**	③

Type rating	Shaft output		Rated output current	SINAMICS GM150 as IGBT version, water cooling, without sinusoidal filter	Circuit versions (page 2/4)
kVA	kW	hp	A	Order No.	Fig. No.
Output voltage 6.0 kV					
1800	1450	2000	170	**6SL3815-2LQ31-7AA0**	②
2100	1750	2250	200	**6SL3815-2LQ32-0AA0**	②
2400	2000	2500	230	**6SL3815-2LQ32-3AA0**	②
2700	2250	3000	260	**6SL3815-2LQ32-6AA0**	②
3000	2500	3500	290	**6SL3815-2LQ33-0AA0**	②
3400	2800	3750	325	**6SL3815-2LQ33-2AA0**	②
3700	3100	4000	360	**6SL3815-2LQ33-6AA0**	②
4100	3400	4500	390	**6SL3815-2LQ33-8AA0**	②
4500	3700	5000	2 × 215	**6SL3815-2LQ34-3AA0**	④
4900	4100	5500	2 × 235	**6SL3815-2LQ34-7AA0**	④
5500	4600	6000	2 × 265	**6SL3815-2LQ35-3AA0**	④
6100	5100	6500	2 × 292	**6SL3815-2LQ35-8AA0**	④
6700	5600	7000	2 × 320	**6SL3815-2LQ36-4AA0**	④
7300	6100	8000	2 × 350	**6SL3815-2LQ37-0AA0**	④
Output voltage 6.6 kV					
1900	1600	2000	170	**6SL3815-2LR31-7AA0**	②
2300	1900	2500	200	**6SL3815-2LR32-0AA0**	②
2600	2200	3000	230	**6SL3815-2LR32-3AA0**	②
3000	2500	3250	260	**6SL3815-2LR32-6AA0**	②
3300	2800	3500	290	**6SL3815-2LR33-0AA0**	②
3700	3100	4000	325	**6SL3815-2LR33-2AA0**	②
4100	3400	4500	360	**6SL3815-2LR33-6AA0**	②
4500	3700	5000	390	**6SL3815-2LR33-8AA0**	②
4900	4100	5500	2 × 215	**6SL3815-2LR34-3AA0**	④
5400	4500	6000	2 × 235	**6SL3815-2LR34-7AA0**	④
6100	5100	6500	2 × 265	**6SL3815-2LR35-3AA0**	④
6700	5600	7000	2 × 292	**6SL3815-2LR35-8AA0**	④
7300	6100	8000	2 × 320	**6SL3815-2LR36-4AA0**	④
8000	6700	9000	2 × 350	**6SL3815-2LR37-0AA0**	④
Output voltage 7.2 kV					
2100	1750	2250	170	**6SL3815-2LS31-7AA0**	②
2500	2100	2500	200	**6SL3815-2LS32-0AA0**	②
2900	2400	3000	230	**6SL3815-2LS32-3AA0**	②
3200	2700	3500	260	**6SL3815-2LS32-6AA0**	②
3600	3000	4000	290	**6SL3815-2LS33-0AA0**	②
4100	3400	4500	325	**6SL3815-2LS33-2AA0**	②
4500	3700	5000	360	**6SL3815-2LS33-6AA0**	②
4900	4100	5500	390	**6SL3815-2LS33-8AA0**	②
5400	4500	6000	2 × 215	**6SL3815-2LS34-3AA0**	④
5900	4900	6500	2 × 235	**6SL3815-2LS34-7AA0**	④
6600	5500	7000	2 × 265	**6SL3815-2LS35-3AA0**	④
7300	6100	8000	2 × 292	**6SL3815-2LS35-8AA0**	④
8000	6700	9000	2 × 320	**6SL3815-2LS36-4AA0**	④
8700	7300	10000	2 × 350	**6SL3815-2LS37-0AA0**	④

Selection and ordering data (continued)

Type rating	Shaft output		Rated output current	SINAMICS GM150 as IGBT version, water cooling, with sinusoidal filter	Circuit versions (page 2/5)
kVA	kW	hp	A	Order No.	Fig. No.
Output voltage 2.3 kV					
1500	1250	1500	380	**6SL3815-2LM35-0AA0–Z Y15**	⑤
1650	1350	1750	410	**6SL3815-2LM35-5AA0–Z Y15**	⑤
1800	1500	2000	450	**6SL3815-2LM36-1AA0–Z Y15**	⑤
2050	1700	2250	510	**6SL3815-2LM36-7AA0–Z Y15**	⑤
2200	1850	2500	550	**6SL3815-2LM37-4AA0–Z Y15**	⑤
2400	2000	2750	600	**6SL3815-2LM38-0AA0–Z Y15**	⑤
Output voltage 3.3 kV					
1550	1300	1750	270	**6SL3815-2LN33-5AA0–Z Y15**	⑤
1750	1450	2000	310	**6SL3815-2LN34-0AA0–Z Y15**	⑤
2000	1650	2250	350	**6SL3815-2LN34-5AA0–Z Y15**	⑤
2150	1800	2500	380	**6SL3815-2LN35-0AA0–Z Y15**	⑤
2350	1950	2750	410	**6SL3815-2LN35-5AA0–Z Y15**	⑤
2700	2250	3000	470	**6SL3815-2LN36-1AA0–Z Y15**	⑤
2950	2500	3250	520	**6SL3815-2LN36-7AA0–Z Y15**	⑤
3200	2700	3500	560	**6SL3815-2LN37-4AA0–Z Y15**	⑤
3500	2900	4000	610	**6SL3815-2LN38-0AA0–Z Y15**	⑤
3900	3250	4500	680	**6SL3815-2LN38-8AA0–Z Y15**	⑦
4350	3650	5000	760	**6SL3815-2LN41-0AA0–Z Y15**	⑦
4800	4000	5500	840	**6SL3815-2LN41-1AA0–Z Y15**	⑦
5250	4400	6000	920	**6SL3815-2LN41-2AA0–Z Y15**	⑦
5600	4700	6250	980	**6SL3815-2LN41-3AA0–Z Y15**	⑦
6050	5100	6500	1060	**6SL3815-2LN41-4AA0–Z Y15**	⑦
Output voltage 4.16 kV					
1600	1300	1750	220	**6SL3815-2LP32-8AA0–Z Y15**	⑤
1750	1450	2000	240	**6SL3815-2LP33-1AA0–Z Y15**	⑤
1950	1600	2250	270	**6SL3815-2LP33-5AA0–Z Y15**	⑤
2250	1850	2500	310	**6SL3815-2LP34-0AA0–Z Y15**	⑤
2500	2100	2750	350	**6SL3815-2LP34-5AA0–Z Y15**	⑤
2800	2350	3000	390	**6SL3815-2LP35-0AA0–Z Y15**	⑤
3100	2600	3500	430	**6SL3815-2LP35-5AA0–Z Y15**	⑤
3450	2900	4000	480	**6SL3815-2LP36-1AA0–Z Y15**	⑤
3800	3200	4250	530	**6SL3815-2LP36-7AA0–Z Y15**	⑤
4100	3450	4500	570	**6SL3815-2LP37-4AA0–Z Y15**	⑤
4500	3800	5000	625	**6SL3815-2LP38-0AA0–Z Y15**	⑤
4950	4200	5500	690	**6SL3815-2LP38-8AA0–Z Y15**	⑦
5550	4600	6000	770	**6SL3815-2LP41-0AA0–Z Y15**	⑦
6150	5100	7000	850	**6SL3815-2LP41-1AA0–Z Y15**	⑦
6700	5600	7500	930	**6SL3815-2LP41-2AA0–Z Y15**	⑦
7350	6200	8000	1020	**6SL3815-2LP41-3AA0–Z Y15**	⑦
7950	6600	9000	1100	**6SL3815-2LP41-4AA0–Z Y15**	⑦

Special version **"–Z"**

The order code **Y15** (sinusoidal filter) must be quoted in addition and requires plain text (see option descriptions, page 5/18).

Type rating	Shaft output		Rated output current	SINAMICS GM150 as IGBT version, water cooling, with sinusoidal filter	Circuit versions (page 2/5)
kVA	kW	hp	A	Order No.	Fig. No.
Output voltage 6.0 kV					
1400	1200	1500	136	**6SL3815-2LQ31-7AA0–Z Y15**	⑥
1650	1400	1750	160	**6SL3815-2LQ32-0AA0–Z Y15**	⑥
1900	1600	2000	184	**6SL3815-2LQ32-3AA0–Z Y15**	⑥
2150	1800	2250	208	**6SL3815-2LQ32-6AA0–Z Y15**	⑥
2400	2000	2500	232	**6SL3815-2LQ33-0AA0–Z Y15**	⑥
2700	2250	2750	260	**6SL3815-2LQ33-2AA0–Z Y15**	⑥
3000	2500	3000	288	**6SL3815-2LQ33-6AA0–Z Y15**	⑥
3250	2700	3500	312	**6SL3815-2LQ33-8AA0–Z Y15**	⑥
3600	3000	4000	344	**6SL3815-2LQ34-3AA0–Z Y15**	⑧
3900	3300	4500	376	**6SL3815-2LQ34-7AA0–Z Y15**	⑧
4400	3700	5000	424	**6SL3815-2LQ35-3AA0–Z Y15**	⑧
4850	4100	5500	468	**6SL3815-2LQ35-8AA0–Z Y15**	⑧
5300	4400	6000	512	**6SL3815-2LQ36-4AA0–Z Y15**	⑧
5800	4900	6500	560	**6SL3815-2LQ37-0AA0–Z Y15**	⑧
Output voltage 6.6 kV					
1550	1300	1750	136	**6SL3815-2LR31-7AA0–Z Y15**	⑥
1850	1500	2000	160	**6SL3815-2LR32-0AA0–Z Y15**	⑥
2100	1750	2250	184	**6SL3815-2LR32-3AA0–Z Y15**	⑥
2400	2000	2750	208	**6SL3815-2LR32-6AA0–Z Y15**	⑥
2650	2200	3000	232	**6SL3815-2LR33-0AA0–Z Y15**	⑥
2950	2500	3250	260	**6SL3815-2LR33-2AA0–Z Y15**	⑥
3300	2750	3500	288	**6SL3815-2LR33-6AA0–Z Y15**	⑥
3550	3000	4000	312	**6SL3815-2LR33-8AA0–Z Y15**	⑥
3950	3300	4500	344	**6SL3815-2LR34-3AA0–Z Y15**	⑧
4300	3600	4750	376	**6SL3815-2LR34-7AA0–Z Y15**	⑧
4850	4000	5000	424	**6SL3815-2LR35-3AA0–Z Y15**	⑧
5350	4500	6000	468	**6SL3815-2LR35-8AA0–Z Y15**	⑧
5850	4900	6500	512	**6SL3815-2LR36-4AA0–Z Y15**	⑧
6400	5400	7000	560	**6SL3815-2LR37-0AA0–Z Y15**	⑧
Output voltage 7.2 kV					
1700	1400	1750	136	**6SL3815-2LS31-7AA0–Z Y15**	⑥
2000	1650	2250	160	**6SL3815-2LS32-0AA0–Z Y15**	⑥
2300	1900	2500	184	**6SL3815-2LS32-3AA0–Z Y15**	⑥
2600	2150	2750	208	**6SL3815-2LS32-6AA0–Z Y15**	⑥
2900	2400	3000	232	**6SL3815-2LS33-0AA0–Z Y15**	⑥
3250	2700	3500	260	**6SL3815-2LS33-2AA0–Z Y15**	⑥
3600	3000	4000	288	**6SL3815-2LS33-6AA0–Z Y15**	⑥
3900	3250	4500	312	**6SL3815-2LS33-8AA0–Z Y15**	⑥
4300	3600	4750	344	**6SL3815-2LS34-3AA0–Z Y15**	⑧
4700	3950	5000	376	**6SL3815-2LS34-7AA0–Z Y15**	⑧
5300	4400	5500	424	**6SL3815-2LS35-3AA0–Z Y15**	⑧
5850	4900	6000	468	**6SL3815-2LS35-8AA0–Z Y15**	⑧
6400	5300	7000	512	**6SL3815-2LS36-4AA0–Z Y15**	⑧
7000	5800	8000	560	**6SL3815-2LS37-0AA0–Z Y15**	⑧

Options

When ordering a converter with options, add **"-Z"** to the order number of the converter, followed by the order code(s) for the desired option(s).

Example:

6SL3810-2LM32-5AA0-Z
+N15+L60+...

In the following tables, related options are arranged in groups. Whether the options can be combined or are mutually exclusive is indicated within these groups. A detailed description of the options can be found in the chapter Description of Options.

Input-side options		**N15**	**N20**	**N21**	**N13**
24-pulse Basic Line Module	**N15**		✓	✓	–
Capacitor trip device 110 to 120 V DC [1]	**N20**	✓		–	✓
Capacitor trip device 230 V DC [1]	**N21**	✓	–		✓
Circuit-breaker at converter input [2] (for 24-pulse Basic Line Module on request)	**N13**	–	✓	✓	

1) The options **N20** and **N21** cannot be combined with the option **U01** (version of the converter for NAFTA with UL listing).
2) The option **N13** is available on request in connection with the option **U01**.

Output-side options		**L08**	**Y15**	**L29**
Output reactor	**L08**		–	✓
Sinusoidal filter (plain text required)	**Y15**	–		✓
Bidirectional synchronized bypass operation	**L29**	✓	✓	

Protective functions		**L48**	**L49**	**L60**	**M10**
Grounding switch at converter input [1] (motorized)	**L48**		✓	✓	✓
Grounding switch at converter output [1] (motorized)	**L49**	✓		✓	✓
EMERGENCY STOP category 1	**L60**	✓	✓		✓
Safety locking system	**M10**	✓	✓	✓	

1) The options **L48** and **L49** are available on request with the option **U01** (version of the converter for NAFTA with UL listing).

Temperature sensing and analysis (standard: 3 PT100 inputs)		**L80**	**L81**	**L82**	**L90**	**L91**	**L93**	**L95**
2 thermistor motor protection relays for warnings and faults [1]	**L80**		–	–	✓	✓	✓	✓
2 x 2 thermistor motor protection relays for warnings and faults [1]	**L81**	–		–	✓	✓	✓	✓
3 x 2 thermistor motor protection relays for warnings and faults [1]	**L82**	–	–		✓	✓	✓	✓
PT100 evaluation unit with 3 inputs [1]	**L90**	✓	✓	✓		–	–	–
2 PT100 evaluation units with 3 inputs each [1]	**L91**	✓	✓	✓	–		–	–
PT100 evaluation unit with 6 inputs, 2 analog outputs (outputs for display connected to controller) [1]	**L93**	✓	✓	✓	–	–		–
PT100 evaluation unit with 6 inputs for hazardous areas, 2 analog outputs (outputs for display connected to controller) [1] [2]	**L95**	✓	✓	✓	–	–	–	

1) A TM31 Terminal Module is required for further processing and display of the signals or analog outputs (option **G61**).
2) The option **L95** cannot be combined with the option **U01** (version of the converter for NAFTA with UL listing).

✓	Options can be combined
–	Options are mutually exclusive

Options (continued)

Enhanced protection for cabinet units in air-cooled version (standard: IP22)		M11	M42
Dust protection	M11		✓
IP42 degree of protection	M42	✓	

Enhanced protection for cabinet units in water-cooled version (standard: IP43)	
IP54 degree of protection	M54

Control of auxiliaries		N30	N31	N32	N33	N35	N36	N37	N38
The contractor is switched on with the ON command at the converter and switched off with the OFF command (example: separate fans on the motor). The supply voltage for the auxiliary to be powered must be provided externally.									
Controlled output for auxiliaries 3 AC 400 V, max. 4 kW	N30		–	–	–	✓	✓	✓	✓
Controlled output for auxiliaries 3 AC 400 V, max. 7 kW	N31	–		–	–	✓	✓	✓	✓
Controlled output for auxiliaries 3 AC 400 V, max. 11 kW	N32	–	–		–	✓	✓	✓	✓
Controlled output for auxiliaries 3 AC 400 V, max. 15 kW	N33	–	–	–		✓	✓	✓	✓
The contractor is switched off with the ON command at the converter and switched on with the OFF command (example: heater). The supply voltage for the auxiliary to be powered must be provided externally.									
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 1 kW	N35	✓	✓	✓	✓		–	–	–
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 2 kW	N36	✓	✓	✓	✓	–		–	–
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 3 kW	N37	✓	✓	✓	✓	–	–		–
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 4 kW	N38	✓	✓	✓	✓	–	–	–	

Ventilation version of air-cooled converter		M61	M64
Redundant fan in power section	M61		–
Converter prepared for connection to an external exhaust air system, with internal cabinet fan	M64	–	

Connection of power and signal cables (standard: power cable connected from below, signal cable connected directly to the terminals of the Terminal Modules)		M13	M78	M32	M33	M34
Power cable connected to converter input from above	M13		✓	✓	✓	✓
Power cable connected to converter output from above	M78	✓		✓	✓	✓
Customer terminal block with spring-loaded terminals for signal cables up to 2.5 mm^2	M32	✓	✓		–	✓
Customer terminal block with screw-type terminals for signal cables up to 2.5 mm^2	M33	✓	✓	–		✓
Auxiliary voltage and signal cable connected from above	M34	✓	✓	✓	✓	

Control and display instruments in the door of the control cabinet unit		K20	K21	K22
Indicator lights and Start/Stop button in the cabinet door	K20		–	–
Display instruments in the cabinet door for voltage, current, speed and output as well as indicator lights and Start/Stop button	K21	–		–
Display instruments in the cabinet door for current, speed, output and winding temperature as well as indicator lights and Start/Stop button	K22	–	–	

✓ Options can be combined

– Options are mutually exclusive

IGBT version

2

Options (continued)

Interface modules for access to external bus systems (standard: PROFIBUS (slave))		G20	G21	G22	G23	G24	G25
CAN bus interface (CANopen, on request)	G20		–	–	–	–	–
Modbus Plus interface	G21	–		–	–	–	–
Modbus RTU slave interface	G22	–	–		–	–	–
DeviceNet interface	G23	–	–	–		–	–
PROFINET interface (on request)	G24	–	–	–	–		–
Teleservice connection (on request)	G25	–	–	–	–	–	

Interface modules for additional customer connections and speed encoders		G61	G62	G63	K50
Additional TM31 Terminal Module	G61		✓	✓	✓
Second additional TM31 Terminal Module	G62	✓		✓	✓
Additional TM15 Terminal Module	G63	✓	✓		✓
SMC30 speed encoder module	K50	✓	✓	✓	

Isolation amplifiers for voltage isolation for optional analog inputs of the options G61, G62		E86	E87
2 isolation amplifiers for optional analog inputs	E86		✓
2 isolation amplifiers for optional analog outputs	E87	✓	

Industry-specific options		B00	M66
NAMUR terminal block	B00		✓
Shipworthiness with type certificate	M66	✓	

Individual certification of the converters for use on ships (contains option M66)		E11	E21	E31	E51	E61	E71
Shipworthiness with individual certificate from Germanische Lloyd (GL)	E11		–	–	–	–	–
Shipworthiness with individual certificate from Lloyds Register (LR)	E21	–		–	–	–	–
Shipworthiness with individual certificate from Bureau Veritas (BV), requires option **Y75** (other auxiliary voltage infeed)	E31	–	–		–	–	–
Shipworthiness with individual certificate from Det Norske Veritas (DNV)	E51	–	–	–		–	–
Shipworthiness with individual certificate from the American Bureau of Shipping (ABS)	E61	–	–	–	–		–
Shipworthiness with individual certificate from the Chinese Classification Society (CCS)	E71	–	–	–	–	–	

✓	Options can be combined
–	Options are mutually exclusive

Options (continued)

Functional options		E01	E02	L32
Control of separately excited synchronous motors with slipring excitation [1]	E01		–	✓
Control of separately excited synchronous motors with brushless RG excitation [1]	E02	–		✓
Automatic restart	L32	✓	✓	

1) The options **E01** and **E02** are available on request with the option **U01** (version of the converter for NAFTA with UL listing).

Documentation (standard: PDF format in English on CD-ROM)		D00	D02	D15	D56	D72	D77	D78	D84	D92	Y10
Documentation in German	D00		✓	✓	–	–	–	–	–	–	✓
Circuit diagrams, terminal diagrams and dimension drawings in DXF format [1]	D02	✓		✓	✓	✓	✓	✓	✓	✓	✓
One set of printed documentation (can be ordered in multiples)	D15	✓	✓		✓	✓	✓	✓	✓	✓	✓
Documentation in Russian (on request)	D56	–	✓	✓		–	–	–	–	–	✓
Documentation in Italian (on request)	D72	–	✓	✓	–		–	–	–	–	✓
Documentation in French (on request)	D77	–	✓	✓	–	–		–	–	–	✓
Documentation in Spanish	D78	–	✓	✓	–	–	–		–	–	✓
Documentation in Chinese	D84	–	✓	✓	–	–	–	–		–	✓
Documentation in Japanese (on request)	D92	–	✓	✓	–	–	–	–	–		✓
Circuit diagrams with customer-specific text field (plain text required) [1]	Y10	✓	✓	✓	✓	✓	✓	✓	✓	✓	

1) The equipment-specific documents (circuit diagrams etc.) are available only in English/German.

Rating plate language (standard: English/German)		T58	T60	T80	T85	T90	T91
Rating plate in English/French	T58		–	–	–	–	–
Rating plate in English/Spanish	T60	–		–	–	–	–
Rating plate in English/Italian	T80	–	–		–	–	–
Rating plate in English/Russian (on request)	T85	–	–	–		–	–
Rating plate in English/Japanese (on request)	T90	–	–	–	–		–
Rating plate in English/Chinese (on request)	T91	–	–	–	–	–	

Auxiliary voltage supply	
Auxiliary voltage other than 3 AC 400 V (primary voltage and frequency must be indicated in plain text)	Y75

✓ Options can be combined
– Options are mutually exclusive

Options (continued)

Version for NAFTA (SINAMICS GM150 as air-cooled IGBT version; 2.3 kV, 3.3 kV and 4.16 kV)		U01
Version of converter for NAFTA with UL listing	U01	
Following options are included as standard in the option **U01**:		
Safety locking system	M10	
Dust protection	M11	
Rating plate language English/French	T58	
Following options cannot be combined with the option **U01**:		
Capacitor trip devices	N20 and N21	–
PT100 evaluation unit with 6 inputs for hazardous areas, 2 analog outputs (outputs for display connected to controller)	L95	–
Following options are available in combination with the option **U01** on special request:		
Circuit-breakers at converter input	N13	
Grounding switch	L48 and L49	
Control of separately excited synchronous motors	E01 and E02	
UPS for power supply from controller and closed-loop control	L53	

Converter acceptance inspections in presence of customer		F03	F73	F77	F97
Visual acceptance of converter	F03		–	–	–
Functional acceptance of converter with inductive load	F73	–		✓	–
Acceptance inspection of the converter insulation test 1)	F77	–	✓		–
Customer-specific converter acceptance inspections (on request)	F97	–	–	–	

1) The option **F77** can be ordered only in connection with the option **F73**.

Recooling unit (water-cooled converter, standard: recooling unit with redundant pumps and one high-grade steel plate heat exchanger)		W02	W11	W12	W14	W20	Y40
Recooling unit with redundant pumps and redundant high-grade steel plate heat exchangers	W02		–	–	–	✓	–
Recooling unit with redundant pumps and one titanium plate heat exchanger	W11	–		–	–	✓	–
Recooling unit with redundant pumps and redundant titanium plate heat exchangers	W12	–	–		–	✓	–
Converter without recooling unit (provided on the installation side)	W14	–	–	–		–	–
Untreated water connection from below	W20	✓	✓	✓	–		✓
Untreated water data deviating from the technical data 1) (on request)	Y40	–	–	–	–	✓	

1) The option **Y40** includes a cooling system which is adapted to the untreated water data according to the customer's specifications.

Miscellaneous options		L50	L53	L55	Y09
Cabinet lighting and service socket in control section	L50		✓	✓	✓
UPS for power supply from controller and closed-loop control 1)	L53	✓		✓	✓
Anti-condensation heating for cabinet unit	L55	✓	✓		✓
Special paint finish to RAL .... (in a color other than RAL 7035; plain text required)	Y09	✓	✓	✓	

1) The option **L53** is available on request with the option **U01** (version of the converter for NAFTA with UL listing).

✓	Options can be combined
–	Options are mutually exclusive

Technical data

General technical data	
Power components	Diodes, 3.3 kV or 6.5 kV IGBTs
Converter on the mains side	
• Standard	- Smaller ratings at 2.3 kV to 4.16 kV: 12-pulse diode rectifier (Basic Line Module) - 6.0 kV to 7.2 kV and greater ratings at 2.3 kV to 4.16 kV: 24-pulse diode rectifier (Basic Line Module)
• Option	- Smaller ratings at 2.3 kV to 4.16 kV: 24-pulse diode rectifier (Basic Line Module)
Converter on the machine side	Inverter (Motor Module)
Closed-loop control	Transvector closed-loop control
Drive quadrants	2 (driving 2 directions of rotation)
Voltage isolation of power section/ controller and closed-loop control	Optical conductor, isolating transformer
Auxiliary current supply (for fans, coolant pumps, precharging the DC link capacitors, controller and close-loop control)	• 1 230 V AC ± 10%, 50/60 Hz ± 3% and • 3 400 V AC ±10%, 50/60 Hz ±3% or another auxiliary voltage (option **Y75**)
Installation altitude	≤ 1000 m above sea level: capacity 100% > 1000 m to 4000 m above sea level: current derating required > 2000 m to 4000 m above sea level: voltage derating required in addition
Insulation	according to DIN EN 50178/VDE 0160 (IEC 62103): pollution degree 2 (without conductive pollution), condensation not permitted
Degree of protection	according to EN 60529/VDE 0470 T1 (IEC 60529):
• Standard	IP22 (air cooling), IP43 (water cooling)
• Option	IP42 (air cooling), IP54 (water cooling)
Protection class	according to DIN EN 61140/VDE 0140 T1 (IEC 61140): 1
Shock-hazard protection	BGV A 3
Interference transmission	according to DIN EN 61800-3/VDE 0160 T100 (IEC 61800-3): no RI suppression
Paint finish/color	Indoor requirements/RAL 7035, light gray
Compliance with standards	
• Standards	- EN 61800-3/VDE 0160 T100 (IEC 61800-3) - EN 61800-4/VDE 0160 T104 (IEC 61800-4) - EN 61800-5-1/VDE 0160 T105 (IEC 61800-5-1) - EN 60146-1-1/VDE 0558 T11 (IEC 60146-1-1) - EN 50178/VDE 0160 T100 (IEC 62103) - EN 60204-11/VDE 0113 T11 (IEC 60204-11)
• EU directives	- 98/37/EC + amendments (Machinery Directive) - 89/336/EEC + amendments (Electromagnetic Compatibility)
Air cooling	Air cooling enhanced with integrated fans
Water cooling	Water-water recooling unit, internal circuit, deionized water (fresh water)
Permitted coolant temperature (untreated water)	
• Inlet	+ 5 °C to + 35 °C
• Outlet	max. + 40 °C

Rated data						
Output voltage	**2.3 kV**	**3.3 kV**	**4.16 kV**	**6.0 kV**	**6.6 kV**	**7.2 kV**
Input voltage	2 x 1.2 kV	2 x 1.7 kV	2 x 2.2 kV	2 × 2 × 1.55 kV	2 × 2 × 1.7 kV	2 × 2 × 1.85 kV
Tolerance of input voltage	± 10%	± 10%	± 10%	± 10%	± 10%	± 10%
Power frequency	50/60 Hz ± 3%	50/60 Hz ± 3%	50/60 Hz ± 3%	50/60 Hz ± 3%	50/60 Hz ± 3%	50/60 Hz ± 3%
Power factor fundamental mode	> 0.96	> 0.96	> 0.96	> 0.96	> 0.96	> 0.96

Technical data (continued)

	Operation of asynchronous motors				Operation of separately excited synchronous motors	
	without speed encoder		with speed encoder		with speed encoder	
	without sinusoidal filter	with sinusoidal filter	without sinusoidal filter	with sinusoidal filter	without sinusoidal filter	with sinusoidal filter
Control properties						
Operating range						
• Lower limit of speed control range (% of rated motor speed)	5%	5%	0%	0%	0%	0%
• Max. permissible output frequency	250 Hz	66 Hz	250 Hz	66 Hz	90 Hz	66 Hz
• Field-shunting range	1:3	1:1,1	1:3	1:1,1	1:4	1:1,1
Stationary operation						
• Speed accuracy (% of rated motor speed)	± 0,2% (from 5% rated speed)	± 0,2% (from 5% rated speed)	± 0,01%	± 0,01%	± 0,01%	± 0,01%
• Torque accuracy (% of rated torque)	± 5% (from 5% rated speed)	± 5% (from 5% rated speed)	± 5%	± 5%	± 2%	± 5%
Dynamic operation						
• Torque rise time	5 ms	20 ms	5 ms	20 ms	5 ms	20 ms

	Storage	Transport	Operation
Climatic ambient conditions			
Ambient temperature	+ 5 °C to + 45 °C	– 25 °C to + 70 °C	+ 5 °C to + 40 °C
Relative air humidity	5% to 95% (only slight condensation permitted; converter must be completely dry before commissioning)	5% to 75%	5% to 85% (condensation not permitted)
Other climatic conditions according to class	1K3 according to EN 60721-3-1 (IEC 60721-3-1) (icing not permitted)	2K2 according to EN 60721-3-2 (IEC 60721-3-2)	3K3 according to EN 60721-3-3 (IEC 60721-3-3)
Degree of pollution	2 without conductive pollution according to EN 50178/VDE 0160 (IEC 62103)	2 without conductive pollution according to EN 50178/VDE 0160 (IEC 62103)	2 without conductive pollution according to EN 50178/VDE 0160 (IEC 62103)
Mechanical ambient conditions			
Dynamic stress			
• Deflection	1.5 mm at 2 Hz to 9 Hz	3.5 mm at 2 Hz to 9 Hz	0.3 mm at 2 Hz to 9 Hz
• Acceleration	5 m/s^2 at 9 Hz to 200 Hz	10 m/s^2 at 9 Hz to 200 Hz 15 m/s^2 at 200 Hz to 500 Hz	1 m/s^2 at 9 Hz to 200 Hz
Other mechanical conditions according to class (greater strength for ship compatibility)	1M2 according to EN 60721-3-1 (IEC 60721-3-1)	2M2 according to EN 60721-3-2 (IEC 60721-3-2)	3M1 according to EN 60721-3-3 (IEC 60721-3-3)
Other ambient conditions			
Biological ambient conditions according to class	1B1 according to EN 60721-3-1 (IEC 60721-3-1)	2B1 according to EN 60721-3-2 (IEC 60721-3-2)	3B2 according to EN 60721-3-3 (IEC 60721-3-3) (without harmful flora)
Chemically active materials according to class	1C1 according to EN 60721-3-1 (IEC 60721-3-1)	2C1 according to EN 60721-3-2 (IEC 60721-3-2)	3C2 according to EN 60721-3-3 (IEC 60721-3-3) (no occurrence of salt mist)
Mechanically active materials according to class	1S1 according to EN 60721-3-1 (IEC 60721-3-1)	2S1 according to EN 60721-3-2 (IEC 60721-3-2)	3S1 according to EN 60721-3-3 (IEC 60721-3-3) (3S3 with water cooling and degree of protection IP54)

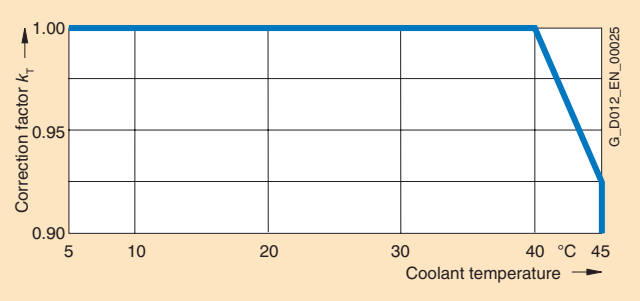
Note: The values specified under storage and transport apply to unpacked converters.

Technical data (continued)

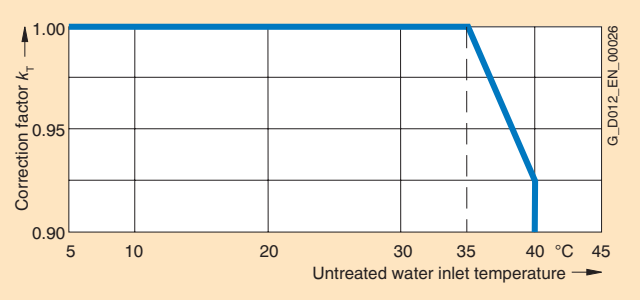
Installation conditions and derating data

Current derating

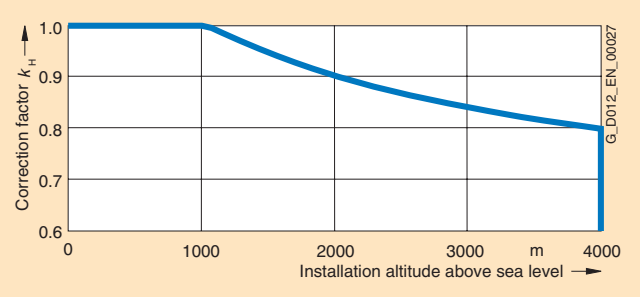
If the converters are operated at installation altitudes > 1000 m above sea level or under ambient or coolant temperatures > 40 °C with air cooling or > 35 °C with water cooling, derating factors k_H and k_T must be taken into account for the rated current (DIN 43671).



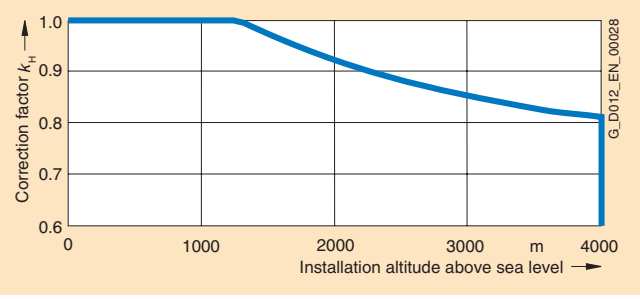
Derating factor k_T with air cooling



Derating factor k_T with water cooling



Derating factor k_H with air cooling



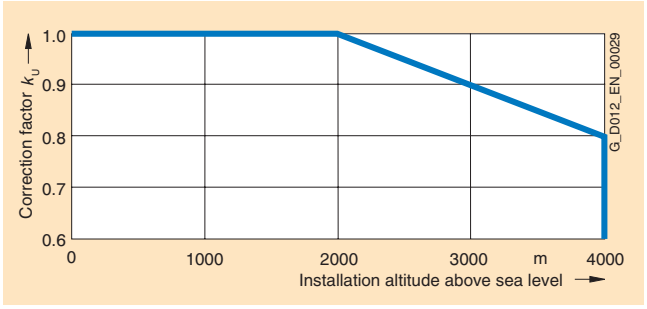
Derating factor k_H with water cooling

For the permitted continuous current I: $I \leq I_n \times k_H \times k_T$

I: permitted continuous current
I_n: rated current

Voltage derating

At installation altitudes > 2000 m, a voltage derating is required in addition to a current correction (EN 60664-1/VDE 0110 (IEC 60664-1)). This depends on the air and creepage distances in the unit.



Derating factor k_U

Technical data (continued)

The technical data from the following examples can be found on page 2/23 onwards.

Example 1

Converter 6SL3810-2LP33-0AA0 (air-cooled version)

Output voltage: 4.16 kV

Input voltage: 2 x 2.2 kV

Type rating: 2200 kVA, 300 A

Installation altitude: 3000 m

Max. ambient temperature: 30 °C
- Derating factor k_H = 0.84
- Derating factor k_T = 1.0
- Derating factor k_U = 0.9

$I \leq I_n \times 0.84 \times 1.0 = I_n \times 0.84$

This means that a voltage derating of 10% is required in addition to a current correction of 16%.

The maximum available output current of the converter is 252 A.

The converter can still be operated at a line voltage of 2 x 3 1.98 kV AC.

The following applies for the water-cooled version:
When determining the current derating factor, it is essential to consider the ambient temperature of the air as well as the temperature of the untreated water in the inlet, as components such as the link busbars are also subject to air cooling. This requires the factors k_T and k_H to be determined from the diagrams for air cooling as well as for water cooling. The smaller of the two products ($k_T \times k_H$) must be used as the current derating factor (see the following examples 2 and 3).

Example 2

Converter 6SL3815-2LN33-5AA0 (water-cooled version)

Output voltage: 3.3 kV

Input voltage: 2 x 1.7 kV

Type rating: 2000 kVA, 350 A

Installation altitude: 2000 m

Max. ambient temperature: 40 °C

Untreated water inlet temperature: 40 °C

- Ambient temperature:
  - Derating factor k_H = 0.9
  - Derating factor k_T = 1.0
  - Derating factor k_U = 1.0
- Untreated water inlet temperature:
  - Derating factor k_H = 0.925
  - Derating factor k_T = 0.925
  - Derating factor k_U = 1.0

The smaller value for $k_T \times k_H$ results in this case from the diagrams for the untreated water in the inlet.

$I \leq I_n \times 0.925 \times 0.925 = I_n \times 0.856$

A current derating of 14.4% is required.

The maximum available output current of the converter is 299 A.

Example 3

Converter 6SL3815-2LN33-5AA0 (water-cooled version)

Output voltage: 3.3 kV

Input voltage: 2 x 1.7 kV

Type rating: 2000 kVA, 350 A

Installation altitude: 2000 m

Max. ambient temperature: 43 °C

Untreated water inlet temperature: 30 °C

- Ambient temperature
  - Derating factor k_H = 0.9
  - Derating factor k_T = 0.955
  - Derating factor k_U = 1.0
- Untreated water inlet temperature:
  - Derating factor k_H = 0.925
  - Derating factor k_T = 1.0
  - Derating factor k_U = 1.0

The smaller value for $k_T \times k_H$ results in this case from the diagrams for the ambient temperature.

$I \leq I_n \times 0.9 \times 0.955 = I_n \times 0.86$

A current derating of 14% is required.

The maximum available output current of the converter is 301 A.

Technical data

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LM32-5AA0	6SL3810-2LM33-0AA0	6SL3810-2LM33-5AA0	6SL3810-2LM34-0AA0
Output voltage 2.3 kV					
Type rating	kVA	1000	1200	1400	1600
Shaft output [1]	kW	820	1000	1150	1300
	hp	1000	1250	1500	1750
Rated output current	A	250	300	350	400
Input voltage	kV	2 × 1.2	2 × 1.2	2 × 1.2	2 × 1.2
Rated input current [1]	A	2 × 220	2 × 264	2 × 308	2 × 351
Power loss [2]	kW	15	18	21	24
Efficiency [2]	%	98.3	98.3	98.3	98.3
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	27	27	27	27
Cooling air throughput	m^3/s	1.6	1.6	1.6	1.6
Sound pressure level L_{pA}	dB(A)	78	80	80	80
Measuring surface measurement L_s	dB(A)	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22
Dimensions (with doors and walls)					
• Width	mm	2420	2420	2420	2420
• Height	mm	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275
Circuit version		①	①	①	①
Weight	kg	1750	1750	1750	1750

1) The figures for the rated input current and the output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor and efficiency of the motor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LM34-5AA0	6SL3810-2LM35-0AA0	6SL3810-2LM35-5AA0	6SL3810-2LM36-0AA0
Output voltage 2.3 kV					
Type rating	kVA	1800	2000	2200	2400
Shaft output [1]	kW	1500	1650	1800	2000
	hp	2000	2250	2500	2750
Rated output current	A	450	500	550	600
Input voltage	kV	2 × 1.2	2 × 1.2	2 × 1.2	2 × 1.2
Rated input current	A	2 × 395	2 × 444	2 × 494	2 × 539
Power loss [2]	kW	27	28	31	34
Efficiency [2]	%	98.3	98.4	98.4	98.4
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	27	27	27	27
Cooling air throughput	m^3/s	1.6	1.6	1.6	1.6
Sound pressure level L_{pA}	dB(A)	78	80	80	80
Measuring surface measurement L_s	dB(A)	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22
Dimensions (with doors and walls)					
• Width	mm	2420	2420	2420	2420
• Height	mm	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275
Circuit version		①	①	①	①
Weight	kg	1750	1750	1800	1800

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LN31-8AA0	6SL3810-2LN32-2AA0	6SL3810-2LN32-6AA0	6SL3810-2LN33-0AA0	6SL3810-2LN33-5AA0	6SL3810-2LN34-0AA0
Output voltage 3.3 kV							
Type rating	kVA	1000	1300	1500	1700	2000	2300
Shaft output [1]	kW	850	1050	1250	1400	1650	1900
	hp	1000	1250	1500	2000	2250	2500
Rated output current	A	180	220	260	300	350	400
Input voltage	kV	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7
Rated input current	A	2 × 153	2 × 199	2 × 230	2 × 260	2 × 309	2 × 360
Power loss [2]	kW	15	20	23	26	28	32
Efficiency [2]	%	98.3	98.2	98.2	98.3	98.4	98.4
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	27	27	27	27	27	27
Cooling air throughput	m^3/s	2.4	2.4	2.4	2.4	2.4	2.4
Sound pressure level L_{pA}	dB(A)	78	78	78	80	80	80
Measuring surface measurement L_s	dB(A)	18	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)							
• Width	mm	2420	2420	2420	2420	2420	2420
• Height	mm	2570	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		①	①	①	①	①	①
Weight	kg	1900	1900	1900	1900	1900	1950

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810- 2LN34-5AA0	6SL3810- 2LN35-0AA0	6SL3810- 2LN35-5AA0	6SL3810- 2LN36-0AA0
Output voltage 3.3 kV					
Type rating	kVA	2600	2900	3100	3400
Shaft output [1]	kW	2150	2400	2650	2850
	hp	3000	3250	3500	3750
Rated output current	A	450	500	550	600
Input voltage	kV	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7
Rated input current	A	2 × 406	2 × 453	2 × 484	2 × 531
Power loss [2]	kW	34	38	40	44
Efficiency [2]	%	98.5	98.5	98.6	98.6
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	27	27	27	27
Cooling air throughput	m^3/s	2.4	2.4	2.4	2.4
Sound pressure level L_{pA}	dB(A)	78	80	80	80
Measuring surface measurement L_s	dB(A)	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22
Dimensions (with doors and walls)					
• Width	mm	2420	2420	2420	2420
• Height	mm	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275
Circuit version		①	①	①	①
Weight	kg	1950	1950	2000	2000

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LN36-6AA0	6SL3810-2LN37-2AA0	6SL3810-2LN38-1AA0	6SL3810-2LN38-8AA0	6SL3810-2LN41-0AA0	6SL3810-2LN41-1AA0
Output voltage 3.3 kV							
Type rating	kVA	3800	4100	4600	5100	5700	6300
Shaft output [1]	kW	3100	3400	3900	4300	4800	500
	hp	4000	4500	5000	6000	6500	7000
Rated output current	A	2 × 330	2 × 360	2 × 405	2 × 450	2 × 500	2 × 550
Input voltage	kV	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)
Rated input current	A	2 × (2 × 297)	2 × (2 × 321)	2 × (2 × 360)	2 × (2 × 399)	2 × (2 × 446)	2 × (2 × 492)
Power loss [2]	kW	49	53	60	66	74	82
Efficiency [2]	%	98.6	98.6	98.5	98.6	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	54	54	54	54	54	54
Cooling air throughput	m^3/s	4.7	4.7	4.7	4.7	4.7	4.7
Sound pressure level L_{pA}	dB(A)	85	85	85	85	85	85
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)							
• Width	mm	4220	4220	4220	4220	4220	4220
• Height	mm	2570	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		③	③	③	③	③	③
Weight	kg	3500	3600	3600	3600	3700	3700

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LP31-8AA0	6SL3810-2LP32-2AA0	6SL3810-2LP32-6AA0	6SL3810-2LP33-0AA0	6SL3810-2LP33-5AA0	6SL3810-2LP34-0AA0
Output voltage 4.16 kV							
Type rating	kVA	1300	1600	1900	2200	2500	2900
Shaft output [1]	kW	1000	1300	1550	1800	2100	2400
	hp	1500	1750	2000	2500	3000	3250
Rated output current	A	180	220	260	300	350	400
Input voltage	kV	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2
Rated input current	A	2 × 158	2 × 194	2 × 233	2 × 273	2 × 310	2 × 359
Power loss [2]	kW	20	24	27	31	33	38
Efficiency [2]	%	98.2	98.3	98.4	98.4	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	27	27	27	27	27	27
Cooling air throughput	m^3/s	2.4	2.4	2.4	2.4	2.4	2.4
Sound pressure level L_{pA}	dB(A)	78	78	78	80	80	80
Measuring surface measurement L_s	dB(A)	18	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)							
• Width	mm	2420	2420	2420	2420	2420	2420
• Height	mm	2570	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		①	①	①	①	①	①
Weight	kg	1900	1900	1900	1950	1950	1950

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LP34-5AA0	6SL3810-2LP35-0AA0	6SL3810-2LP35-5AA0	6SL3810-2LP36-0AA0
Output voltage 4.16 kV					
Type rating	kVA	3200	3600	4000	4300
Shaft output [1]	kW	2700	3000	3300	3600
	hp	3500	4000	4500	5000
Rated output current	A	450	500	550	600
Input voltage	kV	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2
Rated input current	A	2 × 397	2 × 446	2 × 496	2 × 533
Power loss [2]	kW	42	47	52	56
Efficiency [2]	%	98.5	98.5	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	27	27	27	27
Cooling air throughput	m^3/s	2.4	2.4	2.4	2.4
Sound pressure level L_{pA}	dB(A)	78	80	80	80
Measuring surface measurement L_s	dB(A)	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22
Dimensions (with doors and walls)					
• Width	mm	2420	2420	2420	2420
• Height	mm	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275
Circuit version		①	①	①	①
Weight	kg	2000	2000	2000	2000

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LP36-6AA0	6SL3810-2LP37-2AA0	6SL3810-2LP38-1AA0	6SL3810-2LP38-8AA0	6SL3810-2LP41-0AA0	6SL3810-2LP41-1AA0
Output voltage 4.16 kV							
Type rating	kVA	4800	5200	5800	6500	7200	7900
Shaft output [1]	kW	4000	4300	4900	5400	6000	6600
	hp	5500	6000	6500	7000	8000	9000
Rated output current	A	2 × 330	2 × 360	2 × 405	2 × 450	2 × 500	2 × 550
Input voltage	kV	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)
Rated input current	A	2 × (2 × 298)	2 × (2 × 323)	2 × (2 × 360)	2 × (2 × 403)	2 × (2 × 446)	2 × (2 × 490)
Power loss [2]	kW	62	68	75	85	94	103
Efficiency [2]	%	98.6	98.5	98.6	98.5	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	54	54	54	54	54	54
Cooling air throughput	m^3/s	4.7	4.7	4.7	4.7	4.7	4.7
Sound pressure level L_{pA}	dB(A)	85	85	85	85	85	85
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)							
• Width	mm	4220	4220	4220	4220	4220	4220
• Height	mm	2570	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		③	③	③	③	③	③
Weight	kg	3600	3600	3600	3700	3700	3700

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LQ30-8AA0	6SL3810-2LQ31-0AA0	6SL3810-2LQ31-2AA0	6SL3810-2LQ31-5AA0	6SL3810-2LQ31-8AA0
Output voltage 6.0 kV						
Type rating	kVA	800	1000	1200	1600	1900
Shaft output [1]	kW	700	850	1050	1300	1550
	hp	900	1250	1500	1750	2000
Rated output current	A	80	100	120	150	180
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 67	2 × 2 × 84	2 × 2 × 101	2 × 2 × 135	2 × 2 × 162
Power loss [2]	kW	12	15	18	24	27
Efficiency [2]	%	98.3	98.3	98.3	98.3	98.4
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	36	36	36	36	36
Cooling air throughput	m^3/s	2.8	2.8	2.8	2.8	2.8
Sound pressure level L_{pA}	dB(A)	80	80	80	80	80
Measuring surface measurement L_s	dB(A)	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)						
• Width	mm	3020	3020	3020	3020	3020
• Height	mm	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		②	②	②	②	②
Weight	kg	2300	2300	2300	2300	2350

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LQ32-0AA0	6SL3810-2LQ32-2AA0	6SL3810-2LQ32-4AA0	6SL3810-2LQ32-7AA0
Output voltage 6.0 kV					
Type rating	kVA	2100	2300	2500	2800
Shaft output [1]	kW	1750	1950	2100	2350
	hp	2250	2500	2750	3000
Rated output current	A	200	225	245	270
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 181	2 × 2 × 198	2 × 2 × 215	2 × 2 × 241
Power loss [2]	kW	29	32	33	36
Efficiency [2]	%	98.5	98.4	98.5	98.6
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	36	36	36	36
Cooling air throughput	m^3/s	2.8	2.8	2.8	2.8
Sound pressure level L_{pA}	dB(A)	80	82	82	82
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22
Dimensions (with doors and walls)					
• Width	mm	3020	3020	3020	3020
• Height	mm	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275
Circuit version		②	②	②	②
Weight	kg	2350	2350	2350	2350

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LQ33-0AA0	6SL3810-2LQ33-2AA0	6SL3810-2LQ33-6AA0	6SL3810-2LQ34-0AA0	6SL3810-2LQ34-4AA0	6SL3810-2LQ34-8AA0
Output voltage 6.0 kV							
Type rating	kVA	3100	3400	3800	4200	4600	5000
Shaft output [1]	kW	2550	2800	3200	3500	3900	4200
	hp	3500	3750	4000	4500	5000	5500
Rated output current	A	2 × 148	2 × 163	2 × 183	2 × 203	2 × 223	2 × 240
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 266	2 × 2 × 292	2 × 2 × 326	2 × 2 × 361	2 × 2 × 395	2 × 2 × 438
Power loss [2]	kW	40	44	49	55	60	65
Efficiency [2]	%	98.6	98.6	98.6	98.5	98.5	98.6
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	54	54	54	54	54	54
Cooling air throughput	m^3/s	4.7	4.7	4.7	4.7	4.7	4.7
Sound pressure level L_{pA}	dB(A)	86	86	86	86	86	86
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)							
• Width	mm	4220	4220	4220	4220	4220	4220
• Height	mm	2570	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		④	④	④	④	④	④
Weight	kg	3550	3550	3650	3650	3650	3650

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LR30-8AA0	6SL3810-2LR31-0AA0	6SL3810-2LR31-2AA0	6SL3810-2LR31-5AA0	6SL3810-2LR31-8AA0
Output voltage 6.6 kV						
Type rating	kVA	900	1100	1400	1700	2100
Shaft output [1]	kW	750	950	1150	1400	1700
	hp	1000	1250	1500	2000	2250
Rated output current	A	80	100	120	150	180
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 68	2 × 2 × 84	2 × 2 × 107	2 × 2 × 130	2 × 2 × 164
Power loss [2]	kW	14	17	21	26	29
Efficiency [2]	%	98.2	98.2	98.3	98.3	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	36	36	36	36	36
Cooling air throughput	m^3/s	2.8	2.8	2.8	2.8	2.8
Sound pressure level L_{pA}	dB(A)	80	80	80	82	82
Measuring surface measurement L_s	dB(A)	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)						
• Width	mm	3020	3020	3020	3020	3020
• Height	mm	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		②	②	②	②	②
Weight	kg	2300	2300	2300	2300	2300

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LR32-0AA0	6SL3810-2LR32-2AA0	6SL3810-2LR32-4AA0	6SL3810-2LR32-7AA0
Output voltage 6.6 kV					
Type rating	kVA	2300	2600	2800	3100
Shaft output [1]	kW	1900	2150	2300	2600
	hp	2500	2750	3000	3500
Rated output current	A	200	225	245	270
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 180	2 × 2 × 203	2 × 2 × 219	2 × 2 × 242
Power loss [2]	kW	32	34	36	40
Efficiency [2]	%	98.4	98.5	98.6	98.6
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	36	36	36	36
Cooling air throughput	m^3/s	2.8	2.8	2.8	2.8
Sound pressure level L_{pA}	dB(A)	82	82	82	82
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22
Dimensions (with doors and walls)					
• Width	mm	3020	3020	3020	3020
• Height	mm	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275
Circuit version		②	②	②	②
Weight	kg	2350	2350	2350	2350

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, without sinusoidal filter	Type	6SL3810-2LR33-0AA0	6SL3810-2LR33-2AA0	6SL3810-2LR33-6AA0	6SL3810-2LR34-0AA0	6SL3810-2LR34-4AA0	6SL3810-2LR34-8AA0
Output voltage 6.6 kV							
Type rating	kVA	3400	3700	4200	4600	5100	5500
Shaft output [1]	kW	2800	3100	3500	3750	4250	4500
	hp	3750	4000	4500	5000	5500	6000
Rated output current	A	2 × 148	2 × 163	2 × 183	2 × 203	2 × 223	2 × 240
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 266	2 × 2 × 289	2 × 2 × 328	2 × 2 × 359	2 × 2 × 398	2 × 2 × 437
Power loss [2]	kW	44	48	55	60	66	72
Efficiency [2]	%	98.6	98.5	98.5	98.5	98.6	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	54	54	54	54	54	54
Cooling air throughput	m^3/s	4.7	4.7	4.7	4.7	4.7	4.7
Sound pressure level L_{pA}	dB(A)	86	86	86	86	86	86
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)							
• Width	mm	4220	4220	4220	4220	4220	4220
• Height	mm	2570	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		④	④	④	④	④	④
Weight	kg	3550	3550	3550	3650	3650	3650

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LM32-5AA0	6SL3810-2LM33-0AA0	6SL3810-2LM33-5AA0	6SL3810-2LM34-0AA0
Output voltage 2.3 kV					
Type rating	kVA	850	1000	1150	1300
Shaft output [1]	kW	700	800	950	1100
	hp	900	1000	1250	1500
Rated output current	A	210	250	290	330
Input voltage	kV	2 × 1.2	2 × 1.2	2 × 1.2	2 × 1.2
Rated input current	A	2 × 182	2 × 221	2 × 257	2 × 293
Power loss [2]	kW	18	22	24	26
Efficiency [2]	%	97.5	97.5	97.5	97.9
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	33	33	33	33
Cooling air throughput	m^3/s	2.2	2.2	2.2	2.2
Sound pressure level L_{pA}	dB(A)	78	81	81	81
Measuring surface measurement L_s	dB(A)	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22
Dimensions (with doors and walls)					
• Width	mm	3340	3340	3340	3340
• Height	mm	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤
Weight	kg	2800	2800	2800	2850

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LM34-5AA0	6SL3810-2LM35-0AA0	6SL3810-2LM35-5AA0	6SL3810-2LM36-0AA0
Output voltage 2.3 kV					
Type rating	kVA	1450	1650	1850	2000
Shaft output [1]	kW	1200	1400	1500	1650
	hp	1600	1750	2000	2250
Rated output current	A	370	420	460	500
Input voltage	kV	2 × 1.2	2 × 1.2	2 × 1.2	2 × 1.2
Rated input current	A	2 × 329	2 × 366	2 × 403	2 × 444
Power loss [2]	kW	28	30	33	36
Efficiency [2]	%	97.9	97.9	97.9	98.0
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	33	33	33	33
Cooling air throughput	m^3/s	2.2	2.2	2.2	2.2
Sound pressure level L_{pA}	dB(A)	79	81	81	81
Measuring surface measurement L_s	dB(A)	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22
Dimensions (with doors and walls)					
• Width	mm	3340	3340	3340	3340
• Height	mm	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤
Weight	kg	2850	2900	2950	2950

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LN31-8AA0	6SL3810-2LN32-2AA0	6SL3810-2LN32-6AA0	6SL3810-2LN33-0AA0	6SL3810-2LN33-5AA0
Output voltage 3.3 kV						
Type rating	kVA	850	1100	1250	1450	1700
Shaft output [1]	kW	700	900	1050	1200	1400
	hp	900	1000	1250	1500	1750
Rated output current	A	150	190	220	250	300
Input voltage	kV	2 × 1.2	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7
Rated input current	A	2 × 130	2 × 171	2 × 197	2 × 223	2 × 261
Power loss [2]	kW	19	22	24	28	31
Efficiency [2]	%	97.4	97.5	97.9	97.8	97.9
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	33	33	33	33	33
Cooling air throughput	m^3/s	3	3	3	3	3
Sound pressure level L_{pA}	dB(A)	79	79	79	81	81
Measuring surface measurement L_s	dB(A)	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)						
• Width	mm	3340	3340	3340	3340	3340
• Height	mm	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤	⑤
Weight	kg	3050	3050	3100	3100	3100

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LN34-0AA0	6SL3810-2LN34-5AA0	6SL3810-2LN35-0AA0	6SL3810-2LN35-5AA0	6SL3810-2LN36-0AA0
Output voltage 3.3 kV						
Type rating	kVA	1950	2250	2450	2650	2900
Shaft output [1]	kW	1600	1850	2000	2200	2450
	hp	2000	2500	2750	3000	3250
Rated output current	A	340	390	430	460	510
Input voltage	kV	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7
Rated input current	A	2 × 304	2 × 347	2 × 388	2 × 414	2 × 453
Power loss [2]	kW	35	40	42	45	49
Efficiency [2]	%	98.0	98.0	98.1	98.1	98.1
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	33	33	33	33	33
Cooling air throughput	m^3/s	3	3	3	3	3
Sound pressure level L_{pA}	dB(A)	81	79	81	81	81
Measuring surface measurement L_s	dB(A)	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)						
• Width	mm	3340	3340	3640	3640	3640
• Height	mm	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤	⑤
Weight	kg	3300	3300	3350	3400	3500

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LN36-6AA0	6SL3810-2LN37-2AA0	6SL3810-2LN38-1AA0	6SL3810-2LN38-8AA0	6SL3810-2LN41-0AA0	6SL3810-2LN41-1AA0
Output voltage 3.3 kV							
Type rating	kVA	3250	3500	3900	4350	4850	5350
Shaft output [1]	kW	2750	2900	3200	3600	4100	4500
	hp	3500	4000	4500	5000	5500	6000
Rated output current	A	570	610	680	760	850	940
Input voltage	kV	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)
Rated input current	A	2 × (2 × 254)	2 × (2 × 274)	2 × (2 × 307)	2 × (2 × 340)	2 × (2 × 380)	2 × (2 × 420)
Power loss [2]	kW	53	59	63	69	78	86
Efficiency [2]	%	98.1	98.1	98.2	98.2	98.2	98.2
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	66	66	66	66	66	66
Cooling air throughput	m^3/s	5.8	5.8	5.8	5.8	5.8	5.8
Sound pressure level L_{pA}	dB(A)	87	87	87	87	87	87
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)							
• Width	mm	6060	6060	6060	6060	6660	6660
• Height	mm	2570	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		⑦	⑦	⑦	⑦	⑦	⑦
Weight	kg	5900	6300	6300	6300	6500	6500

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LP31-8AA0	6SL3810-2LP32-2AA0	6SL3810-2LP32-6AA0	6SL3810-2LP33-0AA0	6SL3810-2LP33-5AA0
Output voltage 4.16 kV						
Type rating	kVA	1100	1350	1600	1850	2100
Shaft output [1]	kW	900	1150	1300	1550	1750
	hp	1250	1500	1750	2000	2250
Rated output current	A	150	190	220	260	290
Input voltage	kV	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2
Rated input current	A	2 × 133	2 × 163	2 × 195	2 × 225	2 × 262
Power loss [2]	kW	24	25	29	33	38
Efficiency [2]	%	97.5	97.9	97.9	98.0	98.0
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	33	33	33	33	33
Cooling air throughput	m^3/s	3	3	3	3	3
Sound pressure level L_{pA}	dB(A)	79	79	79	81	81
Measuring surface measurement L_s	dB(A)	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)						
• Width	mm	3640	3640	3640	3640	3640
• Height	mm	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤	⑤
Weight	kg	3300	3300	3300	3350	3350

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LP34-0AA0	6SL3810-2LP34-5AA0	6SL3810-2LP35-0AA0	6SL3810-2LP35-5AA0	6SL3810-2LP36-0AA0
Output voltage 4.16 kV						
Type rating	kVA	2450	2650	3050	3400	3600
Shaft output [1]	kW	2000	2200	2500	2750	3000
	hp	2750	3000	3500	3750	4000
Rated output current	A	340	370	420	470	500
Input voltage	kV	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2
Rated input current	A	2 × 304	2 × 335	2 × 376	2 × 418	2 × 449
Power loss [2]	kW	41	46	51	57	61
Efficiency [2]	%	98.1	98.1	98.1	98.1	98.1
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	33	33	33	33	33
Cooling air throughput	m^3/s	3	3	3	3	3
Sound pressure level L_{pA}	dB(A)	81	79	81	81	81
Measuring surface measurement L_s	dB(A)	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)						
• Width	mm	3640	3640	3640	3640	3640
• Height	mm	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤	⑤
Weight	kg	3350	3400	3450	3450	3450

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LP36-6AA0	6SL3810-2LP37-2AA0	6SL3810-2LP38-1AA0	6SL3810-2LP38-8AA0	6SL3810-2LP41-0AA0	6SL3810-2LP41-1AA0
Output voltage 4.16 kV							
Type rating	kVA	4050	4400	4900	5500	6050	6650
Shaft output [1]	kW	3300	3600	4000	4500	5000	5500
	hp	4500	5000	5500	6000	6750	7500
Rated output current	A	560	610	680	760	840	920
Input voltage	kV	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)
Rated input current	A	2 × (2 × 251)	2 × (2 × 272)	2 × (2 × 303)	2 × (2 × 340)	2 × (2 × 376)	2 × (2 × 413)
Power loss [2]	kW	64	70	78	87	97	106
Efficiency [2]	%	98.2	98.2	98.2	98.2	98.2	98.2
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	66	66	66	66	66	66
Cooling air throughput	m^3/s	5.8	5.8	5.8	5.8	5.8	5.8
Sound pressure level L_{pA}	dB(A)	87	87	87	87	87	87
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)							
• Width	mm	6660	6660	6660	6660	6660	6660
• Height	mm	2570	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		⑦	⑦	⑦	⑦	⑦	⑦
Weight	kg	6400	6400	6400	6500	6600	6600

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LQ30-8AA0	6SL3810-2LQ31-0AA0	6SL3810-2LQ31-2AA0	6SL3810-2LQ31-5AA0	6SL3810-2LQ31-8AA0
Output voltage 6.0 kV						
Type rating	kVA	650	850	1000	1250	1500
Shaft output [1]	kW	550	700	800	1050	1250
	hp	700	900	1000	1250	1500
Rated output current	A	64	80	96	120	144
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 54	2 × 2 × 68	2 × 2 × 82	2 × 2 × 108	2 × 2 × 129
Power loss [2]	kW	15	18	21	24	29
Efficiency [2]	%	97.3	97.5	97.5	97.9	97.8
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	42	42	42	42	42
Cooling air throughput	m^3/s	3.4	3.4	3.4	3.4	3.4
Sound pressure level L_{pA}	dB(A)	81	81	81	81	81
Measuring surface measurement L_s	dB(A)	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)						
• Width	mm	4240	4240	4240	4240	4240
• Height	mm	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		⑥	⑥	⑥	⑥	⑥
Weight	kg	4350	4350	4350	4350	4400

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LQ32-0AA0	6SL3810-2LQ32-2AA0	6SL3810-2LQ32-4AA0	6SL3810-2LQ32-7AA0
Output voltage 6.0 kV					
Type rating	kVA	1650	1850	2050	2250
Shaft output [1]	kW	1400	1550	1700	1850
	hp	1750	2000	2250	2500
Rated output current	A	160	180	196	216
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 144	2 × 2 × 157	2 × 2 × 173	2 × 2 × 194
Power loss [2]	kW	30	33	36	40
Efficiency [2]	%	98.0	98.0	98.0	98.0
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	42	42	42	42
Cooling air throughput	m^3/s	3.4	3.4	3.4	3.4
Sound pressure level L_{pA}	dB(A)	81	83	83	83
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22
Dimensions (with doors and walls)					
• Width	mm	4240	4240	4240	4240
• Height	mm	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275
Circuit version		⑥	⑥	⑥	⑥
Weight	kg	4400	4400	4400	4600

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LQ33-0AA0	6SL3810-2LQ33-2AA0	6SL3810-2LQ33-6AA0	6SL3810-2LQ34-0AA0	6SL3810-2LQ34-4AA0	6SL3810-2LQ34-8AA0
Output voltage 6.0 kV							
Type rating	kVA	2450	2700	3050	3350	3700	4000
Shaft output [1]	kW	2000	2250	2500	2800	3000	3300
	hp	2750	3000	3250	3750	4000	4500
Rated output current	A	236	260	292	324	356	384
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 214	2 × 2 × 235	2 × 2 × 262	2 × 2 × 290	2 × 2 × 318	2 × 2 × 352
Power loss [2]	kW	42	46	52	57	63	64
Efficiency [2]	%	98.1	98.1	98.1	98.1	98.1	98.2
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	66	66	66	66	66	66
Cooling air throughput	m^3/s	5.8	5.8	5.8	5.8	5.8	5.8
Sound pressure level L_{pA}	dB(A)	88	88	88	88	88	88
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)							
• Width	mm	6660	6660	6660	6660	6660	6660
• Height	mm	2570	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		⑧	⑧	⑧	⑧	⑧	⑧
Weight	kg	7650	7650	7750	7750	7750	7750

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LR30-8AA0	6SL3810-2LR31-0AA0	6SL3810-2LR31-2AA0	6SL3810-2LR31-5AA0	6SL3810-2LR31-8AA0
Output voltage 6.6 kV						
Type rating	kVA	700	850	1050	1300	1550
Shaft output [1]	kW	550	700	850	1050	1300
	hp	700	900	1000	1250	1500
Rated output current	A	60	75	90	113	135
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 55	2 × 2 × 68	2 × 2 × 86	2 × 2 × 105	2 × 2 × 131
Power loss [2]	kW	16	18	23	26	30
Efficiency [2]	%	97.3	97.6	97.5	97.8	98.0
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	42	42	42	42	42
Cooling air throughput	m^3/s	3.4	3.4	3.4	3.4	3.4
Sound pressure level L_{pA}	dB(A)	81	81	81	83	83
Measuring surface measurement L_s	dB(A)	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)						
• Width	mm	4240	4240	4240	4240	4240
• Height	mm	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		⑥	⑥	⑥	⑥	⑥
Weight	kg	4350	4350	4350	4350	4350

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LR32-0AA0	6SL3810-2LR32-2AA0	6SL3810-2LR32-4AA0	6SL3810-2LR32-7AA0
Output voltage 6.6 kV					
Type rating	kVA	1700	1950	2100	2300
Shaft output [1]	kW	1400	1600	1750	1900
	hp	1750	2000	2250	2500
Rated output current	A	150	169	184	203
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 143	2 × 2 × 163	2 × 2 × 176	2 × 2 × 195
Power loss [2]	kW	31	35	38	40
Efficiency [2]	%	98.0	98.0	98.0	98.1
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	42	42	42	42
Cooling air throughput	m^3/s	3.4	3.4	3.4	3.4
Sound pressure level L_{pA}	dB(A)	83	83	83	83
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22
Dimensions (with doors and walls)					
• Width	mm	4240	4240	4240	4240
• Height	mm	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275
Circuit version		⑥	⑥	⑥	⑥
Weight	kg	4400	4400	4400	4600

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Air cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Air cooling, with sinusoidal filter (option Y15)	Type	6SL3810-2LR33-0AA0	6SL3810-2LR33-2AA0	6SL3810-2LR33-6AA0	6SL3810-2LR34-0AA0	6SL3810-2LR34-4AA0	6SL3810-2LR34-8AA0
Output voltage 6.6 kV							
Type rating	kVA	2550	2800	3150	3500	3800	4200
Shaft output [1]	kW	2100	2400	2600	2800	3200	3500
	hp	2750	3000	3500	4000	4250	4500
Rated output current	A	221	244	274	304	334	368
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 213	2 × 2 × 232	2 × 2 × 264	2 × 2 × 289	2 × 2 × 320	2 × 2 × 351
Power loss [2]	kW	43	47	54	59	61	67
Efficiency [2]	%	98.1	98.1	98.1	98.1	98.2	98.2
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [3]	A	66	66	66	66	66	66
Cooling air throughput	m^3/s	5.8	5.8	5.8	5.8	5.8	5.8
Sound pressure level L_{pA}	dB(A)	88	88	88	88	88	88
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [4]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP22	IP22	IP22	IP22	IP22	IP22
Dimensions (with doors and walls)							
• Width	mm	6660	6660	6660	6660	6660	6660
• Height	mm	2570	2570	2570	2570	2570	2570
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		⑧	⑧	⑧	⑧	⑧	⑧
Weight	kg	7650	7650	7650	7750	7750	7750

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LM35-0AA0	6SL3815-2LM35-5AA0	6SL3815-2LM36-1AA0	6SL3815-2LM36-7AA0	6SL3815-2LM37-4AA0	6SL3815-2LM38-0AA0
Output voltage 2.3 kV							
Type rating	kVA	2000	2200	2400	2700	2900	3200
Shaft output [1]	kW	1650	1800	2000	2250	2450	2650
	hp	2250	2500	2750	3000	3250	3500
Rated output current	A	500	550	610	675	740	800
Input voltage	kV	2 × 1.2	2 × 1.2	2 × 1.2	2 × 1.2	2 × 1.2	2 × 1.2
Rated input current	A	2 × 444	2 × 494	2 × 539	2 × 605	2 × 650	2 × 717
Power loss [2] [3]	kW	28	31	34	35	38	42
Efficiency [3]	%	98.4	98.4	98.4	98.5	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	25	25	25	25	25	25
Cooling water throughput (untreated water/fresh water)	l/min	72	72	72	72	72	72
Sound pressure level L_{pA}	dB(A)	73	73	73	73	73	73
Measuring surface measurement L_s	dB(A)	18	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	3620	3620	3620	3620	3620	3620
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		①	①	①	①	①	①
Weight	kg	2600	2650	2650	2650	2700	2700

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LN33-5AA0	6SL3815-2LN34-0AA0	6SL3815-2LN34-5AA0	6SL3815-2LN35-0AA0	6SL3815-2LN35-5AA0
Output voltage 3.3 kV						
Type rating	kVA	2000	2300	2600	2900	3100
Shaft output [1]	kW	1650	1900	2150	2400	2650
	hp	2250	2500	3000	3250	3500
Rated output current	A	350	400	450	500	550
Input voltage	kV	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7
Rated input current	A	2 × 309	2 × 360	2 × 406	2 × 453	2 × 484
Power loss [2] [3]	kW	28	32	34	38	40
Efficiency [3]	%	98.4	98.4	98.5	98.5	98.6
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	14	14	14	14	14
Cooling water throughput (untreated water/fresh water)	l/min	108	108	108	108	108
Sound pressure level L_{pA}	dB(A)	73	73	73	73	73
Measuring surface measurement L_s	dB(A)	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)						
• Width	mm	3620	3620	3620	3620	3620
• Height	mm	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		①	①	①	①	①
Weight	kg	2750	2800	2800	2800	2850

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LN36-1AA0	6SL3815-2LN36-7AA0	6SL3815-2LN37-4AA0	6SL3815-2LN38-0AA0
Output voltage 3.3 kV					
Type rating	kVA	3500	3900	4200	4600
Shaft output [1]	kW	2900	3200	3500	3800
	hp	4000	4250	4500	5000
Rated output current	A	610	675	740	800
Input voltage	kV	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7
Rated input current	A	2 × 547	2 × 609	2 × 656	2 × 719
Power loss [2] [3]	kW	46	51	55	60
Efficiency [3]	%	98.5	98.5	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	25	25	25	25
Cooling water throughput (untreated water/fresh water)	l/min	108	108	108	108
Sound pressure level L_{pA}	dB(A)	73	73	73	73
Measuring surface measurement L_s	dB(A)	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43
Dimensions (with doors and walls)					
• Width	mm	3620	3620	3620	3620
• Height	mm	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275
Circuit version		①	①	①	①
Weight	kg	2850	2850	2850	2850

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LN38-8AA0	6SL3815-2LN41-0AA0	6SL3815-2LN41-1AA0	6SL3815-2LN41-2AA0	6SL3815-2LN41-3AA0	6SL3815-2LN41-4AA0
Output voltage 3.3 kV							
Type rating	kVA	5100	5700	6300	6900	7400	8000
Shaft output [1]	kW	4250	4750	5300	5700	6200	6700
	hp	6000	6500	7000	7500	8000	9000
Rated output current	A	2 × 445	2 × 495	2 × 550	2 × 600	2 × 650	2 × 700
Input voltage	kV	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)
Rated input current	A	2 × (2 × 399)	2 × (2 × 446)	2 × (2 × 492)	2 × (2 × 539)	2 × (2 × 578)	2 × (2 × 625)
Power loss [2] [3]	kW	66	74	82	90	96	104
Efficiency [3]	%	98.6	98.5	98.5	98.5	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	216	216	216	216	216	216
Sound pressure level L_{pA}	dB(A)	76	76	76	76	76	76
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	5420	5420	5420	5420	5420	5420
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		③	③	③	③	③	③
Weight	kg	4100	4200	4200	4200	4200	4200

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LP32-8AA0	6SL3815-2LP33-1AA0	6SL3815-2LP33-5AA0	6SL3815-2LP34-0AA0	6SL3815-2LP34-5AA0	6SL3815-2LP35-0AA0
Output voltage 4.16 kV							
Type rating	kVA	2000	2200	2500	2900	3200	3600
Shaft output [1]	kW	1700	1850	2100	2400	2700	3000
	hp	2250	2500	2750	3000	3500	4000
Rated output current	A	280	310	350	400	450	500
Input voltage	kV	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2
Rated input current	A	2 × 245	2 × 273	2 × 310	2 × 359	2 × 397	2 × 446
Power loss [2] [3]	kW	28	31	33	38	42	47
Efficiency [3]	%	98.4	98.4	98.5	98.5	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	25	25	25	25	25	25
Cooling water throughput (untreated water/fresh water)	l/min	108	108	108	108	108	108
Sound pressure level L_{pA}	dB(A)	73	73	73	73	73	73
Measuring surface measurement L_s	dB(A)	18	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	3620	3620	3620	3620	3620	3620
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		①	①	①	①	①	①
Weight	kg	2750	2800	2800	2800	2850	2850

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LP35-5AA0	6SL3815-2LP36-1AA0	6SL3815-2LP36-7AA0	6SL3815-2LP37-4AA0	6SL3815-2LP38-0AA0
Output voltage 4.16 kV						
Type rating	kVA	4000	4400	4900	5300	5800
Shaft output [1]	kW	3300	3700	4100	4500	4800
	hp	4500	5000	5500	6000	6500
Rated output current	A	550	610	675	740	800
Input voltage	kV	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2
Rated input current	A	2 × 496	2 × 545	2 × 607	2 × 657	2 × 719
Power loss [2] [3]	kW	52	57	64	69	75
Efficiency [3]	%	98.5	98.5	98.5	98.5	98.6
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	25	25	25	25	25
Cooling water throughput (untreated water/fresh water)	l/min	108	108	108	108	108
Sound pressure level L_{pA}	dB(A)	73	73	73	73	73
Measuring surface measurement L_s	dB(A)	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)						
• Width	mm	3620	3620	3620	3620	3620
• Height	mm	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		①	①	①	①	①
Weight	kg	2850	2850	2850	2850	2850

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LP38-8AA0	6SL3815-2LP41-0AA0	6SL3815-2LP41-1AA0	6SL3815-2LP41-2AA0	6SL3815-2LP41-3AA0	6SL3815-2LP41-4AA0
Output voltage 4.16 kV							
Type rating	kVA	6400	7100	7900	8600	9400	10100
Shaft output [1]	kW	5400	6000	6600	7300	7900	8500
	hp	7000	8000	9000	9500	10000	11000
Rated output current	A	2 × 445	2 × 495	2 × 550	2 × 600	2 × 650	2 × 700
Input voltage	kV	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)
Rated input current	A	2 × (2 × 397)	2 × (2 × 440)	2 × (2 × 490)	2 × (2 × 533)	2 × (2 × 583)	2 × (2 × 627)
Power loss [2] [3]	kW	83	92	103	112	122	131
Efficiency [3]	%	98.5	98.5	98.5	98.5	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	216	216	216	216	216	216
Sound pressure level L_{pA}	dB(A)	76	76	76	76	76	76
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	5420	5420	5420	5420	5420	5420
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		③	③	③	③	③	③
Weight	kg	4200	4200	4200	4200	4200	4200

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LQ31-7AA0	6SL3815-2LQ32-0AA0	6SL3815-2LQ32-3AA0	6SL3815-2LQ32-6AA0
Output voltage 6.0 kV					
Type rating	kVA	1800	2100	2400	2700
Shaft output [1]	kW	1450	1750	2000	2250
	hp	2000	2250	2500	3000
Rated output current	A	170	200	230	260
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 152	2 × 2 × 181	2 × 2 × 206	2 × 2 × 232
Power loss [2] [3]	kW	27	29	34	35
Efficiency [3]	%	98.3	98.5	98.4	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	25	25	25	25
Cooling water throughput (untreated water/fresh water)	l/min	126	126	126	126
Sound pressure level L_{pA}	dB(A)	75	75	75	75
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43
Dimensions (with doors and walls)					
• Width	mm	4220	4220	4220	4220
• Height	mm	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275
Circuit version		②	②	②	②
Weight	kg	3050	3100	3100	3100

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LQ33-0AA0	6SL3815-2LQ33-2AA0	6SL3815-2LQ33-6AA0	6SL3815-2LQ33-8AA0
Output voltage 6.0 kV					
Type rating	kVA	3000	3400	3700	4100
Shaft output [1]	kW	2500	2800	3100	3400
	hp	3500	3750	4000	4500
Rated output current	A	290	325	360	390
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 258	2 × 2 × 292	2 × 2 × 318	2 × 2 × 352
Power loss [2] [3]	kW	39	44	48	53
Efficiency [3]	%	98.5	98.6	98.5	98.6
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	25	25	25	25
Cooling water throughput (untreated water/fresh water)	l/min	126	126	126	126
Sound pressure level L_{pA}	dB(A)	75	75	75	75
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43
Dimensions (with doors and walls)					
• Width	mm	4220	4220	4220	4220
• Height	mm	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275
Circuit version		②	②	②	②
Weight	kg	3150	3150	3150	3150

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LQ34-3AA0	6SL3815-2LQ34-7AA0	6SL3815-2LQ35-3AA0	6SL3815-2LQ35-8AA0	6SL3815-2LQ36-4AA0	6SL3815-2LQ37-0AA0
Output voltage 6.0 kV							
Type rating	kVA	4500	4900	5500	6100	6700	7300
Shaft output [1]	kW	3700	4100	4600	5100	5600	6100
	hp	5000	5500	6000	6500	7000	8000
Rated output current	A	2 × 215	2 × 235	2 × 265	2 × 292	2 × 320	2 × 350
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 387	2 × 2 × 421	2 × 2 × 473	2 × 2 × 524	2 × 2 × 576	2 × 2 × 627
Power loss [2] [3]	kW	59	64	72	79	87	95
Efficiency [3]	%	98.5	98.5	98.5	98.5	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	216	216	216	216	216	216
Sound pressure level L_{pA}	dB(A)	78	78	78	78	78	78
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	5420	5420	5420	5420	5420	5420
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		④	④	④	④	④	④
Weight	kg	4100	4200	4200	4300	4300	4300

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LR31-7AA0	6SL3815-2LR32-0AA0	6SL3815-2LR32-3AA0	6SL3815-2LR32-6AA0
Output voltage 6.6 kV					
Type rating	kVA	1900	2300	2600	3000
Shaft output [1]	kW	1600	1900	2200	2500
	hp	2000	2500	3000	3250
Rated output current	A	170	200	230	260
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 147	2 × 2 × 180	2 × 2 × 203	2 × 2 × 234
Power loss [2] [3]	kW	27	32	34	39
Efficiency [3]	%	98.4	98.4	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	25	25	25	25
Cooling water throughput (untreated water/fresh water)	l/min	126	126	126	126
Sound pressure level L_{pA}	dB(A)	75	75	75	75
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43
Dimensions (with doors and walls)					
• Width	mm	4220	4220	4220	4220
• Height	mm	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275
Circuit version		②	②	②	②
Weight	kg	3050	3100	3100	3100

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, without sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LR33-0AA0	6SL3815-2LR33-2AA0	6SL3815-2LR33-6AA0	6SL3815-2LR33-8AA0
Output voltage 6.6 kV					
Type rating	kVA	3300	3700	4100	4500
Shaft output [1]	kW	2800	3100	3400	3700
	hp	3500	4000	4500	5000
Rated output current	A	290	325	360	390
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 258	2 × 2 × 289	2 × 2 × 320	2 × 2 × 352
Power loss [2] [3]	kW	43	48	53	59
Efficiency [3]	%	98.5	98.5	98.6	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	25	25	25	25
Cooling water throughput (untreated water/fresh water)	l/min	126	126	126	126
Sound pressure level L_{pA}	dB(A)	75	75	75	75
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43
Dimensions (with doors and walls)					
• Width	mm	4220	4220	4220	4220
• Height	mm	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275
Circuit version		②	②	②	②
Weight	kg	3100	3150	3150	3150

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, without sinusoidal filter	Type	6SL3815-2LR34-3AA0	6SL3815-2LR34-7AA0	6SL3815-2LR35-3AA0	6SL3815-2LR35-8AA0	6SL3815-2LR36-4AA0	6SL3815-2LR37-0AA0
Output voltage 6.6 kV							
Type rating	kVA	4900	5400	6100	6700	7300	8000
Shaft output [1]	kW	4100	4500	5100	5600	6100	6700
	hp	5500	6000	6500	7000	8000	9000
Rated output current	A	2 × 215	2 × 235	2 × 265	2 × 292	2 × 320	2 × 350
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 383	2 × 2 × 422	2 × 2 × 476	2 × 2 × 523	2 × 2 × 570	2 × 2 × 625
Power loss [2] [3]	kW	64	70	79	87	95	104
Efficiency [3]	%	98.5	98.5	98.5	98.5	98.5	98.5
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	216	216	216	216	216	216
Sound pressure level L_{pA}	dB(A)	78	78	78	78	78	78
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	5420	5420	5420	5420	5420	5420
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		④	④	④	④	④	④
Weight	kg	4200	4200	4200	4300	4300	4300

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LM35-0AA0	6SL3815-2LM35-5AA0	6SL3815-2LM36-1AA0	6SL3815-2LM36-7AA0	6SL3815-2LM37-4AA0	6SL3815-2LM38-0AA0
Output voltage 2.3 kV							
Type rating	kVA	1500	1650	1800	2050	2200	2400
Shaft output [1]	kW	1250	1350	1500	1700	1850	2000
	hp	1500	1750	2000	2250	2500	2750
Rated output current	A	380	410	450	510	550	600
Input voltage	kV	2 × 1.2	2 × 1.2	2 × 1.2	2 × 1.2	2 × 1.2	2 × 1.2
Rated input current	A	2 × 331	2 × 364	2 × 397	2 × 453	2 × 491	2 × 540
Power loss [2] [3]	kW	29	30	32	37	39	41
Efficiency [3]	%	97.8	97.9	98.0	97.9	98.0	98.1
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	112	112	112	112	112	112
Sound pressure level L_{pA}	dB(A)	74	74	74	74	74	74
Measuring surface measurement L_s	dB(A)	18	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	4540	4540	4540	4540	4540	4540
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤	⑤	⑤
Weight	kg	3750	3850	3850	3900	3950	3950

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LN33-5AA0	6SL3815-2LN34-0AA0	6SL3815-2LN34-5AA0	6SL3815-2LN35-0AA0
Output voltage 3.3 kV					
Type rating	kVA	1550	1750	2000	2150
Shaft output [1]	kW	1300	1450	1650	1800
	hp	1750	2000	2250	2500
Rated output current	A	270	310	350	380
Input voltage	kV	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7
Rated input current	A	2 × 234	2 × 269	2 × 308	2 × 346
Power loss [2] [3]	kW	29	32	36	40
Efficiency [3]	%	97.8	97.9	98.0	98.0
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	148	148	148	148
Sound pressure level L_{pA}	dB(A)	74	74	74	74
Measuring surface measurement L_s	dB(A)	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43
Dimensions (with doors and walls)					
• Width	mm	4540	4540	4540	4540
• Height	mm	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤
Weight	kg	4000	4200	4200	4200

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LN35-5AA0	6SL3815-2LN36-1AA0	6SL3815-2LN36-7AA0	6SL3815-2LN37-4AA0	6SL3815-2LN38-0AA0
Output voltage 3.3 kV						
Type rating	kVA	2350	2700	2950	3200	3500
Shaft output [1]	kW	1950	2250	2500	2700	2900
	hp	2750	3000	3250	3500	4000
Rated output current	A	410	470	520	560	610
Input voltage	kV	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7	2 × 1.7
Rated input current	A	2 × 370	2 × 417	2 × 465	2 × 501	2 × 549
Power loss [2] [3]	kW	42	45	50	54	60
Efficiency [3]	%	98.1	98.1	98.1	98.1	98.1
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	148	148	148	148	148
Sound pressure level L_{pA}	dB(A)	74	74	74	74	74
Measuring surface measurement L_s	dB(A)	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)						
• Width	mm	4840	4840	4840	4840	4840
• Height	mm	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤	⑤
Weight	kg	4300	4300	4400	4400	4400

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LN38-8AA0	6SL3815-2LN41-0AA0	6SL3815-2LN41-1AA0	6SL3815-2LN41-2AA0	6SL3815-2LN41-3AA0	6SL3815-2LN41-4AA0
Output voltage 3.3 kV							
Type rating	kVA	3900	4350	4800	5250	5600	6050
Shaft output [1]	kW	3250	3650	4000	4400	4700	5100
	hp	4500	5000	5500	6000	6250	6500
Rated output current	A	680	760	840	920	980	1060
Input voltage	kV	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)	2 × (2 × 1.7)
Rated input current	A	2 × (2 × 304)	2 × (2 × 340)	2 × (2 × 376)	2 × (2 × 411)	2 × (2 × 441)	2 × (2 × 477)
Power loss [2] [3]	kW	62	69	77	84	90	97
Efficiency [3]	%	98.2	98.2	98.2	98.2	98.2	98.2
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	43	43	43	43	43	43
Cooling water throughput (untreated water/fresh water)	l/min	296	296	296	296	296	296
Sound pressure level L_{pA}	dB(A)	78	78	78	78	78	78
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	7260	7260	7860	7860	7860	7860
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		⑦	⑦	⑦	⑦	⑦	⑦
Weight	kg	6900	7000	7100	7100	7100	7300

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LP32-8AA0	6SL3815-2LP33-1AA0	6SL3815-2LP33-5AA0	6SL3815-2LP34-0AA0	6SL3815-2LP34-5AA0	6SL3815-2LP35-0AA0
Output voltage 4.16 kV							
Type rating	kVA	1600	1750	1950	2250	2500	2800
Shaft output [1]	kW	1300	1450	1600	1850	2100	2350
	hp	1750	2000	2250	2500	2750	3000
Rated output current	A	220	240	270	310	350	390
Input voltage	kV	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2
Rated input current	A	2 × 190	2 × 210	2 × 240	2 × 282	2 × 311	2 × 350
Power loss [2] [3]	kW	30	31	35	41	43	48
Efficiency [3]	%	97.8	97.9	98.0	98.0	98.1	98.1
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	148	148	148	148	148	148
Sound pressure level L_{pA}	dB(A)	74	74	74	74	74	74
Measuring surface measurement L_s	dB(A)	18	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	4840	4840	4840	4840	4840	4840
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤	⑤	⑤
Weight	kg	4200	4250	4250	4250	4300	4300

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LP35-5AA0	6SL3815-2LP36-1AA0	6SL3815-2LP36-7AA0	6SL3815-2LP37-4AA0	6SL3815-2LP38-0AA0
Output voltage 4.16 kV						
Type rating	kVA	3100	3450	3800	4100	4500
Shaft output [1]	kW	2600	2900	3200	3450	3800
	hp	3500	4000	4250	4500	5000
Rated output current	A	430	480	530	570	625
Input voltage	kV	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2	2 × 2.2
Rated input current	A	2 × 388	2 × 427	2 × 475	2 × 514	2 × 562
Power loss [2] [3]	kW	53	58	61	66	72
Efficiency [3]	%	98.1	98.1	98.2	98.2	98.2
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	148	148	148	148	148
Sound pressure level L_{pA}	dB(A)	74	74	74	74	74
Measuring surface measurement L_s	dB(A)	18	18	18	18	18
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)						
• Width	mm	4840	4840	4840	4840	4840
• Height	mm	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275
Circuit version		⑤	⑤	⑤	⑤	⑤
Weight	kg	4350	4350	4850	4850	4850

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LP38-8AA0	6SL3815-2LP41-0AA0	6SL3815-2LP41-1AA0	6SL3815-2LP41-2AA0	6SL3815-2LP41-3AA0	6SL3815-2LP41-4AA0
Output voltage 4.16 kV							
Type rating	kVA	4950	5550	6150	6700	7350	7950
Shaft output [1]	kW	4200	4600	5100	5600	6200	6600
	hp	5500	6000	7000	7500	8000	9000
Rated output current	A	690	770	850	930	1020	1100
Input voltage	kV	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)	2 × (2 × 2.2)
Rated input current	A	2 × (2 × 311)	2 × (2 × 345)	2 × (2 × 383)	2 × (2 × 417)	2 × (2 × 456)	2 × (2 × 491)
Power loss [2] [3]	kW	80	89	99	107	117	126
Efficiency [3]	%	98.2	98.2	98.2	98.2	98.2	98.2
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	43	43	43	43	43	43
Cooling water throughput (untreated water/fresh water)	l/min	296	296	296	296	296	296
Sound pressure level L_{pA}	dB(A)	78	78	78	78	78	78
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	7860	7860	7860	7860	7860	7860
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		⑦	⑦	⑦	⑦	⑦	⑦
Weight	kg	7100	7100	7200	7200	8200	8200

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) 2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) 3) Without cooling system.

4) 4) Plus 20 A precharging current for 25 s.

5) 5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LQ31-7AA0	6SL3815-2LQ32-0AA0	6SL3815-2LQ32-3AA0	6SL3815-2LQ32-6AA0
Output voltage 6.0 kV					
Type rating	kVA	1400	1650	1900	2150
Shaft output [1]	kW	1200	1400	1600	1800
	hp	1500	1750	2000	2250
Rated output current	A	136	160	184	208
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 121	2 × 2 × 144	2 × 2 × 166	2 × 2 × 187
Power loss [2] [3]	kW	27	30	35	39
Efficiency [3]	%	97.9	98.0	98.0	98.0
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	166	166	166	166
Sound pressure level L_{pA}	dB(A)	76	76	76	76
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43
Dimensions (with doors and walls)					
• Width	mm	5440	5440	5440	5440
• Height	mm	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275
Circuit version		⑥	⑥	⑥	⑥
Weight	kg	5150	5200	5200	5400

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LQ33-0AA0	6SL3815-2LQ33-2AA0	6SL3815-2LQ33-6AA0	6SL3815-2LQ33-8AA0
Output voltage 6.0 kV					
Type rating	kVA	2400	2700	3000	3250
Shaft output [1]	kW	2000	2250	2500	2700
	hp	2500	2750	3000	3500
Rated output current	A	232	260	288	312
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 207	2 × 2 × 235	2 × 2 × 255	2 × 2 × 283
Power loss [2] [3]	kW	41	46	50	56
Efficiency [3]	%	98.1	98.1	98.1	98.1
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	166	166	166	166
Sound pressure level L_{pA}	dB(A)	76	76	76	76
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43
Dimensions (with doors and walls)					
• Width	mm	5440	5440	5440	5440
• Height	mm	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275
Circuit version		⑥	⑥	⑥	⑥
Weight	kg	5450	5450	5450	5450

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LQ34-3AA0	6SL3815-2LQ34-7AA0	6SL3815-2LQ35-3AA0	6SL3815-2LQ35-8AA0	6SL3815-2LQ36-4AA0	6SL3815-2LQ37-0AA0
Output voltage 6.0 kV							
Type rating	kVA	3600	3900	4400	4850	5300	5800
Shaft output [1]	kW	3000	3300	3700	4100	4400	4900
	hp	4000	4500	5000	5500	6000	6500
Rated output current	A	344	376	424	468	512	560
Input voltage	kV	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55	2 × 2 × 1.55
Rated input current	A	2 × 2 × 311	2 × 2 × 338	2 × 2 × 379	2 × 2 × 421	2 × 2 × 462	2 × 2 × 503
Power loss [2] [3]	kW	61	63	70	78	86	93
Efficiency [3]	%	98.1	98.2	98.2	98.2	98.2	98.2
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	43	43	43	43	43	43
Cooling water throughput (untreated water/fresh water)	l/min	296	296	296	296	296	296
Sound pressure level L_{pA}	dB(A)	80	80	80	80	80	80
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	7860	7860	7860	7860	7860	7860
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		⑧	⑧	⑧	⑧	⑧	⑧
Weight	kg	8300	8400	8400	8500	8900	8900

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LR31-7AA0	6SL3815-2LR32-0AA0	6SL3815-2LR32-3AA0	6SL3815-2LR32-6AA0
Output voltage 6.6 kV					
Type rating	kVA	1550	1850	2100	2400
Shaft output [1]	kW	1300	1500	1750	2000
	hp	1750	2000	2250	2750
Rated output current	A	136	160	184	208
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 117	2 × 2 × 143	2 × 2 × 163	2 × 2 × 188
Power loss [2] [3]	kW	29	33	37	41
Efficiency [3]	%	97.8	98.0	98.0	98.1
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	166	166	166	166
Sound pressure level L_{pA}	dB(A)	76	76	76	76
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43
Dimensions (with doors and walls)					
• Width	mm	5440	5440	5440	5440
• Height	mm	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275
Circuit version		⑥	⑥	⑥	⑥
Weight	kg	5150	5200	5200	5400

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LR33-0AA0	6SL3815-2LR33-2AA0	6SL3815-2LR33-6AA0	6SL3815-2LR33-8AA0
Output voltage 6.6 kV					
Type rating	kVA	2650	2950	3300	3550
Shaft output [1]	kW	2200	2500	2750	3000
	hp	3000	3250	3500	4000
Rated output current	A	232	260	288	312
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 207	2 × 2 × 232	2 × 2 × 257	2 × 2 × 282
Power loss [2] [3]	kW	45	50	56	61
Efficiency [3]	%	98.1	98.1	98.1	98.1
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	31	31	31	31
Cooling water throughput (untreated water/fresh water)	l/min	166	166	166	166
Sound pressure level L_{pA}	dB(A)	76	76	76	76
Measuring surface measurement L_s	dB(A)	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43
Dimensions (with doors and walls)					
• Width	mm	5440	5440	5440	5440
• Height	mm	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275
Circuit version		⑥	⑥	⑥	⑥
Weight	kg	5400	5450	5450	5450

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Approx. 5% of the power loss is dissipated into the atmosphere.

3) Without cooling system.

4) Plus 20 A precharging current for 25 s.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

IGBT version
Water cooling, with sinusoidal filter

Technical data (continued)

SINAMICS GM150 as IGBT version Water cooling, with sinusoidal filter (option Y15)	Type	6SL3815-2LR34-3AA0	6SL3815-2LR34-7AA0	6SL3815-2LR35-3AA0	6SL3815-2LR35-8AA0	6SL3815-2LR36-4AA0	6SL3815-2LR37-0AA0
Output voltage 6.6 kV							
Type rating	kVA	3950	4300	4850	5350	5850	6400
Shaft output [1]	kW	3300	3600	4000	4500	4900	5400
	hp	4500	4750	5000	6000	6500	7000
Rated output current	A	344	376	424	468	512	560
Input voltage	kV	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7	2 × 2 × 1.7
Rated input current	A	2 × 2 × 307	2 × 2 × 339	2 × 2 × 382	2 × 2 × 420	2 × 2 × 458	2 × 2 × 502
Power loss [2] [3]	kW	63	69	78	86	93	102
Efficiency [3]	%	98.2	98.2	98.2	98.2	98.2	98.2
Max. AC current requirement 50/60 Hz, 230 V	A	10	10	10	10	10	10
Max. current requirement of auxiliary supply 3 AC 50/60 Hz 400 V [4]	A	43	43	43	43	43	43
Cooling water throughput (untreated water/fresh water)	l/min	296	296	296	296	296	296
Sound pressure level L_{pA}	dB(A)	80	80	80	80	80	80
Measuring surface measurement L_s	dB(A)	19	19	19	19	19	19
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240	2 × 240
	AWG/MCM (NEC, CEC)	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM	2 × 500 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)							
• Width	mm	7860	7860	7860	7860	7860	7860
• Height	mm	2280	2280	2280	2280	2280	2280
• Depth	mm	1275	1275	1275	1275	1275	1275
Circuit version		⑧	⑧	⑧	⑧	⑧	⑧
Weight	kg	8400	8400	8800	8900	8900	8900

1) The output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor.
The hp figures are based on the NEC and CEC directives for the North American market. The kW values are quoted in steps which can be divided by 50.
Both approximate values need to be adapted to the motor which is actually used.

2) Without cooling system.

3) Plus 20 A precharging current for 25 s.

4) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

SINAMICS GM150 as IGCT version

3

IGCT version

Overview

SINAMICS GM150 as IGCT version

The water-cooled SINAMICS GM150 converters as IGCT version with IGCT Motor Modules are an addition to the SINAMICS GM150 converters as IGBT version in the upper performance range up to 28 MVA.

SINAMICS GM150 converters as IGCT version are optimally matched to Siemens motors.

SINAMICS GM150 converters as IGCT version offer economic drive solutions that can be matched to customers' specific requirements by adding from the wide range of available components and options.

IGCT converters are available for the following voltage and outputs:

Rated output voltage	Performance
3.3 kV	10 MVA to 28 MVA

Global use

SINAMICS GM150 converters as IGCT version are manufactured to international standards and regulations, making them ideally suited for global use. These converters are also available in ship-going form (meeting the requirements of all major classification organizations).

Benefits

- Compact design and high flexibility in configuration ensures easy plant integration
- Easy operation and observation on the convenient operator panel
- Easy and reliable operation through integrated maintenance functions: the converter signals early and automatically if maintenance is required or components need to be exchanged
- High robustness and reliability thanks to the use of IGCT power semiconductors in the high performance range and fuseless assembly combined with intelligent reaction to external interference
- Can be easily integrated into automation solutions due to PROFIBUS interface supplied as standard and analog and digital interfaces
- High level of service-friendliness through innovative power unit design with compact phase components and easy access to all components

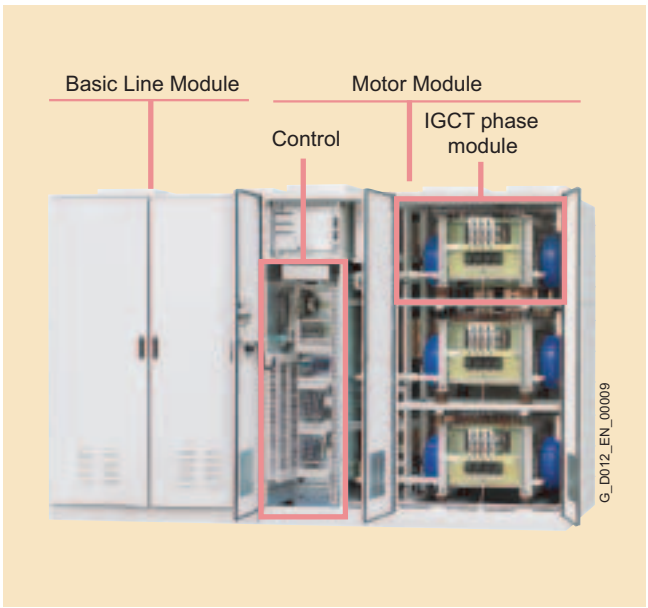
Design

SINAMICS GM150 converters as IGCT version are available in the basic circuit with a 12-pulse or 24-pulse Basic Line Module (option).

For greater output ratings, two or three complete converter units with isolated DC links are operated in parallel.

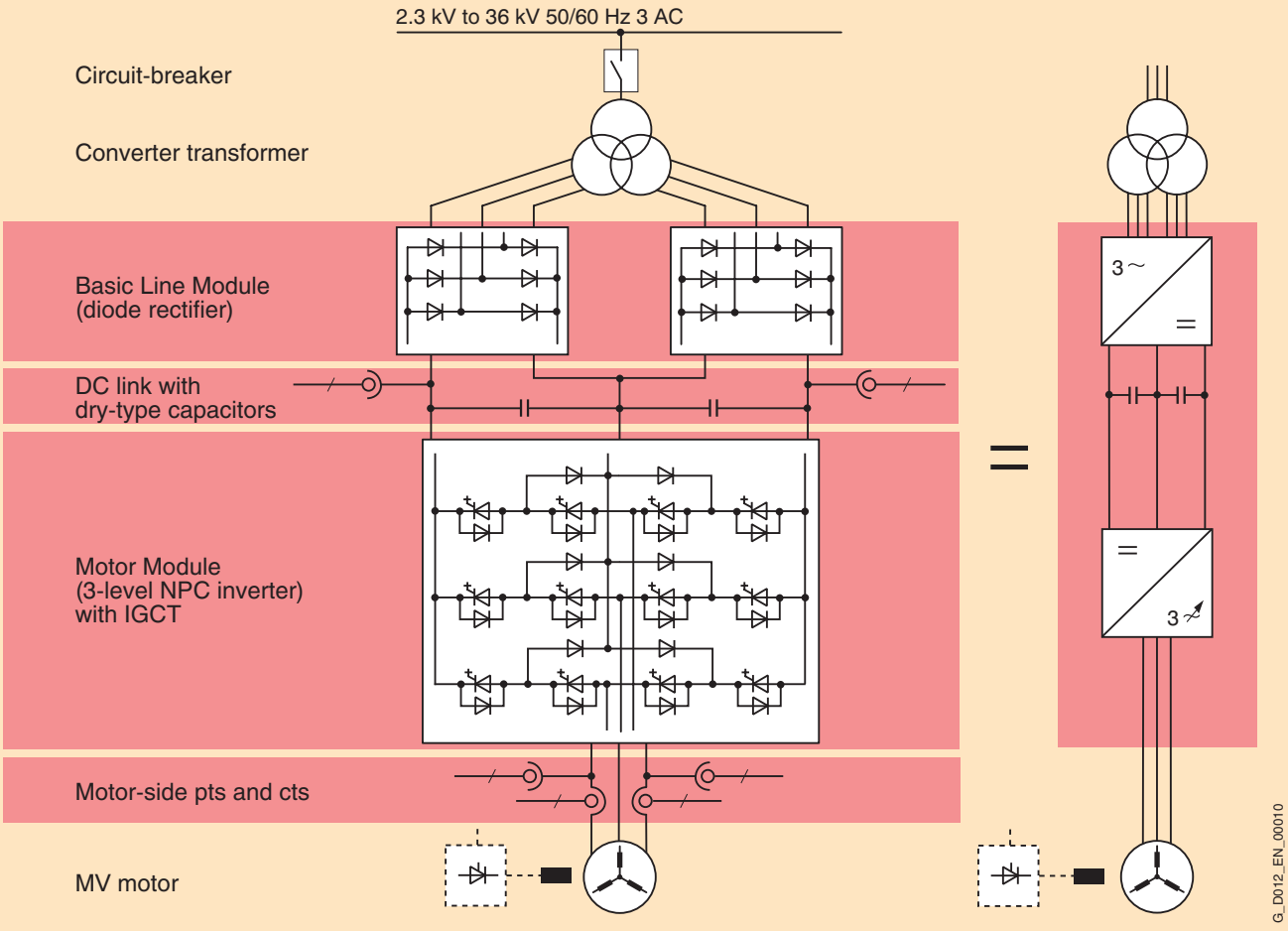
Phase components in which IGCTs, diodes etc. are grouped together in one pressure stack are used in the Motor Modules.

The converter consists of cabinet units for the Basic Line Module and for the Motor Module. One of three phase components and the control section in the Motor Module cabinet unit are highlighted in the illustration.



SINAMICS GM150 as IGCT version, internal configuration (without recooling unit)

Design (continued)

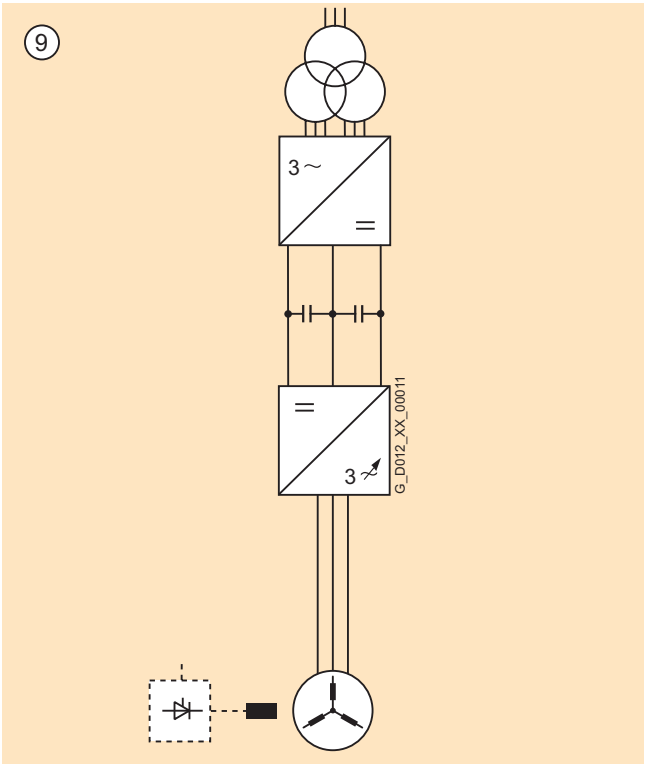


Block diagram

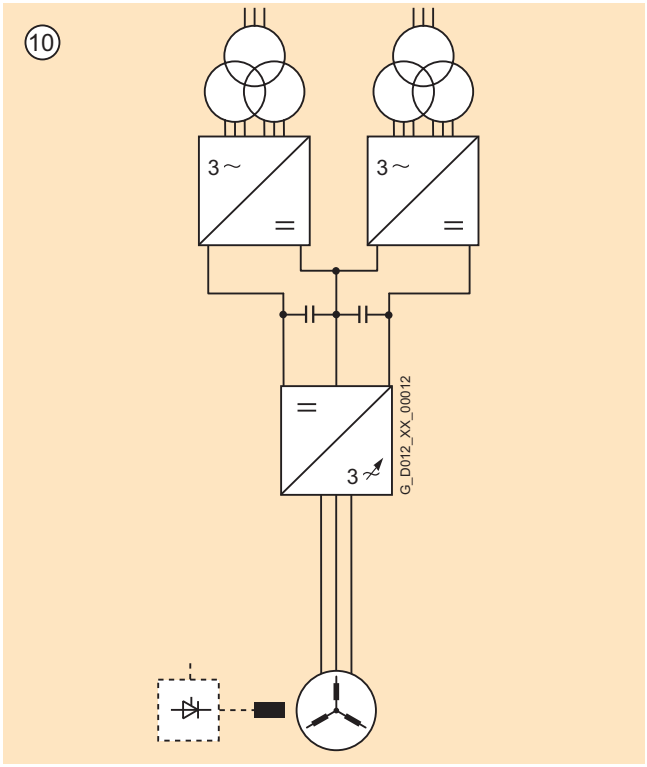
IGCT version

Design (continued)

The following wiring versions are available for SINAMICS GM150 as IGCT version.

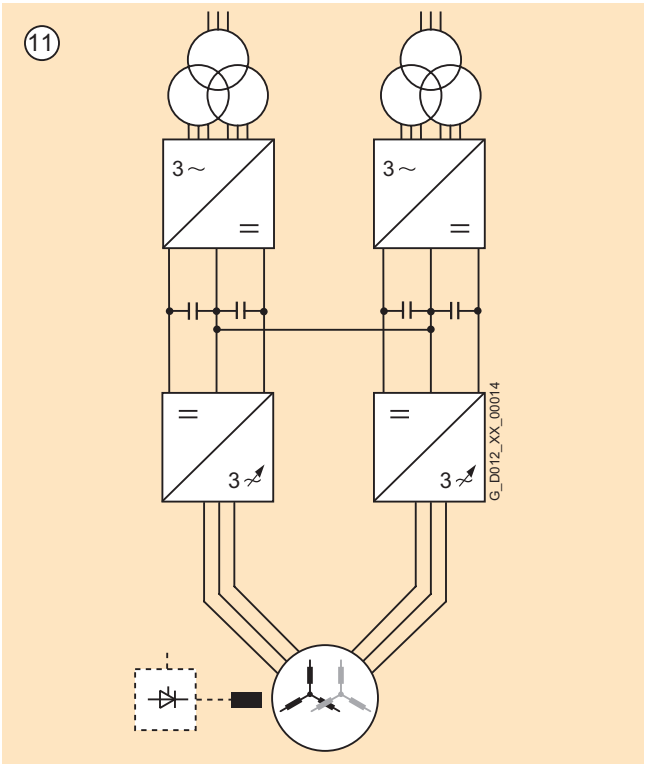


Basic circuit
12-pulse infeed

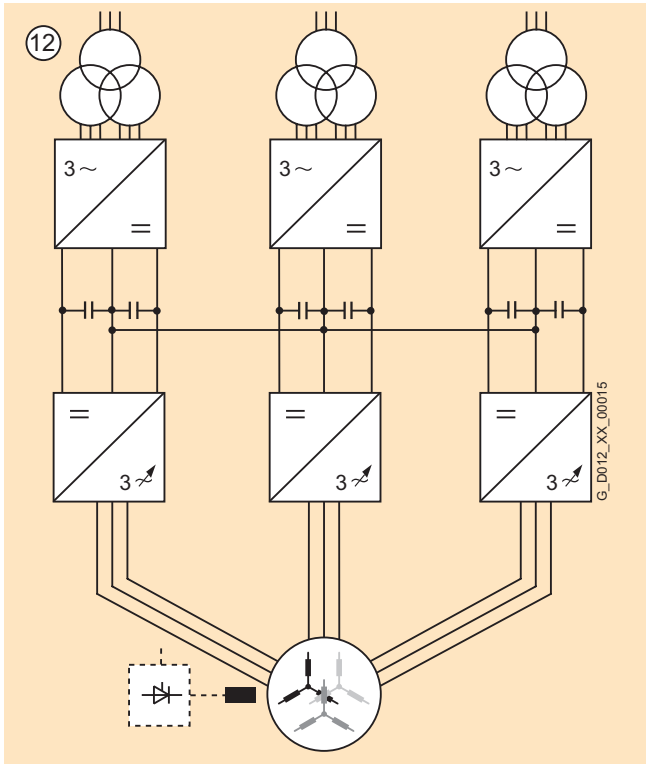


24-pulse infeed through series connection of two Basic Line Modules: option **N15**

Design (continued)



Two converter units may be operated in parallel in order to increase the output [1)]
24-pulse infeed possible



Three converter units may be operated in parallel in order to increase the output [1)]
36-pulse infeed possible

1) Requires a motor with isolated winding systems

IGCT version

Function

Characteristic features

SINAMICS GM150 as IGCT version	
Line Module (rectifier on mains side)	
• Basic Line Module, 12-pulse (two-quadrant operation)	Standard
• Basic Line Module, 24-pulse (two-quadrant operation)	Option
Motor Module (rectifier on motor side)	
Voltage range	3.3 kV
Performance range (typ.)	10 MVA to 28 MVA
Cooling method	
• Water cooling	Standard
Control modes	
• Asynchronous motor	Standard
• Synchronous motor, separately excited	Option
• Synchronous motor, permanently excited	Option

Software and protection functions

SINAMICS GM150 as IGCT version	Description
Closed-loop control	The machine-side closed-loop control has been expanded as a field-oriented transvector closed-loop control which can be operated as a speed or torque control as required. The transvector closed-loop control achieves the dynamics of a DC drive. This is made possible by the fact that the current components forming the torque and flux can be controlled precisely independently of each other. Prescribed torques can thus be observed and limited accurately. In the speed range from 1:10, the field-oriented closed-loop control does not require an actual speed value encoder. An actual speed value encoder is required in the following scenarios: • High dynamics requirements • Torque control/constant torque drives with setting range > 1:10 • Very low speeds • Very high speed accuracy
Setpoint input	The setpoint can be defined internally or externally; internally as a fixed, motorized potentiometer or jog setpoint, externally via the PROFIBUS interface or an analog input of the customer terminal block. The internal fixed setpoints and the motorized potentiometer setpoint can be switched over or altered using control commands from all interfaces.
Ramp-function generator	A user-friendly ramp-function generator with separately adjustable ramp-up and ramp-down times, together with variable smoothing times in the lower and upper speed ranges, improves the control response and therefore prevents mechanical overloading of the drive train. The ramp-down ramps can be parameterized separately for emergency stop.
$V_{dc\ max}$ controller	The $V_{dc\ max}$ controller automatically prevents overvoltages in the DC link if the set ramp-down ramp is too short, for example. This can also extend the set ramp-down time.
Kinetic buffering (KIP)	Power supply failures are bridged to the extent permitted by the kinetic energy of the drive train. The speed drops depending on the moment of inertia and the load torque. The current speed setpoint is resumed when the power supply returns.
Automatic restart (option)	The automatic restart switches the drive on again when the power is restored after a power failure or a general fault, and ramps up to the current speed setpoint.
Flying restart	The flying restart function permits smooth connection of the converter to a rotating motor.
Diagnostics functions	• Self-diagnosis of control hardware • Non-volatile memory for reliable diagnosis when the power supply fails • Monitoring of HV IGBTs with individual messages for each slot • User-friendly on-site operator panel with plain text messages
Operating hours and switching cycle counter	The operating hours of the fans are recorded and logged so that preventive maintenance or replacements can be performed. The switching cycles of the circuit-breaker are recorded and added together, to form the basis of preventive maintenance work.
Detecting the actual motor speed (option)	The SMC30 encoder module can be used to record the actual motor speed. The signals from the rotary pulse encoder are converted here and made available for evaluation via the DRIVE-CLiQ interface of the controller.
Operator protection	The cabinet doors of the power sections are fitted with an electromagnetic lock. This prevents the cabinet doors being opened while hazardous voltages are connected inside the cabinet.

Function (continued)

Software and protection functions

SINAMICS GM150 as IGCT version	Description
EMERGENCY-STOP button	The converters are equipped as standard with an EMERGENCY-STOP button with protective collar which is fitted in the cabinet door. The contacts of the pushbutton are connected in parallel to the terminal block so they can can be integrated in a protection concept on the installation side. EMERGENCY STOP category 0 is set as standard for an uncontrolled shutdown (DIN EN 60204-1/VDE 0113-1 (IEC 60204-1)). The function includes voltage disconnection of the converter output through the circuit-breaker. The motor coasts in the process. EMERGENCY STOP category 1 is optionally available for a controlled shutdown.
Insulation monitoring	The converters feature insulation monitoring of the whole galvanic network from the secondary side of the transformer to the stator windings of the motor.
Monitoring of the peripherals	An extensive package of options for monitoring the peripherals (from the transformer and the motor through to the auxiliaries) is available. In addition it is possible to monitor the temperature by means of thermocouples or PT100 resistors.
Thermal overload protection	A warning message is issued first when the overtemperature threshold responds. If the temperature rises further, either a shutdown is carried out or automatic influencing of the output current so that a reduction in the thermal load is achieved. Following elimination of the cause of the fault (e.g. improvement in the ventilation), the original operating values are automatically resumed. In the case of water-cooled converters, the water temperature and flow rate are recorded at several points in the cooling circuit and evaluated. An extensive self-diagnosis protects the converter and reports faults.
Grounding switch (option)	If grounding on the infeed or motor side is required for safety and protection reasons, a motorized grounding switch can be ordered. For safety reasons, the converter controller locks these grounding switches against activation while voltage is still present. The control is integrated into the protection and monitoring chain of the converter. The grounding switches are inserted automatically when the standard grounding switches of the DC link are inserted.

AOP30 operator panel

The AOP30 operator panel is fitted into the cabinet door of the SINAMICS GM150 to enable operation, monitoring and commissioning.

It has the following features and characteristics:

- Graphical LCD display with backlighting for plain-text display and a bar display of process variables
- LEDs for displaying the operational status
- Help function describing causes of and remedies for faults and alarms
- Membrane keyboard with keypad for operational control of a drive
- Local/remote switchover for selecting the input point (priority assigned to operator panel or customer's terminal block / PROFIBUS)
- Numeric keypad for input of setpoint or parameter values
- Function keys for prompted navigation in the menu
- Two-stage safety strategy to protect against accidental or unauthorized changes to settings. The keyboard lock disables operation of the drive from the operator panel, so that only parameter values and process variables can be displayed. A password can be used to prevent the unauthorized modification of converter parameters.

The operator panel languages - English, German, French, Italian, Spanish and Chinese - are stored on the CompactFlash Card of the Control Unit.

IGCT version

Selection and ordering data

Type rating	Shaft output		Rated output current	SINAMICS GM150 as IGCT version	Circuit versions (pages 3/4 and 3/5)
kVA	kW	hp	A	Order No.	Fig. No.
Output voltage 3.3 kV					
10000	9000	12000	1750	**6SL3835-2LN41-8AA0**	⑨
16000	13000	18000	2 × 1400	**6SL3835-2LN42-8AA0**	⑪
19000	17000	23000	2 × 1660	**6SL3835-2LN43-6AA0**	⑪
24000	20000	27000	3 × 1400	**6SL3835-2LN44-2AA0**	⑫
28000	25000	33000	3 × 1630	**6SL3835-2LN45-4AA0**	⑫

Options

When ordering a converter with options, add **"-Z"** to the order number of the converter, followed by the order code(s) for the desired option(s).

Example:

6SL3835-2LN41-8AA0-Z
+N15+L60+...

In the following tables, related options are arranged in groups. Whether the options can be combined or are mutually exclusive is indicated within these groups. A detailed description of the options can be found in the chapter Description of Options.

Input-side options		**N15**	**N13**
24-pulse Basic Line Module	**N15**		–
Circuit-breaker at converter input (for 24-pulse Basic Line Module on request)	**N13**	–	

Output-side options	
Output reactor	**L08**

Protective functions		**L48**	**L49**	**L51**	**L52**	**L60**	**M10**
Grounding switch at converter input (motorized)	**L48**		✓	✓	✓	✓	✓
Grounding switch at converter output (motorized)	**L49**	✓		✓	✓	✓	✓
Isolator at converter output	**L51**	✓	✓		–	✓	✓
Circuit-breaker at converter output	**L52**	✓	✓	–		✓	✓
EMERGENCY STOP category 1	**L60**	✓	✓	✓	✓		✓
Safety locking system	**M10**	✓	✓	✓	✓	✓	

✓ Options can be combined
– Options are mutually exclusive

Options (continued)

Temperature sensing and analysis (standard: 3 PT100 inputs)		L80	L81	L82	L90	L91	L92	L93	L94	L95	L96
2 thermistor motor protection relays for warnings and faults [1]	L80		–	–	✓	✓	✓	✓	✓	✓	✓
2 x 2 thermistor motor protection relays for warnings and faults [1]	L81	–		–	✓	✓	✓	✓	✓	✓	✓
3 x 2 thermistor motor protection relays for warnings and faults [1]	L82	–	–		✓	✓	✓	✓	✓	✓	✓
PT100 evaluation unit with 3 inputs [1]	L90	✓	✓	✓		–	–	–	–	–	–
2 PT100 evaluation units with 3 inputs each [1]	L91	✓	✓	✓	–		–	–	–	–	–
3 PT100 evaluation units with 3 inputs each [1]	L92	✓	✓	✓	–	–		–	–	–	–
PT100 evaluation unit with 6 inputs, 2 analog outputs (outputs for display connected to controller) [1]	L93	✓	✓	✓	–	–	–		–	–	–
2 PT100 evaluation units each with 6 inputs and 2 analog outputs (outputs for display connected to controller) [2]	L94	✓	✓	✓	–	–	–	–		–	–
PT100 evaluation unit with 6 inputs for hazardous areas, 2 analog outputs (outputs for display connected to controller) [1]	L95	✓	✓	✓	–	–	–	–	–		–
2 PT100 evaluation units each with 6 inputs for hazardous areas and 2 analog outputs (outputs for display connected to controller) [2]	L96	✓	✓	✓	–	–	–	–	–	–	

1) A TM31 Terminal Module is required for further processing and display of the signals or analog outputs (option **G61**).

2) Two TM31 Terminal Modules are required for further processing and display of the signals and analog outputs (options **G61** and **G62**). The options **L94** and **L96** cannot be combined with the option **E86** (2 isolation amplifiers for optional analog inputs).

Control of auxiliaries		N30	N31	N32	N33	N35	N36	N37	N38
The contractor is switched on with the ON command at the converter and switched off with the OFF command (example: separate fans on the motor). The supply voltage for the drive to be powered must be provided externally.									
Controlled output for auxiliaries 3 AC 400 V, max. 4 kW	N30		–	–	–	✓	✓	✓	✓
Controlled output for auxiliaries 3 AC 400 V, max. 7 kW	N31	–		–	–	✓	✓	✓	✓
Controlled output for auxiliaries 3 AC 400 V, max. 11 kW	N32	–	–		–	✓	✓	✓	✓
Controlled output for auxiliaries 3 AC 400 V, max. 15 kW	N33	–	–	–		✓	✓	✓	✓
The contractor is switched off with the ON command at the converter and switched on with the OFF command (example: heater). The supply voltage for the drive to be powered must be provided externally.									
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 1 kW	N35	✓	✓	✓	✓		–	–	–
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 2 kW	N36	✓	✓	✓	✓	–		–	–
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 3 kW	N37	✓	✓	✓	✓	–	–		–
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 4 kW	N38	✓	✓	✓	✓	–	–	–	

✓ Options can be combined

– Options are mutually exclusive

IGCT version

3

Options (continued)

Connection of signal cables (standard: signal cable connected directly to the terminals of the Terminal Modules)		M32	M33
Customer terminal block with spring-loaded terminals for signal cables up to 2.5 mm^2	M32		–
Customer terminal block with screw-type terminals for signal cables up to 2.5 mm^2	M33	–	

Control and display instruments in the door of the control cabinet unit		K20	K21	K22
Indicator lights and Start/Stop button in the cabinet door	K20		–	–
Display instruments in the cabinet door for voltage, current, speed and output as well as indicator lights and Start/Stop button	K21	–		–
Display instruments in the cabinet door for current, speed, output and winding temperature as well as indicator lights and Start/Stop button	K22	–	–	

Interface modules for access to external bus systems (standard: PROFIBUS (slave))		G20	G21	G22	G23	G24	G25
CAN bus interface (CANopen, on request)	G20		–	–	–	–	–
Modbus Plus interface	G21	–		–	–	–	–
Modbus RTU slave interface	G22	–	–		–	–	–
DeviceNet interface	G23	–	–	–		–	–
PROFINET interface (on request)	G24	–	–	–	–		–
Teleservice connection (on request)	G25	–	–	–	–	–	

Interface modules for additional customer connections and speed encoders		G61	G62	G63	K50
Additional TM31 Terminal Module	G61		✓	✓	✓
Second additional TM31 Terminal Module	G62	✓		✓	✓
Additional TM15 Terminal Module	G63	✓	✓		✓
SMC30 speed encoder module	K50	✓	✓	✓	

✓	Options can be combined
–	Options are mutually exclusive

Options (continued)

Isolation amplifiers for voltage isolation for optional analog inputs of the options G61, G62		E86	E87
2 isolation amplifiers for optional analog inputs [1]	E86		✓
2 isolation amplifiers for optional analog outputs [1]	E87	✓	

1) The option **E86** cannot be combined with the options **L94** or **L96** (2 PT100 evaluation units).

Diagnostic module	
PADU8 diagnostic module (8 analog and 8 digital signals)	G66

Industry-specific options		B00	M66
NAMUR terminal block	B00		✓
Shipworthiness with type certificate	M66	✓	

Individual certification of the converters for use on ships (on request, contains option M66)		E11	E21	E31	E51	E61	E71
Shipworthiness with individual certificate from Germanische Lloyd (GL)	E11		–	–	–	–	–
Shipworthiness with individual certificate from Lloyds Register (LR)	E21	–		–	–	–	–
Shipworthiness with individual certificate from Bureau Veritas (BV), requires option **Y75** (other auxiliary voltage infeed)	E31	–	–		–	–	–
Shipworthiness with individual certificate from Det Norske Veritas (DNV)	E51	–	–	–		–	–
Shipworthiness with individual certificate from the American Bureau of Shipping (ABS)	E61	–	–	–	–		–
Shipworthiness with individual certificate from the Chinese Classification Society (CCS)	E71	–	–	–	–	–	

Functional options		E01	E02	E03	L32
Control of separately excited synchronous motors with slipring excitation	E01		–	–	✓
Control of separately excited synchronous motors with brushless rotating exciter	E02	–		–	✓
Control of permanently excited synchronous motors	E03	–	–		✓
Automatic restart	L32	✓	✓	✓	

✓ Options can be combined
– Options are mutually exclusive

IGCT version

3

Options (continued)

Documentation (standard: PDF format in English on CD-ROM)		D00	D02	D15	D56	D72	D77	D78	D84	D92	Y10
Documentation in German	D00		✓	✓	–	–	–	–	–	–	✓
Circuit diagrams, terminal diagrams and dimension drawings in DXF format [1]	D02	✓		✓	✓	✓	✓	✓	✓	✓	✓
One set of printed documentation (can be ordered in multiples)	D15	✓	✓		✓	✓	✓	✓	✓	✓	✓
Documentation in Russian (on request)	D56	–	✓	✓		–	–	–	–	–	✓
Documentation in Italian (on request)	D72	–	✓	✓	–		–	–	–	–	✓
Documentation in French (on request)	D77	–	✓	✓	–	–		–	–	–	✓
Documentation in Spanish	D78	–	✓	✓	–	–	–		–	–	✓
Documentation in Chinese	D84	–	✓	✓	–	–	–	–		–	✓
Documentation in Japanese (on request)	D92	–	✓	✓	–	–	–	–	–		✓
Circuit diagrams with customer-specific text field (plain text required) [1]	Y10	✓	✓	✓	✓	✓	✓	✓	✓	✓	

1) The equipment-specific documents (circuit diagrams etc.) are available only in English/German.

Rating plate language (standard: English/German)		T58	T60	T80	T85	T90	T91
Rating plate in English/French	T58		–	–	–	–	–
Rating plate in English/Spanish	T60	–		–	–	–	–
Rating plate in English/Italian	T80	–	–		–	–	–
Rating plate in English/Russian (on request)	T85	–	–	–		–	–
Rating plate in English/Japanese (on request)	T90	–	–	–	–		–
Rating plate in English/Chinese (on request)	T91	–	–	–	–	–	

Auxiliary voltage supply	
Auxiliary voltage other than 3 AC 400 V (primary voltage and frequency must be indicated in plain text)	Y75

✓	Options can be combined
–	Options are mutually exclusive

Options (continued)

Converter acceptance inspections in presence of customer		F03	F73	F77	F97
Visual acceptance of converter	F03		–	–	–
Functional acceptance of converter with inductive load	F73	–		✓	–
Acceptance inspection of the converter insulation test [1]	F77	–	✓		–
Customer-specific converter acceptance inspections (on request)	F97	–	–	–	

1) The option **F77** can be ordered only in connection with the option **F73**.

Recooling unit (standard: recooling unit with redundant pumps and one high-grade steel plate heat exchanger)		W02	W11	W12	W14	W20	Y40
Recooling unit with redundant pumps and redundant high-grade steel plate heat exchangers	W02		–	–	–	✓	–
Recooling unit with redundant pumps and one titanium plate heat exchanger	W11	–		–	–	✓	–
Recooling unit with redundant pumps and redundant titanium plate heat exchangers	W12	–	–		–	✓	–
Converter without recooling unit (provided on the installation side)	W14	–	–	–		–	–
Untreated water connection from below	W20	✓	✓	✓	–		✓
Untreated water data deviating from the technical data[1] (on request)	Y40	–	–	–	–	✓	

1) The option **Y40** includes a cooling system which is adapted to the untreated water data according to the customer's specifications.

Miscellaneous options		L50	L53	L55	Y09
Cabinet lighting and service socket in control section	L50		✓	✓	✓
UPS for power supply from controller and closed-loop control	L53	✓		✓	✓
Anti-condensation heating for cabinet unit	L55	✓	✓		✓
Special paint finish to RAL .... (in a color other than RAL 7035; plain text required)	Y09	✓	✓	✓	

✓	Options can be combined
–	Options are mutually exclusive

IGCT version

Technical data

General technical data	
Power components	Diodes/IGCTs
Converter on the mains side	
• Standard	12-pulse diode rectifier (Basic Line Module)
• Option	24-pulse diode rectifier (Basic Line Module)
Converter on the machine side	Inverter (Motor Module)
Closed-loop control	Transvector closed-loop control
Drive quadrants	2 (driving 2 directions of rotation)
Voltage isolation of power section/ controller and closed-loop control	Optical conductor, isolating transformer
Auxiliary current supply (for fans, coolant pumps, precharging the DC link capacitors, controller and close-loop control)	• 1 230 V AC ± 10%, 50/60 Hz ± 3% and • 3 400 V AC ±10%, 50/60 Hz ±3% or another auxiliary voltage (option **Y75**)
Installation altitude	≤ 1000 m above sea level: capacity 100% > 1000 m to 4000 m above sea level: current derating required > 2000 m to 4000 m above sea level: voltage derating required in addition
Insulation	according to DIN EN 50178/VDE 0160 (IEC 62103): pollution degree 2 (without conductive pollution), condensation not permitted
Degree of protection	according to EN 60529/VDE 0470 T1 (IEC 60529): IP43
Protection class	according to DIN EN 61140/VDE 0140 T1 (IEC 61140): 1
Shock-hazard protection	BGV A 3
Interference transmission	according to DIN EN 61800-3/VDE 0160 T100 (IEC 61800-3): no RI suppression
Paint finish/color	Indoor requirements/RAL 7035, light gray
Compliance with standards	
• Standards	- EN 61800-3/VDE 0160 T100 (IEC 61800-3) - EN 61800-4/VDE 0160 T104 (IEC 61800-4) - EN 60146-1-1/VDE 0558 T11 (IEC 60146-1-1) - EN 50178/VDE 0160 T100 (IEC 62103) - EN 60204-11/VDE 0113 T11 (IEC 60204-11)
• EU directives	- 98/37/EC + amendments (Machinery Directive) - 89/336/EEC + amendments (Electromagnetic Compatibility)
Water cooling	Water-water recooling unit, internal circuit, deionized water (fresh water)
Permitted coolant temperature (untreated water)	
• Inlet	+ 5 °C to + 35 °C
• Outlet	max. + 40 °C

Rated data	
Output voltage	**3.3 kV**
Input voltage	2 x 1.7 kV
Tolerance of input voltage	± 10%
Power frequency	50/60 Hz ± 3%
Power factor fundamental mode	> 0.96

Technical data (continued)

	Operation of asynchronous motors		Operation of separately excited synchronous motors
	without speed encoder	with speed encoder	with speed encoder
Control properties			
Operating range			
• Lower limit of speed control range (% of rated motor speed)	5%	0%	0%
• Max. permissible output frequency	250 Hz	250 Hz	90 Hz
• Field-shunting range	1:3	1:3	1:4
Stationary operation			
• Speed accuracy (% of rated motor speed)	± 0.2% (from 5% rated speed)	± 0.01%	± 0.01%
• Torque accuracy (% of rated torque)	± 5% (from 5% rated speed)	± 5%	± 2%
Dynamic operation			
• Torque rise time	5 ms	5 ms	5 ms

	Storage	Transport	Operation
Climatic ambient conditions			
Ambient temperature	– 25 °C to + 70 °C	– 25 °C to + 70 °C	+ 5 °C to + 40 °C
Relative air humidity	5% to 95% (only slight condensation permitted; converter must be completely dry before commissioning)	5% to 75%	5% to 85% (condensation not permitted)
Other climatic conditions according to class	1K3 according to EN 60721-3-1 (IEC 60721-3-1) (icing not permitted)	2K2 according to EN 60721-3-2 (IEC 60721-3-2)	3K3 according to EN 60721-3-3 (IEC 60721-3-3)
Degree of pollution	2 without conductive pollution according to EN 50178/VDE 0160 (IEC 62103)	2 without conductive pollution according to EN 50178/VDE 0160 (IEC 62103)	2 without conductive pollution according to EN 50178/VDE 0160 (IEC 62103)
Mechanical ambient conditions			
Dynamic stress			
• Deflection	1.5 mm at 2 Hz to 9 Hz	3.5 mm at 2 Hz to 9 Hz	0.3 mm at 2 Hz to 9 Hz
• Acceleration	5 m/s^2 at 9 Hz to 200 Hz	10 m/s^2 at 9 Hz to 200 Hz 15 m/s^2 at 200 Hz to 500 Hz	1 m/s^2 at 9 Hz to 200 Hz
Other mechanical conditions according to class (greater strength for ship compatibility)	1M2 according to EN 60721-3-1 (IEC 60721-3-1)	2M2 according to EN 60721-3-2 (IEC 60721-3-2)	3M1 according to EN 60721-3-3 (IEC 60721-3-3)
Other ambient conditions			
Biological ambient conditions according to class	1B1 according to EN 60721-3-1 (IEC 60721-3-1)	2B1 according to EN 60721-3-2 (IEC 60721-3-2)	3B2 according to EN 60721-3-3 (IEC 60721-3-3) (without harmful flora)
Chemically active materials according to class	1C1 according to EN 60721-3-1 (IEC 60721-3-1)	2C1 according to EN 60721-3-2 (IEC 60721-3-2)	3C2 according to EN 60721-3-3 (IEC 60721-3-3) (no occurrence of salt mist)
Mechanically active materials according to class	1S1 according to EN 60721-3-1 (IEC 60721-3-1)	2S1 according to EN 60721-3-2 (IEC 60721-3-2)	3S1 according to EN 60721-3-3 (IEC 60721-3-3)

Note: The values specified under storage and transport apply to unpacked converters.

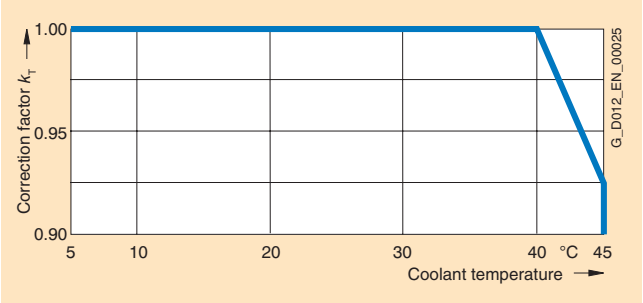
3

Technical data (continued)

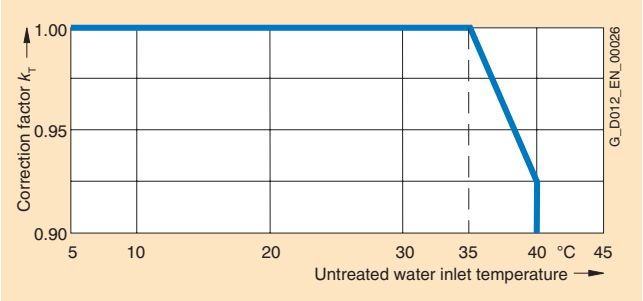
Installation conditions and derating data

Current derating

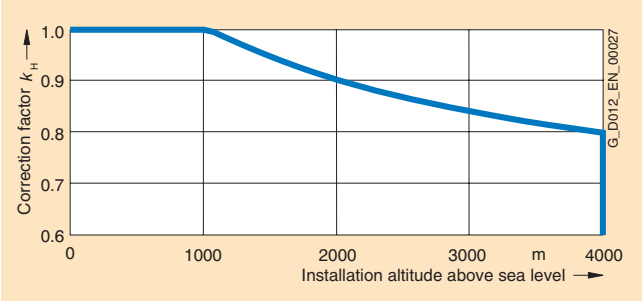
If the converters are operated at installation altitudes > 1000 m above sea level or under coolant temperatures > 35 °C, derating factors k_H and k_T must be taken into account for the rated current (DIN 43671).



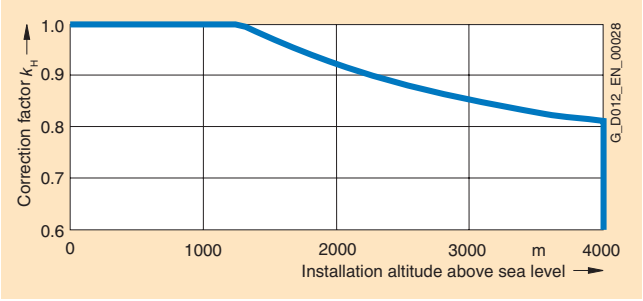
Derating factor k_T with air cooling



Derating factor k_T with water cooling



Derating factor k_H with air cooling



Derating factor k_H with water cooling

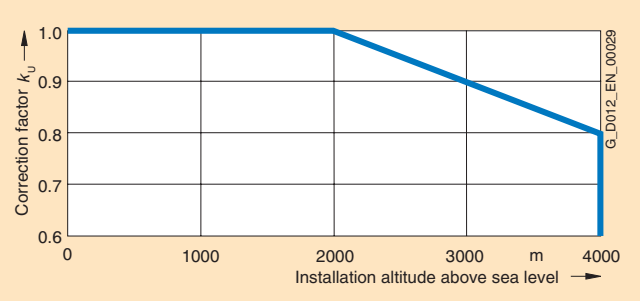
For the permitted continuous current I: $I \leq I_n \times k_H \times k_T$

I: permitted continuous current
I_n: rated current

When determining the current derating factor, it is essential to consider the ambient temperature of the air as well as the temperature of the untreated water in the inlet, as components such as the link busbars are also subject to air cooling. This requires the factors k_T and k_H to be determined from the diagrams for air cooling as well as for water cooling. The smaller of the two products ($k_T \times k_H$) must be used as the current derating factor (see the following example).

Voltage derating

At installation altitudes > 2000 m, a voltage derating is required in addition to a current correction (EN 60664-1/VDE 0110 (IEC 60664-1)). This depends on the air and creepage distances in the unit.



Derating factor k_U

Technical data (continued)

The technical data from the following examples can be found on page 3/16.

Example 1

Converter 6SL3835-2LN43-6AA0

Output voltage: 2 x 3.3 kV

Input voltage: 2 × (2 × 1.7 kV)

Type rating: 19000 kVA, 2 × 1660 A

Installation altitude: 2000 m

Max. ambient temperature: 35 °C

Untreated water inlet temperature: 40 °C

- Ambient temperature:
  - Derating factor k_H = 0.9
  - Derating factor k_T = 1.0
  - Derating factor k_U = 1.0
- Untreated water inlet temperature:
  - Derating factor k_H = 0.925
  - Derating factor k_T = 0.925
  - Derating factor k_U = 1.0

The smaller value for $k_T \times k_H$ results in this case from the diagrams for the untreated water in the inlet.

$I \leq I_n \times 0.925 \times 0.925 = I_n \times 0.856$

A current derating of 14.4% is required.

The maximum available output current of the converter is 1420 A per subsystem.

Example 2

Converter 6SL3835-2LN43-6AA0

Output voltage: 2 x 3.3 kV

Input voltage: 2 × (2 × 1.7 kV)

Type rating: 19000 kVA, 2 × 1660 A

Installation altitude: 2000 m

Max. ambient temperature: 45 °C

Untreated water inlet temperature: 30 °C

- Ambient temperature:
  - Derating factor k_H = 0.9
  - Derating factor k_T = 0.925
  - Derating factor k_U = 1.0
- Untreated water inlet temperature:
  - Derating factor k_H = 0.925
  - Derating factor k_T = 1.0
  - Derating factor k_U = 1.0

The smaller value for $k_T \times k_H$ results in this case from the diagrams for the ambient temperature.

$I \leq I_n \times 0.9 \times 0.925 = I_n \times 0.833$

A current derating of 16.7% is required.

The maximum available output current of the converter is 1382 A per subsystem.

Example 3

Converter 6SL3835-2LN43-6AA0

Output voltage: 2 x 3.3 kV

Input voltage: 2 × (2 × 1.7 kV)

Type rating: 19000 kVA, 2 × 1660 A

Installation altitude: 1000 m

Max. ambient temperature: 45 °C

Untreated water inlet temperature: 38 °C

- Ambient temperature
  - Derating factor k_H = 1.0
  - Derating factor k_T = 0.925
  - Derating factor k_U = 1.0
- Untreated water inlet temperature:
  - Derating factor k_H = 1.0
  - Derating factor k_T = 0.955
  - Derating factor k_U = 1.0

The smaller value for $k_T \times k_H$ results in this case from the diagrams for the ambient temperature.

$I \leq I_n \times 1.0 \times 0.925 = I_n \times 0.925$

A current derating of 7.5% is required.

The maximum available output current of the converter is 1536 A per subsystem.

IGCT version

Technical data

SINAMICS GM150 as IGCT version Water cooling	Type	6SL3835-2LN41-8AA0	6SL3835-2LN42-8AA0	6SL3835-2LN43-6AA0	6SL3835-2LN44-2AA0	6SL3835-2LN45-4AA0
Output voltage 3.3 kV						
Type rating	kVA	10000	16000	19000	24000	28000
Shaft output [1]	kW	9000	13000	17000	20000 [2]	25000 [2]
	hp	12000	18000	23000	27000 [2]	33000 [2]
Rated output current	A	1750	2 × 1400	2 × 1660	3 × 1400	3 × 1630
Input voltage	kV	2 × 1.7	2 × (2 × 1.7)	2 × (2 × 1.7)	3 × (2 × 1.7)	3 × (2 × 1.7)
Rated input current [1]	A	2 × 1550	2 × (2 × 1420)	2 × (2 × 1470)	3 × (2 × 1240)	3 × (2 × 1450)
Power loss [3] [4]	kW	80	128	160	192	240
Efficiency [4]	%	99.1	99.1	99.1	99.1	99.1
Max. AC current requirement 50/60 Hz, 230 V	A	3	6	6	9	9
Max. AC current requirement of auxiliary supply 3 50/60 Hz, 400 V	A	17	20	20	23	23
Precharging current requirement, temporary for approx. 25 s	A	20	40	40	60	60
Cooling water throughput (untreated water/fresh water)	l/min	205	410	410	615	615
Sound pressure level L_{pA}	dB(A)	75	77	77	79	79
Measuring surface measurement L_s	dB(A)	22	23	23	24	24
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	6 × 240	6 × 240	6 × 240	6 × 240	6 × 240
	AWG/MCM (NEC, CEC)	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	6 × 240	6 × 240	6 × 240	6 × 240	6 × 240
	AWG/MCM (NEC, CEC)	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 120	2 × 120	2 × 120	2 × 120	2 × 120
	AWG/MCM (NEC, CEC)	2 × 250 MCM	2 × 250 MCM	2 × 250 MCM	2 × 250 MCM	2 × 250 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)						
• Width	mm	5300	9400	9400	14300	14800
• Height	mm	2540	2540	2540	2540	2540
• Depth	mm	1600	1600	1600	1600	1600
Circuit version		⑨	⑪	⑪	⑫	⑫
Weight	kg	5400	9800	9800	15000	15400

1) The figures for the rated input current and the output figures in hp and kW are approximate values which were determined for operation with asynchronous motors and for a typical value of the cos phi power factor and efficiency of the motor.
The hp figures are based on the NEC and CEC directives for the North American market.
The kW values are quoted in steps which can be divided by 1000. Both approximate values need to be adapted to the motor which is actually used.

2) The basic circuit version is based on a drive group in which the drives operate both as motors and generators (see circuit version). Energy is exchanged by means of the DC link. The specified power corresponds to the infeed power.

3) Approx. 5% of the power loss is dissipated into the atmosphere.

4) Without cooling system.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

SINAMICS SM150

4

SINAMICS SM150

Overview

SINAMICS SM150

Water-cooled regenerative feedback SINAMICS SM150 converters are available as single or multi-motor drives with the standard medium voltage IGCT power semiconductors. With multi-motor drives, a common DC bus enables the direct exchange of energy in generator and motor applications.

IGCT converters are available for the following voltage and outputs:

Rated output voltage	Max. continuous power (without overload capability)	Output (175% overload capability)
3.3 kV	10 MVA to 28 MVA	5 MVA to 17 MVA

The rated output in the concrete application will depend on the necessary load cycle. The transient maximum outputs are 10.5 MVA, 20 MVA and 30 MVA.

Global use

SINAMICS SM150 converters are manufactured to international standards and regulations, making them ideally suited for global use. These converters are also available in ship-going form (meeting the requirements of all major classification organizations).

Benefits

- Compact design and high flexibility in configuration ensures easy plant integration
- Easy operation and observation on the convenient operator panel
- Easy and reliable operation through integrated maintenance functions: the converter signals early and automatically if maintenance is required or components need to be exchanged
- High robustness and reliability thanks to the use of IGCT power semiconductors in the high performance range and fuseless assembly combined with intelligent reaction to external interference
- Can be easily integrated into automation solutions due to PROFIBUS interface supplied as standard and analog and digital interfaces
- High level of service-friendliness through innovative power unit design with compact phase components and easy access to all components
- Assists system cost effectiveness by enabling reactive power to be made available to other drives given suitable configuration

Design

Active Line Modules and Motor Modules share an almost identical structure with both the single-motor and the multi-motor drive. Phase components in which IGCTs, diodes etc. are grouped together in one compact system are used in both.

Single-motor drive

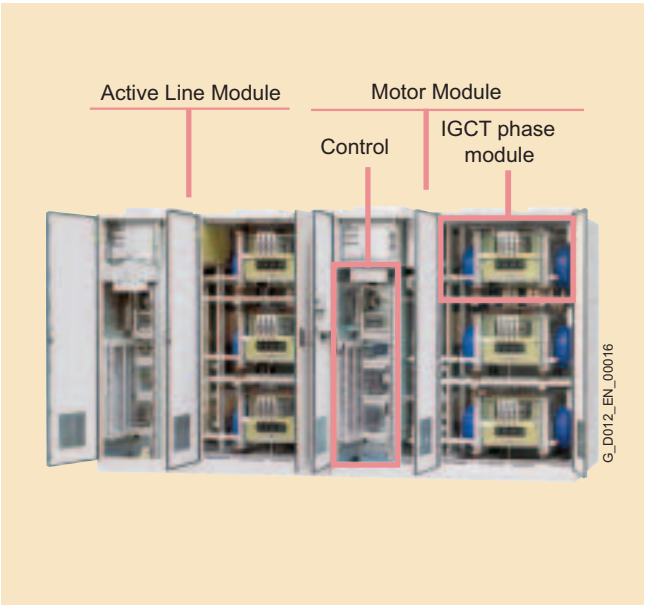
With a single-motor drive, one Active Line Module and one Motor Module are connected “back-to-back” in the basic circuit by means of a DC link.

For greater output ratings, two or three complete converter units with isolated DC links are operated in parallel.

Multi-motor drive

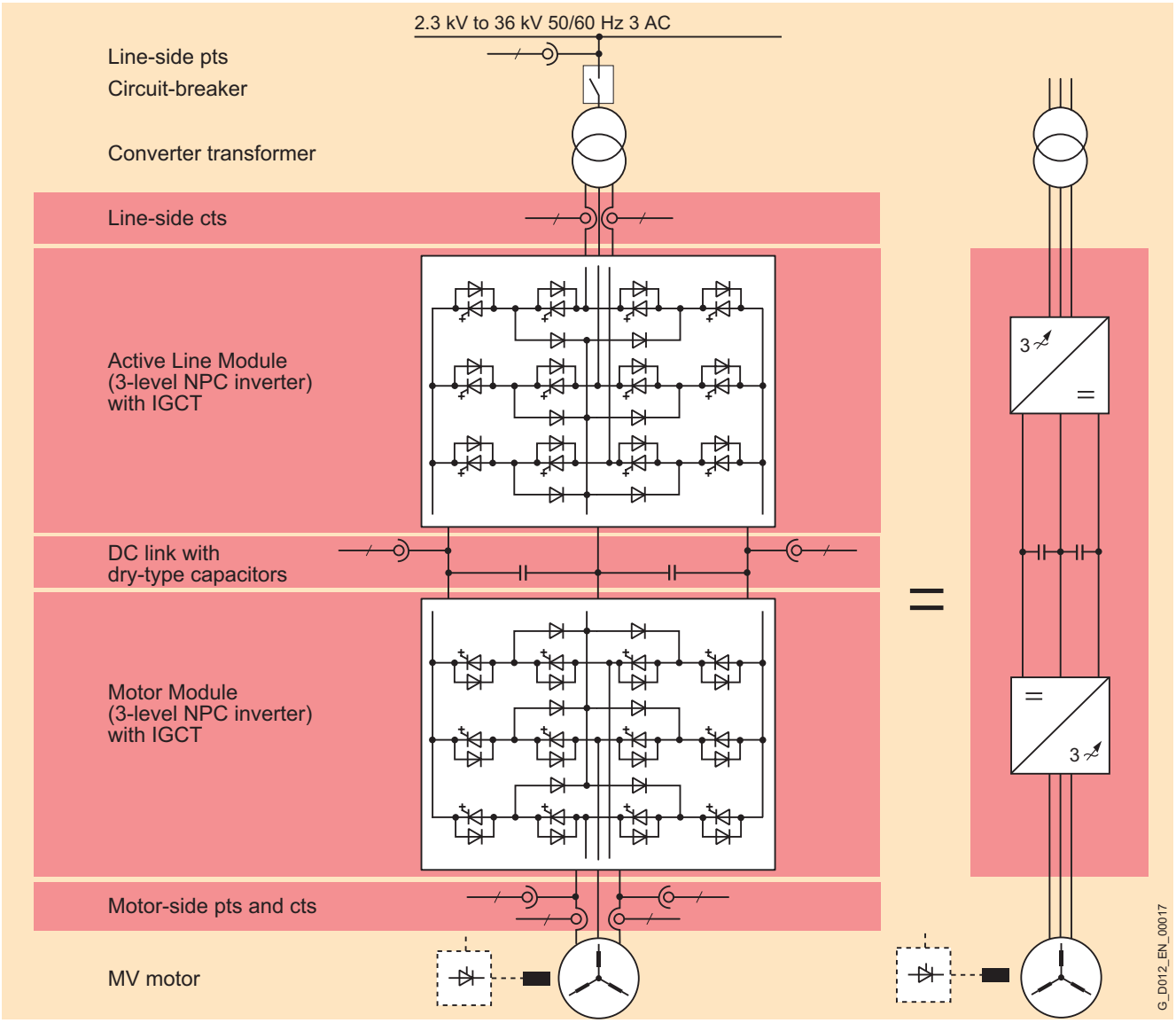
With multi-motor drives, up to four power sections are operated on the common DC bus. In addition to the Active Line Module, three Motor Modules with three motors can be operated on the common DC bus with utilization of the direct exchange of energy.

The converter consists of cabinet units for the Active Line Module and for the Motor Module. One of three phase components and the control section in the Motor Module cabinet unit are highlighted in the illustration.



SINAMICS GM150, internal configuration (without recooling unit)

Design (continued)

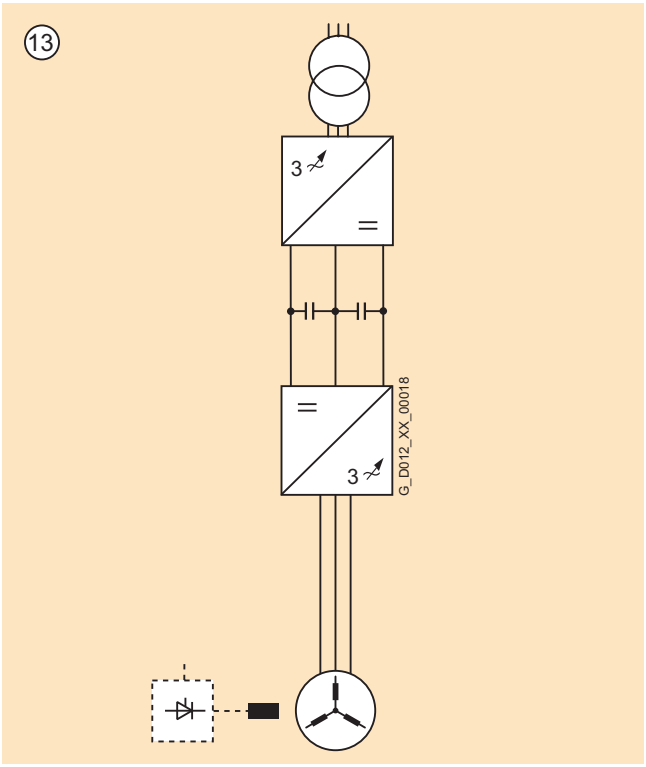


Block diagram

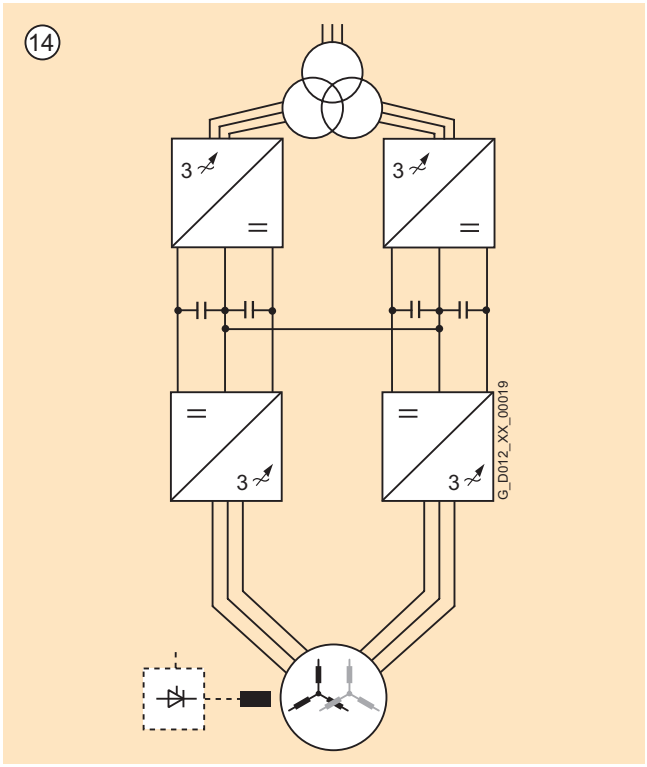
SINAMICS SM150

Design (continued)

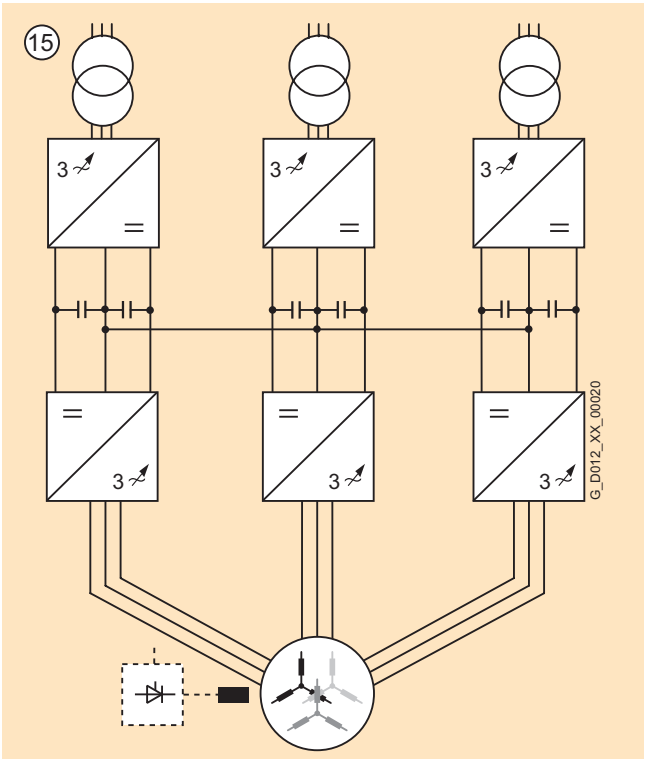
The following wiring versions are available for SINAMICS SM150.



Basic circuit



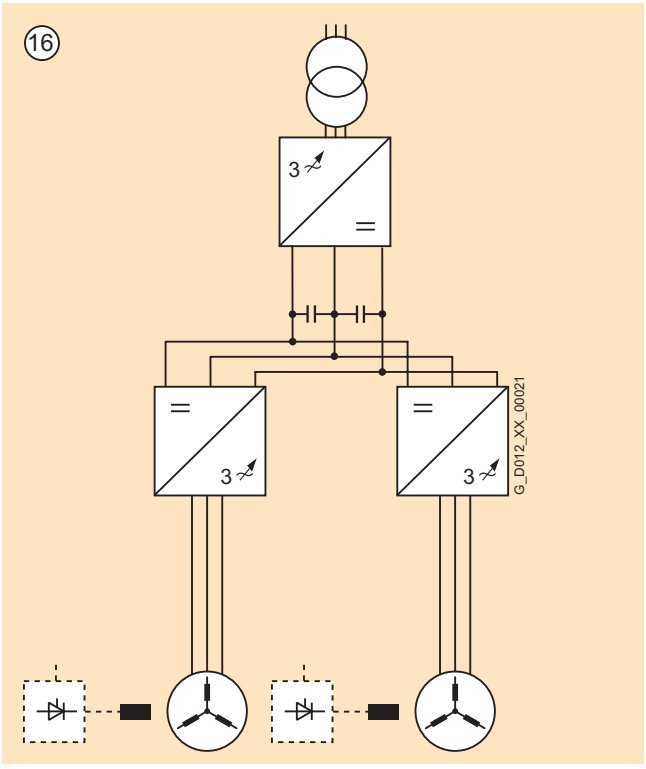
Two converter units may be operated in parallel in order to increase the output (with reduction of circuit feedbacks in addition) [1)]



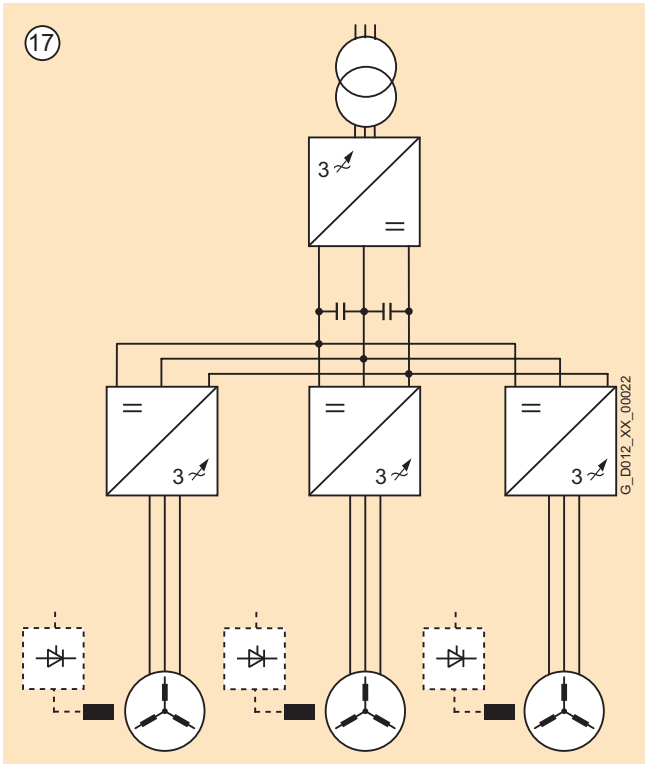
Three converter units may be operated in parallel in order to increase the output (with reduction of circuit feedbacks in addition) [1)]

1) Requires a motor with isolated winding systems

Design (continued)



DC bus configuration with two motors on common DC link



DC bus configuration with three motors on common DC link

On the DC bus configurations with two or three motors, energy can be exchanged through the joint DC link by means of alternate operation as a motor and generator. This results in savings in the Active Line Module, the transformers and the circuit-breakers. These configurations are used mainly for single-stand cold rolling mills with a coiler and for transmission test stands.

SINAMICS SM150

Function

Characteristic features

SINAMICS SM150	
Line Module (rectifier on mains side)	
Active Line Module (four-quadrant operation)	Standard
Motor Module (rectifier on motor side)	
Voltage range	3.3 kV
Performance range (typ.)	5 MVA to 28 MVA
Cooling method	
• Water cooling	Standard
Control modes	
• Asynchronous motor	Standard
• Synchronous motor, separately excited	Option
• Synchronous motor, permanently excited	Option
DC bus configuration with several Motor Modules on one common DC bus	Standard

Software and protection functions

SINAMICS SM150	Description
Closed-loop control	The machine-side closed-loop control has been expanded as a field-oriented transvector closed-loop control which can be operated as a speed or torque control as required. The transvector closed-loop control achieves the dynamics of a DC drive. This is made possible by the fact that the current components forming the torque and flux can be controlled precisely independently of each other. Prescribed torques can thus be observed and limited accurately. In the speed range from 1:10, the field-oriented closed-loop control does not require an actual speed value encoder. An actual speed value encoder is required in the following scenarios: • High dynamics requirements • Torque control/constant torque drives with setting range > 1:10 • Very low speeds • Very high speed accuracy
Setpoint input	The setpoint can be defined internally or externally; internally as a fixed, motorized potentiometer or jog setpoint, externally via the PROFIBUS interface or an analog input of the customer terminal block. The internal fixed setpoints and the motorized potentiometer setpoint can be switched over or altered using control commands from all interfaces.
Ramp-function generator	A user-friendly ramp-function generator with separately adjustable ramp-up and ramp-down times, together with variable smoothing times in the lower and upper speed ranges, improves the control response and therefore prevents mechanical overloading of the drive train. The ramp-down ramps can be parameterized separately for emergency stop.
$V_{dc\ max}$ controller	The $V_{dc\ max}$ controller automatically prevents overvoltages in the DC link if the set ramp-down ramp is too short, for example. This can also extend the set ramp-down time.
Kinetic buffering (KIP)	Power supply failures are bridged to the extent permitted by the kinetic energy of the drive train. The speed drops depending on the moment of inertia and the load torque. The current speed setpoint is resumed when the power supply returns.
Automatic restart (option)	The automatic restart switches the drive on again when the power is restored after a power failure or a general fault, and ramps up to the current speed setpoint.
Flying restart	The flying restart function permits smooth connection of the converter to a rotating motor.
Diagnostics functions	• Self-diagnosis of control hardware • Non-volatile memory for reliable diagnosis when the power supply fails • Monitoring of HV IGBTs with individual messages for each slot • User-friendly on-site operator panel with plain text messages
Operating hours and switching cycle counter	The operating hours of the fans are recorded and logged so that preventive maintenance or replacements can be performed. The switching cycles of the circuit-breaker are recorded and added together, to form the basis of preventive maintenance work.
Operator protection	The cabinet doors of the power sections are fitted with an electromagnetic lock. This prevents the cabinet doors being opened while hazardous voltages are connected inside the cabinet.

Function (continued)

Software and protection functions

SINAMICS SM150	Description
EMERGENCY-STOP button	The converters are equipped as standard with an EMERGENCY-STOP button with protective collar which is fitted in the cabinet door. The contacts of the pushbutton are connected in parallel to the terminal block so they can can be integrated in a protection concept on the installation side. EMERGENCY STOP category 0 is set as standard for an uncontrolled shutdown (DIN EN 60204-1/VDE 0113-1 (IEC 60204-1)). The function includes voltage disconnection of the converter output through the circuit-breaker. The motor coasts in the process. EMERGENCY STOP category 1 is optionally available for a controlled shutdown.
Insulation monitoring	The converters feature insulation monitoring of the whole galvanic network from the secondary side of the transformer to the stator windings of the motor.
Monitoring of the peripherals	An extensive package of options for monitoring the peripherals (from the transformer and the motor through to the auxiliaries) is available. In addition it is possible to monitor the temperature by means of thermocouples or PT100 resistors.
Thermal overload protection	A warning message is issued first when the overtemperature threshold responds. If the temperature rises further, either a shutdown is carried out or automatic influencing of the output current so that a reduction in the thermal load is achieved. Following elimination of the cause of the fault (e.g. improvement in the ventilation), the original operating values are automatically resumed. In the case of water-cooled converters, the water temperature and flow rate are recorded at several points in the cooling circuit and evaluated. An extensive self-diagnosis protects the converter and reports faults.
Grounding switch (option)	If grounding on the infeed or motor side is required for safety and protection reasons, a motorized grounding switch can be ordered. For safety reasons, the converter controller locks these grounding switches against activation while voltage is still present. The control is integrated into the protection and monitoring chain of the converter. The grounding switches are inserted automatically when the standard grounding switches of the DC link are inserted.

SIMATIC OP 177B operator panel

The SIMATIC OP 177B operator panel is fitted into the cabinet door of the SINAMICS SM150 to enable operation, monitoring and commissioning.

It has the following features and characteristics:

- 5.7" STN touch display
- Context-dependent operations by touch, permanently available functions can be selected using individual keys
- Non-volatile message buffer, no battery

English and German are available as operator panel languages.

SINAMICS SM150

Selection and ordering data

Type rating	Shaft output		Rated output current	SINAMICS SM150	Circuit versions (pages 4/4 and 4/5)
kVA	kW	hp	A	Order No.	Fig. No.
Output voltage 3.3 kV					
10000	10000	13000	1750	**6SL3845-7NN41-8AA0**	⑬
19000	19000	25000	2 × 1660	**6SL3845-7NN43-6AA0**	⑭
28000	28000	36000	3 × 1630	**6SL3845-7NN45-4AA0**	⑮
10000	10000	13000	2 × 1750 [1]	**6SL3845-7NN41-8AB0**	⑯
10000	10000	13000	3 × 1750 [2]	**6SL3845-7NN41-8AC0**	⑰

4

Options

When ordering a converter with options, add **"-Z"** to the order number of the converter, followed by the order code(s) for the desired option(s).

Example:

6SL3845-7NN41-8AA0-Z
+L08+L60+...

In the following tables, related options are arranged in groups. Whether the options can be combined or are mutually exclusive is indicated within these groups. A detailed description of the options can be found in the chapter Description of Options.

Output-side options	
Output reactor	**L08**

Protective functions		**L48**	**L49**	**L51**	**L52**	**L60**	**M10**
Grounding switch at converter input (motorized)	**L48**		✓	✓	✓	✓	✓
Grounding switch at converter output (motorized)	**L49**	✓		✓	✓	✓	✓
Isolator at converter output	**L51**	✓	✓		–	✓	✓
Circuit-breaker at converter output	**L52**	✓	✓	–		✓	✓
EMERGENCY STOP category 1	**L60**	✓	✓	✓	✓		✓
Safety locking system	**M10**	✓	✓	✓	✓	✓	

✓ Options can be combined
– Options are mutually exclusive

1) Configuration with **two** motors which operate on a joint DC link. By means of alternate operation as a motor and generator, energy is exchanged through the joint DC link. Differences in the energy balance are equalized through the infeed (active infeed).

2) Configuration with **three** motors which operate on a joint DC link. By means of alternate operation as a motor and generator, energy is exchanged through the joint DC link. Differences in the energy balance are equalized through the infeed (active infeed).

Options (continued)

Temperature sensing and analysis (standard: 3 PT100 inputs)		L80	L81	L82	L90	L91	L92	L93	L94	L95	L96
2 thermistor motor protection relays for warnings and faults [1]	L80		–	–	✓	✓	✓	✓	✓	✓	✓
2 x 2 thermistor motor protection relays for warnings and faults [1]	L81	–		–	✓	✓	✓	✓	✓	✓	✓
3 x 2 thermistor motor protection relays for warnings and faults [1]	L82	–	–		✓	✓	✓	✓	✓	✓	✓
PT100 evaluation unit with 3 inputs [1]	L90	✓	✓	✓		–	–	–	–	–	–
2 PT100 evaluation units with 3 inputs each [1]	L91	✓	✓	✓	–		–	–	–	–	–
3 PT100 evaluation units with 3 inputs each [1]	L92	✓	✓	✓	–	–		–	–	–	–
PT100 evaluation unit with 6 inputs, 2 analog outputs (outputs for display connected to controller) [1]	L93	✓	✓	✓	–	–	–		–	–	–
2 PT100 evaluation units each with 6 inputs and 2 analog outputs (outputs for display connected to controller) [2]	L94	✓	✓	✓	–	–	–	–		–	–
PT100 evaluation unit with 6 inputs for hazardous areas, 2 analog outputs (outputs for display connected to controller) [1]	L95	✓	✓	✓	–	–	–	–	–		–
2 PT100 evaluation units each with 6 inputs for hazardous areas and 2 analog outputs (outputs for display connected to controller) [2]	L96	✓	✓	✓	–	–	–	–	–	–	

1) A TM31 Terminal Module is required for further processing and display of the signals or analog outputs (option **G61**).

2) Two TM31 Terminal Modules are required for further processing and display of the signals and analog outputs (options **G61** and **G62**).
The options **L94** and **L96** cannot be combined with the option **E86** (2 isolation amplifiers for optional analog inputs).

Control of auxiliaries		N30	N31	N32	N33	N35	N36	N37	N38
The contractor is switched on with the ON command at the converter and switched off with the OFF command (example: separate fans on the motor). The supply voltage for the drive to be powered must be provided externally.									
Controlled output for auxiliaries 3 AC 400 V, max. 4 kW	N30		–	–	–	✓	✓	✓	✓
Controlled output for auxiliaries 3 AC 400 V, max. 7 kW	N31	–		–	–	✓	✓	✓	✓
Controlled output for auxiliaries 3 AC 400 V, max. 11 kW	N32	–	–		–	✓	✓	✓	✓
Controlled output for auxiliaries 3 AC 400 V, max. 15 kW	N33	–	–	–		✓	✓	✓	✓
The contractor is switched off with the ON command at the converter and switched on with the OFF command (example: heater). The supply voltage for the drive to be powered must be provided externally.									
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 1 kW	N35	✓	✓	✓	✓		–	–	–
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 2 kW	N36	✓	✓	✓	✓	–		–	–
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 3 kW	N37	✓	✓	✓	✓	–	–		–
Controlled outgoing circuit for auxiliaries 1 230 V AC, max. 4 kW	N38	✓	✓	✓	✓	–	–	–	

✓ Options can be combined
– Options are mutually exclusive

SINAMICS SM150

Options (continued)

Connection of signal cables (standard: signal cable connected directly to the terminals of the Terminal Modules)		M32	M33
Customer terminal block with spring-loaded terminals for signal cables up to 2.5 mm^2	M32		–
Customer terminal block with screw-type terminals for signal cables up to 2.5 mm^2	M33	–	

Control and display instruments in the door of the control cabinet unit		K20	K21	K22
Indicator lights and Start/Stop button in the cabinet door	K20		–	–
Display instruments in the cabinet door for voltage, current, speed and output as well as indicator lights and Start/Stop button	K21	–		–
Display instruments in the cabinet door for current, speed, output and winding temperature as well as indicator lights and Start/Stop button	K22	–	–	

Interface modules for additional customer connections		G61	G62	G63
Additional TM31 Terminal Module	G61		✓	✓
Second additional TM31 Terminal Module	G62	✓		✓
Additional TM15 Terminal Module	G63	✓	✓	

Isolation amplifiers for voltage isolation for optional analog inputs of the options G61, G62		E86	E87
2 isolation amplifiers for optional analog inputs [1]	E86		✓
2 isolation amplifiers for optional analog outputs [1]	E87	✓	

1) The option **E86** cannot be combined with the options **L94** or **L96** (2 PT100 evaluation units).

Other interface modules		G66	M10	G70	G71
PADU8 diagnostic module (8 analog and 8 digital signals)	G66		✓	✓	✓
Safety locking system	M10	✓		✓	✓
Pulse distributor for forwarding the speed encoder signal	G70	✓	✓		✓
Optical bus terminal (OBT) for PROFIBUS	G71	✓	✓	✓	

✓ Options can be combined
– Options are mutually exclusive

Options (continued)

Industry-specific options	
NAMUR terminal block	B00

Functional options		E01	E02	E03	L32
Control of separately excited synchronous motors with slipring excitation	E01		–	–	✓
Control of separately excited synchronous motors with brushless rotating exciter	E02	–		–	✓
Control of permanently excited synchronous motors	E03	–	–		✓
Automatic restart	L32	✓	✓	✓	

Documentation (standard: PDF format in English on CD-ROM)		D00	D02	D15	D56	D72	D77	D78	D84	D92	Y10
Documentation in German	D00		✓	✓	–	–	–	–	–	–	✓
Circuit diagrams, terminal diagrams and dimension drawings in DXF format [1]	D02	✓		✓	✓	✓	✓	✓	✓	✓	✓
One set of printed documentation (can be ordered in multiples)	D15	✓	✓		✓	✓	✓	✓	✓	✓	✓
Documentation in Russian (on request)	D56	–	✓	✓		–	–	–	–	–	✓
Documentation in Italian (on request)	D72	–	✓	✓	–		–	–	–	–	✓
Documentation in French (on request)	D77	–	✓	✓	–	–		–	–	–	✓
Documentation in Spanish	D78	–	✓	✓	–	–	–		–	–	✓
Documentation in Chinese	D84	–	✓	✓	–	–	–	–		–	✓
Documentation in Japanese (on request)	D92	–	✓	✓	–	–	–	–	–		✓
Circuit diagrams with customer-specific text field (plain text required) [1]	Y10	✓	✓	✓	✓	✓	✓	✓	✓	✓	

1) The equipment-specific documents (circuit diagrams etc.) are available only in English/German.

✓	Options can be combined
–	Options are mutually exclusive

SINAMICS SM150

Options (continued)

Rating plate language (standard: English/German)		T58	T60	T80	T85	T90	T91
Rating plate in English/French	T58		–	–	–	–	–
Rating plate in English/Spanish	T60	–		–	–	–	–
Rating plate in English/Italian	T80	–	–		–	–	–
Rating plate in English/Russian (on request)	T85	–	–	–		–	–
Rating plate in English/Japanese (on request)	T90	–	–	–	–		–
Rating plate in English/Chinese (on request)	T91	–	–	–	–	–	

Converter acceptance inspections in presence of customer		F03	F73	F77	F97
Visual acceptance of converter	F03		–	–	–
Functional acceptance of converter with inductive load	F73	–		✓	–
Acceptance inspection of the converter insulation test [1]	F77	–	✓		–
Customer-specific converter acceptance inspections (on request)	F97	–	–	–	

1) The option **F77** can be ordered only in connection with the option **F73**.

Recooling unit (standard: recooling unit with redundant pumps and one high-grade steel plate heat exchanger)		W02	W11	W12	W14	Y40
Recooling unit with redundant pumps and redundant high-grade steel plate heat exchangers	W02		–	–	–	–
Recooling unit with redundant pumps and one titanium plate heat exchanger	W11	–		–	–	–
Recooling unit with redundant pumps and redundant titanium plate heat exchangers	W12	–	–		–	–
Converter without recooling unit (provided on the installation side)	W14	–	–	–		–
Untreated water data deviating from the technical data [1] (on request)	Y40	–	–	–	–	

1) The option **Y40** includes a cooling system which is adapted to the untreated water data according to the customer's specifications.

✓	Options can be combined
–	Options are mutually exclusive

Options (continued)

Miscellaneous options		L50	L55	Y09
Cabinet lighting and service socket in control section	L50		✓	✓
Anti-condensation heating for cabinet unit	L55	✓		✓
Special paint finish to RAL .... (in a color other than RAL 7035; plain text required)	Y09	✓	✓	

✓	Options can be combined
–	Options are mutually exclusive

SINAMICS SM150

Technical data

General technical data	
Power components	IGCTs
Converter on the mains side	Regulated, self-commutating feed/feedback unit (Active Line Module)
Converter on the machine side	Inverter (Motor Module)
Closed-loop control	Transvector closed-loop control
Drive quadrants	4 (driving and braking per 2 directions of rotation)
Voltage isolation of power section/ controller and closed-loop control	Optical conductor, isolating transformer
Auxiliary current supply (for fans, coolant pumps, precharging the DC link capacitors, controller and close-loop control)	• 1 230 V AC ± 10%, 50/60 Hz ± 3% and • 3 400 V AC ± 10%, 50/60 Hz ± 3%
Installation altitude	≤ 1000 m above sea level: capacity 100% > 1000 m to 4000 m above sea level: current derating required > 2000 m to 4000 m above sea level: voltage derating required in addition
Insulation	according to DIN EN 50178/VDE 0160 (IEC 62103): pollution degree 2 (without conductive pollution), condensation not permitted
Degree of protection	according to EN 60529/VDE 0470 T1 (IEC 60529): IP43
Protection class	according to DIN EN 61140/VDE 0140 T1 (IEC 61140): 1
Shock-hazard protection	BGV A 3
Interference transmission	according to DIN EN 61800-3/VDE 0160 T100 (IEC 61800-3): no RI suppression
Paint finish/color	Indoor requirements/RAL 7035, light gray
Compliance with standards	
• Standards	- EN 61800-3/VDE 0160 T100 (IEC 61800-3) - EN 61800-4/VDE 0160 T104 (IEC 61800-4) - EN 60146-1-1/VDE 0558 T11 (IEC 60146-1-1) - EN 50178/VDE 0160 T100 (IEC 62103) - EN 60204-11/VDE 0113 T11 (IEC 60204-11)
• EU directives	- 98/37/EC + amendments (Machinery Directive) - 89/336/EEC + amendments (Electromagnetic Compatibility)
Water cooling	Water-water recooling unit, internal circuit, deionized water (fresh water)
Permitted coolant temperature (untreated water)	
• Inlet	+ 5 °C to + 35 °C
• Outlet	max. + 40 °C

Rated data	
Output voltage	**3.3 kV**
Input voltage	3.3 kV
Tolerance of input voltage	± 10%
Power frequency	50/60 Hz ± 3%
Power factor fundamental mode	1

Technical data (continued)

	Operation of asynchronous motors		Operation of separately excited synchronous motors
	without speed encoder	with speed encoder	with speed encoder
Control properties			
Operating range			
• Lower limit of speed control range (% of rated motor speed)	5%	0%	0%
• Max. permissible output frequency	250 Hz	250 Hz	90 Hz
• Field-shunting range	1:3	1:3	1:4
Stationary operation			
• Speed accuracy (% of rated motor speed)	± 0.2% (from 5% rated speed)	± 0.01%	± 0.01%
• Torque accuracy (% of rated torque)	± 5% (from 5% rated speed)	± 5%	± 2%
Dynamic operation			
• Torque rise time	5 ms	5 ms	5 ms

	Storage	Transport	Operation
Climatic ambient conditions			
Ambient temperature	– 25 °C to + 70 °C	– 25 °C to + 70 °C	+ 5 °C to + 40 °C
Relative air humidity	5% to 95% (only slight condensation permitted; converter must be completely dry before commissioning)	5% to 75%	5% to 85% (condensation not permitted)
Other climatic conditions according to class	1K3 according to EN 60721-3-1 (IEC 60721-3-1) (icing not permitted)	2K2 according to EN 60721-3-2 (IEC 60721-3-2)	3K3 according to EN 60721-3-3 (IEC 60721-3-3)
Degree of pollution	2 without conductive pollution according to EN 50178/VDE 0160 (IEC 62103)	2 without conductive pollution according to EN 50178/VDE 0160 (IEC 62103)	2 without conductive pollution according to EN 50178/VDE 0160 (IEC 62103)
Mechanical ambient conditions			
Dynamic stress			
• Deflection	1.5 mm at 2 Hz to 9 Hz	3.5 mm at 2 Hz to 9 Hz	0.3 mm at 2 Hz to 9 Hz
• Acceleration	5 m/s^2 at 9 Hz to 200 Hz	10 m/s^2 at 9 Hz to 200 Hz 15 m/s^2 at 200 Hz to 500 Hz	1 m/s^2 at 9 Hz to 200 Hz
Other mechanical conditions according to class (greater strength for ship compatibility)	1M2 according to EN 60721-3-1 (IEC 60721-3-1)	2M2 according to EN 60721-3-2 (IEC 60721-3-2)	3M1 according to EN 60721-3-3 (IEC 60721-3-3)
Other ambient conditions			
Biological ambient conditions according to class	1B1 according to EN 60721-3-1 (IEC 60721-3-1)	2B1 according to EN 60721-3-2 (IEC 60721-3-2)	3B2 according to EN 60721-3-3 (IEC 60721-3-3) (without harmful flora)
Chemically active materials according to class	1C1 according to EN 60721-3-1 (IEC 60721-3-1)	2C1 according to EN 60721-3-2 (IEC 60721-3-2)	3C2 according to EN 60721-3-3 (IEC 60721-3-3) (no occurrence of salt mist)
Mechanically active materials according to class	1S1 according to EN 60721-3-1 (IEC 60721-3-1)	2S1 according to EN 60721-3-2 (IEC 60721-3-2)	3S1 according to EN 60721-3-3 (IEC 60721-3-3)

Note: The values specified under storage and transport apply to unpacked converters.

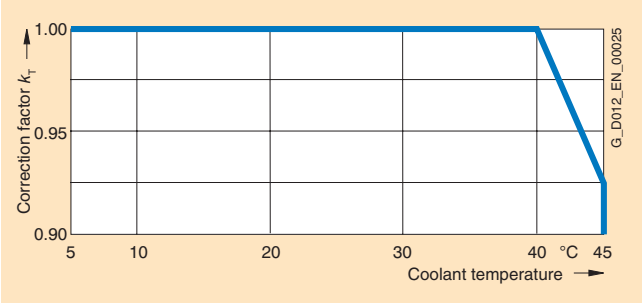
4

Technical data (continued)

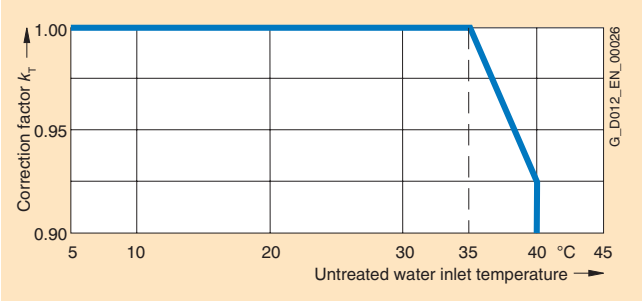
Installation conditions and derating data

Current derating

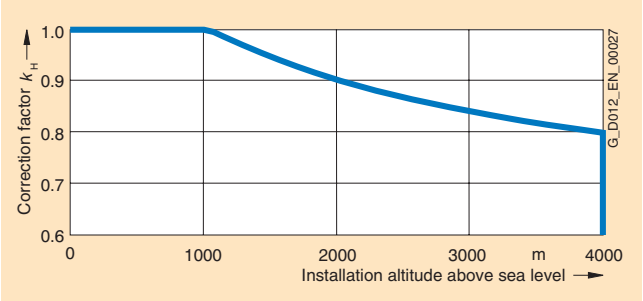
If the converters are operated at installation altitudes > 1000 m above sea level or under coolant temperatures > 35 °C, derating factors k_H and k_T must be taken into account for the rated current (DIN 43671).



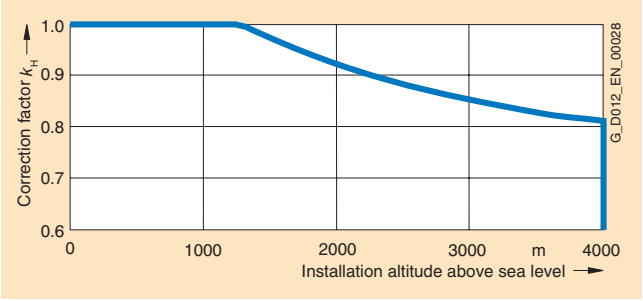
Derating factor k_T with air cooling



Derating factor k_T with water cooling



Derating factor k_H with air cooling



Derating factor k_H with water cooling

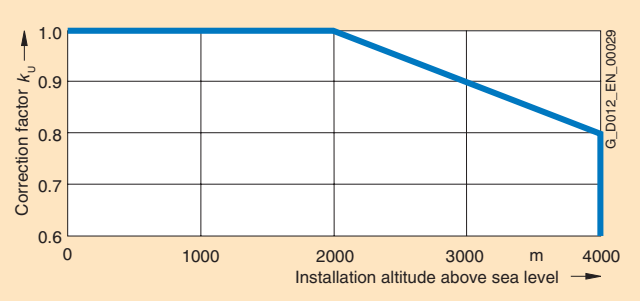
For the permitted continuous current I: $I \leq I_n \times k_H \times k_T$

I: permitted continuous current
I_n: rated current

When determining the current derating factor, it is essential to consider the ambient temperature of the air as well as the temperature of the untreated water in the inlet, as components such as the link busbars are also subject to air cooling. This requires the factors k_T and k_H to be determined from the diagrams for air cooling as well as for water cooling. The smaller of the two products ($k_T \times k_H$) must be used as the current derating factor (see the following example).

Voltage derating

At installation altitudes > 2000 m, a voltage derating is required in addition to a current correction (EN 60664-1/VDE 0110 (IEC 60664-1)). This depends on the air and creepage distances in the unit.



Derating factor k_U

Technical data (continued)

The technical data from the following examples can be found on page 4/16.

Example 1

Converter 6SL3845-7NN41-8AA0

Output voltage: 3.3 kV

Input voltage: 3.3 kV

Type rating: 10000 kVA, 1750 A

Installation altitude: 2000 m

Max. ambient temperature: 35 °C

Untreated water inlet temperature: 40 °C

- Ambient temperature:
  - Derating factor k_H = 0.9
  - Derating factor k_T = 1.0
  - Derating factor k_U = 1.0
- Untreated water inlet temperature:
  - Derating factor k_H = 0.925
  - Derating factor k_T = 0.925
  - Derating factor k_U = 1.0

The smaller value for $k_T \times k_H$ results in this case from the diagrams for the untreated water in the inlet.

$I \leq I_n \times 0.925 \times 0925 = I_n \times 0.856$

A current derating of 14.4% is required.

The maximum available output current of the converter is 1497 A.

Example 2

Converter 6SL3845-7NN41-8AA0

Output voltage: 3.3 kV

Input voltage: 3.3 kV

Type rating: 10000 kVA, 1750 A

Installation altitude: 2000 m

Max. ambient temperature: 43 °C

Untreated water inlet temperature: 37 °C

- Ambient temperature:
  - Derating factor k_H = 0.9
  - Derating factor k_T = 0.955
  - Derating factor k_U = 1.0
- Untreated water inlet temperature:
  - Derating factor k_H = 0.925
  - Derating factor k_T = 0.97
  - Derating factor k_U = 1.0

The smaller value for $k_T \times k_H$ results in this case from the diagrams for the ambient temperature.

$I \leq I_n \times 0.9 \times 0.955 = I_n \times 0.86$

A current derating of 14% is required.

The maximum available output current of the converter is 1504 A.

Water cooling

Technical data (continued)

SINAMICS SM150 Water cooling	Type	6SL3845-7NN41-8AA0	6SL3845-7NN43-6AA0	6SL3845-7NN45-4AA0	6SL3845-7NN41-8AB0	6SL3845-7NN41-8AC0
Output voltage 3.3 kV						
Type rating	kVA	10000	19000	28000	10000	10000
Shaft output [1]	kW	10000	19000	28000	10000 [2]	10000 [2]
	hp	13000	25000	36000	13000 [2]	13000 [2]
Rated output current	A	1750	2 × 1660	3 × 1630	2 × 1750	3 × 1750
Input voltage	kV	3.3	2 × 3.3	3 × 3.3	3.3	3.3
Rated input current [1]	A	1770	2 × 1680	3 × 1650	1770	1770
Power loss [3] [4]	kW	100	200	300	150	225
Efficiency [4]	%	99.0	99.0	98.9	99.3	99.2
Max. AC current requirement 50/60 Hz, 230 V	A	6	12	18	9	12
Max. AC current requirement of auxiliary supply 3 50/60 Hz, 400 V	A	17	20	23	19	20
Precharging current requirement, temporary for approx. 25 s	A	20	40	60	22	24
Cooling water throughput (untreated water/fresh water)	l/min	325	650	975	435	650
Sound pressure level L_{pA}	dB(A)	75	77	79	76	77
Measuring surface measurement L_s	dB(A)	22	23	24	22,5	23
Cable cross-sections, line side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	6 × 240	6 × 240	6 × 240	6 × 240	6 × 240
	AWG/MCM (NEC, CEC)	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM
Cable cross-sections, motor side, max. which can be connected per phase [5]	mm^2 (DIN VDE)	6 × 240	6 × 240	6 × 240	6 × 240	6 × 240
	AWG/MCM (NEC, CEC)	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM	6 × 500 MCM
PE connection, max. connection cross-section at enclosure with M12 screw [5]	mm^2 (DIN VDE)	2 × 120	2 × 120	2 × 120	2 × 120	2 × 120
	AWG/MCM (NEC, CEC)	2 × 250 MCM	2 × 250 MCM	2 × 250 MCM	2 × 250 MCM	2 × 250 MCM
Degree of protection		IP43	IP43	IP43	IP43	IP43
Dimensions (with doors and walls)						
• Width	mm	6100	11200	16300	8900	11700
• Height	mm	2540	2540	2540	2540	2540
• Depth	mm	1600	1600	1600	1600	1600
Circuit version		⑬	⑭	⑮	⑯	⑰
Weight	kg	6400	11800	17200	9300	12200

1) The figures for the rated input current and the output figures in hp and kW are approximate values which were determined for operation with synchronous motors, for the power factor cos phi = 1 and taking into account the efficiency of the motor.
The hp figures are based on the NEC and CEC directives for the North American market.
The kW values are quoted in steps which can be divided by 1000.
Both approximate values need to be adapted to the motor which is actually use.

2) The basic circuit version is based on a drive group in which the drives operate both as motors and generators (see circuit version). Energy is exchanged by means of the DC link. The specified power corresponds to the infeed power.

3) Approx. 5% of the power loss is dissipated into the atmosphere.

4) Without cooling system.

5) Figures refer to a subsystem; please refer to “Circuit Versions” for the number of subsystems to be connected on the line and motor side.

Description of options

5

Description of options

Options

To enable the required description to be found more easily, the following option descriptions are sorted alphabetically by order codes. If an option is only available for certain converter configurations, this is indicated in brackets after the option title.

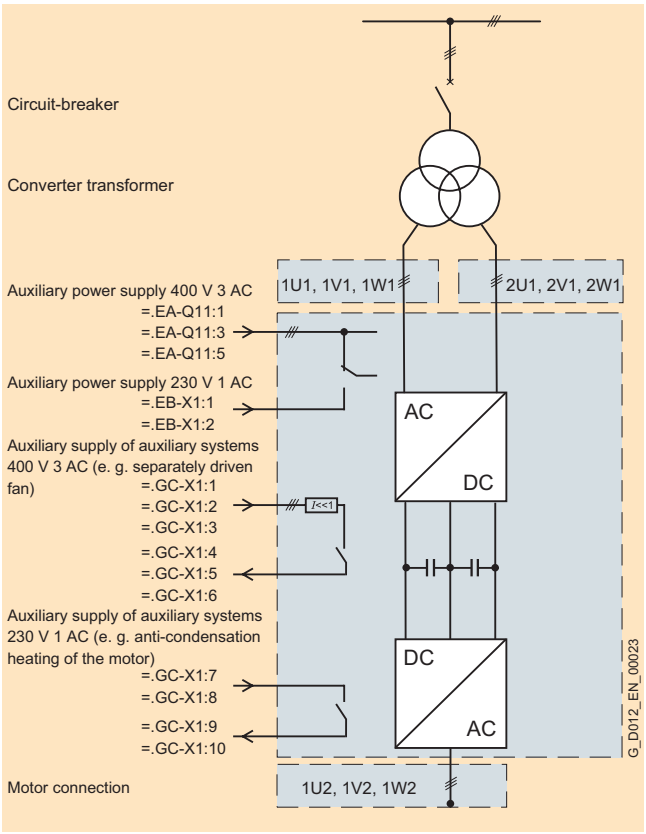
B00

NAMUR terminal block

The terminal block is designed according to the requirements and directives of the standards association for measurement and control in the chemical industry (NAMUR recommendation NE37), i.e. fixed terminals are assigned to certain functions of the devices. The inputs and outputs assigned to the terminals comply with “Protective extra-low voltage PELV” requirements.

Options for PTC tripping units with PTB approval and PT100 evaluation units for use in areas at risk of explosion can be obtained in order to monitor the temperature of explosion-proof motors.

This terminal block and the associated functions are reduced to the required amount. In comparison to the NAMUR recommendation, optional terminals are not listed.



Configuration of the NAMUR terminal block

Terminal	No.	Type	Preassignment	Comment
For signal lines that must meet “Protective extra-low voltage PELV” requirements				
–A1–X2	1	M	Reference conductor to 24 V DC infeed	–
	2, 3	P24	24 V DC infeed	With internal 1 A fuse
	10	DI	ON (dynamic) / ON/OFF(static)	–
	11	DI	OFF (dynamic)	–
	12	DI	Faster	–
	13	DI	Slower	–
	14	DI	RESET	–
	15	DI	Interlock	–
	16	DI	Counterclockwise	“0” signal for CW phase sequence “1” signal for CCW phase sequence
	17, 18		PS disconnection	EMERGENCY STOP sequence
	30, 31		Ready to run	Relay output (NO contact)
	32, 33		Motor rotates	Relay output (NO contact)
	34	DO (NO)	Fault	Relay output (changeover contact)
	35	DO (COM)		
	36	DO (NC)		
	50/51	AI 0/4 mA to 20 mA	Speed setpoint	–
	60/61	AO 0/4 mA to 20 mA	Motor frequency	–
	62, 63	AO 0/4 mA to 20 mA	Motor current	Motor current is default setting; can be reparameterized for other variables
For connecting the PTC sensor of the motor				
–A1–X3	90/91	AI	Connection of a PTC sensor	Motor current is default setting; can be reparameterized for other variables

If PT100 resistance thermometers are fitted in the windings of the motor in order to protect the motor, PT100 evaluation units for hazardous areas are available with the options **L95** and **L96**.

If a forced-ventilated machine is used due to the application (load torque/control range), controlled outgoing circuits fused by means of motor circuit-breakers are available with the options **N30** to **N33** to enable supply to an external fan. The incoming voltage supply for the external fan must be provided on the installation side.

Options (continued)

D00 to D92

Documentation

The standard documentation is supplied in English on CD-ROM. The circuit diagrams/terminal diagrams are available only in English/German.

Option	Description
D00	**Documentation in German** Use the code **D00** to obtain the documentation in German on CD-ROM.
D02	**Circuit diagrams, terminal diagrams and dimension drawings in DXF format** Documents such as circuit diagrams, terminal diagrams, the arrangement diagram and the dimension drawing with the code **D02** are ordered in DXF format so that they can be processed in AutoCAD systems, for instance.
D15	**One set of printed documentation (can be ordered in multiples)** If documentation is also required on paper, this must be ordered using the code **D15**.
D56	**Documentation in Russian (on request)** Use the code **D56** to obtain the documentation in Russian on CD-ROM.
D72	**Documentation in Italian (on request)** Use the code **D72** to obtain the documentation in Italian on CD-ROM.
D77	**Documentation in French (on request)** Use the code **D77** to obtain the documentation in French on CD-ROM.
D78	**Documentation in Spanish** Use the code **D78** to obtain the documentation in Spanish on CD-ROM.
D84	**Documentation in Chinese** Use the code **D84** to obtain the documentation in Chinese on CD-ROM.
D92	**Documentation in Japanese (on request)** Use the code **D92** to obtain the documentation in Japanese on CD-ROM.

E01

Control of separately excited synchronous motors with slipring excitation (for exciter units see Accessories)

If the converter is to be used to control separately excited synchronous motors with slipring excitation, put the code **E01** in the order. For slipring excitation, the exciter cabinet must also be ordered. It has its own order number.

Note: The converter and exciter cabinet must be ordered together.

Note: The option **E01** is available on request with the option **U01** (version of the converter for NAFTA with UL listing).

E02

Control of separately excited synchronous motors with brushless (RG) reverse field excitation (for exciter units see Accessories)

If the converter is to be used to control separately excited synchronous motors with brushless (RG) reverse field excitation, put the code **E02** in the order. For brushless excitation, the exciter cabinet must also be ordered. It has its own order number.

Note: The converter and exciter cabinet must be ordered together.

Note: The option **E02** is available on request with the option **U01** (version of the converter for NAFTA with UL listing).

E03

Control of permanently excited synchronous motors (SINAMICS GM150 as IGCT version and SINAMICS SM150)

If the converter is to be used to control permanently excited synchronous motors, put the code **E03** in the order.

Description of options

Options (continued)

E11 to E71 (SINAMICS GM150 as water-cooled IGBT version, SINAMICS GM150 as IGCT version on request)

Individual certification of the converter by the relevant certifying organizations, including the extensions described under the option M66

Option	Description
E11	**Shipworthiness with individual certificate from Germanische Lloyd (GL)** includes option **M66**
E21	**Shipworthiness with individual certificate from Lloyds Register (LR)** includes option **M66**
E31	**Shipworthiness with individual certificate from Bureau Veritas (BV)** includes option **M66**, requires option **Y75** (other auxiliary voltage than 3 AC 400 V)
E51	**Shipworthiness with individual certificate from Det Norske Veritas (DNV)** includes option **M66**
E61	**Shipworthiness with individual certificate from the American Bureau of Shipping (ABS)** includes option **M66**
E71	**Shipworthiness with individual certificate from the Chinese Classification Society (CCS)** includes option **M66**

Note: It is not possible to combine several individual certificates.

E86

Isolation amplifiers for optional analog inputs

If an additional TM31 Terminal Module is provided to extend the customer's interface and if the analog inputs of the TM31 are to be used for communication with a higher control level, two isolation amplifiers are available with the option **E86**. Multirange transformers are used (setting range: 0 V to 10 V; 0 mA to 20 mA or 4 mA to 20 mA).

Note: The option **E86** cannot be combined with the option **L94** (2 PT100 evaluation units, each with 6 inputs and 2 analog outputs).
The option **E86** requires two additional TM31 Terminal Modules (options **G61** and **G62**).

E87

Isolation amplifiers for optional analog outputs

If an additional TM31 Terminal Module is provided to extend the customer's interface and if the analog outputs of the TM31 are to be used for communication with a higher control level, two isolation amplifiers are available with the option **E87**. Multirange transformers are used (setting range: 0 V to 10 V; 0 mA to 20 mA or 4 mA to 20 mA).

Note: The option **E87** requires two additional TM31 Terminal Modules (options **G61** and **G62**).

F03, F73, F77, F97

Converter acceptance inspections in presence of customer

Option	Description
F03	**Visual inspection** The checks are carried out with the converter deenergized. • The following points should be included in the inspection: - Check of degree of protection - Check of equipment (components) - Check of equipment identifier - Check of clearance and creepage distances - Check of cables - Check of customer documentation - Submitting the acceptance report
F73	**Functional acceptance of the converter with inductive load (SINAMICS GM150 as IGBT version, others on request)** After the visual inspection with the converter off, the converter is connected to rated voltage. Rated current flows in an inductive load at an output frequency of 5 Hz (without connector motor) on the converter output side. • The following points should be included in the inspection: - Visual inspection as described for option **F03** - Check of power supply - Check of protective and monitoring devices (simulation) - Check of fans (or cooling unit in the case of water cooling) - Precharging test - Functional test with inductive load at rated voltage and rated current - Submitting the acceptance report
F77	**Acceptance of the converter insulation test (SINAMICS GM150 as IGBT version, others on request)** • The following points should be included in the inspection: - High-voltage test - Measurement of insulation resistance The insulation test can be ordered only in conjunction with the option **F73**.
F97	**Customer-specific converter acceptance inspections (on request)** If converter acceptance inspections are desired which are not covered by the options **F03**, **F73** or **F77**, customer-specific acceptance inspections/supplementary tests can be ordered on request using the order code **F97** following technical clarification.

Note: An acceptance inspection of exciter units according to the options **F03, F73, F77** and **F97** is possible only together with the converter which must be ordered simultaneously.

Options (continued)

G20 to G25

Access to other bus systems (SINAMICS GM150 as IGBT version)

In the standard version the SINAMICS GM150 and SINAMICS SM150 are equipped with a PROFIBUS interface (slave). Other interface modules are available on request.

Option	Description
G20	CAN bus interface (CANopen, on request)
G21	Modbus Plus interface
G22	Modbus RTU slave interface
G23	DeviceNet interface
G24	PROFINET interface (on request)
G25	Teleservice connection (on request)

G30

PROFIBUS master (SINAMICS GM150 with exciter unit, see Accessories)

SINAMICS GM150 converters can communicate as standard only as PROFIBUS slaves. A SIMATIC CPU with PROFIBUS master capability is used therefore in conjunction with a SINAMICS GM150 converter.

G61

Additional TM31 Terminal Module

One TM31 Terminal Module and two TM15 Terminal Modules for integrating warning and fault messages and drive signals and for communicating with a higher control level are already included in the standard version of the converter. If the number of signals to be monitored is not sufficient, the interface can also be extended by an additional Terminal Module. Additional digital inputs and outputs and two analog inputs and outputs are available with the TM31. These can be used e.g. for reading in temperatures (see the options **L93** to **L96**).

The TM31 Terminal Module has:

- 8 digital inputs
- 4 bidirectional digital inputs and outputs
- 2 relay outputs with changeover contact
- 2 analog inputs
- 2 analog outputs
- 1 temperature sensor input (KTY84-130 or PTC)

If the analog inputs and outputs of the optional TM31 are to be used for communication with the control level, isolating transformers are available as an additional option.

TM31 Terminal Module	
Digital inputs	
• Voltage	– 3 V to + 30 V
• Low level (an open digital input is interpreted as “low”)	– 3 V to + 5 V
• High level	15 V to 30 V
• Current consumption (at 24 V DC)	Typ. 10 mA
• Signal propagation delays for digital inputs	L → H: approx. 50 µs H → L: approx. 100 µs
• Max. connectable cross section	1.5 mm^2
Digital outputs (continued-short-circuit-proof)	
• Voltage	24 V DC
• Max. load current per digital output	100 mA
• Max. total current of digital outputs	400 mA
• Max. connectable cross section	1.5 mm^2
Analog inputs (a switch is used to toggle between voltage and current input)	
• As voltage input	
- Voltage range	– 10 V to + 10 V
- Internal resistance R_i	100 kOhm
• As current input	
- Current range	4 mA to 20 mA/– 20 mA to + 20 mA/ 0 mA to 20 mA
- Internal resistance R_i	250 Ohm
- Resolution	11 bit, + sign
• Max. connectable cross section	1.5 mm^2
Analog outputs (continued-short-circuit-proof)	
• Voltage range	– 10 V to + 10 V
• Max. load current	– 3 mA to + 3 mA
• Current range	4 mA to 20 mA, – 20 mA to + 20 mA, 0 mA to 20 mA
• Max. load resistance	500 Ohm for outputs in the range – 20 mA to + 20 mA
• Resolution	11 bit, + sign
• Max. connectable cross section	1.5 mm^2
Relay outputs (change-over contacts)	
• Max. load current	8 A
• Max. switching voltage	250 V AC, 30 V DC
• Max. switching power (at 250 V AC)	2000 VA (cos phi = 1) 750 VA (cos phi = 0.4)
• Max. switching power (at 30 V DC)	240 W (ohmic load)
• Required minimum current	100 mA
• Max. connectable cross section	2.5 mm^2

G62

Second additional TM31 Terminal Module

A second TM31 Terminal Module can be ordered under code **G62** provided that option **G61** is chosen as well (see description under option **G61**).

Options (continued)

G63

Additional TM15 Terminal Module

One TM31 Terminal Module and one TM15 Terminal Module for integrating warning and fault messages and drive signals and for communicating with a higher control level are already included in the standard version of the converter. The number of digital inputs and outputs can be expanded with an additional TM15 Terminal Module. This is recommended if, for instance, external signals are to be read in and processed or external components are to be controlled in addition to the standard customer's terminal block.

The TM15 Terminal Module has:

- 24 bidirectional digital inputs and outputs (voltage isolation in three groups of eight channels each)
- 24 green status LEDs for indicating the logical signal status of the relevant terminal

TM15 Terminal Module	
Digital inputs	
• Voltage	– 30 V to + 30 V
• Low level (an open digital input is interpreted as "low")	– 30 V to + 5 V
• High level	15 V to 30 V
• Current consumption (at 24 V DC)	5 mA to 11 mA
• Signal propagation delays for digital inputs, typical	L → H: 50 µs H → L: 100 µs
• Max. connectable cross section	1.5 mm^2
Digital outputs (continued-short-circuit-proof)	
• Voltage	24 V DC
• Max. load current per digital output	0.5 A
• Output delay (ohmic load)	
- Standard	L → H: 50 µs H → L: 150 µs
- Maximum	L → H: 100 µs H → L: 225 µs
• Max. total current of outputs (per group)	
- Up to 60 °C	2 A
- Up to 50 °C	3 A
- Up to 40 °C	4 A
• Max. connectable cross section	1.5 mm^2

G66

PADU8 diagnostic module (SINAMICS GM150 as IGCT version and SINAMICS SM150)

The PADU8 diagnostic module reads out up to eight analog signals and up to eight digital signals from the gating and monitoring module of the power section and makes these available for diagnostic purposes or for further processing. The typical detection cycle of all channels in parallel is 1 ms, enabling rapid signal characteristics to be detected and diagnosed simultaneously. The detected values are transferred to an evaluation system (e.g. notebook) either by optical conductors or by an RJ11 socket. All output data are available in parallel at the optical conductor output and at the RJ11 socket. This means that measurements can be taken in parallel at the RJ11 socket without disrupting the transfer of data at the optical conductor. With the option **G66** a PADU8 diagnostic module is integrated in the control section of each Motor Module.

G70

Pulse distributor for forwarding the speed encoder signal (SINAMICS SM150)

With this pulse distributor it is possible to split the encoder signal. This possibility is used, for example, when speed list values from an HTL incremental encoder are required at various points for measured-value acquisition and processing.

The pulse distributor transfers the HTL incremental encoder signals to two separate RS422 signal outputs. The inputs are electrically isolated from the outputs.

8-pole terminal strips are used for the connections.

G71

Optical bus terminal (OBT) for PROFIBUS (SINAMICS SM150)

The PROFIBUS OBT is a network component for use in optical PROFIBUS DP fieldbus networks. The individual bus stations are linked using two-phase plastic optical conductors, resulting automatically in voltage isolation and preventing potential differences in very expansive installations from having any impact.

The OBT has three interfaces:
Channel 1 is an electric RS485 interface which is configured as a 9-pole Sub D socket and establishes the link to the converter controller.
Channels 2 and 3 form the optical interface. They are configured as a duplex socket and can be used for connection on the installation side to higher-level systems.

Options (continued)

K20

Indicator lights and Start/Stop button in the cabinet door

With option **K20**, five indicator lights that signal the operating status of the converter are provided in the cabinet door of the control section.

- Fault (red)
- Warning (yellow)
- Operation (green)
- Drive ready (white)
- Local operation (white)

A Start button (green) and a Stop button (red) are installed in addition in the cabinet door if option **K20** is chosen. In Remote Mode these pushbuttons can be used to switch the drive ON and OFF. In Local Mode these pushbuttons are not active.

K21

Display instruments in the cabinet door for voltage, current, speed and output as well as indicator lights and Start/Stop button

To enable process variables to be displayed, analog display instruments that show the measurement parameter as a % are located in the cabinet door.

- Motor current (0 to + 120%)
- Motor speed (– 120% ... 0 ... 133; + 120%)
- Calculated motor output (0 to + 120%)
- Motor voltage (0 to + 120%)

Note: Option **K21** includes option **K20**.

K22

Display instruments in the cabinet door for current, speed, output and winding temperature as well as indicator lights and Start/Stop button

To enable process variables to be displayed, analog display instruments that show the measurement parameter as a % are located in the cabinet door. The motor winding temperature is displayed as an absolute value in °C.

- Motor current (0 to + 120%)
- Motor speed (– 120% ... 0 ... 133; + 120%)
- Calculated motor output (0 to + 120%)
- Motor winding temperature (0 to 200 °C)

Note: Option **K22** includes option **K20**.

K50

Sensor Module Cabinet-Mounted SMC30 (SINAMICS GM150, standard for SINAMICS SM150)

The SMC30 encoder module can be used to record the actual motor speed. The signals from the rotary pulse encoder are converted here and made available for evaluation via the DRIVE-CLiQ interface of the controller.

The following encoders are supported by the SMC30:

- TTL encoders
- HTL encoders

The maximum connectable conductor cross-section is 20 mm^2.

L08

Output reactor

The output reactor is used to limit the capacitive charge-reversal currents of motor cables. This results in varying cable lengths according to the configuration of the power section (IGBT or IGCT technology).

Converter	Max. cable lengths			
	without output reactor (standard)		with output reactor [1] (option **L08**)	
	shielded	unshielded [2]	shielded	unshielded [2]
Output voltage 2.3 kV to 7.2 kV				
SINAMICS GM150 as IGBT version	up to 2 parallel cables: 100 m 3 parallel cables: 80 m >3 parallel cables: not available	not available	1000 m	not available
Output voltage 3.3 kV				
SINAMICS GM150 as IGCT version	up to 2 parallel cables: 100 m 3 parallel cables: on request 4 parallel cables: on request	not available	500 m	not available
SINAMICS SM150	up to 2 parallel cables: 50 m 3 parallel cables: on request 4 parallel cables: on request	not available	200 m	not available

The output reactor is located in an additional cabinet unit.

L21

Overvoltage protection AC (exciter unit, see Accessories)

Option **L21** provides type SICROWBAR integrated overvoltage protection on the input side.

1) Distance from converter to motor according to current loading for max. 6 parallel three-wire EMC cables.

2) A sinusoidal filter (option **Y15**) must be provided if unshielded motor cables are used.

Description of options

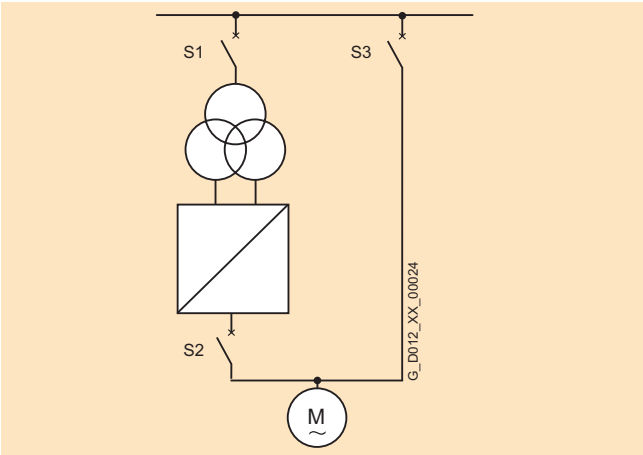
Options (continued)

L29

Bidirectional synchronized bypass mode (SINAMICS GM150 as IGBT version)

Option **L29** offers synchronization with seamless (commutating) passing of the motor to the line and receiving of the motor from the line.

The converter synchronizes the motor to the existing line (phase relation, frequency and voltage). The motor is subsequently connected in parallel to the line by means of circuit-breaker S3 before the output-side circuit-breaker S2 opens.



Approx. 100 ms go by according to the response time constants of the two circuit-breakers (opening time and closing time). Within this period of time the motor commutates from the converter to the line. This ensures smooth passing of the motor to the line.

If the motor is to be subsequently taken from the line and operated using the converter again, the commutation process is executed in the reverse order. The converter is first run up no-load operation and its output voltage is adapted to the line voltage (= motor voltage) in its phase relation, frequency and amplitude. Then circuit-breaker S2 is closed before S3 is opened and the motor is isolated from the line.

This ensures that the motor is received smoothly by the converter so that it can be either operated under variable speed or shut down under control. Speed-controlled operation during running up and shutting down does not produce any high starting and peak transient torques that could damage the mechanical connection or cause transient and pressure fluctuations in the process.

With option **L29** a VSM10 Voltage Sensing Module is integrated into the converter. When combined with voltage transformers on the medium voltage side, the VSM10 detects the line voltage in phase relation, frequency and amplitude. It thus supplies the data for synchronization of the motor to the line and from the line to the converter. The converter control prepares the drive signals of the two circuit-breakers to be provided on the installation side.

Option **L08** (output reactor) or option **Y15** (sinusoidal filter) is also required for the decoupling of the converter output during the commutation process.

The S3 circuit-breaker must be configured to the motor as regards protection. If temperature sensors are fitted in the motor, these must be monitored on the installation side for the case of mains operation.

Attention: Option **L29** is only possible if the converter output voltage is the same as the line voltage.

L32

Automatic restart

Option **L32** enables the converter to be restarted after a power failure once the mains supply has been restored.

If such a restart is required for technical reasons, the conditions set out below must be taken into consideration.

The 3 AC 400 V and 1 AC 230 V auxiliary infeed supplies must not fail; this is so that the voltage supply to the fans and coolant pumps and to the controller and closed-loop control is maintained.

If the main infeed fails, a pulse block is triggered and the DC link is supported through precharging for a short period. It is important to distinguish between two cases here:

Case A:

The circuit-breaker on the input side is still switched on.

When the medium voltage supply returns, the DC link voltage rises. This is detected by the closed-loop control and the controller. Operation is resumed when a threshold value is exceeded.

Case B:

The circuit-breaker on the input side has responded.

After a fixed time (which can be parameterized), the circuit-breaker receives an “ON command”. The response of the DC link voltage is then analyzed.

If the DC link voltage falls, the converter is disconnected.

If the DC link voltage rises, operation is resumed when a threshold value is exceeded.

Depending on the down times, load characteristic and moment of inertia, the drive may be “caught” again or the machine may need to be “excited” again first before operation can be resumed.

With option **L32**, a VSM10 Voltage Sensing Module that detects the voltage at the medium-voltage level before the circuit-breaker is fitted into the converter. Suitable voltage transformers need to be provided for that purpose at the medium-voltage level before the circuit-breaker. This enables the controller and closed-loop control to detect when the medium voltage returns after a power failure if the circuit-breaker on the input side has dropped out.

For safety reasons, a time limit is built in between the power failure and the maximum permitted line restoration time so that the drive cannot start up again uncontrolled.

A signal is issued in addition when restarting and can be used to generate an acoustic warning.

Options (continued)

L48

Grounding switch at converter input (motorized)

If grounding on the infeed side is required for safety and protection reasons, a motorized grounding switch can be ordered under code **L48**. The number of grounding switches will depend on the configuration of the infeed supply (12-/24-pulse for SINAMICS GM150 or 6-pulse for SINAMICS SM150).

For safety reasons, the converter controller locks these grounding switches against activation while voltage is still present. The control is integrated into the protection and monitoring chain of the converter. The grounding switches are inserted automatically when the standard grounding switches of the DC link are inserted.

In the event of maintenance work on the converter, it must be ensured on the installation side that there is no external voltage present, e.g. auxiliary voltage for fans, the cooling system, controller and closed-loop control and any external outputs in the converter.

Attention: Option **L48** increases the width of the cabinet unit by 600 mm.

Note: The option **L48** is available on request with the option **U01** (version of the converter for NAFTA with UL listing).

L49

Grounding switch at converter output (motorized)

With certain operating modes/configurations of the load machine (e.g. drive group with gas turbines) or types of drive machine (e.g. PEM), there can be operating statuses at which there is a risk that energy will be fed back into the converter from the motor. This can lead to dangerous voltages. In these cases a motorized grounding switch for the converter output side can be ordered under code **L49**. Where power sections are connected in parallel, the number of circuit-breakers will rise accordingly.

For safety reasons, the converter controller locks the grounding switch against activation while voltage is still present. The control is integrated into the protection and monitoring chain of the converter. The grounding switches are inserted automatically when the standard grounding switches of the DC link are inserted.

Attention: Option **L49** increases the width of the cabinet unit by 600 mm.

Note: The option **L49** is available on request with the option **U01** (version of the converter for NAFTA with UL listing).

L50

Cabinet lighting and service socket in control section

If option **L50** is chosen, a universal lamp and a service socket (Schuko version) are installed respectively in the cabinet panels of the control sections for Motor Modules and Active Line Modules.

The voltage for the cabinet lighting and service socket (at terminal strip =.EG-X1) is supplied externally and must be fused to no more than 10 A. The cabinet lighting is switched on manually via a switch or automatically by an integrated motion detector. The mode is switch-selected.

Terminal	Meaning
=.EG–X1:1	L1 (230 V)
=.EG–X1:2	N

Note: In conjunction with the option **U01** (version of the converter for NAFTA with UL listing), the option **L50** is configured with supply voltage 120 V. In this case the service socket corresponds to the version for the USA.

L51

Isolator at the converter output (SINAMICS GM150 as IGCT version and SINAMICS SM150)

If isolation between the converter output and the drive motor is required for safety and protection reasons, a motorized isolator at the converter output can be ordered under code **L51**.

Attention: The additional cabinet on the converter makes the cabinet unit wider

- in the basic circuit by 600 mm
- in the parallel circuit by 2 × 600 mm

Description of options

Options (continued)

L53

UPS for power supply from controller and closed-loop control (SINAMICS GM150)

If there is a danger of voltage dips and short-time power failures on the installation, the drive can continue to be operated with a UPS-supported closed-loop control provided that the DC link voltage does not fall below the $U_{d\ min}$ limit and the medium-voltage switch does not switch off because of the undervoltage. This enables the drive to withstand voltage dips to short power failures in conjunction with kinetic buffering, particularly where drives have great moments of inertia.

In the case of interruptions that lead to disconnection of the power section, the down time is reduced in conjunction with the automatic restart (option **L32**). The UPS is configured for a buffer time of up to 10 min.

Note: In conjunction with the option **U01** (version of the converter for NAFTA with UL listing), the option **L53** is available on special request.

L55

Anti-condensation heating for cabinet unit

The anti-condensation heating is recommended at low ambient temperatures and high levels of humidity to prevent condensation. The number of 100 W switch cabinet unit heaters fitted depends on the number of cabinet panels. The anti-condensation heaters are controlled by means of a thermostat. Should the external auxiliary infeed fail, this is monitored and reported by the converter for safety reasons.

The voltage for the anti-condensation heating (110 V to 240 V AC, on terminal block =.GB–X1:) must be supplied externally and fused to a maximum of 16 A.

Terminal	Meaning
=.GB–X1:1	N
=.GB–X1:2	L1 (110 V to 240 V)

L60

EMERGENCY STOP category 1

EMERGENCY STOP category 1 (24 V DC) for controlled shutting down according to EN 60204-1/VDE 0113 T1 (IEC 60204-1).

EMERGENCY STOP category 0 is normally set for an uncontrolled shutdown. The function includes voltage disconnection of the converter output through the circuit-breaker. The motor coasts in the process.

The EMERGENCY STOP category 1 function includes rapid shutdown of the drive through a fast stop using a ramp-down ramp to be parameterized by the user. This is followed by voltage disconnection as described for EMERGENCY STOP category 0. The EMERGENCY STOP button with protective collar is fitted in the converter cabinet door and its contacts are connected on the terminal block so that they can be connected in parallel in the customer's protection concept. (Terminal block =.LA–X51:1A or 1C and =.LA–X51:2A or 2C)

Attention: When the EMERGENCY STOP button is actuated, the motor is shut down uncontrolled or controlled and the main voltage on the motor is disconnected. Auxiliary voltages, e.g. for supplying external fans or anti-condensation heating, may still be present. Certain areas within the converter such as the closed-loop control or auxiliaries, also remain under voltage. If all voltages have to be completely disconnected, the EMERGENCY STOP button must be integrated into a protection concept on the installation side. An NC contact is available at terminal =.LA–X51:1A or 1C and =.LA–X51:2A or 2C for that purpose.

Attention: The braking process can take considerable time even with an EMERGENCY STOP category 1. This depends on the one hand on the moment of inertia of the load and on the other hand on whether the power section on the mains side is an Active Line Module (SINAMICS SM150) or a Basic Line Module (SINAMICS GM150).

Options (continued)

L80

2 thermistor protection relays for warnings and faults

Option **L80** offers two thermistor protection relays (with PTB approval) for PTC thermistors (type A) for warning and disconnection. The power supply for the relay and the evaluation is provided within the converter.

Attention: An additional TM31 Terminal Module (option **G61**) is required for further processing and display of the signals.

Terminal	Meaning (warning)
=.LF–A11:T1	Connection of sensor loop
=.LF–A11:T2	Connection of sensor loop

Terminal	Meaning (disconnection)
=.LF–A12:T1	Connection of sensor loop
=.LF–A12:T2	Connection of sensor loop

L81

2 x 2 thermistor protection relays for warnings and faults

Option **L81** offers four thermistor protection relays (with PTB approval) for PTC thermistors (type A) for warning and disconnection. The power supply for the relay and the evaluation is provided within the converter.

Attention: An additional TM31 Terminal Module (option **G61**) is required for further processing and display of the signals.

Terminal	Meaning (warning)
=.LF–A11:T1	Connection of sensor loop
=.LF–A11:T2	Connection of sensor loop

Terminal	Meaning (disconnection)
=.LF–A12:T1	Connection of sensor loop
=.LF–A12:T2	Connection of sensor loop

Terminal	Meaning (warning)
=.LF–A21:T1	Connection of sensor loop
=.LF–A21:T2	Connection of sensor loop

Terminal	Meaning (disconnection)
=.LF–A22:T1	Connection of sensor loop
=.LF–A22:T2	Connection of sensor loop

L82

3 x 2 thermistor protection relays for warnings and faults

Option **L81** offers six thermistor protection relays (with PTB approval) for PTC thermistors (type A) for warning and disconnection. The power supply for the relay and the evaluation is provided within the converter.

Attention: An additional TM31 Terminal Module (option **G61**) is required for further processing and display of the signals.

Terminal	Meaning (warning)
=.LF–A11:T1	Connection of sensor loop
=.LF–A11:T2	Connection of sensor loop

Terminal	Meaning (disconnection)
=.LF–A12:T1	Connection of sensor loop
=.LF–A12:T2	Connection of sensor loop

Terminal	Meaning (warning)
=.LF–A21:T1	Connection of sensor loop
=.LF–A21:T2	Connection of sensor loop

Terminal	Meaning (disconnection)
=.LF–A22:T1	Connection of sensor loop
=.LF–A22:T2	Connection of sensor loop

Terminal	Meaning (warning)
=.LF–A31:T1	Connection of sensor loop
=.LF–A31:T2	Connection of sensor loop

Terminal	Meaning (disconnection)
=.LF–A32:T1	Connection of sensor loop
=.LF–A32:T2	Connection of sensor loop

L87

Rotor ground-fault monitoring (exciter unit, see Accessories)

Option **L87** provides integrated ground-fault monitoring for the rotor circuit.

Description of options

Options (continued)

L90

PT100 evaluation unit with 3 inputs

The PT100 evaluation unit can monitor up to three sensors. The sensors can be connected using a two-wire or three-wire system. For all three sensors, the limits for warning and disconnection must be set centrally.

The output relays are integrated into the internal fault and shutdown sequence of the converter. The signals can also be picked up in the installation side by means of two spare fault signaling relays.

Attention: An additional TM31 Terminal Module (option **G61**) is required for further processing and display of the signals.

Terminal	Meaning
=.LJ–A11:1T1 to 1T3	PT100; sensor 1
=.LJ–A11:2T1 to 2T3	PT100; sensor 2
=.LJ–A11:3T1 to 3T3	PT100; sensor 3

In a two-wire system inputs xT1 and xT2 must be assigned and a bridge inserted between terminals xT2 and xT3.

L91

2 PT100 evaluation units with 3 inputs each

Each PT100 evaluation unit can monitor up to three sensors. For all three sensors, the limits for warning and disconnection must be set centrally.

The output relays are integrated into the internal fault and shutdown sequence of the converter. The signals can also be picked up in the installation side by means of two spare fault signaling relays.

Attention: An additional TM31 Terminal Module (option **G61**) is required for further processing and display of the signals.

Terminal	Meaning
=.LJ–A11:1T1 to 1T3	PT100; sensor 1
=.LJ–A11:2T1 to 2T3	PT100; sensor 2
=.LJ–A11:3T1 to 3T3	PT100; sensor 3

Terminal	Meaning
=.LJ–A12:1T1 to 1T3	PT100; sensor 1
=.LJ–A12:2T1 to 2T3	PT100; sensor 2
=.LJ–A12:3T1 to 3T3	PT100; sensor 3

The sensors can be connected using a two-wire or three-wire system. In a two-wire system inputs xT1 and xT2 must be assigned and a bridge inserted between terminals xT2 and xT3.

L92

3 PT100 evaluation units each with 3 inputs (SINAMICS GM150 as IGCT version and SINAMICS SM150)

Each PT100 evaluation unit can monitor up to three sensors. For all three sensors, the limits for warning and disconnection must be set centrally.

The output relays are integrated into the internal fault and shutdown sequence of the converter. The signals can also be picked up in the installation side by means of two spare fault signaling relays.

Attention: An additional TM31 Terminal Module (option **G61**) is required for further processing and display of the signals.

Terminal	Meaning
=.LJ–A11:1T1 to 1T3	PT100; sensor 1
=.LJ–A11:2T1 to 2T3	PT100; sensor 2
=.LJ–A11:3T1 to 3T3	PT100; sensor 3

Terminal	Meaning
=.LJ–A12:1T1 to 1T3	PT100; sensor 1
=.LJ–A12:2T1 to 2T3	PT100; sensor 2
=.LJ–A12:3T1 to 3T3	PT100; sensor 3

Terminal	Meaning
=.LJ–A21:1T1 to 1T3	PT100; sensor 1
=.LJ–A21:2T1 to 2T3	PT100; sensor 2
=.LJ–A21:3T1 to 3T3	PT100; sensor 3

The sensors can be connected using a two-wire or three-wire system. In a two-wire system inputs xT1 and xT2 must be assigned and a bridge inserted between terminals xT2 and xT3.

Options (continued)

L93

PT100 evaluation unit with 6 inputs and 2 analog outputs (outputs for display connected to controller)

The PT100 evaluation unit can monitor up to six sensors. The limit values can be programmed by the user for each channel.

In the standard setting, the measuring channels are divided into two groups of three channels each. With motors, for example, three PT100 can, therefore, be monitored in the stator windings and two PT100 in the motor bearings. Channels that are not used can be suppressed using appropriate parameter settings.

The output relays are integrated into the internal fault and shut-down sequence of the converter. The signals can also be picked up in the installation side by means of two spare fault signaling relays. Two freely programmable analog outputs (0/4 mA to 20 mA and 0/2 V to 10 V) are also available.

Attention: An additional TM31 Terminal Module (option **G61**) is required for further processing and display of the signals and analog outputs.

Terminal	Meaning
=.LG–A11:T11 to T13	PT100; sensor 1; group 1
=.LG–A11:T21 to T23	PT100; sensor 2; group 1
=.LG–A11:T31 to T33	PT100; sensor 3; group 1
=.LG–A11:T41 to T43	PT100; sensor 1; group 2
=.LG–A11:T51 to T53	PT100; sensor 2; group 2
=.LG–A11:T61 to T63	PT100; sensor 3; group 2
The sensors can be connected to the PT100 evaluation unit using both a two-wire or three-wire system. In a two-wire system inputs Tx1 and Tx3 must be assigned. In a three-wire system, input Tx2 must also be connected (x = 1, 2 , ..., 6).	
=.LG–A11:11/12/14	Relay output limit for group 1 reached (warning); changeover contact
=.LG–A11:21/22/24	Relay output limit for group 1 reached (fault); changeover contact
=.LG–A11:T1 (OUT 1)	Analog output OUT 1; sensor group 1
=.LG–A11:I1 (OUT 1)	Analog output OUT 1; sensor group 1
=.LG–A11:31/32/34	Relay output limit for group 2 reached (warning); changeover contact
=.LG–A11:41/42/44	Relay output limit for group 2 reached (fault); changeover contact
=.LG–A11:T2 (OUT 2)	Analog output OUT 2; sensor group 2
=.LG–A11:I2 (OUT 2)	Analog output OUT 2; sensor group 2

L94

2 PT100 evaluation units each with 6 inputs and 2 analog outputs (outputs for display connected to controller; SINAMICS GM150 as IGCT version and SINAMICS SM150)

Option **L94** offers two PT100 evaluation units as described under option **L93**, enabling up to 12 sensors in total to be monitored.

Attention: Two TM31 Terminal Modules (options **G61** and **G62**) are required for further processing and display of the signals and analog outputs.

Terminal	Meaning
=.LG–A11:T11 to T13	PT100; sensor 1; group 1
=.LG–A11:T21 to T23	PT100; sensor 2; group 1
=.LG–A11:T31 to T33	PT100; sensor 3; group 1
=.LG–A11:T41 to T43	PT100; sensor 1; group 2
=.LG–A11:T51 to T53	PT100; sensor 2; group 2
=.LG–A11:T61 to T63	PT100; sensor 3; group 2
The sensors can be connected to the PT100 evaluation unit using both a two-wire or three-wire system. In a two-wire system inputs Tx1 and Tx3 must be assigned. In a three-wire system, input Tx2 must also be connected (x = 1, 2 , ..., 6).	
=.LG–A11:11/12/14	Relay output limit for group 1 reached (warning); changeover contact
=.LG–A11:21/22/24	Relay output limit for group 1 reached (fault); changeover contact
=.LG–A11:T1 (OUT 1)	Analog output OUT 1; sensor group 1
=.LG–A11:I1 (OUT 1)	Analog output OUT 1; sensor group 1
=.LG–A11:31/32/34	Relay output limit for group 2 reached (warning); changeover contact
=.LG–A11:41/42/44	Relay output limit for group 2 reached (fault); changeover contact
=.LG–A11:T2 (OUT 2)	Analog output OUT 2; sensor group 2
=.LG–A11:I2 (OUT 2)	Analog output OUT 2; sensor group 2

Terminal	Meaning
=.LG–A21:T11 to T13	PT100; sensor 1; group 3
=.LG–A21:T21 to T23	PT100; sensor 2; group 3
=.LG–A21:T31 to T33	PT100; sensor 3; group 3
=.LG–A21:T41 to T43	PT100; sensor 1; group 4
=.LG–A21:T51 to T53	PT100; sensor 2; group 4
=.LG–A21:T61 to T63	PT100; sensor 3; group 4
The sensors can be connected to the PT100 evaluation unit using both a two-wire or three-wire system. In a two-wire system inputs Tx1 and Tx3 must be assigned. In a three-wire system, input Tx2 must also be connected (x = 1, 2 , ..., 6).	
=.LG–A21:11/12/14	Relay output limit for group 3 reached (warning); changeover contact
=.LG–A21:21/22/24	Relay output limit for group 3 reached (fault); changeover contact
=.LG–A21:T1 (OUT 1)	Analog output OUT 1; sensor group 3
=.LG–A21:I1 (OUT 1)	Analog output OUT 1; sensor group 3
=.LG–A21:31/32/34	Relay output limit for group 4 reached (warning); changeover contact
=.LG–A21:41/42/44	Relay output limit for group 4 reached (fault); changeover contact
=.LG–A21:T2 (OUT 2)	Analog output OUT 2; sensor group 4
=.LG–A21:I2 (OUT 2)	Analog output OUT 2; sensor group 4

Note: The option **L94** cannot be combined with the option **E86** (2 isolation amplifiers for optional analog inputs).

Options (continued)

5

L95

PT100 evaluation unit with 6 inputs for hazardous areas and 2 analog outputs (outputs for display connected to controller)

Six evaluation units are available for use in hazardous areas Zone 2, Zone 22 (non-conductive dusts) Div. 2 and safe areas (inherently safe input: [EEx ia] IIC). The resistance thermometers (PT100, PT500, PT1000) can be operated in a two-wire, three-wire or four-wire system. The six evaluation units are arranged in two groups of three units each. For each group the warning and disconnect messages are arranged together and integrated into the warning and fault reporting chain of the converter. In each group a temperature reading is also led to an analog input of the converter so that it is available to the converter control for measurement and display purposes.

Attention: An additional TM31 Terminal Module (option **G61**) is required for further processing and display of the signals and analog outputs.

Terminal	Meaning
=.LH–A11:10, 11, 12, 14	PT100; sensor 1; group 1
=.LH–A12:10, 11, 12, 14	PT100; sensor 2; group 1
=.LH–A13:10, 11, 12, 14	PT100; sensor 3; group 1

Terminal	Meaning
=.LH–A21:10, 11, 12, 14	PT100; sensor 1; group 1
=.LH–A22:10, 11, 12, 14	PT100; sensor 2; group 1
=.LH–A23:10, 11, 12, 14	PT100; sensor 3; group 1

The sensors can be connected to the PT100 evaluation unit in either a two-wire, three-wire or four-wire system.
In a two-wire system the inputs 10 and 12 must be assigned,
in a three-wire system the inputs 10, 11 and 12 and
in a four-wire system the inputs 10, 11, 12 and 14 must be assigned.
Parameterization is done using software.

Note: The option **L95** cannot be combined with the option **U01** (version of the converter for NAFTA with UL listing).

L96

2 PT100 evaluation units each with 6 inputs for hazardous areas and 2 analog outputs (outputs for display connected to controller; SINAMICS GM150 as IGCT version and SINAMICS SM150)

Two times six evaluation units are available for use in hazardous areas Zone 2, Zone 22 (non-conductive dusts) Div. 2 and safe areas (inherently safe input: [EEx ia] IIC). The resistance thermometers (PT100, PT500, PT1000) can be operated in a two-wire, three-wire or four-wire system. The evaluation units are arranged in groups of three units each. For each group the warning and disconnect messages are arranged together and integrated into the warning and fault reporting chain of the converter. In each group a temperature reading is also led to an analog input of the converter so that it is available to the converter control for measurement and display purposes.

Attention: Two TM31 Terminal Modules (options **G61** and **G62**) are required for further processing and display of the signals and analog outputs.

Terminal	Meaning
=.LH–A11:10, 11, 12, 14	PT100; sensor 1; group 1
=.LH–A12:10, 11, 12, 14	PT100; sensor 2; group 1
=.LH–A13:10, 11, 12, 14	PT100; sensor 3; group 1

Terminal	Meaning
=.LH–A21:10, 11, 12, 14	PT100; sensor 1; group 1
=.LH–A22:10, 11, 12, 14	PT100; sensor 2; group 1
=.LH–A23:10, 11, 12, 14	PT100; sensor 3; group 1

Terminal	Meaning
=.LH–A31:10, 11, 12, 14	PT100; sensor 1; group 1
=.LH–A32:10, 11, 12, 14	PT100; sensor 2; group 1
=.LH–A33:10, 11, 12, 14	PT100; sensor 3; group 1

Terminal	Meaning
=.LH–A41:10, 11, 12, 14	PT100; sensor 1; group 1
=.LH–A42:10, 11, 12, 14	PT100; sensor 2; group 1
=.LH–A43:10, 11, 12, 14	PT100; sensor 3; group 1

The sensors can be connected to the PT100 evaluation unit in either a two-wire, three-wire or four-wire system.
In a two-wire system the inputs 10 and 12 must be assigned,
in a three-wire system the inputs 10, 11 and 12 and
in a four-wire system the inputs 10, 11, 12 and 14 must be assigned.
Parameterization is done using software.

Options (continued)

M10

Safety locking system

The safety locking system is based on the key transfer system from the company Castell and is used in addition to the electromagnetic door locking system provided as standard. To obtain the coded key of the key exchange unit the medium-voltage switch must first be opened. The opened medium-voltage switch releases the key to the key exchange unit, which is used to release the keys to the converter cabinet doors of the power section that are stored here. This ensures that the converter is isolated from the medium voltage and that the medium voltage in the cabinet is no longer applied. As long as the cabinet doors are not closed again and the keys of the converter cabinet doors are not put back into the key exchange unit, the key for the medium voltage switch will not be released and the medium voltage switch cannot be activated again.

M11

Dust protection (SINAMICS GM150, air-cooled)

With option **M11** the cabinet doors are fitted with additional filter mats to prevent the ingress of dangerous dust deposits on the power section components. The filter mats are fitted to the outside of the doors, which means that they can be replaced during operation.

The degree of contamination of the filter mats is monitored constantly by a differential pressure process. A maintenance request is issued in plenty of time before the filter mats get clogged up.

When replacing the filter mats, it must be ensured that no dust gets into the cabinet unit through the air pulled in by the cabinet fans as they run.

M13

Power cable connected to the converter input from above (SINAMICS GM150 as IGBT version)

Given suitable installation conditions, option **M13** enables the line-side power cable to be introduced into the cabinet unit from above.

Attention: Option **M13** increases the width of the cabinet unit by 600 mm.

M32

Customer terminal block with spring-loaded terminals for signal cables up to 2.5 mm^2

The signal cable is normally connected directly to the terminals of the TM31 or TM15 Terminal Modules. It must be remembered that the maximum connectable cross-section for TM31 and TM15 is limited to 1.5 mm^2.

With option **M32**, the signals are led to a terminal block where connection is by means of spring-loaded terminals (applies also to optional Terminal Modules). In this case connection cross-sections of up to 2.5 mm^2 are permitted.

M33

Customer terminal block with screw-type terminals for signal cables up to 2.5 mm^2

The signal cable is normally connected directly to the terminals of the TM31 or TM15 Terminal Modules. It must be remembered that the maximum connectable cross-section for TM31 and TM15 is limited to 1.5 mm^2.

With option **M33**, the signals are led to a terminal block where connection is by means of screw terminals (applies also to optional Terminal Modules). In this case connection cross-sections of up to 2.5 mm^2 are permitted.

M34

Auxiliary voltage and signal cable connected from above (SINAMICS GM150 as IGBT version)

Given suitable installation conditions, option **M34** enables the auxiliary infeed and the signal cable to be introduced into the cabinet unit from above.

Description of options

Options (continued)

M42

IP42 degree of protection (SINAMICS GM150 as air-cooled IGBT version)

With option **M42**, the degree of protection of the air-cooled converters can be enhanced (IP22 is standard). Additional close-meshed grilles where the air comes in and goes out prevent the ingress of solid matter with diameters > 1.0 mm.

M54

IP54 degree of protection (SINAMICS GM150 as water-cooled IGBT version)

With option **M54**, the degree of protection of the water-cooled converters can be enhanced (IP43 is standard). Losses within the cabinet unit that cannot be dissipated directly through the coolant (thermal radiation) are dissipated by an additional internal air circuit by means of an air-water heat exchanger.

M61

Redundant fan in the power section (SINAMICS GM150, air-cooled)

To improve system availability, it is possible to equip the converter with an additional redundantly operating fan. If a fan within the converter cabinet unit fails, this is immediately detected by the differential pressure detector in the cabinet and the redundant fan is activated by the converter controller without the converter and hence the drive system failing. This enables production down times or interruptions to be avoided and replacement of the faulty fan to be postponed until the next scheduled shutdown.

M64

Converter prepared for connection to an external exhaust air system, with internal cabinet fans (SINAMICS GM150, air-cooled)

Retaining the fans inside the cabinet unit ensures that the volume of cool air required for cooling can be supplied without any major distribution faults occurring. If the exhaust air is led in a duct system over long sections or even around bends, the pressure drop that arises in this duct system must be compensated by additional fans within the exhaust air system. Suitable “flange connections” for connecting the converter to an external exhaust air system are located in the roof part of the cabinet unit.

M66

Shipworthiness with type certificate (SINAMICS GM150, water-cooled)

With option **M66**, the version of the converter meets the requirements of the following classification organizations:

- Lloyds Register
- American Bureau of Shipping
- Germanischer Lloyd
- Bureau Veritas
- Det Norske Veritas
- Chinese Classification Society.

Option **M66** includes a reinforced mechanical version of the cabinet unit, handrails below the operator panel and mechanical locking of the cabinet unit doors. The cabinet unit has IP44 protection and contains a cabinet anti-condensation heater (option **L55**). It is supplied with a reinforced base frame which can be welded to the ship floor to ensure that the converter is securely located.

Note: The reinforced base frame increases the height of the converter by 100 mm.

Note: If the converter is used for a safety-relevant (“essential service”) drive on the ship, individual certification is also required (see options **E11** to **E71**).

M78

Power cable connected to the converter output from above (SINAMICS GM150 as IGBT version)

Given suitable installation conditions, option **M78** enables the motor-side power cable to be introduced into the cabinet unit from above.

Attention: Depending on the configuration, the width of the cabinet unit may increase.

Options (continued)

N13

Circuit-breaker at converter input (SINAMICS GM150, for 24-pulse Basic Line Module on request)

Option **N13** provides two integrated circuit-breakers. Option **N13** is particularly important in the retrofit business where existing circuit-breakers do not meet requirements (tripping times, low-voltage coil). The two circuit-breakers are installed below the Basic Line Module in the converter cabinet unit and are thus located on the secondary side of the line-side transformer.

Attention: On the 12-pulse IGBT version of the SINAMICS GM150 (small ratings at 2.3 kV, 3.3 kV and 4.16 kV), the two optional circuit-breakers are integrated with no change of cabinet width when the option **N13** is chosen. For all other versions the cabinet width increases.

Note: In conjunction with the option **U01** (version of the converter for NAFTA with UL listing) and for converters with a 24-pulse Basic Line Module, the option **N13** is available on special request.

N15

24-pulse Basic Line Module (SINAMICS GM150)

For particularly high requirements in respect of low circuit feedbacks, the power sections of voltage ranges 2.3 kV, 3.3 kV and 4.16 kV can be supplied with a 24-pulse Basic Line Module.

Converters of greater ratings with power sections connected in parallel and converters from the voltage ranges 6.0 kV and 6.6 kV can be operated even without this 24-pulse option. The converter transformer required at the medium-voltage level must be designed as a five-winding transformer, or else two two-tier transformers must be provided. Vector groups and winding displacements must be taken into account.

Attention: With the option **N15** the width of the converter cabinet for SINAMICS GM150 as IGBT version increases by 600 mm.

N20

110 V to 120 V DC capacitor trip device (SINAMICS GM150 as IGBT version)

The capacitor trip device is used if the existing circuit-breaker has no low-voltage coil and cannot be retrofitted.

It is installed in the converter and has the following functions:

- Monitoring of the auxiliary voltage supply of the circuit-breaker on the installation side
- Monitoring of the own internal voltage supply
- Locking of the circuit-breaker in the ON position if there is insufficient voltage

The capacitor trip device ensures that the customer's circuit-breaker can still be safely disconnected even if there is a power failure or the normal OFF command is not effective, e.g. because of a wire break.

Note: The option **N20** cannot be combined with the option **U01** (version of the converter for NAFTA with UL listing).

N21

230 V DC capacitor trip device (SINAMICS GM150 as IGBT version)

The capacitor trip device is used if the existing circuit-breaker has no low-voltage coil and cannot be retrofitted.

It is installed in the converter and has the following functions:

- Monitoring of the auxiliary voltage supply of the circuit-breaker on the installation side
- Monitoring of the own internal voltage supply
- Locking of the circuit-breaker in the ON position if there is insufficient voltage

The capacitor trip device ensures that the circuit-breaker on the installation side can still be safely disconnected even if there is a power failure or the normal OFF command is not effective, e.g. because of a wire break.

Note: The option **N21** cannot be combined with the option **U01** (version of the converter for NAFTA with UL listing).

N22

Circuit-breaker on input side (exciter unit, see Accessories)

When option **N22** is chosen, a circuit-breaker which is controlled by the exciter unit itself is integrated on the input side. On the variants for brushless (RG) reverse field excitation this circuit-breaker is configured as a contactor, on the variants for slipring excitation as a disconnector.

Note: If this circuit-breaker is not available, an external circuit-breaker must be provided.

Options (continued)

N30 to N33

Controlled outgoing circuit for auxiliaries 3 AC 400 V/3 AC 480 V

An outgoing circuit for the operation of external auxiliary equipment, e.g. separate fans on the motor or pumps/oil supplies, is available in the converter. It is controlled and is fused by motor circuit-breakers. The voltage supply required for the drive must be provided from an external source.

Depending on the drive output that is required, four different outgoing circuits are available.

The contactor is switched on with the ON command at the converter and switched off with the OFF command.

Option	Description
N30	Controlled output for auxiliaries 3 AC 50 Hz 400 V, max. 5 kW (cos phi = 0.8; setting range of motor circuit-breaker from 7 A to 10 A)
N31	Controlled output for auxiliaries 3 AC 50 Hz 400 V, max. 7 kW (cos phi = 0.8; setting range of motor circuit-breaker from 14 A to 20 A)
N32	Controlled output for auxiliaries 3 AC 50 Hz 400 V, max. 11 kW (cos phi = 0.8; setting range of motor circuit-breaker from 20 A to 25 A)
N33	Controlled output for auxiliaries 3 AC 50 Hz 400 V, max. 16.5 kW (cos phi = 0.8; setting range of motor circuit-breaker from 28 A to 40 A)

Note: Other voltages are also possible according to the ratings in question.

Note: It is not possible to combine several options (**N30** to **N33**).

Infeed of auxiliary voltage	Outgoing circuit for auxiliaries	Checkback auxiliaries ON	
=GC–X1:1 L1	=GC–X1:4 L1	=GC–X2:1	Relay contact max. 60 V DC
=GC–X1:2 L2	=GC–X1:5 L2	=GC–X2:2	
=GC–X1:3 L3	=GC–X1:6 L3		

N35 to N38

Controlled outgoing circuit for auxiliaries 1 AC 230 V/1 AC 120 V

A controlled outgoing circuit protected by miniature circuit-breakers is available in the converter for controlling external auxiliaries, e.g. the anti-condensation heater for the motor. The infeed required for the voltage supply, e.g. the anti-condensation heating, must be provided externally.

Depending on the output that is required, four different outgoing circuits are available.

The contactor is switched off with the ON command at the converter and switched on with the OFF command.

Option	Description
N35	Controlled output for auxiliaries 1 AC 50 Hz 230 V, max. 1.2 kW or 1 AC 60 Hz 120 V, max. 1 kW
N36	Controlled output for auxiliaries 1 AC 50 Hz 230 V, max. 2.2 kW or 1 AC 60 Hz 120 V, max. 1.5 kW
N37	Controlled output for auxiliaries 1 AC 50 Hz 230 V, max. 3.5 kW or 1 AC 60 Hz 120 V, max. 2.1 kW
N38	Controlled output for auxiliaries 1 AC 50 Hz 230 V, max. 4.5 kW or 1 AC 60 Hz 120 V, max. 2.8 kW

Note: It is not possible to combine several options (**N35** to **N38**).

Infeed of auxiliary voltage	Outgoing circuit for auxiliaries	Checkback auxiliaries ON	
=GC–X1:7 L1	=GC–X1:9 L1	=GC–X2:3	Relay contact max. 60 V DC
=GC–X1:8 N	=GC–X1:10 L2	=GC–X2:4	

Options (continued)

T58, T60, T80, T85, T90, T91

Rating plate languages

The rating plate is normally supplied in two languages (English/German). Other languages can be ordered using the codes below.

Option	Description
T58	Rating plate in English/French
T60	Rating plate in English/Spanish
T80	Rating plate in English/Italian
T85	Rating plate in English/Russian (on request)
T90	Rating plate in English/Japanese (on request)
T91	Rating plate in English/Chinese (on request)

Note: It is not possible to combine several options (**T58** to **T91**).

U01

Version of converter for NAFTA with UL listing

A version of the converter for the North American market is supplied with the option **U01**. It is approved and listed by the Underwriter Laboratories (UL).

The option **U01** is available only for SINAMICS GM150 as an air-cooled IGBT version in the voltage classes 2.3 kV, 3.3 kV and 4.16 kV.

- Following options are included as standard in the option **U01**:
  - **M10** (safety locking system)
  - **M11** (dust protection)
  - **T58** (rating plate in English/French)

In addition the converters as NAFTA version have an auxiliary voltage connection for 3 AC 480 V/1 AC 120 V. Both auxiliary voltages must be made available on the installation side.

In conjunction with the option **U01**, the option **L50** (cabinet lighting and service socket in the control section) is configured with supply voltage 120 V. In this case the service socket corresponds to the version for the USA.

- Following options cannotbe combined with the option **U01**:
  - **N20** and **N21** (capacitor trip device)
  - **L95** (PT100 evaluation unit with 6 inputs for hazardous areas)
- Following options are available in combination with the option **U01** on special request:
  - **N13** (circuit-breaker at converter input)
  - **L48** and **L49** (grounding switch at converter input and output)
  - **E01** and **E02** (control of separately excited synchronous motors)
  - **L53** (UPS for power supply from controller and closed-loop control)

W02

Recooling unit with redundant pumps and redundant high-grade steel plate heat exchangers (with water cooling)

The recooling unit is used to dissipate the power loss from the converter and consists of two cooling circuits: the internal cooling circuit with deionized fresh water and the external untreated water circuit for dissipating the power loss. In the standard version the internal cooling circuit has two redundantly operating circulation pumps and one high-grade steel plate heat exchanger. With option **W02**, a second high-grade steel plate heat exchanger is integrated to enable fully redundant operation.

W11

Recooling unit with redundant pumps and a titanium plate heat exchanger (with water cooling)

If the untreated water described in the technical data is not available for the recooling unit, option **W11** must be chosen. This is required in the case of aggressive untreated water such as seawater, for instance. With option **W11**, a titanium plate heat exchanger is installed instead of the high-grade steel plate heat exchanger. The three-way valve for preventing condensation and the necessary pipe connections are still made from high-grade steel.

Attention: When option **W11** is chosen, the piping on the untreated water side is made of high-grade steel, not titanium.

W12

Recooling unit with redundant pumps and redundant titanium plate heat exchangers (with water cooling)

With option **W12**, two fully redundantly operating titanium plate heat exchangers are integrated for the internal cooling circuit (other characteristics as described under option **W11**).

Attention: When option **W12** is chosen, the piping on the untreated water side is made of high-grade steel, not titanium.

W14

Converter without recooling unit, provided on the installation side (with water cooling)

When option **W14** is chosen, the water-cooled converter is supplied without a recooling unit. The necessary cooling system must be provided on the installation side.

Note: Option **W14** reduces the width and weight of the cabinet (data available on request).

W20

Untreated water connection from underneath (SINAMICS GM150 as IGBT version)

Option **W20** enables the untreated water for the recooling unit to be supplied from underneath through the floor by means of a flange connection. The necessary mating flanges are included as a pack with the recooling unit.

Note: With water-cooled IGBT converters, the untreated water is supplied to the recooling unit through the side panel from the left-hand side. With IGCT converters, the untreated water is normally supplied to the recooling unit from underneath.

Description of options

Options (continued)

Y09

Special paint finish according to RAL....

Converters are normally supplied in RAL 7035 (light gray). A special color must be specified in plain text when ordering. In the case of the SINAMICS GM150 in air-cooled version, the fans are still finished in RAL 7035 even if the cabinet unit is in a special color.

Y10

Customized circuit diagrams

The circuit diagrams are given customized headers.

The data for the header must be given in plain text (up to three lines of 45 characters per line).

Y15

Sinusoidal filter (SINAMICS GM150 as IGBT version)

Sinusoidal filters are needed if the converter is used in the retrofit business, where existing motors have to be operated under speed control or where the operation of external motors is intended and where no special additional measures have been made for converter operation. Sinusoidal filters are also needed when unshielded motor cables are used.

The sinusoidal filters charge the motors with almost sinusoidal motor currents and voltages so that the operation of line motors is possible. Standard cables (without EMC shielding) can be used between the sinusoidal filter and the motor. The voltage harmonic distortion at an output frequency of 50 Hz is less than 5% when sinusoidal filters are used.

If the sinusoidal filter is used, the output of the converter must be reduced (see technical data).

It must also be remembered that only machines with a quadratic load characteristic (fluid machines) can be operated. Field-shunting operation is not permitted. Possible nominal output frequencies are limited to the range 30 Hz to max. 66 Hz. The frequency setting range is 1:10.

Note: The rated motor current, the motor current in the operating point and the motor no-load current must be given in plain text when ordering filters.

Converter	Max. cable lengths			
	without sinusoidal filter (standard)		with sinusoidal filter [1] (option **Y15**)	
	shielded	unshielded	shielded	unshielded
Output voltage 2.3 kV to 7.2 kV				
SINAMICS GM150 as IGBT version	up to 2 parallel cables: 100 m 3 parallel cables: 80 m >3 parallel cables: not available	not available	1000 m	1000 m

Attention: Option **Y15** increases the width of the cabinet unit (for dimensions see Technical Data).

Y17

Line reactor (exciter unit, see Accessories)

With the option **Y17** a line reactor is integrated to protect against excessive harmonic currents and to limit the circuit feedbacks. The exact values for the reactor must be given in plain text as they are dependent on the supplying network.

Y40

Untreated water data deviating from the catalog data (with water cooling, on request)

With option **Y40**, untreated water whose data does not conform to the technical data can also be used in water-cooled converters (for specification, see the section Recooling Unit in the chapter Notes on Configuration). Deviations from the values indicated in the specification must be clarified in advance.

Y75

Auxiliary voltage other than 3 AC 400 V (SINAMICS GM150)

An auxiliary supply of 3 AC 400 V must be provided on the installation side to supply voltage to the fans, controller and closed-loop control and protection and monitoring units and to precharge the DC link. If the auxiliary infeed supply on the installation differs from this value, option **Y75** for adjusting the voltage must be chosen. In this case the three-phase infeed supply which differs from the standard version is adapted with three individual transformers to the required voltage level. Tappings from 3 AC 200 V to 3 AC 690 V are available for this purpose. The auxiliary voltage and frequency available at the place of installation must be indicated in plain text so that the required matching transformers can be configured. The current required for the auxiliary infeed supply can be determined from the data for the current requirement at 3 AC 400 V (see Technical Data, Conversion to Existing Auxiliary Voltage).

Note: For isolated systems the maximum supply voltage is 3 AC 500 V.

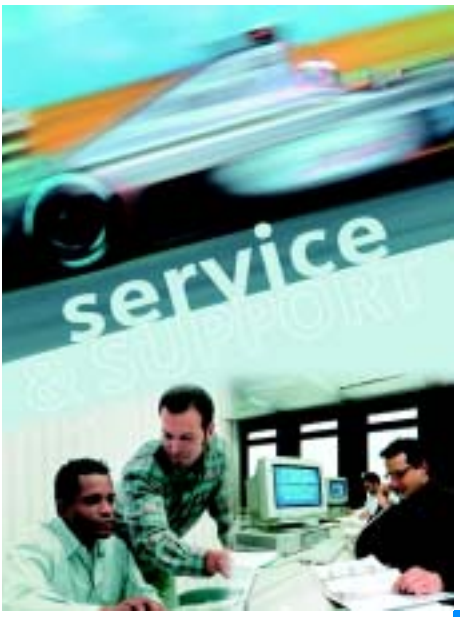
Note: Access to the matching transformers is possible only from the rear of the converter.

Infeed of auxiliary voltage		Supply voltage for
=.EA1-Q11:1	L1	Fans/coolant pumps, controller and close-loop control, protection and monitoring units, precharging the DC link
=.EA1-Q11:3	L2	
=.EA1-Q11:5	L3	

1) Distance from converter to motor according to current loading for max. 6 parallel three-wire EMC cables.

Services and documentation

8



Training

Overview

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8

Design

Courses for SINAMICS GM150/SM150

Here you will find an overview of the training courses available for the SINAMICS GM150/SM150.

The courses are modular in design and are intended for a variety of target groups as well as individual customer requirements.

The system overview will acquaint decision-makers and sales personnel with the system very quickly.

The planning course provides all the information you need to size the drive system.

The basic and follow-up courses are sure to provide all the technical knowledge service engineers will need for servicing/starting up motion control applications, communication and cabinet-mounted units.

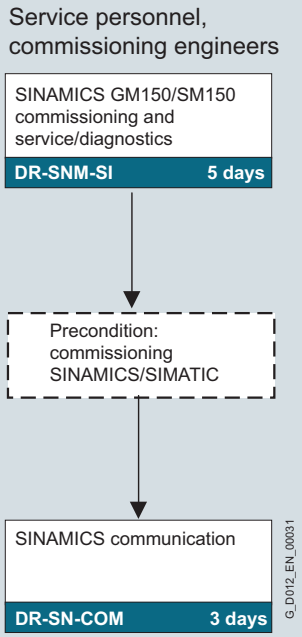
All modules contain as many practical exercises as possible, in order to enable intensive and direct training on the drive system and with the tools in small groups.

Title	Target group					Duration	Course code
	Decision-makers, sales personnel	Project managers, members of project teams	Programmers	Commissioning engineers, configuring engineers	Servicing personnel		
SINAMICS system overview	✓					2 days	DR-SN-UEB
Configuring SINAMICS GM150/SM150		✓	✓			4 days	DR-SNM-PRJ
Commissioning and servicing/ diagnosis of SINAMICS GM150/SM150				✓	✓	5 days	DR-SNM-SI
SINAMICS communication			✓	✓	✓	3 days	DR-SN-COM

Training

Design (continued)

SINAMICS GM150/SM150 learning path



Description

SINAMICS system overview (2 days)
DR-SN-UEB

Description/learning target

This course has been specially designed for sales employees and decision-makers who wish to attain a rapid overview of the SINAMICS drive concept and its position in the existing Siemens drive environment.

The system overview is supplemented by an introduction to the fundamentals of motor and converter technology.

The SIZER configuration tool and the STARTER commissioning tool are presented and explained using short exercises.

Target group

Decision-makers and sales personnel

Content

- SINAMICS system overview
- Position with respect to existing drive systems
- Fundamentals of converter technology and motors
- SIZER configuration tool
- STARTER commissioning tool
- Simple startup of a drive
- Practical exercises using the training case

Configuring SINAMICS GM150/SM150 (4 days)
DR-SNM-PRJ

Description/learning target

The course is appropriate for design engineers, planning engineers and sales employees who plan the SINAMICS GM150/SM150. Training covers the fundamental physical relationships for the design of a drive system. Using the self-explanatory SIZER configuration tool, different applications of SINAMICS are calculated, and consolidated using exercises on PCs. Control functions are explained, and their boundary conditions described. The various options for SINAMICS are also presented to permit derivation of their application.

Target group

Project managers, members of project teams, programmers

Requirements

Knowledge of drive and control technology

Content

- SINAMICS system overview
- Physical fundamentals for drive calculation
- Configuration of the SINAMICS GM150/SM150 cabinet components and their explanation: power supplies, EMC, emergency stop, interfaces
- SIZER configuration tool with example exercises for various applications
- Technical documentation: catalogs, engineering information, instruction manuals
- Open-loop and closed-loop control functions
- Simple startup using the AOP30 operator panel
- Transformer/reactor
- Recooling plant
- High-voltage motor
- Medium-voltage cable

Description (continued)

SINAMICS GM150/SM150 commissioning and servicing/ diagnosis course (5 days) DR-SNM-SI

Description/learning target

Technical information about planning, configuration, commissioning and troubleshooting is provided in this course. Following an introduction to the hardware and documentation of the drive system, detailed information is given about software functions, the parameter structure and function diagrams. Practical exercises on training equipment and the STARTER commissioning tool consolidate this knowledge.

Target group

Commissioning engineers, configuring engineers, servicing personnel

Requirements

Knowledge of drive and control technology

Content

- Components of the converters
  - Rectifiers, DC link, inverter
  - Air/water cooling
  - Terminal Board/Terminal Module
  - Controller and closed-loop control
  - Control of IGBTs
  - Joint power supply
- Exercises on the simulator
  - Operation by means of AOP
  - Initial commissioning steps/test mode
  - Parameterization of converter with STARTER commissioning tool
  - Upload/download functions, learning function
  - Setpoint channel
- Control of converter using PROFIBUS DP
- Basic principle of closed-loop control (transvector control)
- Circuit diagrams
- Spare parts/maintenance

SINAMICS communication (3 days) DR-SN-COM

Description/learning target

The course is appropriate for programmers and servicing personnel who, as an extension to the DR-SNS-SI course, require further knowledge on the PROFIBUS and RS232 communications interfaces for STARTER and AOP30 as well as I/O terminals.

The focal point is PROFIBUS with the PROFIDrive V3 profile with routing, teleservice, and the functionalities associated with the equidistant bus cycle, isochrone mode with servo applications, and direct OP access. Also described are the libraries of DriveES SIMATIC for cyclic and acyclic data exchange.

Practical exercises on the SINAMICS and SIMATIC S7 training cases with CPU 315-2 DP deepen the knowledge conveyed.

Target group

Commissioning engineers, configuring engineers, servicing personnel

Content

- Overview of the PROFIBUS DP, RS232-PPI and CAN interfaces and I/O terminals: function, topology, parameterization
- Fundamentals of PROFIBUS with the PROFIDrive V3 profile
- Basic functions on the PROFIBUS: routing, teleservice and direct access
- PROFIBUS for motion control with: equidistant bus cycle and isochrone mode with servo control
- Cyclic and acyclic data exchange with DriveES SIMATIC modules
- Fault diagnostics of the drive by means of the bus system
- Practical exercises on the SINAMICS S120 and SIMATIC S7 training cases with CPU 315-2DP.

AOP30 cabinet operator panel training case

Application

This training case is used for the training and promotion of SINAMICS cabinet units.

When used as a stand-alone unit, it is possible to carry out offline demonstrations of commissioning and usability. Online operation is implemented by connecting to a SINAMICS cabinet unit or the SINAMICS S120 training case.

Design

- Cabinet operator panel with power supply connection
- Internal 24 V DC power supply
- Can be assembled for demonstration purposes
- Offline functions
- Online functions with SINAMICS control unit CU320 via RS232 PPI.

Technical specifications

AOP30 cabinet operator panel training case	
Input voltage	1 AC 230 V
Degree of protection to DIN VDE 0470	IP00
Width	377 mm
Height	158 mm
Depth	277 mm
Weight, approx.	7 kg

Selection and ordering data

	Order No.
AOP30 cabinet operator panel training case TG-SN-AOP	**6ZB2480-0CA00**

Documentation

Overview

The documentation is supplied with the converter in PDF format on a CD-ROM as standard. It consists of the following sections:

- Instruction Manual
- List Manual (parameter lists and function diagrams)
- Equipment-specific documents such as circuit diagrams, dimension drawings, arrangement diagrams and terminal diagrams
- Additional instruction manuals (comprehensive component descriptions)

The documentation is in English. Further languages can be ordered if required (see option descriptions). The equipment-specific documents are available only in English/German.

Attention: Due to US embargo restrictions, the documentation cannot be supplied on CD-ROM to countries such as Iran, Syria, Cuba, Sudan or Libya, as Adobe Acrobat Reader is not permitted in these countries for reading PDF documents. The documentation must be ordered in paper form when exporting converters to these countries (option **D15**).

SPARESonWeb

Overview

SPARESonWeb - Online spare parts catalog

SPARESonWeb is a web-based tool for selecting the spare parts available for the SINAMICS system. After you have registered and entered the serial number and order number, the spare parts available for the relevant unit are displayed.

The delivery state for specific orders can be displayed for all shipped SINAMICS products.

http://workplace.automation.siemens.com/sparesonweb

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In Germany
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Optimization and upgrading

To enhance productivity and save costs in your project we offer high-quality services in optimization and upgrading. [1)]

Product registration

To guarantee our servicing performance (availability of spare parts, hotline function, readiness of personnel), we offer you product registration for our SINAMICS drive equipment. Feedback on the final destination (installation/operation location) and naming of contact partners allows a servicing response without delay. The feedback can be made either using a feedback form (enclosed with each converter) or via the Internet:
http://www.siemens.com/reg

1) For country-specific telephone numbers go to our Internet site at:
http://www.siemens.com/automation/service&support

Appendix

9

Glossary

Overview

Active infeed

Overall functionality of an infeed with → “Active Line Module”, including the required additional components (filters, switching devices, computing power portion of a → “Control Unit”, voltage detection, and so on).

For cabinet-mounted units, a → “Motor Module” can be used instead of the → “Active Line Module”.

Active Line Module

Regulated, self-commutating feed/feedback unit (with IGBTs in feed/feedback direction), which supplies a constant DC link voltage for the → “Motor Modules”.

Asynchronous motor

The asynchronous motor is an AC motor, which runs at a speed “lagging behind” the synchronous speed.

Asynchronous motors can be connected to the AC line both directly in a star or delta circuit and via a converter.

When combined with a converter, asynchronous motors form a “variable-speed drive system”.

Other commonly used terms: squirrel-cage motor, cage motor.

See also → “Synchronous motor”.

Basic infeed

Overall functionality of an infeed with → “Basic Line Module”, including the required additional components (filters, switching devices, etc.).

Basic Line Module

Unregulated line infeed unit (diode bridge or thyristor bridge, without feedback) for rectifying the line voltage for the DC link.

CompactFlash Card

Memory card for non-volatile storage of the drive software and corresponding parameters. The memory card can be plugged into the → “Control Unit” from the outside.

Control Unit

Central control module in which the closed-loop and open-loop control functions for one or more SINAMICS → “Line Modules” and/or → “Motor Modules” are implemented.

DC link

The component of the converter (or converter system) that connects the input converter (rectifier) and the output converter (one or more inverters).

With voltage source DC link converters like SINAMICS, a constant DC voltage is present in the DC link (rectified line voltage).

DRIVE-CLiQ

Abbreviation for “Drive Component Link with IQ”.

Communication system for connecting the various components of a SINAMICS drive system, e.g. → “Control Unit”, → “Line Modules”, → “Motor Modules”, motors and speed/position encoders.

In terms of hardware, DRIVE CLiQ is based on Standard Industrial Ethernet with twisted-pair cables. The DRIVE-CLiQ line provides the transmit and receive signals, as well as the +24 V power supply.

Field weakening

Field weakening describes the reducing of the magnetizing current of an electric motor in order that the speed can be increased further when the rated voltage is reached.

Kinetic buffering

Kinetic buffering (KIP) is a software function, which can be used to bridge transient line failures (up to approx. 1 s or as long as the drive continues to turn). Kinetic buffering can usually only be used on drives that are primarily motor-driven. It requires a sufficiently large centrifugal mass, i.e., sufficient kinetic energy, on the part of the mechanical transmission element. During the line failure, KIP switches the machine to no-load operation or light regeneration (in order to cover the minor losses from the motor and inverter). Once the line supply has been restored, the machine switches back to standard motor-driven operation.

In order to use kinetic buffering, the technological conditions must be in place to allow the motor to coast or brakes for the duration of the line failure. In some applications with multi-motor drives, the speed ratios between the individual drives have to be maintained during kinetic buffering, in order to prevent the web from tearing or damage. In such cases, kinetic buffering may only be activated on one of the drives (usually the main drive). The reduced speed setpoint values must then be fed into the overall setpoint cascade.

Line Module

A Line Module is a power component that generates the DC link voltage for one or more → “Motor Modules” from a 3-phase line voltage.

The following types of Line Module are used in the SINAMICS system:

→ “Basic Line Module” and → “Active Line Module”.

Overview (continued)

Motor Module

A Motor Module is a power unit (DC-AC inverter) that provides the power supply for the connected motor.

Power is supplied through the → "DC link" of the drive line-up.

A Motor Module must be connected to a → "Control Unit" housing the open-loop and closed-loop control functions for the Motor Module via → "DRIVE-CLiQ".

Non-Siemens motor

A motor is designated as a non-Siemens motor if its motor data is not known to the drive line-up, and it cannot be identified by means of its order number.

The motor data of an external motor is required for commissioning. It must be entered manually in the corresponding parameters.

Output reactor

Reactor (inductance) at the converter or inverter output for reducing the capacitive charge/discharge currents in long power cables.

PROFIBUS

Standardized field bus to IEC 61158, Sections 2 to 6.

PROFIdrive

PROFIBUS profile specified for speed and position-controlled drives by the PROFIBUS user organization (German: PNO).

The latest version is the PROFIdrive V3 profile.

Sensor Module

Hardware module for evaluating speed/position encoder signals.

Synchronous motor

Synchronous motors run at the same frequency with which they are operated: They do not have a slip (like → "Asynchronous motors"). Synchronous motors require different feedforward and feedback control concepts depending on their design to ensure that they can be operated with converters.

Synchronous motors are distinguished by the following features:

- permanent-field/separately excited
- with/without damping cage
- with/without position encoder.

Synchronous motors are used for different reasons:

- high drive dynamic response
- high overload capability
- high speed accuracy with exactly specified frequency (SIEMOSYN motors).

Terminal Module

Terminal extension module for snapping onto the installation rail, for installation in the control cabinet.

In SINAMICS, Terminal Module TM31 is available with analog and digital I/O terminals.

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