Catalog News D 11.1 N • May 2006

sinamics

SINAMICS G120
Inverter Chassis Units
0.37 kW to 90 kW

SIEMENS

Related catalogs

SINAMICS G110 D 11.1
Inverter Chassis Units
0.12 kW to 3 kW

Order No.:
German: E86060-K5511-A111-A2
English: E86060-K5511-A111-A2-7600

SINAMICS G130 D 11
Drive Converter Chassis Units
SINAMICS G150
Drive Converter Cabinet Units
Order No.:
German: E86060-K5511-A101-A3
English: E86060-K5511-A101-A3-7600

MICROMASTER DA 51.2
MICROMASTER 410/420/430/440
Inverters
0.12 kW to 250 kW
Order No.:
German: E86060-K5151-A121-A5
English: E86060-K5151-A121-A5-7600

MICROMASTER/COMBIMASTER DA 51.3
MICROMASTER 411 Inverters
COMBIMASTER 411 Distributed
Drive Solutions
Order No.:
German: E86060-K5251-A131-A2
English: E86060-K5251-A131-A2-7600

Low-Voltage Motors D 81.1
IEC Squirrel-Cage Motors
Frame sizes 56 to 450

Order No.:
German: E86060-K5581-A111-A1
English: E86060-K5581-A111-A1-7600

Geared motors M 15
Helical, Flat, Bevel-helical,
Helical-worm and
Worm Geared Motors
Order No.:
E86060-K1715-A101-A5
(available in German only)

Geared motors M 15
The catalog can be downloaded News
from the Internet at:

http://www.siemens.com/gearedmotors

AC NEMA & IEC Motors D 81.2
Further details available on the U.S./
Internet at: Canada

http://www.sea.siemens.com/motors

Catalog CA 01 CA 01
The Offline Mall of Automation
and Drives
Order No.:
CD-ROM: E86060-D4001-A110-C4-7600
DVD: E86060-D4001-A510-C4-7600

A&D Mall

Internet:
http://www.siemens.com/automation/mall

Additional documentation

You will find all information material, such as brochures, catalogues, manuals and operating instructions for standard drive systems up-to-date on the Internet at the address

http://www.siemens.com/motors

You can order the listed documentation or download it in common file formats (PDF, ZIP).

Catalog CA 01 – SD configurator selection aid

The **SD configurator selection aid** is available in combination with the CA 01 electronic catalog.

On CD 2 of the selection and configuring aids, you will find the SD configurator for low-voltage motors, inverters MICROMASTER 4, SINAMICS G110 and SINAMICS G120 inverter chassis units and frequency converters for distributed I/Os SIMATIC ET 200S FC including:

- Dimension drawing generator for motors
- Data sheet generator for motors and inverters
- Starting calculation
- 3D models in .stp format
- Extensive documentation

Hardware and software requirements

- PC with 500 MHz CPU or faster
- Operating systems
  – Windows 98/ME
  – Windows 2000
  – Windows XP
  – Windows NT 4.0
    (Service Pack 6 or higher)
- Internet Explorer 5.5 or higher
- 256 MB work memory (minimum)
- Screen resolution 800 x 600 pixels or higher (1024 x 768) recommended
- Small fonts
- 150 MB spare hard disk space (after installation)
- CD-ROM drive
- Windows-compatible sound card
- Windows-compatible mouse

Installation

You can install this catalog directly from the CD-ROM as a complete or partial version on your hard disk or in the network.

SINAMICS G120 Inverter Chassis Units 0.37 kW to 90 kW

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The products contained in this catalog are also part of the CA 01 Catalog

Please contact your Siemens branch office for further information

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 (Certificate Registration No. DE-000357 QM) and DIN EN ISO 14001 (Certificate Registration No. 0813420 UM and EMS 57390).
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.

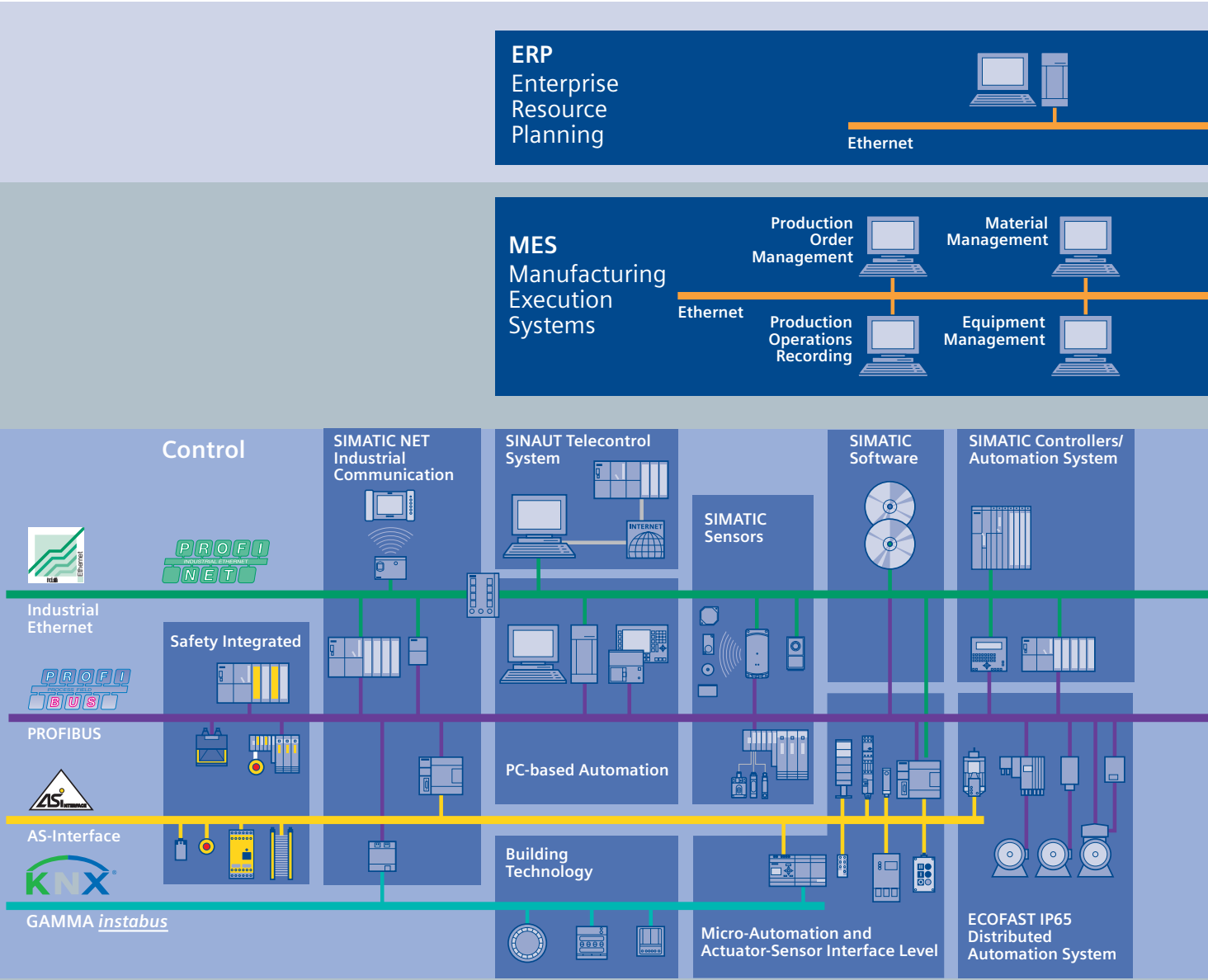
They will be glad to assist you.

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.

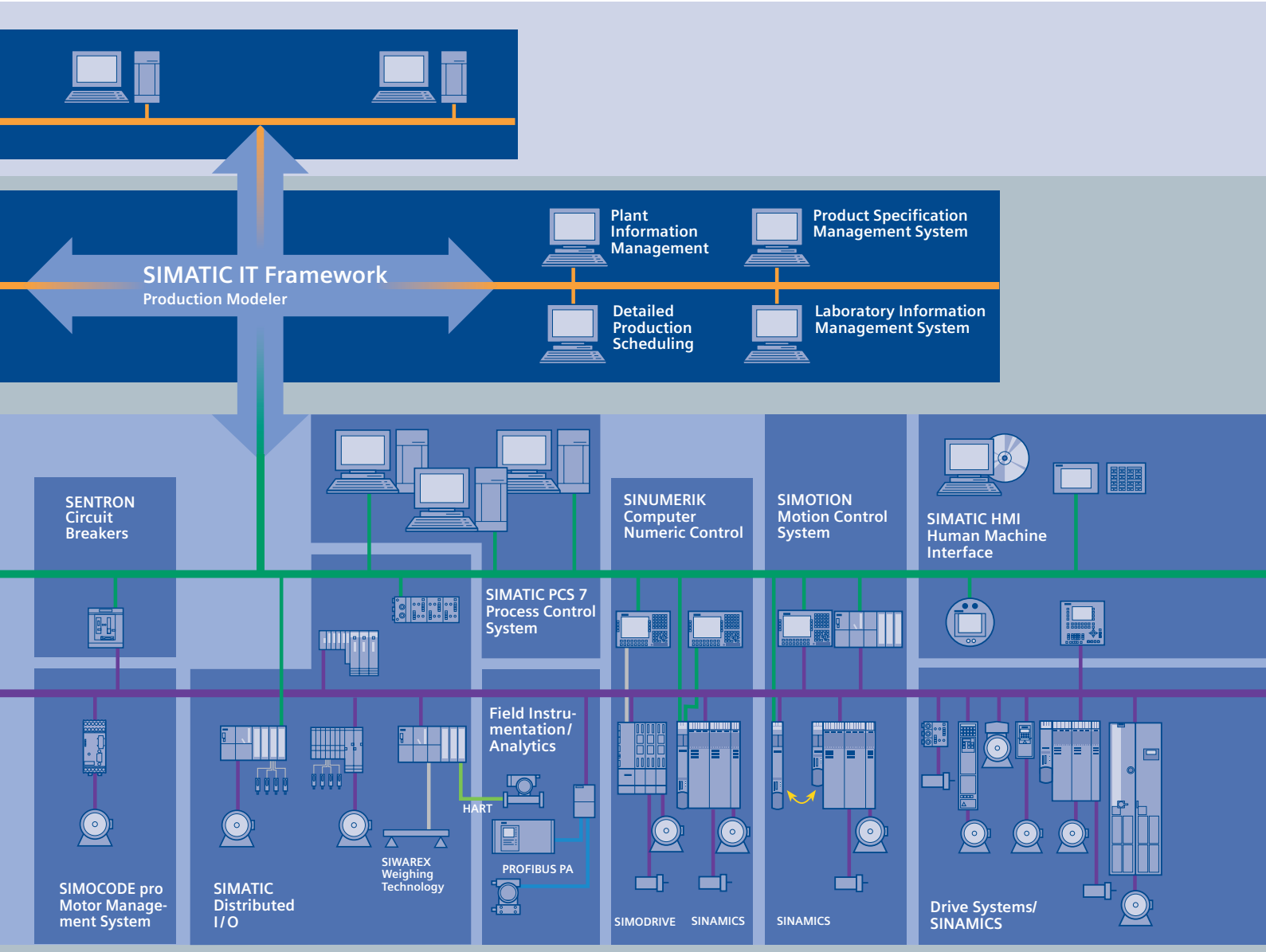
Whether your industry is process- and production-oriented or a hybrid, Totally Integrated Automation is a unique "common solution" platform that covers all the sectors.

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

Application range of the SINAMICS drive family

Application

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 single 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

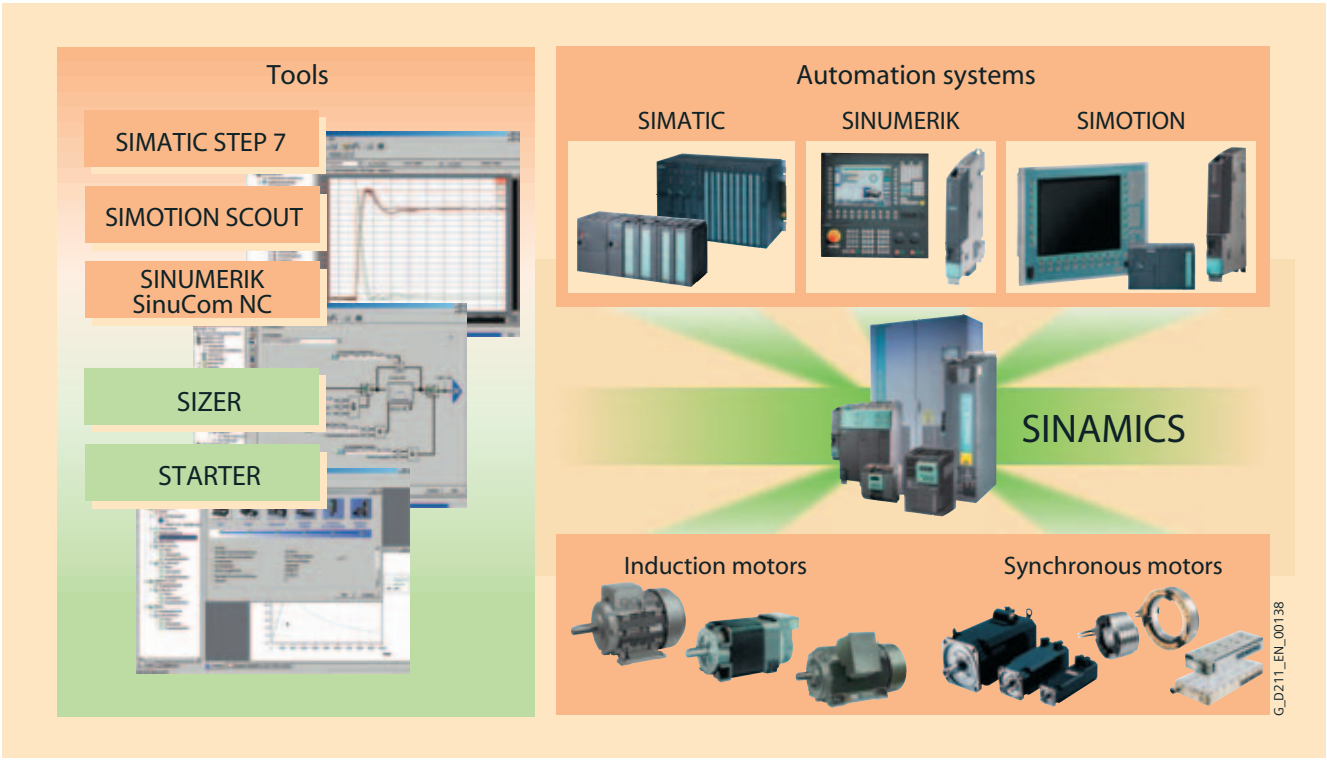
Depending on the application, the SINAMICS range offers the ideal version for any drive task.

- SINAMICS G is designed for standard applications with asynchronous (induction) 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 (induction) 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. Common 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, SIMOTION and SINUMERIK control systems.



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.

Suitable for global use

SINAMICS meets the requirements of relevant international standards and regulations – from the EN standards through IEC standards to UL and cULus regulations.

The SINAMICS drive family

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

Low-voltage inverters (line supply <1000 V)

- SINAMICS G110 – the versatile drive for low power ranges
- SINAMICS G120 – the modular single drive for low to medium 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

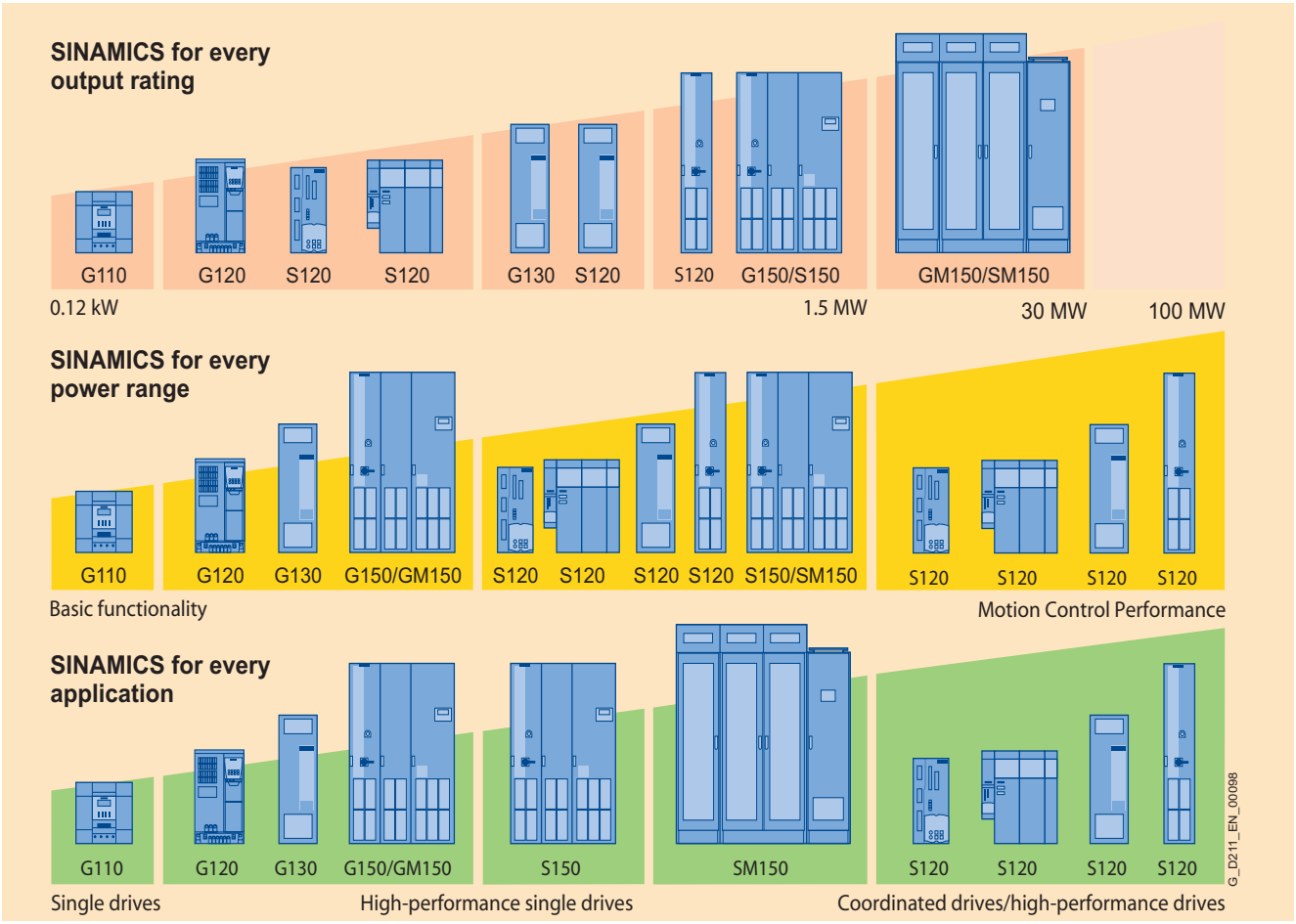
Medium-voltage inverters (line supply >1000 V)

- SINAMICS GM150 – the universal drive solution for single drives in the medium voltage range
- SINAMICS SM150 – the advanced drive solution for single and multi-motor drives in the medium voltage range

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

SINAMICS ...


SINAMICS for every output rating
G110
G120
S120
S120
G130
S120
S120
G150/S150
GM150/SM150
0.12 kW
1.5 MW
30 MW
100 MW
SINAMICS for every power range
G110
G120
G130
G150/GM150
S120
S120
S120
S120
S150/SM150
S120
S120
S120
S120
Basic functionality
Motion Control Performance
SINAMICS for every application
G110
G120
G130
G150/GM150
S150
SM150
S120
S120
S120
S120
Single drives
High-performance single drives
Coordinated drives/high-performance drives
G_D211_EN_00098

The members of the SINAMICS family

SINAMICS Low-voltage inverters

SINAMICS G110	SINAMICS G120	SINAMICS G130/G150	SINAMICS S120
			
The versatile drive for low power ranges	***The modular single drive for low to medium power ranges***	***The universal drive solution for high-performance single drives***	***The flexible, modular drive system for complex drive tasks***
Main applications			
• Machines and plants for industrial and commercial applications	• Machines and plants for industrial and commercial applications (mechanical engineering, automotive, textiles, chemicals, printing, steel)	• Machines and plants in the process and production industry, water/waste, power stations, oil and gas, petrochemicals, chemical raw materials, paper, cement, stone, steel	• Machines and plants for industrial applications (packaging, plastics, textile, printing, wood, glass, ceramics, presses, paper, lifting equipment, semiconductors, automated assembly and testing equipment, handling)
Application examples			
• Pumps and fans • Auxiliary drives • Conveyor belts • Billboards • Door/gate operating mechanisms • Centrifuges	• Pumps and fans • Compressors • Conveyor belts	• Pumps and fans • Compressors • Extruders and mixers • Mills	• Motion Control applications (e.g. positioning, synchronous operation, …) • Technological applications
Benefits			
• Compact • Flexible adaptation to different applications • Simple, fast commissioning • Clear terminal layout • Optimum interaction with SIMATIC and LOGO!	• Modular • Flexible expansion capability • Simple, fast commissioning • Regenerative feedback • Innovative cooling concept • Optimum interaction with SIMOTION and LOGO! • SINAMICS Safety Integrated	• 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 • Scalable infeed/regenerative feedback concept • Wide range of motors • Optimum interaction with SIMOTION and SIMATIC • SINAMICS Safety Integrated

	SINAMICS Medium-voltage inverters	
SINAMICS S150	**SINAMICS GM150**	**SINAMICS SM150**
		
The advanced drive solution for high-performance single drives	***The drive solution for variable-speed drives***	***The drive solution for high-performance variable-speed single and multi-motor drives***
Main applications		
• Machines and plants in the process and production industry, food, beverages and tobacco, automotive and steel industry, mining/open-cast mining, shipbuilding, lifting equipment/ conveyors	• Machines and plants in the process industry	• Machines and plants, e.g. steel manufacture and mining
Application examples		
• Test bay drives • Centrifuges • Elevators and cranes • Cross cutters and shears • Conveyor belts • Presses • Cable winches	• Pumps and fans • Compressors • Extruders and mixers • Mills • Marine drives	• Rolling mills • Mine cages • Test stands • Conveyor belts
Benefits		
• Four-quadrant operation as standard • High control accuracy and dynamic response • Almost no system perturbation, well below THD values in accordance with IEEE 519 • Tolerant to fluctuations in line voltage • Option of power factor compensation • Simple, fast commissioning • Ready-to-connect cabinet unit • Optimum interaction with SIMATIC	• Space-saving • Simple, fast commissioning • Ready-to-connect cabinet unit • Optimum interaction with SIMATIC	• Four-quadrant operation as standard • High efficiency and motor-friendly operation • High level of control accuracy and dynamic response • Almost no line harmonic distortions • Option of power factor compensation • Simple, fast commissioning • Ready-to-connect cabinet unit • Optimum interaction with SIMATIC

SINAMICS G120 – The modular single drive for low to medium power ranges

Overview

The new SINAMICS G120 frequency inverter has a modular structure (Power Module with Control Unit and BOP) and features numerous innovative functions, e.g. for safety (Safety Integrated), communication capability and energy recovery. With its various device versions (frame sizes FSA to FSF) in the power range of 0.37 kW to 90 kW it is suitable for a wide range of drive solutions.

Benefits

- Flexibility due to modularity. For a drive concept designed for the future - each innovative step can be performed simultaneously in the same system.
- The safety functions make it easier for drives to be installed in safety-oriented, integrated automation and drive environments.
- Communication capability via PROFIBUS
- Increased ruggedness due to innovatice cooling concept and paint finish of the electronic modules (longer service life)
- Engineering and commissioning with standard tools SIZER and STARTER
- Simple device replacement and parameter cloning with optional and pre-installed MMC card
- Low-noise motor operation due to high pulse frequency
- Compact, small design
- Worldwide certifiation: in UL and CE, Safety Integrated (IEC 61508/SIL2)

Application

SINAMICS G120 is ideal

- as a universal drive in all industrial and commercial applications
- in the automotive, textiles, printing and chemical industries
- for end-to-end applications, e.g. in conveyor systems

Design

The SINAMICS G120 is a modular frequency inverter for standard drives. Each SINAMICS G120 comprises two operative units - the Power Module (PM) and the Control Unit (CU). For parameterization, operation and monitoring, a Basic Operator Panel (BOP) is available or via interface the STARTER commissioning software.

Different Control Units and Power Modules can be combined to create application and cost-optimized drive solutions. All Power Modules are suitable for use in safety-related applications. In connection with a Safety Control Unit, the drive becomes a Safety Integrated Drive. This features a fails-safe closed-loop control function for induction motors in different control modes (*V/f*, FCC, Vector Control with and without encoder).

Technical data

Electrical data	
Line voltages; power ranges	380 to 480 V 3 AC, ±10%; 0.37 to 90 kW
Network types	IT, TN, TT
Line frequency	50 Hz/60 Hz
Output frequency	0 to 650 Hz
Control methods	• *V/f* control, linear (*M*~*n*) • *V/f* control, quadratic (*M*~n^2) • *V/f* control, parameterizable • Sensorless Vector Control • Vector Control with encoder (closed-loop control circuit) • Torque control
Fixed frequencies	16, parameterizable
Digital inputs	Up to 9 digital inputs, depending on the Control Unit, for fail-safe versions 2 fail-safe digital inputs, 24 V DC
Analog version: analog input	2 analog inputs, scalable from 0 to 10 V
Digital outputs	3 digital outputs
Communication interfaces	RS485/USS (CU240S/CU240E – both available soon); PROFIBUS (CU240S DP);
	PROFIsafe (CU240S DP-F); PROFINET (CU240S PN – available soon)
Functions	
Software functions	• Torque control, flying restart, slip compensation, automatic restart after interruption of operation due to power failure, free function blocks for logical and arithmetic operations • Signal interconnection with BICO technology • Kinetic buffering, positioning deceleration ramp • Simple process control with internal high-quality PID controller • Parameterizable ramp-up times 0 to 650 s, ramp smoothing • Compund braking for controlled rapid deceleration • 3 switchable motor data sets
Protection functions	Undervoltage, overvoltage, ground fault, stall protection, thermal motor protection I^2t, inverter overtemperature, motor overtemperature
Safety Integrated function	Yes
Connectable motors	Induction motors
Mechanical data	
Degree of protection	IP20
Cooling method	Innovative cooling concept; cooling of power electronics via heat sinks with external fan; open-loop and closed-loop control electronics cooled by convection
Standards	
Compliance with standards	CE, UL, cUL, C-tick, Safety Integrated IEC 61508/SIL2

Notes

SINAMICS G120
Inverter chassis units

2

SINAMICS G120 chassis units 0.37 kW to 90 kW

Overview

The new SINAMICS G120 series of frequency inverters is designed to provide precise and cost-effective speed/torque control of AC motors.

With different device versions (frame sizes FSA to FSF) in the power range of 0.37 kW to 90 kW, it is suitable for a wide variety of drive solutions.

Examples of SINAMICS G120, frame sizes FSA, FSB and FSC; each with Power Module, Control Unit and Basic Operator Panel

Examples of SINAMICS G120, frame sizes FSD, FSE and FSF; each with Power Module, Control Unit and Basic Operator Panel

Overview (continued)

Modularity

SINAMICS G120 is a modular converter system comprising a variety of functional units. The two main units are

- Control Unit (CU)
- Power Module (PM)

The Control Unit controls and monitors the Power Module and the connected motor in several different modes. It supports communication with a local or central control and with monitoring equipment or input/output terminals for a direct control function.

The Power Module supplies the motor in the power range 0.37 kW to 90 kW. The Power Module is controlled by a microprocessor in the Control Unit. State-of-the-art IGBT technology with pulse-width-modulated motor voltage and selectable pulse frequency is applied to achieve extremely reliable, flexible motor operation. An extensive range of protective functions afford a high degree of motor protection.

Furthermore, a large number of additional components are available, such as:

- Basic Operator Panel (BOP) for parameterization, diagnostics, control and copying of drive parameters
- Line filter classes A and B
- Line reactors
- Braking resistors
- Output reactors

Safety Integrated

The SINAMICS G120 inverter chassis units include versions for safety-oriented applications. All Power Modules are designed as intrinsically failsafe. A Safety Integrated Drive can be created by combining a Power Module with the relevant Failsafe Control Unit.

The SINAMICS G120 fail-safe frequency inverter provides four safety functions, certified in accordance with EN 954-1, Cat. 3 and IEC 61508 SIL 2:

- Safe stop 1 (SS1)
- Safely limited speed (SLS)
- Safe brake control (SBC)
- Safe torque off (STO)

Innovative cooling concept and paint finish of electronic modules

Significant increase in service life or useful life is achieved by the innovative cooling system and paint finish of the electronic modules. These features are based on the following principles:

- Disposal of all heat losses via an external heat sink
- Electronic modules not located in air duct
- Standardized convection cooling of Control Unit
- All cooling air is directed through the heat sink

STARTER drive/commissioning software

The STARTER drive/commissioning software supports the commissioning and maintenance of SINAMICS G120 inverters. It provides operator guidance designed to simplify and speed up commissioning, combined with comprehensive, user-friendly functions for the relevant drive solution.

Benefits

- Modularity ensures flexibility for an advanced drive concept
  - Each innovative step of a component can improve the existing drive system
  - Tailored to the customer, selectable and scalable
  - Only the required functions are purchased
  - Module replacement under voltage possible (hot swap)
  - Pluggable terminals
  - The modules can be easily replaced, which makes the system extremely service-friendly
- The safety functions make it easier to integrate drives into safety-oriented machines or plants
- Communication capability via PROFIBUS with PROFIdrive Profil 4.0
  - Reduced number of interfaces
  - Plant-wide engineering
  - Easy to handle
- Increased ruggedness due to innovative cooling concept and paint finish of the electronic modules
- Simple device replacement and time-saving parameter cloning with optional Basic Operator Panel or optional MMC memory card
- Low-noise motor operation due to high pulse frequency
- Compact, space-saving design
- Software parameters for easy adaptation to 50 Hz or 60 Hz motors (IEC or NEMA motors)
- 2/3-wire method (static/pulsed signals) for universal control via digital inputs
- Engineering and commissioning with standard engineering tools such as SIZER, STARTER and Drive ES: ensures fast configuration and easy commissioning – with Drive ES Basic STARTER is integrated into STEP 7 resulting in centralized data storage and continuous communication
- Worldwide certification in accordance with CE, UL, cUL, c-tick and Safety Integrated in accordance with IEC 61508 SIL 2

Application

SINAMICS G120 is ideal

- as a universal drive in all industrial and commercial applications
- in the automotive, textiles, printing and chemical industries
- for end-to-end applications, e.g. in conveyor systems

Design

The SINAMICS G120 inverter chassis units are modular frequency inverters for standard drives. Each SINAMICS G120 comprises two operative units – the Power Module and Control Unit.

Power Modules

The following Power Modules are available for SINAMICS G120 inverter chassis units:

PM240 Power Modules

PM240 Power Modules feature an integrated brake chopper and are designed for drives without energy recovery. Generator energy produced during braking is converted to heat via externally connected braking resistors.

PM250 Power Modules (available soon)

PM250 Power Modules use an innovative circuit design which allows line-commutated energy recovery to the supply. This innovative circuit permits generator energy to be fed back into the supply system and therefore saves energy.

Design (continued)

Control Units

The following Control Units and an MMC memory card are available as accessories for SINAMICS G120 inverter chassis units:

CU240 Control Units

The Control Unit performs closed-loop control functions for the inverter. In addition to control functions, the Control Unit can also perform other tasks which can be adapted to the relevant application by parameterization. Several versions of Control Units are available:

- CU240S DP
- CU240S DP-F
- CU240S PN (available soon)
- CU240S (available soon)
- CU240E (available soon)

MMC memory card

The parameter settings for a converter are stored on the MMC memory card. When the plant is serviced, it is immediately ready for use again after, for example, replacement of the frequency inverter and transfer of the memory card data. The respective slot is located at the top of the Control Unit.

There is also a large number of components available for expanding the system, e.g. line-side power components, DC link components, load-side power components and supplementary system components.

Line-side power components

The following line-side power components are available for SINAMICS G120 inverter chassis units:

Line filters

The PM240 Power Module complies with a higher radio interference class with one of the additional line filters.

Line reactors

A line reactor is needed for high system fault levels, partly to protect the actual inverter against excessive harmonic currents, and thus against overload, and partly to limit the line harmonic distortions to the permitted values.

Recommended line components

This is a recommendation for further line-side components, such as fuses and circuit-breakers (line-side components must be dimensioned in accordance with IEC standards). Further information on the listed fuses and circuit-breakers can be found in Catalogs LV 1 and LV 1 T.

DC link components

The following DC link components are available for SINAMICS G120 inverter chassis units:

Braking resistors

Excess power in the DC link is dissipated via the braking resistor. The braking resistors are designed for use with PM240 Power Modules. These feature an integrated brake chopper (electronic switch).

Load-side power components

The following load-side power components are available for SINAMICS G120 inverter chassis units. During operation with an output reactor or a LC filter or sinusoidal filter, shielded motor cable lengths are possible and the motor service life is increased:

Output reactors

Output reactors reduce the voltage loading on the motor windings. At the same time, the capacitive charge/discharge currents, which place an additional load on the power section when long motor cables are used, are reduced.

LC filter and sinusoidal filter (available soon)

The LC filter/sinusoidal filter limits the rate of rise of voltage and the capacitive charge/discharge currents which usually occur with inverter operation. It is therefore not necessary to use an output reactor.

Availability as base components

The following line-side power components, DC link components and load-side power components are designed as base components in the corresponding frame sizes:

	Size					
	FSA	FSB	FSC	FSD	FSE	FSF
Line-side power components						
Line filter class A	✓					
Line filter class B	✓	✓	✓			
Line reactors	✓	✓	✓	✓	✓	
DC link components						
Braking resistors	✓	✓				
Load-side power components						
Output reactors	✓	✓	✓			

Supplementary system components

The following supplementary system components are available for SINAMICS G120 inverter chassis units:

BOP Basic Operator Panel

The BOP Basic Operator Panel can be plugged onto the Control Unit and can be used to commission drives, monitor drives in operation and input individual parameter settings. The BOP also provides a function for quick copying of parameters.

PC-inverter connection kit

For controlling and commissioning a converter directly from a PC if the appropriate software (STARTER) has been installed.
The STARTER commissioning tool is supplied on CD-ROM in the scope of supply of the PC-inverter connection kit.

Brake Relay

The Brake Relay allows the Power Module to be connected to an electromechanical motor brake, thereby allowing the motor brake to be driven directly by the Control Unit.

Safe Brake Relay

The Safe Brake Relay allows the Power Module to be connected to an electromechanical motor brake, allowing the brake to be directly and safely controlled by the Control Unit in accordance with EN 954-1, safety category 3 and IEC 61508 SIL 2.

Design (continued)

Adapter for mounting on DIN rail

The adapter for DIN rail mounting can be used to mount inverters of frame size A and B on DIN rails (2 units with a center-to-center distance of 100 mm).

Screen termination kit

The screen termination kit makes it easier to bond the shields of supply and control cables, offers mechanical strain relief and thus ensures optimum EMC performance.

NEMA1 kit (available soon)

The SINAMICS G120 inverter chassis units are designed to comply with type "UL OPEN". The NEMA1 kit is required to obtain a type 1 NEMA housing compliant with NEMA1 directives (NEMA 250-2003).

Configuration

The following electronic configuration and engineering tools are available for SINAMICS G120 inverter chassis units:

SD configurator selection aid within the CA 01

The interactive catalog CA 01 – the offline mall of Siemens Automation and Drives (A&D) – contains over 100000 products with approximately 5 million potential drive system product variants. The SD configurator has been developed to facilitate selection of the correct motor and/or inverter from the wide spectrum of A&D SD products. The configurator is integrated in this catalog with the selection and configuration tools as a "selection aid" on CD 2 "Configuring".

SIZER configuration tool

The SIZER PC tool provides an easy-to-use means of configuring the SINAMICS and MICROMASTER 4 drive family. It provides support when setting up the technologies involved in the hardware and firmware components required for a drive task. SIZER supports the complete configuration of the drive system, from simple single drives to complex multi-axis applications.

STARTER drive/commissioning software

The STARTER drive/commissioning software provides menu-guided assistance with commissioning, optimization and diagnostics. STARTER is not only designed for use on SINAMICS drives but also for MICROMASTER4 units and SIMATIC ET 200S FC frequency inverter for distributed I/Os.

Drive ES engineering system

Drive ES is the engineering system used to integrate Siemens drive technology into the SIMATIC automation world easily, efficiently and cost-effectively in terms of communication, configuration and data management. The STEP 7 Manager user interface provides the basis for this procedure. A variety of software packages, i.e. Drive ES Basic, Drive ES SIMATIC and Drive ES PCS 7, is available for SINAMICS.

Technical data

Unless explicitly specified otherwise, the following technical data are valid for all the following components of the SINAMICS G120 inverter chassis unit.

Mechanical data	
Vibratory load	
• Transport [1]	Class 2M3 in acc. with EN 60068-2-6
• Operation	Class 3M4 in acc. with EN 60068-2-6 10 Hz to 58 Hz: constant deflection 0.075 mm 58 Hz to 200 Hz: constant acceleration = 9.81 m/s^2 (1 *g*)
Shock load	
• Transport [1]	Class 2M2 in acc. with EN 60068-2-27
• Operation	Class 3M4 in acc. with EN 60068-2-27 49 m/s^2 (5 *g*)/30 ms
Ambient conditions	
Protection class	Class I (with protective conductor system) and class III (PELV) in acc. with EN 61800-5-1
Shock protection	in acc. with EN 61800-5-1 when used properly
Permissible ambient and coolant temperature (air) during operation for line-side power components and Power Modules	0 °C to +40 °C without derating, > 40 °C to +55 °C see derating characteristics
Permissible ambient and coolant temperature (air) during operation for Control Units, supplementary system components and DC link components	0 °C to +50 °C with CU240S DP-F: 0 °C to +45 °C up to 2000 m above sea level
Standards	
Compliance with standards	UL, cUL, CE, c-tick
CE mark	in accordance with Low-Voltage Directive 73/23/EEC and Machinery Directive 98/37/EC
EMC directive	
• Frame sizes FSB to FSF with integrated line filter class A	Category C2 [2] in acc. with EN 61800-3 or class A in acc. with EN 55011
• Frame size FSA without integrated line filter and with additional line filter class A	Category C2 [2] in acc. with EN 61800-3 or class A in acc. with EN 55011
• Frame size FSA with additional line filter class A and with additional line filter class B	Category C2 [2] in acc. with EN 61800-3 or class B in acc. with EN 55011
• Frame sizes FSB and FSC with integrated line filter class A and with additional line filter class B	Category C2 [2] in acc. with EN 61800-3 or class B in acc. with EN 55011

Note:
The EMC product standard EN 61800-3 does not directly refer to a frequency inverter, but to a PDS (Power Drive System), that covers beside the inverter the whole circuiting as well as the motor and cables. The inverters themselves are in general not subject to marking in accordance with the EMC directive.

1) In transport packaging.

2) With shielded motor cable up to 25 m.

CU240 Control Units

Overview

Example of CU240S DP-F Control Unit

The Control Unit performs closed-loop control functions for the inverter. In addition to control functions, the Control Unit can also perform other tasks which can be adapted to the relevant application by parameterization. Several versions of Control Units are available:

- CU240S DP
- CU240S DP-F

Design

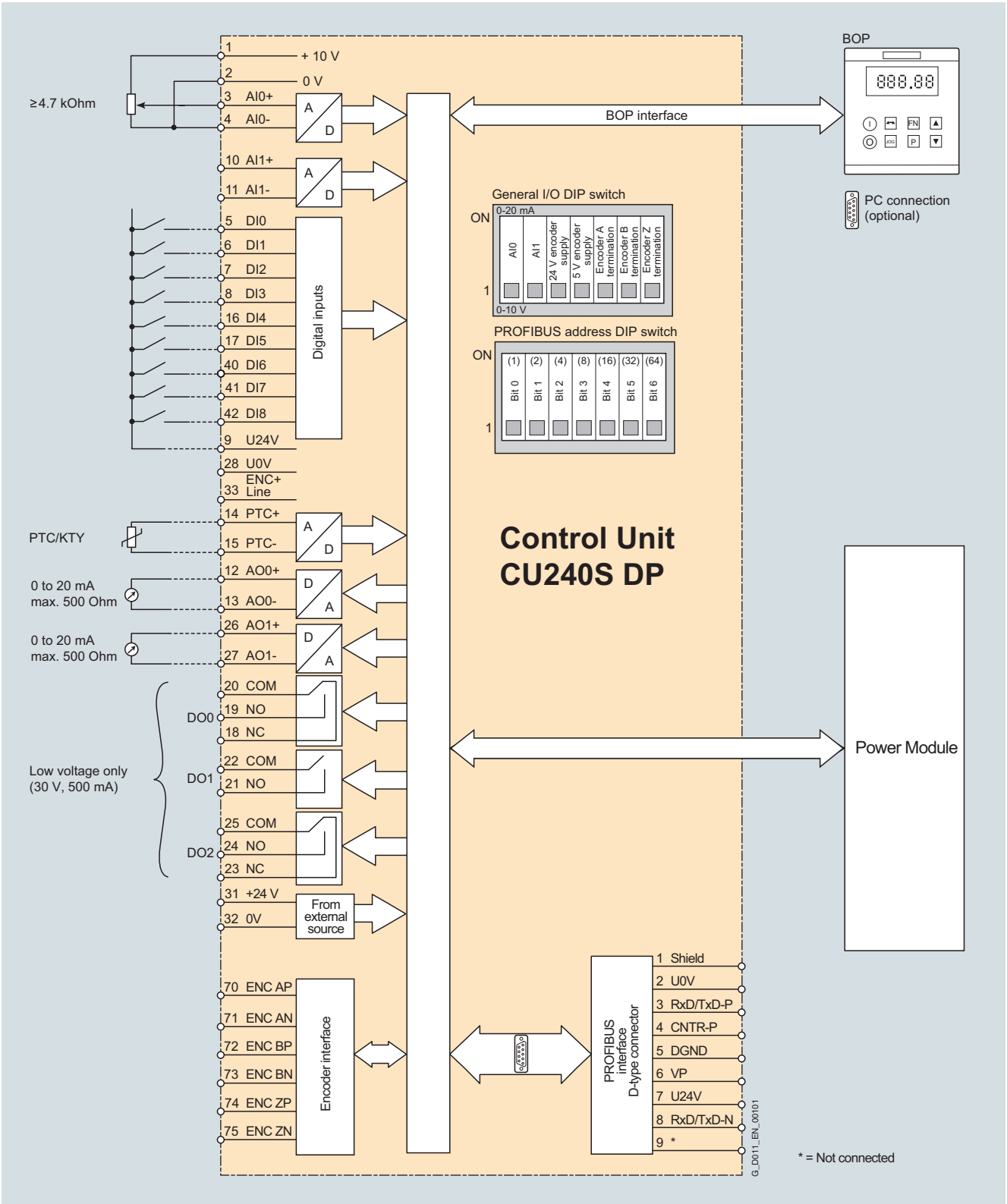
Example of Control Unit CU240S DP without terminal cover, with pluggable terminals

Terminal No.	Signal	Features
Digital inputs (DI) – standard		
5 to 8, 16, 17	DI0 to DI5	Freely programmable (isolated) 5.5 mA/24 V
40 to 42 (for CU240S DP only)	DI6 to DI8	Freely programmable (isolated) 5.5 mA/24 V
Digital inputs (DI) – failsafe (for CU240S DP-F only)		
60 to 64 (for CU240S DP-F only)	FDI0A FDI0B FDI1A FDI1B	Failsafe digital inputs, 2 channels (redundant), freely programmable (isolated) 5.5 mA/24 V
Digital outputs (DO)		
18	DO0, NC	Relay output 1 NC contact (0.5 A, 30 V DC)
19	DO0, NO	Relay output 1 NO contact (0.5 A, 30 V DC)
20	DO0, COM	Relay output 1 Common contact (0.5 A, 30 V DC)
21	DO1, NO	Relay output 2 NO contact (0.5 A, 30 V DC)
22	DO1, COM	Relay output 2 Common contact (0.5 A, 30 V DC)
23	DO2, NC	Relay output 3 NC contact (0.5 A, 30 V DC)
24	DO2, NO	Relay output 3 NO contact (0.5 A, 30 V DC)
25	DO2, COM	Relay output 3 Common contact (0.5 A, 30 V DC)

Terminal No.	Signal	Features
Analog inputs (AI)		
3	AI0+	0 V to 10 V, –10 V to +10 V, 0/2 V to 10 V or 0/4 mA to 20 mA
4	AI0–	
10	AI1+	0 V to 10 V, 0 mA to 20 mA
11	AI1–	
Analog outputs (AO)		
12	AO0+	Freely programmable (0/4 mA to 20 mA, 0/2 V to 10 V with 500 W load)
13	AO0–	M
26	AO1+	Freely programmable (0/4 mA to 20 mA with 500 W load)
27	AO1–	M
Encoder interfaces		
70	ENC AP	Encoder AP – channel A non-negating input
71	ENC AN	Encoder AN – channel A negating input
72	ENC BP	Encoder BP – channel B non-negating input
73	ENC BN	Encoder BN – channel B negating input
74	ENC ZP	Encoder ZP – zero pulse non-negating input
75	ENC ZN	Encoder ZN – zero pulse negating input
PTC/KTY interface		
14	PTC+	Positive PTC/KTY input
15	PTC-	Negative PTC/KTY input
Power supply		
33	ENC+ supply	Isolated encoder power supply (+24 V with 100 mA, +5 V with 300 mA or > 30 V input by user), configured using DIP switches
9	U 24 V	Isolated user power supply +24 V with 100 mA
28	U 0 V	Isolated encoder power supply and user reference voltage
1	+ 10 V	Non-isolated, stabilized 10 V power supply for I/O – max. 10 mA
2	0 V	Power supply reference
31	+ 24 V	24 V power supply input
32	0 V	24 V power supply reference

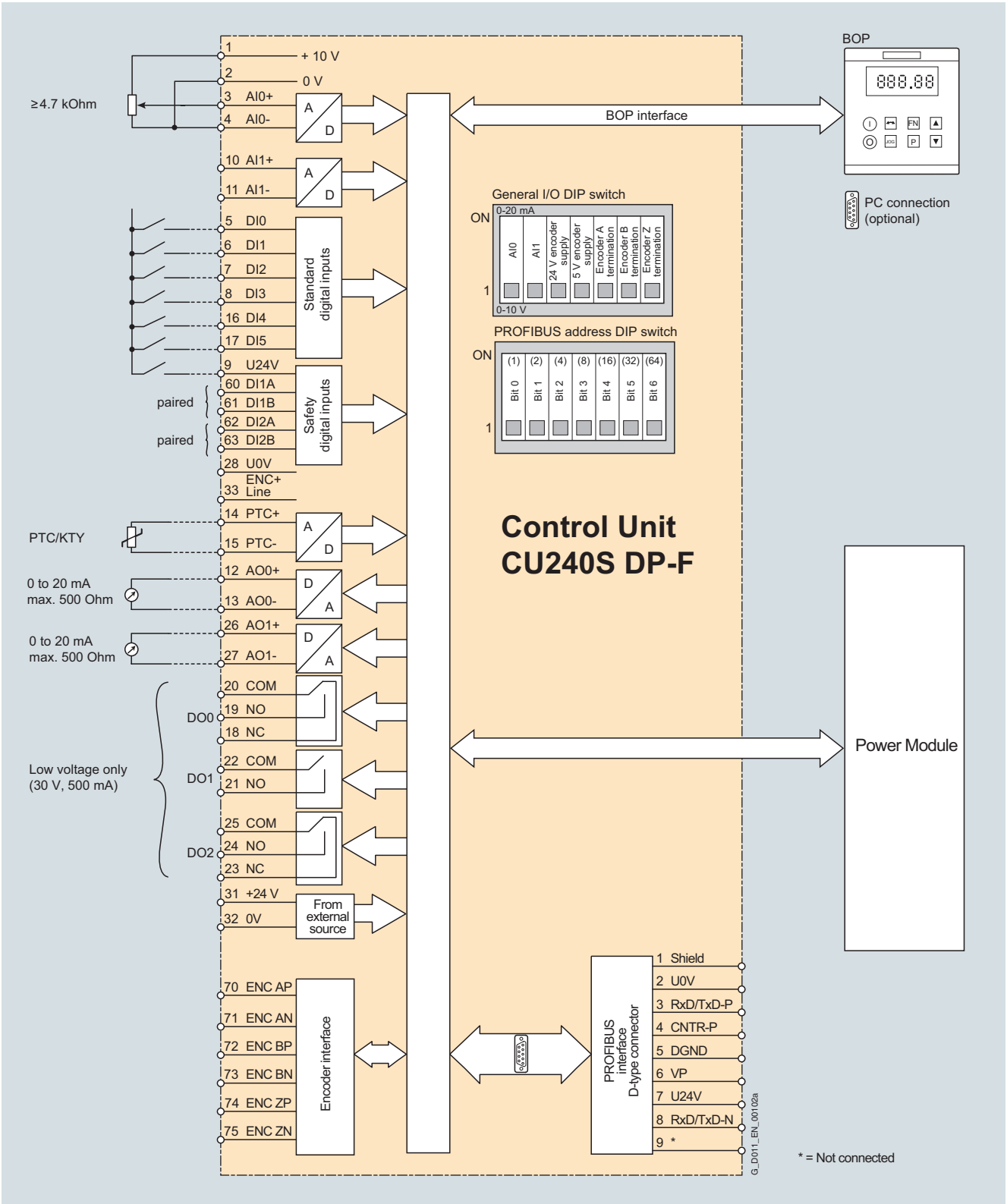
CU240 Control Units

Integration



Connection diagram CU240S DP Control Unit

Integration (continued)



Connection diagram CU240S DP-F Control Unit

CU240 Control Units

Technical data

	CU240S DP Control Unit 6SL3244-0BA20-1PA0	CU240S DP-F Control Unit 6SL3244-0BA21-1PA0
Electrical data		
Operating voltage	24 V DC via the Power Module or an external 24 V DC supply	24 V DC via the Power Module or an external 24 V DC supply
Interfaces		
Digital inputs – standard	9	6
Digital inputs – failsafe	–	2
Digital outputs	3	3
Analog inputs	2	2
	Both analog inputs can be configured as supplementary digital inputs if an additional function is required. Switching thresholds: 0 → 1: Rated voltage 2 V 1 → 0: Rated voltage 0.8 V Analog inputs are protected against inputs in a voltage range of ±30 V and have a common-mode voltage in the ±15 V range.	
Analog outputs	2	2
	Analog outputs have short-circuit protection, but are not isolated. Maximum output voltage = 10 V in current mode, maximum output current = 20 mA in voltage mode. The reaction time should equal approximately 1 ms with a load of maximum 10 kΩ in voltage mode.	
Bus interface	PROFIBUS DP	PROFIBUS DP, PROFIsafe
Encoder interfaces	1	1
PTC/KTY interface	✓	✓
Brake Relay interface or Safe Brake Relay interface (connection via Power Module)	✓	✓
MMC memory card slot	✓	✓
RS232/USS interface (connection via PC-inverter connection kit)	✓	✓
Safety functions		
Integrated safety functions in accordance with Category 3 of EN 954-1 or in accordance with SIL2 of IEC 61508	–	• Safe Stop 1 – SS1 • Safely limited speed – SLS • Safe brake control – SBC • Safe torque off – STO
Open-loop and closed-loop control functions		
V/f linear/quadratic/parameterizable	✓	✓
V/f with flux current control (FCC)	✓	✓
Vector Control, without encoder	✓	✓
Vector Control with encoder	✓	✓
Torque control, without encoder	✓	✓
Torque control with encoder	✓	✓

Technical data (continued)

	CU240S DP Control Unit 6SL3244-0BA20-1PA0	CU240S DP-F Control Unit 6SL3244-0BA21-1PA0
Software functions		
Fixed frequencies	16, parameterizable	16, parameterizable
Signal interconnection with BICO technology	✓	✓
Automatic restart after line failure or operation fault	✓	✓
Positioning deceleration ramp	✓	✓
Slip compensation	✓	✓
Free function blocks for logical and arithmetic operations	✓	✓
Kinetic buffering	✓	✓
Ramp smoothing	✓	✓
3 switchable drive data sets	✓	✓
3 switchable command data sets (CDS) (manual/automatic)	✓	✓
Flying restart	✓	✓
JOG	✓	✓
Controller (PID)	✓	✓
Thermal motor protection	✓	✓
Thermal inverter protection	✓	✓
V_{dcmax} controller	✓	✓
Setpoint input	✓	✓
Motor identification	✓	✓
Motor holding brake	✓	✓
Braking functions • DC injection braking • compound braking • dynamic braking with integrated brake chopper	✓	✓
Mechanical data		
Degree of protection	IP20	IP20
Operating temperature	-10 °C to +50 °C (14 °F to 122 °F)	0 °C to +45 °C (32 °F to 113 °F)
Relative humidity	< 95% RH, condensation not permissible	< 95% RH, condensation not permissible
Dimensions (W × H × D), mm	73 × 177 × 63	73 × 177 × 63
Weight, approx. kg	0.52	0.52

Selection and ordering data

Communication	Digital inputs Standard	Digital inputs Failsafe	Digital outputs	Encoder interfaces	Designation	**Control Unit** Order No.
Standard						
PROFIBUS DP	9	–	3	1	CU240S DP	**6SL3244-0BA20-1PA0**
Failsafe for Safety Integrated						
PROFIBUS DP	6	2	3	1	CU240S DP-F	**6SL3244-0BA21-1PA0**

Memory card for Control Units

Overview

The parameter settings for an inverter are stored on the MMC memory card. When the plant is serviced, it is immediately ready for use again after, for example, replacement of the frequency inverter and transfer of the memory card data.

- All parameter settings can be written from the MMC memory card to the inverter or saved from the inverter to the MMC memory card.
- Up to 100 parameter sets can be stored.
- Supports serial commissioning without using further commissioning tools such as BOP and STARTER.
- How the MMC memory card is commissioned can be defined by the user (parameter p8458):
  - 0 = parameter set 0 is never automatically downloaded from the MMC ("never")
  - 1 = parameter set 0 is downloaded once after PowerOn ("once“)
  - 2 = parameter set 0 is always downloaded once after PowerOn ("always")

Note:
The MMC memory card is not necessary for the running operation and must not remain inserted.

Integration

Inserting the MMC memory card into the Control Unit

Control Unit with inserted MMC memory card

Selection and ordering data

	Order No.
MMC memory card	**6SL3254-0AM00-0AA0**

Overview

PM240 Power Modules feature an integrated brake chopper to which an external braking resistor can be connected via terminals DCP/R1 and R2 (see DC link components).

The DC link capacitance of the DC link is such that the PM240 Power Module provides sufficient control range for the DC link voltage and is easily capable of handling applications such as kinetic buffering (maintenance of DC link voltage through regenerative feedback to DC link of kinetic energy produced by the load) or controlled, safe deceleration after a power failure using kinetic energy produced by the load. Furthermore, several PM240 Power Modules can be electrically coupled by this method.

The PM240 Power Module is also designed for safety-sensitive applications. In conjunction with a Safety Control Unit, the drive can be turned into a Safety Integrated Drive (see Control Units).

The permissible cable lengths between converter and motor are limited depending on cable type. Longer cables can be used if output reactors are connected (see load-side power components).

Line reactors are available for minimization of line harmonic distortions (see line-side power components).

Frame size FSA of the PM240 Power Module is only available without integrated line filter of class A. A base filter for compliance with class A and another for compliance with class B are therefore provided (see line-side power components).

Frame sizes FSB and FSC of the PM240 Power Module are available both with and without integrated line filter of class A. For compliance with class B, PM240 Power Modules with integrated line filter of class A must be fitted additionally with a base filter of class B (see line-side power components).

Power Modules with integrated line filter of class A are suitable only for connection to TN supply systems. Power Modules without integrated line filter can be connected to grounded (TN, TT) and non-grounded (IT) supply systems.

Integration

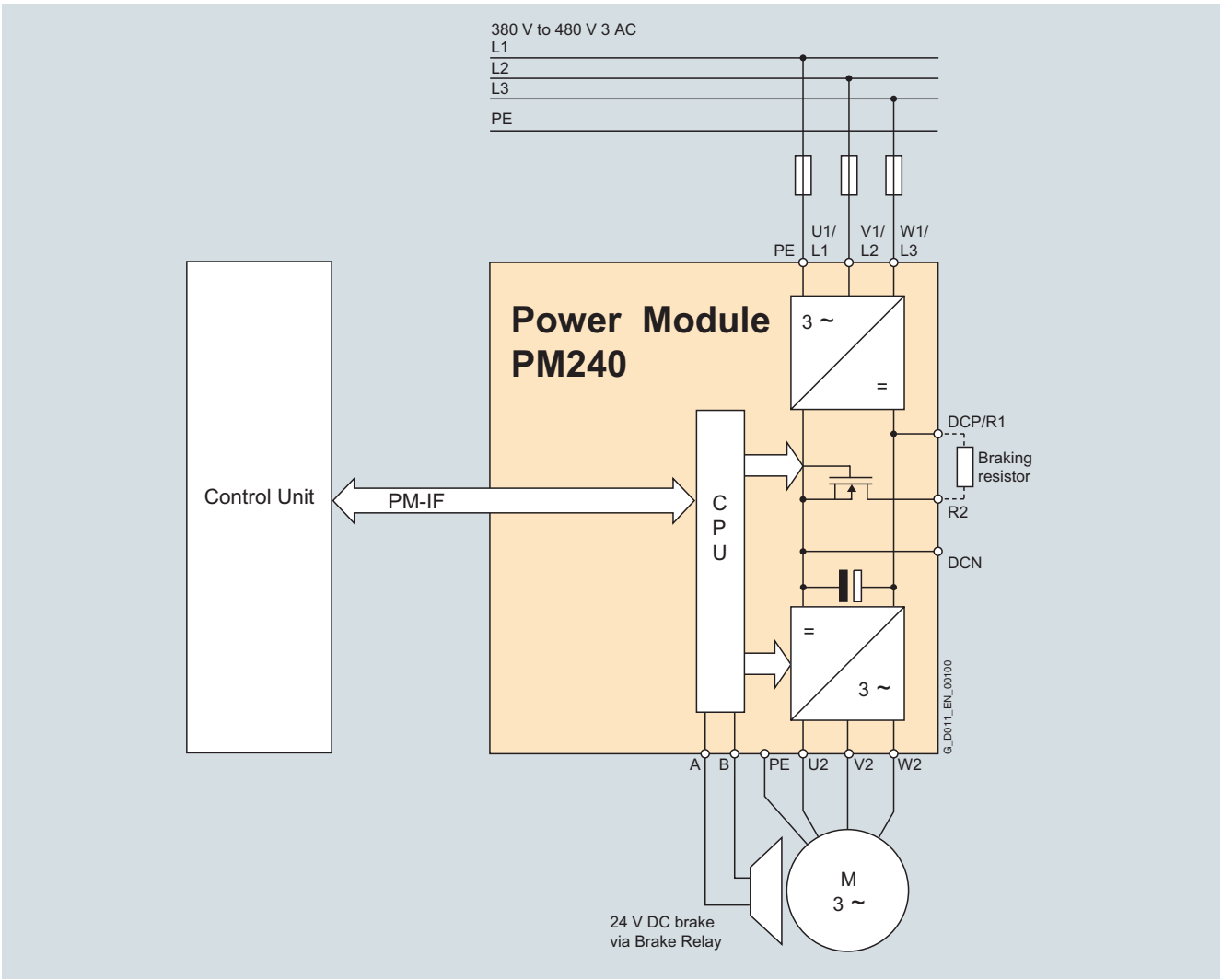
PM240 Power Modules communicate with the Control Unit via the PM-IF interface.

PM240 Power Modules feature the following interfaces as standard:

- DC link connections DCP/R1 and DC-N
- Terminals DCP/R1 and R2 for connection of an external braking resistor
- PM-IF interface for connection of the PM240 Power Module and Control Unit. The PM240 Power Module also supplies power to the Control Unit by means of an integrated power pack
- Motor connection made with screw terminals or screw studs
- Drive circuit for the Safe Brake Relay or Brake Relay for controling a holding brake
- 2 x PE (protective earth) connections

PM240 Power Modules

Integration (continued)



Connection diagram for PM240 Power Module

Availability as base components

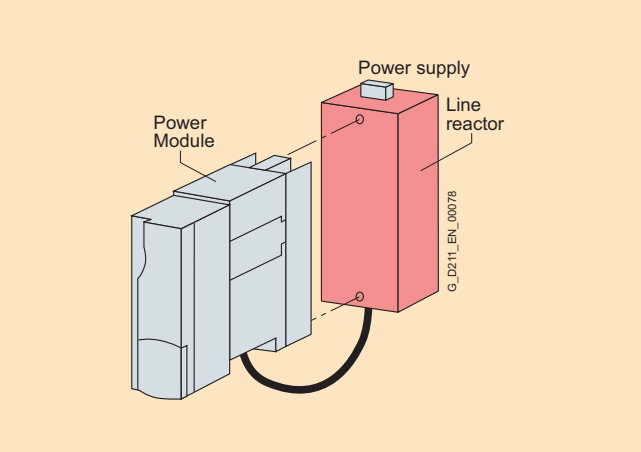
Many system components for PM240 Power Modules are designed as base components, i.e. the component is mounted on the baseplate and the PM240 Power Module above it in a space-saving construction. Up to two base components can be mounted above one another.

The following line-side power components, DC link components and load-side power components are designed as base components in the corresponding frame sizes:

	Frame size					
	FSA	FSB	FSC	FSD	FSE	FSF
Line-side power components						
Line filter class A	✓					
Line filter class B	✓	✓	✓			
Line reactors	✓	✓	✓	✓	✓	
DC link components						
Braking resistors	✓	✓				
Load-side power components						
Output reactors (motor reactors)	✓	✓	✓			

Integration (continued)

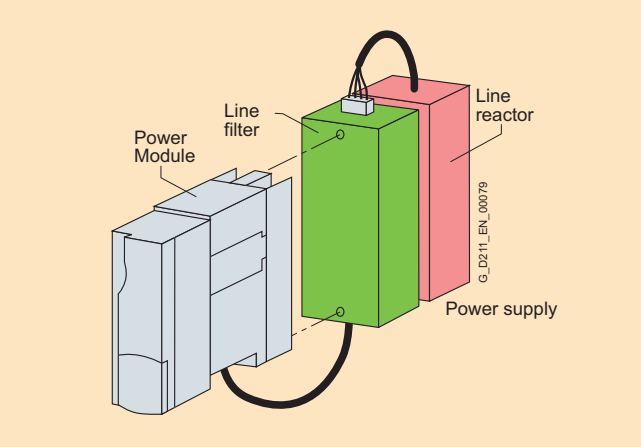
The following diagram shows the basic layout of a PM240 Power Module with line reactor as base component. The line-side reactors are equipped with terminals and the reactors at the Power Module end with a pre-assembled cable. In the final installation position, the line terminals are at the top on frame sizes FSA to FSC, and at the bottom on frame sizes FSD to FSE.



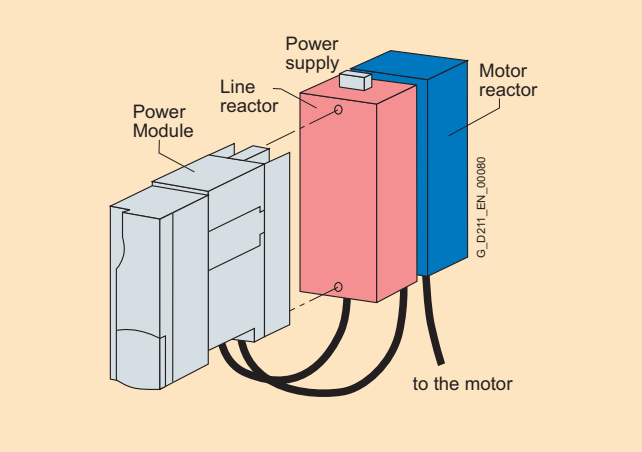
Basic layout of a PM240 Power Module with line reactor as base component

If a line filter is installed in addition to the line reactor on frame size FSA, the components must be arranged as shown in the diagram below. In this case, the line connection is below.

Power Modules of frame size FSB and higher are available with integrated line filters, an external line filter is then not required.

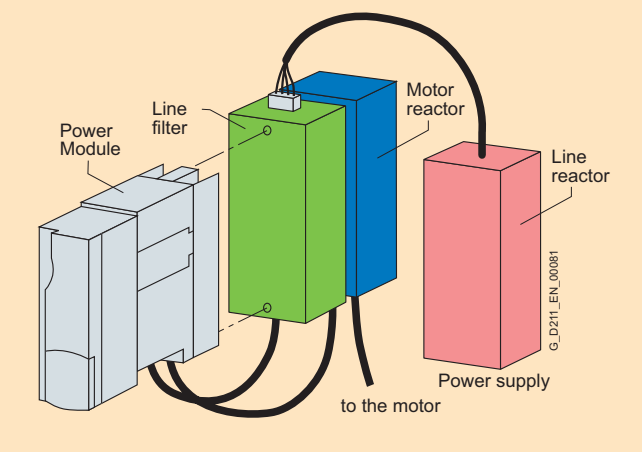


Power Module PM240 frame size FSA with line reactor and line filter



Power Module PM240 frame size FSA with line reactor and motor reactor

For configurations involving more than two base-type system components, e.g. line reactor + motor reactor + braking resistor, individual components must be mounted to the side of the Power Modules. In this case, the line and motor reactors must be installed under the Power Module and the braking resistor to the side.



2

Technical data

General technical data

Line operating voltage	380 V to 480 V 3 AC ±10%
Input frequency	47 Hz to 63 Hz
Output frequency	0 Hz to 650 Hz
Pulse frequency	4 kHz, (standard), for higher pulse frequencies see derating data
Power factor	0.95
Converter efficiency	95% to 97%
Overload capability	
• High overload (HO)	1.5 x rated output current (i.e. 150% overload) for 57 s with a cycle time of 300 s 2 × rated output current (i.e. 200% overload) for 3 s with a cycle time of 300 s
• Light overload (LO)	1.1 x rated output current (i.e. 110% overload) for 57 s with a cycle time of 300 s 1.5 × rated output current (i.e. 150% overload) for 3 s with a cycle time of 300 s
Electromagnetic compatibility	Optional line filter class A or B in accordance with EN 55011 is available
Possible braking methods	• DC injection braking • Compound braking • Dynamic braking with integrated brake chopper
Degree of protection	IP20
Ambient temperature	0 °C to +40 °C without derating, > 40 °C to +55 °C see derating characteristics
Operating temperature	
• High overload (HO)	0 °C to +50 °C (32 °F to 122 °F)
• Light overload (LO)	0 °C to +40 °C (32 °F to 104 °F)
Storage temperature	–40 °C to +70 °C (–40 °F to +158 °F)
Relative humidity	< 95% RH, condensation not permissible
Cooling	Internal air cooling, power sections with increased air cooling by in-built fans
Installation altitude	Up to 1000 m above sea level without power reduction, > 1000 m see derating characterics
Protective functions	• Undervoltage • Overvoltage • Overload • Ground fault • Short-circuit • Stall prevention • Motor blocking protection • Motor overtermperature • Inverter overtemperature • Parameter interlock
Compliance with standards	UL, cUL, CE, c-tick
CE mark	In accordance with Low-Voltage Directive 73/23/EEC and Machinery Directive 98/37/EC

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		PM240 Power Modules Type 6SL3224-...				
		0BE13-7UA0	0BE15-5UA0	0BE17-5UA0	0BE21-1UA0	0BE21-5UA0
Rated output current I_{rated} 1)	A	1.3	1.7	2.2	3.1	4.1
Base load current I_H 2)	A	1.3	1.7	2.2	3.1	4.1
Max. output current I_{max}	A	2.6	3.4	4.4	6.2	8.2
Rated power based on I_{rated}	kW	0.37	0.55	0.75	1.1	1.5
Rated power based on I_H	kW	0.37	0.55	0.75	1.1	1.5
Rated pulse frequency	kHz	4	4	4	4	4
Efficiency η		0.95	0.95	0.95	0.95	0.95
Power loss	kW	Available soon	Available soon	Available soon	Available soon	Available soon
Cooling air requirement	m^3/s	0.005	0.005	0.005	0.005	0.005
Sound pressure level	dB(A)	Available soon	Available soon	Available soon	Available soon	Available soon
24 V DC power supply for the Control Unit	A	1.0	1.0	1.0	1.0	1.0
Rated input current 3)						
• with line reactor	A	1.4	1.8	2.3	3.2	4.3
• without line reactor	A	1.7	2.1	2.6	3.9	4.9
Max. cable length to braking resistor	m	15	15	15	15	15
Line connection U1/L1, V1/L2, W1/L3		Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2
Motor connection U2, V2, W2		Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2
DC link connection, connection for braking resistor DCP/R1, DCN, R2		Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2	Screw terminals for cable cross-sections 1.0 to 2.5 mm^2
PE connection		On housing with M4 screw	On housing with M4 screw	On housing with M4 screw	On housing with M4 screw	On housing with M4 screw
Max. motor cable length 4)	m	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)
Degree of protection		IP20	IP20	IP20	IP20	IP20
Width	mm	73	73	73	73	73
Height	mm	173	173	173	173	173
Depth						
• PM240 without Control Unit	mm	145	145	145	145	145
• PM240 with Control Unit	mm	210	210	210	210	210
Frame size		FSA	FSA	FSA	FSA	FSA
Weight, approx.	kg	1.1	1.1	1.1	1.1	1.1

1) The rated output current I_{rated} is based on the load cycle for light overload (LO).

2) The base load current I_H is based on the load cycle for high overload (HO).

3) The input current depends on the motor load and line impedance. The input currents apply for a load representing the rated power (based on I_{rated}) for a line impedance corresponding to u_k = 1%.

4) Max. motor cable length 25 m (shielded) for PM240 Power Modules with integrated line filter to maintain the limit values of EN 61800-3 Category C2.

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		PM240 Power Modules Type 6SL3224-...				
		0BE22-2UA0 0BE22-2AA0	0BE23-0UA0 0BE23-0AA0	0BE24-0UA0 0BE24-0AA0	0BE25-5UA0 0BE25-5AA0	0BE27-5UA0 0BE27-5AA0
Rated output current I_{rated} [1]	A	5.9	7.7	10.2	18	25
Base load current I_H [2]	A	5.9	7.7	10.2	13.2	19
Max. output current I_{max}	A	11.8	15.4	20.4	26.4	38
Rated power based on I_{rated}	kW	2.2	3	4	7.5	11
Rated power based on I_H	kW	2.2	3	4	5.5	7.5
Rated pulse frequency	kHz	4	4	4	4	4
Efficiency η		0.95	0.95	0.95	0.95	0.95
Power loss	kW	Available soon	Available soon	Available soon	Available soon	Available soon
Cooling air requirement	m^3/s	0.009	0.009	0.009	0.038	0.038
Sound pressure level	dB(A)	Available soon	Available soon	Available soon	Available soon	Available soon
24 V DC power supply for the Control Unit	A	1.0	1.0	1.0	1.0	1.0
Rated input current [3]						
• with line reactor	A	6.1	8	10.4	18.7	26
• without line reactor	A	7.6	10.2	13.4	21.9	31.5
Max. cable length to braking resistor	m	15	15	15	15	15
Line connection U1/L1, V1/L2, W1/L3		Screw terminals for cable cross-sections 1.0 to 6 mm^2	Screw terminals for cable cross-sections 1.0 to 6 mm^2	Screw terminals for cable cross-sections 1.0 to 6 mm^2	Screw terminals for cable cross-sections 2.5 to 10 mm^2	Screw terminals for cable cross-sections 2.5 to 10 mm^2
Motor connection U2, V2, W2		Screw terminals for cable cross-sections 1.0 to 6 mm^2	Screw terminals for cable cross-sections 1.0 to 6 mm^2	Screw terminals for cable cross-sections 1.0 to 6 mm^2	Screw terminals for cable cross-sections 2.5 to 10 mm^2	Screw terminals for cable cross-sections 2.5 to 10 mm^2
DC link connection, connection for braking resistor DCP/R1, DCN, R2		Screw terminals for cable cross-sections 1.0 to 6 mm^2	Screw terminals for cable cross-sections 1.0 to 6 mm^2	Screw terminals for cable cross-sections 1.0 to 6 mm^2	Screw terminals for cable cross-sections 2.5 to 10 mm^2	Screw terminals for cable cross-sections 2.5 to 10 mm^2
PE connection		On housing with M5 screw	On housing with M5 screw	On housing with M5 screw	On housing with M5 screw	On housing with M5 screw
Max. motor cable length [4]	m	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)
Degree of protection		IP20	IP20	IP20	IP20	IP20
Width	mm	153	153	153	189	189
Height	mm	270	270	270	334	334
Depth						
• PM240 without Control Unit	mm	165	165	165	185	185
• PM240 with Control Unit	mm	230	230	230	250	250
Frame size		FSB	FSB	FSB	FSC	FSC
Weight, approx.	kg	4.0	4.0	4.0	7.0	7.0

1) The rated output current I_{rated} is based on the load cycle for light overload (LO).

2) The base load current I_H is based on the load cycle for high overload (HO).

3) The input current depends on the motor load and line impedance. The input currents apply for a load representing the rated power (based on I_{rated}) for a line impedance corresponding to u_k = 1%.

4) Max. motor cable length 25 m (shielded) for PM240 Power Modules with integrated line filter to maintain the limit values of EN 61800-3 Category C2.

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		PM240 Power Modules Type 6SL3224-...				
		0BE31-1UA0 0BE31-1AA0	0BE31-5UA0 0BE31-5AA0	0BE31-8UA0 0BE31-8AA0	0BE32-2UA0 0BE32-2AA0	0BE33-0UA0 0BE33-0AA0
Rated output current I_{rated} [1]	A	32	38	45	60	75
Base load current I_H [2]	A	26	32	38	45	60
Max. output current I_{max}	A	52	64	76	90	124
Rated power based on I_{rated}	kW	15	18.5	22	30	37
Rated power based on I_H	kW	11	15	18.5	22	30
Rated pulse frequency	kHz	4	4	4	4	4
Efficiency η		0.95	0.95	0.95	0.95	0.95
Power loss	kW	Available soon	Available soon	Available soon	Available soon	Available soon
Cooling air requirement	m^3/s	0.038	0.022	0.022	0.039	0.022
Sound pressure level	dB(A)	Available soon	Available soon	Available soon	Available soon	Available soon
24 V DC power supply for the Control Unit	A	1.0	1.0	1.0	1.0	1.0
Rated input current [3]						
• with line reactor	A	33	40	47	63	78
• without line reactor	A	39	46	53	72	88
Max. cable length to braking resistor	m	15	15	15	15	15
Line connection U1/L1, V1/L2, W1/L3		Screw terminals for cable cross-sections 2.5 to 10 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2
Motor connection U2, V2, W2		Screw terminals for cable cross-sections 2.5 to 10 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2
DC link connection, connection for braking resistor DCP/R1, DCN, R2		Screw terminals for cable cross-sections 2.5 to 10 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2	M6 stud, connectable cable cross-section 10 to 35 mm^2
PE connection		On housing with M5 screw	On housing with M6 screw	On housing with M6 screw	On housing with M6 screw	On housing with M6 screw
Max. motor cable length [4]	m	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)
Degree of protection		IP20	IP20	IP20	IP20	IP20
Width	mm	189	275	275	275	275
Height						
• PM240 without integrated filter	mm	334	419	419	419	499
• PM240 with integrated filter	mm	334	512	512	512	635
Depth						
• PM240 without Control Unit	mm	185	204	204	204	204
• PM240 with Control Unit	mm	250	260	260	260	260
Frame size		FSC	FSD	FSD	FSD	FSE
Weight, approx.						
• PM240 without integrated filter	kg	7.0	15.9	15.9	15.9	19.8
• PM240 with integrated filter	kg	7.0	19.3	19.3	19.3	27.1

1) The rated output current I_{rated} is based on the load cycle for light overload (LO).

2) The base load current I_H is based on the load cycle for high overload (HO).

3) The input current depends on the motor load and line impedance. The input currents apply for a load representing the rated power (based on I_{rated}) for a line impedance corresponding to u_k = 1%.

4) Max. motor cable length 25 m (shielded) for PM240 Power Modules with integrated line filter to maintain the limit values of EN 61800-3 Category C2.

PM240 Power Modules

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		PM240 Power Modules Type 6SL3224-...			
		0BE33-7UA0 0BE33-7AA0	0BE34-5UA0 0BE34-5AA0	0BE35-5UA0 0BE35-5AA0	0BE37-5UA0 0BE37-5AA0
Rated output current I_{rated} [1]	A	90	110	145	178
Base load current I_H [2]	A	75	90	110	145
Max. output current I_{max}	A	150	180	220	290
Rated power based on I_{rated}	kW	45	55	75	90
Rated power based on I_H	kW	37	45	55	75
Rated pulse frequency	kHz	4	4	4	4
Efficiency η		0.95	0.95	0.95	0.95
Power loss	kW	Available soon	Available soon	Available soon	Available soon
Cooling air requirement	m^3/s	0.039	0.094	0.094	0.117
Sound pressure level	dB(A)	Available soon	Available soon	Available soon	Available soon
24 V DC power supply for the Control Unit	A	1.0	1.0	1.0	1.0
Rated input current [3]					
• with line reactor	A	94	115	151	186
• without line reactor	A	105	129	168	204
Max. cable length to braking resistor	m	15	15	15	15
Line connection U1/L1, V1/L2, W1/L3		M6 stud, connectable cable cross-section 10 to 35 mm^2	M8 stud, max. connectable cable cross-section 1 x 120 mm^2 or 2 x 50 mm^2	M8 stud, max. connectable cable cross-section 1 x 120 mm^2 or 2 x 50 mm^2	M8 stud, max. connectable cable cross-section 1 x 120 mm^2 or 2 x 50 mm^2
Motor connection U2, V2, W2		M6 stud, connectable cable cross-section 10 to 35 mm^2	M8 stud, max. connectable cable cross-section 1 x 120 mm^2 or 2 x 50 mm^2	M8 stud, max. connectable cable cross-section 1 x 120 mm^2 or 2 x 50 mm^2	M8 stud, max. connectable cable cross-section 1 x 120 mm^2 or 2 x 50 mm^2
DC link connection, connection for braking resistor DCP/R1, DCN, R2		M6 stud, connectable cable cross-section 10 to 35 mm^2	M8 stud, max. connectable cable cross-section 1 x 120 mm^2 or 2 x 50 mm^2	M8 stud, max. connectable cable cross-section 1 x 120 mm^2 or 2 x 50 mm^2	M8 stud, max. connectable cable cross-section 1 x 120 mm^2 or 2 x 50 mm^2
PE connection		On housing with M6 screw	On housing with M8 screw	On housing with M8 screw	On housing with M8 screw
Max. motor cable length [4]	m	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)	50 (shielded) 100 (unshielded)
Degree of protection		IP20	IP20	IP20	IP20
Width	mm	275	350	350	350
Height					
• PM240 without integrated filter	mm	499	634	634	634
• PM240 with integrated filter	mm	635	934	934	934
Depth					
• PM240 without Control Unit	mm	204	316	316	316
• PM240 with Control Unit	mm	260	372	372	372
Frame size		FSE	FSF	FSF	FSF
Weight, approx.					
• PM240 without integrated filter	kg	19.8	50.7	50.7	50.7
• PM240 with integrated filter	kg	27.1	66.7	66.7	66.7

1) The rated output current I_{rated} is based on the load cycle for light overload (LO).

2) The base load current I_H is based on the load cycle for high overload (HO).

3) The input current depends on the motor load and line impedance. The input currents apply for a load representing the rated power (based on I_{rated}) for a line impedance corresponding to u_k = 1%.

4) Max. motor cable length 25 m (shielded) for PM240 Power Modules with integrated line filter to maintain the limit values of EN 61800-3 Category C2.

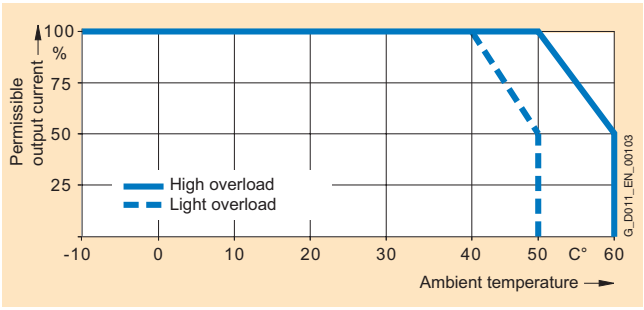
Characteristics

Derating data

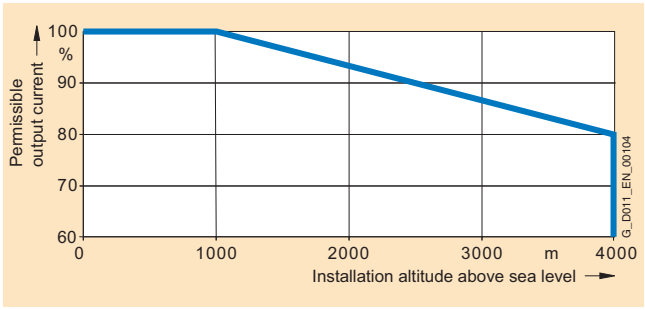
Pulse frequency

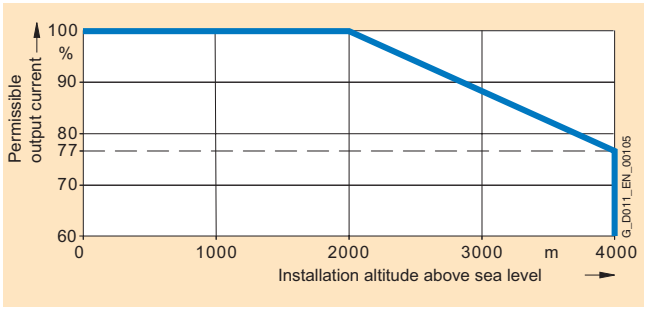
Line voltage	Rated output		Rated output current in A at a switching frequency of						
	kW	hp	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
400 V 3 AC	0.37	0.50	1.3	1.1	0.9	0.8	0.7	0.6	0.5
	0.55	0.75	1.7	1.4	1.2	1.0	0.9	0.8	0.7
	0.75	1.0	2.2	1.9	1.5	1.3	1.1	1.0	0.9
	1.1	1.5	3.1	2.6	2.2	1.9	1.6	1.4	1.2
	1.5	2.0	4.1	3.5	2.9	2.5	2.1	1.8	1.6
	2.2	3.0	5.9	5.0	4.1	3.5	3.0	2.7	2.4
	3.0	4.0	7.7	6.5	5.4	4.6	3.9	3.5	3.1
	4.0	5.0	10.2	8.7	7.1	6.1	5.1	4.6	4.1
	7.5	10	18.0	16.2	13.3	11.4	9.5	8.6	7.6
	11.0	15	25.0	22.1	18.2	15.6	13.0	11.7	10.4
	15.0	20	32.0	27.2	22.4	19.2	16.0	14.4	12.8
	18.5	25	38.0	32.3	26.6	22.8	19.0	17.1	15.2
	22.0	30	45.0	38.3	31.5	27.0	22.5	20.3	18.0
	30.0	40	62.0	52.7	43.4	37.2	31.0	27.9	24.8
	37.0	50	75.0	63.8	52.5	45.0	37.5	33.8	30.0
	45.0	60	90.0	76.5	63.0	54.0	45.0	40.5	36.0
	55.0	75	110.0	93.5	77.0	66.0	55.0	49.5	44.0
	75.0	100	145.0	123.3	101.5	87.0	72.5	65.3	58.0
	90.0	125	178.0	151.3	124.6	–	–	–	–

Ambient temperature



Installation altitude





PM240 Power Modules

Selection and ordering data

Rated output [1]		Rated output current [2]	Output based on base load current [3]		Base load current [4]	Frame size	SINAMICS G120 PM240 Power Module without integrated line filter	SINAMICS G120 PM240 Power Module with integrated line filter
		I_{rated}			I_H		Order No.	Order No.
kW	hp	A	kW	hp	A			
380 V to 480 V 3 AC								
0.37	0.50	1.3	0.37	0.50	1.3	FSA	**6SL3224-0BE13-7UA0**	–
0.55	0.75	1.7	0.55	0.75	1.7	FSA	**6SL3224-0BE15-5UA0**	–
0.75	1.0	2.2	0.75	1.0	2.2	FSA	**6SL3224-0BE17-5UA0**	–
1.1	1.5	3.1	1.1	1.5	3.1	FSA	**6SL3224-0BE21-1UA0**	–
1.5	2.0	4.1	1.5	2.0	4.1	FSA	**6SL3224-0BE21-5UA0**	–
2.2	3.0	5.9	2.2	3.0	5.9	FSB	**6SL3224-0BE22-2UA0**	**6SL3224-0BE22-2AA0**
3.0	4.0	7.7	3.0	4.0	7.7	FSB	**6SL3224-0BE23-0UA0**	**6SL3224-0BE23-0AA0**
4.0	5.0	10.2	4.0	5.0	10.2	FSB	**6SL3224-0BE24-0UA0**	**6SL3224-0BE24-0AA0**
7.5	10	18	5.5	7.5	13.2	FSC	**6SL3224-0BE25-5UA0**	**6SL3224-0BE25-5AA0**
11.0	15	25	7.5	10	19	FSC	**6SL3224-0BE27-5UA0**	**6SL3224-0BE27-5AA0**
15.0	20	32	11.0	15	26	FSC	**6SL3224-0BE31-1UA0**	**6SL3224-0BE31-1AA0**
18.5	25	38	15.0	20	32	FSD	**6SL3224-0BE31-5UA0**	**6SL3224-0BE31-5AA0**
22	30	45	18.5	25	38	FSD	**6SL3224-0BE31-8UA0**	**6SL3224-0BE31-8AA0**
30	40	60	22	30	45	FSD	**6SL3224-0BE32-2UA0**	**6SL3224-0BE32-2AA0**
37	50	75	30	40	60	FSE	**6SL3224-0BE33-0UA0**	**6SL3224-0BE33-0AA0**
45	60	90	37	50	75	FSE	**6SL3224-0BE33-7UA0**	**6SL3224-0BE33-7AA0**
55	75	110	45	60	90	FSF	**6SL3224-0BE34-5UA0**	**6SL3224-0BE34-5AA0**
75	100	145	55	75	110	FSF	**6SL3224-0BE35-5UA0**	**6SL3224-0BE35-5AA0**
90	125	178	75	100	145	FSF	**6SL3224-0BE37-5UA0**	**6SL3224-0BE37-5AA0**

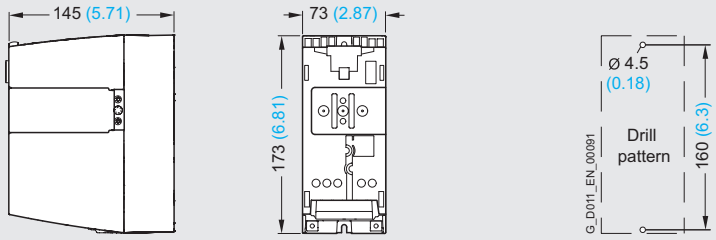
1) Rated output based on rated output current I_{rated}: The rated output current I_{rated} is based on the load cycle for light overload (LO).

2) The rated output current I_{rated} is based on the load cycle for light overload (LO). This current values are placed on the rating plate of the Power Module.

3) These output values are placed on the rating plate of the Power Module. The base load current I_H is based on the load cycle for high overload (HO).

4) The base load current I_H is based on the load cycle for high overload (HO).

Dimension drawings



PM240 Power Module frame size FSA

Fixing with 2 M4 studs, 2 M4 nuts, 2 M4 washers

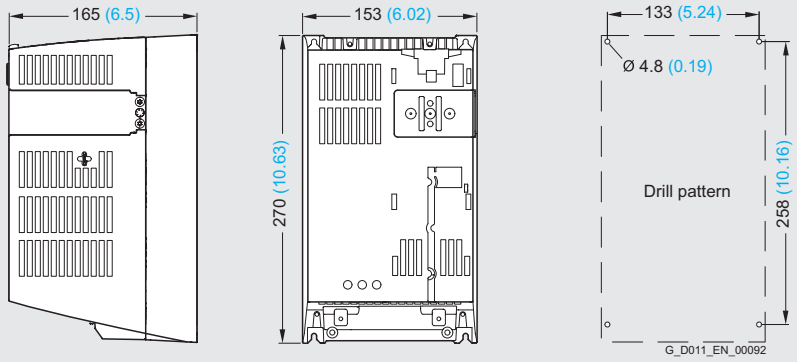
Tightening torque: 2.5 Nm *(22.1 lbf-in)*

Required ventilation clearance at top and bottom: 100 mm *(3.94 inches)*

Required ventilation clearance at side: 30 mm *(1.18 inches)*

When the Control Unit is plugged in, the mounting depth increases by 65 mm *(2.56 inches)* and the total depth by 14 mm *(0.55 inches)*.

All dimensions in mm *(values in brackets are in inches)*.



PM240 Power Module frame size FSB

Fixing with 4 M4 studs, 4 M4 nuts, 4 M4 washers

Tightening torque: 2.5 Nm *(22.1 lbf-in)*

Required ventilation clearance at top and bottom: 100 mm *(3.94 inches)*

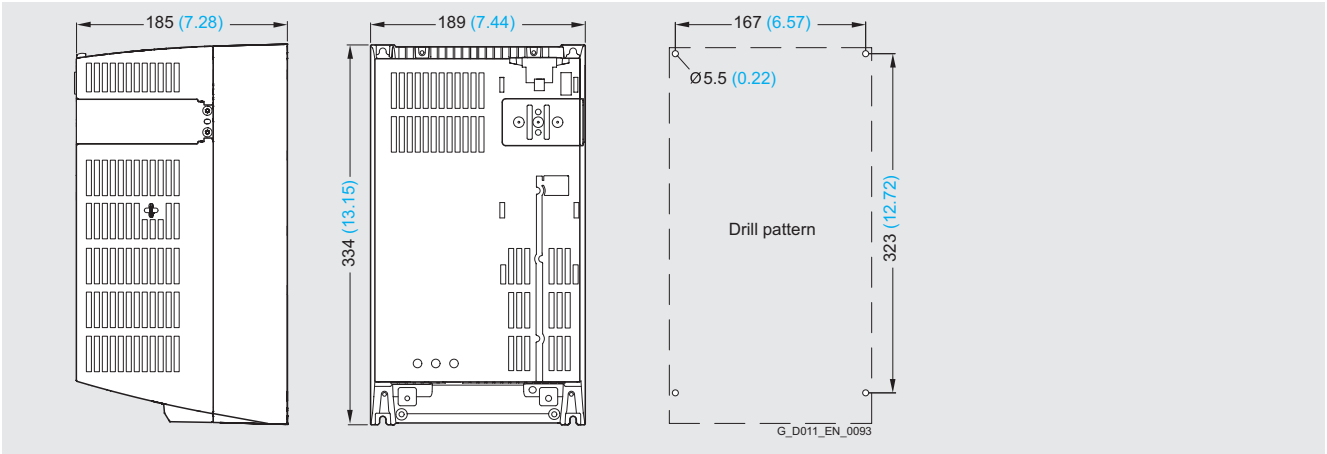
Required ventilation clearance at side: 40 mm *(1.57 inches)*

When the Control Unit is plugged in, the mounting depth increases by 65 mm *(2.56 inches)*.

All dimensions in mm *(values in brackets are in inches)*.

PM240 Power Modules

Dimension drawings (continued)



PM240 Power Module frame size FSC

Fixing with 4 M5 studs, 4 M5 nuts, 4 M5 washers

Tightening torque: 2.5 Nm *(22.1 lbf-in)*

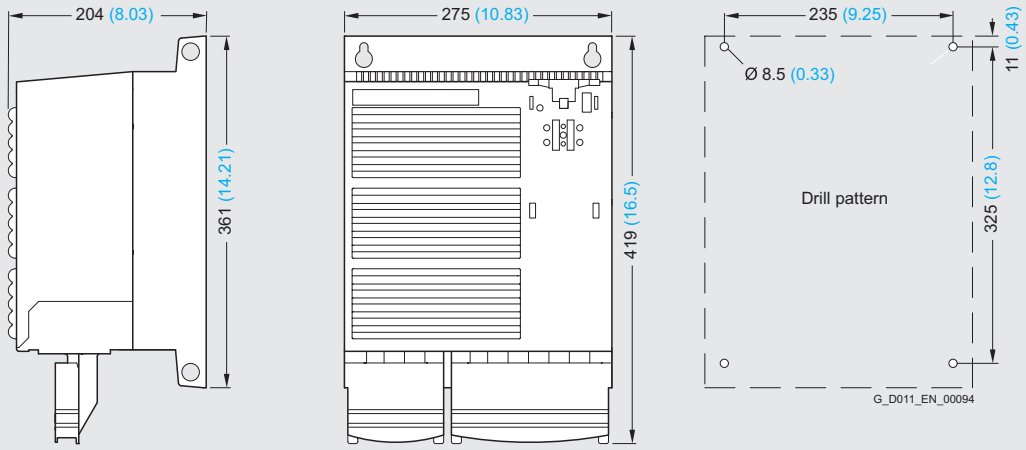
Required ventilation clearance at top and bottom: 100 mm *(3.94 inches)*

Required ventilation clearance at side: 50 mm *(1.97 inches)*

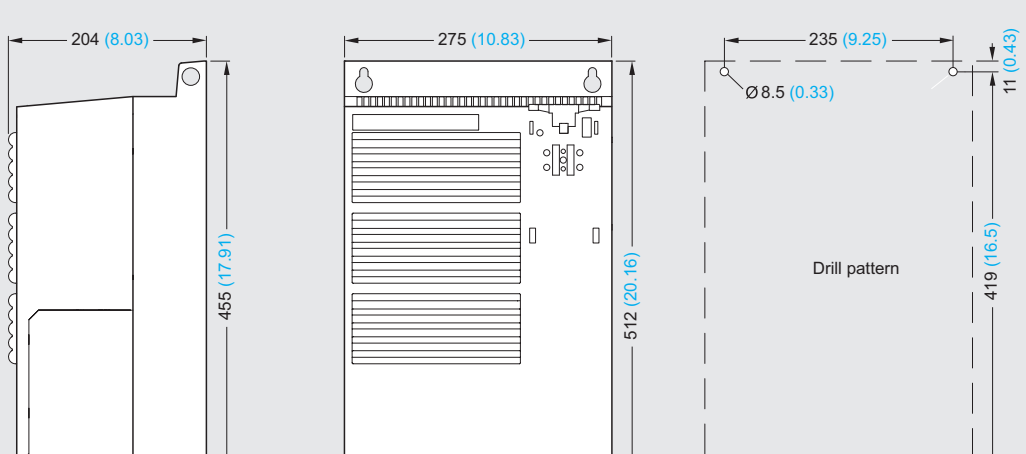
When the Control Unit is plugged in, the mounting depth increases by 65 mm *(2.56 inches)*.

All dimensions in mm *(values in brackets are in inches)*.

Dimension drawings (continued)



PM240 Power Module frame size FSD without line filter



PM240 Power Module frame size FSD with integrated line filter class A

Fixing with 4 M6 studs, 4 M6 nuts, 4 M6 washers

Tightening torque: 6 Nm *(53 lbf-in)*

Required ventilation clearance at top and bottom: 300 mm *(11.81 inches)*

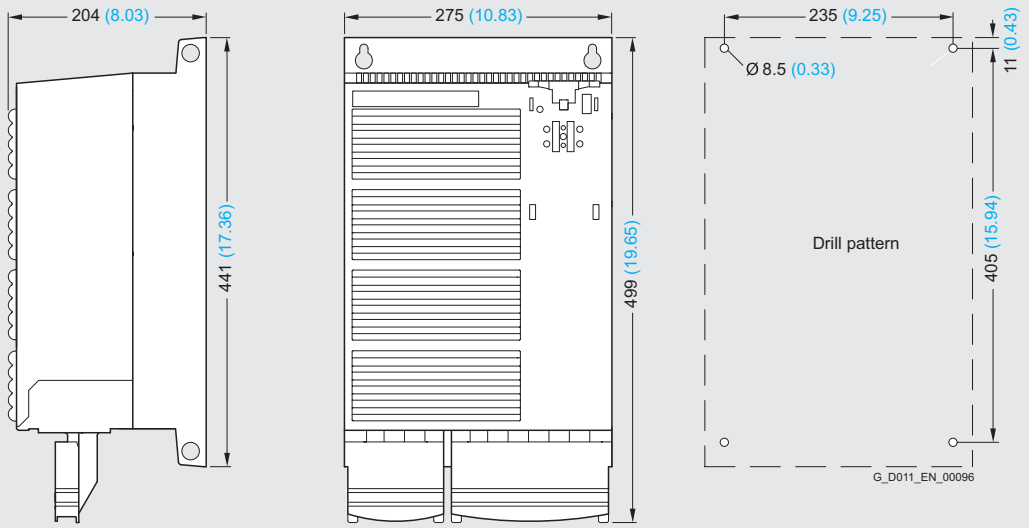
Required ventilation clearance at front: 28 mm *(1.1 inches)*

When the Control Unit is plugged in, the mounting depth increases by 56 mm *(2.2 inches)*.

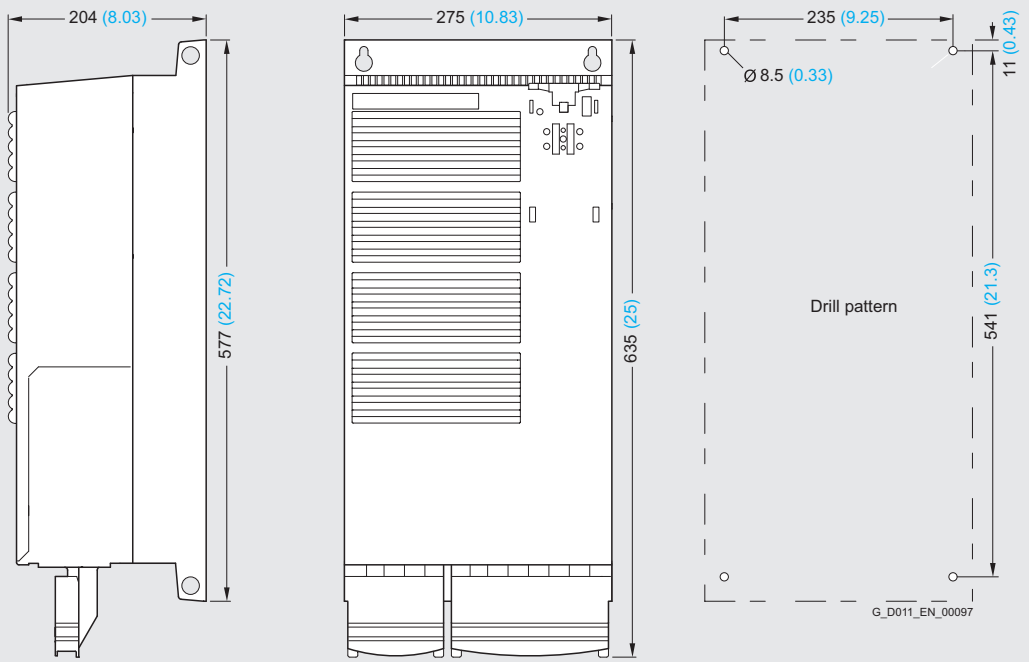
All dimensions in mm *(values in brackets are in inches)*.

2

Dimension drawings (continued)



PM240 Power Module frame size FSE without line filter



PM240 Power Module frame size FSE with integrated line filter class A

Fixing with 4 M6 studs, 4 M6 nuts, 4 M6 washers

Tightening torque: 6 Nm *(53 lbf-in)*

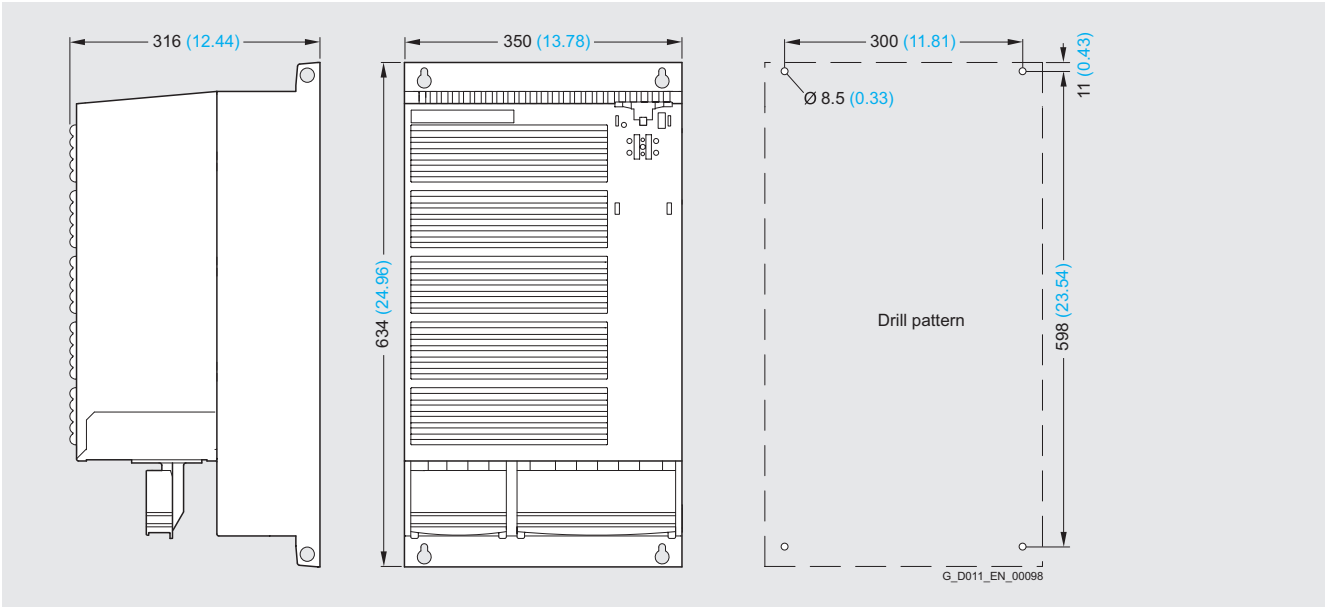
Required ventilation clearance at top and bottom: 300 mm *(11.81 inches)*

Required ventilation clearance at front: 28 mm *(1.1 inches)*

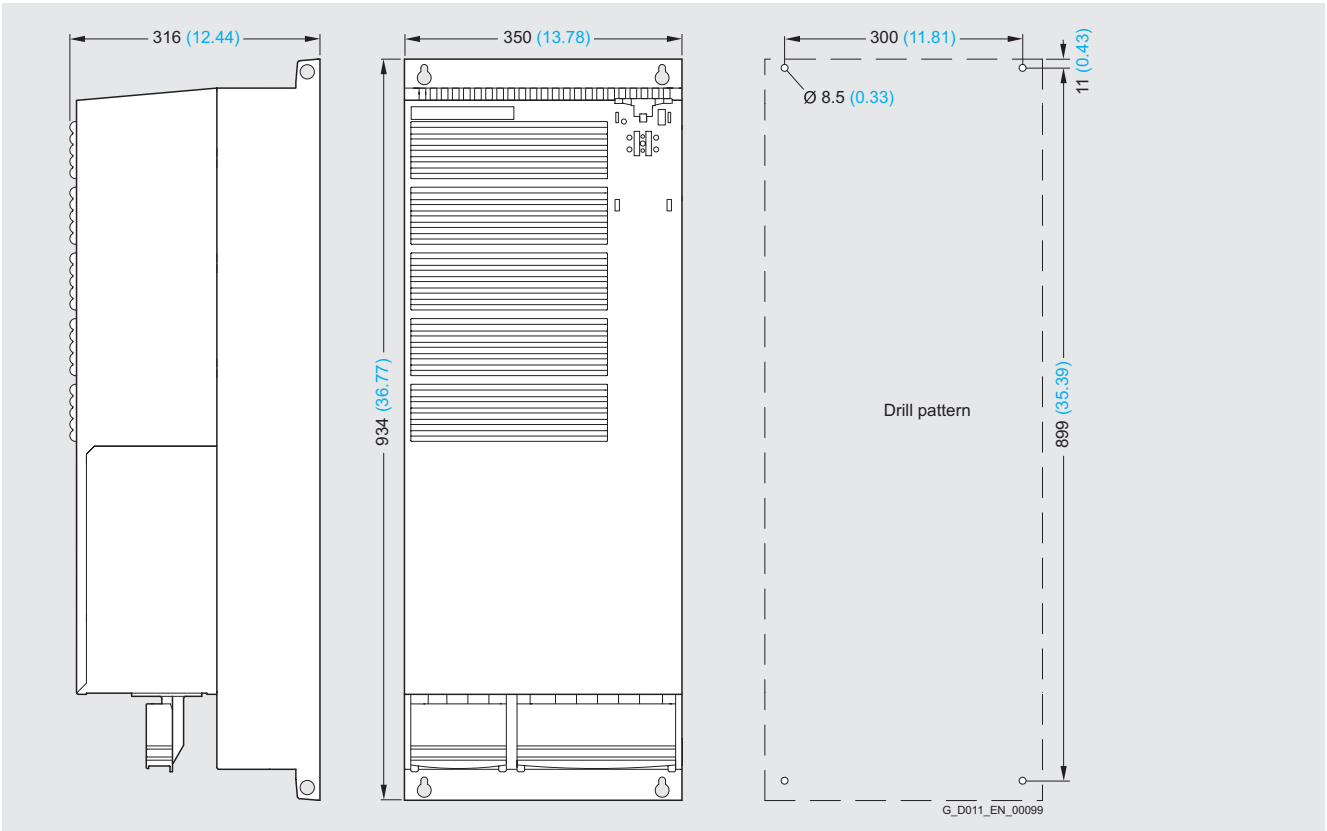
When the Control Unit is plugged in, the mounting depth increases by 56 mm *(2.2 inches)*.

All dimensions in mm *(values in brackets are in inches)*.

Dimension drawings (continued)



PM240 Power Module frame size FSF without line filter



PM240 Power Module frame size FSF with integrated line filter class A

Fixing with 4 M8 studs, 4 M8 nuts, 4 M8 washers

Tightening torque: 13 Nm *(115 lbf-in)*

Required ventilation clearance at top and bottom: 350 mm *(13.78 inches)*

Required ventilation clearance at front: 28 mm *(1.1 inches)*

When the Control Unit is plugged in, the mounting depth increases by 56 mm *(2.2 inches)*.

All dimensions in mm *(values in brackets are in inches)*.

Line filters

Overview

The PM240 Power Module complies with a higher radio interference class with one additional line filter.

Frame size FSA of the PM240 Power Module is only available without integrated line filter of class A. A base filter for compliance with class A and another for compliance with class B are therefore available.

Frame sizes FSB and FSC of the PM240 Power Module are available both with and without integrated line filter of class A. For compliance with class B, PM240 Power Modules with integrated line filter of class A must be fitted additionally with a base filter of class B.

Technical data

Line voltage 380 V to 480 V 3 AC		Line filter class A	Line filter class B		
		6SE6400-2FA00-6AD0	6SE6400-2FB00-6AD0	6SL3203-0BE21-6SA0	6SL3203-0BD23-8SA0
Rated current	A	6	6	10.2	39.4
Line connection L1, L2, L3		2.5 mm^2 screw terminals	2.5 mm^2 screw terminals	2.5 mm^2 screw terminals	4 mm^2 screw terminals
Load connection U, V, W		Shielded cable 3 x 2.5 mm^2 0.4 m long	Shielded cable 3 x 2.5 mm^2 0.4 m long	Shielded cable 3 x 2.5 mm^2 0.4 m long	Shielded cable 3 x 4 mm^2 0.4 m long
PE connection		On housing with M4 stud	On housing with M4 stud	On housing with M4 stud	On housing with M4 stud
Degree of protection		IP20	IP20	IP20	IP20
Width	mm	73	73	153	190
Height	mm	200	200	296	362
Depth	mm	42.5	42.5	50	55
Possible as base component		Yes	Yes	Yes	Yes
Weight, approx.	kg	0.5	0.5	1.5	2.3
Suitable for Power Module	Type	6SL3224-0BE13-7UA0 6SL3224-0BE15-5UA0 6SL3224-0BE17-5UA0 6SL3224-0BE21-1UA0 6SL3224-0BE21-5UA0	6SL3224-0BE13-7UA0 6SL3224-0BE15-5UA0 6SL3224-0BE17-5UA0 6SL3224-0BE21-1UA0 6SL3224-0BE21-5UA0	6SL3224-0BE22-2UA0 6SL3224-0BE23-0AA0 6SL3224-0BE24-0AA0	6SL3224-0BE25-5AA0 6SL3224-0BE27-5AA0 6SL3224-0BE31-1AA0
Frame size		FSA	FSA	FSB	FSC

Selection and ordering data

Rated output		SINAMICS G120 PM240 Power Module		**Line filter class A in accordance with EN 55011**
kW	hp	Type 6SL3224-...	Frame size	Order No.
380 V to 480 V 3 AC				
0.37	0.50	0BE13-7UA0	FSA	**6SE6400-2FA00-6AD0**
0.55	0.75	0BE15-5UA0	FSA	
0.75	1.0	0BE17-5UA0	FSA	
1.1	1.5	0BE21-1UA0	FSA	
1.5	2.0	0BE21-5UA0	FSA	

Rated output		SINAMICS G120 PM240 Power Module		**Line filter class B in accordance with EN 55011**
kW	hp	Type 6SL3224-...	Frame size	Order No.
380 V to 480 V 3 AC				
0.37	0.50	0BE13-7UA0	FSA	**6SE6400-2FB00-6AD0**
0.55	0.75	0BE15-5UA0	FSA	
0.75	1.0	0BE17-5UA0	FSA	
1.1	1.5	0BE21-1UA0	FSA	
1.5	2.0	0BE21-5UA0	FSA	
2.2	3.0	0BE22-2AA0	FSB	**6SL3203-0BE21-6SA0**
3.0	4.0	0BE23-0AA0	FSB	
4.0	5.0	0BE24-0AA0	FSB	
7.5	10	0BE25-5AA0	FSC	**6SL3203-0BD23-8SA0**
11.0	15	0BE27-5AA0	FSC	
15.0	20	0BE31-1AA0	FSC	

Line reactors

Overview

A line reactor is needed for high system fault levels, partly to protect the actual inverter against excessive harmonic currents, and thus against overload, and partly to limit the line harmonic distortions to the permitted values.

Integration

The line reactors for PM240 Power Modules of frame sizes FSA to FSE are designed as base components. The line reactor is attached to the mounting surface and the Power Module is mounted compactly on the line reactor. The cables to the Power Modules are already connected at the line reactor.

The line reactor is connected to the line supply through terminals.

Technical data

Line voltage 380 V to 480 V 3 AC		Line reactor			
		6SE6400-3CC00-2AD3	**6SE6400-3CC00-4AD3**	**6SE6400-3CC00-6AD3**	**6SL3203-0CD21-0AA0**
Rated current	A	1.9	3.5	4.8	9
Power loss at 50 Hz/60 Hz, approx.	W	Available soon	Available soon	Available soon	Available soon
Line connection U1, V1, W1		6 mm^2 screw terminals	6 mm^2 screw terminals	6 mm^2 screw terminals	6 mm^2 screw terminals
Load connection		Cable 4 x AWG16 (1.5 mm^2) length approx. 0.38 m	Cable 4 x AWG16 (1.5 mm^2) length approx. 0.38 m	Cable 4 x AWG16 (1.5 mm^2) length approx. 0.38 m	Cable 4 x AWG16 (1.5 mm^2) length approx. 0.46 m
PE connection		On housing with M5 studs	On housing with M5 studs	On housing with M5 studs	On housing with M5 studs
Degree of protection		IP20	IP20	IP20	IP20
Width	mm	75.5	75.5	75.5	153
Height	mm	200	200	200	290
Depth	mm	50	50	50	70
Possible as base component		Yes	Yes	Yes	Yes
Weight, approx.	kg	0.6	0.8	0.6	3.4
Suitable for Power Module	Type	6SL3224-0BE13-7UA0 6SL3224-0BE15-5UA0	6SL3224-0BE17-5UA0 6SL3224-0BE21-1UA0	6SL3224-0BE21-5UA0	6SL3224-0BE22-2 . A0 6SL3224-0BE23-0 . A0
Frame size		FSA	FSA	FSA	FSB

Line voltage 380 V to 480 V 3 AC		Line reactor			
		6SL3203-0CD21-4AA0	**6SL3203-0CD22-2AA0**	**6SL3203-0CD23-5AA0**	**6SL3203-0CJ24-5AA0**
Rated current	A	11.6	25	31.3	45.8
Power loss at 50 Hz/60 Hz, approx.	W	Available soon	Available soon	Available soon	Available soon
Line connection U1, V1, W1		6 mm^2 screw terminals	6 mm^2 screw terminals	6 mm^2 screw terminals	16 mm^2 screw terminals
Load connection		Cable 4 x AWG16 (1.5 mm^2) length approx. 0.46 m	Cable 4 x AWG10 (2.5 mm^2) length approx. 0.49 m	Cable 4 x AWG10 (2.5 mm^2) length approx. 0.49 m	Cable 4 x 16 mm^2 length approx. 0.70 m
PE connection		On housing with M5 studs	On housing with M5 studs	On housing with M5 studs	On housing with M8 screw
Degree of protection		IP20	IP20	IP20	IP20
Width	mm	153	189	189	275
Height	mm	290	371	371	455
Depth	mm	70	50	50	84
Possible as base component		Yes	Yes	Yes	Yes
Weight, approx.	kg	3.4	5.2	5.9	13
Suitable for Power Module	Type	6SL3224-0BE24-0 . A0	6SL3224-0BE25-5 . A0 6SL3224-0BE27-5 . A0	6SL3224-0BE31-1 . A0	6SL3224-0BE31-5 . A0 6SL3224-0BE31-8 . A0
Frame size		FSB	FSC	FSC	FSD

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		Line reactor 6SL3203-0CD25-3AA0	6SL3203-0CJ28-6AA0	6SE6400-3CC11-2FD0	6SE6400-3CC11-7FD0
Rated current	A	53.6	86.9	129	183
Power loss at 50 Hz/60 Hz, approx.	W	Available soon	Available soon	Available soon	Available soon
Line connection U1, V1, W1		16 mm^2 screw terminals	50 mm^2 screw terminals	Flat connector for M10 cable lug	Flat connector for M10 cable lug
Load connection		Cable 4 x 16 mm^2 length approx. 0.70 m	Cable 4 x 35 mm^2 length approx. 0.70 m	Flat connector for M10 cable lug	Flat connector for M10 cable lug
PE connection		On housing with M8 screw	On housing with M8 screw	On housing with M8 studs	On housing with M8 studs
Degree of protection		IP20	IP20	IP00	IP00
Width	mm	275	275	240	240
Height	mm	455	577	228	228
Depth	mm	84	94	141	141
Possible as base component		Yes	Yes	No	No
Weight, approx.	kg	13	19	25	25
Suitable for Power Module	Type	6SL3224-0BE32-2 . A0	6SL3224-0BE33-0 . A0 6SL3224-0BE33-7 . A0	6SL3224-0BE34-5 . A0 6SL3224-0BE35-5 . A0	6SL3224-0BE37-5 . A0
Frame size		FSD	FSE	FSF	FSF

Selection and ordering data

Rated output		SINAMICS G120 PM240 Power Module		Line reactor
kW	hp	Type 6SL3224-...	Frame size	Order No.
380 V to 480 V 3 AC				
0.37	0.50	0BE13-7UA0	FSA	**6SE6400-3CC00-2AD3**
0.55	0.75	0BE15-5UA0	FSA	
0.75	1.0	0BE17-5UA0	FSA	**6SE6400-3CC00-4AD3**
1.1	1.5	0BE21-1UA0	FSA	
1.5	2.0	0BE21-5UA0	FSA	**6SE6400-3CC00-6AD3**
2.2	3.0	0BE22-2 . A0	FSB	**6SL3203-0CD21-0AA0**
3.0	4.0	0BE23-0 . A0	FSB	
4.0	5.0	0BE24-0 . A0	FSB	**6SL3203-0CD21-4AA0**
7.5	10	0BE25-5 . A0	FSC	**6SL3203-0CD22-2AA0**
11.0	15	0BE27-5 . A0	FSC	
15.0	20	0BE31-1 . A0	FSC	**6SL3203-0CD23-5AA0**
18.5	25	0BE31-5 . A0	FSD	**6SL3203-0CJ24-5AA0**
22	30	0BE31-8 . A0	FSD	
30	40	0BE32-2 . A0	FSD	**6SL3203-0CD25-3AA0**
37	50	0BE33-0 . A0	FSE	**6SL3203-0CJ28-6AA0**
45	60	0BE33-7 . A0	FSE	
55	75	0BE34-5 . A0	FSF	**6SE6400-3CC11-2FD0**
75	100	0BE35-5 . A0	FSF	
90	125	0BE37-5 . A0	FSF	**6SE6400-3CC11-7FD0**

Recommended line components

Overview

The following table lists recommendations for further line-side components, such as fuses and circuit-breakers (line-side components dimensioned in accordance with IEC standards). The specified circuit-breakers are UL-certified. Fuses of type 3NA3 are recommended for European countries. The 3NE1 fuses are UL-compliant (corresponds to UL).

Further information on the listed fuses and circuit-breakers can be found in Catalogs LV 1 and LV 1 T.

Selection and ordering data

Rated output		SINAMICS G120 PM240 Power Module		**Fuses**		**Circuit-breakers**
kW	hp	Type 6SL3224-...	Frame size	Type 3NA3 Order No.	Type 3NE3 (UL) Order No.	Order No.
380 V to 480 V 3 AC						
0.37	0.50	0BE13-7UA0	FSA	**3NA3803**	**UL-listed fuses such as the Class NON fuse series from Bussmann are required for North American countries.**	**3RV1021-1CA10**
0.55	0.75	0BE15-5UA0	FSA			**3RV1021-1DA10**
0.75	1.0	0BE17-5UA0	FSA			**3RV1021-1FA10**
1.1	1.5	0BE21-1UA0	FSA			**3RV1021-1GA10**
1.5	2.0	0BE21-5UA0	FSA			**3RV1021-1JA10**
2.2	3.0	0BE22-2.A0	FSB	**3NA3805**		**3RV1021-1KA10**
3.0	4.0	0BE23-0.A0	FSB			**3RV1021-4AA10**
4.0	5.0	0BE24-0.A0	FSB	**3NA3807**		**3RV1021-4BA10**
7.5	10	0BE25-5.A0	FSC			**3RV1031-4EA10**
11.0	15	0BE27-5.A0	FSC			**3RV1031-4FA10**
15.0	20	0BE31-1.A0	FSC	**3NA3812**		**3RV1031-4HA10**
18.5	25	0BE31-5.A0	FSD	**3NA3820**	**3NE1817-0**	**3RV1042-4KA10**
22	30	0BE31-8.A0	FSD	**3NA3822**	**3NE1818-0**	
30	40	0BE32-2.A0	FSD	**3NA3824**	**3NE1820-0**	**3RV1042-4MA10**
37	50	0BE33-0.A0	FSE	**3NA3830**	**3NE1021-0**	**3VL1712-.DD33-....**
45	60	0BE33-7.A0	FSE	**3NA3832**	**3NE1022-0**	**3VL1716-.DD33-....**
55	75	0BE34-5.A0	FSF	**3NA3836**	**3NE1224-0**	**3VL3720-.DC36-....**
75	100	0BE35-5.A0	FSF	**3NA3140**	**3NE1225-0**	**3VL3725-.DC36-....**
90	125	0BE37-5.A0	FSF	**3NA3144**	**3NE1227-0**	**3VL4731-.DC36-....**

Overview

Excess power in the DC link is dissipated via the braking resistor. The braking resistors are intended for use with PM240 Power Modules which feature an integrated brake chopper, but cannot regenerate energy to the supply system. For regenerative operation, e.g. the braking of a rotating mass with high moment of inertia, a braking resistor must be connected to convert the resulting energy into heat.

The braking resistors can be installed at the side next to the PM240 Power Modules. The braking resistors for the FSA and FSB frame sizes are designed as substructure components. If the PM240 Power Modules of the FSA and FSB frame size are operated without line reactor, the braking resistors can also be installed under the Power Modules.

The braking resistors for the Power Modules of the FSC to FSF frame sizes should be placed outside the switchgear cabinet or outside the switchgear room in order to lead the resulting heat loss from the area of the Power Modules, thereby allowing a corresponding reduction in the level of air conditioning required.

Each braking resistor is designed with a temperature switch (UL-listed). The temperature switch can be evaluated to prevent consequential damage if the braking resistor overheats.

Technical data

Line voltage 380 V to 480 V 3 AC		Braking resistors for PM240 Power Modules		
		6SE6400-4BD11-0AA0	**6SL3201-0BE12-0AA0**	**6SE6400-4BD16-5CA0**
Resistor	Ohm	390	160	56
Rated output P_{DB}	kW	0.1	0.2	0.65
Peak power P_{max}	kW	2.0	4.0	11.0
Degree of protection		IP20	IP20	IP20
Power connections		Shielded cable 3 x 2.5 mm^2, length 0.5 m	Shielded cable 3 x 2.5 mm^2, length 0.5 m	Shielded cable 3 x 2.5 mm^2, length 0.9 m
Thermostatic switch (NC contact) maximum contact load		250 V AC/2.5 A	250 V AC/2.5 A	250 V AC/2.5 A
Frame size		FSA	FSB	FSC
Width	mm	72	153	185
Height	mm	230	329	285
Depth	mm	43.5	43.5	150
Possible as base component		Yes	Yes	No
Weight, approx.	kg	1.0	2.0	3.8

Line voltage 380 V to 480 V 3 AC		Braking resistors for PM240 Power Modules		
		6SE6400-4BD21-2DA0	**6SE6400-4BD22-2EA0**	**6SE6400-4BD24-0FA0**
Resistor	Ohm	27	15	8.2
Rated output P_{DB}	kW	1.2	2.2	4.0
Peak power P_{max}	kW	24	44	80
Degree of protection		IP20	IP20	IP20
Power connections		M6 screw studs	M6 screw studs	M6 screw studs
Thermostatic switch (NC contact) maximum contact load		250 V AC/2.5 A	250 V AC/2.5 A	250 V AC/0,2 A
Frame size		FSD	FSE	FSF
Width	mm	270	270	395
Height	mm	515	645	650
Depth	mm	175	175	315
Possible as base component		No	No	No
Weight, approx.	kg	7.4	10.6	16.7

Braking resistors

Selection and ordering data

Rated output		SINAMICS G120 PM240 Power Module		**Braking resistor**
kW	hp	Type 6SL3224-...	Frame Size	Order No.
380 V to 480 V 3 AC				
0.37	0.50	0BE13-7UA0	FSA	**6SE6400-4BD11-0AA0**
0.55	0.75	0BE15-5UA0	FSA	
0.75	1.0	0BE17-5UA0	FSA	
1.1	1.5	0BE21-1UA0	FSA	
1.5	2.0	0BE21-5UA0	FSA	
2.2	3.0	0BE22-2 . A0	FSB	**6SL3201-0BE12-0AA0**
3.0	4.0	0BE23-0 . A0	FSB	
4.0	5.0	0BE24-0 . A0	FSB	
7.5	10	0BE25-5 . A0	FSC	**6SE6400-4BD16-5CA0**
11.0	15	0BE27-5 . A0	FSC	
15.0	20	0BE31-1 . A0	FSC	
18.5	25	0BE31-5 . A0	FSD	**6SE6400-4BD21-2DA0**
22	30	0BE31-8 . A0	FSD	
30	40	0BE32-2 . A0	FSD	
37	50	0BE33-0 . A0	FSE	**6SE6400-4BD22-2EA0**
45	60	0BE33-7 . A0	FSE	
55	75	0BE34-5 . A0	FSF	**6SE6400-4BD24-0FA0**
75	100	0BE35-5 . A0	FSF	
90	125	0BE37-5 . A0	FSF	

Overview

Output reactors reduce the voltage loading on the motor windings. At the same time, the capacitive charge/discharge currents, which place an additional load on the power section when long motor cables are used, are reduced.

The maximum permissible output frequency is 150 Hz when an output reactor is used – the pulse frequency must not exceed 4 kHz.

The output reactor must be installed as close as possible to the Power Module.

Output reactors are approved for use only in conjunction with "Vector" and "*V*/*f* control" modes.

Technical data

Line voltage 380 V to 480 V 3 AC		**Output reactor (for a 4 kHz pulse frequency)**					
		6SE6400-3TC00-4AD2					**6SL3202-0AE21-0CA0**
Rated current	A	4					9.4
Power loss	kW	Available soon					Available soon
Connection to the Power Module		Cable 4 x AWG16 (1.5 mm^2) length approx. 0.3 m					Cable 4 x AWG14 (1.5 mm^2) length approx. 0.4 m
Motor connection		Screw terminals for cable cross-section 6 mm^2					Screw terminals for cable cross-section 6 mm^2
PE connection		M5 stud					M5 stud
Max. permissible cable length between output reactor and motor	m	100 (shielded) 150 (unshielded)					100 (shielded) 150 (unshielded)
Width	mm	75.5					154
Height	mm	200					270
Depth	mm	110					70
Possible as base component		Yes					Yes
Degree of protection		IP00					IP00
Weight, approx.	kg	2.0					4.4
Suitable for Power Module	Type	6SL3224-0BE13-7UA0	6SL3224-0BE15-5UA0	6SL3224-0BE17-5UA0	6SL3224-0BE21-1UA0	6SL3224 0BE21-5UA0	6SL3224-0BE22-2UA0 6SL3224-0BE22-2UA0
Rated output of the Power Module	kW	0.37	0.55	0.75	1.1	1.5	2.2
Rated current I_{rated} of the Power Module	A	1.3	1.7	2.2	3.1	4.1	5.9
Frame size		FSA	FSA	FSA	FSA	FSA	FSB

Output reactors

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		Output reactor (for a 4 kHz pulse frequency)					
		6SL3202-0AE21-0CA0		6SL3202-0AJ23-2CA0			6SE6400-3TC05-4DD0
Rated current	A	9.4		32			68
Power loss	kW	Available soon		Available soon			Available soon
Connection to the Power Module		Cable 4 x AWG14 (1.5 mm^2) length approx. 0.4 m		Cable 4 x AWG14 (1.5 mm^2) length approx. 0.35 m			Flat connection for M6 cable lug
Motor connection		Screw terminals for cable cross-section 6 mm^2		Screw terminals for cable cross-section 6 mm^2			Flat connection for M6 cable lug
PE connection		M5 stud		M5 stud			M6 screw
Max. permissible cable length between output reactor and motor	m	100 (shielded) 150 (unshielded)		100 (shielded) 150 (unshielded)			200 (shielded) 300 (unshielded)
Width	mm	154		189			225
Height	mm	270		334			210
Depth	mm	70		80			150
Possible as base component		Yes		Yes			No
Degree of protection		IP00		IP00			IP00
Weight, approx.	kg	4.4		9.1			10.7
Suitable for Power Module	Type	6SL3224-0BE23-0UA0 6SL3224-0BE23-0AA0	6SL3224-0BE24-0UA0 6SL3224-0BE24-0AA0	6SL3224-0BE25-5UA0 6SL3224-0BE25-5AA0	6SL3224-0BE27-5UA0 6SL3224-0BE27-5AA0	6SL3224-0BE31-1UA0 6SL3224-0BE31-1AA0	6SL3224-0BE31-5UA0 6SL3224-0BE31-5AA0
Rated output of the Power Module	kW	3.0	4.0	7.5	11.0	15	18.5
Rated current I_{rated} of the Power Module	A	7.7	10	18	25	32	38
Frame size		FSB	FSB	FSC	FSC	FSC	FSD

Line voltage 380 V to 480 V 3 AC		Output reactor (for a 4 kHz pulse frequency)					
		6SE6400-3TC03-8DD0	6SE6400-3TC05-4DD0	6SE6400-3TC08-0ED0	6SE6400-3TC07-5ED0	6SE6400-3TC14-5FD0	6SE6400-3TC15-4FD0
Rated current	A	45	68	104	90	178	178
Power loss	kW	Available soon	Available soon	Available soon	Available soon	Available soon	Available soon
Connection to the Power Module		Flat connection for M6 cable lug	Flat connection for M6 cable lug	Flat connection for M6 cable lug	Flat connection for M6 cable lug	Flat connection for M8 cable lug	Flat connection for M8 cable lug
Motor connection		Flat connection for M6 cable lug	Flat connection for M6 cable lug	Flat connection for M6 cable lug	Flat connection for M6 cable lug	Flat connection for M8 cable lug	Flat connection for M8 cable lug
PE connection		M6 screw	M6 screw	M6 screw	M6 screw	M8 screw	M6 screw
Max. permissible cable length between output reactor and motor	m	200 (shielded) 300 (unshielded)	200 (shielded) 300 (unshielded)	200 (shielded) 300 (unshielded)	200 (shielded) 300 (unshielded)	200 (shielded) 300 (unshielded)	200 (shielded) 300 (unshielded)
Width	mm	225	225	225	270	350	270
Height	mm	210	210	210	248	321	248
Depth	mm	179	150	150	209	288	209
Possible as base component		No	No	No	No	No	No
Degree of protection		IP00	IP00	IP00	IP00	IP00	IP00
Weight, approx.	kg	16.1	10.7	10.4	24.9	51.5	24.0
Suitable for Power Module	Type	6SL3224-0BE31-8UA0 6SL3224-0BE31-8AA0	6SL3224-0BE32-2UA0 6SL3224-0BE32-2AA0	6SL3224-0BE33-0UA0 6SL3224-0BE33-0AA0	6SL3224-0BE33-7UA0 6SL3224-0BE33-7AA0	6SL3224-0BE34-5UA0 6SL3224-0BE34-5AA0	6SL3224-0BE35-5UA0 6SL3224-0BE35-5AA0
Rated output of the Power Module	kW	22	30	37	45	55	75
Rated current I_{rated} of the Power Module	A	45	60	75	90	110	145
Frame size		FSD	FSD	FSE	FSE	FSF	FSF

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		**Output reactor (for a 4 kHz pulse frequency) 6SE6400-3TC14-5FD0**
Rated current	A	178
Power loss	kW	Available soon
Connection to the Power Module		Flat connection for M8 cable lug
Motor connection		Flat connection for M8 cable lug
PE connection		M8 screw
Max. permissible cable length between output reactor and motor	m	200 (shielded) 300 (unshielded)
Width	mm	350
Height	mm	321
Depth	mm	288
Possible as base component		No
Degree of protection		IP00
Weight, approx.	kg	51.5
Suitable for Power Module	Type	6SL3224-0BE37-5UA0 6SL3224-0BE37-5AA0
Rated output of the Power Module	kW	75
Rated current I_{rated} of the Power Module	A	178
Frame size		FSF

Selection and ordering data

Rated output		SINAMICS G120 PM240 Power Module		**Output reactor**
kW	hp	Type 6SL3224-...	Frame size	Order No.
380 V to 480 V 3 AC				
0.37	0.50	0BE13-7UA0	FSA	**6SE6400-3TC00-4AD2**
0.55	0.75	0BE15-5UA0	FSA	
0.75	1.0	0BE17-5UA0	FSA	
1.1	1.5	0BE21-1UA0	FSA	
1.5	2.0	0BE21-5UA0	FSA	
2.2	3.0	0BE22-2 . A0	FSB	**6SL3202-0AE21-0CA0**
3.0	4.0	0BE23-0 . A0	FSB	
4.0	5.0	0BE24-0 . A0	FSB	
7.5	10	0BE25-5 . A0	FSC	**6SL3202-0AJ23-2CA0**
11.0	15	0BE27-5 . A0	FSC	
15.0	20	0BE31-1 . A0	FSC	
18.5	25	0BE31-5 . A0	FSD	**6SE6400-3TC05-4DD0**
22	30	0BE31-8 . A0	FSD	**6SE6400-3TC03-8DD0**
30	40	0BE32-2 . A0	FSD	**6SE6400-3TC05-4DD0**
37	50	0BE33-0 . A0	FSE	**6SE6400-3TC08-0ED0**
45	60	0BE33-7 . A0	FSE	**6SE6400-3TC07-5ED0**
55	75	0BE34-5 . A0	FSF	**6SE6400-3TC14-5FD0**
75	100	0BE35-5 . A0	FSF	**6SE6400-3TC15-4FD0**
90	125	0BE37-5 . A0	FSF	**6SE6400-3TC14-5FD0**

BOP Basic Operator Panel

Overview

The BOP Basic Operator Panel can be used to commission drives, monitor drives in operation and input individual parameter settings.

Values and units are displayed via a 5-digit display.

One BOP can be used for several inverters. It is plugged directly onto the Control Unit.

The BOP provides a function for time-saving copying of parameters. A parameter set of one inverter can be saved and then loaded to another inverter.

Integration

Control Unit with plugged in BOP Basic Operator Panel

Selection and ordering data

	Order No.
BOP Basic Operator Panel	**6SL3255-0AA00-4BA1**

Overview

For controlling and commissioning an inverter directly from a PC if the appropriate software (STARTER) has been installed.

This is an isolated RS232 adapter board for a reliable point-to-point connection to a PC with a serial RS232 interface. A USB/RS232 adapter can be used as an alternative.

The scope of supply includes a 9-pole Sub-D connector and an RS232 standard cable (3 m) and the STARTER commissioning tool on CD-ROM.

With these, the inverter can be

- parameterized (commissioning, optimization),
- monitored (diagnostics) and
- controlled (master control via STARTER for test purposes)

Selection and ordering data

	Order No.
PC-inverter connection kit including a 9-pole Sub-D connector, a RS232 standard cable (3 m) and the STARTER commissioning tool on CD-ROM	**6SL3255-0AA00-2AA1**

Brake Relay

Overview

The Brake Relay allows the Power Module to be connected to an electromechanical motor brake, thereby allowing the motor brake to be driven directly by the Control Unit.

Integration

The Brake Relay has the following interfaces:

- a switch contact (NO contact) to control the motor brake coil
- a connection for the cable harness (CTRL) for connection to the Power Module

The Brake Relay can be installed on the screen termination plate near the power terminals of the Power Module.

The supplied brake relay includes the cable harness for connection with the Power Module.

Technical data

Brake Relay	
Switching capability of the NO contact	Max. 440 V AC / 3.5 A 30 V DC / 12 A
Max. connectable cross-section	2.5 mm^2
Width	68 mm
Height	63 mm
Depth	33 mm
Degree of protection	IP20
Weight, approx.	0.17 kg

Selection and ordering data

	Order No.
Brake Relay including cable harness for connection to PM240 Power Module	**6SL3252-0BB00-0AA0**

Overview

The Safe Brake Relay allows the Power Module to be safely connected to an electromechanical motor brake, thereby allowing the brake to be directly and safely controlled by the Control Unit in accordance with EN 954-1, safety category 3 and IEC 61508 SIL 2.

Integration

The Safe Brake Relay has the following interfaces:

- a switch contact (NO contact) to control the motor brake coil
- a connection for a 24 V DC voltage supply
- a connection for the cable harness (CTRL) for connection to the Power Module

The Safe Brake Relay can be installed on the screen termination plate near the power terminals of the Power Module.

The supplied safe brake relay includes the cable harness for connection with the Power Module.

The 24 V DC coil of the motor brake is directly connected to the Safe Brake Relay. External overvoltage limiters are not required.

Technical data

Safe Brake Relay	
Supply voltage	20.4 V DC to 28.8 V DC Recommended rated value of the supply voltage 26 V DC (to compensate for the voltage drop along the feeder cable to the 24 V DC coil of the motor brake)
Max. permissible current requirement of the motor brake	Available soon
Max. current requirement (at 24 V DC)	Available soon
Max. connectable cross-section	2.5 mm^2
Width	68 mm
Height	63 mm
Depth	33 mm
Degree of protection	IP20
Weight, approx.	0.17 kg

Selection and ordering data

	Order No.
Safe Brake Relay including cable harness for connection to PM240 Power Module	**6SL3252-0BB01-0AA0**

Adapter for mounting on DIN rail

Overview

The adapter for DIN rail attachment can be used to mount inverters of frame size FSA and FSB on DIN rails (2 units with a center-to-center distance of 100 mm).

Furthermore, the motor cable screen connection and other cable screens required for DIN rail mounting of inverters comply with the same standards for emissions and conducted emissions as if the inverter was directly installed in a control cabinet.

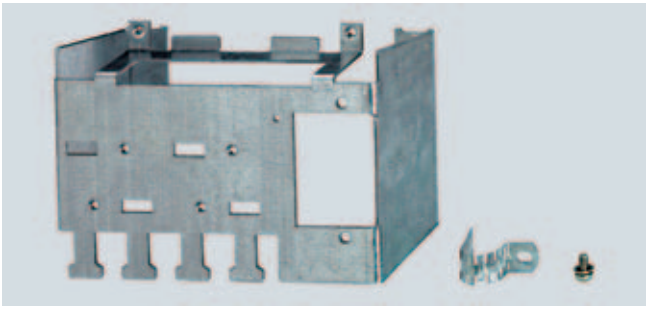
The adapter for inverter frame size FSA can be used to mount inverters singly or with matching line filter.

The adapter for inverter frame size FSB can be used to mount inverters with or without an integrated line filter.

Selection and ordering data

Adapter for mounting on DIN rail	Order No.
for Power Module frame size FSA	**6SL3262-1BA00-0BA0**
for Power Module frame size FSB	**6SL3262-1BB00-0BA0**

Overview



Example of screen termination kit for Power Module frame size FSB

The screen termination kit

- makes it easier to bond the screens of supply and control cables
- provides mechanical strain relief
- ensures optimum EMC performance

The screen termination kit includes

- a screen bonding plate for the required Power Module
- a screen bonding plate for a Control Unit
- connection elements and clamps for mounting
- mounting equipment for brake relay or safe brake relay – frame sizes FSB to FSF

Selection and ordering data

Screen termination kit	Order No.
for Power Module frame size FSA	**6SL3262-1AA00-0BA0**
for Power Module frame size FSB	**6SL3262-1AB00-0DA0**
for Power Module frame size FSC	**6SL3262-1AC00-0DA0**
for Power Module frame size FSD and FSE	**6SL3262-1AD00-0DA0**
for Power Module frame size FSF	**6SL3262-1AF00-0DA0**

NEMA1 kit

Overview

The SINAMICS G120 inverter chassis units are designed to comply with type "UL OPEN". The NEMA1 kit is required to obtain a type 1 NEMA housing.

An inverter with the NEMA1 kit can be operated in accordance with NEMA1 directives (NEMA 250-2003):

- Wall mounting without control cabinet in enclosed areas
- Protection against falling dirt ingress
- Personnel protection against accidental contact with housing

The NEMA1 kit comprises the following components:

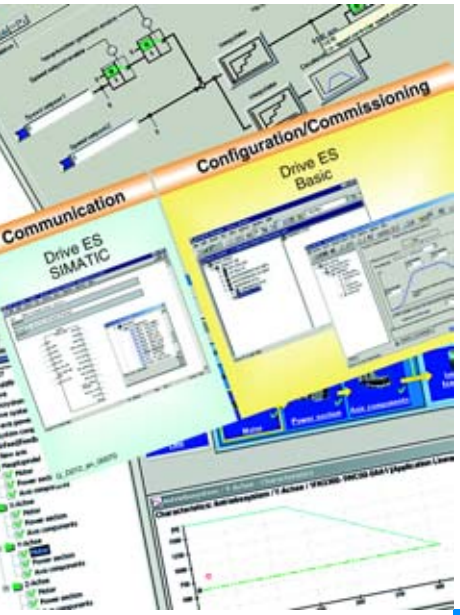
- Screen termination plate
- Screening plate for the Control Unit
- Cable duct
- Cover hood
- Cover

Selection and ordering data

NEMA1 kit (available soon)	Order No.
for Power Module frame size FSA	**6SL3262-1CA00-0BA0**
for Power Module frame size FSB	**6SL3262-1CB00-0DA0**
for Power Module frame size FSC	**6SL3262-1CC00-0DA0**
for Power Module frame size FSD and FSE	**6SL3262-1CD00-0DA0**
for Power Module frame size FSF	**6SL3262-1CF00-0DA0**

SINAMICS G120
Engineering tools

3



Engineering tools

Overview

The following electronic configuration and engineering tools are available for SINAMICS G120 inverter chassis units:

SD configurator selection aid

The interactive catalog CA 01 – the offline mall of Siemens Automation and Drives (A&D) – contains over 100,000 products with approximately 5 million potential drive system product versions. The SD configurator has been developed to facilitate selection of the correct motor and/or inverter from the wide spectrum of A&D SD products. The configurator is integrated in this catalog with the selection and configuration tools as a "selection aid" on CD2 "Configuring".

SIZER configuration tool

The SIZER PC tool provides an easy-to-use means of configuring the SINAMICS and MICROMASTER 4 drive family. It provides support when setting up the technologies involved in the hardware and firmware components required for a drive task. SIZER supports the complete configuration of the drive system, from simple single drives to complex multi-axis applications.

STARTER drive/commissioning software

The STARTER drive/commissioning software provides menu-guided assistance with commissioning, optimization and diagnostics. STARTER is not only designed for use on SINAMICS drives but also for MICROMASTER4 units and frequency inverters for distributed I/Os SIMATIC ET 200S FC.

Drive ES engineering system

Drive ES is the engineering system used to integrate Siemens drive technology into the SIMATIC automation world easily, efficiently and cost-effectively in terms of communication, configuration and data management. The STEP 7 Manager user interface provides the basis for this procedure. A variety of software packages, i.e. Drive ES Basic, Drive ES SIMATIC and Drive ES PCS 7, is available for SINAMICS.

Overview

The interactive catalog CA 01 – the offline mall of Siemens Automation and Drives (A&D) – contains over 100,000 products with approximately 5 million potential drive system product versions on CD2 "Configuring".

The SD configurator has been developed to facilitate selection of the correct motor and/or inverter from the wide spectrum of A&D SD products. It is integrated as a "selection help" in this catalog. The SD configurator is used to help locate the correct drive solution and delivers both the correct order number and relevant documentation.

It can display operating instructions, factory test certificates, terminal box documentations, etc. and generates data sheets, dimension drawings and a start-up calculation for the relevant products. It can also be used to identify a suitable inverter for the selected motor. 3D models in .stp format are also available.

The comprehensive aid system not only explains the program functions, but also provides access to detailed technical background knowledge.

Product range

The SD configurator covers the product spectrum of low-voltage motors (energy-saving and increased-safety motors) with associated documentation and dimension drawings, low-voltage inverters in the MICROMASTER 4 range, SINAMICS G110 and G120 inverter chassis units and the frequency inverters for the distributed I/Os SIMATIC ET 200S FC.

Hardware and software requirements

- PC with Pentium II or comparable processor
- Operating systems
  - Windows 98/ME
  - Windows 2000
  - Windows XP
  - Windows NT (Service Pack 5 and higher)
- At least 128 MB RAM user memory
- 1024 × 768 graphics with over 256 colors/small fonts
- CD-ROM drive
- Windows-compatible sound card
- Windows-compatible mouse

Installation

You can install this catalog on your hard disk or network directly from the CD-ROM/DVD as a light or full version.

Selection and ordering data

Description	Order No.
Interactive catalog CA 01 on CD-ROM including SD configurator selection aid, English	**E86060-D4001-A110-C4-7600**
Interactive catalog CA 01 on DVD including SD configurator selection aid, English	**E86060-D4001-A510-C4-7600**

Further information

The interactive catalog CA 01 can be ordered from the relevant Siemens sales office or via Internet:

http://www.siemens.com/automation/CA01

Links to tips, tricks and downloads for functional or content updates can also be found at this address.

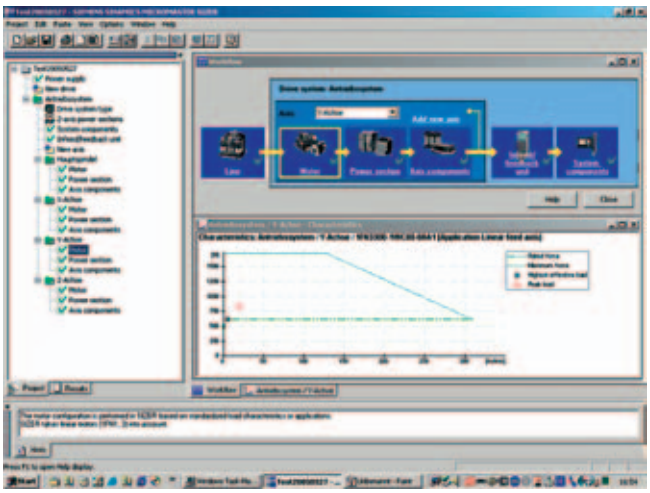
For technical advice and hotline support, you can also contact our hotline for catalog CA 01:

Tel.: +49 (0) 180 50 50 22 2

Email: adsupport@siemens.com

SIZER configuration tool

Overview



The SIZER configuration tool provides an easy-to-use means of configuring the SINAMICS and MICROMASTER 4 drive families, as well as the SINUMERIK solution line CNC control and SIMOTION Motion Control. It provides technical support when sizing the hardware and firmware components required for a drive task. SIZER supports the complete configuration of the drive system, from simple single drives to complex multi-axis applications.

SIZER supports all of the engineering steps in a workflow:

- selection of the line supply
- motor design as a result of load configuration
- calculation of the drive components
- selection of the required accessories
- selection of the line-side and motor-side power options

When SIZER was being designed, particular importance was placed on high usability and a universal, function-based approach to the drive task. The extensive user guidance makes using the tool easy. Status information keeps you continually informed about the progress about the configuration process.

The SIZER user interface is available in German and English.

The drive configuration is saved in a project. In the project, the components and functions used are displayed in a hierarchical tree structure.

The project view permits the configuration of drive systems and the copying/inserting/modifying of drives already configured.

The configuration process produces the following results:

- a parts list of the components required
- technical data
- characteristics
- comments on line harmonic distortions
- location diagram and dimension drawings

These results are displayed in a results tree and can be reused for documentation purposes.

User support is provided by the technological online help menu, which provides the following information:

- detailed technical data
- information about the drive systems and their components
- decision-making criteria for the selection of components

Minimum hardware and software requirements

PG or PC with Pentium™ II 400 MHz (Windows™ 2000), Pentium™ III 500 MHz (Windows™ XP)

256 MB RAM (512 MB recommended)

At least 990 MB of free hard disk space

An additional 100 MB of free hard disk space on Windows system drive

Monitor resolution 1024 × 768 pixels

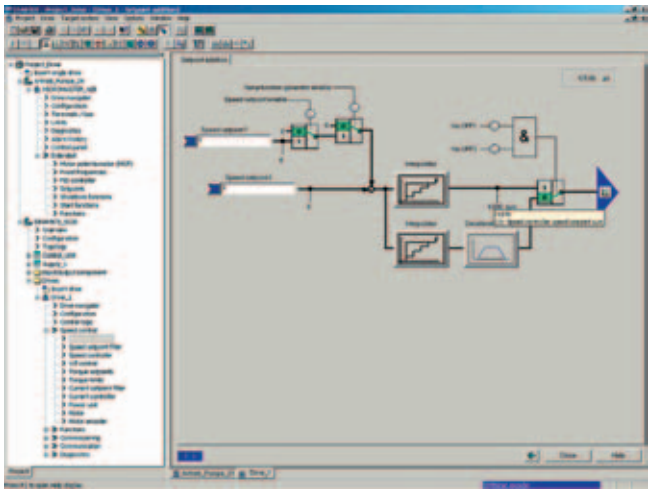
Windows™ 2000 SP2, XP Professional SP1, XP Home Edition SP1

Microsoft Internet Explorer 5.5 SP2

Selection and ordering data

	Order No.
SINAMICS MICROMASTER SIZER configuration tool German/English	**6SL3070-0AA00-0AG0**
SIZER LD Snap-In Suite Extension for medium-voltage systems,motors and DC inverters German/English	**on request**

Overview



The easy-to-use STARTER drive/commissioning software can be used for

- commissioning
- optimization and
- diagnostics.

This software can be operated either as a standalone PC application or can be integrated into the SCOUT engineering system (on SIMOTION) or STEP 7 (with Drive ES Basic). The basic functions and handling are the same in both cases.

In addition to the SINAMICS drives, the current version of STARTER also supports MICROMASTER 4 devices and inverters for the distributed I/O system SIMATIC ET 200S FC.

The project wizards can be used to create the drives within the structure of the project tree.

First-time users are supported by solution-based dialog menu, with a standard graphics-based display maximizing clarity when setting the drive parameters.

First commissioning is guided by wizards, which make all the basic settings in the drive. This enables a drive to be up and running after only setting a small number of parameters within the drive configuration process.

The individual settings required are made using graphics-based parameterization screenforms, which also display the mode of operation.

Examples of individual settings that can be made include:

- terminals
- bus interface
- setpoint channel (e.g. fixed setpoints)
- speed control (e.g. ramp-function generator, limits)
- BICO interconnections
- diagnostics

Experts can gain rapid access to the individual parameters via the expert list and do not have to navigate dialogs.

In addition, the following functions are available for optimization purposes:

- self-optimization
- trace (depending on drive)

Diagnostics functions provide information about:

- control/status words
- parameter status
- operating conditions
- communication states

Performance

- Easy to use: only a small number of settings need to be made for successful first commissioning: axis turning.
- Solution-based dialog-based user guidance simplifies commissioning.
- Self-optimization functions reduce manual effort for optimization.
- The built-in trace function provides optimum support during commissioning, optimization and troubleshooting.

Minimum hardware and software requirements

PG device or PC with Pentium™ II 400 MHz (Windows™ 2000), Pentium™ III 500 MHz (Windows™ XP)

256 MB RAM (512 MB recommended)

Monitor resolution 1024 × 768 pixels

Windows™ 2000 SP3, XP Professional SP1

Microsoft Internet Explorer 5.01

Integration

A PROFIBUS Communication Module and a connection cable are required to make the communication link between the PG/PC and a Control Unit.

For example, PROFIBUS Communication Module CP 5512 (PCMCIA type 2 card + adapter with 9-pole SUB-D socket for connection to PROFIBUS). For Windows 2000/XP Professional and PCMCIA 32)
Order No.: 6GK1551-2AA00

and connection cable between CP 5512 and PROFIBUS
Order No.: 6ES7901-4BD00-0XA0

PC-inverter connection kits are available for MICROMASTER 4, SINAMICS G110 and SINAMICS G120 for a safe point-to-point connection to the PC.
Order No. for MICROMASTER 4: 6SE6400-1PC00-0AA0
(the scope of supply includes a 9-pole SUB-D connector and a RS232 standard cable, 3 m)

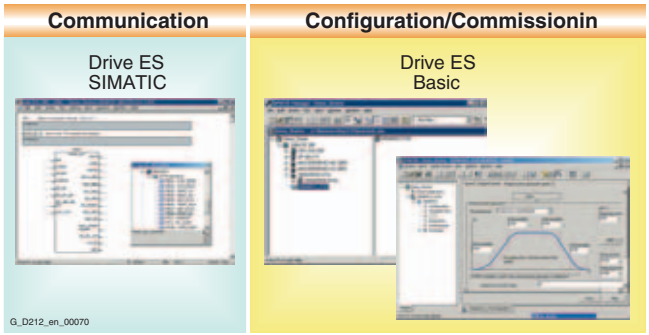
Order No. for SINAMICS G110 and SINAMICS G120:
6SL3255-0AA00-2AA1
(the scope of supply includes a 9-pole SUB-D connector and a RS232 standard cable, 3 m, and the STARTER commissioning tool on CD-ROM)

Selection and ordering data

	Order No.
STARTER commissioning tool for SINAMICS and MICROMASTER German / English / French / Italian	**6SL3072-0AA00-0AG0**

Drive ES engineering system

Overview



Drive ES is the engineering system used to integrate Siemens drive technology into the SIMATIC automation world easily, efficiently and cost-effectively in terms of communication, configuration and data management. The STEP 7 Manager user interface provides the basis for this procedure.

Various software packages are available for SINAMICS:

- **Drive ES Basic**
  for first-time users of the world of Totally Integrated Automation and the option for routing beyond network limits and the use of the SIMATIC teleservice.
  Drive ES Basic is the basic software program for setting the parameters of all drives online and offline.
  Drive ES Basic processes both the automation system and drives to be handled via the SIMATIC Manager user interface.
  Drive ES Basic is the starting point for common data archiving for complete projects and for extending the use of the SIMATIC teleservice to drives. Drive ES Basic provides the configuration tools for the new Motion Control functions slave-to-slave communication, equidistance and isochronous operation with PROFIBUS DP.
- **Drive ES SIMATIC**
  simple parameterization of the STEP 7 communication instead of programming. In order to use Drive ES SIMATIC, STEP 7 must be installed. It features a SIMATIC function block library, making the programming of the PROFIBUS interface in the SIMATIC CPU for the drives easy and secure.
  There is no need for separate, time-consuming programming of the data exchange between the SIMATIC CPU and the drive.
  All Drive ES users need to remember is:
  Copy – Modify – Download – Ready.
  Customized, fully-developed function blocks are copied from the library into user-specific projects.
  Frequently-used functions are set to run in program format:
  - Read out complete diagnostics buffer automatically from the drive
  - Download complete parameter set automatically from the SIMATIC CPU to the drive, e.g. in the event of a device being replaced
  - Load part parameter set (e.g. in the event of a device being replaced) automatically from the SIMATIC CPU
  - Read back, i.e. update, complete parameterization or part parameter sets from the drive into the SIMATIC CPU.
- **Drive ES PCS 7**
  integrates drives with the PROFIBUS interface into the SIMATIC PCS 7 process control system.
  Drive ES PCS 7 can only be used with SIMATIC PCS 7 version 5.0 and higher. Drive ES PCS 7 provides a function block library with function blocks for the drives and the corresponding faceplates for the operator station, which enables the drives to be operated from the PCS 7 process control system.

For further information please visit us on the Internet at:

http://www.siemens.com/drivesolutions

Selection and ordering data

	Order No.
Drive ES Basic V 5.4 • Configuration software for the integration of drives into Totally Integrated Automation • Requirement: STEP 7 V 5.3 and higher, SP3 • Supply format: on CD-ROM – Ger., Eng., Fr., Sp., It. – with electronic documentation	
Single-user license	**6SW1700-5JA00-4AA0**
Multi-user license, 60 pieces	**6SW1700-5JA00-4AA1**
Update service for single-user license	**6SW1700-0JA00-0AB2**
Update service for multi-user license	**6SW1700-0JA00-1AB2**
Upgrade from V 5.x to V 5.4	**6SW1700-5JA00-4AA4**
Drive ES SIMATIC V 5.4 • Function block library for SIMATIC for the parameterization of communication with the drives • Requirement: STEP 7 V 5.3 and higher, SP3 • Supply format: on CD-ROM – Ger., Eng., Fr., Sp., It. – with electronic documentation	
Single-user license incl. 1 x runtime license	**6SW1700-5JC00-4AA0**
Runtime license	**6SW1700-5JC00-1AC0**
Update service for single-user license	**6SW1700-0JC00-0AB2**
Upgrade from V 5.x to V 5.4	**6SW1700-5JC00-4AA4**
Drive ES PCS 7 V 6.1 • Function block library for PCS 7 for the integration of drives • Requirement: PCS 7 V 6.1 and higher • Supply format: on CD-ROM – Ger., Eng., Fr., Sp., It. – with electronic documentation	
Single-user license incl. 1 x runtime license	**6SW1700-6JD00-1AA0**
Runtime license	**6SW1700-5JD00-1AC0**
Update service for single-user license	**6SW1700-0JD00-0AB2**
Upgrade from V 5.x to V 6.1	**6SW1700-6JD00-1AA4**

SINAMICS G120
Services and documentation

4

Services and documentation

Overview

The following services and documentation are available for SINAMICS G120 inverter chassis units:

Training

To use drive systems economically, specialists are required who can operate, program and service the devices. The training centers of the Automation and Drives Group train your employees to master this innovative technology. Well-trained employees are motivated and implement optimal automation tasks with dedication. SINAMICS product training is carried out using specially developed training equipment in training centers.

Training case

The modular SIDEMO case system also includes a training case for SINAMICS G120 which is designed for mobile use for sales and servicing. Many of the new innovative functions of the SINAMICS G120 system – especially the Safety Integrated functions – can be demonstrated with this case.

Documentation

A wide variety of manuals in different forms and versions is available for the components of the SINAMICS G120 chassis unit range. A multi-language package on CD-ROM is supplied with each Control Unit. This package contains all available manuals for SINAMICS G120 in a variety of languages. A Getting Started guide is supplied in hard copy form with every Power Module and Control Unit.

Replacement fans for SINAMICS G120

The Power Module fans are designed for extra long service life. Replacement fans can be ordered for special applications.

SPARESonWeb

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.

Service & Support

At the end of the day, every detail has to be just right. This is why we offer a comprehensive range of professional service and support features. This enables you to make use of the solution best suited to your particular needs, be it fast access to information about technical issues via the Internet by means of our online support or a direct telephone connection to a contact who can deal with your questions or on-site support from our service team; a service agreement for the duration of a project; or even the handing over of all responsibility in all service matters. Your wish is our command.

Overview

Training is decisive for your success

SITRAIN – Siemens Training for Automation and Industrial Solutions – provides you with comprehensive support in solving your tasks.

Training by the market leader in automation, plant installation and plant support enables you to make your decisions with certainty and full command. Especially where the optimum and efficient use of products and plants are concerned. You can eliminate deficiencies in existing plants, and exclude expensive faulty planning right from the beginning.

All in all, this represents an enormous gain for your company: shortened commissioning times, optimized plant components, faster troubleshooting, reduced downtimes. In other words, increased profits and lower costs.

Top trainers

Our trainers know their topics in practice, and possess comprehensive didactic experience. Course developers have a direct wire to product development, and directly pass on their knowledge to the trainers.

Practical experience

The practical experience of our trainers makes it possible for them to pass on theoretical matter in a plausible manner. But since it is known that all theory is drab, we attach great importance to practical exercises which can comprise up to half of of the course time. You can therefore immediately implement your new knowledge in practice. We train you on state-of-the-art methodically/didactically designed training equipment. You feel absolutely certain when trained in this manner.

Wide variety

With a total of approx. 300 local attendance courses, we train the complete range of A&D products and a large portion of the system solutions from I&S. Telecourses, teach-yourself software and seminars presented on the Web supplement our classical range of courses.

Close to our customer

The distance is short. You can find us approx. 60 times in Germany, and worldwide in 62 countries. You wish to have individual training instead of one of our 300 courses? Our solution: we will provide a program tailored exactly to your personal requirements. Training can be carried out in our training centers or at your company.

The right mixture: blended learning

Blended learning is understood to be the combination of various training media and sequences. For example, a local attendance course in a training center can be optimally supplemented by a teach-yourself program as preparation or follow-up. Furthermore, SITRAIN utilizes supported online training for live instruction on the Internet at agreed times.

The right mixture is the solution. Therefore blended learning can convey complex topics well, and train networked thinking. Additional effect: reduced traveling costs and periods of absence through training sequences independent of location and time.

The international learning portal

Additional information is available on the Internet under:

http://www.siemens.com/sitrain

All training facilities at a glance: search in the worldwide range of courses at leisure, call up all course dates online, utilize the daily updated display of vacant course spaces - and register directly.

Or let us advise you personally:

Course office, Infoline Germany
Phone: +49 (0)1805-23 56 11
Fax: +49 (0)1805-23 56 12

... and request our latest training catalog on:

	Language	Order No.
ITC Catalog (paper version)	German	**E86060-K6850-A101-B6**
Dates and price list including CD-ROM	German	**E86060-P6850-A101-D2**
SITRAINonCD interactive course information system on CD-ROM	German/ English	**E86060-D6850-A100-C4-7400**

Training

Design

SINAMICS G120 courses

The courses are modular in design and are intended for a variety of target groups as well as individual customer requirements. A training course on the subject of SINAMICS G120 service and commissioning offers the necessary depth of technical know-how.

SINAMICS G120 is also covered by various courses which deal more generally with the SINAMICS drive system.

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

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	Programmers	Commissioning engineers, configuration engineers	Service personnel	Maintenance personnel		
SINAMICS G120 commissioning and service	✔		✔	✔	✔	2 days	DR-G120-EXP
SINAMICS system overview	✔					2 days	DR-SN-UEB
SINAMICS communication		✔	✔	✔		3 days	DR-SN-COM

Function

SINAMICS G120 commissioning and service (2 days)
DR-G120-EXP

Description/learning target

The course is aimed primarily at configuration engineers, service personnel and commissioning engineers who require an indepth understanding of the SINAMICS G120 drive system for the purpose of configuration and initial commissioning. Based on commissioning procedures with the STARTER commissioning tool, the course covers various inverter functions, closed-loop control optimization and BICO technology.

Target group

Decision-makers, sales personnel, commissioning engineers, configuration engineers, service and maintenance personnel

Content

- Design of the SINAMICS G120 drive system
- Commissioning and parameterization with the STARTER commissioning tool
- Inverter functions (flying restart, braking, closed-loop control)
- Data storage
- Flexible signal interconnection with BICO technology
- Safety Integrated functions
- Diagnostics and troubleshooting
- Practical exercises using the training case

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

Description/learning target

This course has been specially designed for sales personnel 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 inverter 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 inverter engineering and motors
- SIZER configuration tool
- STARTER commissioning tool
- Simple commissioning of a drive
- Practical exercises using the training case

SINAMICS communication (3 days)
DR-SN-COM

Description/learning target

The course is appropriate for programmers and service personnel who, as an extension to the DR-SNS-SI course, require further knowledge of 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, isochronous mode with servo applications, and direct OP access. Also described are the libraries of DriveES SIMATIC for cyclic and acyclic data exchange.

This knowledge is expanded by practical exercises using SINAMICS and SIMATIC S7 training cases with CPU 315-2 DP.

Target group

Commissioning engineers, configuration engineers, service personnel

Content

- Overview of the PROFIBUS DP, RS232-PPI, CAN 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 isochronous mode with Servo Control
- Cyclic and acyclic data exchange with DriveES SIMATIC components
- Fault diagnostics of the drive via the bus system
- Practical exercises on the SINAMICS S120 and SIMATIC S7 training cases with CPU 315-2 DP

SINAMICS G120 training case

Application

A training case has been developed for on-site training and demonstration of the SINAMICS G120 system. It can demonstrate and increase understanding of a wide range of SINAMICS G120 functions.

The case uses the CU240S DP-F as a Control Unit with which the PROFIBUS interface and safety functions can be demonstrated.

Design

- Drive system comprising:
  - CU240S DP-F Control Unit
  - PM240 Power Module frame size FSA, 0.37 kW
  - Basic Operator Panel (BOP)
  - Induction motor 1LA7060-4AB10
  - Encoder
  - Load equipment
- Control station with toggle switches and potentiometers
- Power cable, PROFIBUS cable
- Storage and carrying case (Tanos box made of hard plastic)

The training case is supplied ready for use. As an option, the case can be supplied with a Zarges box (robust hard shell case).

4

Technical data

SINAMICS G120 training case	
Input voltage	230 V 1 AC
Degree of protection in accordance with DIN VDE 0470 Part 1, EN 60529, IEC 529	IP00
Permissible ambient temperature	
• Storage and transport	–20 °C to +60 °C
• Operation	+5 °C to +40 °C
Width	540 mm
Height	500 mm
Depth	400 mm
Weight, approx.	13 kg

Selection and ordering data

	Order No.
SINAMICS G120 training case with Tanos box	**6ZB2480-0CD00**
SINAMICS G120 training case with Zarges box	**6ZB2480-0CD00-Z A01**
Accessory Line adapter 115 V 1 AC/230 V 1 AC	**6AG1064-1AA02-0AA0**

Overview

The following manuals are available:

	Manuals			
	Operating instructions	**Operating instructions (compact)**	**List manual**	**Getting Started**
Control Units				
CU240S	✓	✓	✓	✓
Power Modules				
PM240	✓	✓	– [1]	✓

1) The parameter settings for the Power Modules are integrated in the list manual for the Control Units.

Operating instructions

Operating instructions are a comprehensive collection of all information necessary for the normal and safe operation of products, process cells and complete plants (EN 62079).

Usage phases: Planning and configuration phase, implementation phase, setup and commissioning phase, application phase, maintenance and service phase.

Languages: English and German.

Operating instructions (compact)

Operating instructions (compact) are a compressed collection of all information necessary for the normal and safe operation of products, process cells and complete plants (EN 62079).

Usage phases: Planning and configuration phase, implementation phase, setup and commissioning phase, application phase, maintenance and service phase.

Languages: English, German, French, Italian and Spanish.

List manual

The list manual describes all parameters, function charts and faults/warnings for the product/system as well as their meanings and setting options. It contains parameter data and fault/warning descriptions with functional correlations.

Usage phases: Commissioning of components that have already been connected, configuration of system functions and fault cause/diagnostics.

Languages: English and German.

Getting Started

The Getting Started guide provides information about getting started for the first-time user as well as references to additional information. It contains information about the basic steps to be taken during commissioning. Descriptions of more advanced procedures can be found in the other documentation.

Usage phases: Commissioning of components that have already been connected.

Languages: Multilingual in English, German, French, Italian and Spanish.

Manuals are available in the following forms:

Multi-language package on CD-ROM

A multi-language package on CD-ROM is supplied with every Control Unit. This package contains all available manuals in a variety of languages.

Paper documentation

A Getting Started guide is supplied in hard copy form with every Power Module and Control Unit.

Online version on Internet as download

The documentation is also available on the Internet under

http://www.siemens.com/sinamics-g120

Replacement fans for SINAMICS G120

Overview

The Power Module fans are designed for extra long service life.
Replacement fans can be ordered for special applications.

Selection and ordering data

Rated output		SINAMICS G120 PM240 Power Module		**Replacement fans**
kW	hp	Type 6SL3224-...	Frame size and number of fans	Order No.
380 V to 480 V 3 AC				
0.37	0.50	0BE13-7UA0	FSA, 1 fan	**6SL3200-0SF01-0AA0** (includes 1 replacement fan)
0.55	0.75	0BE15-5UA0		
0.75	1.0	0BE17-5UA0		
1.1	1.5	0BE21-1UA0		
1.5	2.0	0BE21-5UA0		
2.2	3.0	0BE22-2 . A0	FSB, 2 fans [1]	
3.0	4.0	0BE23-0 . A0		
4.0	5.0	0BE24-0 . A0		
7.5	10	0BE25-5 . A0	FSC, 2 fans [1]	**6SL3200-0SF03-0AA0** (includes 1 replacement fan)
11.0	15	0BE27-5 . A0		
15.0	20	0BE31-1 . A0		
18.5	25	0BE31-5 . A0	FSD, 2 fans	**6SL3200-0SF04-0AA0** (includes 2 replacement fans)
22	30	0BE31-8 . A0		
30	40	0BE32-2 . A0		
37	50	0BE33-0 . A0	FSE, 2 fans	**6SL3200-0SF05-0AA0** (includes 2 replacement fans)
45	60	0BE33-7 . A0		
55	75	0BE34-5 . A0	FSF, 2 fans	**6SL3200-0SF06-0AA0** (includes 2 replacement fans)
75	100	0BE35-5 . A0		
90	125	0BE37-5 . A0		**6SL3200-0SF07-0AA0** (includes 2 replacement fans)

1) Recommendation: Even if only one fan on the Power Module is defective, it is advisable to replace both. In this case, the order quantity must be doubled.

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

Service & Support

Overview

In the face of harsh competition you need optimum conditions to keep ahead all the time:
a strong starting position, a sophisticated strategy and team for the necessary support – in every phase.
Service & Support from Siemens provides this support with a complete range of different services for automation and drives.

In every phase: from planning and commissioning to maintenance and upgrading.

Our specialists know when and where to act to keep the productivity and cost-effectiveness of your system running in top form.

Online support

The comprehensive information system available round the clock via Internet ranging from Product Support and Service & Support services to Support Tools in the Shop.

http://www.siemens.com/automation/service&support

Technical support

Competent consulting in technical questions covering a wide range of customer-oriented services for all our products and systems.

Phone: +49 (0)180 50 50 222
Fax: +49 (0)180 50 50 223
E-Mail:
adsupport@siemens.com

In the United States, call toll-free:
Phone: +1 800 333 7421
Fax: +1 423 262 2200
E-Mail: solutions.support@sea.siemens.com

In Canada, call:
Phone: +1 888 303 3353
E-Mail: cic@siemens.ca

In Asia:
Phone: +86 10 6475 7575
Fax: +86 10 6474 7474
E-Mail:
adsupport.asia@siemens.com

Technical consulting

Support in the planning and designing of your project from detailed actual-state analysis, target definition and consulting on product and system questions right to the creation of the automation solution. 1)

Configuration and software engineering

Support in configuring and developing with customer-oriented services from actual configuration to implementation of the automation project. 1)

Service on site

With service on site we offer services for startup and maintenance, essential for ensuring system availability.

In Germany
Phone: +49 (0)180 50 50 444 1)

In the United States, call toll-free:
Phone: +1 800 333 7421

In Canada, call:
Phone: +1 888 303 3353

Repairs and spare parts

In the operating phase of a machine or automation system we provide a comprehensive repair and spare parts service ensuring the highest degree of operating safety and reliability.

In Germany
Phone: +49 (0)180 50 50 448 1)

In the United States, call toll-free:
Phone: +1 800 241 4453

In Canada, call:
Phone: +1 888 303 3353

Optimization and upgrading

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

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

SINAMICS G120
Appendix

5

Siemens contacts worldwide

At

http://www.siemens.com/automation/partner

you can find details of Siemens contact partners worldwide responsible for particular technologies.

You can obtain in most cases a contact partner for

- technical support,
- spare parts/repairs,
- service,
- training,
- sales or
- consultation/engineering.

You start by selecting a

- country,
- product or
- sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.

A&D in the WWW

A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

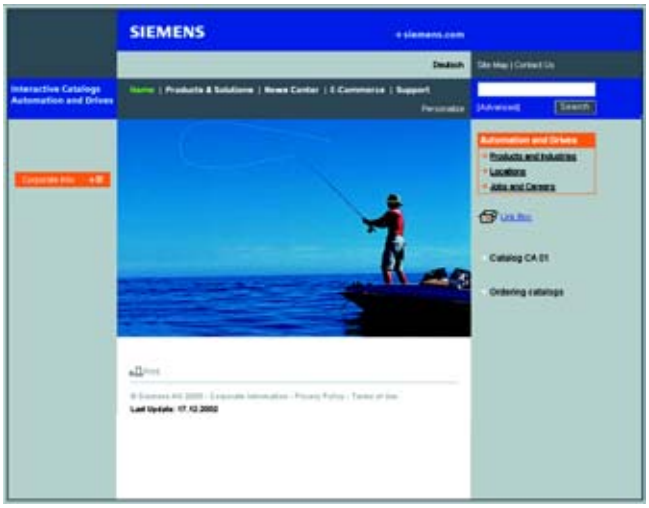
The Siemens Automation and Drives Group (A&D) has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

http://www.siemens.com/automation

you will find everything you need to know about products, systems and services.

Product selection using the Offline Mall of Automation and Drives



Detailed information together with convenient interactive functions:
The Offline Mall CA 01 covers more than 80,000 products and thus provides a full summary of the Siemens Automation and Drives product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives.
All information is linked into a user interface which is easy to work with and intuitive.

After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the Offline Mall CA 01 can be found on the Internet under

http://www.siemens.com/automation/ca01

or on CD-ROM or DVD.

Easy shopping with the A&D Mall

The A&D Mall is the virtual department store of Siemens AG on the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the A&D Mall on the Internet under:

http://www.siemens.com/automation/mall

Subject index

Terms and conditions of sale and delivery
Export regulations

Terms and conditions of sale and delivery

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  (for customers based in the Federal Republic of Germany)
- 6ZB5310-0KS53-0BA0
  (for customers based outside of the Federal Republic of Germany)

or download them from the Internet:
http://www.siemens.com/automation/mall
(Germany: A&D Mall Online-Help System)

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A&D/VuL/En 06.03.06

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Technical content:
Siemens AG, A&D SD SPA, Erlangen

Editor:
Siemens AG, A&D PT 5, Erlangen

Siemens AG
Automation and Drives
Standard Drives

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91050 ERLANGEN
FEDERAL REPUBLIC OF GERMANY

Order No.
E86060-K5511-A111-A3-7600

KG 0806 30.0 E 80 En/622236

Printed in Germany

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Further information can be obtained from our branch offices listed in the appendix or at www.siemens.com/automation/partner

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SINAMICS GM150/SINAMICS SM150 Medium-Voltage Converters	D 12
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Subject to changes | Dispo 18404 | KG 0806 30.0 E 80 EN / 622236 | Printed in Germany | © Siemens AG 2006

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