SIEMENS

SINAMICS Inverters for Single-Axis Drives and SIMOTICS Motors

Motion Control Drives

Catalog D 31

Edition 2015

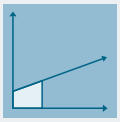
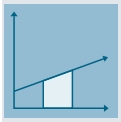
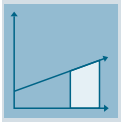
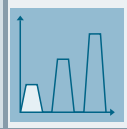
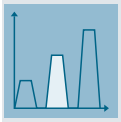
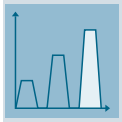
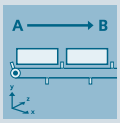
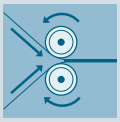
Answers for industry.

SINAMICS G110M distributed inverters
0.37 kW to 4 kW (0.5 hp to 5 hp)

6

Introduction

Application

Use	Requirements for torque accuracy/speed accuracy/position accuracy/coordination of axes/functionality					
	Continuous motion			Non-continuous motion		
	Basic	Medium	High	Basic	Medium	High
						
Pumping, ventilating, compressing	Centrifugal pumps Radial / axial fans Compressors	Centrifugal pumps Radial / axial fans Compressors	Eccentric screw pumps	Hydraulic pumps Metering pumps	Hydraulic pumps Metering pumps	Descaling pumps Hydraulic pumps
	V20 G110 G120C G120P	G120P G130/G150 G180 [1]	S120	G120	S110	S120
Moving	Conveyor belts Roller conveyors Chain conveyors	Conveyor belts Roller conveyors Chain conveyors Lifting/lowering devices Elevators Escalators/moving walkways Indoor cranes Marine drives Cable railways	Elevators Container cranes Mining hoists Excavators for open-cast mining Test bays	Acceleration conveyors Storage and retrieval machines	Acceleration conveyors Storage and retrieval machines Cross cutters Reel changers	Storage and retrieval machines Robotics Pick & place Rotary index tables Cross cutters Roll feeds Engagers/ disengagers
	V20 G110 G110D **G110M** G120C	G120 G120D G130/G150 G180 [1]	S120 S150 DCM	G120 G120D	S110 DCM	S120 DCM
Processing	Mills Mixers Kneaders Crushers Agitators Centrifuges	Mills Mixers Kneaders Crushers Agitators Centrifuges Extruders Rotary furnaces	Extruders Winders/unwinders Lead/follower drives Calenders Main press drives Printing machines	Tubular bagging machines Single-axis motion control such as • Position profile • Path profile	Tubular bagging machines Single-axis motion control such as • Position profile • Path profile	Servo presses Rolling mill drives Multi-axis motion control such as • Multi-axis positioning • Cams • Interpolations
	V20 G120C	G120 G130/G150 G180 [1]	S120 S150 DCM	G120	S110	S120 DCM
Machining	Main drives for • Turning • Milling • Drilling	Main drives for • Drilling • Sawing	Main drives for • Turning • Milling • Drilling • Gear cutting • Grinding	Axis drives for • Turning • Milling • Drilling	Axis drives for • Drilling • Sawing	Axis drives for • Turning • Milling • Drilling • Lasering • Gear cutting • Grinding • Nibbling and punching
	S110	S110 S120	S120	S110	S110 S120	S120

SINAMICS G110M fulfills all requirements that plant manufacturers demand from their frequency inverters in drives for conveyor system applications. The inverter is supplied as a motor integrated unit in degree of protection IP66 and sets standards in efficiency – from the installation phase to commissioning and handling. SINAMICS G110M is also suitable for pump and fan applications in which a motor integrated inverter is required as a distributed system.

Practical application examples and descriptions are available on the Internet at

www.siemens.com/sinamics-applications
www.siemens.com/conveyor-technology

More information

You may also be interested in these frequency drives:

- Simple applications with AS-Interface in IP65 degree of protection ⇒ SINAMICS G110D
- More performance for the control cabinet in IP20 degree of protection ⇒ SINAMICS G120, SINAMICS G120C
- With enhanced functionality, with positioning function in IP65 degree of protection ⇒ SINAMICS G120D
- With positioning function in the control cabinet in IP20 degree of protection ⇒ SINAMICS G120

[1] Industry-specific inverters.

Overview

The SINAMICS G110M distributed frequency inverters are the solution for drive tasks in which a motor integrated frequency inverter is required. With different device versions (frame sizes FSA to FSB) in a power range from 0.37 kW to 4 kW (0.5 hp to 5 hp), the SINAMICS G110M is suitable for a wide variety of drive solutions. SINAMICS G110M supports continuous speed control of three-phase asynchronous motors and fulfills all the requirements of conveyor system applications from simple speed control through to demanding sensorless vector control. It can be integrated seamlessly into the system thanks to its compact design in IP65/IP66 degree of protection.

Through the integrated functions such as quick stop and the limit switch function, the SINAMICS G110M is particularly suited for conveyor system applications.

For applications that require safety engineering, the SINAMICS G110M has the integrated STO (Safe Torque Off [1]) function, which can be implemented without further external components. Integration via PROFIBUS, PROFINET or USS into a higher-level SIMATIC controller is very easy thanks to the full TIA Portal integration [1] – one tool, one operating concept, one data storage.

SINAMICS G110M CU240M PN Control Unit, cable gland and PM240M Power Module FSA 1.5 kW (2 hp)

SINAMICS G110M CU240M PN Control Unit, plug-in and PM240M Power Module FSA 1.5 kW (2 hp)

Reasons for using distributed drive systems

- Modular drive solutions – thus standardized mechatronic elements that can be individually tested
- No need for a cabinet, resulting in a smaller space requirement and less cooling
- Long cables between the inverter and motor can be avoided (which means lower power losses, reduced interference emission and lower costs for shielded cables and additional filters)
- Considerable benefits for conveyor systems with their extensive coverage (e.g. in the automotive and logistics industries)

Siemens family of distributed drives

Siemens offers an innovative portfolio of frequency inverters to optimally implement distributed drive solutions. The strengths of the individual members of the drive family permit simple adaptation to the widest range of application demands:

- Identical connection systems
- Standard commissioning and configuration tools

Products from the family of distributed drives:

- SINAMICS G110M frequency inverters
- SINAMICS G110D frequency inverters
- SINAMICS G120D frequency inverters
- SIMATIC ET200pro FC-2 inverters (available soon)
- SIRIUS M200D motor starters

Modularity

SINAMICS G110M is a modular, motor integrated inverter system with IP65/66 degree of protection comprising various function units. The main units are:

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

The Control Unit controls and monitors the Power Module and the connected motor using several different closed-loop control types that can be selected. The digital and analog inputs and digital outputs on the device support the simple wiring of sensors and actuators directly at the drive. The input signals can either be directly linked within the Control Unit and initiate local responses independently or they can be transferred to the central control via PROFIBUS or PROFINET for further processing within the context of the overall plant.

The Power Module supplies the motor in a performance range from 0.37 kW to 4 kW (0.5 hp to 5 hp). The Power Module is controlled by a microprocessor in the Control Unit. State-of-the-art IGBT technology with pulse width modulation is used for highly reliable and flexible motor operation. Comprehensive protection functions provide a high degree of protection for the Power Module and the motor. The latest technical documentation (catalogs, dimensional drawings, certificates, manuals and operating instructions) is available on the Internet at the following address:

www.siemens.com/sinamics-g110m

and offline on the DVD-ROM CA 01 in the Drive Technology Configurator (DT Configurator). In addition, the DT Configurator can now be used on the Internet without requiring any installation. The DT Configurator can be found in the Siemens Industry Mall at the following address:

www.siemens.com/dt-configurator

[1] Available for firmware version V4.7 or higher.

Overview

Safety Integrated

The distributed SINAMICS G110M inverters are already equipped with the integrated STO safety function (Safe Torque Off [1]), certified in accordance with IEC 61508 SIL 2 as well as EN ISO 13849-1 PL d and Category 3). It can be activated either over PROFIsafe or over the safety input.

Additional information is provided in the Highlights section, subsection Safety Integrated.

STARTER commissioning tool

The STARTER commissioning tool (V4.3 SP3 and higher) supports the commissioning and maintenance of SINAMICS G110M inverters. The operator guidance combined with comprehensive, user-friendly functions for the relevant drive solution allow you to commission the device quickly and easily.

SINAMICS Startdrive commissioning tool (V13 and higher)

SINAMICS Startdrive is a tool for configuring, commissioning, and diagnosing the SINAMICS family of drives and is integrated into the TIA Portal. SINAMICS Startdrive can be used to implement drive tasks with the SINAMICS G110M, SINAMICS G120, SINAMICS G120C, SINAMICS G120D and SINAMICS G120P inverter series. The commissioning tool has been optimized with regard to user friendliness and consistent use of the TIA Portal benefits of a common working environment for PLC, HMI and drives.

Benefits

Fast commissioning

- Preconfigured with SIMOGEAR
- Loop-through of 24 V DC and 400 V 3 AC and communication – no T-distributor necessary
- Internal braking resistors - typical applications can be implemented without external braking resistors
- Rugged, with IP65/66 degree of protection, up to 55 °C ambient temperature
- Commissioning via fieldbus

Fast commissioning on site

- Local commissioning via DIP switch, standard USB interface and potentiometer or Intelligent Operator Panel (IOP)
- Plug-in connections for 400 V 3 AC and 24 V DC, plug-in I/Os and communication
- Local diagnostics with LEDs
- Uploading, saving and cloning of parameters with SINAMICS SD card and IOP Intelligent Operator Panel

Full functionality

- Integrated safety functions (STO locally via F-DI or via PROFIsafe)
- PROFINET communication to PROFIBUS at no extra cost
- Integrated communication: USS, Modbus RTU, PROFIBUS, PROFINET and EtherNet/IP
- Basic PLC functions and additional conveyor technology functions
- I/Os can be used as distributed I/Os of the PLC

Efficient engineering

- Fully integrated in Totally Integrated Automation, Totally Integrated Automation Portal and Integrated Drive System
- Automatic diagnostics in combination with SIMATIC controller

Flexible commissioning

- Integrated, specific software functionality for conveyor systems:
  - Quick stop function for fast reaction times to sensors
  - Limit switch functionality, e.g. for rotary table, corner transfer unit
- Use of the same software tools (STARTER and SINAMICS Startdrive) as for all SINAMICS drives

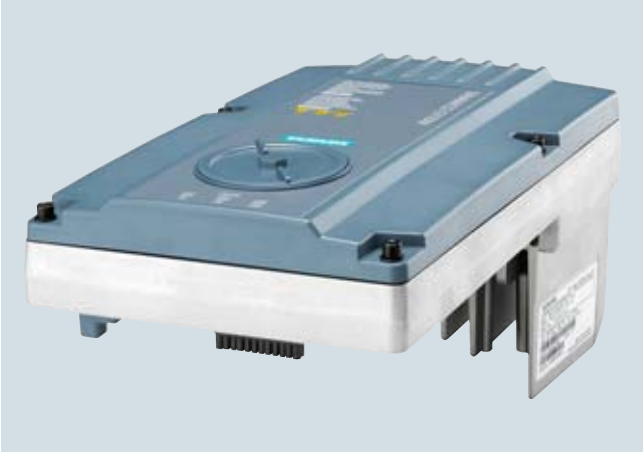
[1] Available for firmware version V4.7 or higher.

Design

The SINAMICS G110M distributed inverters are modular frequency inverters for standard drives. Each SINAMICS G110M comprises two operative units – a Power Module and a Control Unit.

SINAMICS G110M CU240M PN Control Unit plug-in and PM240M Power Module FSA 1.5 kW (2 hp)

Power Modules

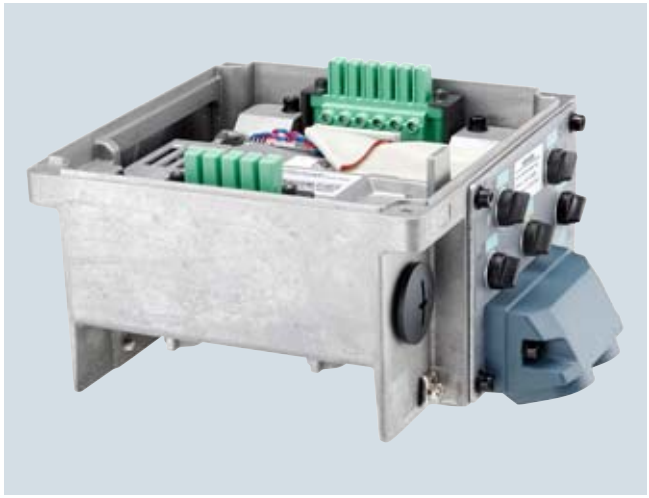


SINAMICS G110M PM240M Power Module FSA 1.5 kW (2 hp)

The following PM240M Power Modules are available for the SINAMICS G110M distributed inverters:

PM240M Power Modules Rated power kW (hp)	Frame size
0.37 (0.5)	FSA
0.75 (1)	FSA
1.1 (1.5)	FSA
1.5 (2)	FSA
2.2 (3)	FSB
3 (4)	FSB
4 (5)	FSB

Control Units



SINAMICS G110M CU240M PN Control Unit cable gland

A Control Unit performs closed-loop control functions for the inverter. In addition to the closed-loop control, it has additional functions that can be adapted to the particular application through parameterization.

The following Control Units are available for SINAMICS G110M distributed inverters:

CU240M Control Units

Several Control Units are available in different versions:

Control Unit	Fieldbus communication via	Connection system	For motor frame sizes
CU240M	USS/ Modbus RTU	Screw-type version	71, 80/90, 100/112
CU240M DP	PROFIBUS	Screw-type version	71, 80/90, 100/112
CU240M DP	PROFIBUS	Plug-in version	71, 80/90, 100/112
CU240M PN	PROFINET, EtherNet/IP	Screw-type version	71, 80/90, 100/112
CU240M PN	PROFINET, EtherNet/IP	Plug-in version	71, 80/90, 100/112

Design

Supplementary system components

Intelligent Operator Panel IOP Handheld

The IOP supports both entry-level personnel and drive experts. Thanks to the large plain text display, menu-based operation and the application wizards, it is easy to commission, diagnose and locally control standard drives.

Memory card

The parameter settings for the inverter can be stored on the SINAMICS SD memory card. When service is required, e.g. after the inverter has been replaced and the data have been downloaded from the memory card, the system is immediately ready for use again.

PC inverter connection kit (mini USB interface cable) for communication with a PC

For controlling and commissioning an inverter directly from a PC if the appropriate software (STARTER commissioning tool V4.3 and higher or SINAMICS Startdrive V13 and higher) has been installed.

Internal braking resistors

Excess energy in the DC link is dissipated in the internal braking resistor.

24 V DC power supply

A 24 V DC power supply is also available for SINAMICS G110M. This is mounted directly on the inverter and supplies the device with 24 V DC, so there is no need to connect an external 24 V DC power supply.

Connecting cable for the Control Units

Flexible plug-in cables to transfer data between the Industrial Ethernet stations or PROFIBUS stations, as well as to supply power to the Control Unit.

Connecting cable for the Power Modules

Connector sets and pre-assembled cables for the line supply can be ordered as accessories.

Installation kits

Different installation kits can be ordered as accessories for the Control Units with plug-in connections and Control Units with cable gland connections.

These kits include covers or cable glands for protecting or connecting the 400 V 3 AC supply, the 24 V DC supply and the mechanical motor brake.

Spare Parts Kit

A Spare Parts Kit is available which comprises small parts such as seals, caps and screws.

Configuration

The following electronic configuring aids and engineering tools are available for the SINAMICS G110M distributed inverters:

Drive Technology Configurator (DT Configurator) within the CA 01

The interactive catalog CA 01 – the offline Industry mall of Siemens on DVD-ROM – contains over 100,000 products with approximately 5 million possible drive system product variants. The Drive Technology Configurator (DT Configurator) has been developed to facilitate selection of the correct motor and/or inverter from the wide spectrum of drives. It is integrated as a selection tool in Catalog CA 01.

Online DT Configurator

In addition, the DT Configurator can now be used on the Internet without requiring any installation. The DT Configurator can be found in the Siemens Industry Mall at the following address:

www.siemens.com/dt-configurator

SIZER for Siemens Drives engineering tool

The SIZER for Siemens Drives engineering tool makes it easy to configure the SINAMICS and MICROMASTER 4 drive family. It provides support when selecting the hardware and firmware components necessary to implement a drive task. SIZER for Siemens Drives is designed to support configuring of the entire drive system.

You can find further information on the SIZER for Siemens Drives engineering tool in the section Engineering Tools.

The SIZER for Siemens Drives engineering tool is available free on the Internet at
www.siemens.com/sizer

STARTER commissioning tool

The STARTER commissioning tool allows menu-prompted commissioning, optimization and diagnostics. Apart from the SINAMICS drives, STARTER is also suitable for the MICROMASTER 4 devices; for SINAMICS G110M , STARTER V4.3 SP3 and higher.

You can find further information on the STARTER commissioning tool in the section Engineering Tools.

Additional information about the STARTER commissioning tool is available on the Internet at
www.siemens.com/starter

SINAMICS Startdrive commissioning tool (V13 and higher)

SINAMICS Startdrive is a tool for configuring, commissioning, and diagnosing the SINAMICS family of drives and is integrated into the TIA Portal. SINAMICS Startdrive can be used to implement drive tasks with the SINAMICS G110M, SINAMICS G120, SINAMICS G120C, SINAMICS G120D and SINAMICS G120P inverter series. The commissioning tool has been optimized with regard to user friendliness and consistent use of the TIA Portal benefits of a common working environment for PLC, HMI and drives.

You can find further information on the SINAMICS Startdrive commissioning tool in the section Engineering Tools.

The SINAMICS Startdrive commissioning tool is available free on the Internet at
www.siemens.com/startdrive

Technical specifications

Unless explicitly specified otherwise, the following technical specifications are valid for all the following SINAMICS G110M distributed inverter components listed here.

SINAMICS G110M	
Mechanical specifications	
Vibratory load	
• Transport acc. to EN 60721-3-2 [1]	Class 1M2
• Operation acc. to EN 60721-3-3	Class 3M3
Shock load	
• Transport acc. to EN 60721-3-2 [1]	Class 1M2
• Operation acc. to EN 60721-3-3	Class 3M3
Ambient conditions	
Protection class according to EN 61800-5-1	Class III (PELV)
Touch protection according to EN 61800-5-1	Class I (with protective conductor system)
Permissible ambient and coolant temperature (air) during operation for Power Modules	-10 ... +40 °C (14 ... 104 °F) without derating >40 ... 55 °C (104 ... 131 °F) see derating characteristics
Permissible ambient and coolant temperature (air) during operation for Control Units	-10 ... +55 °C (14 ... 131 °F) without derating
Humidity, max.	95 % at 40 °C (104 °F)
Ambient temperature	
• Storage [1] acc. to EN 60068-2-1	-40 ... +70 °C (-40 ... +158 °F)
• Transport [1] acc. to EN 60068-2-1	-40 ... +70 °C (-40 ... +158 °F)
• Operation acc. to EN 60068-2-2	-10 ... +40 °C (14 ... 104 °F) without derating
Environmental class/harmful chemical substances	
• Operation acc. to EN 60721-3-3	Class 3C2
Degree of pollution acc. to EN 61800-5-1	2
Certification for fail-safe versions	
• According to IEC 61508	SIL 2
• According to EN ISO 13849-1	PL d and Category 3
Standards	
Compliance with standards	UL 508C (UL list number E121068), cUL, CE, C-Tick
CE marking, according to	Low-Voltage Directive 2006/95/EC
EMC Directive [2]	
• Frame sizes FSA to FSC with integrated line filter class A	Category C2 [3] according to EN 61800-3 Note: The EMC product standard EN 61800-3 does not apply directly to a frequency inverter but to a PDS (Power Drive System), which comprises the complete circuitry, motor and cables in addition to the inverter. The frequency inverters on their own do not generally require identification according to the EMC Directive.

[1] In product packaging.

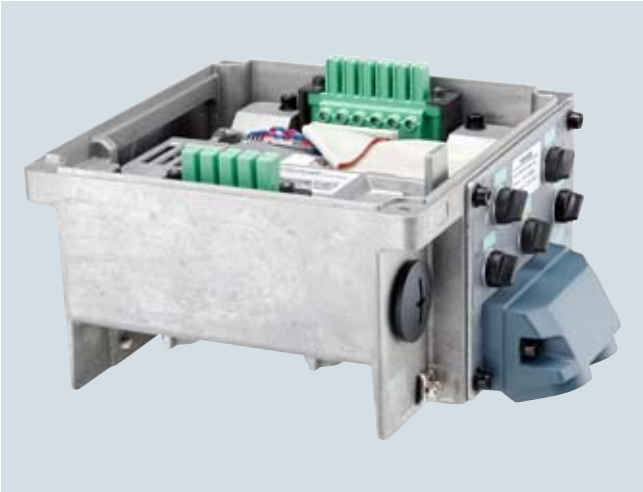
[2] For further general information, see also chapter SINAMICS G120, section Technical specifications, Compliance with standards.

[3] With shielded motor cable up to 5 m (16.41 ft).

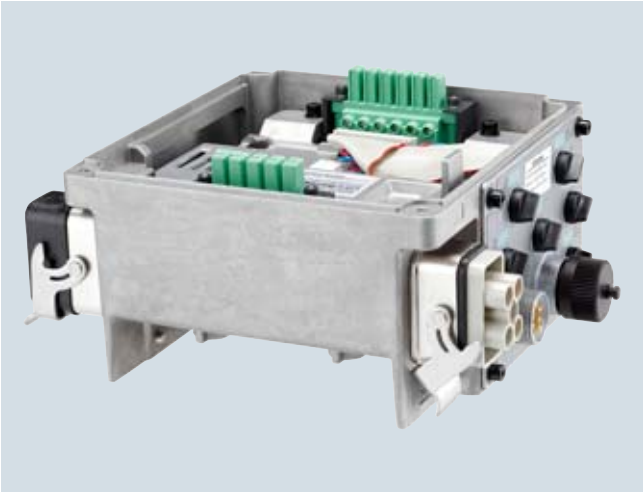
Overview

The Control Unit performs closed-loop control functions for the inverter. In addition to the primary closed-loop control function, it has many additional functions that can be adapted to the particular application through parameterization.

The Control Units are available in two versions for connection to 400 V 3 AC and 24 V DC – screw-type or plug-in. The version in USS fieldbus communication is only available as screw-type. The differences between the screw-type and plug-in versions are presented in the following pictures:



SINAMICS G110M CU240M Control Unit PN cable gland



SINAMICS G110M CU240M Control Unit PN plug-in

Several Control Units are available in different versions:

Control Unit		Communications via	Connection system	For motor frame sizes
CU240M Control Unit, screw-type	CU240M	USS, Modbus RTU	Screw-type	71, 80/90, 100/112
CU240M DP Control Unit, screw-type	CU240M DP	PROFIBUS	Screw-type	71, 80/90, 100/112
CU240M DP Control Unit, plug-in	CU240M DP	PROFIBUS	Plug-in version	71, 80/90, 100/112
CU240M PN Control Unit, screw-type	CU240M PN	PROFINET, EtherNet/IP	Screw-type	71, 80/90, 100/112
CU240M PN Control Unit, plug-in	CU240M PN	PROFINET, EtherNet/IP	Plug-in	71, 80/90, 100/112

Safety Integrated functions

The safety function "Safe Torque Off" (STO [1]) (certified according to IEC 61508 SIL 2 and EN ISO 13849-1 PL d and Category 3) is already integrated into the basic versions of the CU240M series (CU240M, CU240M DP and CU240M PN). It prevents active movement of the drive. It can be activated either over PROFIsafe or over the safety input.

Existing systems in particular can be simply updated with safety technology without the need to change the motor or mechanical system.

[1] Available for firmware version V4.7 or higher

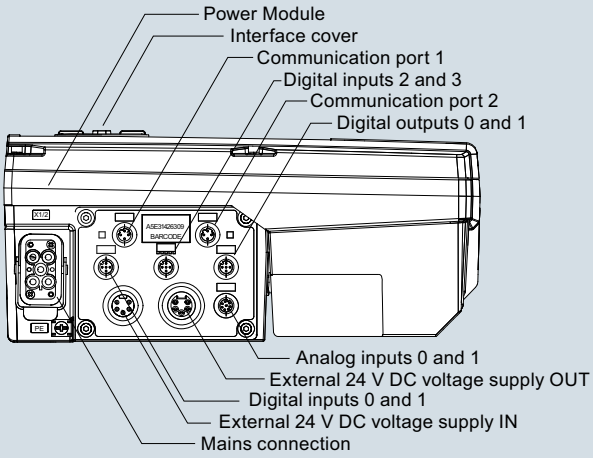
Selection and ordering data

Communication	Digital inputs (number which can be parameterized as fail-safe given below)	Analog inputs (of which can be used optionally as digital input (10 V)	Digital outputs	Safety Integrated functions [1]	Designation of Control Unit	Motor Frame size		**Control Unit** Article No.
CU240M – screw-type								
USS, Modbus RTU	4 (1)	2 (2)	2	STO	CU240M	71	NEW	**6SL3544-0LB02-1BA0**
	4 (1)	2 (2)	2			80/90	NEW	**6SL3544-0MB02-1BA0**
	4 (1)	2 (2)	2			100/112	NEW	**6SL3544-0NB02-1BA0**
CU240M DP – screw-type								
PROFIBUS DP	4 (1)	2 (2)	2	STO	CU240M DP	71	NEW	**6SL3544-0LB02-1PA0**
	4 (1)	2 (2)	2			80/90	NEW	**6SL3544-0MB02-1PA0**
	4 (1)	2 (2)	2			100/112	NEW	**6SL3544-0NB02-1PA0**
CU240M DP – plug-in								
PROFIBUS DP	4 (1)	2 (2)	2	STO	CU240M DP	71	NEW	**6SL3544-0TB02-1PA0**
	4 (1)	2 (2)	2			80/90	NEW	**6SL3544-0PB02-1PA0**
	4 (1)	2 (2)	2			100/112	NEW	**6SL3544-0QB02-1PA0**
CU240M PN – screw-type								
PROFINET, EtherNet/IP	4 (1)	2 (2)	2	STO	CU240M PN	71	NEW	**6SL3544-0LB02-1FA0**
	4 (1)	2 (2)	2			80/90	NEW	**6SL3544-0MB02-1FA0**
	4 (1)	2 (2)	2			100/112	NEW	**6SL3544-0NB02-1FA0**
CU240M PN – plug-in								
PROFINET, EtherNet/IP	4 (1)	2 (2)	2	STO	CU240M PN	71	NEW	**6SL3544-0TB02-1FA0**
	4 (1)	2 (2)	2			80/90	NEW	**6SL3544-0PB02-1FA0**
	4 (1)	2 (2)	2			100/112	NEW	**6SL3544-0QB02-1FA0**

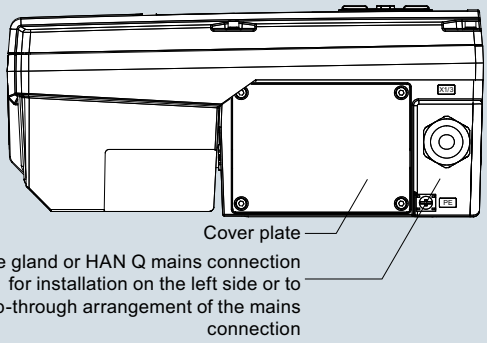
[1] Available for firmware version V4.7 or higher

Design

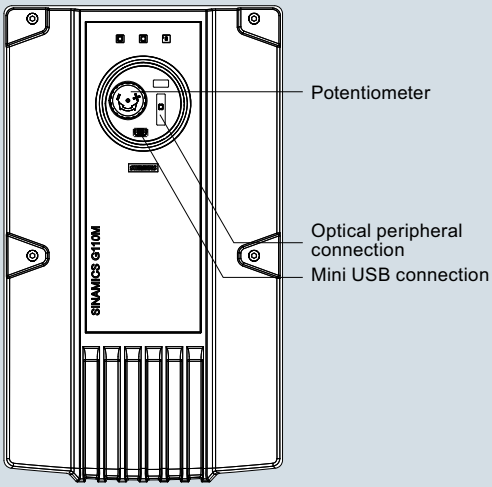
Control Unit and Power Module (view from the right side)



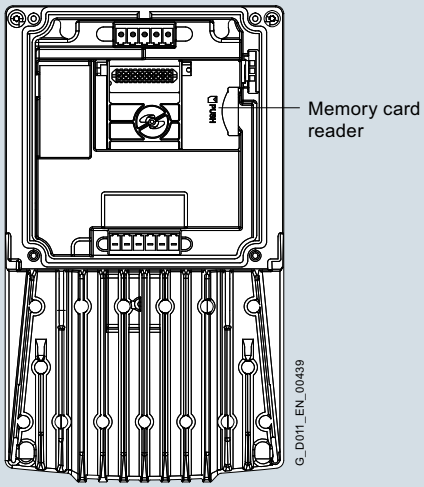
Control Unit and Power Module (view from the left side)



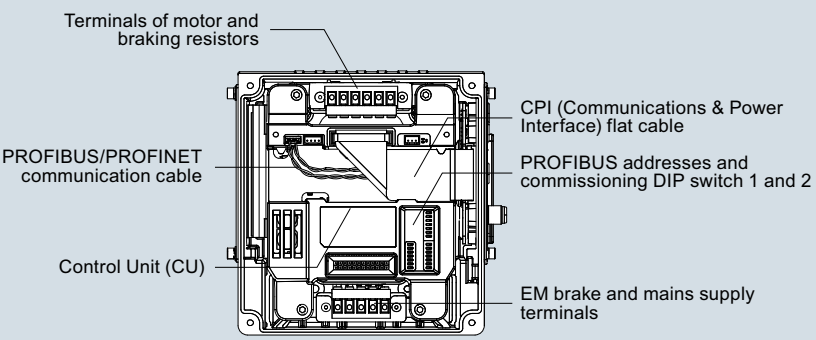
Power Module (top view)



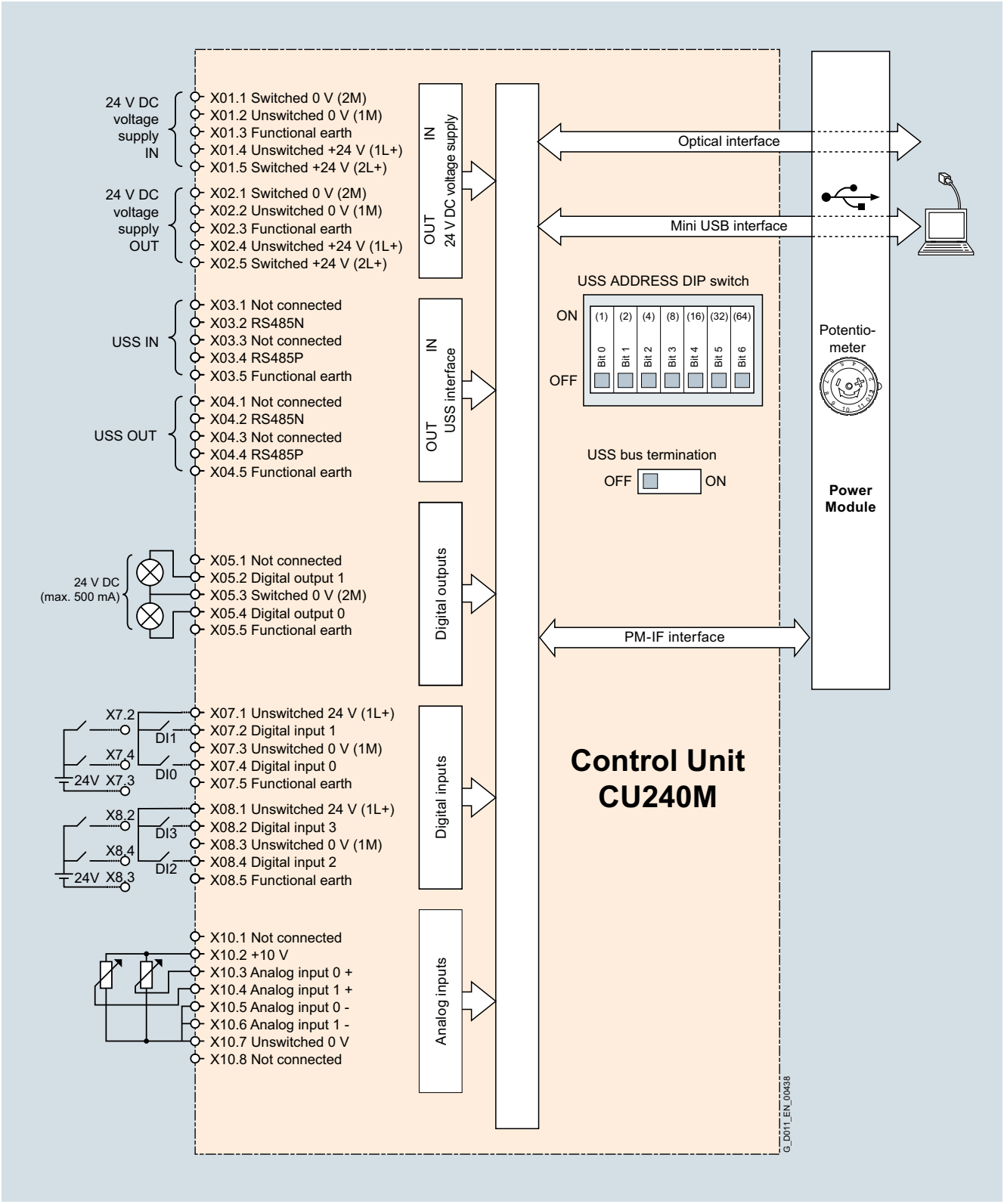
Power Module (inside view)



Control Unit (top view/inside view)

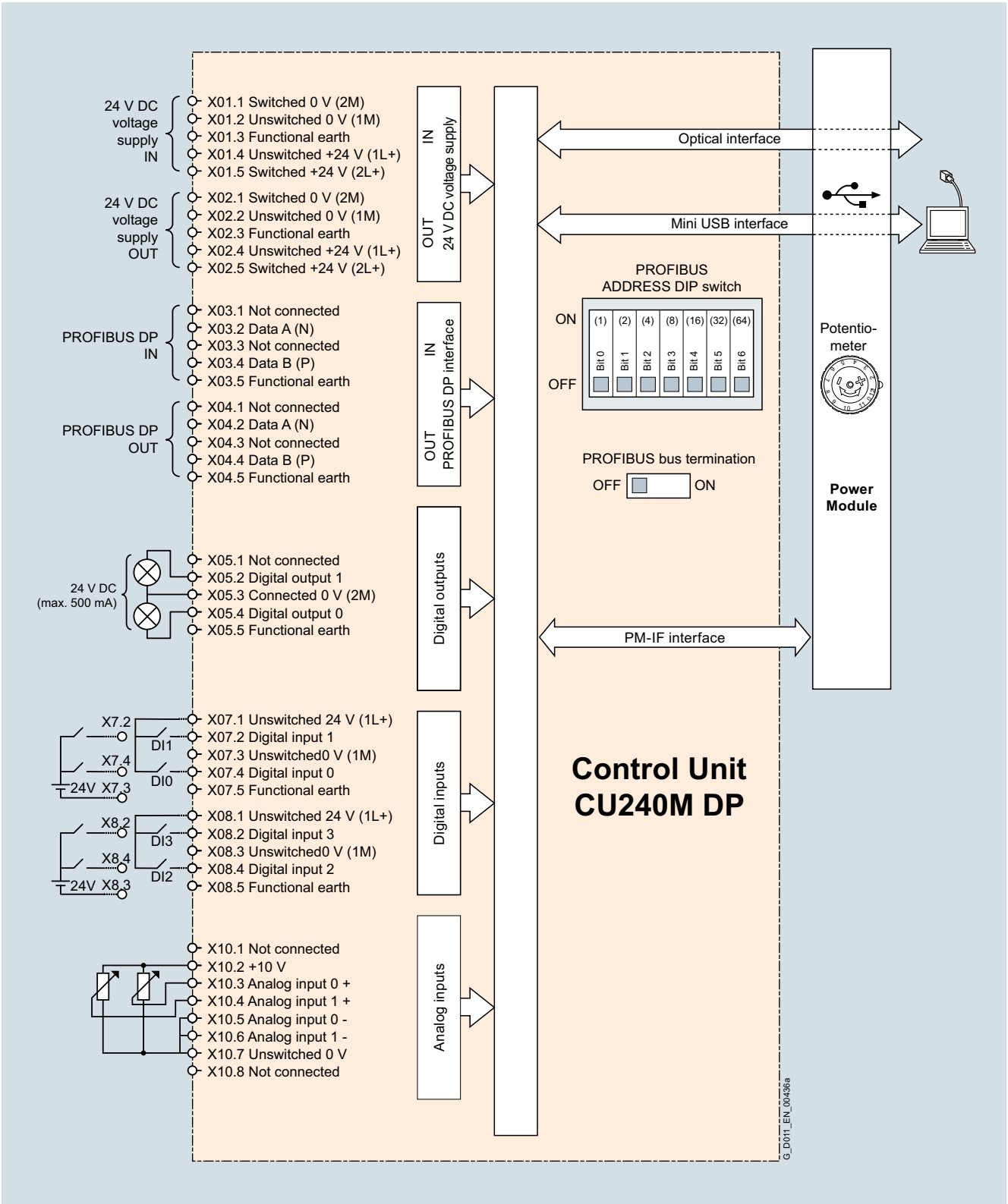


Integration



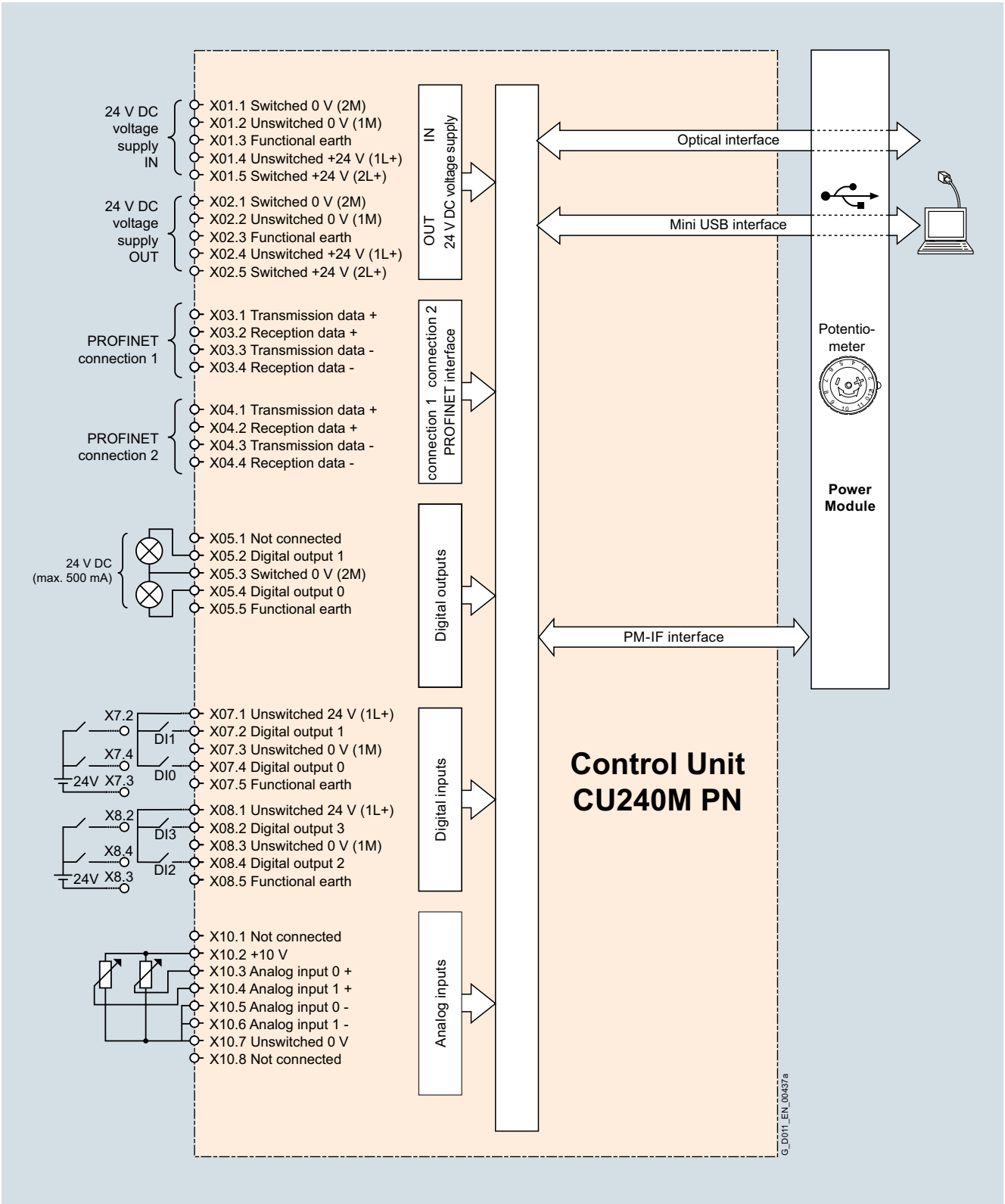
Connection diagram for CU240M Control Units

Integration



Connection diagram for CU240M DP Control Units

Integration



Connection diagram for CU240M PN Control Units

Technical specifications

Control Unit	**CU240M** With screw-type connections 6SL3544-0LB02-1BA0, 6SL3544-0MB02-1BA0, 6SL3544-0NB02-1BA0	**CU240M PROFIBUS** With screw-type connections 6SL3544-0LB02-1PA0, 6SL3544-0MB02-1PA0, 6SL3544-0NB02-1PA0	**CU240M PROFIBUS** With plug-in connections 6SL3544-0TB02-1PA0, 6SL3544-0PB02-1PA0, 6SL3544-0QB02-1PA0	**CU240M PROFINET** With screw-type connections 6SL3544-0LB02-1FA0, 6SL3544-0MB02-1FA0, 6SL3544-0NB02-1FA0	**CU240M PROFINET** With plug-in connections 6SL3544-0TB02-1FA0, 6SL3544-0PB02-1FA0, 6SL3544-0QB02-1FA0
Electrical specifications					
Operating voltage	External 24 V DC ± 15 % power supply with protective extra low voltage PELV acc. to EN 61800-5-1 must be used.	External 24 V DC ± 15 % power supply with protective extra low voltage PELV acc. to EN 61800-5-1 must be used.	External 24 V DC ± 15 % power supply with protective extra low voltage PELV acc. to EN 61800-5-1 must be used.	External 24 V DC ± 15 % power supply with protective extra low voltage PELV acc. to EN 61800-5-1 must be used.	External 24 V DC ± 15 % power supply with protective extra low voltage PELV acc. to EN 61800-5-1 must be used.
Current consumption [1] (from the 24 V DC supply)					
• With Power Module frame size FSA	235 mA	235 mA	235 mA	290 mA	290 mA
• With Power Module frame size FSB	235 mA	235 mA	235 mA	290 mA	290 mA
Interfaces					
Digital inputs (non-isolated)	4 programmable, PNP, SIMATIC compatible	4 programmable, PNP, SIMATIC compatible	4 programmable, PNP, SIMATIC compatible	4 programmable, PNP, SIMATIC compatible	4 programmable, PNP, SIMATIC compatible
• Optionally parameterizable as safe inputs	1	1	1	1	1
Analog inputs (0 ... 10 V or 0 ... 20 mA with 12-bit resolution)	2	2	2	2	2
Digital outputs 24 V DC (0 ... 0.5 A)	2, programmable	2, programmable	2, programmable	2, programmable	2, programmable
Bus interface	USS	PROFIBUS DP	PROFIBUS DP	PROFINET	PROFINET
• Fieldbus protocols	USS Modbus RTU	PROFIBUS DP incl. PROFIsafe	PROFIBUS DP incl. PROFIsafe	PROFINET incl. PROFIsafe EtherNet/IP	PROFINET incl. PROFIsafe EtherNet/IP
• Profile	–	PROFIdrive	PROFIdrive	PROFIdrive PROFIenergy	PROFIdrive PROFIenergy
PTC/KTY interface (connection via Power Module)	✓	✓	✓	✓	✓
• Motor temperature sensor	1 input, sensors that can be connected: PTC, KTY or bimetal	1 input, sensors that can be connected: PTC, KTY or bimetal	1 input, sensors that can be connected: PTC, KTY or bimetal	1 input, sensors that can be connected: PTC, KTY or bimetal	1 input, sensors that can be connected: PTC, KTY or bimetal
Control of a mechanical motor brake (connection via the Control Unit)	✓	✓	✓	✓	✓
Slot for SINAMICS memory card (SD card)	✓	✓	✓	✓	✓
Commissioning interface (mini USB)	✓	✓	✓	✓	✓
Safety functions					
Integrated safety functions [2] acc. to IEC 61508 SIL 2 and EN ISO 13849-1 PL d and Category 3	Safe Torque Off (STO)	Safe Torque Off (STO)	Safe Torque Off (STO)	Safe Torque Off (STO)	Safe Torque Off (STO)
Open-loop/closed-loop control techniques					
V/f linear/square/ parameterizable	✓	✓	✓	✓	✓
V/f with flux current control (FCC)	✓	✓	✓	✓	✓
Vector control, sensorless	✓	✓	✓	✓	✓
Torque control, sensorless	✓	✓	✓	✓	✓

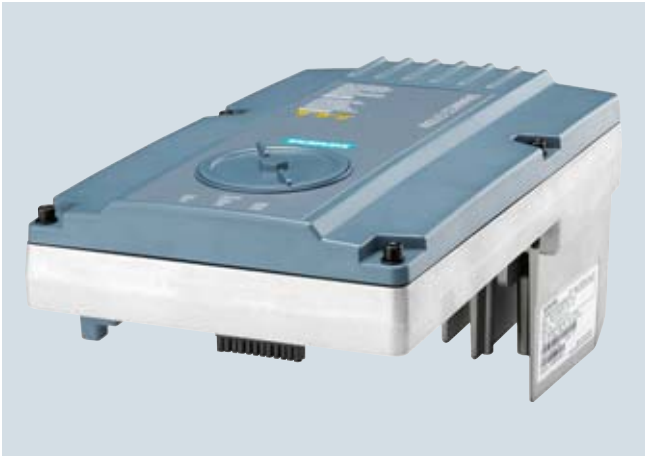
[1] The current consumption of connected sensors (total, max. 200 mA) as well as the current drawn from the digital outputs (total, max. 500 mA).

[2] Available for firmware version V4.7 or higher.

Technical specifications

Control Unit	**CU240M** With screw-type connections	**CU240M PROFIBUS** With screw-type connections	**CU240M PROFIBUS** With plug-in connections	**CU240M PROFINET** With screw-type connections	**CU240M PROFINET** With plug-in connections
	6SL3544-0LB02-1BA0, 6SL3544-0MB02-1BA0, 6SL3544-0NB02-1BA0	6SL3544-0LB02-1PA0, 6SL3544-0MB02-1PA0, 6SL3544-0NB02-1PA0	6SL3544-0TB02-1PA0, 6SL3544-0PB02-1PA0, 6SL3544-0QB02-1PA0	6SL3544-0LB02-1FA0, 6SL3544-0MB02-1FA0, 6SL3544-0NB02-1FA0	6SL3544-0TB02-1FA0, 6SL3544-0PB02-1FA0, 6SL3544-0QB02-1FA0
Software functions					
Fixed frequencies	✓	✓	✓	✓	✓
Signal interconnection with BICO technology	✓	✓	✓	✓	✓
Automatic restart after line supply failure or operational fault	✓	✓	✓	✓	✓
Slip compensation	✓	✓	✓	✓	✓
Free function blocks (FFB) for logical and arithmetic operations	✓	✓	✓	✓	✓
Ramp smoothing	✓	✓	✓	✓	✓
Selectable drive data sets	✓ (4)	✓ (4)	✓ (4)	✓ (4)	✓ (4)
Selectable command data sets (CDS) (manual/auto)	✓ (4)	✓ (4)	✓ (4)	✓ (4)	✓ (4)
Flying restart	✓	✓	✓	✓	✓
JOG	✓	✓	✓	✓	✓
Cyclic recording of ramp-up and ramp-down	✓	✓	✓	✓	✓
Technology controller (PID)	✓	✓	✓	✓	✓
Quick stop	✓	✓	✓	✓	✓
Limit switch logic	✓	✓	✓	✓	✓
Thermal motor protection	✓	✓	✓	✓	✓
Thermal inverter protection	✓	✓	✓	✓	✓
Setpoint input	✓	✓	✓	✓	✓
Motor identification	✓	✓	✓	✓	✓
Motor holding brake	✓	✓	✓	✓	✓
Mechanical specifications and ambient conditions					
Degree of protection	IP66/UL Type 3	IP66/UL Type 3	IP66/UL Type 3	IP66/UL Type 3	IP66/UL Type 3
Operating temperature	-10 ... +55 °C (14 ... 131 °F)	-10 ... +55 °C (14 ... 131 °F)	-10 ... +55 °C (14 ... 131 °F)	-10 ... +55 °C (14 ... 131 °F)	-10 ... +55 °C (14 ... 131 °F)
Air temperature	-40 ... +70 °C (40 ... 158 °F)	-40 ... +70 °C (40 ... 158 °F)	-40 ... +70 °C (40 ... 158 °F)	-40 ... +70 °C (40 ... 158 °F)	-40 ... +70 °C (40 ... 158 °F)
Relative humidity	<95 % RH, condensation not permissible	<95 % RH, condensation not permissible	<95 % RH, condensation not permissible	<95 % RH, condensation not permissible	<95 % RH, condensation not permissible
Dimensions					
• Width	205 mm (8.07 in)	205 mm (8.07 in)	205 mm (8.07 in)	205 mm (8.07 in)	205 mm (8.07 in)
• Height	105 mm (4.13 in)	105 mm (4.13 in)	105 mm (4.13 in)	105 mm (4.13 in)	105 mm (4.13 in)
• Depth	171 mm (6.73 in)	171 mm (6.73 in)	171 mm (6.73 in)	171 mm (6.73 in)	171 mm (6.73 in)
Weight, approx.	1.75 kg	1.85 kg	1.85 kg	1.85 kg	1.85 kg

Overview



SINAMICS G110M PM240M Power Module FSA 1.5 kW (2 hp)

SINAMICS G110M PM240M Power Module FSB 4 kW (5 hp)

The PM240M Power Modules are suitable for safety-related applications. In conjunction with the CU240M Control Unit, the drive can be transformed into a Safety Integrated drive (see Control Units).

The PM240M Power Modules with integrated line filter class A are suitable for connection to TN and TT supply systems.

Selection and ordering data

Rated power [1]		Rated output current [2]	Rated input current [2]	Frame size	PM240M Power Modules
kW	hp	A	A		Article No.
0.37	0.5	1.3	1.3	FSA NEW	6SL3517-1BE11-3AM0
0.75	1	2.2	2	FSA NEW	6SL3517-1BE12-3AM0
1.1	1.5	3.1	2.8	FSA NEW	6SL3517-1BE13-3AM0
1.5	2	4.1	3.6	FSA NEW	6SL3517-1BE14-3AM0
2.2	3	5.6	5.3	FSB NEW	6SL3517-1BE16-3AM0
3	4	7.3	6.9	FSB NEW	6SL3517-1BE17-7AM0
4	5	8.8	8	FSB NEW	6SL3517-1BE21-0AM0

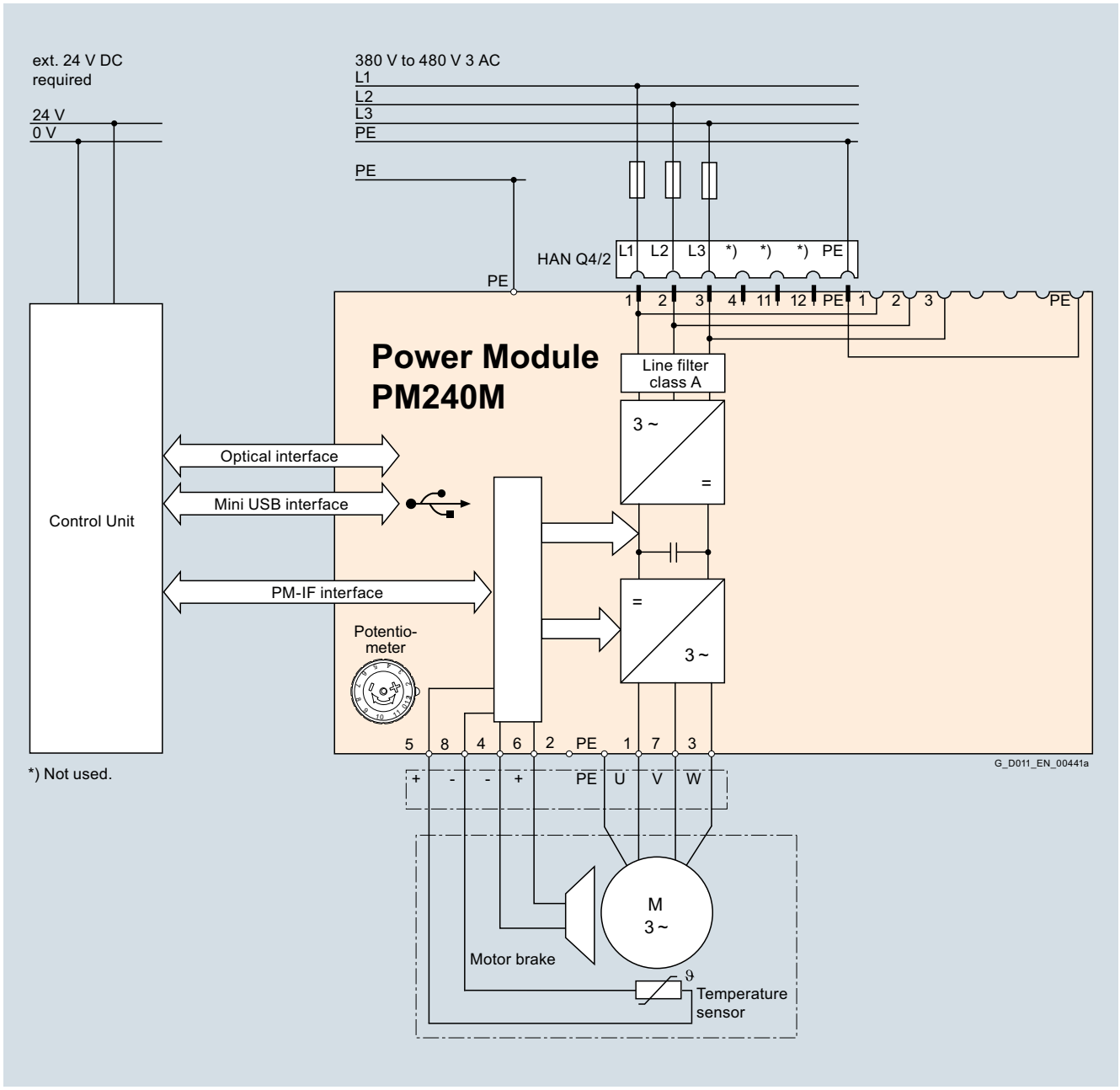
1) Rated power based on the rated output current I_{rated}. The rated output current I_{rated} is based on the duty cycle for high overload (HO).

2) The rated output current I_{rated} is based on the duty cycle for high overload (HO). These current values are valid for 400 V and are specified on the rating plate of the Power Module.

Integration

PM240M Power Modules feature the following interfaces as standard:

- PM-IF interface for connection of the PM240M Power Module and Control Unit
- Motor connection including control of the motor brake and temperature sensor
- Line connection via cable gland or HAN Q4/2 (connector)
- Line supply loop-through via cable gland/terminal or HAN Q4/2 (socket)
- USB connection for connection of a PC
- Analog potentiometer for setting a speed
- SD card slot for the use of memory cards



Connection diagram for PM240M Power Module with integrated line filter class A

Technical specifications

General technical specifications

	PM240M Power Modules
System operating voltage	380 V (-10 %) ... 480 V (+10 %) 3 AC
Line supply requirements Short-circuit power ratio R_{SC}	>100
Input frequency	47 ... 63 Hz
Output frequency	
• Control type V/f	0 ... 650 Hz (due to legal regulations, the maximum output frequency is restricted to 550 Hz with firmware V4.7 and higher)
• Control type Vector	0 ... 200 Hz
Pulse frequency	4 kHz (standard); 4 ... 16 Hz (in steps of 2 kHz) see derating data
Power factor	0.95
Inverter efficiency	95 ... 97 %
Output voltage, max. in % of the input voltage	87 %
Overload capability	
• High overload (HO)	0.37 ... 3 kW (0.5 ... 4 hp): 2 × rated output current for 3 s, followed by 1.5 × rated output current for 57 s, over a cycle time of 300 s (110 % on average) 4 kW (5 hp): 1.6 × rated output current for 3 s, followed by 1.5 × rated output current for 57 s, over a cycle time of 300 s (110 % on average)
Electromagnetic compatibility	Integrated line filter class A according to EN 55011
Possible braking methods	Dynamic braking with internal braking resistors DC brake Integrated brake control supplies DC power supply for the brake

Line input voltage	380 V AC	400 V AC	440 V AC	480 V AC	500 V AC
Resulting brake voltage	171 V DC	180 V DC	198 V DC	216 V DC	225 V DC

	Disconnection on the DC side permits "fast" braking (max. output current 1 A)
Degree of protection	IP65/66 (applicable to Power Module and Control Unit in mounted state)
Operating temperature	-10 ... +55 °C (14 ... +131 °F)
Storage temperature	-40 ... +70 °C (-40 ... +158 °F)
Permissible mounting positions	All
Relative humidity	<95 % RH, condensation not permissible
Cooling	External cooling with motor fan
Installation altitude	Up to 1000 m (3281 ft) above sea level without derating Over 1000 m (3281 ft), see derating data
Short Circuit Current Rating (SCCR) [1]	40 kA
Protection functions	• Undervoltage • Phase failure detection • Overvoltage • Overload • Ground fault • Short-circuit • Stall prevention • Motor blocking protection • Motor overtemperature • Inverter overtemperature • Parameter locking
Compliance with standards	UL, cUL, CE, C-Tick
CE marking, according to	EC Low Voltage Directive 73/23/EEC; filtered variants also: EC Low Voltage Directive 89/336/EEC

[1] Applies to industrial control panel installations to NEC Article 409 or UL 508A.

Technical specifications

Line voltage 380 … 480 V 3 AC		**PM240M Power Modules**			
		6SL3517-1BE11-3AM0	6SL3517-1BE12-3AM0	6SL3517-1BE13-3AM0	6SL3517-1BE14-3AM0
Rated output current I_{rated} [1]	A	1.3	2.2	3.1	4.1
Maximum output current I_{max}	A	2.6	4.4	6.2	8.2
Rated power	kW (hp)	0.37 (0.5)	0.75 (1)	1.1 (1.5)	1.5 (2)
Rated pulse frequency	kHz	4	4	4	4
Efficiency η	%	96.8	98.1	98.2	97.3
Power loss [2] at rated output current	kW	0.025	0.032	0.041	0.052
Cooling air requirement	m^3/s	0.0048	0.0048	0.0048	0.0048
Sound pressure level L_{pA} (1 m)	dB	–	–	–	–
Rated input current [3]	A	1.3	2	2.8	3.6
Line supply connection U1/L1, V1/L2, W1/L3, PE					
• Conductor cross-section (recommended)	mm^2	1 ... 2.5 18 ... 14 AWG	1 ... 2.5 18 ... 14 AWG	1 ... 2.5 18 ... 14 AWG	1 ... 2.5 18 ... 14 AWG
PE connection (external connection)					
• Conductor cross-section (recommended)	mm^2	10	10	10	10
Motor connection U2, V2, W2, PE, motor brake, temperature sensor					
• Conductor cross-section	mm^2	1 ... 2.5 18 ... 14 AWG	1 ... 2.5 18 ... 14 AWG	1 ... 2.5 18 ... 14 AWG	1 ... 2.5 18 ... 14 AWG
Motor cable length, max. Shielded	m	–	–	–	–
Degree of protection		IP66	IP66	IP66	IP66
Dimensions					
• Width	mm (in)	161 (6.34)	161 (6.34)	161 (6.34)	161 (6.34)
• Height	mm (in)	135 (5.31)	135 (5.31)	135 (5.31)	135 (5.31)
• Depth	mm (in)	270 (10.63)	270 (10.63)	270 (10.63)	270 (10.63)
Frame size		FSA	FSA	FSA	FSA
Weight, approx.	kg (lb)	2.1	2.1	2.1	2.1

[1] The rated output current I_{rated} is based on the duty cycle for high overload (HO).

[2] Typical values. Additional information is available on the Internet at http://support.automation.siemens.com/WW/view/en/94059311.

[3] The input current depends on the motor load and line impedance. The input currents apply for loading at rated power with a line impedance corresponding to u_K = 1 %.

Technical specifications

Line voltage 380 … 480 V 3 AC		PM240M Power Modules		
		6SL3517-1BE16-3AM0	6SL3517-1BE17-7AM0	6SL3517-1BE21-0AM0
Rated output current I_{rated} [1]	A	5.6	7.3	8.8
Maximum output current I_{max}	A	11.2	14.6	14.1
Rated power	kW (hp)	2.2 (3)	3 (4)	4 (5)
Rated pulse frequency	kHz	4	4	4
Efficiency η	%	97.6	97.6	97.7
Power loss [2] at rated output current	kW	0.078	0.103	0.126
Cooling air requirement	m^3/s	0.024	0.024	0.024
Sound pressure level L_{pA} (1 m)	dB	–	–	–
Rated input current [3]	A	5.3	6.9	8
Line supply connection U1/L1, V1/L2, W1/L3, PE				
• Conductor cross-section (recommended)	mm^2	1 ... 2.5 18 ... 14 AWG	1 ... 2.5 18 ... 14 AWG	1 ... 2.5 18 ... 14 AWG
PE connection (external connection)				
• Conductor cross-section (recommended)	mm^2	10	10	10
Motor connection U2, V2, W2, PE, motor brake, temperature sensor				
• Conductor cross-section	mm^2	1 ... 2.5 18 ... 14 AWG	1 ... 2.5 18 ... 14 AWG	1 ... 2.5 18 ... 14 AWG
Motor cable length, max. Shielded	m	–	–	–
Degree of protection		IP66	IP66	IP66
Dimensions				
• Width	mm (in)	181 (7.13)	181 (7.13)	181 (7.13)
• Height	mm (in)	135 (5.31)	135 (5.31)	135 (5.31)
• Depth	mm (in)	309 (12.17)	309 (12.17)	309 (12.17)
Frame size		FSB	FSB	FSB
Weight, approx.	kg (lb)	3.4	3.4	3.4

[1] The rated output current I_{rated} is based on the duty cycle for high overload (HO).

[2] Typical values. Additional information is available on the Internet at http://support.automation.siemens.com/WW/view/en/94059311.

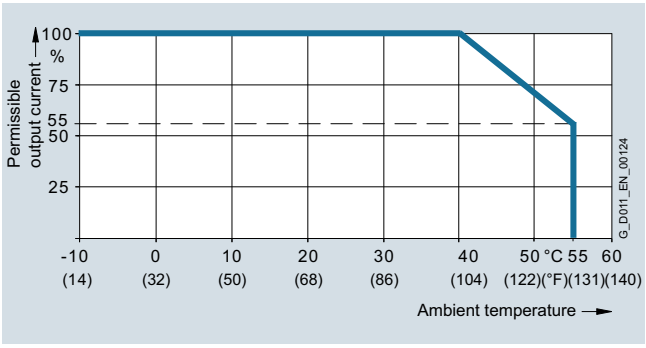
[3] The input current depends on the motor load and line impedance. The input currents apply for loading at rated power with a line impedance corresponding to u_K = 1 %.

Characteristic curves

Derating data

Rated power at 400 V 3 AC		**Rated output current in A** for a pulse frequency of (derating as a function of the pulse frequency [1])						
kW	hp	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
0.37	0.5	1.3	1.3	1.11	0.91	0.78	0.65	0.59
0.75	1	2.2	1.9	1.5	1.3	1.1	1	0.9
1.1	1.5	3.1	2.6	2.2	1.9	1.6	1.4	1.2
1.5	2	4.1	3.5	2.9	2.5	2.1	1.8	1.6
2.2	3	5.6	4.8	3.9	3.4	2.8	2.5	2.2
3	4	7.3	6.2	5.1	4.4	3.7	3.3	2.9
4	5	8.8	7.5	6.2	5.3	4.4	4	3.5

Ambient temperature

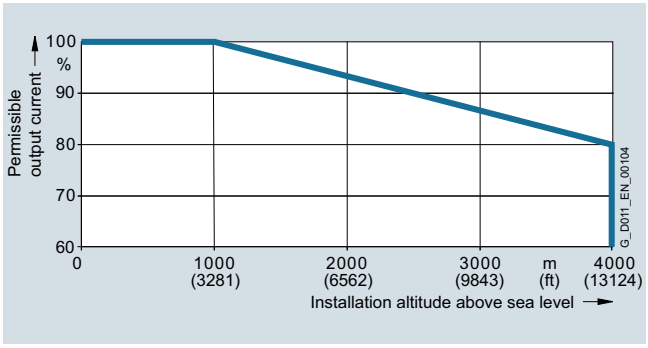


Permissible output current as a function of ambient temperature for PM240M Power Modules, frame sizes FSA and FSB

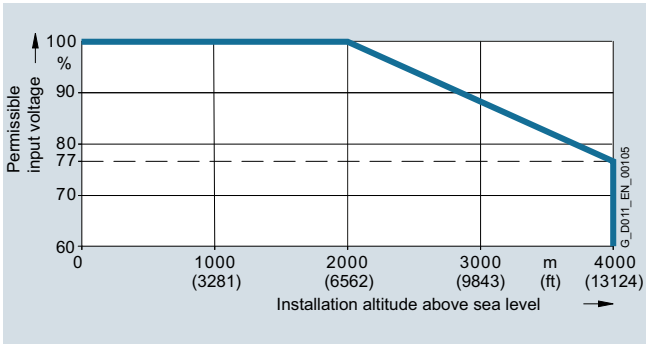
Note:

The operating temperature ranges of the Control Units must be taken into account. The temperature ranges are specified in the technical specifications under Control Units.

Installation altitude



Permissible output current as a function of installation altitude for PM240M Power Modules, frame sizes FSA and FSB

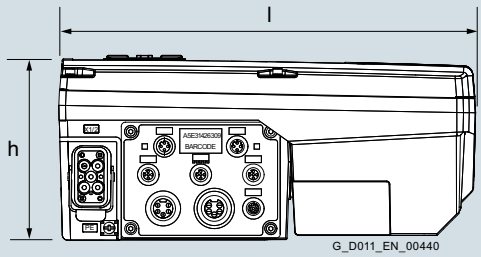


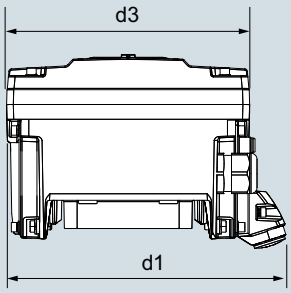
Permissible input voltage as a function of installation altitude for PM240M Power Modules, frame sizes FSA and FSB

[1] The permissible motor cable length also depends on the cable type and the selected pulse frequency.

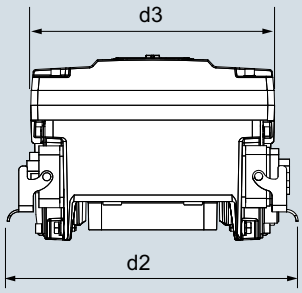
Dimensional drawings

Dimensions of PM240M Power Modules (including CU240M Control Unit)





Screwed version



HAN-Q version

6

Frame size	**Dimensions** in mm (inches)				
	h	l	d1	d2	d3
FSA	135 (5.31)	270 (10.63)	208 (8.19)	216 (8.5)	161 (6.34)
FSB	135 (5.31)	309 (12.17)	208 (8.19)	216 (8.5)	181 (7.13)

Selection and Ordering Data

The following table lists recommendations for additional line-side components, such as fuses and circuit breakers.

Note for use in compliance with IEC standards:
3NA3 type fuses and 3RV type circuit breakers are recommended for European countries. The values in the table take into account the overload capability of the inverter.

Note for use in compliance with UL regulations:
Fuses for use in North America must be UL-certified, Class J fuses with a rated voltage of 600 V AC.

Short Circuit Current Rating (SCCR)
according to UL

Applies to industrial control panel installations according to NEC Article 409 or UL 508A.

- PM240M: 40 kA

Additional information about the listed fuses and circuit breakers can be found in Catalogs LV 10, IC 10 and IC 10 AO.

Individual protection

Rated power		SINAMICS G110M PM240M Power Modules		IEC-compliant			UL/cUL-compliant	
				Fuse		Circuit breaker	Fuse type Rated voltage 600 V AC	
				Current				Current
kW	hp	Type	Frame size	A	Article No.	Article No.	Class	A
380 ... 480 V 3 AC								
0.37	0.5	6SL3517-1BE11-3AM0	FSA	10	**3NA3803**	**3RV2011-1JA10**	J	10
0.75	1	6SL3517-1BE12-3AM0	FSA	10	**3NA3803**	**3RV2011-1JA10**	J	10
1.1	1.5	6SL3517-1BE13-3AM0	FSA	10	**3NA3803**	**3RV2011-1JA10**	J	10
1.5	2	6SL3517-1BE14-3AM0	FSA	10	**3NA3803**	**3RV2011-1JA10**	J	10
2.2	3	6SL3517-1BE16-3AM0	FSB	20	**3NA3807**	**3RV2021-4BA10**	J	20
3	4	6SL3517-1BE17-7AM0	FSB	20	**3NA3807**	**3RV2021-4BA10**	J	20
4	5	6SL3517-1BE21-0AM0	FSB	20	**3NA3807**	**3RV2021-4BA10**	J	20

The SINAMICS G110M system supports an inverter loop-through of line current to several inverters connected in series.

Further information can be found in the operating instructions on the Internet at

www.siemens.com/sinamics-g110m/documentation

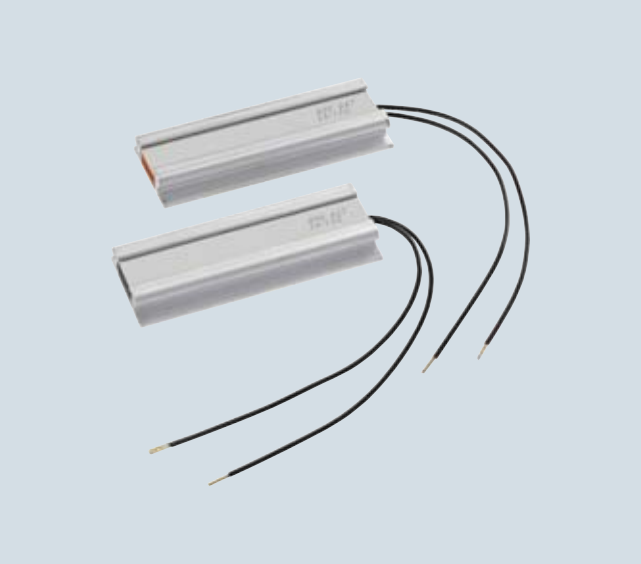
Group protection (installation on power bus)

For installations with several inverters, the inverters are normally supplied from a 400 V power bus.

Further information can be found in the operating instructions on the Internet at

www.siemens.com/sinamics-g110m/documentation

Overview



SINAMICS G110M braking resistors FSA and FSB

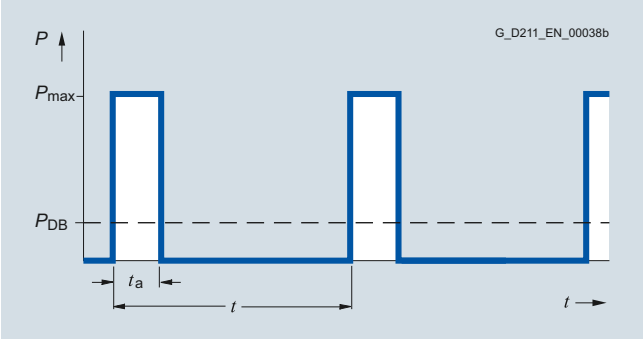
Excess energy in the DC link is dissipated in the braking resistors in regenerative operation.

The braking resistors are intended for use with SINAMICS G110M, which have an integrated braking chopper, but cannot regenerate energy to the line supply. 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 mounted on the side of the Control Unit housing at the bottom. The heat from the braking resistor is dissipated over the Control Unit housing. Every braking resistor is equipped with thermal protection. The thermal protection prevents the braking resistor from being thermally overloaded.

All braking resistors are provided as standard with a cable for connecting to the internal terminals.

Characteristic curves



Load diagram for the breaking resistors
t_a = 12 s
t = 120 s

Selection and ordering data

Rated power kW	Rated power hp	SINAMICS G110M Type 6SL3517-...	SINAMICS G110M Frame size		Braking resistor Article No.
380 ... 500 V 3 AC					
0.37	0.5	1BE11-3AM0	FSA	NEW	**6SL3501-0BE18-8AA0**
0.75	1	1BE12-3AM0	FSA		
1.1	1.5	1BE13-3AM0	FSA		
1.5	2	1BE14-3AM0	FSA		
2.2	3	1BE16-3AM0	FSB	NEW	**6SL3501-0BE22-0AA0**
3	4	1BE17-7AM0	FSB		
4	5	1BE21-0AM0	FSB		

Technical specifications

Line voltage 380 ... 480 V 3 AC		**Braking resistor** 6SL3501-0BE18-8AA0	6SL3501-0BE22-0AA0
Resistance	Ω	350	175
Rated power P_{DB} (continuous braking power)	kW	0.0075	0.02
Peak power P_{max} (load period t_a = 12 s over a period t = 240 s)	kW	0.075	0.2
Degree of protection		IP20	IP20
Dimensions			
• Width	mm (in)	11 (0.43)	11 (0.43)
• Height	mm (in)	34 (1.34)	34 (1.34)
• Length	mm (in)	84 (3.31)	84 (3.31)
Weight, approx.	kg (lb)	0.1	0.1
Suitable for SINAMICS G110M (frame size)		6SL3517-1BE11-3AM0 (FSA) 6SL3517-1BE12-3AM0 (FSA) 6SL3517-1BE13-3AM0 (FSA) 6SL3517-1BE14-3AM0 (FSA)	6SL3517-1BE16-3AM0 (FSB) 6SL3517-1BE17-7AM0 (FSB) 6SL3517-1BE21-0AM0 (FSB)

Overview

24 V DC power supply

24 V DC power supply

The optional 24 V DC power supply enables the internal electronics to be supplied with 24 V DC directly from the DC link. No external cable is needed for the 24 V DC supply and only the 400 V 3 AC line supply has to be connected. The optional 24 V DC power supply supplies power to the internal circuitry of the Control Unit, the low-voltage circuits of the Power Module and all inputs and outputs.

Selection and ordering data

Description		Article No.
24 V DC power supply	NEW	**6SL3555-0PV00-0AA0**

Technical specifications

24 V DC power supply	
Operating voltage	24 V DC ±10 %
Current consumption (from the DC link, with PM, CU and DOs operating at a maximum)	1.2 A
Output current, max.	2 A

Overview

Compatible motors for SINAMICS G110M

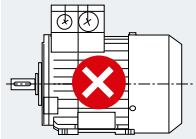
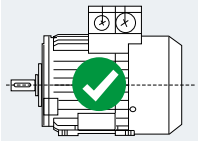
Motors compatible with SINAMICS G110M are listed individually in the table below.

Due to the specific properties of the SINAMICS G110M, the following comments and restrictions apply to the options and devices used with the motors:

- Note mounting position when encoders are used
- The brake lever cannot be positioned at 12 o'clock owing to the position of the inverter terminal enclosure.
- 24 V DC brake voltage not possible.
- 230/400 V AC brake voltage not possible for a motor on which a CU240M Control Unit is mounted
- Standby heating is not permitted for the motor
- External motor fan cannot be mounted if the terminal enclosure is mounted in the 12 o'clock position
- Motor terminal box must be located at NDE

Rules for the use of 2- and 4-pole motors with 50 Hz 400 V 3 AC

- Rated output current of the inverter ≥ rated input current of the motor
- Mechanical execution of the motor: Utilization of SINAMICS G100M only in conjunction with motors SIMOTICS GP-1LA, frame size 71 or SIMOTICS GP-1LE, frame sizes 80, 90, 100 or 112
- This motor configuration is only possible with terminal box at NDE – see figure below. Following options are available when motor is selected - for SIMOTICS GP-1LA motors select option **M64**, for SIMOTICS GP-1LE motors select option **H08** (in preparation for 1LE1 motors with frame sizes 80 and 90).

Terminal box	
Standard DE terminal box (not possible)	
NDE terminal box 1LA motor: Option **M64** 1LE motor: Option **H08** (**H08** in preparation for 1LE1 motors frame sizes 80 and 90).	

Overview

The table below applies to IEC-compliant applications only

SINAMICS G110M characteristics			Motor characteristics									
Output at high overload (HO)	Rated output current	Frame size	**Rating**	**2-pole motors**, 50 Hz 400 V 3 AC				**4-pole motors**, 50 Hz 400 V 3 AC				
				Type	Frame size	Rated current	Efficiency Class	Type	Frame size	Rated current	Efficiency Class
kW (hp)	A		**kW (hp)**		FS	A			FS	A	
0.37 (0.5)	1.3	FSA	**0.37 (0.5)**	1LA7070-2AA	71M	0.99	–	1LA7073-4AB	71M	1.04	–
		FSA	**0.37 (0.5)**	1LA9070-2KA	71M	0.95	–	1LA9073-4KA	71M	0.96	–
0.75 (1)	2.2	FSA	**0.37 (0.5)**	1LA7070-2AA	71M	0.99	–	1LA7073-4AB	71M	1.04	–
		FSA	**0.37 (0.5)**	1LA9070-2KA	71M	0.95	–	1LA9073-4KA	71M	0.96	–
		FSA	**0.75 (1)**	1LE1001-0DA2 [1]	80M	1.67	IE2	1LE1001-0DB3 [1]	80M	1.79	IE2
1.1 (1.5)	3.1	FSA	**0.37 (0.5)**	1LA7070-2AA	71M	0.99	–	1LA7073-4AB	71M	1.04	–
		FSA	**0.37 (0.5)**	1LA9070-2KA	71M	0.95	–	1LA9073-4KA	71M	0.96	–
		FSA	**0.75 (1)**	1LE1001-0DA2 [1]	80M	1.67	IE2	1LE1001-0DB3 [1]	80M	1.79	IE2
		FSA	**1.1 (1.5)**	1LE1001-0DA3 [1]	80M	2.4	IE2	1LE1001-0EB0 [1]	90S	2.5	IE2
1.5 (2)	4.1	FSA	**0.37 (0.5)**	1LA7070-2AA	71M	0.99	–	1LA7073-4AB	71M	1.04	–
		FSA	**0.37 (0.5)**	1LA9070-2KA	71M	0.95	–	1LA9073-4KA	71M	0.96	–
		FSA	**0.75 (1)**	1LE1001-0DA2 [1]	80M	1.67	IE2	1LE1001-0DB3 [1]	80M	1.79	IE2
		FSA	**1.1 (1.5)**	1LE1001-0DA3 [1]	80M	2.4	IE2	1LE1001-0EB0 [1]	90S	2.5	IE2
		FSA	**1.5 (2)**	1LE1001-0EA0 [1]	90S	3.15	IE2	1LE1001-0EB4 [1]	90L	3.3	IE2
2.2 (3)	5.6	FSB	**0.37 (0.5)**	1LA7070-2AA	71M	0.99	–	1LA7073-4AB	71M	1.04	–
		FSB	**0.37 (0.5)**	1LA9070-2KA	71M	0.95	–	1LA9073-4KA	71M	0.96	–
		FSB	**0.75 (1)**	1LE1001-0DA2 [1]	80M	1.67	IE2	1LE1001-0DB3 [1]	80M	1.79	IE2
		FSB	**1.1 (1.5)**	1LE1001-0DA3 [1]	80M	2.4	IE2	1LE1001-0EB0 [1]	90S	2.5	IE2
		FSB	**1.5 (2)**	1LE1001-0EA0 [1]	90S	3.15	IE2	1LE1001-0EB4 [1]	90L	3.3	IE2
		FSB	**2.2 (3)**	1LE1001-0EA4 [1]	90L	4.5	IE2	1LE1001-1AB4	100L	4.65	IE2
3 (4)	7.3	FSB	**0.37 (0.5)**	1LA7070-2AA	71M	0.99	–	1LA7073-4AB	71M	1.04	–
		FSB	**0.37 (0.5)**	1LA9070-2KA	71M	0.95	–	1LA9073-4KA	71M	0.96	–
		FSB	**0.75 (1)**	1LE1001-0DA2 [1]	80M	1.67	IE2	1LE1001-0DB3 [1]	80M	1.79	IE2
		FSB	**1.1 (1.5)**	1LE1001-0DA3 [1]	80M	2.4	IE2	1LE1001-0EB0 [1]	90S	2.5	IE2
		FSB	**1.5 (2)**	1LE1001-0EA0 [1]	90S	3.15	IE2	1LE1001-0EB4 [1]	90L	3.3	IE2
		FSB	**2.2 (3)**	1LE1001-0EA4 [1]	90L	4.5	IE2	1LE1001-1AB4	100L	4.65	IE2
		FSB	**3 (4)**	1LE1001-1AA4	100L	6.1	IE2	1LE1001-1AB5	100L	6.2	IE2
4 (5)	8.8	FSB	**0.37 (0.5)**	1LA7070-2AA	71M	0.99	–	1LA7073-4AB	71M	1.04	–
		FSB	**0.37 (0.5)**	1LA9070-2KA	71M	0.95	–	1LA9073-4KA	71M	0.96	–
		FSB	**0.75 (1)**	1LE1001-0DA2 [1]	80M	1.67	IE2	1LE1001-0DB3 [1]	80M	1.79	IE2
		FSB	**1.1 (1.5)**	1LE1001-0DA3 [1]	80M	2.4	IE2	1LE1001-0EB0 [1]	90S	2.5	IE2
		FSB	**1.5 (2)**	1LE1001-0EA0 [1]	90S	3.15	IE2	1LE1001-0EB4 [1]	90L	3.3	IE2
		FSB	**2.2 (3)**	1LE1001-0EA4 [1]	90L	4.5	IE2	1LE1001-1AB4	100L	4.65	IE2
		FSB	**3 (4)**	1LE1001-1AA4	100L	6.1	IE2	1LE1001-1AB5	100L	6.2	IE2
		FSB	**4 (5)**	1LE1001-1BA2	112M	7.8	IE2	1LE1001-1BB2	112M	8.2	IE2

For further information see Catalog D 81.1.

[1] The option **H08** (terminal box on NDE) is essential when ordering these motors (in preparation).

Overview

SINAMICS G110M CU240M PN Control Unit, plug-in,
PM240M Power Module FSA 1.5 kW (2 hp) and SIMOGEAR geared motor shaft height 90

The SINAMICS G110M is designed for mounting on SIMOGEAR geared motors. It is compatible with versions IE1, IE2 and IE3 of SIMOGEAR geared motors in shaft heights 71 to 112.
For additional information see Catalog MD 50.1 SIMOGEAR Geared Motors and the SIMOGEAR Configurator.

Accessories

Intelligent Operator Panel IOP Handheld

IOP Handheld for mobile use

The Intelligent Operator Panel IOP Handheld is a very user-friendly and powerful operator panel for commissioning and diagnostics as well as local operator control and monitoring of SINAMICS G110D, SINAMICS G120D and SINAMICS G110M distributed inverters.

The IOP supports both entry-level personnel and drive experts. Thanks to the large plain text display, the menu-based operation and the application wizards, it is easy to commission standard drives. A drive can be essentially commissioned without having to use a printed parameter list – as the parameters are displayed in plain text, and explanatory help texts and a parameter filtering function are provided.

Application wizards interactively guide you when commissioning important applications such as conveyor technology, pumps, fans and compressors.

There is a basic commissioning wizard for general commissioning.

The drives are easily controlled manually using directly assigned buttons and the navigation wheel. The IOP Handheld has a dedicated switchover button to switch over from automatic to manual mode.

The inverter can be diagnosed in a user-friendly fashion using the plain text display of faults and alarms. Help texts can be obtained by pressing the INFO button.

Up to 2 process values can be displayed graphically or numerically on the status screen/status display.

Process values can also be displayed in technological units.

The IOP Handheld supports standard commissioning of identical drives. For this purpose, a parameter list can be copied from an inverter into the IOP Handheld and when required, downloaded into other drive units of the same type.

The IOP supports the following languages [1]: German, English, French, Italian, Spanish, Portuguese, Dutch, Swedish, Russian, Czech, Polish, Turkish, Finnish.

In addition to the IOP, the IOP Handheld includes a housing with rechargeable batteries, charging unit and RS232 connecting cable. The charging unit is supplied with connector adapters for Europe, the US and UK. When the batteries are fully charged, the operating time is up to 8 hours.

To connect the IOP handheld to SINAMICS G110D, SINAMICS G120D and SINAMICS G110M, the RS232 connecting cable with optical interface is required in addition.

Updating the IOP Handheld

The IOP Handheld can be updated and expanded using the integrated USB interface.

Data to support future drive systems can be transferred from the PC to the IOP Handheld via drag & drop. Further, the USB interface allows user languages and wizards that will become available in the future to be subsequently downloaded and the firmware to be updated for the IOP Handheld [1].

Selection and ordering data

Description	Article No.
IOP Handheld For use with SINAMICS G120, SINAMICS G120C, SINAMICS G120P, SINAMICS G110D, SINAMICS G120D, SINAMICS G110M and SINAMICS S110 Included in the scope of delivery: • IOP • Handheld housing • Rechargeable batteries (4 × AA) • Charging unit (international) • RS232 connecting cable (3 m (9.84 ft) long, for use with SINAMICS G120, SINAMICS G120C, SINAMICS G120P and SINAMICS S110) • USB cable (1 m (3.28 ft) long)	**6SL3255-0AA00-4HA0**
RS232 connecting cable With optical interface to connect the SINAMICS G110D, SINAMICS G120D or SINAMICS G110M inverters to the IOP Handheld (2.5 m (8.2 ft) long)	**3RK1922-2BP00**

[1] For additional information, see http://support.automation.siemens.com/WW/view/en/67273266

Accessories

Memory card

SINAMICS memory card (SD card)

The parameter settings for an inverter can be stored on the SINAMICS SD memory card. When service is required, e.g. after the inverter has been replaced and the data have been downloaded from the memory card the drive system is immediately ready for use again.

- Parameter settings can be written from the memory card to the inverter or saved from the inverter to the memory card.
- Up to 100 parameter sets can be stored.
- The memory card supports standard commissioning without the use of the Intelligent Operator Panel IOP Handheld or the STARTER and SINAMICS Startdrive commissioning tools.

Note:

The memory card is not required for operation and does not have to remain inserted.

Selection and ordering data

Description	Article No.
SINAMICS memory card (SD card) 512 MB	**6SL3054-4AG00-2AA0**

PC inverter connection kit 2 (mini USB interface cable for communication with a PC)

For controlling and commissioning an inverter directly from a PC via a point-to-point connection if the appropriate software (STARTER commissioning tool[1], V4.3 SP3 and higher or SINAMICS Startdrive V13 and higher) has been installed.

Selection and ordering data

Description	Article No.
PC inverter connection kit 2 USB cable (length 3 m (9.84 ft)) for • SINAMICS G120C • SINAMICS G120 Control Units • SINAMICS G110M Control Units • SINAMICS G120D Control Units - CU230P-2 - CU240B-2 - CU240E-2 - CU250S-2 • SINAMICS G110M Control Units - CU240M • SINAMICS G120D Control Units - CU240D-2 - CU250D-2	**6SL3255-0AA00-2CA0**

Installation kits

Different installation kits can be ordered as accessories for the Control Units with plug-in connections and Control Units with cable gland connections.

These kits include covers or cable glands for protecting or connecting the 400 V 3 AC supply, the 24 V DC supply and the mechanical motor brake.

Selection and ordering data

Description		Article No.
Installation kit for Control Units with cable gland connections Includes cable glands for connecting the 400 V 3 AC supply, the 24 V DC supply and the mechanical motor brake	NEW	**6SL3566-2VA00-0GA0**
Installation kit for Control Units with plug-in connections Includes covers for protecting the 400 V 3 AC and 24 V DC input connectors and a cable gland for connecting the mechanical motor holding brake	NEW	**6SL3566-2LA00-0GA0**

STARTER commissioning tool

The STARTER commissioning tool (V4.3 SP3 and higher) supports the commissioning and maintenance of SINAMICS G110M inverters. The operator guidance combined with comprehensive, user-friendly functions for the relevant drive solution allow you to commission the device quickly and easily.

Selection and ordering data

Description	Article No.
STARTER commissioning tool [1] on DVD-ROM	**6SL3072-0AA00-0AG0**

SINAMICS Startdrive commissioning tool

The SINAMICS Startdrive commissioning tool (V13 and higher) supports the commissioning and maintenance of SINAMICS G110M inverters. SINAMICS Startdrive is part of the TIA Portal engineering platform. It supports the intuitive integration of SINAMICS drives in automation. The same operator control concept, the elimination of interfaces and a high degree of user-friendliness make it possible to quickly integrate SINAMICS into an automation process and start it up with the TIA Portal. The TIA Portal with SINAMICS Startdrive offers you a totally integrated engineering platform for the complete application from the project engineering phase through to commissioning and diagnostics.

Selection and ordering data

Description	Article No.
SINAMICS Startdrive commissioning tool [2] on DVD-ROM	**6SL3072-4DA02-0XG0**

1) STARTER commissioning tool is also available on the Internet at http://support.automation.siemens.com/WW/view/en/10804985/133100

2) The SINAMICS Startdrive commissioning tool is also available on the Internet at http://support.automation.siemens.com/WW/view/en/68034568

Accessories

An overview of all available supplementary products (e.g. connectors and cables) can be found under the following link: www.siemens.com/distributeddrives-supplementaryproducts

Connecting cables for the Control Unit

PROFINET connecting cable

Flexible plug-in cables and plug-in connectors that can be assembled in the field for transmission of data (up to 100 Mbit/s) between Industrial Ethernet stations with IP65 degree of protection.

Selection and ordering data

Description	Article No.
IE connecting cable M12-180/M12-180, axial outlet Pre-assembled IE FC TP trailing cable GP 2 x 2 PROFINET type C with two 4-pole M12 plugs (4-pole, D-coded), IP65/IP67 degree of protection, UL, plug/plug connector (IN/OUT) Length:	
0.3 m (0.98 ft)	**6XV1870-8AE30**
0.5 m (1.64 ft)	**6XV1870-8AE50**
1.0 m (3.28 ft)	**6XV1870-8AH10**
1.5 m (4.92 ft)	**6XV1870-8AH15**
2.0 m (6.56 ft)	**6XV1870-8AH20**
3.0 m (9.84 ft)	**6XV1870-8AH30**
5.0 m (16.41 ft)	**6XV1870-8AH50**
10 m (32.81 ft)	**6XV1870-8AN10**
15 m (49.22 ft)	**6XV1870-8AN15**
IE connecting cable M12-180/IE FC RJ45 Plug 145 axial outlet Pre-assembled IE FC TP Trailing Cable GP 2 x 2 (PROFINET Type C) with M12 plugs (D-coded) and IE FC RJ45 plug, IP65/IP67 degree of protection Length:	
• 2 m (6.56 ft)	**6XV1871-5TH20**
• 3 m (9.84 ft)	**6XV1871-5TH30**
• 5 m (16.41 ft)	**6XV1871-5TH50**
• 10 m (32.81 ft)	**6XV1871-5TN10**
• 15 m(49.22 ft)	**6XV1871-5TN15**
IE M12 Plug PRO axial outlet For assembly in the field, M12 plug-in connector (D-coded), metal enclosure, UL, fast connection method, plug connector	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**

PROFIBUS connecting cable

Flexible plug-in cables/connectors for transmission of data (up to 12 Mbit/s) from PROFIBUS stations.

Selection and ordering data

Description	Article No.
PROFIBUS M12 plug-in cable axial outlet Pre-assembled with two 5-pole M12 plug/socket connectors, UL Length:	
0.3 m (0.98 ft)	**6XV1830-3DE30**
0.5 m (1.64 ft)	**6XV1830-3DE50**
1.0 m (3.28 ft)	**6XV1830-3DH10**
1.5 m (4.92 ft)	**6XV1830-3DH15**
2.0 m (6.56 ft)	**6XV1830-3DH20**
3.0 m (9.84 ft)	**6XV1830-3DH30**
5.0 m (16.41 ft)	**6XV1830-3DH50**
10 m (32.81 ft)	**6XV1830-3DN10**
15 m (49.22 ft)	**6XV1830-3DN15**
PROFIBUS M12 plug connector axial outlet 5-pole, B-coded, metal enclosure, 1 package = 5 units	
• Pin insert	**6GK1905-0EA00**
• Female contact insert	**6GK1905-0EB00**

Accessories

Connecting cables/plug-in connectors for supplying the Control Unit with power

Selection and ordering data

Description	Article No.
7/8" plug-in cable, axial outlet For 24 V switched and unswitched, pre-assembled with 2 × 7/8" at both ends (axial), 5 × 1.5 mm², 5-pole plug/socket connectors Length:	
0.3 m (0.98 ft)	**6XV1822-5BE30**
0.5 m (1.64 ft)	**6XV1822-5BE50**
1.0 m (3.28 ft)	**6XV1822-5BH10**
1.5 m (4.92 ft)	**6XV1822-5BH15**
2.0 m (6.56 ft)	**6XV1822-5BH20**
3.0 m (9.84 ft)	**6XV1822-5BH30**
5.0 m (16.41 ft)	**6XV1822-5BH50**
10 m (32.81 ft)	**6XV1822-5BN10**
15 m (49.22 ft)	**6XV1822-5BN15**
7/8" power cable, angled outlet, pre-assembled at one end For 24 V switched and unswitched, pre-assembled with 1 × 7/8" angled at one end, 5 × 1.5 mm² 5-pole socket connector Length:	
• 3 m (9.84 ft)	**3RK1902-3GB30**
• 5 m (16.41 ft)	**3RK1902-3GB50**
• 10 m (32.81 ft)	**3RK1902-3GC10**
7/8" power cable, angled outlet For 24 V switched and unswitched, pre-assembled with 2 × 7/8" angled at both ends, 5 × 1.5 mm², 5-pole plug/socket connectors Length:	
• 3 m (9.84 ft)	**3RK1902-3NB30**
• 5 m (16.41 ft)	**3RK1902-3NB50**
• 10 m (32.81 ft)	**3RK1902-3NC10**
7/8" plug-in connector, axial outlet 5-pole, B-coded, plastic enclosure, 1 package = 5 units	
• Pin insert (OUT)	**6GK1905-0FA00**
• Female contact insert (IN)	**6GK1905-0FB00**
7/8" plug-in connector, angled outlet 5-pole, B-coded, plastic enclosure, 1 package = 5 units	
• Pin insert (OUT)	**3RK1902-3BA00**
• Female contact insert (IN)	**3RK1902-3DA00**

Connecting cables and connectors for digital inputs and outputs

Selection and ordering data

Description	Article No.
M12 plug-in cable pre-assembled at both ends, axial outlet M12 straight plug, M12 straight socket, screw mounting, 3-pole, 3 x 0.34 mm², A-coded, black PUR sheath, max. 4 A Length:	
• 1.5 m (4.92 ft)	**3RK1902-4PB15-3AA0**
M12 connector Y cable for distributed I/Os for dual connection of I/Os using single 5-pole M12 cables, 200 mm (7.87 in)	
• Straight	**6ES7194-6KA00-0XA0**

Connecting cables and connectors for analog inputs

Selection and ordering data

Description	Article No.
M12 cable connector 8-pole plug connector	
• Straight cable outlet	Ordered from and supplied by KnorrTec
T distribution piece To connect two analog inputs 8-pole M12 male connector to 2 × 4-pole M12 socket, angled	Ordered from and supplied by KnorrTec

Connecting cables for Power Modules

Connecting cables pre-assembled at one end and connector sets to connect to the line supply

Selection and ordering data

Description	Article No.
Connecting cable pre-assembled at one end Power supply cable, open at one end, for HAN Q4/2, angled, 4 × 4 mm²	
• 1.5 m (4.92 ft) long	**3RK1911-0DB13**
• 5 m (16.41 ft) long	**3RK1911-0DB33**
Connector set for the power supply Female contact insert HAN Q4/2, 5 socket contacts, grommet housing, angled outlet including screw connection	
• 2.5 mm²	**3RK1911-2BE50**
• 4 mm²	**3RK1911-2BE10**
• 6 mm²	**3RK1911-2BE30**

Connector insert for power loop-through

Selection and ordering data

Description	Article No.
Connector set for power loop-through Plug insert HAN Q4/2, 4 socket contacts, grommet housing, angled outlet including screw connection	
• 2.5 mm²	**3RK1911-2BF50**
• 4 mm²	**3RK1911-2BF10**

Accessories

Power bus distribution 400 V in IP65 degree of protection

Selection and ordering data

Not essential (daisy chaining within device); use is optional.

Description	Article No. (to order, see Solution Partners)
Power T clamp connector for 2.5 ... 6 mm² With attached 7-pole connector, female contact insert, grommet housing, UL Seals for various cable cross-sections must be ordered separately	Ordered from and supplied by Harting
T clamp connector Completely pre-assembled	Ordered from and supplied by KnorrTec
T distributor box, IDC connection power cable Pre-assembled, UL, uncut power cable, 2.5 ... 6 mm² Push-in connection: 1.5 ... 6 mm² Seals for various cable cross-sections must be ordered separately	Ordered from and supplied by Weidmüller
Y distributor For direct connection of 400 V supply line, HAN Q4/2, conductor cross-section 1.5 ... 4 mm²	Ordered from and supplied by Harting

More information

An overview of further supplementary products (e.g. connectors and cables) can be found under the following link:
www.siemens.com/distributeddrives-supplementaryproducts

For further information about the connecting cables and plug-in connectors mentioned above, please refer to Catalog IK PI.

Further selected accessories are available from Siemens Solution Partners.
Please go to the "Solution Partner Finder" and select technology "Distributed Field Installation System".
www.siemens.com/automation/partnerfinder

Overview

A Spare Parts Kit can be ordered, comprising small parts such as replacement seals, caps, PROFIBUS address windows and screws.

Selection and ordering data

Description		Article No.
Spare Parts Kit for SINAMICS G110M Comprising replacement seals, caps, connectors and screws	NEW	**6SL3500-0TK02-0AA0**

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