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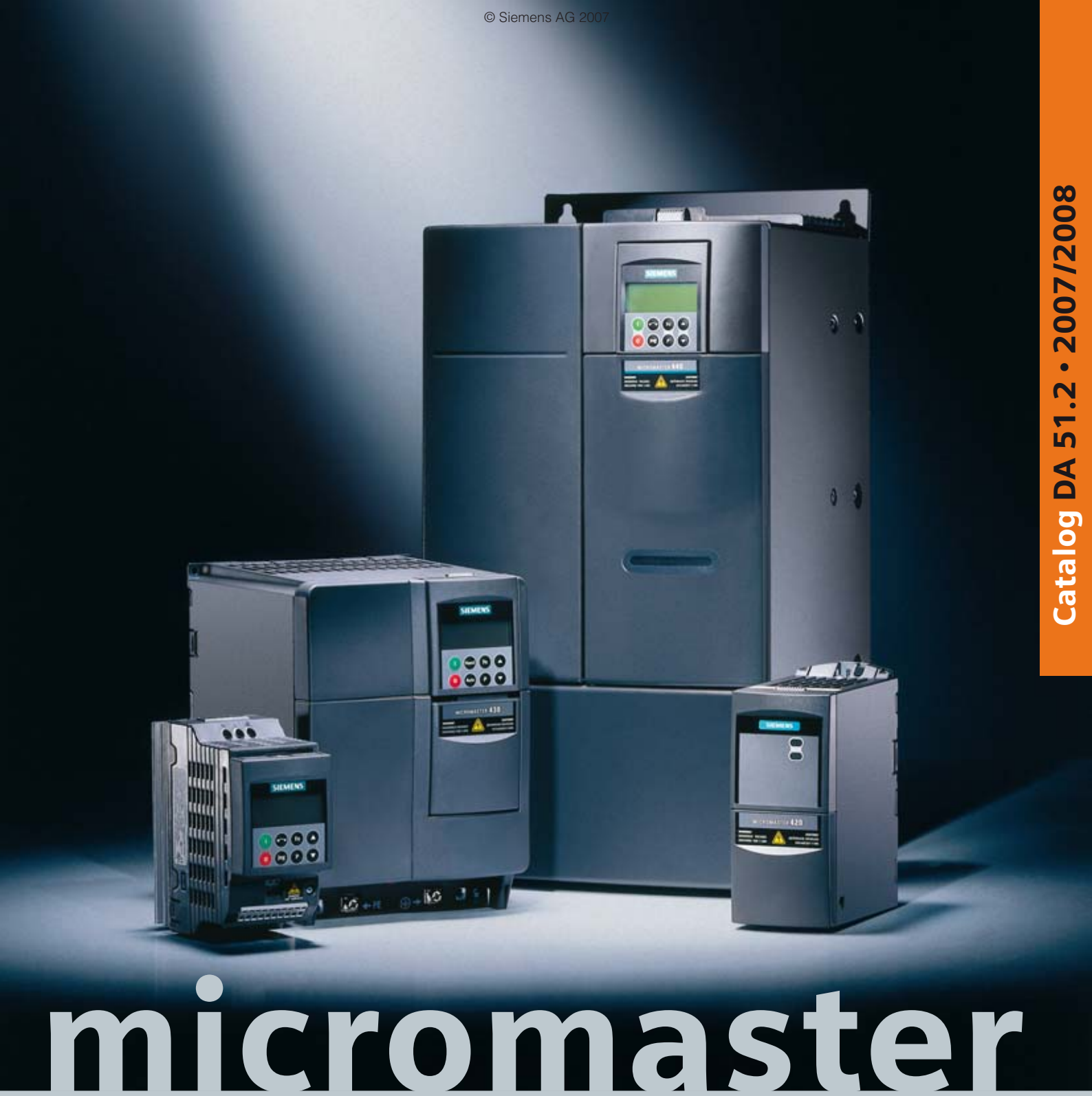

Catalog DA 51.2 • 2007/2008

micromaster

MICROMASTER 420/430/440
Inverters
0.12 kW to 250 kW

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Related catalogs

SINAMICS G110/SINAMICS G120 D 11.1
Inverter Chassis Units
SINAMICS G120D
Distributed Frequency Inverters
Order No.:
German: E86060-K5511-A111-A4
English: E86060-K5511-A111-A4-7600

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/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

Industrial Communication for Automation and Drives IK PI
Part 6: ET 200 Distributed I/O
ET 200S FC Frequency Converter
Order No.:
German: E86060-K6710-A101-B5
English: E86060-K6710-A101-B5-7600

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

Order No.:
German: E86060-K5581-A111-A2
English: E86060-K5581-A111-A2-7600

Low-Voltage Motors D 81.1
IEC Squirrel-Cage Motors News
New Generation 1LE1
Frame size 100 to 160
Order No.:
German: E86060-K5581-A121-A2
English: E86060-K5581-A121-A2-7600

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

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

MOTOX D 87.1
Geared Motors

Order No.:
German: E86060-K5287-A111-A1
English: Catalog available soon

Catalog CA 01 CA 01
The Offline Mall of Automation and Drives
Order No.:
CD: E86060-D4001-A100-C6 (Germ.)
CD: E86060-D4001-A110-C6-7600 (Engl.)
DVD: E86060-D4001-A500-C6 (Germ.)
DVD: E86060-D4001-A510-C6-7600 (Engl.)

A&D Mall

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

Additional documentation

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

http://www.siemens.com/micromaster/printmaterial

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

Catalog CA 01 – Selection tool SD configurator

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

On CD 2 for the selection and configuring tools, you will find the SD configurators for low-voltage motors, MICROMASTER 4 inverters, SINAMICS G110 and SINAMICS G120 inverter chassis units as well as SINAMICS G120D distributed frequency inverters and SIMATIC ET 200S FC frequency converters for distributed I/O, complete with:

- 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)
- 256 MB work memory (minimum)
- Screen resolution 1024 x 768, graphic with more than 256 colors, 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 partial version or full version on your hard disk or in the network.

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MICROMASTER 420/430/440 Inverters 0.12 kW to 250 kW

Catalog DA 51.2
2007/2008

Supersedes:
Catalog DA 51.2 · 2005/2006

The products in this catalog are also included in the electronic catalog CA 01.
Order No.:
E86060-D4001-A110-C6-7600 (CD-ROM)
E86060-D4001-A510-C6-7600 (DVD)

Contact your local Siemens representative for further information

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SIEMENS

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MICROMASTER	Overview	1
MICROMASTER 420 “The universal”	0.12 kW to 11 kW	2
MICROMASTER 430 “The specialist for pumps and fans”	7.5 kW to 250 kW	3
MICROMASTER 440 “The all-purpose”	0.12 kW to 250 kW	4
Appendix		A

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Siemens Automation and Drives. Welcome

More than 70,000 people aiming for the same goal: increasing your competitiveness. That's Siemens Automation and Drives.

We offer you a comprehensive portfolio for sustained success in your sector, whether you're talking automation engineering, drives or electrical installation systems. Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) form the core of our offering. TIA and TIP are the basis of our integrated range of products and systems for the manufacturing and process industries as well as building automation. This portfolio is rounded off by innovative services over the entire life cycle of your plants.

Learn for yourself the potential our products and systems offer. And discover how you can permanently increase your productivity with us.

Your regional Siemens contact can provide more information. He or she will be glad to help.

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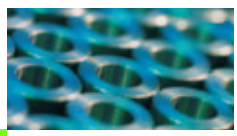

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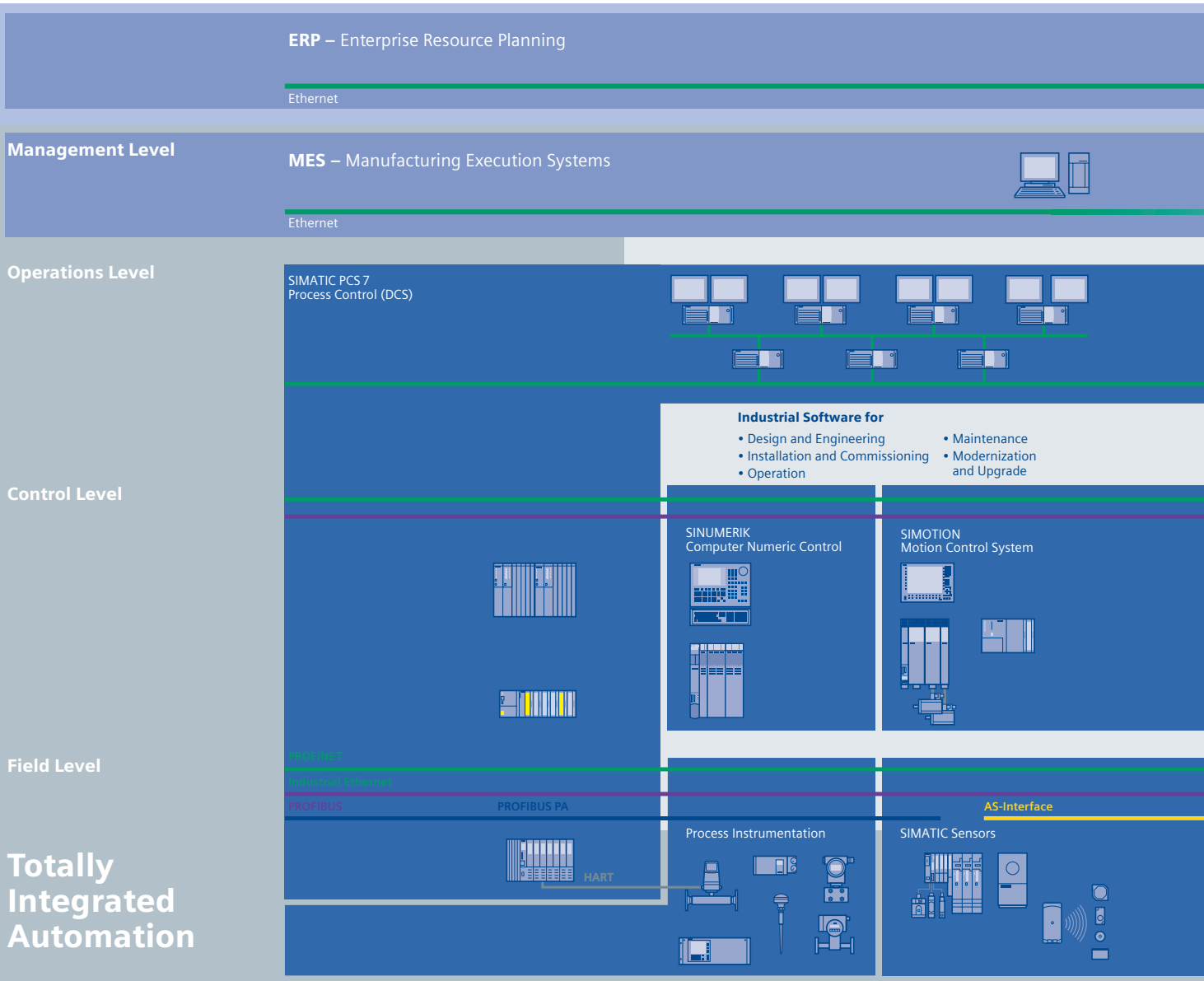
Sharpen your competitive edge. Totally Integrated Automation

With Totally Integrated Automation (TIA), Siemens is the only manufacturer to offer an integrated range of products and systems for automation in all sectors – from incoming goods to outgoing goods, from the field level through the production control level to connection with the corporate management level.

On the basis of TIA, we implement solutions that are perfectly tailored to your specific requirements and are characterized by a unique level of integration. This integration not only ensures significant reductions in interface costs but also guarantees the highest level of transparency across all levels.



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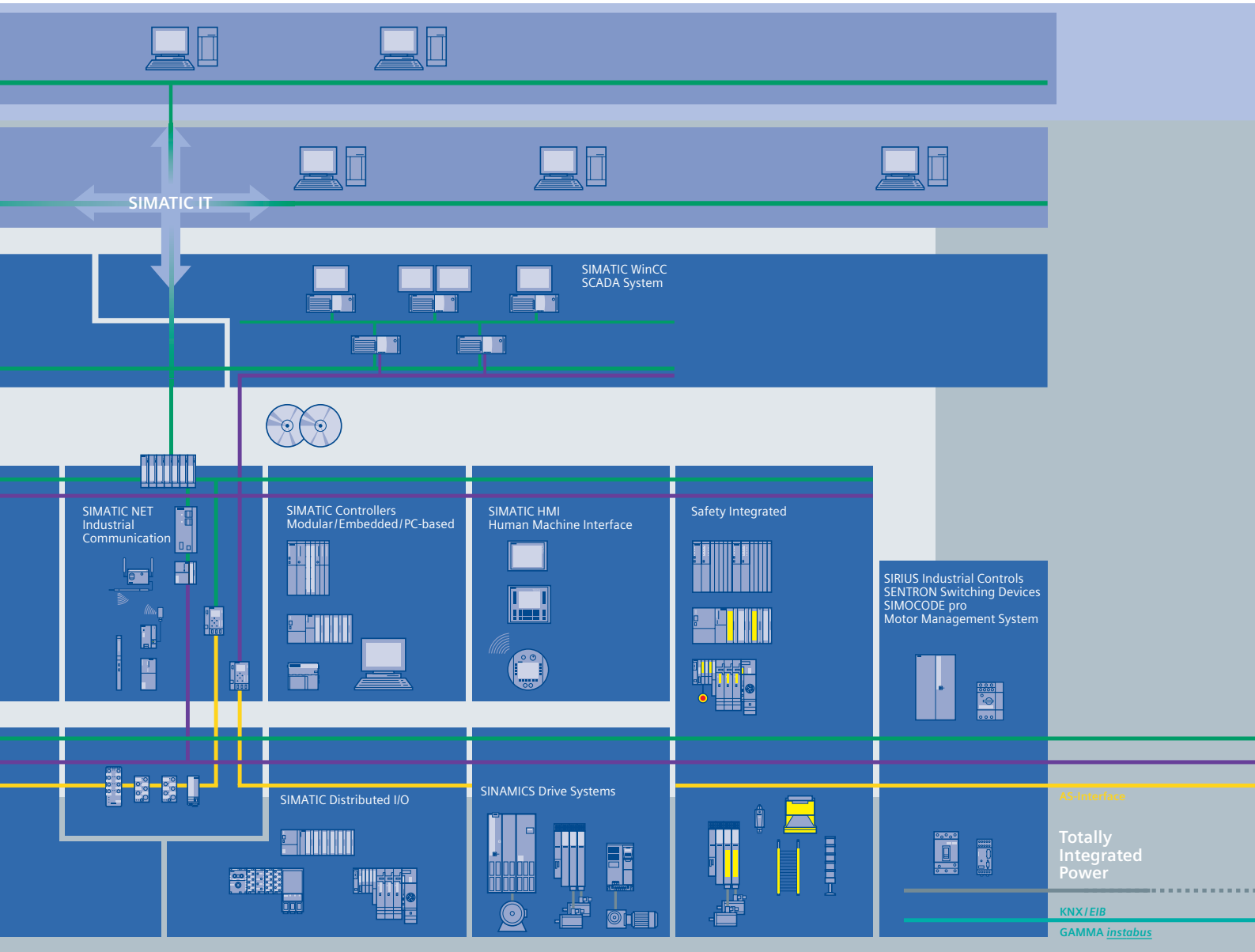
It goes without saying that you profit from Totally Integrated Automation during the entire life cycle of your plants – from the first planning steps, through operation, right up to modernization. Consistent integration in the further development of our products and systems guarantees a high degree of investment security here.

Totally Integrated Automation makes a crucial contribution towards optimizing everything that happens in the plant and thus creates the conditions for a significant increase in productivity.



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Protecting the environment and resources. Environmental sustainability

Environmental protection will continue to grow in importance as a result of progressive urbanization and global population growth. These global mega-trends make the careful and sustainable handling of natural resources a central challenge.

We are convinced that every individual - and especially every company - has an ecological responsibility. At Siemens Automation and Drives, we stand by this conviction. Our high environmental protection goals are part of our strict environmental management. We investigate the possible effects of our products and systems on the environment right back at the development stage. We concern ourselves, for example, with the question of how to reduce power consumption in plant operation - and we offer appropriate solutions, such as our energy-saving motors that cut power consumption in industrial manufacturing by up to 40% thanks to their high efficiency levels.

Many of our products and systems comply with the EC Directive RoHS (Restriction of Hazardous Substances). All the relevant Siemens AG sites are, of course, certified in accordance with DIN EN ISO 14001.

Our commitment goes well beyond compliance with the relevant directives and legislation: we are an active driving force behind environmental protection, through further development of environmental management systems, for example, and we are involved in professional associations such as the German Electrical and Electronic Manufacturers Association (ZVEI).

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Inverter
MICROMASTER

1/2 **Selection guide**

1/4 **Options**

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Selection guide

	MICROMASTER 410	MICROMASTER 420
Main characteristics	**Discontinued product** The MICROMASTER 410 is no longer available. The model will be discontinued as of October 1, 2007. The MICROMASTER 410 can then only be ordered as a spare part.	***"The universal"*** for three-phase networks and optional fieldbus interfacing, e.g. for conveyor belts, material transport, pumps, fans and machine tools
Power ranges	–	0.12 kW to 11 kW
Voltage ranges	–	1 AC 200 V to 240 V 3 AC 200 V to 240 V 3 AC 380 V to 480 V
Control methods	–	• *V/f* characteristic • Multipoint characteristic (programmable *V/f* characteristic) • FCC (flux current control)
Process control	–	Internal PI controller
Inputs	–	3 digital inputs 1 analog input
Outputs	–	1 analog output 1 relay output
Interfacing to automation system	–	The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION
Additional features	–	• BICO technology • Compound braking for controlled rapid braking

Section 2

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MICROMASTER 430

"The specialist for pumps and fans"
with optimized OP (manual/automatic switchover), matched software functionality and optimized power yield

7.5 kW to 250 kW

3 AC 380 V to 480 V

- *V/f* characteristic
- Multipoint characteristic (programmable *V/f* characteristic)
- FCC (flux current control)

Internal PID controller

6 digital inputs
2 analog inputs
1 PTC/KTY input

2 analog outputs
3 relay outputs

The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION

- Low-energy mode
- Load torque monitoring (detects dry run of pumps)
- Motor staging
- Bypass mode
- BICO technology

Section 3

MICROMASTER 440

"The all-purpose"
with advanced vector control (with and without encoder feedback) for versatile applications in sectors such as conveying systems, textiles, elevators, hoisting equipment and machine construction

0.12 kW to 250 kW

1 AC 200 V to 240 V
3 AC 200 V to 240 V
3 AC 380 V to 480 V
3 AC 500 V to 600 V

- *V/f* characteristic
- Multipoint characteristic (programmable *V/f* characteristic)
- FCC (flux current control)
- Vector control

Internal PID controller (autotuning)

6 digital inputs
2 analog inputs
1 PTC/KTY input

2 analog outputs
3 relay outputs

The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION

- 3 selectable drive data kits
- Integrated brake chopper (up to 75 kW)
- Torque control
- BICO technology

Section 4

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Overview

Options

Various options are available for the MICROMASTER inverters:

- Filters
- Chokes
- Operator panels
- PROFIBUS module
- DeviceNet module
- CANopen module
- Pulse encoder evaluation module
- Gland plates
- Mounting kits, etc.

1) The MICROMASTER 410 is no longer available. The model will be discontinued as of October 1, 2007. The MICROMASTER 410 can then only be ordered as a spare part.

Assignment of operator panels and modules to the inverter ranges

Options	Order No.	MICROMASTER 410 [1]	420	430	440
Operator panels					
OP [1]	6SE6400-0SP00-0AA0	●			
BOP	6SE6400-0BP00-0AA0		●		●
BOP-2	6SE6400-0BE00-0AA0			●	
AOP	6SE6400-0AP00-0AA1		●		●
AAOP	6SE6400-0AP00-0AB0		●		●
CAOP	6SE6400-0AP00-0CA0		●		●
Modules					
PROFIBUS	6SE6400-1PB00-0AA0		●	●	●
DeviceNet	6SE6400-1DN00-0AA0		●	●	●
CANopen	6SE6400-1CB00-0AA0		●	●	●
Pulse encoder evaluation	6SE6400-0EN00-0AA0			●	●
Maximum possible configuration: One pulse encoder evaluation module + one communication module + one operator panel		● Possible assignment			

BOP in new design (available soon)

BOP-2 in new design (available soon)

AOP

AAOP

Operator panels

PROFIBUS

DeviceNet

CANopen

Pulse encoder evaluation

Modules

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Inverter
MICROMASTER 420

2/2 Description
2/4 Circuit diagrams
2/6 Technical data
2/8 Selection and ordering data
2/9 Options
2/18 Dimension drawings

2

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Description

Application

The MICROMASTER 420 inverter is suitable for a variety of variable-speed drive applications. It is especially suitable for applications with pumps, fans and in conveyor systems.

It is the ideal cost-optimized frequency inverter solution. The inverter is especially characterized by its customer-oriented performance and ease-of-use. Its large mains voltage range enables it to be used all over the world.

Design

The MICROMASTER 420 inverter has a modular design. The operator panels and communication modules can be easily exchanged without requiring any tools.

Main characteristics

- Easy, guided start-up
- Modular construction allows maximum configuration flexibility
- Three fully programmable isolated digital inputs
- One analog input (0 V to 10 V, scaleable) or for use as 4th digital input
- One programmable analog output (0 mA to 20 mA)
- One programmable relay output (30 V DC/5 A resistive load; 250 V AC/2A inductive load)
- Low-noise motor operation through high pulse frequency, adjustable (observe derating if necessary)
- Complete protection for motor and inverter.

Options (overview)

- EMC filter, Class A/B
- LC filter
- Line commutating chokes
- Output chokes
- Gland plates
- Basic Operator Panel (BOP) for parameterizing the inverter
- Advanced Operator Panel (AOP) with multi-language plain text display
- Asian Advanced Operator Panel (AAOP) with Chinese and English plain text display
- Cyrillic Advanced Operator Panel (CAOP) with Cyrillic, German and English plain text display
- Communication modules
  - PROFIBUS
  - DeviceNet
  - CANopen
- PC connection kits
- Mounting kits for installing the operator panels in the control cabinet doors
- PC start-up programs executable under Windows 98 and NT/2000/ME/ XP Professional
- TIA integration with Drive ES

International standards

- The MICROMASTER 420 inverter complies with the requirements of the EU low-voltage guideline
- The MICROMASTER 420 inverter has the CE marking
- acc. to UL and cUL certified
- c-tick

Note:

See Appendix for standards.

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Mechanical features

- Modular design
- Operating temperature –10 °C to +50 °C (+14 °F to +122 °F)
- Compact housing as a result of high power density
- Easy cable connection, mains and motor connections are separated for optimum electromagnetic compatibility
- Detachable operator panels
- Screwless control terminals

Performance features

- Latest IGBT technology
- Digital microprocessor control
- Flux Current Control (FCC) for improved dynamic response and optimized motor control
- Linear *V/f* characteristic
- Quadratic *V/f* characteristic
- Multipoint characteristic (programmable *V/f* characteristic)
- Flying restart
- Slip compensation
- Automatic restart following mains failure or fault
- Internal PI controller for simple process control
- Programmable acceleration/deceleration times from 0 s to 650 s
- Ramp smoothing
- Fast Current Limit (FCL) for trip-free operation
- Fast, repeatable digital input response time
- Fine adjustment using a high-resolution 10-bit analog input
- Compound braking for controlled rapid braking
- Four skip frequencies
- Removable “Y” capacitor for use on IT systems (with non-grounded mains supplies, the “Y” capacitor must be removed and an output choke installed).

Protection features

- Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, cycle time 300 s
- Overvoltage/undervoltage protection
- Inverter overtemperature protection
- Motor protection using PTC via digital input (possible with supplementary circuit)
- Earth fault protection
- Short-circuit protection
- I^2t motor thermal protection
- Locked motor protection
- Stall prevention
- Parameter interlock

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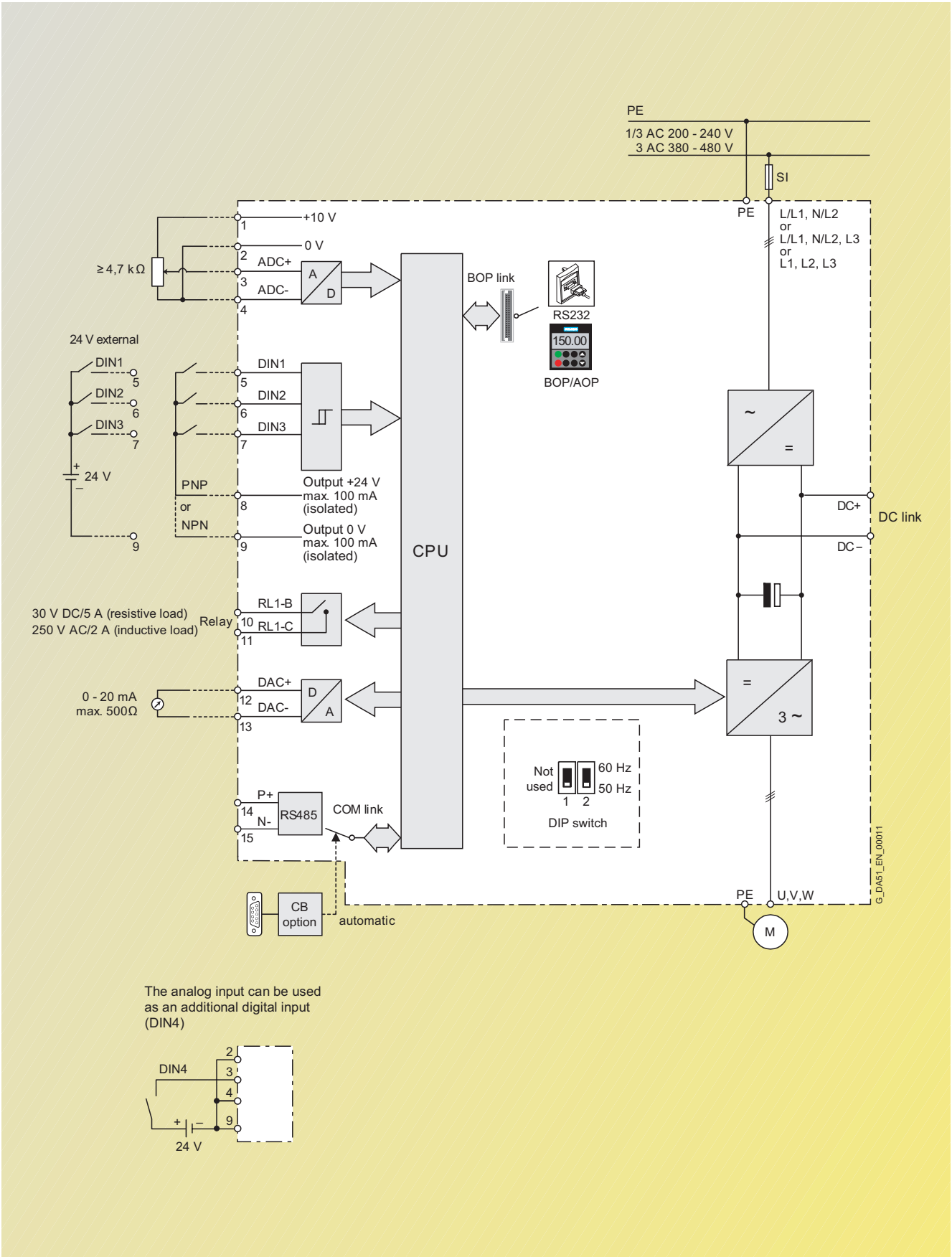
Circuit diagrams

General circuit diagram



The analog input can be used as an additional digital input (DIN4)

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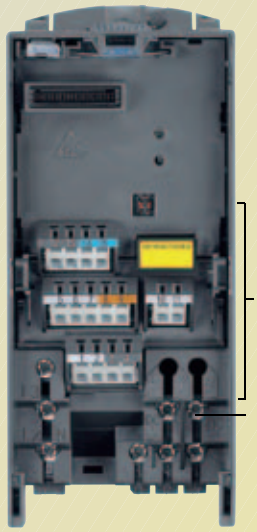
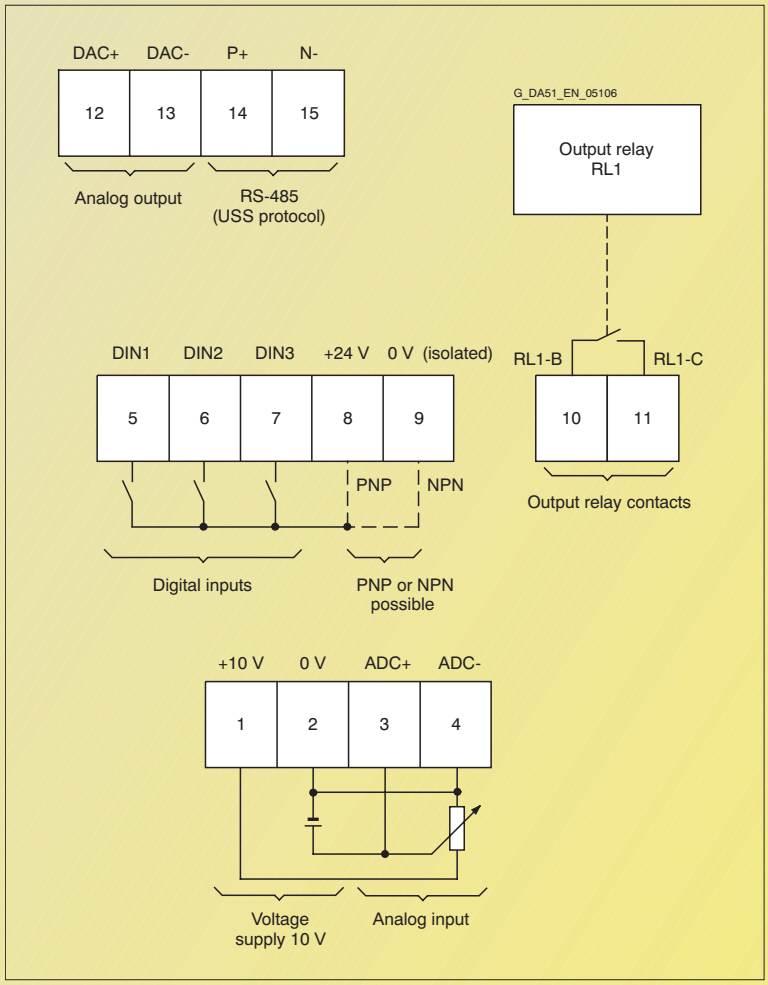
Terminal connection diagram

Example frame size A



View A



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Technical data

MICROMASTER 420 inverter

Mains voltage and power ranges	1 AC 200 V to 240 V ± 10 % 3 AC 200 V to 240 V ± 10 % 3 AC 380 V to 480 V ± 10 %	0.12 kW to 3 kW 0.12 kW to 5.5 kW 0.37 kW to 11 kW		
Power frequency	47 Hz to 63 Hz			
Output frequency	0 Hz to 650 Hz			
Power factor	≥ 0.95			
Inverter efficiency	96 % to 97 % (Further information is available on the Internet at: http://support.automation.siemens.com/WW/view/en/22978972)			
Overload capability	Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, cycle time 300 s			
Inrush current	Less than rated input current			
Control method	Linear *V/f*-characteristic; quadratic *V/f* characteristic; multipoint characteristic (programmable *V/f* characteristic); flux current control (FCC)			
Pulse frequency	16 kHz (standard with 1/3 AC 230 V) 4 kHz (standard with 3 AC 400 V) 2 kHz to 16 kHz (in 2 kHz steps)			
Fixed frequencies	7, programmable			
Skip frequency ranges	4, programmable			
Setpoint resolution	0.01 Hz digital 0.01 Hz serial 10 bit analog			
Digital inputs	3 fully programmable isolated digital inputs; switchable PNP/NPN			
Analog input	1, for setpoint or PI controller (0 V to 10 V, scaleable or for use as 4th digital input)			
Relay outputs	1, programmable, 30 V DC/5 A (resistive load); 250 V AC/2A (inductive load)			
Analog output	1, programmable (0 mA to 20 mA)			
Serial interfaces	RS-485, optional RS-232			
Motor cable lengths without output choke without output choke	 max. 50 m (shielded) max. 100 m (unshielded) see variant dependent options			
Electromagnetic compatibility	Inverter available with internal EMC filter Class A; available as options are EMC filters to EN 55 011, Class A or Class B			
Braking	DC braking, compound braking			
Degree of protection	IP20			
Operating temperature	–10 °C to +50 °C (+14 °F to +122 °F)			
Storage temperature	–40 °C to +70 °C (–40 °F to +158 °F)			
Relative humidity	95 % (non-condensing)			
Installation altitude	Up to 1000 m above sea level without derating			
Standard SCCR (Short Circuit Current Rating) [1]	10 kA			
Protection features for	• Undervoltage • Overvoltage • Overload • Earth faults • Short circuit • Stall prevention • Locked motor protection • Motor overtemperature • Inverter overtemperature • Parameter interlock			
Compliance with standards	UL, cUL, CE, c-tick			
CE marking	Conformity with low-voltage directive 73/23/EEC			
Cooling-air volumetric flow required, dimensions and weights (without options)	Frame size (FS) A B C	Cooling-air volumetric flow required (l/s)/(CFM) 4.8/10.2 24/51 54.9/116.3	H x W x D (mm) 173 x 73 x 149 202 x 149 x 172 245 x 185 x 195	Weight, approx. (kg) 1.0 3.3 5.0

CFM: Cubic Feet per Minute

1) Applies to industrial control cabinet installations to NEC article 409/UL 508A.

For further information, visit us on the Internet at:

http://support.automation.siemens.com/WW/view/en/23995621

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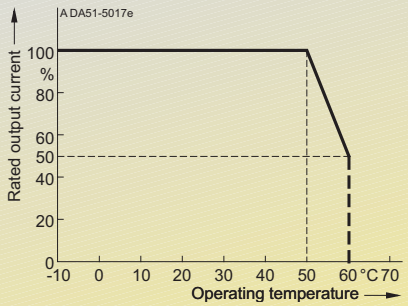
Derating data

Pulse frequency

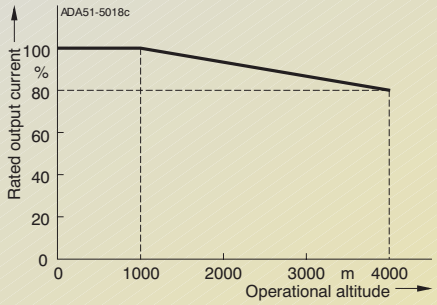
Output (for 3 AC 400 V)	**Rated output current in A** for a pulse frequency of						
kW	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
0.37	1.2	1.2	1.2	1.2	1.2	1.2	1.1
0.55	1.6	1.6	1.6	1.6	1.6	1.6	1.1
0.75	2.1	2.1	2.1	2.1	1.6	1.6	1.1
1.1	3.0	3.0	2.7	2.7	1.6	1.6	1.1
1.5	4.0	4.0	2.7	2.7	1.6	1.6	1.1
2.2	5.9	5.9	5.1	5.1	3.6	3.6	2.6
3.0	7.7	7.7	5.1	5.1	3.6	3.6	2.6
4.0	10.2	10.2	6.7	6.7	4.8	4.8	3.6
5.5	13.2	13.2	13.2	13.2	9.6	9.6	7.5
7.5	19.0	18.4	13.2	13.2	9.6	9.6	7.5
11	26.0	26.0	17.9	17.9	13.5	13.5	10.4

Operating temperature

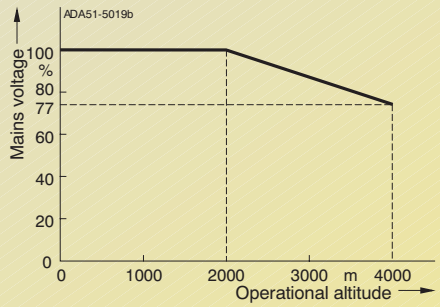


Installation altitude above sea level

Permissible output current
in % of the rated output current



Permissible mains voltage
in % of the max. possible mains voltage



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Selection and ordering data

MICROMASTER 420 inverter

Output		Rated input current [1]	Rated output current	Frame size	Order No.	
					MICROMASTER 420 without filter [3]	**MICROMASTER 420 with internal filter Class A [2]**
kW	hp	A	A	(FS)		
Mains operating voltage 1 AC 200 V to 240 V						
0.12	0.16	1.8	0.9	A	**6SE6420-2UC11-2AA1**	**6SE6420-2AB11-2AA1**
0.25	0.33	3.2	1.7	A	**6SE6420-2UC12-5AA1**	**6SE6420-2AB12-5AA1**
0.37	0.50	4.6	2.3	A	**6SE6420-2UC13-7AA1**	**6SE6420-2AB13-7AA1**
0.55	0.75	6.2	3.0	A	**6SE6420-2UC15-5AA1**	**6SE6420-2AB15-5AA1**
0.75	1.0	8.2	3.9	A	**6SE6420-2UC17-5AA1**	**6SE6420-2AB17-5AA1**
1.1	1.5	11.0	5.5	B	**6SE6420-2UC21-1BA1**	**6SE6420-2AB21-1BA1**
1.5	2.0	14.4	7.4	B	**6SE6420-2UC21-5BA1**	**6SE6420-2AB21-5BA1**
2.2	3.0	20.2	10.4	B	**6SE6420-2UC22-2BA1**	**6SE6420-2AB22-2BA1**
3.0	4.0	35.5	13.6	C	**6SE6420-2UC23-0CA1**	**6SE6420-2AB23-0CA1**
Mains operating voltage 3 AC 200 V to 240 V						
0.12	0.16	1.1	0.9	A	**6SE6420-2UC11-2AA1**	–
0.25	0.33	1.9	1.7	A	**6SE6420-2UC12-5AA1**	–
0.37	0.50	2.7	2.3	A	**6SE6420-2UC13-7AA1**	–
0.55	0.75	3.6	3.0	A	**6SE6420-2UC15-5AA1**	–
0.75	1.0	4.7	3.9	A	**6SE6420-2UC17-5AA1**	–
1.1	1.5	6.4	5.5	B	**6SE6420-2UC21-1BA1**	–
1.5	2.0	8.3	7.4	B	**6SE6420-2UC21-5BA1**	–
2.2	3.0	11.7	10.4	B	**6SE6420-2UC22-2BA1**	–
3.0	4.0	15.6	13.6	C	**6SE6420-2UC23-0CA1**	**6SE6420-2AC23-0CA1**
4.0	5.0	19.7	17.5	C	**6SE6420-2UC24-0CA1**	**6SE6420-2AC24-0CA1**
5.5	7.5	26.5	22.0	C	**6SE6420-2UC25-5CA1**	**6SE6420-2AC25-5CA1**
Mains operating voltage 3 AC 380 V to 480 V						
0.37	0.50	2.2	1.2	A	**6SE6420-2UD13-7AA1**	–
0.55	0.75	2.8	1.6	A	**6SE6420-2UD15-5AA1**	–
0.75	1.0	3.7	2.1	A	**6SE6420-2UD17-5AA1**	–
1.1	1.5	4.9	3.0	A	**6SE6420-2UD21-1AA1**	–
1.5	2.0	5.9	4.0	A	**6SE6420-2UD21-5AA1**	–
2.2	3.0	7.5	5.9	B	**6SE6420-2UD22-2BA1**	**6SE6420-2AD22-2BA1**
3.0	4.0	10.0	7.7	B	**6SE6420-2UD23-0BA1**	**6SE6420-2AD23-0BA1**
4.0	5.0	12.8	10.2	B	**6SE6420-2UD24-0BA1**	**6SE6420-2AD24-0BA1**
5.5	7.5	15.6	13.2	C	**6SE6420-2UD25-5CA1**	**6SE6420-2AD25-5CA1**
7.5	10.0	22.0	19.0	C	**6SE6420-2UD27-5CA1**	**6SE6420-2AD27-5CA1**
11	15.0	32.3	26.0	C	**6SE6420-2UD31-1CA1**	**6SE6420-2AD31-1CA1**

See Appendix for note on ordering.

All MICROMASTER 420 inverters are supplied with a Status Display Panel (SDP). A BOP, AOP or other options have to be ordered separately (see Pages 2/12 to 2/16).

Motors for MICROMASTER 420

Catalog D 81.1 contains selection and ordering data for motors which are particularly suitable for operation with the MICROMASTER 420 inverters (see Appendix for overview).

This catalog is suitable for IEC motors. For motors according to US standards (NEMA) please refer to Catalog D 81.2 U.S./Canada (see Appendix for overview) and to: http://www.sea.siemens.com/motors

1) Supplementary conditions: Input current at rated operating point, applicable at short-circuit voltage of the supply U_{sc} = 2 % with reference to the inverter rated power and rated mains voltage of 240 V or 400 V without a line commutating choke.

2) Use of MICROMASTER inverters with internal filter is not permissible on non-grounded (IT) mains supplies.

3) Acc. to EMC EN 61800-3 generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.

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Overview

EMC filter, Class A

Filter for inverters without an internal filter for
– 3 AC 200 V to 240 V, frame sizes A and B
– 3 AC 380 V to 480 V, frame size A.

All other inverters can be supplied with an internal Class A filter.

The requirements are fulfilled using shielded cables with a max. length of 25 m.

EMC filter, Class B

Filter for inverters without an internal filter for
– 3 AC 200 V to 240 V, frame sizes A and B
– 3 AC 380 V to 480 V, frame size A.

With this filter, the inverter complies with the emission standard EN 55 011, Class B for conducted interference emissions.

The requirements are fulfilled using shielded cables with a max. length of 25 m.

Additional EMC filter, Class B

Available for inverters with an internal Class A EMC filter.

With this filter, the inverter complies with the emission standard EN 55 011, Class B for conducted interference emissions.

The requirements are fulfilled using shielded cables with a max. length of 25 m.

Filter Class B with low leakage currents

EMC filter for 1 AC 200 V to 240 V inverters, frame sizes A and B, without an internal EMC filter Class A.

With this filter, the inverter complies with the emission standard EN 55 011, Class B for conducted interference emissions. The leakage currents are reduced to < 3.5 mA.

The requirements are fulfilled using shielded cables with a max. length of 5 m.

Leakage currents:

The leakage currents of the inverters with/without filter (internal/external) may exceed 30 mA. Typical values in practice are between 10 mA and 50 mA. The exact values depend on the design, environment and cable lengths. Interference-free operation with residual current operated devices with a trigger value of 30 mA cannot be guaranteed. However, operation with residual current circuit-breakers with a trigger value of 300 mA is possible. Please refer to the Instruction Manual for details.

LC filter

The LC filter limits the rate of rise of voltage and the capacitive charge/discharge currents which usually occur with inverter operation. This means that much longer shielded motor cables are possible when using LC filters and the service life of the motor achieves values similar to those with direct mains operation.
Use of an output choke isn't required with that.

Please note when using LC filters:

- Only *V/f*, FCC control permissible
- Please observe the derating of 15 % when selecting the appropriate inverter
- Operation only permissible with 4 kHz pulse frequency
- The output frequency is limited to 150 Hz
- Operation and commissioning only with connected motor as the LC filter is not idling-proof!

The LC filters can be used for all MICROMASTER 420 inverters of frame sizes A to C.

Line commutating choke

Line commutating chokes are used to smooth voltage peaks or to bridge commutating dips. In addition, line commutating chokes reduce the effects of harmonics on the inverter and the power supply. If the line impedance is < 1 %, a line commutating choke must be used in order to reduce the current peaks.

In line with EN 61 000-3-2 regulations "Limits for harmonic currents with device input current ≤ 16 A per phase", there are special aspects for drives with 250 W to 550 W and 230 V single-phase supplies which can be used in non-industrial applications (1st environment).

For devices with 250 W and 370 W, it is necessary either to fit the recommended input chokes or to apply to the power utility company for authorization to connect the devices to the public power supply. No limits are currently defined in the EN 61 000-3-2 standard for professionally used devices with a connected load > 1 kW which means that the inverters with an output power ≥ 0.75 kW comply with the EN 61 000-3-2 standard.

However, in accordance with the regulations of EN 61000-3-12 "Limits for harmonic currents > 16 A and ≤ 75 A per phase" an approval is necessary from the power supplier for drives that are intended to be connected to the public low-voltage network. Please refer to the Operating Instructions for the values of the harmonic currents.

Output choke

Output chokes can be supplied for reducing the capacitive currents and d*V*/d*t* in the case of motor cables > 50 m (shielded) or > 100 m (unshielded).

For max. permissible cable lengths, see Technical Data.

Gland plate

The gland plate facilitates the shield connection of power and control cables and ensures optimum EMC performance.

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Options
Variant dependent options

Technical data

LC filter

Mains voltage		3 AC 380 V to 480 V
Current (at 40 °C/50 °C)	for frame size A for frame size B for frame size C	4.5 A/ 4.1 A 11.2 A/10.2 A 32.6 A/29.7 A
Limiting of motor overvoltage		≤ 1078 V
d*V*/d*t* limiting		≤ 500 V/μs
Pulse frequency		4 kHz
Max. motor frequency		150 Hz
Max. permissible motor cable lengths	shielded unshielded	200 m 300 m
Insulation strength		Overvoltage category III to VDE 0110
Electromagnetic compatibility		Up to 200 m motor cable length with emissions to Class A according to EN 55 011 in conjunction with filtered inverters and unshielded cables
Conformity		CE according to the low-voltage directive 73/23/EEC
Approvals		UL available soon
Strain resistance		EN 60 068-2-31
Humidity		95 % humidity, non-condensing
Degree of protection		IP20 (to EN 60529)
Insulation class		H (180 °C)
Permissible temperature	Operation Storage	–10 °C to +40 °C (+14 °F to +104 °F) 100 % P_n to +50 °C (to +122 °F) 80 % P_n –25 °C to +70 °C (–13 °F to +158 °F)
Installation altitude	up to 2000 m 2000 to 4000 m	100 % P_n 62.5 % P_n
Mounting position		Footprint or suspended
Free space	Top Bottom Side	100 mm 100 mm 100 mm
Connection system	Input, litz wire or terminal Output, terminals	1U1, 1V1, 1W1 1U2, 1V2, 1W2
Torque for power conductor connections		1.5 Nm to 1.8 Nm
Weight, approx.	for frame size A for frame size B for frame size C	7 kg 11 kg 29 kg

Max. permissible cable lengths from the motor to the inverter when using output chokes

The following table shows the maximum permissible cable lengths from the motor to the inverter when using output chokes.

Frame size	Output choke	**Max. permissible motor cable lengths (shielded/unshielded)** for a mains voltage of		
(FS)	Type	200 V to 240 V ± 10 %	380 V to 400 V ± 10 %	401 V to 480 V ± 10 %
A	6SE6400-3TC00-4AD3	200 m/300 m	–	–
A	6SE6400-3TC00-4AD2	200 m/300 m	150 m/225 m	100 m/150 m
B	6SE6400-3TC01-0BD3	200 m/300 m	150 m/225 m	100 m/150 m
C	6SE6400-3TC03-2CD3	200 m/300 m	200 m/300 m	100 m/150 m

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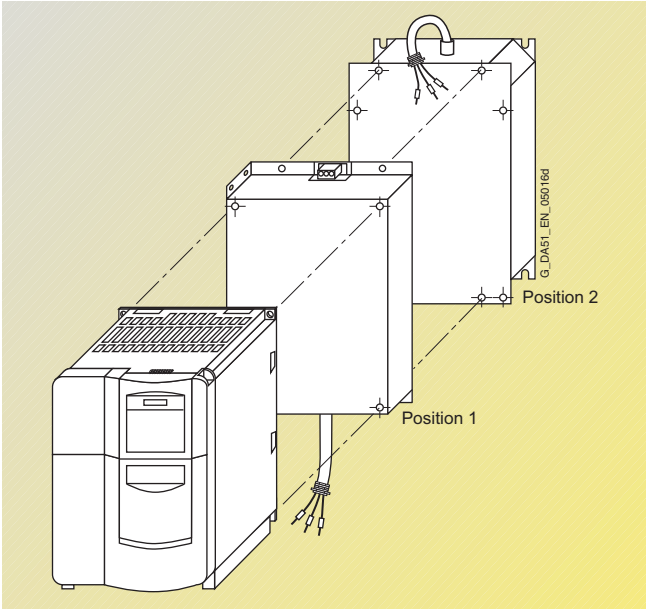
Design

General installation instructions

- A maximum of two footprint components plus inverter are permissible.
- If an LC filter is used, it must be mounted directly on the wall of the control cabinet due to weight reasons.
  If an LC filter of frame size C is used, therefore, only one footprint component is permissible. If a line choke and LC filter are used, the line choke must be located on the left of the inverter.
  Required distance between line choke and inverter: 75 mm.
- The EMC filter must be mounted directly below the frequency inverter if possible.
- If mounted on the side, the line-side components are to be mounted to the left of the frequency inverter whereas the output-side components are to be mounted to the right of the frequency inverter.



Example of installation with frequency inverter, EMC filter (position 1) and line choke (position 2)

Availability of the options as footprint components

	Frame size		
	A	B	C
Line commutating choke	✓	✓	✓
EMC filter	✓	✓	✓
LC filter	✓	✓	✓
Output choke	✓	✓	✓

Recommended combinations of inverters and options

Frequency inverter	**Footprint**		**Mounted on side**	
Frame size	Position 1	Position 2	To the left of the inverter (for line-side components)	To the right of the inverter (for output-side components)
A and B	EMC filter	Line commutating choke	–	Output choke
	EMC filter or Line commutating choke	Output choke or LC filter	–	–
C	EMC filter	Line commutating choke	–	Output choke
	EMC filter or Line commutating choke	Output choke	–	–
	LC filter	–	EMC filter and/or Line commutating choke	–

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Options
Variant dependent options

Selection and ordering data

The options listed here (filters, chokes, gland plates, fuses, and circuit-breakers) must be selected to match the inverter. The inverter and the associated options have the same voltage ratings. Alternatively fuses and circuit-breakers can be provided. Both provide short circuit protection of the inverter supply line and the inverter. A semiconductor protection of the inverter with the suggested 3NA... fuses and the 3RV... circuit-breakers is not envisaged.

Mains voltage	Output		Inverter **without** filter	Order No. of the options		
				EMC filter Class A	**EMC filter Class B**	**Additional EMC filter, Class B**
	kW	hp				
1 AC 200 V to 240 V	0.12	0.16	6SE6420-2UC11-2AA1	–	**6SE6400-2FL01-0AB0** with low leakage currents	–
	0.25	0.33	6SE6420-2UC12-5AA1	–		–
	0.37	0.50	6SE6420-2UC13-7AA1	–		–
	0.55	0.75	6SE6420-2UC15-5AA1	–		–
	0.75	1.0	6SE6420-2UC17-5AA1	–		–
	1.1	1.5	6SE6420-2UC21-1BA1	–	**6SE6400-2FL02-6BB0** with low leakage currents	–
	1.5	2.0	6SE6420-2UC21-5BA1	–		–
	2.2	3.0	6SE6420-2UC22-2BA1	–		–
	3.0	4.0	6SE6420-2UC23-0CA1	–	–	–
3 AC 200 V to 240 V	0.12	0.16	6SE6420-2UC11-2AA1	**6SE6400-2FA00-6AD0**	**6SE6400-2FB00-6AD0**	–
	0.25	0.33	6SE6420-2UC12-5AA1			–
	0.37	0.50	6SE6420-2UC13-7AA1			–
	0.55	0.75	6SE6420-2UC15-5AA1			–
	0.75	1.0	6SE6420-2UC17-5AA1			–
	1.1	1.5	6SE6420-2UC21-1BA1	**6SE6400-2FA01-4BC0**	**6SE6400-2FB01-4BC0**	–
	1.5	2.0	6SE6420-2UC21-5BA1			–
	2.2	3.0	6SE6420-2UC22-2BA1			–
	3.0	4.0	6SE6420-2UC23-0CA1	–	–	–
	4.0	5.0	6SE6420-2UC24-0CA1	–	–	–
	5.5	7.5	6SE6420-2UC25-5CA1	–	–	–
3 AC 380 V to 480 V	0.37	0.50	6SE6420-2UD13-7AA1	**6SE6400-2FA00-6AD0**	**6SE6400-2FB00-6AD0**	–
	0.55	0.75	6SE6420-2UD15-5AA1			–
	0.75	1.0	6SE6420-2UD17-5AA1			–
	1.1	1.5	6SE6420-2UD21-1AA1			–
	1.5	2.0	6SE6420-2UD21-5AA1			–
	2.2	3.0	6SE6420-2UD22-2BA1	–	–	–
	3.0	4.0	6SE6420-2UD23-0BA1	–	–	–
	4.0	5.0	6SE6420-2UD24-0BA1	–	–	–
	5.5	7.5	6SE6420-2UD25-5CA1	–	–	–
	7.5	10.0	6SE6420-2UD27-5CA1	–	–	–
	11	15.0	6SE6420-2UD31-1CA1	–	–	–
			Inverter **with** internal filter Class A			
1 AC 200 V to 240 V	0.12	0.16	6SE6420-2AB11-2AA1	–	–	**6SE6400-2FS01-0AB0**
	0.25	0.33	6SE6420-2AB12-5AA1	–	–	
	0.37	0.50	6SE6420-2AB13-7AA1	–	–	
	0.55	0.75	6SE6420-2AB15-5AA1	–	–	
	0.75	1.0	6SE6420-2AB17-5AA1	–	–	
	1.1	1.5	6SE6420-2AB21-1BA1	–	–	**6SE6400-2FS02-6BB0**
	1.5	2.0	6SE6420-2AB21-5BA1	–	–	
	2.2	3.0	6SE6420-2AB22-2BA1	–	–	
	3.0	4.0	6SE6420-2AB23-0CA1	–	–	**6SE6400-2FS03-5CB0**
3 AC 200 V to 240 V	3.0	4.0	6SE6420-2AC23-0CA1	–	–	**6SE6400-2FS03-8CD0**
	4.0	5.0	6SE6420-2AC24-0CA1	–	–	
	5.5	7.5	6SE6420-2AC25-5CA1	–	–	
3 AC 380 V to 480 V	2.2	3.0	6SE6420-2AD22-2BA1	–	–	**6SE6400-2FS01-6BD0**
	3.0	4.0	6SE6420-2AD23-0BA1	–	–	
	4.0	5.0	6SE6420-2AD24-0BA1	–	–	
	5.5	7.5	6SE6420-2AD25-5CA1	–	–	**6SE6400-2FS03-8CD0**
	7.5	10.0	6SE6420-2AD27-5CA1	–	–	
	11	15.0	6SE6420-2AD31-1CA1	–	–	

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Selection and ordering data (continued)

All options are certified to UL, except fuses. The fuses of Type 3NA3 are recommended for Europe.

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

Use in America requires UL-listed fuses such as the Class NON/NOS range from Bussmann.

Mains voltage	Output		Inverter **without** filter	Order No. of the options		
				Line commutating choke	**LC filter**	**Output choke**
	kW	hp				
1 AC 200 V to 240 V	0.12	0.16	6SE6420-2UC11-2AA1	**6SE6400-3CC00-4AB3**	–	**6SE6400-3TC00-4AD3**
	0.25	0.33	6SE6420-2UC12-5AA1		–	
	0.37	0.50	6SE6420-2UC13-7AA1	**6SE6400-3CC01-0AB3**	–	
	0.55	0.75	6SE6420-2UC15-5AA1		–	
	0.75	1.0	6SE6420-2UC17-5AA1		–	
	1.1	1.5	6SE6420-2UC21-1BA1	**6SE6400-3CC02-6BB3**	–	**6SE6400-3TC01-0BD3**
	1.5	2.0	6SE6420-2UC21-5BA1		–	
	2.2	3.0	6SE6420-2UC22-2BA1		–	
	3.0	4.0	6SE6420-2UC23-0CA1	**6SE6400-3CC03-5CB3**	–	**6SE6400-3TC03-2CD3**
3 AC 200 V to 240 V	0.12	0.16	6SE6420-2UC11-2AA1	**6SE6400-3CC00-3AC3**	–	**6SE6400-3TC00-4AD3**
	0.25	0.33	6SE6420-2UC12-5AA1		–	
	0.37	0.50	6SE6420-2UC13-7AA1	**6SE6400-3CC00-5AC3**	–	
	0.55	0.75	6SE6420-2UC15-5AA1		–	
	0.75	1.0	6SE6420-2UC17-5AA1		–	
	1.1	1.5	6SE6420-2UC21-1BA1	**6SE6400-3CC00-8BC3**	–	**6SE6400-3TC01-0BD3**
	1.5	2.0	6SE6420-2UC21-5BA1	**6SE6400-3CC01-4BD3**	–	
	2.2	3.0	6SE6420-2UC22-2BA1		–	
	3.0	4.0	6SE6420-2UC23-0CA1	**6SE6400-3CC01-7CC3**	–	**6SE6400-3TC03-2CD3**
	4.0	5.0	6SE6420-2UC24-0CA1	**6SE6400-3CC03-5CD3**	–	
	5.5	7.5	6SE6420-2UC25-5CA1		–	
3 AC 380 V to 480 V	0.37	0.50	6SE6420-2UD13-7AA1	**6SE6400-3CC00-2AD3**	**6SE6400-3TD00-4AD0**	**6SE6400-3TC00-4AD2**
	0.55	0.75	6SE6420-2UD15-5AA1			
	0.75	1.0	6SE6420-2UD17-5AA1	**6SE6400-3CC00-4AD3**		
	1.1	1.5	6SE6420-2UD21-1AA1			
	1.5	2.0	6SE6420-2UD21-5AA1	**6SE6400-3CC00-6AD3**		
	2.2	3.0	6SE6420-2UD22-2BA1	**6SE6400-3CC01-0BD3**	**6SE6400-3TD01-0BD0**	**6SE6400-3TC01-0BD3**
	3.0	4.0	6SE6420-2UD23-0BA1			
	4.0	5.0	6SE6420-2UD24-0BA1	**6SE6400-3CC01-4BD3**		
	5.5	7.5	6SE6420-2UD25-5CA1	**6SE6400-3CC02-2CD3**	**6SE6400-3TD03-2CD0**	**6SE6400-3TC03-2CD3**
	7.5	10.0	6SE6420-2UD27-5CA1			
	11	15.0	6SE6420-2UD31-1CA1	**6SE6400-3CC03-5CD3**		
			Inverter **with** internal filter Class A			
1 AC 200 V to 240 V	0.12	0.16	6SE6420-2AB11-2AA1	**6SE6400-3CC00-4AB3**	–	**6SE6400-3TC00-4AD3**
	0.25	0.33	6SE6420-2AB12-5AA1		–	
	0.37	0.50	6SE6420-2AB13-7AA1	**6SE6400-3CC01-0AB3**	–	
	0.55	0.75	6SE6420-2AB15-5AA1		–	
	0.75	1.0	6SE6420-2AB17-5AA1		–	
	1.1	1.5	6SE6420-2AB21-1BA1	**6SE6400-3CC02-6BB3**	–	**6SE6400-3TC01-0BD3**
	1.5	2.0	6SE6420-2AB21-5BA1		–	
	2.2	3.0	6SE6420-2AB22-2BA1		–	
	3.0	4.0	6SE6420-2AB23-0CA1	**6SE6400-3CC03-5CB3**	–	**6SE6400-3TC03-2CD3**
3 AC 200 V to 240 V	3.0	4.0	6SE6420-2AC23-0CA1	**6SE6400-3CC01-7CC3**	–	**6SE6400-3TC03-2CD3**
	4.0	5.0	6SE6420-2AC24-0CA1	**6SE6400-3CC03-5CD3**	–	
	5.5	7.5	6SE6420-2AC25-5CA1		–	
3 AC 380 V to 480 V	2.2	3.0	6SE6420-2AD22-2BA1	**6SE6400-3CC01-0BD3**	**6SE6400-3TD01-0BD0**	**6SE6400-3TC01-0BD3**
	3.0	4.0	6SE6420-2AD23-0BA1			
	4.0	5.0	6SE6420-2AD24-0BA1	**6SE6400-3CC01-4BD3**		
	5.5	7.5	6SE6420-2AD25-5CA1	**6SE6400-3CC02-2CD3**	**6SE6400-3TD03-2CD0**	**6SE6400-3TC03-2CD3**
	7.5	10.0	6SE6420-2AD27-5CA1			
	11	15.0	6SE6420-2AD31-1CA1	**6SE6400-3CC03-5CD3**		

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Options
Variant dependent options

Selection and ordering data (continued)

Mains voltage	Output		Inverter **without** filter	Order No. of the options		
				Gland plate	**Fuse** (see Catalog LV 1)	**Circuit-breaker** (see Catalog LV 1)
	kW	hp				
1 AC 200 V to 240 V	0.12	0.16	6SE6420-2UC11-2AA1	**6SE6400-0GP00-0AA0**	**3NA3803**	**3RV1021-1DA10**
	0.25	0.33	6SE6420-2UC12-5AA1			**3RV1021-1GA10**
	0.37	0.50	6SE6420-2UC13-7AA1			**3RV1021-1HA10**
	0.55	0.75	6SE6420-2UC15-5AA1			**3RV1021-1JA10**
	0.75	1.0	6SE6420-2UC17-5AA1		**3NA3805**	**3RV1021-4AA10**
	1.1	1.5	6SE6420-2UC21-1BA1	**6SE6400-0GP00-0BA0**	**3NA3807**	**3RV1021-4BA10**
	1.5	2.0	6SE6420-2UC21-5BA1			**3RV1021-4DA10**
	2.2	3.0	6SE6420-2UC22-2BA1		**3NA3812**	**3RV1031-4FA10**
	3.0	4.0	6SE6420-2UC23-0CA1	**6SE6400-0GP00-0CA0**	**3NA3817**	**3RV1031-4HA10**
3 AC 200 V to 240 V	0.12	0.16	6SE6420-2UC11-2AA1	**6SE6400-0GP00-0AA0**	**3NA3803**	**3RV1021-1AA10**
	0.25	0.33	6SE6420-2UC12-5AA1			**3RV1021-1DA10**
	0.37	0.50	6SE6420-2UC13-7AA1			**3RV1021-1EA10**
	0.55	0.75	6SE6420-2UC15-5AA1			**3RV1021-1GA10**
	0.75	1.0	6SE6420-2UC17-5AA1			**3RV1021-1HA10**
	1.1	1.5	6SE6420-2UC21-1BA1	**6SE6400-0GP00-0BA0**	**3NA3805**	**3RV1021-1KA10**
	1.5	2.0	6SE6420-2UC21-5BA1			**3RV1021-4AA10**
	2.2	3.0	6SE6420-2UC22-2BA1		**3NA3807**	**3RV1021-4BA10**
	3.0	4.0	6SE6420-2UC23-0CA1	**6SE6400-0GP00-0CA0**	**3NA3810**	**3RV1021-4CA10**
	4.0	5.0	6SE6420-2UC24-0CA1		**3NA3812**	**3RV1031-4EA10**
	5.5	7.5	6SE6420-2UC25-5CA1		**3NA3814**	**3RV1031-4FA10**
3 AC 380 V to 480 V	0.37	0.50	6SE6420-2UD13-7AA1	**6SE6400-0GP00-0AA0**	**3NA3803**	**3RV1021-1CA10**
	0.55	0.75	6SE6420-2UD15-5AA1			**3RV1021-1DA10**
	0.75	1.0	6SE6420-2UD17-5AA1			**3RV1021-1EA10**
	1.1	1.5	6SE6420-2UD21-1AA1			**3RV1021-1GA10**
	1.5	2.0	6SE6420-2UD21-5AA1			**3RV1021-1HA10**
	2.2	3.0	6SE6420-2UD22-2BA1	**6SE6400-0GP00-0BA0**	**3NA3805**	**3RV1021-1JA10**
	3.0	4.0	6SE6420-2UD23-0BA1			**3RV1021-1KA10**
	4.0	5.0	6SE6420-2UD24-0BA1		**3NA3807**	**3RV1021-4AA10**
	5.5	7.5	6SE6420-2UD25-5CA1	**6SE6400-0GP00-0CA0**		**3RV1021-4CA10**
	7.5	10.0	6SE6420-2UD27-5CA1		**3NA3810**	**3RV1031-4EA10**
	11	15.0	6SE6420-2UD31-1CA1		**3NA3814**	**3RV1031-4GA10**
			Inverter **with** internal filter Class A			
1 AC 200 V to 240 V	0.12	0.16	6SE6420-2AB11-2AA1	**6SE6400-0GP00-0AA0**	**3NA3803**	**3RV1021-1DA10**
	0.25	0.33	6SE6420-2AB12-5AA1			**3RV1021-1GA10**
	0.37	0.50	6SE6420-2AB13-7AA1			**3RV1021-1HA10**
	0.55	0.75	6SE6420-2AB15-5AA1			**3RV1021-1JA10**
	0.75	1.0	6SE6420-2AB17-5AA1		**3NA3805**	**3RV1021-4AA10**
	1.1	1.5	6SE6420-2AB21-1BA1	**6SE6400-0GP00-0BA0**	**3NA3807**	**3RV1021-4BA10**
	1.5	2.0	6SE6420-2AB21-5BA1			**3RV1021-4DA10**
	2.2	3.0	6SE6420-2AB22-2BA1		**3NA3812**	**3RV1031-4FA10**
	3.0	4.0	6SE6420-2AB23-0CA1	**6SE6400-0GP00-0CA0**	**3NA3817**	**3RV1031-4HA10**
3 AC 200 V to 240 V	3.0	4.0	6SE6420-2AC23-0CA1	**6SE6400-0GP00-0CA0**	**3NA3810**	**3RV1021-4CA10**
	4.0	5.0	6SE6420-2AC24-0CA1		**3NA3812**	**3RV1031-4EA10**
	5.5	7.5	6SE6420-2AC25-5CA1		**3NA3814**	**3RV1031-4FA10**
3 AC 380 V to 480 V	2.2	3.0	6SE6420-2AD22-2BA1	**6SE6400-0GP00-0BA0**	**3NA3805**	**3RV1021-1JA10**
	3.0	4.0	6SE6420-2AD23-0BA1			**3RV1021-1KA10**
	4.0	5.0	6SE6420-2AD24-0BA1		**3NA3807**	**3RV1021-4AA10**
	5.5	7.5	6SE6420-2AD25-5CA1	**6SE6400-0GP00-0CA0**		**3RV1021-4CA10**
	7.5	10.0	6SE6420-2AD27-5CA1		**3NA3810**	**3RV1031-4EA10**
	11	15.0	6SE6420-2AD31-1CA1		**3NA3814**	**3RV1031-4GA10**

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Overview

Basic Operator Panel (BOP)

With the BOP, individual parameter settings can be made. Values and units are shown on a 5-digit display.

Basic Operator Panel (BOP)

A BOP can be used for several inverters. It can be directly mounted on the inverter or in a control cabinet door using a mounting kit.

Advanced Operator Panel (AOP)

The AOP enables parameter kits to be read out of the inverter or to be written into the inverter (upload/download). Different parameter kits can be stored in the AOP. It has a plain text display with the possibility of switching between several languages.

Advanced Operator Panel (AOP)

Up to 30 inverters can be controlled from an AOP via USS. It can be directly mounted on the inverter or in a control cabinet door using a mounting kit.

Asian Advanced Operator Panel (AAOP)

The AAOP is the Chinese version of the AOP operator panel. It has an enhanced display and supports the operating languages of Chinese (simplified) and English.

Asian Advanced Operator Panel (AAOP)

Cyrillic Advanced Operator Panel (CAOP)

The CAOP is the Cyrillic version of the AOP Advanced Operator Panel. It supports the Cyrillic, German and English operator languages.

PROFIBUS module

For a complete PROFIBUS connection with up to ≤ 12 Mbaud. Remote control of the inverter is possible with the PROFIBUS module. Remote control and operation at the inverter can be combined using an operator panel plugged onto the PROFIBUS module. The PROFIBUS module can be supplied by an external 24 V DC power supply and is thus also active when the inverter is disconnected from the power supply.

Connection by means of a 9-pin Sub-D connector (available as an option).

DeviceNet module

For networking the inverters to the DeviceNet fieldbus system widely used on the American market. A maximum transmission rate of 500 Kbaud is possible. Remote control of the inverter is possible with the DeviceNet module. Remote control and operation at the inverter can be combined using an operator panel plugged onto the DeviceNet module.

The connection to the DeviceNet bus system is made using a 5-pin connector with terminal strip.

CANopen module

Using the CANopen communications module, an inverter can be linked to the CANopen fieldbus system and remote control is then possible.

Remote control and operation at the inverter can be combined using an operator panel plugged onto the CANopen module.

The module is connected to the bus system through a 9-pin Sub-D connector.

Connection kit for PC to inverter

For controlling an inverter directly from a PC if the appropriate software has been installed (e.g. STARTER). Isolated RS-232 adapter module for reliable point-to-point connection to a PC. Includes a Sub-D connector and an RS-232 standard cable (3 m).

Connection kit for PC to AOP

For connecting a PC to an AOP or AAOP. Offline programming of inverters and archiving of parameter kits possible. Includes a desktop attachment kit for an AOP or AAOP, an RS-232 standard cable (3 m) with Sub-D connectors and a universal power supply unit.

Operator panel door mounting kit for single inverter

For mounting an operator panel in a control cabinet door. Degree of protection IP56. Contains a cable adapter module with screwless terminals for use with user's own RS-232-cables [1]).

AOP door mounting kit for multiple inverters (USS)

For mounting an AOP or AAOP in a control cabinet door. Degree of protection IP56. The AOP or AAOP can communicate with several inverters by means of the RS-485 USS protocol. The 4-pin connecting cable from the AOP or AAOP to the RS-485 terminals of the inverter and to the 24 V user terminal strip is not included [2]).

Start-up tools

- STARTER
  is a graphic start-up software for guided start-up for MICROMASTER 410/420/430/440 frequency inverters under Windows 2000/XP Professional. Parameter lists can be read out, altered, stored, entered and printed.
- DriveMonitor
  is a start-up software for list-oriented programming of frequency inverters. This program executes under Windows 98/NT/2000/ME/XP Professional.

Both programs are included on the Docu DVD which is provided with every inverter.

1) A shielded cable of type Belden 8132 (28 AWG) is recommended. The maximum cable length is 5 m for RS-232.

2) A shielded cable of type Belden 8132 (28 AWG) is recommended. The maximum cable length is 10 m for RS-485.

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Options
Variant independent options

Selection and ordering data

The options listed here are suitable for all MICROMASTER 420 inverters.

Options	Order No.	
Basic Operator Panel (BOP)	**6SE6400-0BP00-0AA0**	
Advanced Operator Panel (AOP)	**6SE6400-0AP00-0AA1**	
Asian Advanced Operator Panel (AAOP)	**6SE6400-0AP00-0AB0**	
Cyrillic Advanced Operator Panel (CAOP)	**6SE6400-0AP00-0CA0**	
PROFIBUS module	**6SE6400-1PB00-0AA0**	
DeviceNet module	**6SE6400-1DN00-0AA0**	
CANopen module	**6SE6400-1CB00-0AA0**	
RS485/PROFIBUS bus connector	**6GK1500-0FC00**	
Connection kit for PC to inverter	**6SE6400-1PC00-0AA0**	
Connection kit for PC to AOP	**6SE6400-0PA00-0AA0**	
Operator panel door mounting kit for single inverter	**6SE6400-0PM00-0AA0**	
AOP door mounting kit for multiple inverters (USS)	**6SE6400-0MD00-0AA0**	
Start-up tool STARTER on DVD	**6SL3072-0AA00-0AG0**	Available on the Internet at: http://support.automation.siemens.com/WW/view/en/10804985/133100

Technical data of the communication modules

		PROFIBUS module 6SE6400-1PB00-0AA0	**DeviceNet module** 6SE6400-1DN00-0AA0
Size (height x width x depth)		161 mm x 73 mm x 46 mm	
Degree of protection		IP20	
Degree of pollution		2 to IEC 60664-1 (DIN VDE 0110/T1), no condensation permitted during operation	
Strain resistance • Stationary • Transport	 Deflection Acceleration Deflection Acceleration	to DIN IEC 60068-2-6 (if module is installed correctly) 0.15 mm in the frequency range of 10 Hz to 58 Hz 19.6 m/s^2 in the frequency range of 58 Hz to 500 Hz 3.5 mm in the frequency range of 5 Hz to 9 Hz 9.8 m/s^2 in the frequency range of 9 Hz to 500 Hz	
Climatic category (during operation)		3K3 to DIN IEC 60721-3-3	
Cooling method		Natural air cooling	
Permissible ambient or cooling agent temperature • Operation • Storage and transport		 –10 °C to +50 °C (+14 °F to +122 °F) –25 °C to +70 °C (–13 °F to +158 °F)	
Relative humidity (permissible humidity rating) • Operation • Storage and transport		 ≤ 85 % (non-condensing) ≤ 95 %	
Electromagnetic compatibility	Emission Interference	to EN 55011 (1991) Class A to IEC 60801-3 and EN 61000-4-3	
Power supply		6.5 V ± 5 %, max. 300 mA, internal from inverter or 24 V ± 10 %, max. 350 mA, external	6.5 V ± 5 %, max. 300 mA internal from inverter or 24 V, max. 60 mA from DeviceNet-Bus
Output voltage		5 V ± 10 %, max. 100 mA, galvanically isolated supply • for terminating the serial interface bus or • for supplying the OLP (Optical Link Plug)	–
Data transmission rate		max. 12 Mbaud	125, 250 and 500 Kbaud

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Technical data of the communication modules (continued)

		CANopen module 6SE6400-1CB00-0AA0
Size (height x width x depth)		161 mm x 73 mm x 46 mm
Degree of protection		IP20
Degree of pollution		2 to IEC 60 664-1 (DIN VDE 0110/T1), no condensation permitted during operation
Strain resistance • Stationary • Transport	 Deflection Acceleration Deflection Acceleration	to IEC 60 068-2-6 (if module is installed correctly) 0.15 mm in the frequency range of 10 Hz to 58 Hz 19.6 m/s^2 in the frequency range of 58 Hz to 500 Hz 3.5 mm in the frequency range of 5 Hz to 9 Hz 9.8 m/s^2 in the frequency range of 9 Hz to 500 Hz
Climatic category (during operation)		3K3 to DIN IEC 60 721-3-3
Cooling method		Natural air cooling
Permissible ambient or cooling agent temperature • Operation • Storage • Transport		 –10 °C to +50 °C (+14 °F to +122 °F) –40 °C to +70 °C (–40 °F to +158 °F) –25 °C to +70 °C (–13 °F to +158 °F)
Relative humidity (permissible humidity rating) • Operation • Storage and transport		 ≤ 85 % (non-condensing) ≤ 95 %
Power supply		The CAN bus is supplied from the inverter power supply
Data transmission rate		10, 20, 50, 125, 250, 500, 800 Kbaud and 1 Mbaud

Selection and ordering data

Type of documentation	Language	Order No.
Docu pack, supplied with each inverter, containing DVD [1]) and Getting Started Guide [2]) (paper version)	Multilanguage	**6SE6400-5AD00-1AP1**
Operating instructions (paper version)	German, English, French, Italian, Spanish	
	Available as pdf file on the Internet at http://support.automation.siemens.com/WW/view/en/10804926/133300	
Parameter list (paper version)	German, English, French, Italian, Spanish	
	Available as pdf file on the Internet at http://support.automation.siemens.com/WW/view/en/10804926/133300	

1) The DVD contains operating instructions, parameter list, commissioning tools STARTER and DriveMonitor, multilanguage.

Available on the Internet:
DriveMonitor at http://support.automation.siemens.com/WW/view/en/10804984/133100

STARTER at http://support.automation.siemens.com/WW/view/en/10804985/133100

2) Available on the Internet at http://support.automation.siemens.com/WW/view/en/10804926/133300

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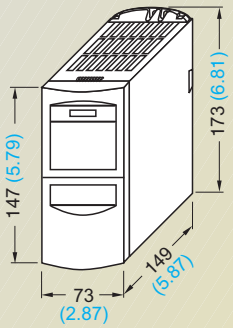
Dimension drawings

MICROMASTER 420 inverter

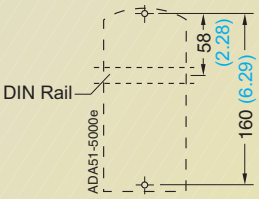
Frame size	1/3 AC 200 V to 240 V	3 AC 380 V to 480 V
A	0.12 kW to 0.75 kW	0.37 kW to 1.5 kW
B	1.1 kW to 2.2 kW	2.2 kW to 4 kW
C	3 kW to 5.5 kW	5.5 kW to 11 kW

Note:
The inverters must not be mounted horizontally.
But the inverters can be mounted without lateral spacing.

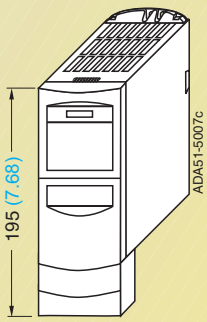


Inverter frame size **A**

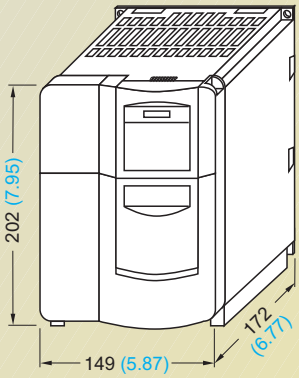
Drill and fixing pattern



Fixing with
2 x M4 bolts, 2 x M4 nuts, 2 x M4 washers, or snap onto the DIN rail
Tightening torque with washers fitted: 2.5 Nm
Ventilation clearance required at top and bottom: 100 mm

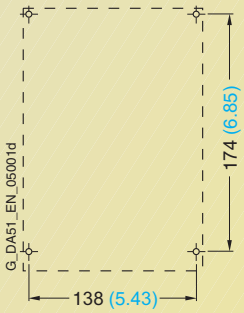


Inverter frame size **A** with **gland plate**

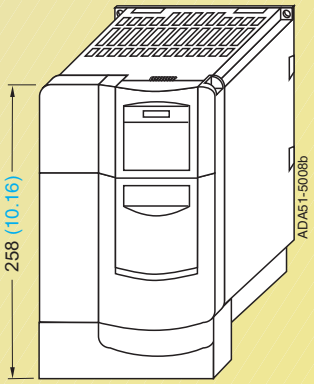


Inverter frame size **B**

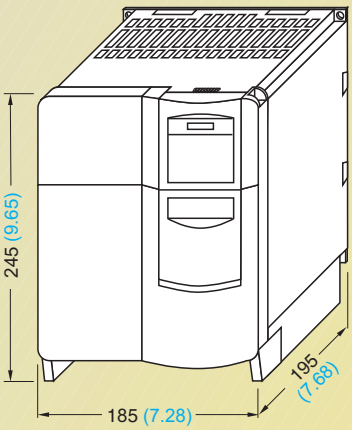
Drill pattern



Fixing with
4 x M4 bolts, 4 x M4 nuts, 4 x M4 washers
Tightening torque with washers fitted: 2.5 Nm
Ventilation clearance required at top and bottom: 100 mm

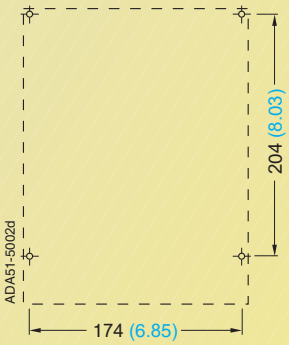


Inverter frame size **B** with **gland plate**

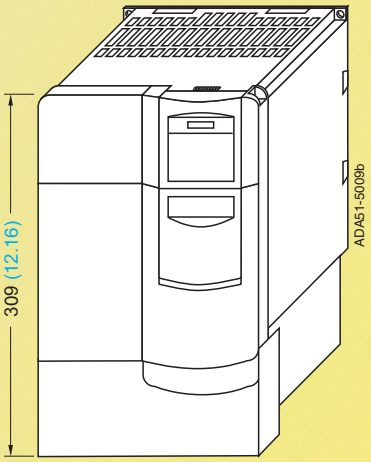


Inverter frame size **C**

Drill pattern



Fixing with
4 x M5 bolts, 4 x M5 nuts, 4 x M5 washers
Tightening torque with washers fitted: 3.0 Nm
Ventilation clearance required at top and bottom: 100 mm



Inverter frame size **C** with **gland plate**

With the communications module, the mounting depth increases by 23 mm (0.91 inches).

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

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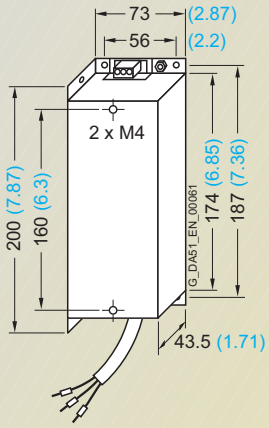
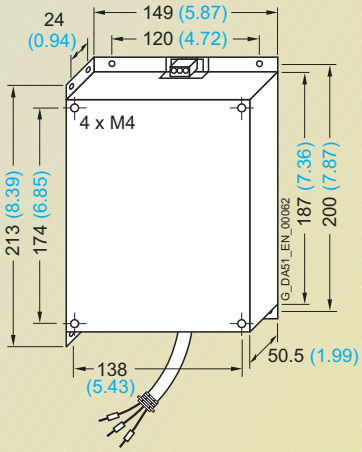
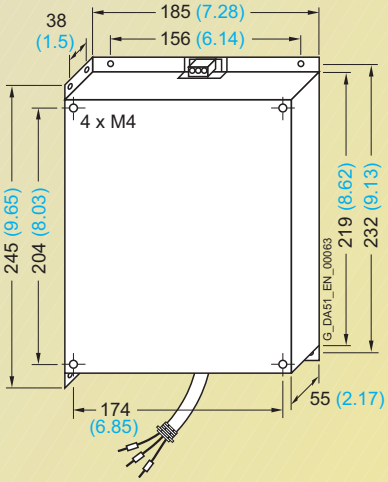
Filters and chokes



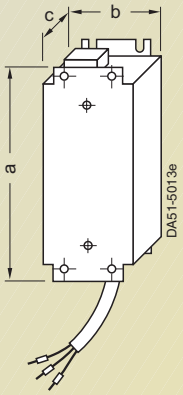
Filter frame size **A**



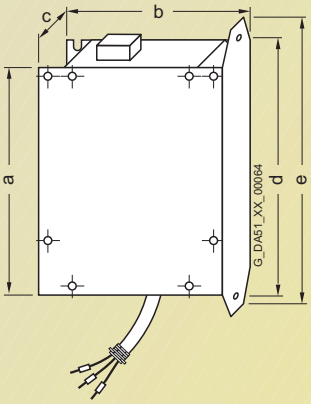
For frame size **B**



For frame size **C**

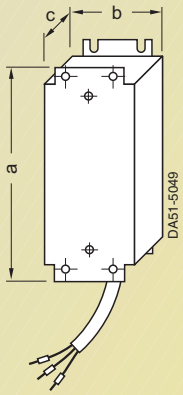


Line commutating choke
for frame size **A**

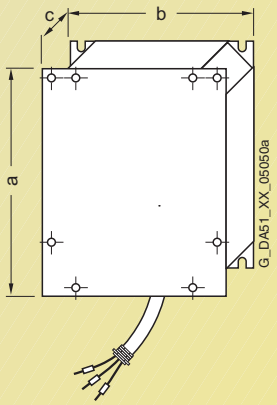


For frame sizes **B** and **C**

Line commutating choke for	Dimensions a	b	c	d	e	Weight (max.) kg
Frame size **A**	200 (7.87)	75.5 (2.97)	50 (1.97)	–	–	1.4
Frame size **B**	213 (8.39)	150 (5.91)	50 (1.97)	220 (8.66)	233 (9.17)	2.2
Frame size **C**	245 (9.65)	185 (7.28)	50 (1.97)	264 (10.39)	280 (11.02)	5.1



Output choke
for frame size **A**
6SE6400-3TC00-4AD2
6SE6400-3TC00-4AD3



For frame sizes **B** and **C**
6SE6400-3TC01-0BD3
6SE6400-3TC03-2CD3

Output choke type 6SE6400-	Dimensions a	b	c	Weight (max.) kg
3TC00-4AD2	200 (7.87)	75.5 (2.97)	110 (4.33)	1.9
3TC00-4AD3	200 (7.87)	75.5 (2.97)	50 (1.97)	1.3
3TC01-0BD3	213 (8.39)	150 (5.91)	80 (3.15)	4.1
3TC03-2CD3	245 (9.65)	185 (7.28)	80 (3.15)	6.6

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

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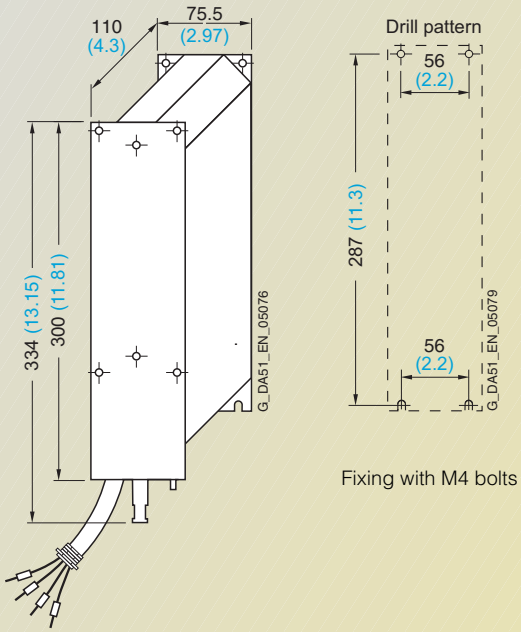
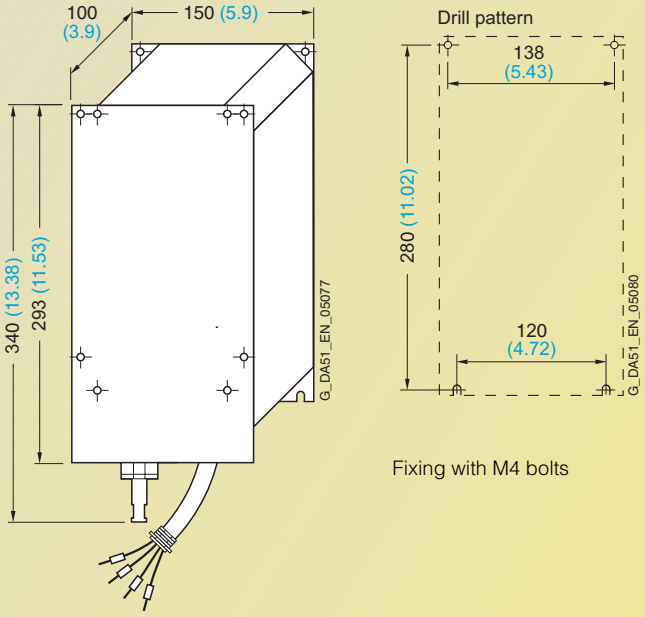
Dimension drawings

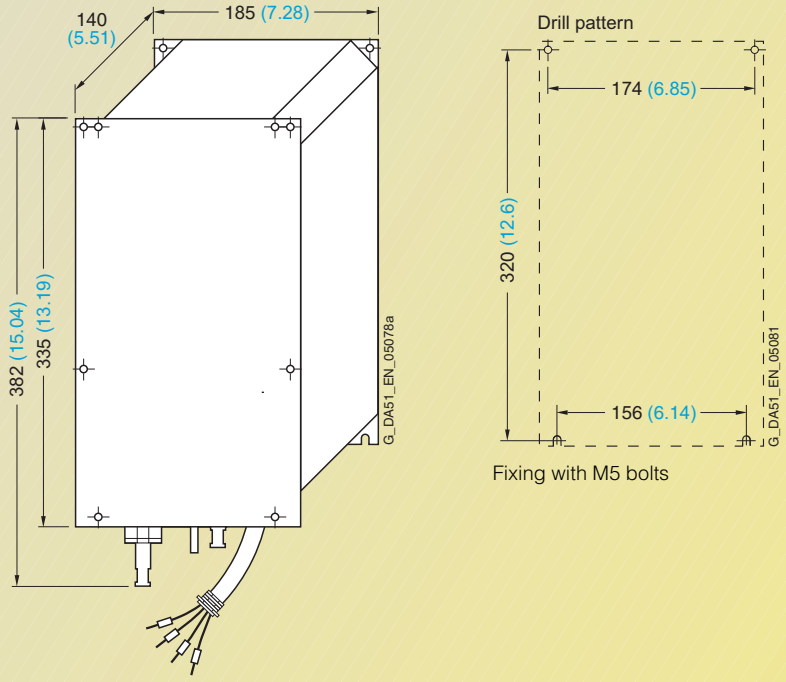
LC filter



LC filter for frame size **A**



LC filter for frame size **B**



LC filter for frame size **C**

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

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Inverter
MICROMASTER 430

3/2 Description

3/4 Circuit diagrams

3/6 Technical data

3/9 Selection and ordering data

3/10 Options

3/19 Dimension drawings

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Description

Application

The MICROMASTER 430 inverter is suitable for a variety of variable-speed drive applications. Its flexibility provides for a wide spectrum of applications. It is especially suitable for use with industrial pumps and fans. The inverter is especially characterized by its customer-oriented performance and ease-of-use. It has more inputs and outputs than the MICROMASTER 420, an optimized operator panel with manual/automatic switchover and adapted software functionality.

Design

The MICROMASTER 430 inverter has a modular design.

The operator panels and communication modules can be easily exchanged.

Main characteristics

- Easy, guided start-up
- Modular construction allows maximum configuration flexibility
- Six programmable isolated digital inputs
- Two scaleable analog inputs (0 V to 10 V, 0 mA to 20 mA) can also be used as a 7th/8th digital input
- Two programmable analog outputs (0 mA to 20 mA)
- Three programmable relay outputs (30 V DC/5 A resistive load; 250 V AC/2A inductive load)
- Low-noise motor operation thanks to high pulse frequencies, adjustable (observe derating if necessary)
- Complete protection for motor and inverter
- Control of up to three additional drives on the basis of PID control (motor staging)
- Operation of drive directly on mains (with external bypass circuit)
- Low-energy mode
- Detects dry run of pumps (belt failure detection).

Options (overview)

- Line commutating chokes
- Output chokes
- LC filter and sinusoidal filter
- Gland plates
- Basic Operator Panel 2 (BOP-2) for parameterizing the inverter
- Communication modules
  - PROFIBUS
  - DeviceNet
  - CANopen
- PC connection kits
- Mounting kits for installing the operator panels in the control cabinet doors
- PC start-up tools executable under Windows 98 and NT/2000/ME/ XP Professional.
- TIA integration with Drive ES

International standards

- The MICROMASTER 430 inverter complies with the requirements of the EU low-voltage guideline
- The MICROMASTER 430 inverter has the CE marking
- acc. to UL and cUL certified
- c-tick

Note:

See Appendix for standards.

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Mechanical features

- Modular design
- Operating temperature –10 °C to +40 °C (+14 °F to +104 °F)
- Compact housing as a result of high power density
- Easy cable connection, mains and motor connections are separated for optimum electromagnetic compatibility
- Detachable operator panels
- Screwless control terminal strip on detachable I/O board.

Performance features

- Latest IGBT technology
- Digital microprocessor control
- Flux Current Control (FCC) for improved dynamic response and optimized motor control
- Linear *V/f* characteristic
- Quadratic *V/f* characteristic
- Multipoint characteristic (programmable *V/f* characteristic)
- Flying restart
- Slip compensation
- Automatic restart following mains failure or fault
- Energy saving mode (stopping e.g. of a pump at low speeds)
- Motor staging (connection and disconnection of additional motors, use of inverter as control drive in a pump cascade)
- Manual/automatic mode
- Load torque monitoring (belt failure detection; detects dry run of pumps)
- High-grade internal PID controller for simple process control
- Programmable acceleration/deceleration times from 0 s to 650 s
- Ramp smoothing
- Fast Current Limit (FCL) for trip-free operation
- Fast, repeatable digital input response time
- Fine adjustment using two high-resolution 10-bit analog inputs
- Compound braking for controlled rapid braking
- Four skip frequencies
- Removable “Y” capacitor for use on IT systems (with non-grounded mains supplies, the “Y” capacitor must be removed and an output choke installed).

Protection features

- Overload capability
  7.5 kW to 90 kW:
  Overload current 1.4 x rated output current (i.e. +140 % overload capability) for 3 s, and 1.1 x rated output current (i.e. 110 % overload capability) for 60 s, cycle time 300 s
  110 kW to 250 kW:
  Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 1 s, and 1.1 x rated output current (i.e. 110 % overload capability) for 59 s, cycle time 300 s
- Overvoltage/undervoltage protection
- Inverter overtemperature protection
- Special direct connection for PTC or KTY to protect the motor
- Earth fault protection
- Short-circuit protection
- I^2t motor thermal protection
- Locked motor protection
- Stall prevention
- Parameter interlock

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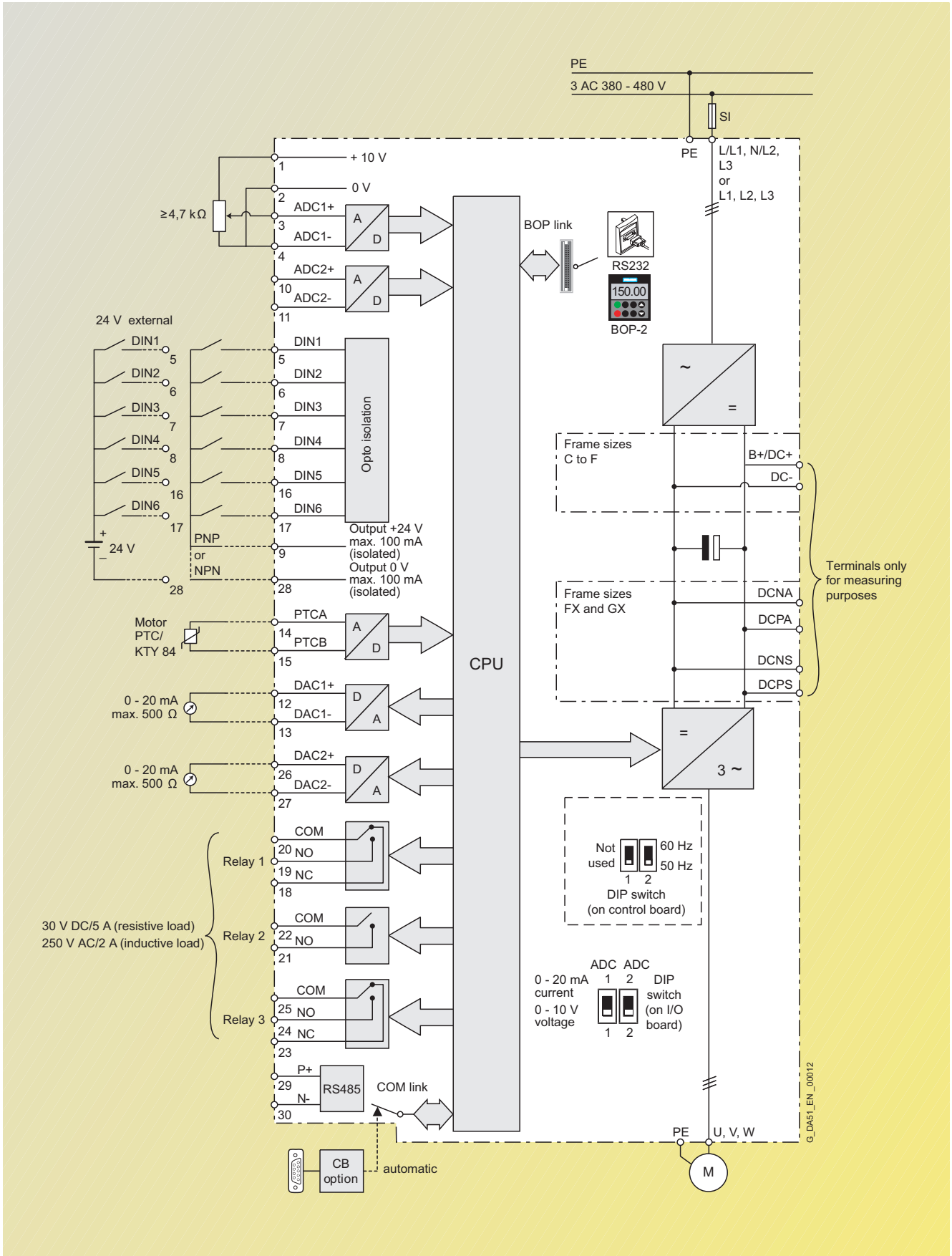
Circuit diagrams

General circuit diagram



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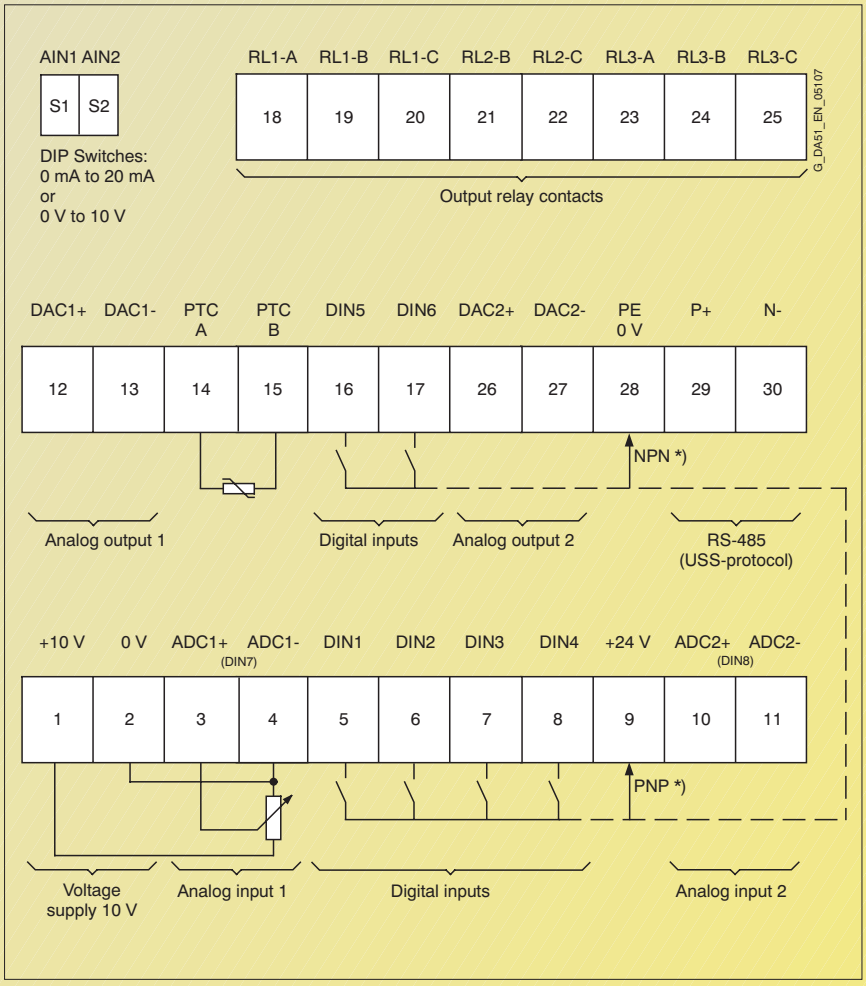
Terminal connection diagram

Example, frame size C

View A



*) PNP or NPN possible

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Technical data

MICROMASTER 430 inverter

Mains voltage and Power ranges		3 AC 380 V to 480 V ± 10 % 7.5 kW to 250 kW (variable torque)
Power frequency		47 Hz to 63 Hz
Output frequency	7.5 kW to 90 kW 110 kW to 250 kW	0 Hz to 650 Hz 0 Hz to 267 Hz
Power factor		≥ 0.95
Inverter efficiency	7.5 kW to 90 kW 110 kW to 250 kW	96 % to 97 % 97 % to 98 % (Further information is available on the Internet at: http://support.automation.siemens.com/WW/view/en/22978972)
Overload capability	7.5 kW to 90 kW 110 kW to 250 kW	Overload current 1.4 x rated output current (i.e. +140 % overload capability) for 3 s, and 1.1 x rated output current (i.e. 110 % overload capability) for 60 s, cycle time 300 s Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 1 s and 1.1 x rated output current (i.e. 110 % overload capability) for 60 s, cycle time 300 s
Inrush current		Less than rated input current
Control method		Linear *V/f* characteristic; quadratic *V/f* characteristic; multipoint characteristic (programmable *V/f* characteristic); flux current control (FCC), energy saving mode
Pulse frequency	7.5 kW to 90 kW 110 kW to 250 kW	4 kHz (standard) 2 kHz to 16 kHz (in 2 kHz steps) 2 kHz (standard) 2 kHz to 4 kHz (in 2 kHz steps)
Fixed frequencies		15, programmable
Skip frequency ranges		4, programmable
Setpoint resolution		0.01 Hz digital; 0.01 Hz serial; 10 bit analog
Digital inputs		6 fully programmable isolated digital inputs; switchable PNP/NPN
Analog inputs		2 programmable analog inputs • 0 V to 10 V, 0 mA to 20 mA and –10 V to +10 V (AIN1) • 0 V to 10 V and 0 mA to 20 mA (AIN2) • both can be used as 7th/8th digital input
Relay outputs		3, programmable, 30 V DC/5 A (resistive load); 250 V AC/2A (inductive load)
Analog outputs		2, programmable (0/4 mA to 20 mA)
Serial interfaces		RS-485, optional RS-232
Motor cable length	7.5 kW to 90 kW without output choke with output choke 110 kW to 250 kW without output choke with output choke	 max. 50 m (shielded); max. 100 m (unshielded) see variant dependent options max. 200 m (shielded); max. 300 m (unshielded) see variant dependent options
Electromagnetic compatibility 7.5 kW to 90 kW For inverters without filter 7.5 kW to 15 kW 18.5 kW to 90 kW 110 kW to 250 kW		Inverter with internal filter Class A available EMC filter, Class B to EN 55 011 available as an option EMC filter, Class B from Schaffner available as an option EMC filter, Class A available as an option
Braking		DC braking, compound braking
Degree of protection		IP20
Operating temperature range 7.5 kW to 90 kW 110 kW to 250 kW		–10 °C to +40 °C (+14 °F to +104 °F) 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 % (non-condensing)
Installation altitude	7.5 kW to 90 kW 110 kW to 250 kW	Up to 1000 m above sea level without derating Up to 2000 m above sea level without derating
Standard SCCR (Short Circuit Current Rating) [1]		FSC: 10 kA FSD, FSE, FSF, FSFX, FSGX: 42 kA
Protection features for		undervoltage, overvoltage, overload, earth faults, short-circuits, stall prevention, locked motor protection, motor overtemperature, inverter overtemperature, parameter change protection
Conformity with standards 7.5 kW to 90 kW 110 kW to 250 kW		 cULus, CE, c-tick cULus available soon, CE
CE marking		Conformity with low-voltage directive 73/23/EEC

Cooling-air volumetric flow required, dimensions and weights (without options)

Frame size (FS)	Cooling-air volumetric flow required (l/s)/(CFM)	H x W x D (mm)	Weight, approx. (kg)
C	54.9/116.3	245 x 185 x 195	5.7
D	2 x 54.9/2 x 116.3	520 x 275 x 245	17
E	2 x 54.9/2 x 116.3	650 x 275 x 245	22
F without filter	150/317.79	850 x 350 x 320	56
F with filter	150/317.79	1150 x 350 x 320	75
FX	225/478.13	1400 x 326 x 356	116
GX	440/935	1533 x 326 x 545	174

1) For footnote, see page 3/7.

CFM: Cubic Feet per Minute

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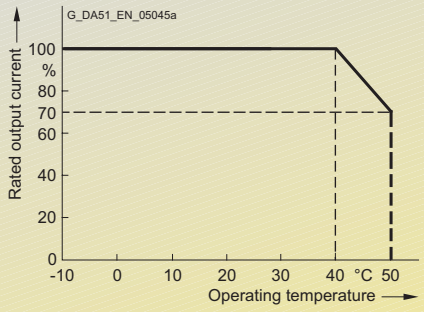
Derating data

Pulse frequency

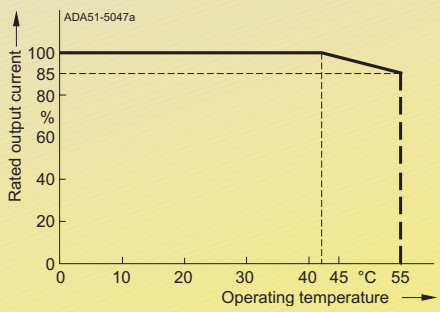
Output (for 3 AC 400 V)	**Rated output current in A** for a pulse frequency of							
kW	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
7.5	19.0	19.0	17.1	15.2	13.3	11.4	9.5	7.6
11.0	26.0	26.0	24.7	23.4	20.8	18.2	15.6	13.0
15.0	32.0	32.0	28.8	25.6	22.4	19.2	16.0	12.8
18.5	38.0	38.0	36.1	34.2	30.4	26.6	22.8	19.0
22	45.0	45.0	40.5	36.0	31.5	27.0	22.5	18.0
30	62.0	62.0	55.8	49.6	43.4	37.2	31.0	24.8
37	75.0	75.0	71.3	67.5	60.0	52.5	45.0	37.5
45	90.0	90.0	81.0	72.0	63.0	54.0	45.0	36.0
55	110.0	110.0	93.5	77.0	63.3	49.5	41.3	33.0
75	145.0	145.0	123.3	101.5	83.4	65.3	54.4	43.5
90	178.0	178.0	138.0	97.9	84.6	71.2	62.3	53.4
110	205.0	180.4	–	–	–	–	–	–
132	250.0	220.0	–	–	–	–	–	–
160	302.0	265.8	–	–	–	–	–	–
200	370.0	325.6	–	–	–	–	–	–
250	477.0	419.8	–	–	–	–	–	–

Operating temperature

Inverter 7.5 kW to 90 kW



Inverter 110 kW to 250 kW



1) Applies to industrial control cabinet installations to NEC article 409/UL 508A.

For further information, visit us on the Internet at:

http://support.automation.siemens.com/WW/view/en/23995621

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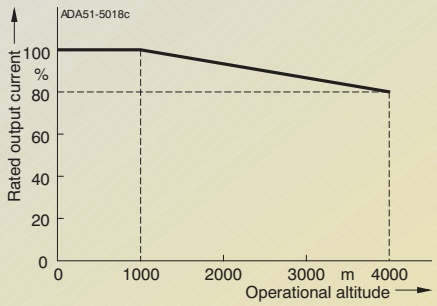
Technical data

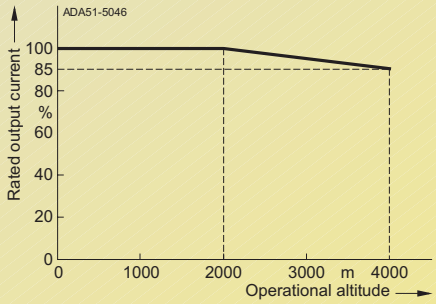
Derating data (continued)

Installation altitude above sea level

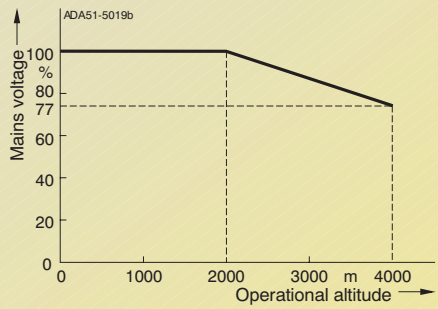
Permissible output current
in % of the rated output current
Inverter 7.5 kW to 90 kW



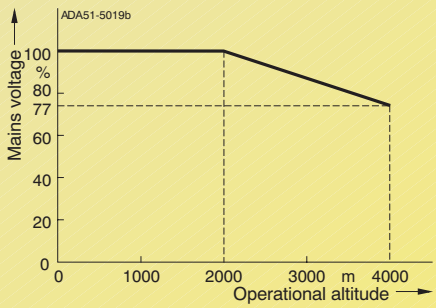
Inverter 110 kW to 250 kW



Permissible mains voltage
in % of the max. possible mains voltage
Inverter 7.5 kW to 90 kW



Inverter 110 kW to 250 kW



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MICROMASTER 430 inverter

Output		Rated input current	Rated output current	Frame size	Order No.	
					MICROMASTER 430 without filter [4]	**MICROMASTER 430 with internal filter Class A [3]**
kW	hp	A	A	(FS)		
Mains operating voltage 3 AC 380 V to 480 V						
7.5	10	17.3 [1]	19	C	**6SE6430-2UD27-5CA0**	**6SE6430-2AD27-5CA0**
11.0	15	23.1 [1]	26	C	**6SE6430-2UD31-1CA0**	**6SE6430-2AD31-1CA0**
15.0	20	33.8 [1]	32	C	**6SE6430-2UD31-5CA0**	**6SE6430-2AD31-5CA0**
18.5	25	37.0 [1]	38	D	**6SE6430-2UD31-8DA0**	**6SE6430-2AD31-8DA0**
22	30	43.0 [1]	45	D	**6SE6430-2UD32-2DA0**	**6SE6430-2AD32-2DA0**
30	40	59.0 [1]	62	D	**6SE6430-2UD33-0DA0**	**6SE6430-2AD33-0DA0**
37	50	72.0 [1]	75	E	**6SE6430-2UD33-7EA0**	**6SE6430-2AD33-7EA0**
45	60	87.0 [1]	90	E	**6SE6430-2UD34-5EA0**	**6SE6430-2AD34-5EA0**
55	75	104.0 [1]	110	F	**6SE6430-2UD35-5FA0**	**6SE6430-2AD35-5FA0**
75	100	139.0 [1]	145	F	**6SE6430-2UD37-5FA0**	**6SE6430-2AD37-5FA0**
90	120	169.0 [1]	178	F	**6SE6430-2UD38-8FA0**	**6SE6430-2AD38-8FA0**
110	150	200.0 [2]	205	FX	**6SE6430-2UD41-1FA0**	–
132	200	245.0 [2]	250	FX	**6SE6430-2UD41-3FA0**	–
160	250	297.0 [2]	302	GX	**6SE6430-2UD41-6GA0**	–
200	300	354.0 [2]	370	GX	**6SE6430-2UD42-0GA0**	–
250	350	442.0 [2]	477	GX	**6SE6430-2UD42-5GA0**	–

See Appendix for note on ordering.

All MICROMASTER 430 inverters are supplied with a Status Display Panel (SDP). A BOP-2 or other options have to be ordered separately (see Pages 3/14 to 3/16).

Motors for MICROMASTER 430

Catalog D 81.1 contains selection and ordering data for motors which are particularly suitable for operation with the MICROMASTER 430 inverters (see Appendix for overview).

This catalog is suitable for IEC motors. For motors according to US standards (NEMA) please refer to Catalog D 81.2 U.S./Canada (see Appendix for overview) and to: http://www.sea.siemens.com/motors

1) Supplementary conditions: Input current at rated operating point, applicable at short-circuit voltage of the supply U_{SC} = 2 % with reference to the inverter rated power and rated mains operating voltage of 400 V without a line commutating choke.

2) Supplementary conditions: Input current at rated operating point, applicable at short-circuit voltage of the supply $U_{SC} \geq 2.33$ % with reference to the inverter rated power and rated mains voltage of 400 V.

3) Use of MICROMASTER inverters with internal filter is not permissible on non-grounded mains supplies.

4) Acc. to EMC EN 61800-3 generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.

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Options
Variant dependent options

Overview

EMC filter, Class A

All 7.5 kW to 90 kW inverters are supplied with an internal filter Class A.
For inverters 110 kW to 250 kW, EMC filters Class A are available. In this performance range, the EMC filters are only permitted to be used in combination with a line commutating choke.

The requirements are fulfilled using shielded cables with a max. length of 25 m.

EMC filter, Class B

Available for inverters 7.5 kW to 15 kW with an internal Class A EMC filter.

The requirements are fulfilled using shielded cables with a max. length of 25 m.

For inverters 18.5 kW to 90 kW without filters, EMC filters of Class B from Schaffner can be used.

The requirements are fulfilled using shielded cables with a max. length of 25 m to 50 m (depending on the type, details on request).

With this filter, the inverter complies with the emission standard EN 55 011, Class B for conducted interference emissions.

Leakage currents:

The leakage currents of the inverters with/without filter (internal/external) may exceed 30 mA. Typical values in practice are between 10 mA and 50 mA. The exact values depend on the design, environment and cable lengths. Interference-free operation with residual current operated devices with a trigger value of 30 mA cannot be guaranteed.

However, operation with residual current operated devices with a trigger value of 300 mA is possible. Please refer to the Instruction Manual for details.

LC filter and sinusoidal filter

The LC filter/sinusoidal filter limits the rate of rise of voltage and the capacitive charge/discharge currents which usually occur with inverter operation. This means that much longer shielded motor cables are possible when using LC filters/sinusoidal filters and the service life of the motor achieves values similar to those with direct mains operation. Use of an output choke isn't required with that.

Please note when using LC filters/sinusoidal filters:

- Only *V/f*, FCC control permissible
- Please observe the derating of 15 % when selecting the appropriate inverter
- Operation only permissible with 4 kHz pulse frequency
  Note: Please observe derating for frame sizes FX and GX.
- The output frequency is limited to 150 Hz
- Operation and commissioning only with connected motor as the LC filter/sinusoidal filter is not idling-proof!

The LC filters/sinusoidal filters can be used for all MICROMASTER 430 inverters of frame sizes C to GX.

- Frame sizes D to F:
  The LC filters, frame sizes D to F, are designed for mounting upright in the control cabinet. Due to leakage flux lines caused by physical sources, a minimum distance of 50 mm to adjacent modules and metal parts is recommended.
- Frame sizes FX and GX:
  The sinusoidal filters, frame sizes FX and GX, are designed for mounting upright in the control cabinet. Due to leakage flux lines caused by physical sources, a minimum distance of 100 mm to adjacent modules and metal parts is recommended.

3

Technical data

LC filter and sinusoidal filter

Mains voltage	3 AC 380 V to 480 V
Current (at 40 °C/50 °C)	
For frame size C (7.5 to 15 kW)	32.6 A/ 26 A
For frame size D (18.5 kW)	38.8 A/ 32 A
For frame size D (22 kW)	45.9 A/ 38 A
For frame size D (30 kW)	63.2 A/ 45 A
For frame size E (37 kW)	76.5 A/ 62 A
For frame size E (45 kW)	112.2 A/ 90 A
For frame size F (55 kW)	112.2 A/ 90 A
For frame size F (75 kW)	147.9 A/110 A
For frame size F (90 kW)	181.6 A/145 A
Current (at 40 °C/55 °C)	
For frame size FX (110 kW and 132 kW)	225 A/191 A
For frame size GX (160 kW)	276 A/235 A
For frame size GX (200 kW)	333 A/283 A
For frame size GX (250 kW)	408 A/347 A
Limiting of motor overvoltage	≤ 1078 V
d*V*/d*t* limiting	≤ 500 V/μs
Pulse frequency	4 kHz
Max. motor frequency	150 Hz

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Technical data (continued)

LC filter and sinusoidal filter

Max. permissible motor cable lengths		
For frame sizes C to F	shielded	200 m
	unshielded	300 m
For frame sizes FX and GX	shielded	300 m
	unshielded	450 m
Insulation strength		Overvoltage category III to VDE 0110
Electromagnetic compatibility		
For frame sizes C to F		Up to 200 m motor cable length with emissions to Class A according to EN 55 011 in conjunction with filtered inverters and unshielded cables
For frame sizes FX and GX		Up to 150 m motor cable length with emissions to Class A according to EN 55 011 in conjunction with filtered inverters and unshielded cables
Conformity		CE according to the low-voltage directive 73/23/EEC
Approvals		cUL E 219022
Strain resistance		EN 60 068-2-31
Humidity		95 % humidity, non-condensing
Degree of protection		
For frame size C		IP20 (to EN 60 529)
For frame sizes D to F		IP00/IP20 (to EN 60 529 with terminal covers)
For frame sizes FX and GX		IP00
Insulation class		H (180 °C)
Temperature range		
For frame sizes C to F	Operation	–10 °C to +40 °C (+14 °F to +104 °F) 100 % P_n
		to +50 °C (to +122 °F) 80 % P_n
	Storage	–25 °C to +70 °C (–13 °F to +158 °F)
For frame sizes FX and GX	Operation	–10 °C to +40 °C (+14 °F to +104 °F) 100 % P_n
		to +55 °C (to +131 °F) 85 % P_n
	Storage	–40 °C to +70 °C (–40 °F to +158 °F)
Installation altitude		
For frame size C		Up to 2000 m: 100 % P_n 2000 to 4000 m: 62.5 % P_n
For frame sizes D to F		Up to 1000 m: 100 % P_n 1000 to 4000 m: 12.5 % derating for each 1000 m
For frame sizes FX and GX		Up to 2000 m: 100 % P_n 2000 to 4000 m: 7.5 % derating for each 1000 m
Mounting position		
For frame size C		Footprint or suspended
For frame sizes D to F, FX and GX		upright
Free space		
For frame size C	Top	100 mm
	Bottom	100 mm
	Side	100 mm
For frame sizes D to F, FX and GX	Top	100 mm
	Side	100 mm
Connection system	Input, litz wire or terminal	1U1, 1V1, 1W1
	Output, terminals	1U2, 1V2, 1W2

Torque for conductor connections	Terminal cross-section	Torque
For frame size C	–	1.5 Nm to 1.8 Nm
For frame sizes D to F	16 mm^2	2.0 Nm to 4.0 Nm
	35 mm^2	2.5 Nm to 5.0 Nm
	50 mm^2	3.0 Nm to 6.0 Nm
	95 mm^2	6.0 Nm to 12.0 Nm
	150 mm^2	10.0 Nm to 20.0 Nm
For frame sizes FX and GX	–	14.0 Nm to 31.0 Nm

Weight, approx.	
For frame size C	8.5 kg to 29 kg
For frame size D	21 kg to 34 kg
For frame size E	49.5 kg to 67 kg
For frame size F	67 kg to 77.5 kg
For frame size FX	135 kg
For frame size GX	138 kg to 208 kg

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Options
Variant dependent options

Overview

Line commutating choke

Line commutating chokes are used to smooth voltage peaks or to bridge commutating dips.
In addition, line commutating chokes reduce the effects of harmonics on the inverter and the power supply. If the line impedance is < 1 %, a line commutating choke must be used in order to reduce the current peaks.

No limits are currently defined in the EN 61 000-3-2 standard for professionally used devices with a connected load > 1 kW.

This means that the inverters with an output power ≥ 0.75 kW comply with the EN 61 000-3-2 standard.

However, in accordance with the regulations of EN 61000-3-12 “Limits for harmonic currents > 16 A and ≤ 75 A per phase” an approval is necessary from the power supplier for drives that are intended to be connected to the public low-voltage network. Please refer to the Operating Instructions for the values of the harmonic currents.

Output choke

Output chokes can be supplied for reducing the capacitive compensation currents and d*V*/d*t* in the case of motor cables >50 m (shielded) or > 100 m (unshielded).

For max. permissible cable lengths, see Technical Data.

Gland plate

Gland plates are available for inverters of frame size C. All the other frame sizes have the shield connection for the control cable integrated in the inverter.

The shield for the power cable has to be connected externally (e.g. in the control cabinet). Exception: Inverters of frame sizes D and E and frame size F with integrated class A filter. In this case the shield connection is integrated in the inverter.

The gland plate facilitates the shield connection of power and control cables and thus ensures optimum EMC performance.

Technical data

Max. permissible cable lengths from the motor to the inverter when using output chokes

The following table shows the maximum permissible cable lengths from the motor to the inverter when using output chokes.

Note:

Operation up to 150 Hz output frequency only!

Frame size	Output choke	**Max. permissible motor cable lengths (shielded/unshielded)** for a mains voltage of	
(FS)	Type	380 V to 400 V ± 10 %	401 V to 480 V ± 10 %
C	6SE6400-3TC03-2CD3	200 m/300 m	100 m/150 m
D to F	6SE6400-3TC . . -. . D0	200 m/300 m	200 m/300 m
FX	6SL3000-2BE32-1AA0	300 m/450 m	300 m/450 m
FX	6SL3000-2BE32-6AA0	300 m/450 m	300 m/450 m
GX	6SL3000-2BE33-2AA0	300 m/450 m	300 m/450 m
GX	6SL3000-2BE33-8AA0	300 m/450 m	300 m/450 m
GX	6SL3000-2BE35-0AA0	300 m/450 m	300 m/450 m

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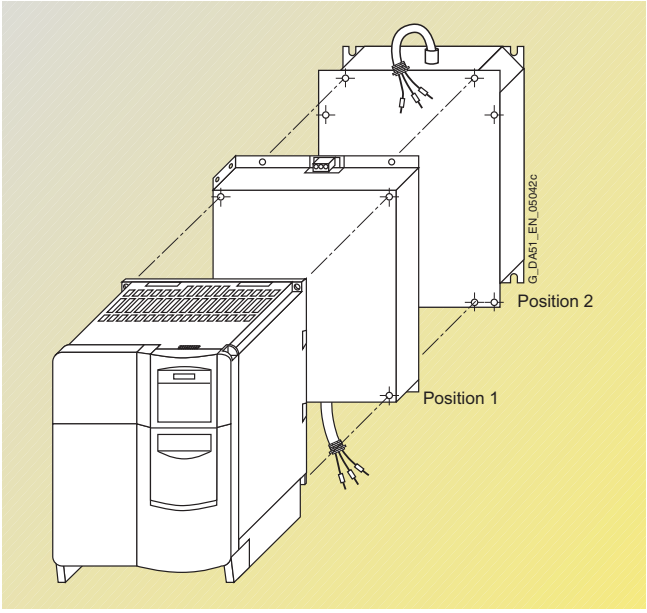
Design

General installation instructions

- A maximum of two footprint components plus inverter are permissible.
- If an LC filter is used, it must be mounted directly on the wall of the control cabinet due to weight reasons.
  If an LC filter of frame size C is used, therefore, only one footprint component is permissible. If a line choke and LC filter are used, the line choke must be located on the left of the inverter.
  Required distance between line choke and inverter: 75 mm.
- The EMC filter must be mounted directly below the frequency inverter if possible.
- If mounted on the side, the line-side components are to be mounted to the left of the frequency inverter whereas the output-side components are to be mounted to the right of the frequency inverter.



Example of installation with frequency inverter, EMC filter (position 1) and line choke (position 2)

Availability of the options as footprint components

	Frame size						
	C	D	E	F	G	FX	GX
Line commutating choke	✓	✓	✓				
EMC filter	✓						
LC filter	✓						
Output choke	✓						

Recommended combinations of inverters and options

Frequency inverter	**Footprint**		**Mounted on side**	
Frame size	Position 1	Position 2	To the left of the inverter (for line-side components)	To the right of the inverter (for output-side components)
C	EMC filter	Line commutating choke	–	Output choke
	EMC filter or Line commutating choke	Output choke	–	–
	LC filter	–	EMC filter and/or Line commutating choke	–
D and E	Line commutating choke	–	EMC filter	Output choke or LC filter
F, G, FX and GX	–	–	EMC filter and/or Line commutating choke	Output choke or LC filter

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Options
Variant dependent options

Selection and ordering data

The options listed here (filters, chokes, gland plates, fuses and circuit-breakers) must be selected to match the inverter. The inverter and the associated options have the same voltage ratings. Alternatively fuses and circuit-breakers can be provided. Both provide short circuit protection of the inverter supply line and the inverter. A semiconductor protection of the inverter with the suggested 3NA... fuses and the 3RV.../3VL... circuit-breakers is not envisaged.

Mains voltage	Output kW	Output hp	Inverter **without** filter	Order No. of the options **EMC filter, Class A**	**EMC filter, Class B**	**Line commutating choke**
3 AC 380 V to 480 V	7.5	10	6SE6430-2UD27-5CA0	–	–	**6SE6400-3CC02-2CD3**
	11.0	15	6SE6430-2UD31-1CA0	–	–	
	15.0	20	6SE6430-2UD31-5CA0	–	–	**6SE6400-3CC03-5CD3**
	18.5	25	6SE6430-2UD31-8DA0	–	EMC filter, Class B, available from Schaffner	**6SE6400-3CC04-4DD0**
	22	30	6SE6430-2UD32-2DA0	–		
	30	40	6SE6430-2UD33-0DA0	–		**6SE6400-3CC05-2DD0**
	37	50	6SE6430-2UD33-7EA0	–		**6SE6400-3CC08-3ED0**
	45	60	6SE6430-2UD34-5EA0	–		
	55	75	6SE6430-2UD35-5FA0	–		**6SE6400-3CC11-2FD0**
	75	100	6SE6430-2UD37-5FA0	–		
	90	120	6SE6430-2UD38-8FA0	–		**6SE6400-3CC11-7FD0**
	110	150	6SE6430-2UD41-1FA0	**6SL3000-0BE32-5AA0 *)**	–	**6SL3000-0CE32-3AA0**
	132	200	6SE6430-2UD41-3FA0	**6SL3000-0BE34-4AA0 *)**	–	**6SL3000-0CE32-8AA0**
	160	250	6SE6430-2UD41-6GA0		–	**6SL3000-0CE33-3AA0**
	200	300	6SE6430-2UD42-0GA0		–	**6SL3000-0CE35-1AA0**
	250	350	6SE6430-2UD42-5GA0	**6SL3000-0BE36-0AA0 *)**	–	

*) Must be used in combination with a line commutating choke.

Mains voltage	Output kW	Output hp	Inverter **without** filter	Order No. of the options **LC/sinusoidal filter**	**Output choke**	**Gland plate**
3 AC 380 V to 480 V	7.5	10	6SE6430-2UD27-5CA0	**6SE6400-3TD03-2CD0**	**6SE6400-3TC03-2CD3**	**6SE6400-0GP00-0CA0**
	11.0	15	6SE6430-2UD31-1CA0			
	15.0	20	6SE6430-2UD31-5CA0			
	18.5	25	6SE6430-2UD31-8DA0	**6SE6400-3TD03-7DD0**	**6SE6400-3TC05-4DD0**	Integrated as standard for shield connection of the control cable and the power cable.
	22	30	6SE6430-2UD32-2DA0	**6SE6400-3TD04-8DD0**	**6SE6400-3TC03-8DD0**	
	30	40	6SE6430-2UD33-0DA0	**6SE6400-3TD06-1DD0**	**6SE6400-3TC05-4DD0**	
	37	50	6SE6430-2UD33-7EA0	**6SE6400-3TD07-2ED0**	**6SE6400-3TC08-0ED0**	
	45	60	6SE6430-2UD34-5EA0	**6SE6400-3TD11-5FD0**	**6SE6400-3TC07-5ED0**	
	55	75	6SE6430-2UD35-5FA0		**6SE6400-3TC14-5FD0**	Integrated as standard for shield connection of the control cable. The shield of the power cable has to be connected externally (e.g. in the control cabinet).
	75	100	6SE6430-2UD37-5FA0	**6SE6400-3TD15-0FD0**	**6SE6400-3TC15-4FD0**	
	90	120	6SE6430-2UD38-8FA0	**6SE6400-3TD18-0FD0**	**6SE6400-3TC14-5FD0**	
	110	150	6SE6430-2UD41-1FA0	**6SL3000-2CE32-3AA0**	**6SL3000-2BE32-1AA0**	
	132	200	6SE6430-2UD41-3FA0		**6SL3000-2BE32-6AA0**	
	160	250	6SE6430-2UD41-6GA0	**6SL3000-2CE32-8AA0**	**6SL3000-2BE33-2AA0**	
	200	300	6SE6430-2UD42-0GA0	**6SL3000-2CE33-3AA0**	**6SL3000-2BE33-8AA0**	
	250	350	6SE6430-2UD42-5GA0	**6SL3000-2CE34-1AA0**	**6SL3000-2BE35-0AA0**	

Mains voltage	Output kW	Output hp	Inverter **without** filter	Order No. of the options **Fuses** (see Catalog LV 1) **3NA3**	**3NE1 (cULus)**	**Circuit-breaker** (see Catalog LV 1)
3 AC 380 V to 480 V	7.5	10	6SE6430-2UD27-5CA0	**3NA3807**	● (see page 3/15)	**3RV1031-4EA10**
	11.0	15	6SE6430-2UD31-1CA0	**3NA3812**		**3RV1031-4FA10**
	15.0	20	6SE6430-2UD31-5CA0	**3NA3814**		**3RV1031-4HA10**
	18.5	25	6SE6430-2UD31-8DA0	**3NA3820**	**3NE1817-0**	**3RV1042-4KA10**
	22	30	6SE6430-2UD32-2DA0	**3NA3822**	**3NE1818-0**	
	30	40	6SE6430-2UD33-0DA0	**3NA3824**	**3NE1820-0**	**3RV1042-4MA10**
	37	50	6SE6430-2UD33-7EA0	**3NA3830**	**3NE1021-0**	**3VL1712-.DD33-....**
	45	60	6SE6430-2UD34-5EA0	**3NA3832**	**3NE1022-0**	**3VL1716-.DD33-....**
	55	75	6SE6430-2UD35-5FA0	**3NA3836**	**3NE1224-0**	**3VL3720-.DC36-....**
	75	100	6SE6430-2UD37-5FA0	**3NA3140**	**3NE1225-0**	**3VL3725-.DC36-....**
	90	120	6SE6430-2UD38-8FA0	**3NA3144**	**3NE1227-0**	**3VL3725-.DC36-....**
	110	150	6SE6430-2UD41-1FA0	–		**3VL4731-.DC36-....**
	132	200	6SE6430-2UD41-3FA0	–	**3NE1230-0**	
	160	250	6SE6430-2UD41-6GA0	–	**3NE1332-0**	
	200	300	6SE6430-2UD42-0GA0	–	**3NE1333-0**	**3VL4740-.DC36-....**
	250	350	6SE6430-2UD42-5GA0	–	**3NE1435-0**	**3VL5750-.DC36-....**

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Selection and ordering data (continued)

All options are certified to UL, except fuses. The 3NE1 fuses are UL-listed (equivalent to cULus).

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

● Use in America requires UL-listed fuses such as the Class NON/NOS range from Bussmann.

Mains voltage	Output kW	Output hp	Inverter **with** internal filter Class A	Order No. of the options **Additional EMC filter, Class B**	**Line commutating choke**	**LC filter**
3 AC 380 V to 480 V	7.5	10	6SE6430-2AD27-5CA0	**6SE6400-2FS03-8CD0**	**6SE6400-3CC02-2CD3**	**6SE6400-3TD03-2CD0**
	11.0	15	6SE6430-2AD31-1CA0			
	15.0	20	6SE6430-2AD31-5CA0		**6SE6400-3CC03-5CD3**	
	18.5	25	6SE6430-2AD31-8DA0	An inverter **without** filter must be selected to satisfy the EMC requirements of Class B. In addition, an appropriate EMC filter of Class B is from Schaffner is required.	**6SE6400-3CC04-4DD0**	**6SE6400-3TD03-7DD0**
	22	30	6SE6430-2AD32-2DA0			**6SE6400-3TD04-8DD0**
	30	40	6SE6430-2AD33-0DA0		**6SE6400-3CC05-2DD0**	**6SE6400-3TD06-1DD0**
	37	50	6SE6430-2AD33-7EA0		**6SE6400-3CC08-3ED0**	**6SE6400-3TD07-2ED0**
	45	60	6SE6430-2AD34-5EA0			**6SE6400-3TD11-5FD0**
	55	75	6SE6430-2AD35-5FA0		**6SE6400-3CC11-2FD0**	
	75	100	6SE6430-2AD37-5FA0			**6SE6400-3TD15-0FD0**
	90	120	6SE6430-2AD38-8FA0		**6SE6400-3CC11-7FD0**	**6SE6400-3TD18-0FD0**

Mains voltage	Output kW	Output hp	Inverter **with** internal filter Class A	Order No. of the options **Output choke**	**Gland plate**
3 AC 380 V to 480 V	7.5	10	6SE6430-2AD27-5CA0	**6SE6400-3TC03-2CD3**	**6SE6400-0GP00-0CA0**
	11.0	15	6SE6430-2AD31-1CA0		
	15.0	20	6SE6430-2AD31-5CA0		
	18.5	25	6SE6430-2AD31-8DA0	**6SE6400-3TC05-4DD0**	Integrated as standard for shield connection of the control cable and the power cable.
	22	30	6SE6430-2AD32-2DA0	**6SE6400-3TC03-8DD0**	
	30	40	6SE6430-2AD33-0DA0	**6SE6400-3TC05-4DD0**	
	37	50	6SE6430-2AD33-7EA0	**6SE6400-3TC08-0ED0**	
	45	60	6SE6430-2AD34-5EA0	**6SE6400-3TC07-5ED0**	
	55	75	6SE6430-2AD35-5FA0	**6SE6400-3TC14-5FD0**	
	75	100	6SE6430-2AD37-5FA0	**6SE6400-3TC15-4FD0**	
	90	120	6SE6430-2AD38-8FA0	**6SE6400-3TC14-5FD0**	

Mains voltage	Output kW	Output hp	Inverter **with** internal filter Class A	Order No. of the options **Fuses** (see Catalog LV 1) **3NA3**	**3NE1 (cULus)**	**Circuit-breaker** (see Catalog LV 1)
3 AC 380 V to 480 V	7.5	10	6SE6430-2AD27-5CA0	**3NA3807**	●	**3RV1031-4EA10**
	11.0	15	6SE6430-2AD31-1CA0	**3NA3812**		**3RV1031-4FA10**
	15.0	20	6SE6430-2AD31-5CA0	**3NA3814**		**3RV1031-4HA10**
	18.5	25	6SE6430-2AD31-8DA0	**3NA3820**	**3NE1817-0**	**3RV1042-4KA10**
	22	30	6SE6430-2AD32-2DA0	**3NA3822**	**3NE1818-0**	
	30	40	6SE6430-2AD33-0DA0	**3NA3824**	**3NE1820-0**	**3RV1042-4MA10**
	37	50	6SE6430-2AD33-7EA0	**3NA3830**	**3NE1021-0**	**3VL1712-.DD33-....**
	45	60	6SE6430-2AD34-5EA0	**3NA3832**	**3NE1022-0**	**3VL1716-.DD33-....**
	55	75	6SE6430-2AD35-5FA0	**3NA3836**	**3NE1224-0**	**3VL3720-.DC36-....**
	75	100	6SE6430-2AD37-5FA0	**3NA3140**	**3NE1225-0**	**3VL3725-.DC36-....**
	90	120	6SE6430-2AD38-8FA0	**3NA3144**	**3NE1227-0**	**3VL4731-.DC36-....**

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Options
Variant independent options

Overview

Basic Operator Panel 2 (BOP-2)

With the BOP-2, individual parameter settings can be made. Values and units are shown on a 5-digit display.

Basic Operator Panel (BOP-2)

A BOP-2 can be used for several inverters. It can be directly mounted on the inverter or in a control cabinet door using a mounting kit.

PROFIBUS module

For a complete PROFIBUS connection with up to ≤12 Mbaud. Remote control of the inverter is possible with the PROFIBUS module. Remote control and operation at the inverter can be combined using an operator panel plugged onto the PROFIBUS module. The PROFIBUS module can be supplied by an external 24 V DC power supply and is thus also active when the inverter is disconnected from the power supply.

Connection by means of a 9-pin Sub-D connector (available as an option).

DeviceNet module

For networking the inverters to the DeviceNet fieldbus system widely used on the American market. A maximum transmission rate of 500 kbaud is possible. Remote control of the inverter is possible with the DeviceNet module.

Remote control and operation at the inverter can be combined using an operator panel plugged onto the DeviceNet module.

The connection to the DeviceNet bus system is made using a 5-pin connector with terminal strip.

CANopen module

Using the CANopen communications module, an inverter can be linked to the CANopen fieldbus system and remote control is then possible.

Remote control and operation at the inverter can be combined using an operator panel plugged onto the CANopen module.

The module is connected to the bus system through a 9-pin Sub-D connector.

Connection kit for PC to inverter

For controlling an inverter directly from a PC if the appropriate software has been installed (e.g. STARTER). Isolated RS-232 adapter module for reliable point-to-point connection to a PC. Includes a Sub-D connector and an RS-232 standard cable (3 m).

Operator panel door mounting kit for single inverter

For mounting an operator panel BOP-2 in a control cabinet door. Degree of protection IP56. Contains a cable adapter module with screwless terminals for use with user's own RS-232 cables [1]).

Start-up tools

- STARTER
  is a graphic start-up software for guided start-up for MICROMASTER 410/420/430/440 frequency inverters under Windows 2000/XP Professional. Parameter lists can be read out, altered, stored, entered and printed.
- DriveMonitor
  is a start-up software for list-oriented programming of frequency inverters. This program executes under Windows 98/NT/2000/ME/XP Professional.

Both programs are included on the Docu DVD which is provided with every inverter.

1) A shielded cable of type Belden 8132 (28 AWG) is recommended.
The maximum cable length is 5 m for RS-232.

Selection and ordering data

The options listed here are suitable for all MICROMASTER 430 inverters.

Options	Order No.	
Basic Operator Panel 2 (BOP-2)	**6SE6400-0BE00-0AA0**	
PROFIBUS module	**6SE6400-1PB00-0AA0**	
DeviceNet module	**6SE6400-1DN00-0AA0**	
CANopen module	**6SE6400-1CB00-0AA0**	
RS485/PROFIBUS bus connector	**6GK1500-0FC00**	
Connection kit for PC to inverter	**6SE6400-1PC00-0AA0**	
Operator panel door mounting kit for single inverter	**6SE6400-0PM00-0AA0**	
Start-up tool STARTER on DVD	**6SL3072-0AA00-0AG0**	Available on the Internet at: http://support.automation.siemens.com/WW/view/en/10804985/133100

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Technical data of the communication modules

		PROFIBUS module 6SE6400-1PB00-0AA0	DeviceNet module 6SE6400-1DN00-0AA0
Size (height x width x depth)		161 mm x 73 mm x 46 mm	
Degree of protection		IP20	
Degree of pollution		2 to IEC 60664-1 (DIN VDE 0110/T1), no condensation permitted during operation	
Strain resistance • Stationary • Transport	 Deflection Acceleration Deflection Acceleration	to IEC 60068-2-6 (if module is installed correctly) 0.15 mm in the frequency range of 10 Hz to 58 Hz 19.6 m/s^2 in the frequency range of 58 Hz to 500 Hz 3.5 mm in the frequency range of 5 Hz to 9 Hz 9.8 m/s^2 in the frequency range of 9 Hz to 500 Hz	
Climatic category (during operation)		3K3 to IEC 60721-3-3	
Cooling method		Natural air cooling	
Permissible ambient or cooling agent temperature • Operation • Storage and transport		 –10 °C to +50 °C (+14 °F to +122 °F) –25 °C to +70 °C (–13 °F to +158 °F)	
Relative humidity (permissible humidity rating) • Operation • Storage and transport		 ≤ 85 % (non-condensing) ≤ 95 %	
Electromagnetic compatibility	Emission Interference	to EN 55011 (1991) Class A to IEC 60801-3 and EN 61000-4-3	
Power supply		6.5 V ± 5 %, max. 300 mA, internal from inverter or 24 V ± 10 %, max. 350 mA, external	6.5 V ± 5 %, max. 300 mA internal from inverter or 24 V, max. 60 mA from DeviceNet-Bus
Output voltage		5 V ± 10 %, max. 100 mA, galvanically isolated supply • for terminating the serial interface bus or • for supplying the OLP (Optical Link Plug)	–
Data transmission rate		max. 12 Mbaud	125, 250 and 500 Kbaud

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Options
Variant independent options

Technical data of the communication modules (continued)

CANopen module
6SE6400-1CB00-0AA0

Size (height x width x depth)	161 mm x 73 mm x 46 mm
Degree of protection	IP20
Degree of pollution	2 to IEC 60664-1 (DIN VDE 0110/T1), no condensation permitted during operation
Strain resistance • Stationary Deflection Acceleration • Transport Deflection Acceleration	to IEC 60068-2-6 (if module is installed correctly) 0.15 mm in the frequency range of 10 Hz to 58 Hz 19.6 m/s^2 in the frequency range of 58 Hz to 500 Hz 3.5 mm in the frequency range of 5 Hz to 9 Hz 9.8 m/s^2 in the frequency range of 9 Hz to 500 Hz
Climatic category (during operation)	3K3 to IEC 60721-3-3
Cooling method	Natural air cooling
Permissible ambient or cooling agent temperature • Operation • Storage • Transport	 –10 °C to +50 °C (+14 °F to +122 °F) –40 °C to +70 °C (–40 °F to +158 °F) –25 °C to +70 °C (–13 °F to +158 °F)
Relative humidity (permissible humidity rating) • Operation • Storage and transport	 ≤ 85 % (non-condensing) ≤ 95 %
Power supply	The CAN bus is supplied from the inverter power supply
Data transmission rate	10, 20, 50, 125, 250, 500, 800 Kbaud and 1 Mbaud

3

Documentation

Selection and ordering data

Type of documentation	Language	Order No.
Docu pack, supplied with each inverter, containing DVD [1]) and Getting Started Guide [2]) (paper version)	Multilanguage	**6SE6400-5AD00-1AP1**
Operating instructions (paper version)	German, English, French, Italian, Spanish	
	Available as pdf file on the Internet at http://support.automation.siemens.com/WW/view/en/10804926/133300	
Parameter list (paper version)	German, English, French, Italian, Spanish	
	Available as pdf file on the Internet at http://support.automation.siemens.com/WW/view/en/10804926/133300	

1) The DVD contains operating instructions, parameter list, commissioning tools STARTER and DriveMonitor, multilanguage.

Available on the Internet:
DriveMonitor at
http://support.automation.siemens.com/WW/view/en/10804984/133100

STARTER at
http://support.automation.siemens.com/WW/view/en/10804985/133100

2) Available on the Internet at
http://support.automation.siemens.com/WW/view/en/10804926/133300

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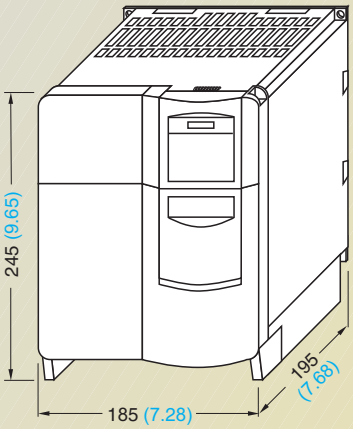
MICROMASTER 430 inverter

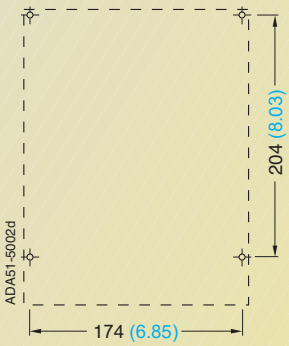
Frame size	3 AC 380 V to 480 V
C	7.5 kW to 15 kW
D	18.5 kW to 30 kW
E	37 kW to 45 kW

Note:
The inverters must not be mounted horizontally.
But the inverters can be mounted without lateral spacing.



Inverter frame size **C**

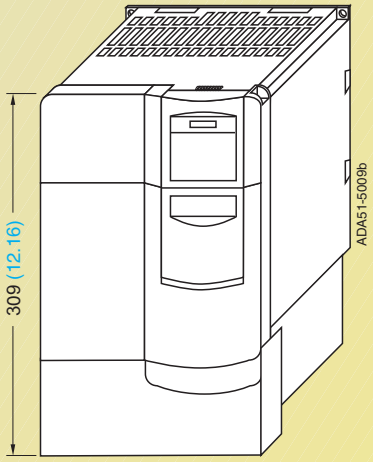
Drill pattern



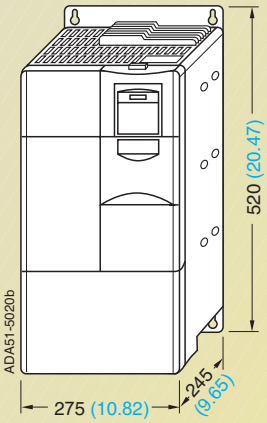
Fixing with
4 x M5 bolts
4 x M5 nuts
4 x M5 washers

Tightening torque with washers fitted: 3.0 Nm

Ventilation clearance required at top and bottom: 100 mm

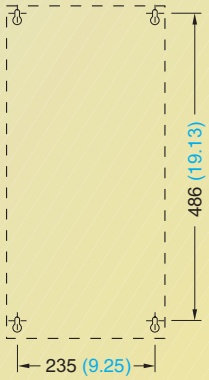


Inverter frame size **C** with **gland plate**



Inverter frame size **D**

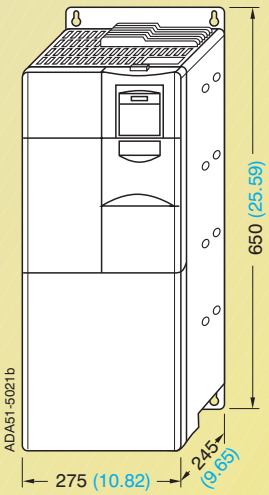
Drill pattern



Fixing with
4 x M8 bolts
4 x M8 nuts
4 x M8 washers

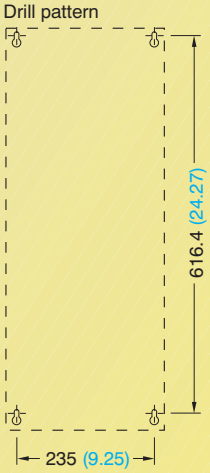
Tightening torque with washers fitted: 13 Nm

Ventilation clearance required at top and bottom: 300 mm



Inverter frame size **E**

Drill pattern



Fixing with
4 x M8 bolts
4 x M8 nuts
4 x M8 washers

Tightening torque with washers fitted: 13 Nm

Ventilation clearance required at top and bottom: 300 mm

With the communication module, the mounting depth increases for frame size C by 23 mm (0.91 inches).

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

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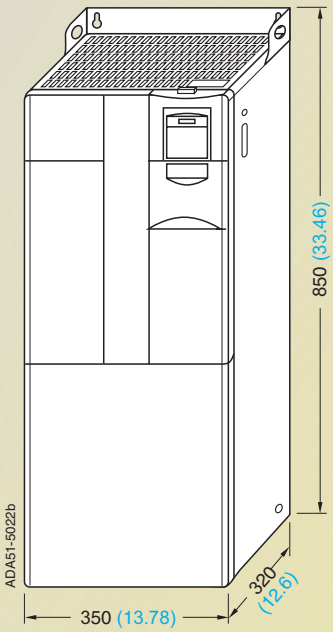
Dimension drawings

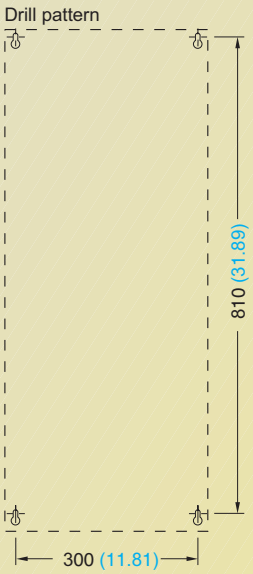
MICROMASTER 430 inverter

Frame size	3 AC 380 V to 480 V
F	55 kW to 90 kW

Note:
The inverters must not be mounted horizontally.
But the inverters can be mounted without lateral spacing.



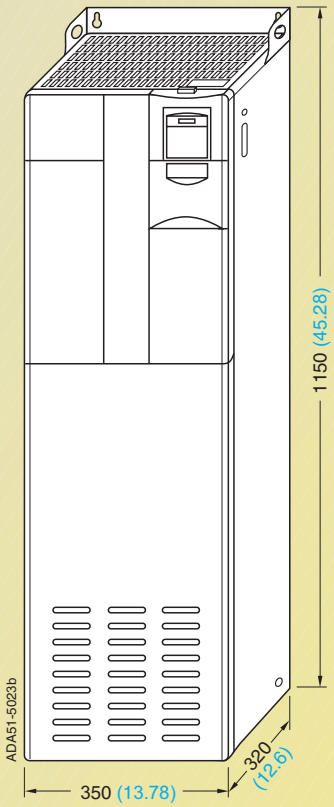
Inverter frame size **F** without filter



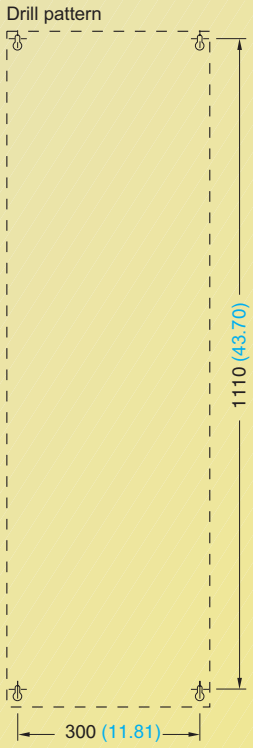
Fixing with
4 x M8 bolts
4 x M8 nuts
4 x M8 washers

Tightening torque with washers fitted: 13 Nm

Ventilation clearance required at top and bottom: 350 mm



Inverter frame size **F** with filter



Fixing with
4 x M8 bolts
4 x M8 nuts
4 x M8 washers

Tightening torque with washers fitted: 13 Nm

Ventilation clearance required at top and bottom: 350 mm

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

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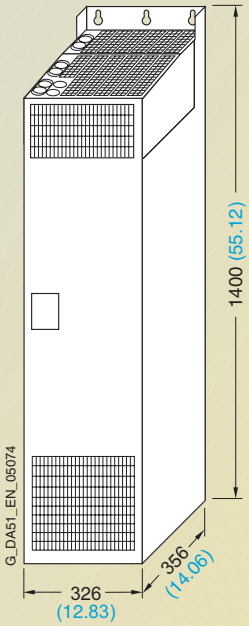
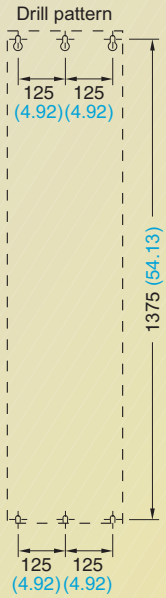
MICROMASTER 430 inverter

Frame size	3 AC 380 V to 480 V
FX	110 kW to 132 kW
GX	160 kW to 250 kW

Note:
The inverters must not be mounted horizontally.
But the inverters can be mounted without lateral spacing.



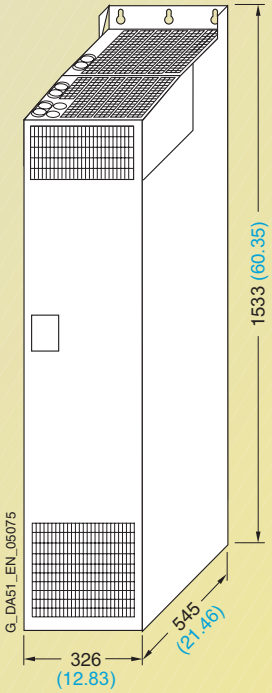
Inverter frame size **FX**



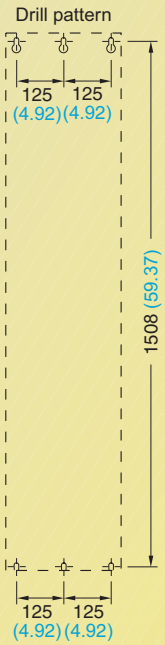
Fixing with
6 x M8 bolts
6 x M8 nuts
6 x M8 washers

Tightening torque
with washers
fitted: 13.0 Nm

Ventilation clearance
required:
at top: 250 mm
at bottom: 150 mm
in front: 40 mm



Inverter frame size **GX**



Fixing with
6 x M8 bolts
6 x M8 nuts
6 x M8 washers

Tightening torque
with washers
fitted: 13.0 Nm

Ventilation clearance
required:
at top: 250 mm
at bottom: 150 mm
in front: 50 mm

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

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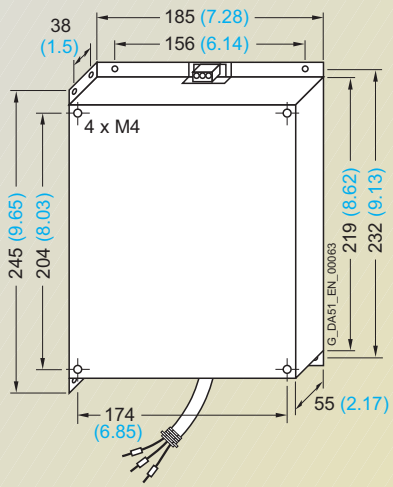
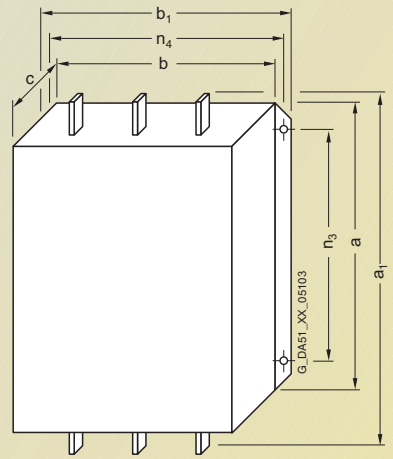
Dimension drawings

EMC filter



EMC filter for frame size **C**



EMC filter Class A Type 6SL3000-	for inverter Frame size (FS)	Dimensions a	a_1	b	b_1	c	n_3	n_4	Weight, approx. kg
0BE32-5AA0	**FX**	270 (10.63)	360 (14.17)	200 (7.87)	240 (9.45)	116 (4.57)	210 (8.27)	220 (8.66)	12.3
0BE34-4AA0	**FX/GX**	270 (10.63)	360 (14.17)	200 (7.87)	240 (9.45)	116 (4.57)	210 (8.27)	220 (8.66)	12.3
0BE36-0AA0	**GX**	310 (12.2)	400 (15.75)	215 (8.46)	265 (10.43)	140 (5.51)	250 (9.84)	240 (9.45)	19.0

EMC filter for frame sizes **FX** and **GX**

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

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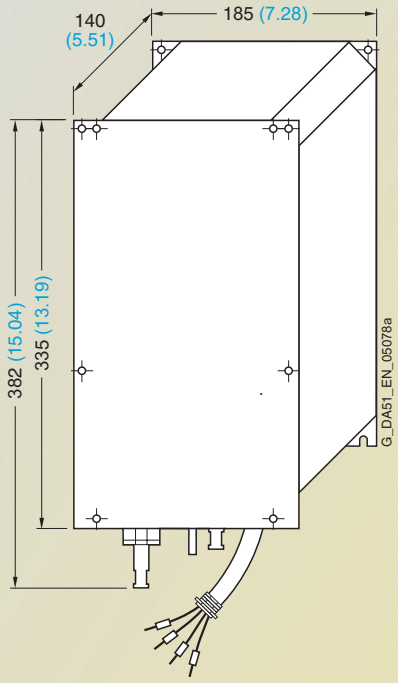
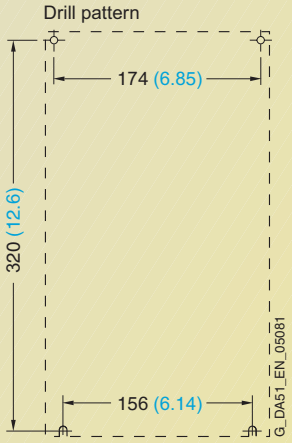
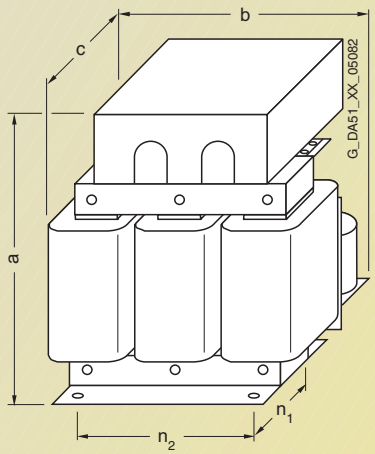
LC filter





Fixing with M5 bolts

LC filter 6SE6400-3TD03-2CD0 for frame size **C**



Fixing with M10 bolts

LC filter for frame sizes **D** to **F**

LC filter Type	for inverter Frame size (FS)	Dimensions					Weight (max.)
		a	b	c	n_1	n_2	kg
6SE6400-3TD03-7DD0	**D**	278 (10.94)	240 (9.45)	230 (9.06)	115 (4.53)	190 (7.48)	21.0
6SE6400-3TD04-8DD0	**D**	290 (11.42)	240 (9.45)	240 (9.45)	125 (4.92)	190 (7.48)	26.0
6SE6400-3TD06-1DD0	**D**	345 (13.58)	300 (11.81)	220 (8.66)	120 (4.72)	240 (9.45)	34.0
6SE6400-3TD07-2ED0	**E**	355 (13.98)	300 (11.81)	235 (9.25)	145 (5.71)	240 (9.45)	49.5
6SE6400-3TD11-5FD0	**E/F**	460 (18.11)	360 (14.17)	235 (9.25)	125 (4.92)	264 (10.39)	67.0
6SE6400-3TD15-0FD0	**F**	460 (18.11)	360 (14.17)	250 (9.84)	140 (5.51)	264 (10.39)	75.0
6SE6400-3TD18-0FD0	**F**	520 (20.47)	420 (16.54)	290 (11.42)	173 (6.81)	316 (12.44)	77.5

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

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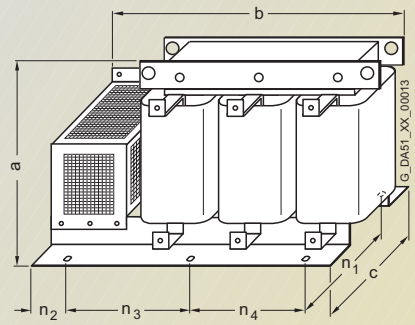
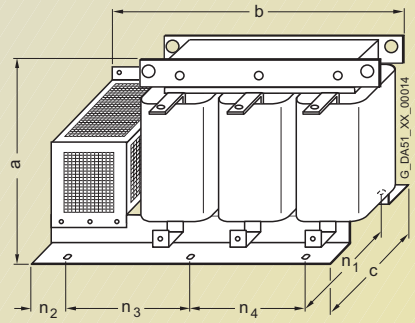
Dimension drawings

Sinusoidal filter



Sinusoidal filter for frame sizes **FX** and **GX**

Sinusoidal filter Type 6SL3000-	for inverter Frame size (FS)	Dimensions							Weight (max.)
		a	b	c	n_1	n_2	n_3	n_4	kg
2CE32-3AA0	**FX**	300 (11.81)	620 (24.41)	320 (12.6)	280 (11.02)	105 (4.13)	225 (8.86)	150 (5.91)	135.0
2CE32-8AA0	**GX**	300 (11.81)	620 (24.41)	320 (12.6)	280 (11.02)	105 (4.13)	225 (8.86)	150 (5.91)	138.0



Sinusoidal filter for frame size **GX**

Sinusoidal filter Type 6SL3000-	for inverter Frame size (FS)	Dimensions							Weight (max.)
		a	b	c	n_1	n_2	n_3	n_4	kg
2CE33-3AA0	**GX**	370 (14.57)	620 (24.41)	360 (14.17)	320 (12.6)	105 (4.13)	225 (8.86)	150 (5.91)	144.0
2CE34-1AA0	**GX**	370 (14.57)	620 (24.41)	360 (14.17)	320 (12.6)	105 (4.13)	225 (8.86)	150 (5.91)	208.0

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

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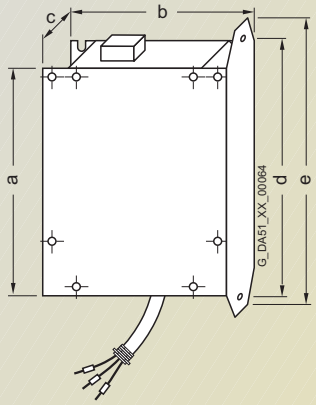
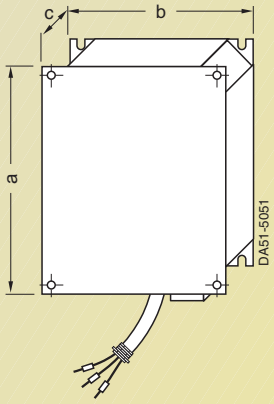
Line commutating chokes



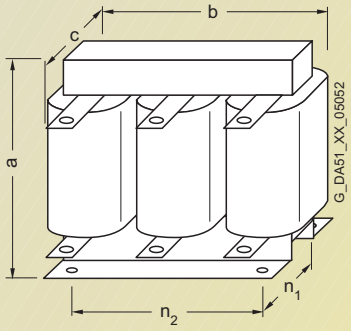
Line commutating choke for	Dimensions					Weight (max.)
	a	b	c	d	e	kg
Frame size **C**	245 (9.65)	185 (7.28)	50 (1.97)	264 (10.39)	280 (11.02)	5.1

Line commutating choke for frame size **C**



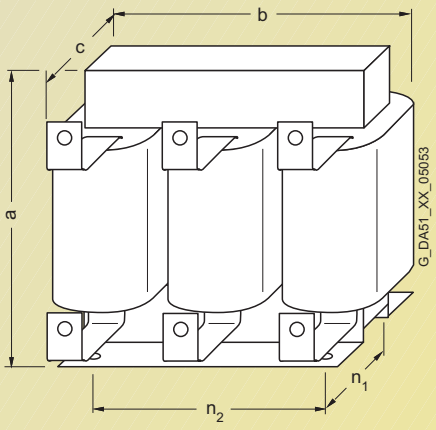
Line commutating choke for	Dimensions			Weight (max.)
	a	b	c	kg
Frame size **D**	520 (20.47)	275 (10.83)	85 (3.35)	9.5
Frame size **E**	650 (25.59)	275 (10.83)	95 (3.74)	17.0

Line commutating choke for frame sizes **D** and **E**



Line commutating choke Type 6SE6400-	for inverter Frame size	Dimensions					Weight (max.)
		a	b	c	n_1	n_2	kg
3CC11-....	**F**	228 (8.98)	240 (9.45)	141 (5.55)	95 (3.74)	185 (7.28)	25.0

Line commutating choke for inverter frame size **F**



Line commutating choke Type 6SL3000-	for inverter Frame size (FS)	Dimensions					Weight (max.)
		a	b	c	n_1	n_2	kg
0CE32-....	**FX**	248 (9.76)	255 (10.04)	203 (7.99)	101 (3.98)	200 (7.87)	24.0
0CE33-....	**GX**	248 (9.76)	255 (10.04)	203 (7.99)	101 (3.98)	200 (7.87)	25.0
0CE35-....	**GX**	269 (10.59)	275 (10.83)	210 (8.27)	118 (4.65)	224 (8.82)	35.0

Line commutating choke for inverters of frame sizes **FX** and **GX**

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

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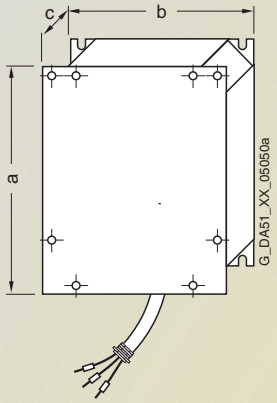
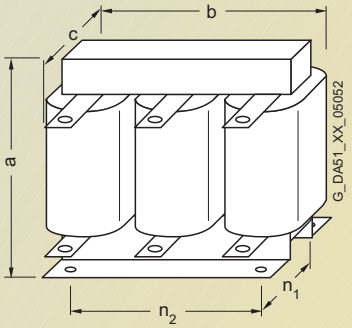
Dimension drawings

Output chokes



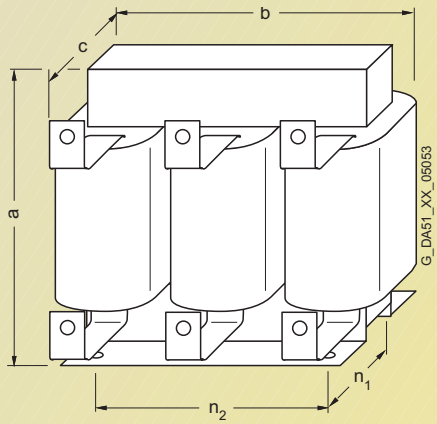
Line commutating choke
for frame size **C**

Output chokes for	Dimensions			Weight (max.)
	a	b	c	kg
Frame size **C**	245 (9.65)	185 (7.28)	80 (3.15)	6.6



Output chokes
for inverters of size **D**, **E** and **F**

Output choke Type 6SE6400-	for inverter Frame size (FS)	Dimensions a	b	c	n_1 (to DIN 41308)	n_2	Weight (max.) kg
3TC03-8DD0	**D**	210 (8.27)	225 (8.86)	179 (7.05)	94 (3.70)	176 (6.93)	16.1
3TC05-4DD0	**D**	210 (8.27)	225 (8.86)	150 (5.91)	70 (2.76)	176 (6.93)	10.7
3TC07-5ED0	**E**	248 (9.76)	270 (10.63)	209 (8.23)	101 (3.98)	200 (7.87)	24.9
3TC08-0ED0	**E**	210 (8.27)	225 (8.86)	150 (5.91)	70 (2.76)	176 (6.93)	10.4
3TC14-5FD0	**F**	321 (12.64)	350 (13.78)	288 (11.34)	138 (5.43)	264 (10.39)	51.5
3TC15-4FD0	**F**	248 (9.76)	270 (10.63)	209 (8.23)	101 (3.98)	200 (7.87)	24.0



Output chokes
for inverters of size **FX** and **GX**

Output choke Type 6SL3000-	for inverter Frame size (FS)	Dimensions a	b	c	n_1	n_2	Weight (max.) kg
2BE32-1AA0	**FX**	285 (11.22)	300 (11.81)	257 (10.12)	163 (6.42)	224 (8.82)	60.0
2BE32-6AA0	**FX**	315 (12.4)	300 (11.81)	277 (10.91)	183 (7.2)	224 (8.82)	66.0
2BE33-2AA0	**GX**	285 (11.22)	300 (11.81)	257 (10.12)	163 (6.42)	224 (8.82)	62.0
2BE33-8AA0	**GX**	285 (11.22)	300 (11.81)	277 (10.91)	183 (7.2)	224 (8.82)	73.0
2BE35-0AA0	**GX**	365 (14.37)	300 (11.81)	277 (10.91)	183 (7.2)	224 (8.82)	100.0

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

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Inverter
MICROMASTER 440

4/2 Description

4/4 Circuit diagrams

4/6 Technical data

4/9 Selection and ordering data

4/12 Options

4/26 Dimension drawings

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Description

Application

The MICROMASTER 440 inverter is suitable for a variety of variable-speed drive applications. Its flexibility provides for a wide spectrum of applications. These also include cranes and hoisting gear, high-bay warehouses, production machines for food, beverages and tobacco, packaging machines etc.; i.e. applications which require the frequency inverter to have a higher functionality and dynamic response than usual.

The inverter is especially characterized by its customer-oriented performance and ease-of-use. Its large mains voltage range enables it to be used all over the world.

Design

The MICROMASTER 440 inverter has a modular design. The operator panels and modules can be easily exchanged.

International standards

- The MICROMASTER 440 inverter complies with the requirements of the EU low-voltage guideline
- The MICROMASTER 440 inverter has the CE marking
- acc. to UL and cUL certified
- c-tick

Note:

- See Appendix for standards.

Main characteristics

- Easy, guided start-up
- Modular construction allows maximum configuration flexibility
- Six programmable isolated digital inputs
- Two scaleable analog inputs (0 V to 10 V, 0 mA to 20 mA) can also be used as a 7th/8th digital input
- Two programmable analog outputs (0 mA to 20 mA)
- Three programmable relay outputs (30 V DC/5 A resistive load; 250 V AC/2A inductive load)
- Low-noise motor operation thanks to high pulse frequencies, adjustable (observe derating if necessary)
- Complete protection for motor and inverter.

Options (overview)

- EMC filter, Class A/B
- LC filter and sinusoidal filter
- Line commutating chokes
- Output chokes
- Gland plates
- Basic Operator Panel (BOP) for parameterizing the inverter
- Plain text Advanced Operator Panel (AOP) with multi-language display
- Plain text Asian Advanced Operator Panel (AAOP) with Chinese and English display
- Plain text Cyrillic Advanced Operator Panel (CAOP) with Cyrillic, German and English display
- Communication modules
  – PROFIBUS
  – DeviceNet
  – CANopen
- Pulse encoder evaluation module
- PC connection kits
- Mounting kits for installing the operator panels in the control cabinet doors
- PC start-up tools executable under Windows 98 and NT/2000/ME/ XP Professional
- TIA integration with Drive ES.

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Mechanical features

- Modular design
- Operating temperature
  0.12 kW to 75 kW:
  –10 °C to +50 °C
  (+14 °F to +122 °F)
  90 kW to 200 kW:
  0 °C to +40 °C
  (+32 °F to +104 °F)
- Compact housing as a result of high power density
- Easy cable connection, mains and motor connections are separated for optimum electromagnetic compatibility
- Detachable operator panels
- Screwless control terminals on detachable I/O board.

Performance features

- Latest IGBT technology
- Digital microprocessor control
- High-quality Vector Control system
- Flux Current Control (FCC) for improved dynamic response and optimized motor control
- Linear *V/f* characteristic
- Quadratic *V/f* characteristic
- Multipoint characteristic (programmable *V/f* characteristic)
- Torque control
- Flying restart
- Slip compensation
- Automatic restart following mains failure or fault
- User-definable function blocks for logic and arithmetic operations
- Kinetic buffering
- Positioning ramp down
- High-grade PID controller for simple internal process control (autotuning)
- Programmable acceleration/deceleration, 0 s to 650 s
- Ramp smoothing
- Fast Current Limit (FCL) for trip-free operation
- Fast, repeatable digital input response time
- Fine adjustment using two high-resolution 10-bit analog inputs
- Compound braking for controlled rapid braking
- Integrated brake chopper (for 0.12 kW to 75 kW inverters)
- Four skip frequencies
- Removable “Y” capacitor for use on IT systems (with non-grounded mains supplies, the “Y” capacitor must be removed and an output choke installed).

Protection features

- Overload capability
  - **CT mode**
    0.12 kW to 75 kW:
    Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, cycle time 300 s, and 2 x rated output current (i.e. 200 % overload capability) for 3 s, cycle time 300 s
    90 kW to 200 kW:
    Overload current 1.36 x rated output current (i.e. 136 % overload capability) for 57 s, cycle time 300 s, and 1.6 x rated output current (i.e. 160 % overload capability) for 3 s, cycle time 300 s
  - **VT mode**
    5.5 kW to 90 kW:
    Overload current 1.4 x rated output current (i.e. 140 % overload capability) for 3 s, and 1.1 x rated output current (i.e. 110 % overload capability) for 60 s, cycle time 300 s
    110 kW to 250 kW:
    Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 1 s, and 1.1 x rated output current (i.e. 110 % overload capability) for 59 s, cycle time 300 s
- Overvoltage/undervoltage protection
- Inverter overtemperature protection
- Special direct connection for PTC or KTY to protect the motor
- Earth fault protection
- Short-circuit protection
- I^2t motor thermal protection
- Locked motor protection
- Stall prevention
- Parameter interlock.

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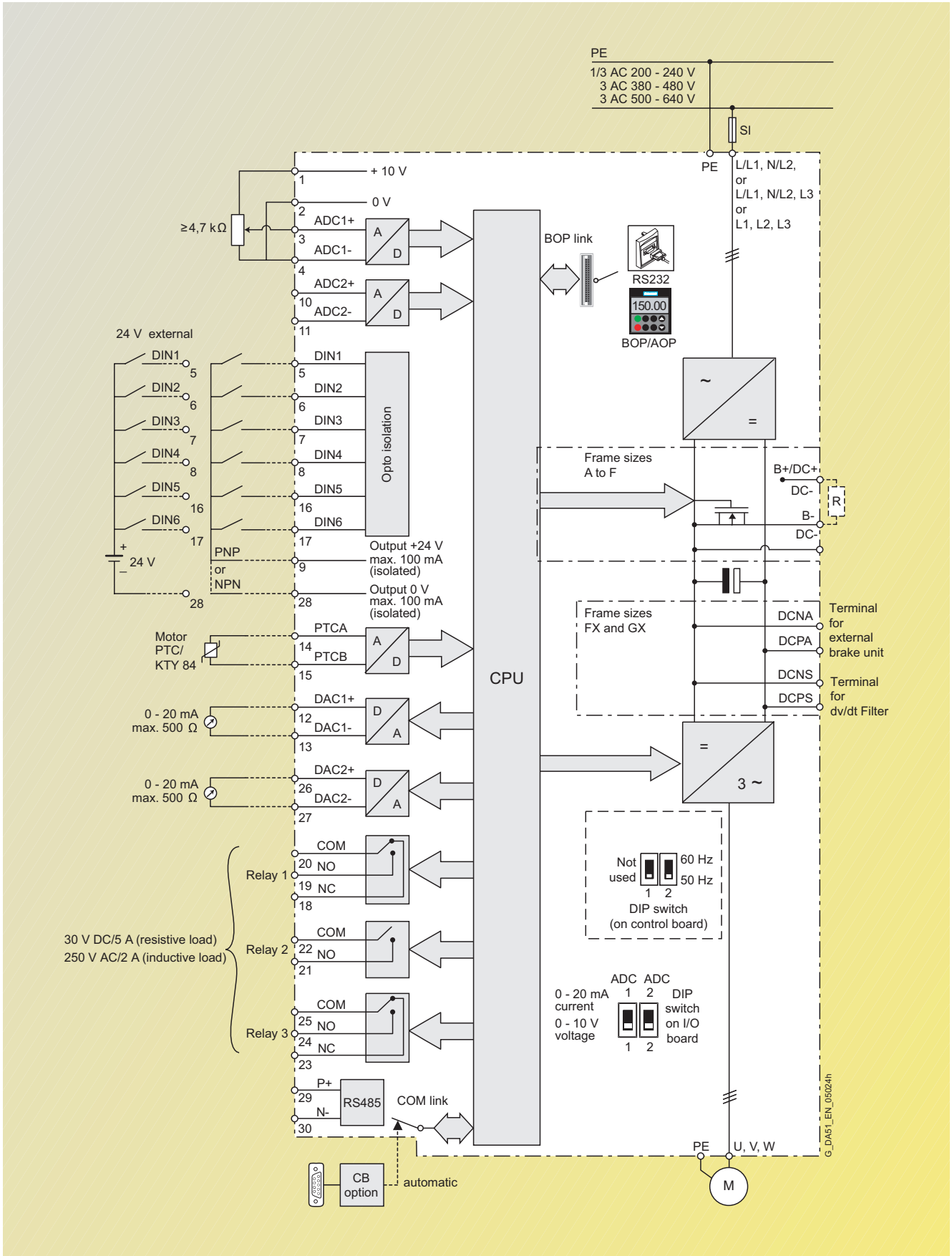
Circuit diagrams

General circuit diagram



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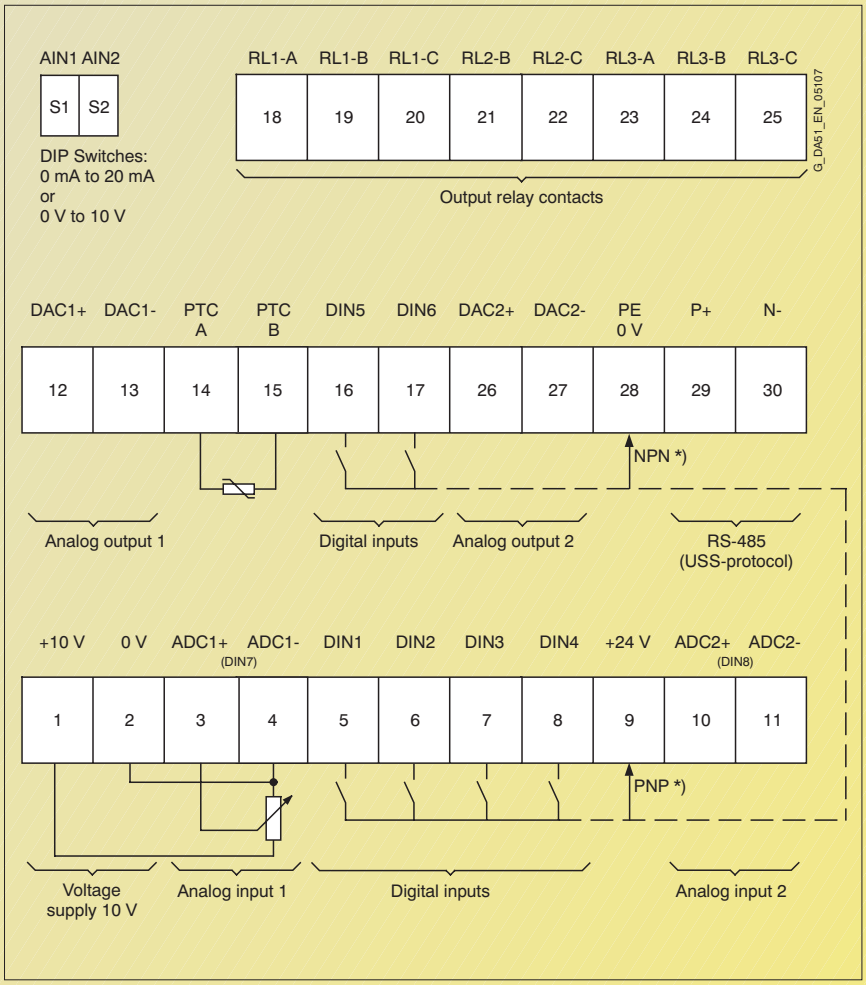
Terminal connection diagram

Example, frame size FX

View A



*) PNP or NPN possible

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Technical data

MICROMASTER 440 inverter

Mains voltage and power ranges		**CT** (constant torque)	**VT** (variable torque)
	1 AC 200 V to 240 V ± 10 %	0.12 kW to 3 kW	–
	3 AC 200 V to 240 V ± 10 %	0.12 kW to 45 kW	5.5 kW to 55 kW
	3 AC 380 V to 480 V ± 10 %	0.37 kW to 200 kW	7.5 kW to 250 kW
	3 AC 500 V to 600 V ± 10 %	0.75 kW to 75 kW	1.5 kW to 90 kW
Input frequency		47 Hz to 63 Hz	
Output frequency	0.12 kW to 75 kW	0 Hz to 650 Hz (in *V/f* mode)	0 Hz to 200 Hz (in vector mode)
	90 kW to 200 kW	0 Hz to 267 Hz (in *V/f* mode)	0 Hz to 200 Hz (in vector mode)
Power factor		≥ 0.95	
Inverter efficiency		0.12 kW to 75 kW: 96 % to 97 %; 90 kW to 200 kW: 97 % to 98 % (Further information is available on the Internet at: http://support.automation.siemens.com/WW/view/en/22978972)	
Overload capability			
– CT mode	0.12 kW to 75 kW	Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, cycle time 300 s and 2 x rated output current (i.e. 200 % overload capability) for 3 s, cycle time 300 s	
	90 kW to 200 kW	Overload current 1.36 x rated output current (i.e. 136 % overload capability) for 57 s, cycle time 300 s and 1.6 x rated output current (i.e. 160 % overload capability) for 3 s, cycle time 300 s	
– VT mode	5.5 kW to 90 kW	Overload current 1.4 x rated output current (i.e. 140 % overload capability) for 3 s, and 1.1 x rated output current (i.e. 110 % overload capability) for 60 s, cycle time 300 s	
	110 kW to 250 kW	Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 1 s, and 1.1 x rated output current (i.e. 110 % overload capability) for 59 s, cycle time 300 s	
Inrush current		not higher than rated input current	
Control method		Vector control, torque control, linear *V/f* characteristic; quadratic *V/f* characteristic; Multipoint characteristic (programmable *V/f* characteristic); flux current control (FCC)	
Pulse frequency	0.12 kW to 75 kW	4 kHz (standard); 16 kHz (standard with 230 V inverters 0.12 kW to 5.5 kW) 2 kHz to 16 kHz (in 2 kHz steps)	
	90 kW to 200 kW	2 kHz (standard with VT mode); 4 kHz (standard with CT mode) 2 kHz to 4 kHz (in 2 kHz steps)	
Fixed frequencies		15, programmable	
Skip frequency ranges		4, programmable	
Setpoint resolution		0.01 Hz digital; 0.01 Hz serial; 10 bit analog	
Digital inputs		6 fully programmable isolated digital inputs; switchable PNP/NPN	
Analog inputs		2 programmable analog inputs • 0 V to 10 V, 0 mA to 20 mA and –10 V to +10 V (AIN1) • 0 V to 10 V and 0 mA to 20 mA (AIN2) • both can be used as 7th/8th digital input	
Relay outputs		3, programmable, 30 V DC/5 A (resistive load); 250 V AC/2A (inductive load)	
Analog outputs		2, programmable (0/4 mA to 20 mA)	
Serial interfaces		RS-485, optional RS-232	
Motor cable lengths	without output choke	0.12 – 75 kW: max. 50 m (shielded), max. 100 m (unshielded) 90 – 250 kW: max. 200 m (shielded), max. 300 m (unshielded)	
	with output choke	see variant dependent options	
Electromagnetic compatibility (see Selection and Ordering Data)		EMC filter, Class A or Class B to EN 55 011 available as an option Inverter with internal filter Class A available	
Braking		Resistance braking with DC braking, compound braking, integrated brake chopper (integrated brake chopper only with 0.12 kW to 75 kW inverters)	
Degree of protection		IP20	
Operating temperature (without derating)	0.12 kW to 75 kW	CT: –10 °C to +50 °C (+14 °F to +122 °F) VT: –10 °C to +40 °C (+14 °F to +104 °F)	
	90 kW to 200 kW	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% (non-condensing)	
Installation altitude	0.12 kW to 75 kW	up to 1000 m above sea level without derating	
	90 kW to 200 kW	up to 2000 m above sea level without derating	
Standard SCCR (Short Circuit Current Rating) [1]		FSA, FSB, FSC: 10 kA FSD, FSE, FSF, FSFX, FSGX: 42 kA	
Protection features for		Undervoltage, overvoltage, overload, earth faults, short-circuits, stall prevention, locked motor protection, motor over-temperature, inverter overtemperature, parameter change protection	
Compliance with standards		ⓤ, cⓤ, CE, c-tick	
CE marking		Conformity with low-voltage directive 73/23/EEC	

Cooling-air volumetric flow required, dimensions and weights (without options)

Frame size (FS)	Cooling-air volumetric flow required (l/s)/(CFM)	H x W x D, max. (mm)	Weight, approx. (kg)
A	4.8/10.2	173 x 73 x 149	1.3
B	24/51	202 x 149 x 172	3.4
C	54.9/116.3	245 x 185 x 195	5.7
D	2 x 54.9/2 x 116.3	520 x 275 x 245	17
E	2 x 54.9/2 x 116.3	650 x 275 x 245	22
F without filter	150/317.79	850 x 350 x 320	56
F with filter	150/317.79	1150 x 350 x 320	75
FX	225/478.13	1400 x 326 x 356	116
GX	440/935	1533 x 326 x 545	174

1) For footnote, see page 4/7.

CFM: Cubic Feet per Minute

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Derating data

Pulse frequency

Output	Rated output current in A for a pulse frequency of						
kW	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
Mains voltage 1/3 AC 200 V							
0.12 to 5.5	Values correspond to the 4 kHz standard values. No derating, since 16 kHz standard.						
7.5	28.0	26.6	25.2	22.4	19.6	16.8	14.0
11	42.0	37.8	33.6	29.4	25.2	21.0	16.8
15	54.0	48.6	43.2	37.8	32.4	27.0	21.6
18.5	68.0	64.6	61.2	54.4	47.6	40.8	34.0
22	80.0	72.0	64.0	56.0	48.0	40.0	32.0
30	104.0	91.0	78.0	70.2	62.4	57.2	52.0
37	130.0	113.8	97.5	87.8	78.0	71.5	65.0
45	154.0	134.8	115.5	104.0	92.4	84.7	77.0
Mains operating voltage 3 AC 400 V							
0.37	1.3	1.3	1.3	1.3	1.3	1.2	1.0
0.55	1.7	1.7	1.7	1.6	1.5	1.4	1.2
0.75	2.2	2.2	2.2	2.0	1.8	1.5	1.3
1.1	3.1	2.9	2.8	2.5	2.2	1.9	1.6
1.5	4.1	3.7	3.3	2.9	2.5	2.1	1.6
2.2	5.9	5.6	5.3	4.7	4.1	3.5	3.0
3.0	7.7	6.9	6.2	5.4	4.6	3.9	3.1
4.0	10.2	9.2	8.2	7.1	6.1	5.1	4.1
5.5	13.2	11.9	10.6	9.2	7.9	6.6	5.3
7.5	19.0	18.1	17.1	15.2	13.3	11.4	9.5
11.0	26.0	23.4	20.8	18.2	15.6	13.0	10.4
15.0	32.0	30.4	28.8	25.6	22.4	19.2	16.0
18.5	38.0	34.2	30.4	26.6	22.8	19.0	15.2
22	45.0	40.5	36.0	31.5	27.0	22.5	18.0
30	62.0	58.9	55.8	49.6	43.4	37.2	31.0
37	75.0	67.5	60.0	52.5	45.0	37.5	30.0
45	90.0	76.5	63.0	51.8	40.5	33.8	27.0
55	110.0	93.5	77.0	63.3	49.5	41.3	33.0
75	145.0	112.4	79.8	68.9	58.0	50.8	43.5
90	178.0	–	–	–	–	–	–
110	205.0	–	–	–	–	–	–
132	250.0	–	–	–	–	–	–
160	302.0	–	–	–	–	–	–
200	370.0	–	–	–	–	–	–
Mains operating voltage 3 AC 500 V							
0.75	1.4	1.2	1.0	0.8	0.7	0.6	0.6
1.5	2.7	2.2	1.6	1.4	1.1	0.9	0.8
2.2	3.9	2.9	2.0	1.6	1.2	1.0	0.8
4.0	6.1	4.6	3.1	2.4	1.8	1.5	1.2
5.5	9.0	6.8	4.5	3.6	2.7	2.3	1.8
7.5	11.0	8.8	6.6	5.5	4.4	3.9	3.3
11.0	17.0	12.8	8.5	6.8	5.1	4.3	3.4
15.0	22.0	17.6	13.2	11.0	8.8	7.7	6.6
18.5	27.0	20.3	13.5	10.8	8.1	6.8	5.4
22	32.0	24.0	16.0	12.8	9.6	8.0	6.4
30	41.0	32.8	24.6	20.5	16.4	14.4	12.3
37	52.0	39.0	26.0	20.8	15.6	13.0	10.4
45	62.0	52.7	43.4	40.3	37.2	32.6	27.9
55	77.0	67.4	57.8	52.0	46.2	42.4	38.5
75	99.0	84.2	69.3	64.4	59.4	52.0	44.6

1) Applies to industrial control cabinet installations to NEC article 409/UL 508A.

For further information, visit us on the Internet at:

http://support.automation.siemens.com/WW/view/en/23995621

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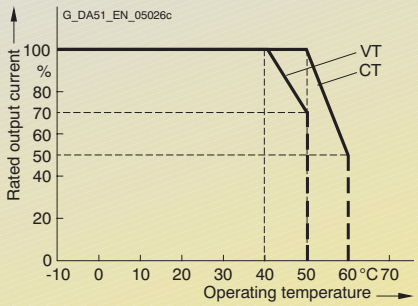
Technical data

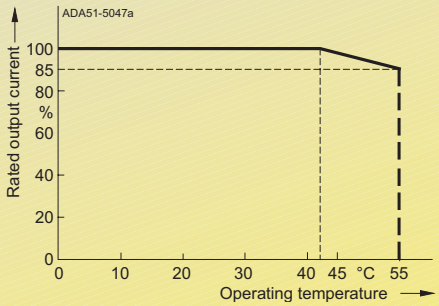
Derating data (continued)

Operating temperature

Inverter 0.12 kW to 75 kW



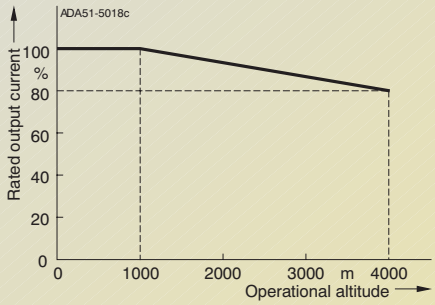
Inverter 90 kW to 200 kW



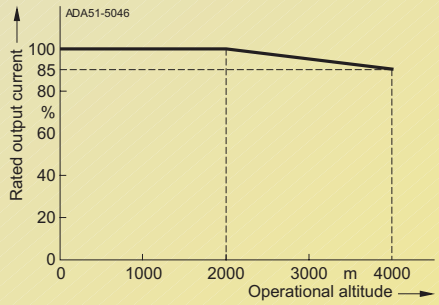
Installation altitude above sea level

Permissible output current
in % of the rated output current

Inverter 0.12 kW to 75 kW

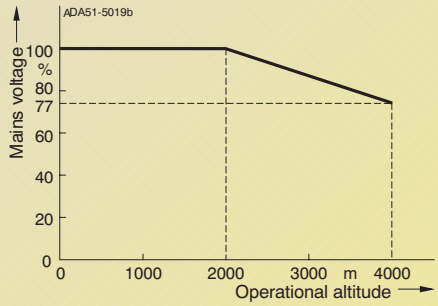


Inverter 90 kW to 200 kW

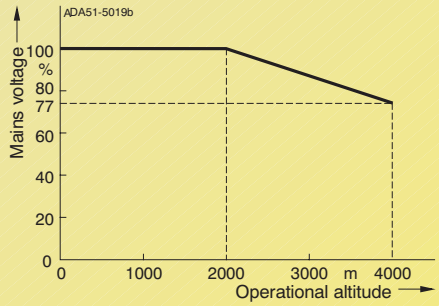


Permissible mains voltage
in % of the max. possible mains voltage

Inverter 0.12 kW to 75 kW



Inverter 90 kW to 200 kW



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MICROMASTER 440 inverter without filter [2])

CT (constant torque)				VT (variable torque)				MICROMASTER 440 without filter [2])		
Output		Rated input current [1])	Rated output current	Output		Rated input current [1])	Rated output current	Frame size	Weight, approx.	Order No.
kW	hp	A	A	kW	hp	A	A	(FS)	kg	
Mains voltage 1 AC 200 V to 240 V										
0.12	0.16	1.8	0.9	–	–	–	–	A	1.3	**6SE6440-2UC11-2AA1**
0.25	0.33	3.2	1.7	–	–	–	–	A	1.3	**6SE6440-2UC12-5AA1**
0.37	0.50	4.6	2.3	–	–	–	–	A	1.3	**6SE6440-2UC13-7AA1**
0.55	0.75	6.2	3.0	–	–	–	–	A	1.3	**6SE6440-2UC15-5AA1**
0.75	1.0	8.2	3.9	–	–	–	–	A	1.3	**6SE6440-2UC17-5AA1**
1.1	1.5	11.0	5.5	–	–	–	–	B	3.3	**6SE6440-2UC21-1BA1**
1.5	2	14.4	7.4	–	–	–	–	B	3.3	**6SE6440-2UC21-5BA1**
2.2	3	20.2	10.4	–	–	–	–	B	3.3	**6SE6440-2UC22-2BA1**
3.0	4	35.5	13.6	–	–	–	–	C	5.5	**6SE6440-2UC23-0CA1**
Mains operating voltage 3 AC 200 V to 240 V										
0.12	0.16	1.1	0.9	–	–	–	–	A	1.3	**6SE6440-2UC11-2AA1**
0.25	0.33	1.9	1.7	–	–	–	–	A	1.3	**6SE6440-2UC12-5AA1**
0.37	0.50	2.7	2.3	–	–	–	–	A	1.3	**6SE6440-2UC13-7AA1**
0.55	0.75	3.6	3.0	–	–	–	–	A	1.3	**6SE6440-2UC15-5AA1**
0.75	1.0	4.7	3.9	–	–	–	–	A	1.3	**6SE6440-2UC17-5AA1**
1.1	1.5	6.4	5.5	–	–	–	–	B	3.3	**6SE6440-2UC21-1BA1**
1.5	2.0	8.3	7.4	–	–	–	–	B	3.3	**6SE6440-2UC21-5BA1**
2.2	3.0	11.7	10.4	–	–	–	–	B	3.3	**6SE6440-2UC22-2BA1**
3.0	4.0	15.6	13.6	–	–	–	–	C	5.5	**6SE6440-2UC23-0CA1**
4.0	5.0	19.7	17.5	**5.5**	7.5	28.3	22	C	5.5	**6SE6440-2UC24-0CA1**
5.5	7.5	26.5	22	**7.5**	10	34.2	28	C	5.5	**6SE6440-2UC25-5CA1**
7.5	10	34.2	28	**11.0**	15	38.0	42	D	16	**6SE6440-2UC27-5DA1**
11.0	15	38.0	42	**15.0**	20	50.0	54	D	16	**6SE6440-2UC31-1DA1**
15.0	20	50.0	54	**18.5**	25	62.0	68	D	16	**6SE6440-2UC31-5DA1**
18.5	25	62.0	68	**22**	30	71.0	80	E	20	**6SE6440-2UC31-8EA1**
22	30	71.0	80	**30**	40	96.0	104	E	20	**6SE6440-2UC32-2EA1**
30	40	96.0	104	**37**	50	114.0	130	F	55	**6SE6440-2UC33-0FA1**
37	50	114.0	130	**45**	60	135.0	154	F	55	**6SE6440-2UC33-7FA1**
45	60	135.0	154	**55**	75	164.0	178	F	55	**6SE6440-2UC34-5FA1**
Mains operating voltage 3 AC 380 V to 480 V										
0.37	0.50	2.2	1.3	–	–	–	–	A	1.3	**6SE6440-2UD13-7AA1**
0.55	0.75	2.8	1.7	–	–	–	–	A	1.3	**6SE6440-2UD15-5AA1**
0.75	1.0	3.7	2.2	–	–	–	–	A	1.3	**6SE6440-2UD17-5AA1**
1.1	1.5	4.9	3.1	–	–	–	–	A	1.3	**6SE6440-2UD21-1AA1**
1.5	2.0	5.9	4.1	–	–	–	–	A	1.3	**6SE6440-2UD21-5AA1**
2.2	3.0	7.5	5.9	–	–	–	–	B	3.3	**6SE6440-2UD22-2BA1**
3.0	4.0	10.0	7.7	–	–	–	–	B	3.3	**6SE6440-2UD23-0BA1**
4.0	5.0	12.8	10.2	–	–	–	–	B	3.3	**6SE6440-2UD24-0BA1**
5.5	7.5	15.6	13.2	**7.5**	10	17.3	19	C	5.5	**6SE6440-2UD25-5CA1**
7.5	10	22.0	18.4	**11.0**	15	23.1	26	C	5.5	**6SE6440-2UD27-5CA1**
11.0	15	23.1	26	**15.0**	20	33.8	32	C	5.5	**6SE6440-2UD31-1CA1**
15.0	20	33.8	32	**18.5**	25	37.0	38	D	16	**6SE6440-2UD31-5DA1**
18.5	25	37.0	38	**22**	30	43.0	45	D	16	**6SE6440-2UD31-8DA1**
22	30	43.0	45	**30**	40	59.0	62	D	16	**6SE6440-2UD32-2DA1**
30	40	59.0	62	**37**	50	72.0	75	E	20	**6SE6440-2UD33-0EA1**
37	50	72.0	75	**45**	60	87.0	90	E	20	**6SE6440-2UD33-7EA1**
45	60	87.0	90	**55**	75	104.0	110	F	56	**6SE6440-2UD34-5FA1**
55	75	104.0	110	**75**	100	139.0	145	F	56	**6SE6440-2UD35-5FA1**
75	100	139.0	145	**90**	125	169.0	178	F	56	**6SE6440-2UD37-5FA1**

1) Supplementary conditions: Input current at rated operating point, applicable at short-circuit voltage of the supply U_{sc} = 2 % with reference to the inverter rated power and rated mains operating voltage of 240 V or 400 V without a line commutating choke.

2) Acc. to EMC EN 61800-3 generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.

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Selection and ordering data

MICROMASTER 440 inverter without filter [3] (continued)

CT (constant torque)				VT (variable torque)				MICROMASTER 440 without filter [3]		
Output		Rated input current	Rated output current	Output		Rated input current	Rated output current	Frame size	Weight, approx.	Order No.
kW	hp	A	A	kW	hp	A	A	(FS)	kg	
Mains operating voltage 3 AC 380 V to 480 V										
90	125	169.0 [1]	178	**110**	150	200.0 [1]	205	FX	116	**6SE6440-2UD38-8FA1**
110	150	200.0 [1]	205	**132**	200	245.0 [1]	250	FX	116	**6SE6440-2UD41-1FA1**
132	200	245.0 [1]	250	**160**	250	297.0 [1]	302	GX	174	**6SE6440-2UD41-3GA1**
160	250	297.0 [1]	302	**200**	300	354.0 [1]	370	GX	174	**6SE6440-2UD41-6GA1**
200	300	354.0 [1]	370	**250**	350	442.0 [1]	477	GX	174	**6SE6440-2UD42-0GA1**
Mains operating voltage 3 AC 500 V to 600 V										
0.75	1.0	2.0 [2]	1.4	**1.5**	2.0	3.2 [2]	2.7	C	5.5	**6SE6440-2UE17-5CA1**
1.5	2.0	3.7 [2]	2.7	**2.2**	3.0	4.4 [2]	3.9	C	5.5	**6SE6440-2UE21-5CA1**
2.2	3.0	5.3 [2]	3.9	**4.0**	5.0	6.9 [2]	6.1	C	5.5	**6SE6440-2UE22-2CA1**
4.0	5.0	8.1 [2]	6.1	**5.5**	7.5	9.4 [2]	9	C	5.5	**6SE6440-2UE24-0CA1**
5.5	7.5	11.1 [2]	9	**7.5**	10	12.6 [2]	11	C	5.5	**6SE6440-2UE25-5CA1**
7.5	10	14.4 [2]	11	**11.0**	15	18.1 [2]	17	C	5.5	**6SE6440-2UE27-5CA1**
11.0	15	21.5 [2]	17	**15.0**	20	24.9 [2]	22	C	5.5	**6SE6440-2UE31-1CA1**
15.0	20	24.9 [2]	22	**18.5**	25	30.0 [2]	27	D	16	**6SE6440-2UE31-5DA1**
18.5	25	30.0 [2]	27	**22**	30	35.0 [2]	32	D	16	**6SE6440-2UE31-8DA1**
22	30	35.0 [2]	32	**30**	40	48.0 [2]	41	D	16	**6SE6440-2UE32-2DA1**
30	40	48.0 [2]	41	**37**	50	58.0 [2]	52	E	20	**6SE6440-2UE33-0EA1**
37	50	58.0 [2]	52	**45**	60	69.0 [2]	62	E	20	**6SE6440-2UE33-7EA1**
45	60	69.0 [2]	62	**55**	75	83.0 [2]	77	F	56	**6SE6440-2UE34-5FA1**
55	75	83.0 [2]	77	**75**	100	113.0 [2]	99	F	56	**6SE6440-2UE35-5FA1**
75	100	113.0 [2]	99	**90**	120	138.0 [2]	125	F	56	**6SE6440-2UE37-5FA1**

See Appendix for note on ordering.

All MICROMASTER 440 inverters are supplied with a Status Display Panel (SDP). A BOP, AOP or other options have to be ordered separately (see Pages 4/16 to 4/22).

Motors for MICROMASTER 440

Catalog D 81.1 contains selection and ordering data for motors which are particularly suitable for operation with the MICROMASTER 440 inverters (see Appendix for overview).

This catalog is suitable for IEC motors. For motors according to US standards (NEMA) please refer to Catalog D 81.2 U.S./Canada (see Appendix for overview) and to: http://www.sea.siemens.com/motors

1) Supplementary conditions: Input current at rated operating point, applicable at short-circuit voltage of the supply $U_{sc} \geq 2.33$ % with reference to the inverter rated power and rated mains operating voltage of 400 V.

2) Supplementary conditions: Input current at rated operating point, applicable at short-circuit voltage of the supply $U_{SC} = 2$ % with reference to the inverter rated power and rated mains operating voltage of 500 V without a line commutating choke.

3) Acc. to EMC EN 61800-3 generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.

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MICROMASTER 440 inverter with internal filter Class A [2])

CT (constant torque)				VT (variable torque)				MICROMASTER 440 with internal filter Class A [2])		
Output		Rated input current [1])	Rated output current	Output		Rated input current [1])	Rated output current	Frame size	Weight, approx.	Order No.
kW	hp	A	A	kW	hp	A	A	(FS)	kg	
Mains operating voltage 1 AC 200 V to 240 V										
0.12	0.16	1.8	0.9	–	–	–	–	A	1.3	**6SE6440-2AB11-2AA1**
0.25	0.33	3.2	1.7	–	–	–	–	A	1.3	**6SE6440-2AB12-5AA1**
0.37	0.50	4.6	2.3	–	–	–	–	A	1.3	**6SE6440-2AB13-7AA1**
0.55	0.75	6.2	3.0	–	–	–	–	A	1.3	**6SE6440-2AB15-5AA1**
0.75	1.0	8.2	3.9	–	–	–	–	A	1.3	**6SE6440-2AB17-5AA1**
1.1	1.5	11.0	5.5	–	–	–	–	B	3.4	**6SE6440-2AB21-1BA1**
1.5	2	14.4	7.4	–	–	–	–	B	3.4	**6SE6440-2AB21-5BA1**
2.2	3	20.2	10.4	–	–	–	–	B	3.4	**6SE6440-2AB22-2BA1**
3.0	4	35.5	13.6	–	–	–	–	C	5.7	**6SE6440-2AB23-0CA1**
Mains operating voltage 3 AC 200 V to 240 V										
3.0	4.0	15.6	13.6	–	–	–	–	C	5.7	**6SE6440-2AC23-0CA1**
4.0	5.0	19.7	17.5	**5.5**	7.5	28.3	22	C	5.7	**6SE6440-2AC24-0CA1**
5.5	7.5	26.5	22.0	**7.5**	10.0	34.2	28	C	5.7	**6SE6440-2AC25-5CA1**
Mains operating voltage 3 AC 380 V to 480 V										
2.2	3.0	7.5	5.9	–	–	–	–	B	3.4	**6SE6440-2AD22-2BA1**
3.0	4.0	10.0	7.7	–	–	–	–	B	3.4	**6SE6440-2AD23-0BA1**
4.0	5.0	12.8	10.2	–	–	–	–	B	3.4	**6SE6440-2AD24-0BA1**
5.5	7.5	15.6	13.2	**7.5**	10	17.6	19	C	5.7	**6SE6440-2AD25-5CA1**
7.5	10	22.0	18.4	**11.0**	15	23.1	26	C	5.7	**6SE6440-2AD27-5CA1**
11.0	15	23.1	26	**15.0**	20	33.8	32	C	5.7	**6SE6440-2AD31-1CA1**
15.0	20	33.8	32	**18.5**	25	37.0	38	D	17	**6SE6440-2AD31-5DA1**
18.5	25	37.0	38	**22**	30	43.0	45	D	17	**6SE6440-2AD31-8DA1**
22	30	43.0	45	**30**	40	59.0	62	D	17	**6SE6440-2AD32-2DA1**
30	40	59.0	62	**37**	50	72.0	75	E	22	**6SE6440-2AD33-0EA1**
37	50	72.0	75	**45**	60	87.0	90	E	22	**6SE6440-2AD33-7EA1**
45	60	87.0	90	**55**	75	104.0	110	F	75	**6SE6440-2AD34-5FA1**
55	75	104.0	110	**75**	100	139.0	145	F	75	**6SE6440-2AD35-5FA1**
75	100	139.0	145	**90**	125	169.0	178	F	75	**6SE6440-2AD37-5FA1**

See Appendix for note on ordering.

All MICROMASTER 440 inverters are supplied with a Status Display Panel (SDP). A BOP, AOP or other options have to be ordered separately (see Pages 4/16 to 4/22).

Motors for MICROMASTER 440

Catalog D 81.1 contains selection and ordering data for motors which are particularly suitable for operation with the MICROMASTER 440 inverters (see Appendix for overview).

This catalog is suitable for IEC motors. For motors according to US standards (NEMA) please refer to Catalog D 81.2 U.S./Canada (see Appendix for overview) and to: http://www.sea.siemens.com/motors

1) Supplementary conditions: Input current at rated operating point, applicable at short-circuit voltage of the supply U_{sc} = 2 % with reference to the inverter rated power and rated mains operating voltage of 240 V or 400 V without a line commutating choke.

2) Use of MICROMASTER inverters with internal filter is not permissible on non-grounded mains supplies.

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Options
Variant dependent options

Overview

EMC filter, Class A

Filter for inverters without an internal filter for

- 3 AC 200 V to 240 V, frame sizes A and B
- 3 AC 380 V to 480 V, frame size A, FX, GX

Filters for frame sizes FX and GX are only permitted to be used in combination with a line commutating choke.

All other inverters with the exception of inverters for 500 V to 600 V can be supplied with an internal Class A filter.

The requirements are fulfilled using shielded cables with a max. length of 25 m.

EMC filter, Class B

Filter for inverters without an internal filter for

- 3 AC 200 V to 240 V, frame sizes A and B
- 3 AC 380 V to 480 V, frame size A.

The requirements are fulfilled using shielded cables with a max. length of 25 m.

For inverters 15 kW to 75 kW without filters, EMC filters of Class B from Schaffner can be used.

The requirements are fulfilled using shielded cables with a max. length of 25 m to 50 m (depending on the type, details on request).

With this filter, the inverter complies with the emission standard EN 55 011, Class B for conducted interference emissions.

Additional EMC filter, Class B

Available for inverters with an internal Class A EMC filter, frame sizes A, B and C.

The requirements are fulfilled using shielded cables with a max. length of 25 m.

With this filter, the inverter complies with the emission standard EN 55 011, Class B for conducted interference emissions.

Filter Class B with low leakage currents

EMC filter for 1 AC 200 V to 240 V inverters, frame sizes A and B, without an internal EMC filter Class A.

With this filter, the inverter complies with the emission standard EN 55 011, Class B for conducted interference emissions. The leakage currents are reduced to < 3.5 mA.

The requirements are fulfilled using shielded cables with a max. length of 5 m.

Leakage currents:

The leakage currents of the inverters with/without filter (internal/external) may exceed 30 mA. Typical values in practice are between 10 mA and 50 mA. The exact values depend on the design, environment and cable lengths. Interference-free operation with residual current operated devices with a trigger value of 30 mA cannot be guaranteed. However, operation with residual current circuit-breakers with a trigger value of 300 mA is possible. Please refer to the Instruction Manual for details.

LC filter and sinusoidal filter

The LC filter/sinusoidal filter limits the rate of rise of voltage and the capacitive charge/discharge currents which usually occur with inverter operation. This means that much longer shielded motor cables are possible when using LC filters/sinusoidal filters and the service life of the motor achieves values similar to those with direct mains operation. Use of an output choke isn't required with that.

Please note when using LC filters/sinusoidal filters:

- Only *V/f*, FCC control permissible
- Please observe the derating of 15 % when selecting the appropriate inverter
- Operation only permissible with 4 kHz pulse frequency Note: Please observe derating for frame sizes FX and GX.
- The output frequency is limited to 150 Hz
- Operation and commissioning only with connected motor as the LC filter/sinusoidal filter is not idling-proof!

The LC filters/sinusoidal filters can be used for all MICROMASTER 440 inverters of frame sizes A to GX.

- Frame sizes D to F: The LC filters, frame sizes D to F, are designed for mounting upright in the control cabinet. Due to leakage flux lines caused by physical sources, a minimum distance of 50 mm to adjacent modules and metal parts is recommended.
- Frame sizes FX and GX: The sinusoidal filters, frame sizes FX and GX, are designed for mounting upright in the control cabinet. Due to leakage flux lines caused by physical sources, a minimum distance of 100 mm to adjacent modules and metal parts is recommended.

Technical data

LC filter and sinusoidal filter

Mains voltage	3 AC 380 V to 480 V	3 AC 500 V to 600 V
Current (at 40 °C/50 °C)		
For frame size A (0.37 to 1.5 kW)	4.5 A/4.1 A	–
For frame size B (2.2 to 4 kW)	11.2 A/10.2 A	–
For frame size C (0.75 to 4 kW)	–	9.0 A/6.1 A
For frame size C (5.5 to 11 kW)	32.6 A/26 A	22.4 A/17 A
For frame size D (15 kW)	38.8 A/32 A	27.5 A/22 A
For frame size D (18.5 kW)	45.9 A/38 A	32.6 A/27 A
For frame size D (22 kW)	63.2 A/45 A	41.8 A/32 A
For frame size E (30 kW)	76.5 A/62 A	53 A/41 A
For frame size E (37 kW)	112.2 A/90 A	63.2 A/52 A
For frame size F (45 kW)	112.2 A/90 A	78.5 A/62 A
For frame size F (55 kW)	147.9 A/110 A	101 A/77 A
For frame size F (75 kW)	181.6 A/145 A	127.5 A/99 A
Current (at 40 °C/55 °C)		
For frame size FX (90 kW and 110 kW)	225 A/191 A	–
For frame size GX (132 kW)	276 A/235 A	–
For frame size GX (160 kW)	333 A/283 A	–
For frame size GX (200 kW)	408 A/347 A	–

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Technical data (continued)

LC filter and sinusoidal filter

Limiting of motor overvoltage		≤ 1078 V
d*V*/d*t* limiting		≤ 500 V/μs
Pulse frequency		4 kHz
Max. motor frequency		150 Hz
Max. permissible motor cable lengths		
For frame sizes A to F	shielded	200 m
	unshielded	300 m
For frame sizes FX and GX	shielded	300 m
	unshielded	450 m
Insulation strength		Overvoltage category III to VDE 0110
Electromagnetic compatibility		
For frame sizes A to F		Up to 200 m motor cable length with emissions to Class A according to EN 55 011 in conjunction with filtered inverters and unshielded cables
For frame sizes FX and GX		Up to 150 m motor cable length with emissions to Class A according to EN 55 011 in conjunction with filtered inverters and unshielded cables
Conformity		CE according to the low-voltage directive 73/23/EEC
Approvals		cUL E 219022
Strain resistance		EN 60 068-2-31
Humidity		95 % humidity, non-condensing
Degree of protection		
For frame sizes A to C		IP20 (to EN 60 529)
For frame sizes D to F		IP00/IP20 (to EN 60 529 with terminal covers)
For frame sizes FX and GX		IP00
Insulation class		H (180 °C)
Temperature range		
For frame sizes A to F	Operation	–10 °C to +40 °C (+14 °F to +104 °F) 100 % P_n
		to +50 °C (to +122 °F) 80 % P_n
	Storage	–25 °C to +70 °C (–13 °F to +158 °F)
For frame sizes FX and GX	Operation	–10 °C to +40 °C (+14 °F to +104 °F) 100 % P_n
		to +55 °C (to +131 °F) 85 % P_n
	Storage	–40 °C to +70 °C (–40 °F to +158 °F)
Installation altitude		
For frame sizes A to C		Up to 2000 m: 100 % P_n 2000 to 4000 m: 62.5 % P_n
For frame sizes D to F		Up to 1000 m: 100 % P_n 1000 to 4000 m: 12.5 % derating for each 1000 m
For frame sizes FX and GX		Up to 2000 m: 100 % P_n 2000 to 4000 m: 7.5 % derating for each 1000 m
Mounting position		
For frame sizes A to C		Footprint or suspended
For frame sizes D to F, FX and GX		upright
Ventilation clearances		
For frame sizes A to C	Top	100 mm
	Bottom	100 mm
	Side	100 mm
For frame sizes D to F, FX and GX	Top	100 mm
	Side	100 mm
Connection system	Input, litz wire or terminal	1U1, 1V1, 1W1
	Output, terminals	1U2, 1V2, 1W2

Torque for conductor connections	Terminal cross-section	Torque
For frame sizes A to C	–	1.5 Nm to 1.8 Nm
For frame sizes D to F	16 mm²	2.0 Nm to 4.0 Nm
	35 mm²	2.5 Nm to 5.0 Nm
	50 mm²	3.0 Nm to 6.0 Nm
	95 mm²	6.0 Nm to 12.0 Nm
	150 mm²	10.0 Nm to 20.0 Nm
For frame sizes FX and GX	–	14.0 Nm to 31.0 Nm

Weight, approx.	
For frame size A	7 kg
For frame size B	11 kg
For frame size C	8.5 kg to 29 kg
For frame size D	21 kg to 42 kg
For frame size E	49.5 kg to 67 kg
For frame size F	67 kg to 126 kg
For frame size FX	135 kg
For frame size GX	138 kg to 208 kg

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Options
Variant dependent options

Overview

Line commutating choke

Line commutating chokes are used to smooth voltage peaks or to bridge commutating dips. In addition, line commutating chokes reduce the effects of harmonics on the inverter and the power supply. If the line impedance is < 1 %, a line commutating choke must be used in order to reduce the current peaks.

In line with EN 61 000-3-2 regulations "Limits for harmonic currents with device input current ≤16 A per phase", there are special aspects for drives with 250 W to 550 W and 230 V single-phase supplies which can be used in non-industrial applications (1st environment).

For devices with 250 W and 350 W, it is necessary either to fit the recommended input chokes or to apply to the power utility company for authorization to connect the devices to the public power supply.
No limits are currently defined in the EN 61 000-3-2 standard for professionally used devices with a connected load >1 kW which means that the inverters with an output power ≥ 0.75 kW comply with the EN 61 000-3-2 standard.

However, in accordance with the regulations of EN 61000-3-12 "Limits for harmonic currents > 16 A and ≤ 75 A per phase" an approval is necessary from the power supplier for drives that are intended to be connected to the public low-voltage network. Please refer to the Operating Instructions for the values of the harmonic currents.

Output choke

Output chokes can be supplied for reducing the capacitive compensation currents and d*V*/d*t* in the case of motor cables >50 m (shielded) or >100 m (unshielded).

For max. permissible cable lengths, see the Technical Data.

Brake resistors

The brake resistors are designed for use with the MICROMASTER 440 inverter series, frame sizes A to F, with internal brake chopper and enable loads with a large moment of inertia to be braked quickly. During braking of the motor and the load, excess energy is fed back to the inverter. This causes the voltage to rise in the DC link. The inverter transfers the excess energy to the externally mounted braking resistor.

For MICROMASTER 440 inverters of frame sizes FX and GX, external SIMOVERT MASTERDRIVES brake units and the appropriate brake resistors can be used (see Catalog DA 65.10).

Gland plate

Gland plates are available for inverters of frame sizes A, B and C. All the other frame sizes have the shield connection for the control cable integrated in the inverter.

The shield for the power cable has to be connected externally (e.g. in the control cabinet). Exception: Inverters of frame sizes D and E and frame size F with integrated class A filter. In this case the shield connection is integrated in the inverter.

The gland plate enables the shields of the power and control cables to be terminated ensuring optimum EMC performance.

Technical data

Max. permissible cable lengths from the motor to the inverter when using output chokes

The following table shows the maximum permissible cable lengths from the motor to the inverter when using output chokes.

Note:

Operation up to 150 Hz output frequency only!

Frame size	Output choke	**Max. permissible motor cable lengths (shielded/unshielded)** for a mains voltage of			
(FS)	Type	200 V to 240 V ± 10 %	380 V to 400 V ± 10 %	401 V to 480 V ± 10 %	500 V to 600 V ± 10 %
A	6SE6400-3TC00-4AD3	200 m/300 m	–	–	–
A	6SE6400-3TC00-4AD2	–	150 m/225 m	100 m/150 m	–
B	6SE6400-3TC01-0BD3	200 m/300 m	150 m/225 m	100 m/150 m	–
C	6SE6400-3TC03-2CD3	200 m/300 m	200 m/300 m	100 m/150 m	–
C	6SE6400-3TC01-8CE3	–	–	–	100 m/150 m
D to F	6SE6400-3TC. .-. . . .	200 m/300 m	200 m/300 m	200 m/300 m	200 m/300 m
FX	6SL3000-2BE32-1AA0	–	300 m/450 m	300 m/450 m	–
FX	6SL3000-2BE32-6AA0	–	300 m/450 m	300 m/450 m	–
GX	6SL3000-2BE33-2AA0	–	300 m/450 m	300 m/450 m	–
GX	6SL3000-2BE33-8AA0	–	300 m/450 m	300 m/450 m	–
GX	6SL3000-2BE35-0AA0	–	300 m/450 m	300 m/450 m	–

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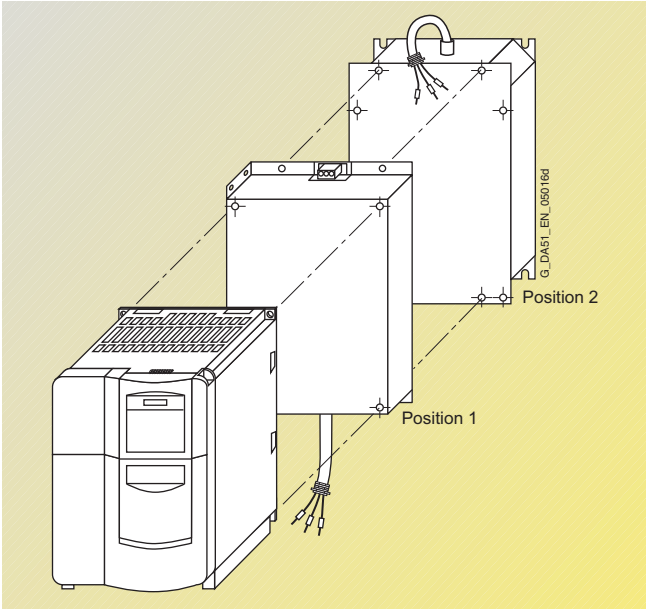
Design

General installation instructions

- A maximum of two footprint components plus inverter are permissible.
- If an LC filter is used, it must, if possible, be mounted directly on the wall of the control cabinet due to weight reasons.
  If an LC filter of frame size C is used, therefore, only one footprint component is permissible. If a line choke and LC filter are used, the line choke must be located on the left of the inverter.
  Required distance between line choke and inverter: 75 mm.
- The EMC filter must be mounted directly below the frequency inverter if possible.
- If mounted on the side, the line-side components are to be mounted to the left of the frequency inverter whereas the output-side components are to be mounted to the right of the frequency inverter.
- If a braking resistor is used, it must, if possible, be mounted directly on the wall of the control cabinet due to reasons relating to temperature increases.



Example of installation with frequency inverter, EMC filter (position 1) and line choke (position 2)

Availability of the options as footprint components

	Frame size								
	A	B	C	D	E	F	G	FX	GX
Line commutating choke	✓	✓	✓	✓	✓				
EMC filter	✓	✓	✓						
LC filter	✓	✓	✓						
Output choke	✓	✓	✓						
Braking resistor	✓	✓							

Recommended combinations of inverters and options

Frequency inverter	**Footprint**		**Mounted on side**	
Frame size	Position 1	Position 2	To the left of the inverter (for line-side components)	To the right of the inverter (for output-side components)
A and B	EMC filter	Line commutating choke	–	Output choke and/or Braking resistor
	EMC filter or Line commutating choke	Output choke or LC filter	–	Braking resistor
	EMC filter or Line commutating choke	Braking resistor	–	–
	EMC filter or Line commutating choke or Braking resistor	–	–	–
C	EMC filter	Line commutating choke	–	Output choke and/or Braking resistor
	EMC filter or Line commutating choke	Output choke	–	Braking resistor
	LC filter	–	EMC filter and/or Line commutating choke	Braking resistor
D and E	Line commutating choke	–	EMC filter	Output choke or LC filter and/or Braking resistor
F, G, FX and GX	–	–	EMC filter and/or Line commutating choke	Output choke or LC filter and/or Braking resistor

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Options
Variant dependent options

Selection and ordering data

The options listed here (filters, chokes, brake resistors, gland plates, fuses and circuit-breakers) must be selected to match the respective inverter.

The inverter and the associated options have the same voltage ratings. Alternatively fuses and circuit-breakers can be provided. Both provide short circuit protection of the inverter supply line and the inverter. A semiconductor protection of the inverter with the suggested 3NA... fuses and the 3RV.../3VL... circuit-breakers is not envisaged.

*) Must be used in combination with a line commutating choke.

Mains voltage	Output (CT)		Inverter **without** filter	Order No. of the options		
				EMC filter, Class A	**EMC filter, Class B**	**Line commutating choke**
	kW	hp				
1 AC 200 V to 240 V	0.12	0.16	6SE6440-2UC11-2AA1	–	**6SE6400-2FL01-0AB0** with low leakage currents	**6SE6400-3CC00-4AB3**
	0.25	0.33	6SE6440-2UC12-5AA1	–		
	0.37	0.50	6SE6440-2UC13-7AA1	–		**6SE6400-3CC01-0AB3**
	0.55	0.75	6SE6440-2UC15-5AA1	–		
	0.75	1.0	6SE6440-2UC17-5AA1	–		
	1.1	1.5	6SE6440-2UC21-1BA1	–	**6SE6400-2FL02-6BB0** with low leakage currents	**6SE6400-3CC02-6BB3**
	1.5	2.0	6SE6440-2UC21-5BA1	–		
	2.2	3.0	6SE6440-2UC22-2BA1	–		
	3.0	4.0	6SE6440-2UC23-0CA1	–	–	**6SE6400-3CC03-5CB3**
3 AC 200 V to 240 V	0.12	0.16	6SE6440-2UC11-2AA1	**6SE6400-2FA00-6AD0**	**6SE6400-2FB00-6AD0**	**6SE6400-3CC00-3AC3**
	0.25	0.33	6SE6440-2UC12-5AA1			
	0.37	0.50	6SE6440-2UC13-7AA1			**6SE6400-3CC00-5AC3**
	0.55	0.75	6SE6440-2UC15-5AA1			
	0.75	1.0	6SE6440-2UC17-5AA1			
	1.1	1.5	6SE6440-2UC21-1BA1	**6SE6400-2FA01-4BC0**	**6SE6400-2FB01-4BC0**	**6SE6400-3CC00-8BC3**
	1.5	2.0	6SE6440-2UC21-5BA1			**6SE6400-3CC01-4BD3**
	2.2	3.0	6SE6440-2UC22-2BA1			
	3.0	4.0	6SE6440-2UC23-0CA1	–	–	**6SE6400-3CC01-7CC3**
	4.0	5.0	6SE6440-2UC24-0CA1	–	–	**6SE6400-3CC03-5CD3**
	5.5	7.5	6SE6440-2UC25-5CA1	–	–	
	7.5	10	6SE6440-2UC27-5DA1	–	–	**6SE6400-3CC05-2DD0**
	11.0	15	6SE6440-2UC31-1DA1	–	–	
	15.0	20	6SE6440-2UC31-5DA1	–	–	
	18.5	25	6SE6440-2UC31-8EA1	–	–	**6SE6400-3CC08-8EC0**
	22	30	6SE6440-2UC32-2EA1	–	–	
	30	40	6SE6440-2UC33-0FA1	–	–	**6SE6400-3CC11-7FD0**
	37	50	6SE6440-2UC33-7FA1	–	–	
	45	60	6SE6440-2UC34-5FA1	–	–	
3 AC 380 V to 480 V	0.37	0.50	6SE6440-2UD13-7AA1	**6SE6400-2FA00-6AD0**	**6SE6400-2FB00-6AD0**	**6SE6400-3CC00-2AD3**
	0.55	0.75	6SE6440-2UD15-5AA1			
	0.75	1.0	6SE6440-2UD17-5AA1			**6SE6400-3CC00-4AD3**
	1.1	1.5	6SE6440-2UD21-1AA1			
	1.5	2.0	6SE6440-2UD21-5AA1			**6SE6400-3CC00-6AD3**
	2.2	3.0	6SE6440-2UD22-2BA1	–	–	**6SE6400-3CC01-0BD3**
	3.0	4.0	6SE6440-2UD23-0BA1	–	–	
	4.0	5.0	6SE6440-2UD24-0BA1	–	–	**6SE6400-3CC01-4BD3**
	5.5	7.5	6SE6440-2UD25-5CA1	–	–	**6SE6400-3CC02-2CD3**
	7.5	10	6SE6440-2UD27-5CA1	–	–	
	11.0	15	6SE6440-2UD31-1CA1	–	–	**6SE6400-3CC03-5CD3**
	15.0	20	6SE6440-2UD31-5DA1	–	EMC filter, Class B, available from Schaffner	**6SE6400-3CC04-4DD0**
	18.5	25	6SE6440-2UD31-8DA1	–		
	22	30	6SE6440-2UD32-2DA1	–		**6SE6400-3CC05-2DD0**
	30	40	6SE6440-2UD33-0EA1	–		**6SE6400-3CC08-3ED0**
	37	50	6SE6440-2UD33-7EA1	–		
	45	60	6SE6440-2UD34-5FA1	–		**6SE6400-3CC11-2FD0**
	55	75	6SE6440-2UD35-5FA1	–		
	75	100	6SE6440-2UD37-5FA1	–		**6SE6400-3CC11-7FD0**
	90	125	6SE6440-2UD38-8FA1	**6SL3000-0BE32-5AA0 *)**	–	**6SL3000-0CE32-3AA0**
	110	150	6SE6440-2UD41-1FA1	**6SL3000-0BE34-4AA0 *)**	–	**6SL3000-0CE32-8AA0**
	132	200	6SE6440-2UD41-3GA1		–	**6SL3000-0CE33-3AA0**
	160	250	6SE6440-2UD41-6GA1		–	**6SL3000-0CE35-1AA0**
	200	300	6SE6440-2UD42-0GA1	**6SL3000-0BE36-0AA0 *)**	–	
3 AC 500 V to 600 V	0.75	1.0	6SE6440-2UE17-5CA1	–	–	**6SE6400-3CC00-4CE3**
	1.5	2.0	6SE6440-2UE21-5CA1	–	–	
	2.2	3.0	6SE6440-2UE22-2CA1	–	–	**6SE6400-3CC00-8CE3**
	4.0	5.0	6SE6440-2UE24-0CA1	–	–	
	5.5	7.5	6SE6440-2UE25-5CA1	–	–	**6SE6400-3CC02-4CE3**
	7.5	10	6SE6440-2UE27-5CA1	–	–	
	11.0	15	6SE6440-2UE31-1CA1	–	–	
	15.0	20	6SE6440-2UE31-5DA1	–	–	**6SE6400-3CC04-4DD0**
	18.5	25	6SE6440-2UE31-8DA1	–	–	
	22	30	6SE6440-2UE32-2DA1	–	–	
	30	40	6SE6440-2UE33-0EA1	–	–	**6SE6400-3CC08-3ED0**
	37	50	6SE6440-2UE33-7EA1	–	–	
	45	60	6SE6440-2UE34-5FA1	–	–	**6SE6400-3CC11-2FD0**
	55	75	6SE6440-2UE35-5FA1	–	–	
	75	100	6SE6440-2UE37-5FA1	–	–	

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Selection and ordering data (continued)

All options are certified to UL, except fuses. The 3NE1 fuses are UL-listed (equivalent to cULus).

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

Mains voltage	Output (CT)		Inverter **without** filter	Order No. of the options		
	kW	hp		**LC/sinusoidal filter**	**Output choke**	**Brake resistors**
1 AC 200 V to 240 V	0.12	0.16	6SE6440-2UC11-2AA1	–	**6SE6400-3TC00-4AD3**	**6SE6400-4BC05-0AA0**
	0.25	0.33	6SE6440-2UC12-5AA1	–		
	0.37	0.50	6SE6440-2UC13-7AA1	–		
	0.55	0.75	6SE6440-2UC15-5AA1	–		
	0.75	1.0	6SE6440-2UC17-5AA1	–		
	1.1	1.5	6SE6440-2UC21-1BA1	–	**6SE6400-3TC01-0BD3**	**6SE6400-4BC11-2BA0**
	1.5	2.0	6SE6440-2UC21-5BA1	–		
	2.2	3.0	6SE6440-2UC22-2BA1	–		
	3.0	4.0	6SE6440-2UC23-0CA1	–	**6SE6400-3TC03-2CD3**	**6SE6400-4BC12-5CA0**
3 AC 200 V to 240 V	0.12	0.16	6SE6440-2UC11-2AA1	–	**6SE6400-3TC00-4AD3**	**6SE6400-4BC05-0AA0**
	0.25	0.33	6SE6440-2UC12-5AA1	–		
	0.37	0.50	6SE6440-2UC13-7AA1	–		
	0.55	0.75	6SE6440-2UC15-5AA1	–		
	0.75	1.0	6SE6440-2UC17-5AA1	–		
	1.1	1.5	6SE6440-2UC21-1BA1	–	**6SE6400-3TC01-0BD3**	**6SE6400-4BC11-2BA0**
	1.5	2.0	6SE6440-2UC21-5BA1	–		
	2.2	3.0	6SE6440-2UC22-2BA1	–		
	3.0	4.0	6SE6440-2UC23-0CA1	–	**6SE6400-3TC03-2CD3**	**6SE6400-4BC12-5CA0**
	4.0	5.0	6SE6440-2UC24-0CA1	–		**6SE6400-4BC13-0CA0**
	5.5	7.5	6SE6440-2UC25-5CA1	–		
	7.5	10	6SE6440-2UC27-5DA1	–	**6SE6400-3TC05-4DD0**	**6SE6400-4BC18-0DA0**
	11.0	15	6SE6440-2UC31-1DA1	–		
	15.0	20	6SE6440-2UC31-5DA1	–		
	18.5	25	6SE6440-2UC31-8EA1	–	**6SE6400-3TC08-0ED0**	**6SE6400-4BC21-2EA0**
	22	30	6SE6440-2UC32-2EA1	–		
	30	40	6SE6440-2UC33-0FA1	–	**6SE6400-3TC15-4FD0**	**6SE6400-4BC22-5FA0**
	37	50	6SE6440-2UC33-7FA1	–		
	45	60	6SE6440-2UC34-5FA1	–		
3 AC 380 V to 480 V	0.37	0.50	6SE6440-2UD13-7AA1	**6SE6400-3TD00-4AD0**	**6SE6400-3TC00-4AD2**	**6SE6400-4BD11-0AA0**
	0.55	0.75	6SE6440-2UD15-5AA1			
	0.75	1.0	6SE6440-2UD17-5AA1			
	1.1	1.5	6SE6440-2UD21-1AA1			
	1.5	2.0	6SE6440-2UD21-5AA1			
	2.2	3.0	6SE6440-2UD22-2BA1	**6SE6400-3TD01-0BD0**	**6SE6400-3TC01-0BD3**	**6SE6400-4BD12-0BA0**
	3.0	4.0	6SE6440-2UD23-0BA1			
	4.0	5.0	6SE6440-2UD24-0BA1			
	5.5	7.5	6SE6440-2UD25-5CA1	**6SE6400-3TD03-2CD0**	**6SE6400-3TC03-2CD3**	**6SE6400-4BD16-5CA0**
	7.5	10	6SE6440-2UD27-5CA1			
	11.0	15	6SE6440-2UD31-1CA1			
	15.0	20	6SE6440-2UD31-5DA1	**6SE6400-3TD03-7DD0**	**6SE6400-3TC05-4DD0**	**6SE6400-4BD21-2DA0**
	18.5	25	6SE6440-2UD31-8DA1	**6SE6400-3TD04-8DD0**	**6SE6400-3TC03-8DD0**	
	22	30	6SE6440-2UD32-2DA1	**6SE6400-3TD06-1DD0**	**6SE6400-3TC05-4DD0**	
	30	40	6SE6440-2UD33-0EA1	**6SE6400-3TD07-2ED0**	**6SE6400-3TC08-0ED0**	**6SE6400-4BD22-2EA0**
	37	50	6SE6440-2UD33-7EA1	**6SE6400-3TD11-5FD0**	**6SE6400-3TC07-5ED0**	
	45	60	6SE6440-2UD34-5FA1		**6SE6400-3TC14-5FD0**	**6SE6400-4BD24-0FA0**
	55	75	6SE6440-2UD35-5FA1	**6SE6400-3TD15-0FD0**	**6SE6400-3TC15-4FD0**	
	75	100	6SE6440-2UD37-5FA1	**6SE6400-3TD18-0FD0**	**6SE6400-3TC14-5FD0**	
	90	125	6SE6440-2UD38-8FA1	**6SL3000-2CE32-3AA0**	**6SL3000-2BE32-1AA0**	–
	110	150	6SE6440-2UD41-1FA1		**6SL3000-2BE32-6AA0**	–
	132	200	6SE6440-2UD41-3GA1	**6SL3000-2CE32-8AA0**	**6SL3000-2BE33-2AA0**	–
	160	250	6SE6440-2UD41-6GA1	**6SL3000-2CE33-3AA0**	**6SL3000-2BE33-8AA0**	–
	200	300	6SE6440-2UD42-0GA1	**6SL3000-2CE34-1AA0**	**6SL3000-2BE35-0AA0**	–
3 AC 500 V to 600 V	0.75	1.0	6SE6440-2UE17-5CA1	**6SE6400-3TD01-0CE0**	**6SE6400-3TC01-8CE3**	**6SE6400-4BE14-5CA0**
	1.5	2.0	6SE6440-2UE21-5CA1			
	2.2	3.0	6SE6440-2UE22-2CA1			
	4.0	5.0	6SE6440-2UE24-0CA1			
	5.5	7.5	6SE6440-2UE25-5CA1	**6SE6400-3TD02-3CE0**		
	7.5	10	6SE6440-2UE27-5CA1			**6SE6400-4BE16-5CA0**
	11.0	15	6SE6440-2UE31-1CA1			
	15.0	20	6SE6440-2UE31-5DA1	**6SE6400-3TD02-3DE0**	**6SE6400-3TC03-2DE0**	**6SE6400-4BE21-3DA0**
	18.5	25	6SE6440-2UE31-8DA1	**6SE6400-3TD03-2DE0**		
	22	30	6SE6440-2UE32-2DA1	**6SE6400-3TD03-7DE0**		
	30	40	6SE6440-2UE33-0EA1	**6SE6400-3TD04-8EE0**	**6SE6400-3TC06-2FE0**	**6SE6400-4BE21-8EA0**
	37	50	6SE6440-2UE33-7EA1	**6SE6400-3TD06-1EE0**		
	45	60	6SE6440-2UE34-5FA1	**6SE6400-3TD07-1FE0**		**6SE6400-4BE24-2FA0**
	55	75	6SE6440-2UE35-5FA1	**6SE6400-3TD10-0FE0**	**6SE6400-3TC08-8FE0**	
	75	100	6SE6440-2UE37-5FA1	**6SE6400-3TD11-5FE0**		

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Options
Variant dependent options

Selection and ordering data (continued)

● Use in America requires Ⓤ-listed fuses such as the Class NON/NOS range from Bussmann.

Mains voltage	Output (CT) kW	hp	Inverter **without** filter	Order No. of options **Gland plate**	**Fuses** (see LV 1) **3NA3**	**3NE1 (Ⓤ)**	**Circuit-breaker** (see Catalog LV 1)
1 AC 200 V to 240 V	0.12	0.16	6SE6440-2UC11-2AA1	**6SE6400-0GP00-0AA0**	**3NA3803**	●	**3RV1021-1EA10**
	0.25	0.33	6SE6440-2UC12-5AA1				**3RV1021-1HA10**
	0.37	0.50	6SE6440-2UC13-7AA1				**3RV1021-1JA10**
	0.55	0.75	6SE6440-2UC15-5AA1		**3NA3805**		**3RV1021-1KA10**
	0.75	1.0	6SE6440-2UC17-5AA1				**3RV1021-4AA10**
	1.1	1.5	6SE6440-2UC21-1BA1	**6SE6400-0GP00-0BA0**	**3NA3807**		**3RV1021-4DA10**
	1.5	2.0	6SE6440-2UC21-5BA1				**3RV1031-4EA10**
	2.2	3.0	6SE6440-2UC22-2BA1		**3NA3812**		**3RV1031-4FA10**
	3.0	4.0	6SE6440-2UC23-0CA1	**6SE6400-0GP00-0CA0**	**3NA3817**		**3RV1041-4JA10**
3 AC 200 V to 240 V	0.12	0.16	6SE6440-2UC11-2AA1	**6SE6400-0GP00-0AA0**	**3NA3803**	●	**3RV1021-1BA10**
	0.25	0.33	6SE6440-2UC12-5AA1				**3RV1021-1DA10**
	0.37	0.50	6SE6440-2UC13-7AA1				**3RV1021-1FA10**
	0.55	0.75	6SE6440-2UC15-5AA1		**3NA3805**		**3RV1021-1GA10**
	0.75	1.0	6SE6440-2UC17-5AA1				**3RV1021-1HA10**
	1.1	1.5	6SE6440-2UC21-1BA1	**6SE6400-0GP00-0BA0**	**3NA3807**		**3RV1021-1KA10**
	1.5	2.0	6SE6440-2UC21-5BA1				**3RV1021-4AA10**
	2.2	3.0	6SE6440-2UC22-2BA1		**3NA3810**		**3RV1021-4CA10**
	3.0	4.0	6SE6440-2UC23-0CA1	**6SE6400-0GP00-0CA0**			**3RV1031-4EA10**
	4.0	5.0	6SE6440-2UC24-0CA1		**3NA3812**		**3RV1031-4FA10**
	5.5	7.5	6SE6440-2UC25-5CA1		**3NA3814**		**3RV1031-4HA10**
	7.5	10	6SE6440-2UC27-5DA1	Integrated as standard for shield connection of the control cable and the power cable.	**3NA3820**	**3NE1817-0**	**3RV1042-4JA10**
	11.0	15	6SE6440-2UC31-1DA1		**3NA3824**	**3NE1820-0**	**3RV1042-4LA10**
	15.0	20	6SE6440-2UC31-5DA1				**3VL1712-.DD33-....**
	18.5	25	6SE6440-2UC31-8EA1		**3NA3830**	**3NE1021-0**	
	22	30	6SE6440-2UC32-2EA1		**3NA3832**	**3NE1022-0**	**3VL1716-.DD33-....**
	30	40	6SE6440-2UC33-0FA1	Integrated as standard for shield connection of the control cable. The shield of the power cable has to be connected externally (e.g. in the control cabinet).	**3NA3140**	**3NE1225-0**	**3VL3725-.DC36-....**
	37	50	6SE6440-2UC33-7FA1		**3NA3142**	**3NE1225-0**	**3VL4731-.DC36-....**
	45	60	6SE6440-2UC34-5FA1		**3NA3144**	**3NE1227-0**	
3 AC 380 V to 480 V	0.37	0.50	6SE6440-2UD13-7AA1	**6SE6400-0GP00-0AA0**	**3NA3803**	●	**3RV1021-1CA10**
	0.55	0.75	6SE6440-2UD15-5AA1				**3RV1021-1DA10**
	0.75	1.0	6SE6440-2UD17-5AA1				**3RV1021-1FA10**
	1.1	1.5	6SE6440-2UD21-1AA1				**3RV1021-1GA10**
	1.5	2.0	6SE6440-2UD21-5AA1				**3RV1021-1JA10**
	2.2	3.0	6SE6440-2UD22-2BA1	**6SE6400-0GP00-0BA0**	**3NA3805**		**3RV1021-1KA10**
	3.0	4.0	6SE6440-2UD23-0BA1				**3RV1021-4AA10**
	4.0	5.0	6SE6440-2UD24-0BA1		**3NA3807**		**3RV1021-4BA10**
	5.5	7.5	6SE6440-2UD25-5CA1	**6SE6400-0GP00-0CA0**			**3RV1031-4EA10**
	7.5	10	6SE6440-2UD27-5CA1		**3NA3812**		**3RV1031-4FA10**
	11.0	15	6SE6440-2UD31-1CA1		**3NA3814**		**3RV1031-4HA10**
	15.0	20	6SE6440-2UD31-5DA1	Integrated as standard for shield connection of the control cable and the power cable.	**3NA3820**	**3NE1817-0**	**3RV1042-4KA10**
	18.5	25	6SE6440-2UD31-8DA1		**3NA3822**	**3NE1818-0**	
	22	30	6SE6440-2UD32-2DA1		**3NA3824**	**3NE1820-0**	**3RV1042-4MA10**
	30	40	6SE6440-2UD33-0EA1		**3NA3830**	**3NE1021-0**	**3VL1712-.DD33-....**
	37	50	6SE6440-2UD33-7EA1		**3NA3832**	**3NE1022-0**	**3VL1716-.DD33-....**
	45	60	6SE6440-2UD34-5FA1	Integrated as standard for shield connection of the control cable. The shield of the power cable has to be connected externally (e.g. in the control cabinet).	**3NA3836**	**3NE1224-0**	**3VL3720-.DC36-....**
	55	75	6SE6440-2UD35-5FA1		**3NA3140**	**3NE1225-0**	**3VL3725-.DC36-....**
	75	100	6SE6440-2UD37-5FA1		**3NA3144**	**3NE1227-0**	**3VL3725-.DC36-....**
	90	125	6SE6440-2UD38-8FA1		–		**3VL4731-.DC36-....**
	110	150	6SE6440-2UD41-1FA1		–	**3NE1230-0**	
	132	200	6SE6440-2UD41-3GA1		–	**3NE1332-0**	
	160	250	6SE6440-2UD41-6GA1		–	**3NE1333-0**	**3VL4740-.DC36-....**
	200	300	6SE6440-2UD42-0GA1		–	**3NE1435-0**	**3VL5750-.DC36-....**
3 AC 500 V to 600 V	0.75	1.0	6SE6440-2UE17-5CA1	**6SE6400-0GP00-0CA0**	**3NA3803-6**	●	**3RV1021-1EA10**
	1.5	2.0	6SE6440-2UE21-5CA1				**3RV1021-1GA10**
	2.2	3.0	6SE6440-2UE22-2CA1				**3RV1021-1JA10**
	4.0	5.0	6SE6440-2UE24-0CA1		**3NA3805-6**		**3RV1021-4AA10**
	5.5	7.5	6SE6440-2UE25-5CA1				**3RV1021-4BA10**
	7.5	10	6SE6440-2UE27-5CA1		**3NA3810-6**		**3RV1021-4DA10**
	11.0	15	6SE6440-2UE31-1CA1		**3NA3812-6**		**3RV1031-4FA10**
	15.0	20	6SE6440-2UE31-5DA1	Integrated as standard for shield connection of the control cable and the power cable.	**3NA3814-6**	**3NE1803-0**	**3RV1031-4HA10**
	18.5	25	6SE6440-2UE31-8DA1		**3NA3820-6**	**3NE1817-0**	**3RV1042-4JA10**
	22	30	6SE6440-2UE32-2DA1		**3NA3822-6**	**3NE1818-0**	**3RV1042-4KA10**
	30	40	6SE6440-2UE33-0EA1		**3NA3824-6**	**3NE1820-0**	**3RV1042-4MA10**
	37	50	6SE6440-2UE33-7EA1				**3VL1712-.DD33-....**
	45	60	6SE6440-2UE34-5FA1	Integrated as standard for shield connection of the control cable. The shield of the power cable has to be connected externally (e.g. in the control cabinet).	**3NA3132-6**	**3NE1022-0**	**3VL1716-.DD33-....**
	55	75	6SE6440-2UE35-5FA1		**3NA3136-6**	**3NE1224-0**	**3VL3720-.DC36-....**
	75	100	6SE6440-2UE37-5FA1				**3VL3725-.DC36-....**

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Selection and ordering data (continued)

Mains voltage	Output (CT) kW	Output (CT) hp	Inverter **with** internal filter Class A	Order No. of options **Additional EMC filter, Class B**	**Line commutating choke**	**LC filter**
1 AC 200 V to 240 V	0.12	0.16	6SE6440-2AB11-2AA1	**6SE6400-2FS01-0AB0**	**6SE6400-3CC00-4AB3**	–
	0.25	0.33	6SE6440-2AB12-5AA1			–
	0.37	0.50	6SE6440-2AB13-7AA1		**6SE6400-3CC01-0AB3**	–
	0.55	0.75	6SE6440-2AB15-5AA1			–
	0.75	1.0	6SE6440-2AB17-5AA1			–
	1.1	1.5	6SE6440-2AB21-1BA1	**6SE6400-2FS02-6BB0**	**6SE6400-3CC02-6BB3**	–
	1.5	2.0	6SE6440-2AB21-5BA1			–
	2.2	3.0	6SE6440-2AB22-2BA1			–
	3.0	4.0	6SE6440-2AB23-0CA1	**6SE6400-2FS03-5CB0**	**6SE6400-3CC03-5CB3**	–
3 AC 200 V to 240 V	3.0	4.0	6SE6440-2AC23-0CA1	**6SE6400-2FS03-8CD0**	**6SE6400-3CC01-7CC3**	–
	4.0	5.0	6SE6440-2AC24-0CA1		**6SE6400-3CC03-5CD3**	–
	5.5	7.5	6SE6440-2AC25-5CA1			–
3 AC 380 V to 480 V	2.2	3.0	6SE6440-2AD22-2BA1	**6SE6400-2FS01-6BD0**	**6SE6400-3CC01-0BD3**	**6SE6400-3TD01-0BD0**
	3.0	4.0	6SE6440-2AD23-0BA1			
	4.0	5.0	6SE6440-2AD24-0BA1		**6SE6400-3CC01-4BD3**	
	5.5	7.5	6SE6440-2AD25-5CA1	**6SE6400-2FS03-8CD0**	**6SE6400-3CC02-2CD3**	**6SE6400-3TD03-2CD0**
	7.5	10	6SE6440-2AD27-5CA1			
	11.0	15	6SE6440-2AD31-1CA1		**6SE6400-3CC03-5CD3**	
	15.0	20	6SE6440-2AD31-5DA1	An inverter **without** filter must be selected to satisfy the EMC requirements of Class B. In addition, an appropriate EMC filter of Class B from Schaffner is required.	**6SE6400-3CC04-4DD0**	**6SE6400-3TD03-7DD0**
	18.5	25	6SE6440-2AD31-8DA1			**6SE6400-3TD04-8DD0**
	22	30	6SE6440-2AD32-2DA1		**6SE6400-3CC05-2DD0**	**6SE6400-3TD06-1DD0**
	30	40	6SE6440-2AD33-0EA1		**6SE6400-3CC08-3ED0**	**6SE6400-3TD07-2ED0**
	37	50	6SE6440-2AD33-7EA1			**6SE6400-3TD11-5FD0**
	45	60	6SE6440-2AD34-5FA1		**6SE6400-3CC11-2FD0**	
	55	75	6SE6440-2AD35-5FA1			**6SE6400-3TD15-0FD0**
	75	100	6SE6440-2AD37-5FA1		**6SE6400-3CC11-7FD0**	**6SE6400-3TD18-0FD0**

Mains voltage	Output (CT) kW	Output (CT) hp	Inverter **with** internal filter Class A	Order No. of options **Output choke**	**Brake resistors**	**Gland plate**
1 AC 200 V to 240 V	0.12	0.16	6SE6440-2AB11-2AA1	**6SE6400-3TC00-4AD3**	**6SE6400-4BC05-0AA0**	**6SE6400-0GP00-0AA0**
	0.25	0.33	6SE6440-2AB12-5AA1			
	0.37	0.50	6SE6440-2AB13-7AA1			
	0.55	0.75	6SE6440-2AB15-5AA1			
	0.75	1.0	6SE6440-2AB17-5AA1			
	1.1	1.5	6SE6440-2AB21-1BA1	**6SE6400-3TC01-0BD3**	**6SE6400-4BC11-2BA0**	**6SE6400-0GP00-0BA0**
	1.5	2.0	6SE6440-2AB21-5BA1			
	2.2	3.0	6SE6440-2AB22-2BA1			
	3.0	4.0	6SE6440-2AB23-0CA1	**6SE6400-3TC03-2CD3**	**6SE6400-4BC12-5CA0**	**6SE6400-0GP00-0CA0**
3 AC 200 V to 240 V	3.0	4.0	6SE6440-2AC23-0CA1	**6SE6400-3TC03-2CD3**	**6SE6400-4BC12-5CA0**	**6SE6400-0GP00-0CA0**
	4.0	5.0	6SE6440-2AC24-0CA1		**6SE6400-4BC13-0CA0**	
	5.5	7.5	6SE6440-2AC25-5CA1			
3 AC 380 V to 480 V	2.2	3.0	6SE6440-2AD22-2BA1	**6SE6400-3TC01-0BD3**	**6SE6400-4BD12-0BA0**	**6SE6400-0GP00-0BA0**
	3.0	4.0	6SE6440-2AD23-0BA1			
	4.0	5.0	6SE6440-2AD24-0BA1			
	5.5	7.5	6SE6440-2AD25-5CA1	**6SE6400-3TC03-2CD3**	**6SE6400-4BD16-5CA0**	**6SE6400-0GP00-0CA0**
	7.5	10	6SE6440-2AD27-5CA1			
	11.0	15	6SE6440-2AD31-1CA1			
	15.0	20	6SE6440-2AD31-5DA1	**6SE6400-3TC05-4DD0**	**6SE6400-4BD21-2DA0**	Integrated as standard for shield connection of the control cable and the power cable.
	18.5	25	6SE6440-2AD31-8DA1	**6SE6400-3TC03-8DD0**		
	22	30	6SE6440-2AD32-2DA1	**6SE6400-3TC05-4DD0**		
	30	40	6SE6440-2AD33-0EA1	**6SE6400-3TC08-0ED0**	**6SE6400-4BD22-2EA0**	
	37	50	6SE6440-2AD33-7EA1	**6SE6400-3TC07-5ED0**		
	45	60	6SE6440-2AD34-5FA1	**6SE6400-3TC14-5FD0**	**6SE6400-4BD24-0FA0**	
	55	75	6SE6440-2AD35-5FA1	**6SE6400-3TC15-4FD0**		
	75	100	6SE6440-2AD37-5FA1	**6SE6400-3TC14-5FD0**		

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Options
Variant dependent options

Selection and ordering data (continued)

Mains voltage	Output (CT) kW	hp	Inverter **with** internal filter Class A	Order No. of the options **Fuses** (see Catalog LV 1) **3NA3**	**3NE1 (UL)**	**Circuit-breaker** (see Catalog LV 1)
1 AC 200 V to 240 V	0.12	0.16	6SE6440-2AB11-2AA1	**3NA3803**	●	**3RV1021-1EA10**
	0.25	0.33	6SE6440-2AB12-5AA1			**3RV1021-1HA10**
	0.37	0.50	6SE6440-2AB13-7AA1			**3RV1021-1JA10**
	0.55	0.75	6SE6440-2AB15-5AA1	**3NA3805**		**3RV1021-1KA10**
	0.75	1.0	6SE6440-2AB17-5AA1			**3RV1021-4AA10**
	1.1	1.5	6SE6440-2AB21-1BA1	**3NA3807**		**3RV1021-4DA10**
	1.5	2.0	6SE6440-2AB21-5BA1			**3RV1031-4EA10**
	2.2	3.0	6SE6440-2AB22-2BA1	**3NA3812**		**3RV1031-4FA10**
	3.0	4.0	6SE6440-2AB23-0CA1	**3NA3817**		**3RV1041-4JA10**
3 AC 200 V to 240 V	3.0	4.0	6SE6440-2AC23-0CA1	**3NA3810**	●	**3RV1031-4EA10**
	4.0	5.0	6SE6440-2AC24-0CA1	**3NA3812**		**3RV1031-4FA10**
	5.5	7.5	6SE6440-2AC25-5CA1	**3NA3814**		**3RV1031-4HA10**
3 AC 380 V to 480 V	2.2	3.0	6SE6440-2AD22-2BA1	**3NA3805**	●	**3RV1021-1KA10**
	3.0	4.0	6SE6440-2AD23-0BA1			**3RV1021-4AA10**
	4.0	5.0	6SE6440-2AD24-0BA1	**3NA3807**		**3RV1021-4BA10**
	5.5	7.5	6SE6440-2AD25-5CA1			**3RV1031-4EA10**
	7.5	10	6SE6440-2AD27-5CA1	**3NA3812**		**3RV1031-4FA10**
	11.0	15	6SE6440-2AD31-1CA1	**3NA3814**		**3RV1031-4HA10**
	15.0	20	6SE6440-2AD31-5DA1	**3NA3820**	**3NE1817-0**	**3RV1042-4KA10**
	18.5	25	6SE6440-2AD31-8DA1	**3NA3822**	**3NE1818-0**	
	22	30	6SE6440-2AD32-2DA1	**3NA3824**	**3NE1820-0**	**3RV1042-4MA10**
	30	40	6SE6440-2AD33-0EA1	**3NA3830**	**3NE1021-0**	**3VL1712-.DD33-....**
	37	50	6SE6440-2AD33-7EA1	**3NA3832**	**3NE1022-0**	**3VL1716-.DD33-....**
	45	60	6SE6440-2AD34-5FA1	**3NA3836**	**3NE1224-0**	**3VL3720-.DC36-....**
	55	75	6SE6440-2AD35-5FA1	**3NA3140**	**3NE1225-0**	**3VL3725-.DC36-....**
	75	100	6SE6440-2AD37-5FA1	**3NA3144**	**3NE1227-0**	**3VL4731-.DC36-....**

● Use in America requires UL-listed fuses such as the Class NON/NOS range from Bussmann.

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Overview

Basic Operator Panel (BOP)

With the BOP, individual parameter settings can be made. Values and units are shown on a 5-digit display.

Basic Operator Panel (BOP)

A BOP can be used for several inverters. It can be directly mounted on the inverter or in a control cabinet door using a mounting kit.

Advanced Operator Panel (AOP)

The AOP enables MICROMASTER 440 parameter kits to be easily read and modified. In contrast to the BOP, the value and meaning of the parameters can be directly displayed as plain text in several languages by fast scrolling of the address.

Advanced Operator Panel (AOP)

The AOP is directly plugged into the inverter, or communicates with the latter through a door mounting kit. Together with the "AOP door mounting kit for multiple inverters", the AOP permits bus communication with up to 30 inverters at a transmission rate of 38 kbaud. (RS485, USS).

For servicing purposes, the AOP furthermore supports the download and upread of complete parameter kits.

Asian Advanced Operator Panel (AAOP)

The AAOP is the Chinese version of the AOP operator panel. It has an enhanced display and supports the operating languages of Chinese (simplified) and English.

Asian Advanced Operator Panel (AAOP)

Cyrillic Advanced Operator Panel (CAOP)

The CAOP is the Cyrillic version of the AOP Advanced Operator Panel. It supports the Cyrillic, German and English operator languages.

PROFIBUS module

For a complete PROFIBUS connection with up to ≤ 12 Mbaud. Remote control of the inverter is possible with the PROFIBUS module. Remote control and operation at the inverter can be combined using an operator panel plugged onto the PROFIBUS module. The PROFIBUS module can be supplied by an external 24 V DC power supply and is thus also active when the inverter is disconnected from the power supply.

Connection by means of a 9-pin Sub-D connector (available as an option).

DeviceNet module

For networking the inverters to the DeviceNet fieldbus system widely used on the American market. A maximum transmission rate of 500 kbaud is possible. Remote control of the inverter is possible with the DeviceNet module. Remote control and operation at the inverter can be combined using an operator panel plugged onto the DeviceNet module.

The connection to the DeviceNet bus system is made using a 5-pin connector with terminal strip.

CANopen module

Using the CANopen communications module, an inverter can be linked to the CANopen fieldbus system and remote control is then possible.

Remote control and operation at the inverter can be combined using an operator panel plugged onto the CANopen module.

The module is connected to the bus system through a 9-pin Sub-D connector.

Pulse encoder evaluation module

The pulse encoder evaluation module permits direct connection of the most widely encountered digital pulse encoders to the inverter.

They offer the following functions:

- Zero speed at full load torque
- Extremely accurate speed control
- Increased dynamic response of speed and torque control.

This module can be used with HTL and TTL pulse encoders (High voltage Transistor Logic, 24 V and Transistor Logic, 5 V).

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Options
Variant independent options

Overview (continued)

Connection kit for PC to inverter

For controlling an inverter directly from a PC if the appropriate software has been installed (e.g. STARTER). Isolated RS-232 adapter module for reliable point-to-point connection to a PC. Includes a Sub-D connector and an RS-232 standard cable (3 m).

Connection kit for PC to AOP

For connecting a PC to an AOP or AAOP. Offline programming of inverters and archiving of parameter kits possible. Includes a desktop attachment kit for an AOP or AAOP, an RS-232 standard cable (3 m) with Sub-D connectors and a universal power supply unit.

Operator panel door mounting kit for single inverter

For mounting an operator panel in a control cabinet door. Degree of protection IP56. Contains a cable adapter module with screwless terminals for use with user's own RS-232 cables [1]).

AOP door mounting kit for multiple inverters (USS)

For mounting an AOP or AAOP in a control cabinet door. Degree of protection IP56. The AOP or AAOP can communicate with several inverters by means of the RS-485 USS protocol. The 4-pin connecting cable from the AOP or AAOP to the RS-485 terminals of the inverter and to the 24 V user terminal strip is not included [2]).

Start-up tools

- STARTER
  Starter is graphic start-up software for guided start-up for MICROMASTER 410/420/430/440 frequency inverters under Windows 2000/XP Professional. Parameter lists can be read out, altered, stored, entered and printed.
- DriveMonitor
  is a start-up software for list-oriented programming of frequency inverters. This program executes under Windows 98/NT/2000/ME/XP Professional.

Both programs are included on the Docu DVD which is provided with every inverter.

Selection and ordering data

The options listed here are suitable for all MICROMASTER 440 inverters.

Options	Order No.	
Basic Operator Panel (BOP)	**6SE6400-0BP00-0AA0**	
Advanced Operator Panel (AOP)	**6SE6400-0AP00-0AA1**	
Asian Advanced Operator Panel (AAOP)	**6SE6400-0AP00-0AB0**	
Cyrillic Advanced Operator Panel (CAOP)	**6SE6400-0AP00-0CA0**	
PROFIBUS module	**6SE6400-1PB00-0AA0**	
DeviceNet module	**6SE6400-1DN00-0AA0**	
CANopen module	**6SE6400-1CB00-0AA0**	
Pulse encoder evaluation module	**6SE6400-0EN00-0AA0**	
RS485/PROFIBUS bus connector	**6GK1500-0FC00**	
Connection kit for PC to inverter	**6SE6400-1PC00-0AA0**	
Connection kit for PC to AOP	**6SE6400-0PA00-0AA0**	
Operator panel door mounting kit for single inverter	**6SE6400-0PM00-0AA0**	
AOP door mounting kit for multiple inverters (USS)	**6SE6400-0MD00-0AA0**	
Start-up tool STARTER on DVD	**6SL3072-0AA00-0AG0**	Available on the Internet at: http://support.automation.siemens.com/WW/view/en/10804985/133100

1) A shielded cable of type Belden 8132 (28 AWG) is recommended. The maximum cable length is 5 m for RS-232.

2) A shielded cable of type Belden 8132 (28 AWG) is recommended. The maximum cable length is 10 m for RS-485.

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Technical data

		PROFIBUS module 6SE6400-1PB00-0AA0	DeviceNet module 6SE6400-1DN00-0AA0
Size (height x width x depth)		161 mm x 73 mm x 46 mm	
Degree of protection		IP20	
Degree of pollution		2 to IEC 60 664-1 (DIN VDE 0110/T1), no condensation permitted during operation	
Strain resistance • Stationary • Transport	 Deflection Acceleration Deflection Acceleration	to IEC 60 068-2-6 (if module is installed correctly) 0.15 mm in the frequency range of 10 Hz to 58 Hz 19.6 m/s^2 in the frequency range of 58 Hz to 500 Hz 3.5 mm in the frequency range of 5 Hz to 9 Hz 9.8 m/s^2 in the frequency range of 9 Hz to 500 Hz	
Climatic category (during operation)		3K3 to IEC 60 721-3-3	
Cooling method		Natural air cooling	
Permissible ambient or cooling agent temperature • Operation • Storage and transport		 –10 °C to +50 °C (+14 °F to +122 °F) –25 °C to +70 °C (–13 °F to +158 °F)	
Relative humidity (permissible humidity rating) • Operation • Storage and transport		 ≤ 85 % (non-condensing) ≤ 95 %	
Electromagnetic compatibility	Emission Interference	to EN 55 011 (1991) Class A to IEC 60 801-3 and EN 61 000-4-3	
Power supply		6.5 V ± 5 %, max. 300 mA, internal from inverter or 24 V ± 10 %, max. 350 mA, external	6.5 V ± 5 %, max. 300 mA internal from inverter or 24 V, max. 60 mA from DeviceNet-Bus
Output voltage		5 V ± 10 %, max. 100 mA, galvanically isolated supply • for terminating the serial interface bus or • for supplying the OLP (Optical Link Plug)	–
Data transmission rate		max. 12 Mbaud	125, 250 and 500 Kbaud

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Options
Variant independent options

Technical data (continued)

		CANopen module 6SE6400-1CB00-0AA0	Pulse encoder evaluation module 6SE6400-0EN00-0AA0
Size (height x width x depth)		161 mm x 73 mm x 46 mm	161 mm x 73 mm x 42 mm
Degree of protection		IP20	
Degree of pollution		2 to IEC 60664-1 (DIN VDE 0110/T1), no condensation permitted during operation	
Strain resistance • Stationary • Transport	 Deflection Acceleration Deflection Acceleration	to IEC 60068-2-6 (if module is installed correctly) 0.15 mm in the frequency range of 10 Hz to 58 Hz 19.6 m/s^2 in the frequency range of 58 Hz to 500 Hz 3.5 mm in the frequency range of 5 Hz to 9 Hz 9.8 m/s^2 in the frequency range of 9 Hz to 500 Hz	
Climatic category (during operation)		3K3 to IEC 60721-3-3	
Cooling method		Natural air cooling	
Permissible ambient or cooling agent temperature • Operation • Storage • Transportation		 –10 °C to +50 °C (+14 °F to +122 °F) –40 °C to +70 °C (–40 °F to +158 °F) –25 °C to +70 °C (–13 °F to +158 °F)	 –10 °C to +50 °C (+14 °F to +122 °F) –20 °C to +70 °C (–14 °F to +158 °F) –20 °C to +70 °C (–14 °F to +158 °F)
Electromagnetic compatibility	Emission Interference	to EN 55011 (1991) Class A to IEC 60801-3 and EN 61000-4-3	
Relative humidity (permissible humidity rating) • Operation • Storage and transport		 ≤ 85 % (non-condensing) ≤ 95 %	
Power supply		The CAN bus is supplied from the inverter power supply	5 V ± 5 %, 330 mA or 18 V non-regulated, 140 mA, short-circuit proof
Data transmission rate		10, 20, 50, 125, 250, 500, 800 kbaud and 1 Mbaud	–
Pulse frequency		–	max. 300 kHz

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Selection and ordering data

Type of documentation	Language	Order No.
Docu pack, supplied with each inverter, containing DVD [1]) and Getting Started Guide [2]) (paper version)	Multilanguage	**6SE6400-5AD00-1AP1**
Operating instructions (paper version)	German, English, French, Italian, Spanish	
	Available as pdf file on the Internet at http://support.automation.siemens.com/WW/view/en/10804926/133300	
Parameter list (paper version)	German, English, French, Italian, Spanish	
	Available as pdf file on the Internet at http://support.automation.siemens.com/WW/view/en/10804926/133300	

1) The DVD contains operating instructions, parameter list, commissioning tools STARTER and DriveMonitor, multilanguage.

Available on the Internet: DriveMonitor at http://support.automation.siemens.com/WW/view/en/10804984/133100

STARTER at http://support.automation.siemens.com/WW/view/en/10804985/133100

2) Available on the Internet at http://support.automation.siemens.com/WW/view/en/10804926/133300

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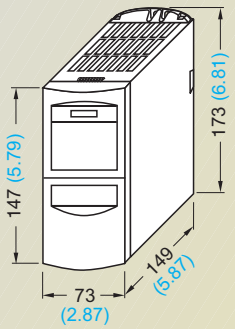
Dimension drawings

MICROMASTER 440 inverter

Frame size	1/3 AC 200 V to 240 V	3 AC 380 V to 480 V	3 AC 500 V to 600 V
A	0.12 kW to 0.75 kW	0.37 kW to 1.5 kW	–
B	1.1 kW to 2.2 kW	2.2 kW to 4 kW	–
C	3 kW to 5.5 kW	5.5 kW to 11 kW	0.75 kW to 11 kW

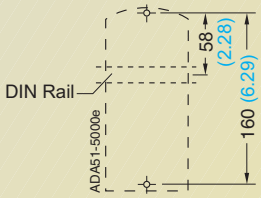
The specified outputs are valid for CT mode.

Note:
The inverters must not be mounted horizontally. But the inverters can be mounted without lateral spacing.

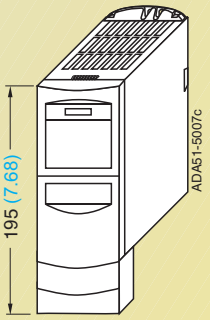


Inverter frame size **A**

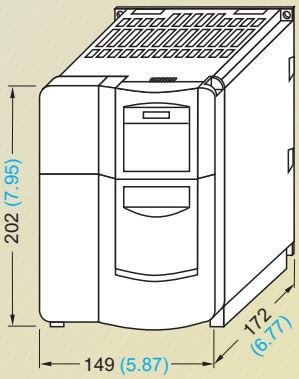
Drill and fixing pattern



Fixing with 2 x M4 bolts, 2 x M4 nuts, 2 x M4 washers
or by snapping onto a rail
Tightening torque with washers fitted: 2.5 Nm
Ventilation clearance required
Top and bottom: 100 mm

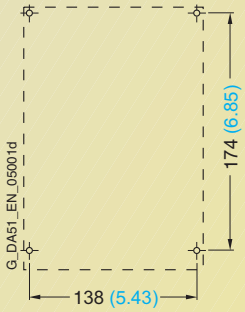


Inverter frame size **A** with **gland plate**

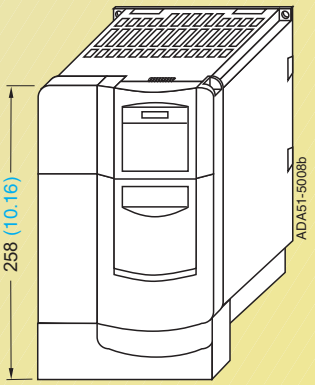


Inverter frame size **B**

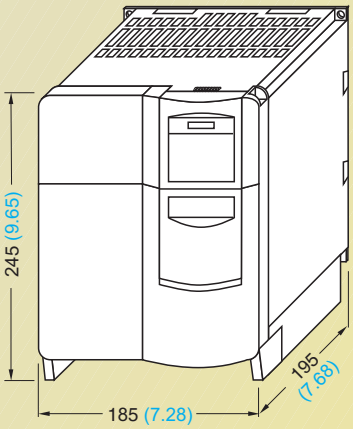
Drill pattern



Fixing with 4 x M4 bolts, 4 x M4 nuts, 4 x M4 washers
Tightening torque with washers fitted: 2.5 Nm
Ventilation clearance required
Top and bottom: 100 mm

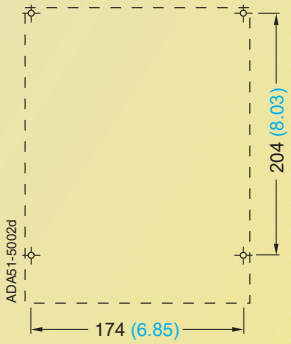


Inverter frame size **B** with **gland plate**

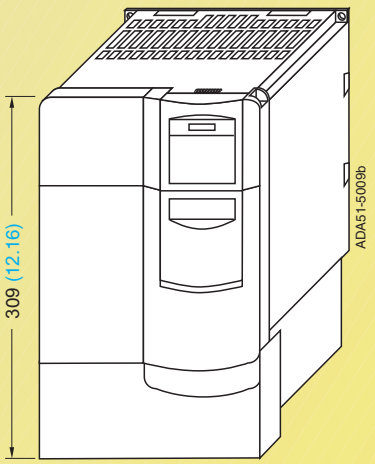


Inverter frame size **C**

Drill pattern



Fixing with 4 x M5 bolts, 4 x M5 nuts, 4 x M5 washers
Tightening torque with washers fitted: 3.0 Nm
Ventilation clearance required
Top and bottom: 100 mm



Inverter frame size **C** with **gland plate**

With the communications module, the mounting depth increases by 23 mm (0.91 inches). If a pulse encoder evaluation module is mounted in addition, the installation depth increases by another 23 mm (0.91 inches).

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

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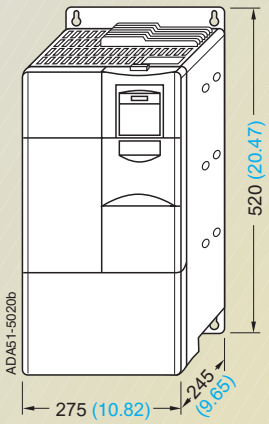
MICROMASTER 440 inverter (continued)

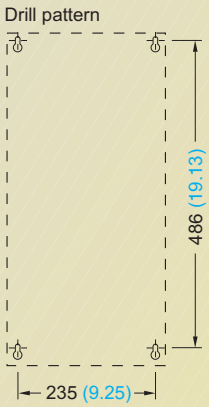
Frame size	3 AC 200 V to 240 V	3 AC 380 V to 480 V	3 AC 500 V to 600 V
D	7.5 kW to 15 kW	15 kW to 22 kW	15 kW to 22 kW
E	18.5 kW to 22 kW	30 kW to 37 kW	30 kW to 37 kW
F	30 kW to 45 kW	45 kW to 75 kW	45 kW to 75 kW

The specified outputs are valid for CT mode.

Note:
The inverters must not be mounted horizontally. But the inverters can be mounted without lateral spacing.

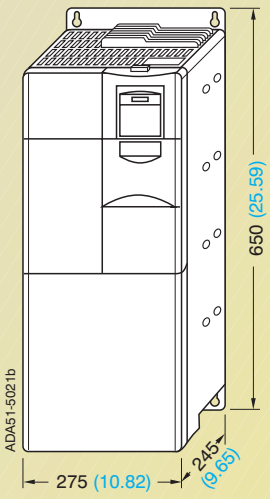


Inverter frame size **D**

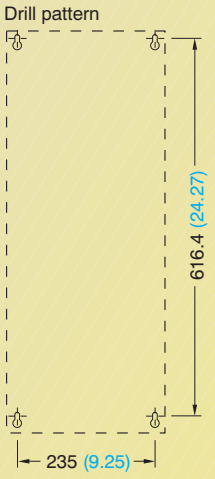


Fixing with
4 x M8 bolts, 4 x M8 nuts,
4 x M8 washers

Tightening torque with washers fitted: 13 Nm
Ventilation clearance required
Top and bottom: 300 mm

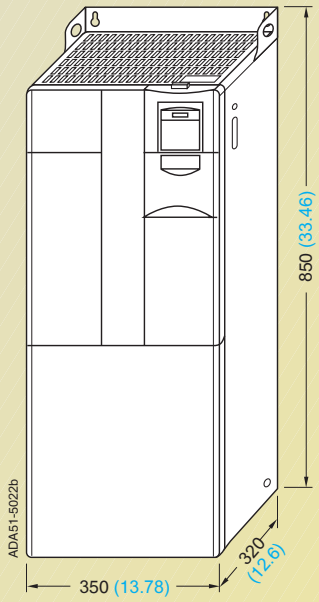


Inverter frame size **E**

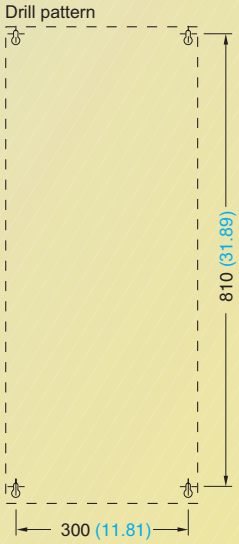


Fixing with
4 x M8 bolts, 4 x M8 nuts,
4 x M8 washers

Tightening torque with washers fitted: 13 Nm
Ventilation clearance required
Top and bottom: 300 mm

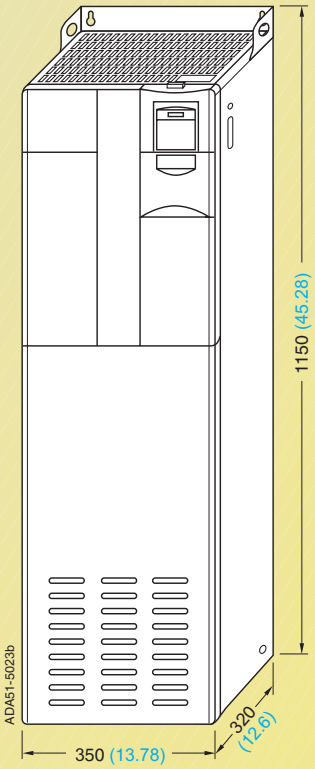


Inverter frame size **F**
without filter

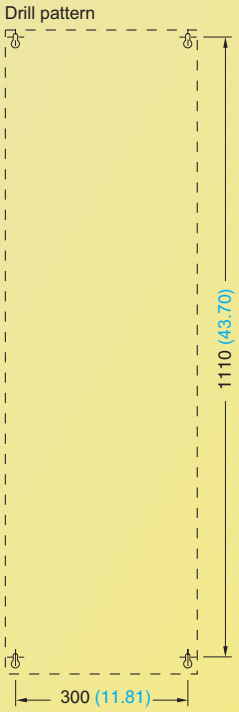


Fixing with
4 x M8 bolts, 4 x M8 nuts,
4 x M8 washers

Tightening torque with washers fitted: 13 Nm
Ventilation clearance required
Top and bottom: 350 mm



Inverter frame size **F**
with filter



Fixing with
4 x M8 bolts, 4 x M8 nuts,
4 x M8 washers

Tightening torque with washers fitted: 13 Nm
Ventilation clearance required
Top and bottom: 350 mm

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

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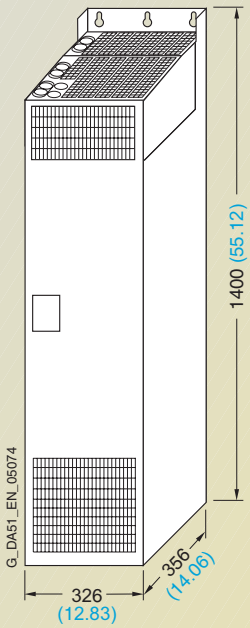
Dimension drawings

MICROMASTER 440 inverter (continued)

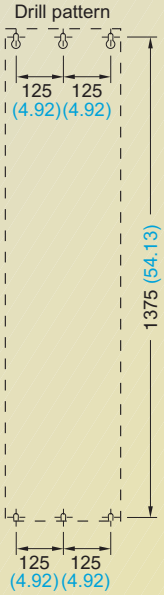
Frame size	3 AC 380 V to 480 V
FX	90 kW to 110 kW
GX	132 kW to 200 kW

The specified outputs are valid for CT mode.

Note:
The inverters must not be mounted horizontally. But the inverters can be mounted without lateral spacing.



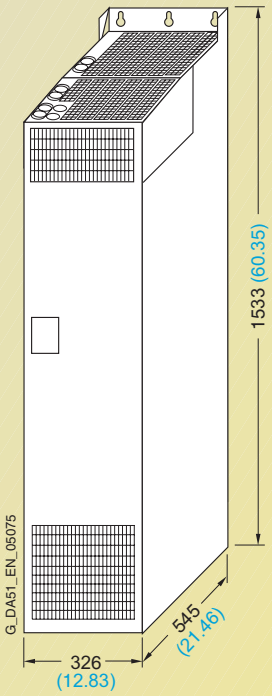
Inverter frame size **FX**



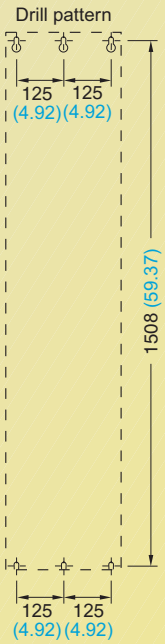
Fixing with
6 x M8 bolts
6 x M8 nuts
6 x M8 washers

Tightening torque with washers fitted: 13.0 Nm

Ventilation clearance required:
at top: 250 mm
at bottom: 150 mm
in front: 40 mm



Inverter frame size **GX**



Fixing with
6 x M8 bolts
6 x M8 nuts
6 x M8 washers

Tightening torque with washers fitted: 13.0 Nm

Ventilation clearance required:
at top: 250 mm
at bottom: 150 mm
in front: 50 mm

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

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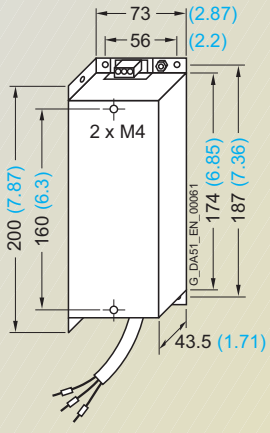
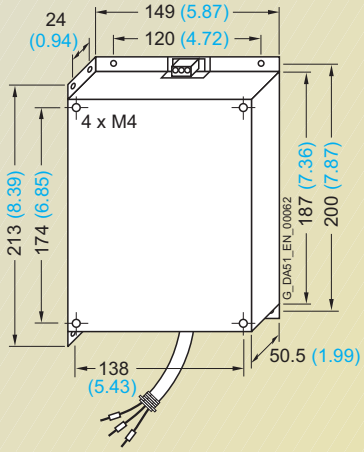
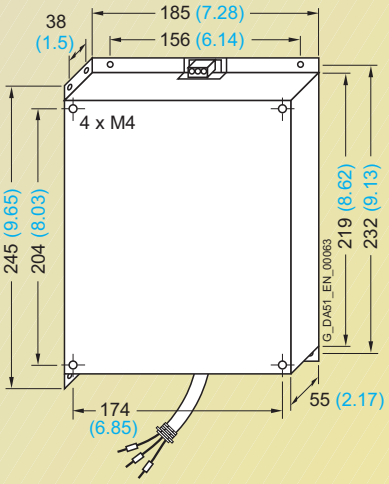
EMC filter



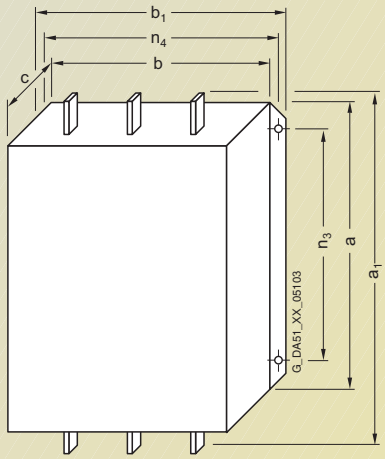
EMC filter for frame size **A**



For frame size **B**



For frame size **C**



EMC filter Class A Type 6SL3000-	for inverter Frame size (FS)	Dimensions a	a_1	b	b_1	c	n_3	n_4	Weight, approx kg
0BE32-5AA0	**FX**	270 (10.63)	360 (14.17)	200 (7.87)	240 (9.45)	116 (4.57)	210 (8.27)	220 (8.66)	12.3
0BE34-4AA0	**GX/GX**	270 (10.63)	360 (14.17)	200 (7.87)	240 (9.45)	116 (4.57)	210 (8.27)	220 (8.66)	12.3
0BE36-0AA0	**GX**	310 (12.2)	400 (15.75)	215 (8.46)	265 (10.43)	140 (5.51)	250 (9.84)	240 (9.45)	19.0

EMC filter for frame sizes **FX and GX**

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

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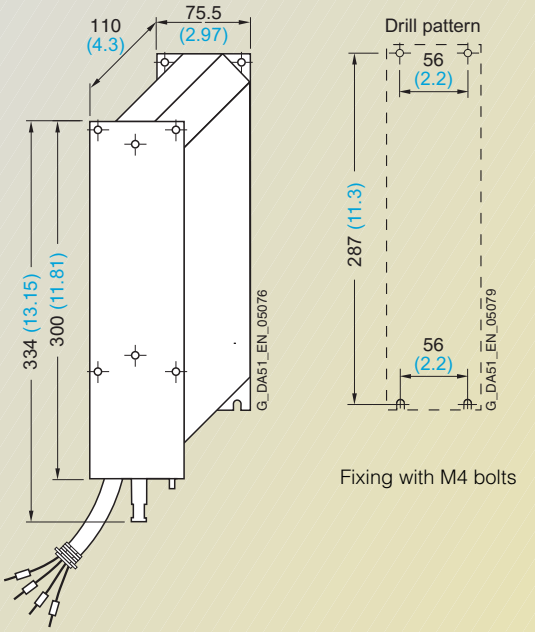
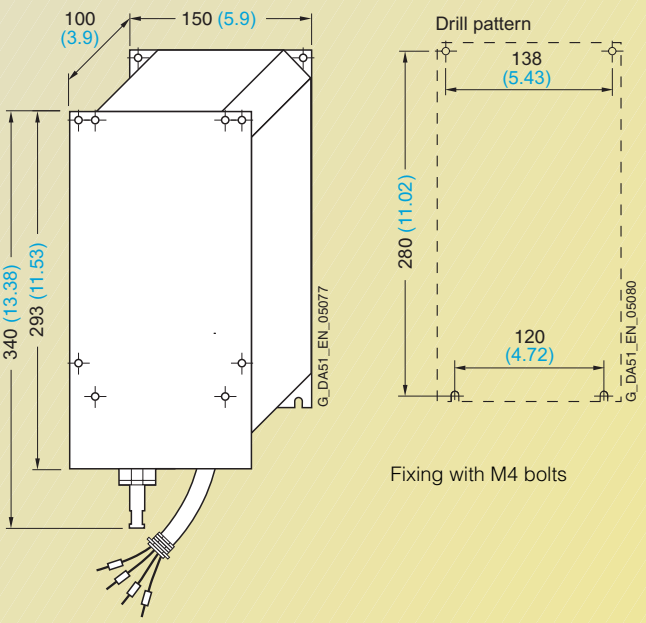
Dimension drawings

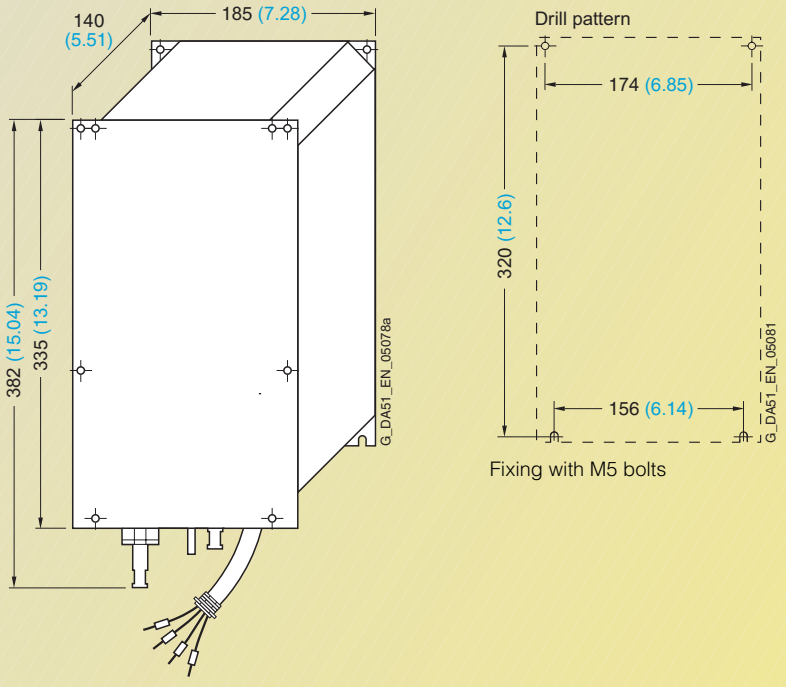
LC filter



LC filter for frame size **A**



For frame size **B**



LC filter for frame size **C**

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

4

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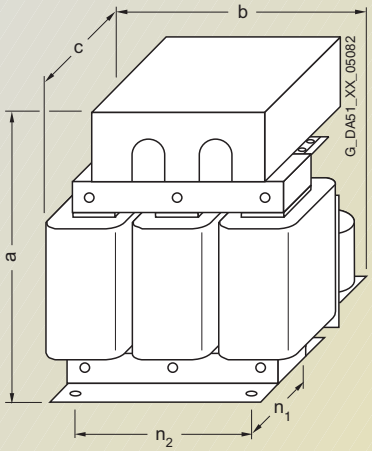
LC filter



Fixing with M10 bolts

LC filter for frame sizes **D** to **F**

LC filter Type	for inverter Frame size (FS)	Dimensions					Weight, approx
		a	b	c	n_1	n_2	kg
6SE6400-3TD03-7DD0	**D**	278 (10.94)	240 (9.45)	230 (9.06)	115 (4.53)	190 (7.48)	21.0
6SE6400-3TD04-8DD0	**D**	290 (11.42)	240 (9.45)	240 (9.45)	125 (4.92)	190 (7.48)	26.0
6SE6400-3TD06-1DD0	**D**	345 (13.58)	300 (11.81)	220 (8.66)	120 (4.72)	240 (9.45)	34.0
6SE6400-3TD02-3DE0	**D**	280 (11.02)	240 (9.45)	240 (9.45)	125 (4.92)	190 (7.48)	26.1
6SE6400-3TD03-2DE0	**D**	300 (11.81)	300 (11.81)	235 (9.25)	133 (5.24)	240 (9.45)	39.5
6SE6400-3TD03-7DE0	**D**	310 (12.2)	300 (11.81)	250 (9.84)	145 (5.71)	240 (9.45)	42.0
6SE6400-3TD07-2ED0	**E**	355 (13.98)	300 (11.81)	235 (9.25)	145 (5.71)	240 (9.45)	49.5
6SE6400-3TD04-8EE0	**E**	345 (13.58)	300 (11.81)	260 (10.24)	160 (6.3)	240 (9.45)	48.5
6SE6400-3TD06-1EE0	**E**	345 (13.58)	300 (11.81)	275 (10.83)	171 (6.73)	240 (9.45)	57.5
6SE6400-3TD11-5FD0	**E/F**	460 (18.11)	360 (14.17)	235 (9.25)	125 (4.92)	264 (10.39)	67.0
6SE6400-3TD15-0FD0	**F**	460 (18.11)	360 (14.17)	250 (9.84)	140 (5.51)	264 (10.39)	75.0
6SE6400-3TD18-0FD0	**F**	520 (20.47)	420 (16.54)	290 (11.42)	173 (6.81)	316 (12.44)	77.5
6SE6400-3TD07-1FE0	**F**	380 (14.96)	300 (11.81)	285 (11.22)	171 (6.73)	240 (9.45)	70.5
6SE6400-3TD10-0FE0	**F**	460 (18.11)	360 (14.17)	250 (9.84)	140 (5.11)	264 (10.39)	70.5
6SE6400-3TD11-5FE0	**F**	515 (20.28)	420 (16.54)	290 (11.42)	173 (6.81)	316 (12.44)	125.5

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

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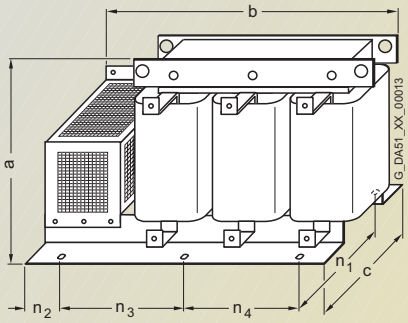
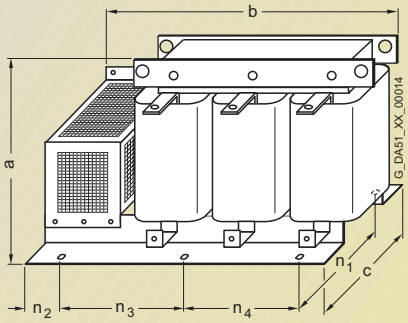
Dimension drawings

Sinusoidal filter



Sinusoidal filter for frame sizes **FX** and **GX**

Sinusoidal filter Type 6SL3000-	for inverter Frame size (FS)	Dimensions							Weight (max.)
		a	b	c	n_1	n_2	n_3	n_4	kg
2CE32-3AA0	**FX**	300 (11.81)	620 (24.41)	320 (12.6)	280 (11.02)	105 (4.13)	225 (8.86)	150 (5.91)	135.0
2CE32-8AA0	**GX**	300 (11.81)	620 (24.41)	320 (12.6)	280 (11.02)	105 (4.13)	225 (8.86)	150 (5.91)	138.0



Sinusoidal filter for frame size **GX**

Sinusoidal filter Type 6SL3000-	for inverter Frame size (FS)	Dimensions							Weight (max.)
		a	b	c	n_1	n_2	n_3	n_4	kg
2CE33-3AA0	**GX**	370 (14.57)	620 (24.41)	360 (14.17)	320 (12.6)	105 (4.13)	225 (8.86)	150 (5.91)	144.0
2CE34-1AA0	**GX**	370 (14.57)	620 (24.41)	360 (14.17)	320 (12.6)	105 (4.13)	225 (8.86)	150 (5.91)	208.0

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

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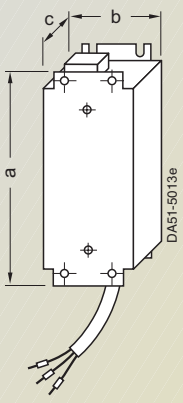
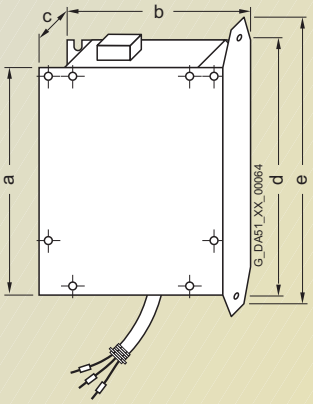
Line commutating chokes

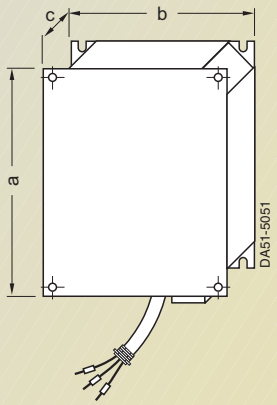


Line commutating choke for frame size **A**



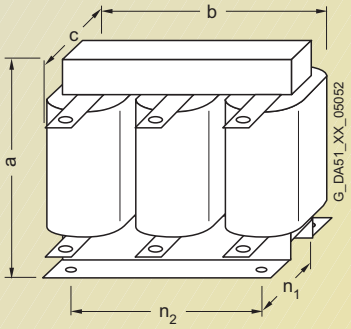
For frame sizes **B** and **C**

Line commutating choke for	Dimensions a	b	c	d	e	Weight (max.) kg
Frame size **A**	200 (7.87)	75.5 (2.97)	50 (1.97)	–	–	1.4
Frame size **B**	213 (8.39)	150 (5.91)	50 (1.97)	220 (8.66)	233 (9.17)	2.2
Frame size **C** (380–480 V)	245 (9.65)	185 (7.28)	50 (1.97)	264 (10.39)	280 (11.02)	5.1
Frame size **C** (500–600 V, 0.75–1.5 kW)	245 (9.65)	185 (7.28)	50 (1.97)	264 (10.39)	280 (11.02)	3.8
Frame size **C** (500–600 V, 2.2–4 kW)	245 (9.65)	185 (7.28)	50 (1.97)	264 (10.39)	280 (11.02)	4.0
Frame size **C** (500–600 V, 5.5–11 kW)	245 (9.65)	185 (7.28)	80 (3.15)	264 (10.39)	280 (11.02)	8.0



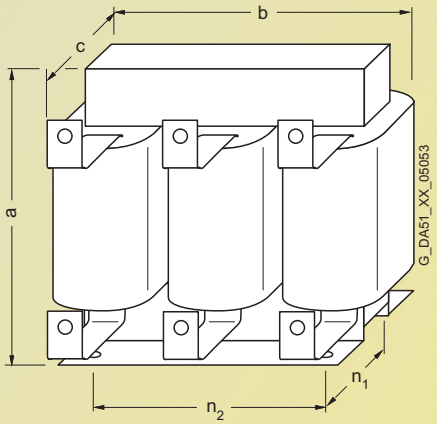
Line commutating choke for frame sizes **D** and **E**

Line commutating choke for	Dimensions a	b	c	Weight (max.) kg
Frame size **D**	520 (20.47)	275 (10.83)	85 (3.35)	9.5
Frame size **E**	650 (25.59)	275 (10.83)	95 (3.74)	17.0



Line commutating choke for inverter frame size **F**

Line commutating choke Type 6SE6400-	for inverter Frame size (FS)	Dimensions a	b	c	n_1	n_2	Weight (max.) kg
3CC11-....	**F**	228 (8.98)	240 (9.45)	141 (5.55)	95 (3.74)	185 (7.28)	25.0



Line commutating choke for inverters of frame sizes **FX** and **GX**

Line commutating choke Type 6SL3000-	for inverter Frame size (FS)	Dimensions a	b	c	n_1	n_2	Weight (max.) kg
0CE32-....	**FX**	248 (9.76)	255 (10.04)	203 (7.99)	101 (3.98)	200 (7.87)	24.0
0CE33-....	**GX**	248 (9.76)	255 (10.04)	203 (7.99)	101 (3.98)	200 (7.87)	25.0
0CE35-....	**GX**	269 (10.59)	275 (10.83)	210 (8.27)	118 (4.65)	224 (8.82)	35.0

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

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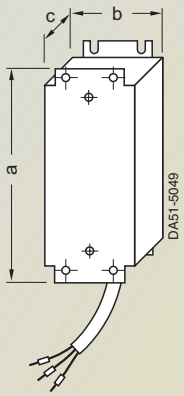
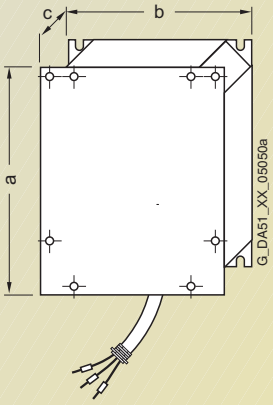
Dimension drawings

Output chokes

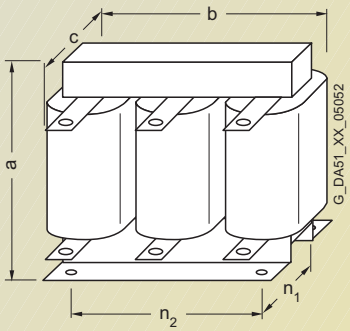


Output choke
for frame size **A**
6SE6400-3TC00-4AD2
6SE6400-3TC00-4AD3



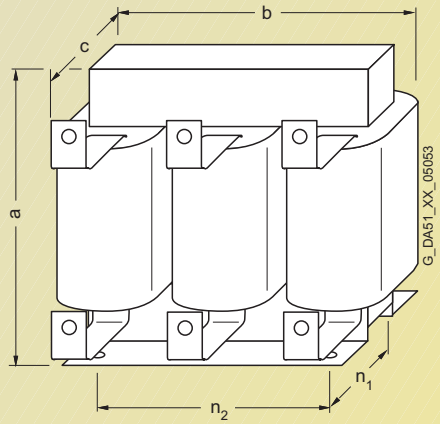
For frame sizes **B** and **C**
6SE6400-3TC01-0BD3
6SE6400-3TC01-8CE3
6SE6400-3TC03-2CD3

Output choke Type 6SE6400-	Dimensions			Weight (max.)
	a	b	c	kg
3TC00-4AD2	200 (7.87)	75.5 (2.97)	110 (4.33)	1.9
3TC00-4AD3	200 (7.87)	75.5 (2.97)	50 (1.97)	1.3
3TC01-0BD3	213 (8.39)	150 (5.91)	80 (3.15)	4.1
3TC01-8CE3	245 (9.65)	185 (7.28)	110 (4.33)	10.8
3TC03-2CD3	245 (9.65)	185 (7.28)	80 (3.15)	6.6



Output chokes
for inverters of frame sizes **D**, **E** and **F**

Output choke Type 6SE6400-	for inverter Frame size (FS)	Dimensions			to DIN 41 308		Weight (max.)
		a	b	c	n_1	n_2	kg
3TC03-2DE0	**D**	210 (8.27)	225 (8.86)	179 (7.05)	94 (3.70)	176 (6.93)	16.0
3TC03-8DD0	**D**	210 (8.27)	225 (8.86)	179 (7.05)	94 (3.70)	176 (6.93)	16.1
3TC05-4DD0	**D**	210 (8.27)	225 (8.86)	150 (5.91)	70 (2.76)	176 (6.93)	10.7
3TC06-2FE0	**F**	269 (10.59)	300 (11.81)	220 (8.66)	118 (4.65)	224 (8.82)	33.9
3TC07-5ED0	**E**	248 (9.76)	270 (10.63)	209 (8.23)	101 (3.98)	200 (7.87)	24.9
3TC08-0ED0	**E**	210 (8.27)	225 (8.86)	150 (5.91)	70 (2.76)	176 (6.93)	10.4
3TC08-8FE0	**F**	321 (12.64)	350 (13.78)	288 (11.34)	138 (5.43)	264 (10.39)	51.5
3TC14-5FD0	**F**	321 (12.64)	350 (13.78)	288 (11.34)	138 (5.43)	264 (10.39)	51.5
3TC15-4FD0	**F**	248 (9.76)	270 (10.63)	209 (8.23)	101 (3.98)	200 (7.87)	24.0



Output chokes
for inverters of frame sizes **FX** and **GX**

Output choke Type 6SL3000-	for inverter Frame size (FS)	Dimensions					Weight (max.)
		a	b	c	n_1	n_2	kg
2BE32-1AA0	**FX**	285 (11.22)	300 (11.81)	257 (10.12)	163 (6.42)	224 (8.82)	60.0
2BE32-6AA0	**FX**	315 (12.4)	300 (11.81)	277 (10.91)	183 (7.2)	224 (8.82)	66.0
2BE33-2AA0	**GX**	285 (11.22)	300 (11.81)	257 (10.12)	163 (6.42)	224 (8.82)	62.0
2BE33-8AA0	**GX**	285 (11.22)	300 (11.81)	277 (10.91)	183 (7.2)	224 (8.82)	73.0
2BE35-0AA0	**GX**	365 (14.37)	300 (11.81)	277 (10.91)	183 (7.2)	224 (8.82)	100.0

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

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Brake resistors

Fig. 1:

Frame sizes A, B
Frame sizes C, D, E, F

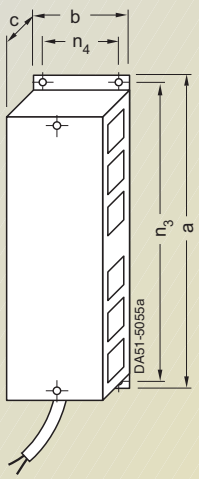


Fig. 2:

Fastening hole: circular hole Ø 5.2 mm
Fastening hole: slotted hole 6 x 12 mm or circular hole Ø 6.5 mm

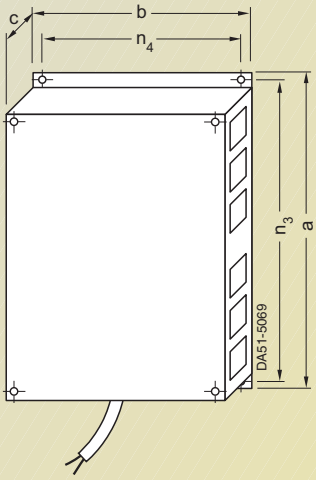
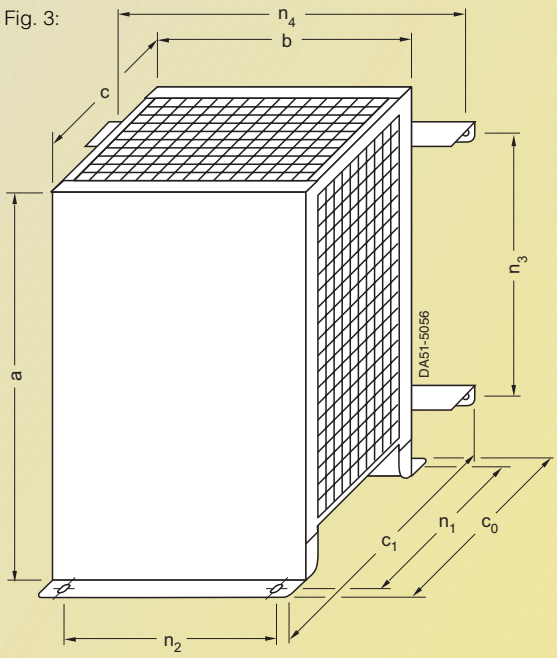


Fig. 3:



Brake resistors Type 6SE6400-	Resistor Ohm	for inverter Frame size (FS)	Figure No.	Dimensions a	b	c	c_0	c_1	For floor mounting n_1	n_2	For wall mounting n_3	n_4	Weight (max.) kg
4BC05-0AA0	180	**A**	1	230 (9.06)	72 (2.83)	43.5 (1.71)	–	–	–	–	217 (8.54)	56 (2.20)	1.0
4BC11-2BA0	68	**B**	2	239 (9.41)	149 (5.87)	43.5 (1.71)	–	–	–	–	226 (8.90)	133 (5.24)	1.6
4BC12-5CA0	39	**C**	3	285 (11.22)	185 (7.28)	150 (5.91)	185 (7.28)	217 (8.54)	170 (6.69)	145 (5.71)	200 (7.87)	230 (9.06)	3.8
4BC13-0CA0	27	**C**	3	285 (11.22)	185 (7.28)	150 (5.91)	185 (7.28)	217 (8.54)	170 (6.69)	145 (5.71)	200 (7.87)	230 (9.06)	3.8
4BC18-0DA0	10	**D**	3	515 (20.28)	270 (10.63)	175 (6.89)	210 (8.27)	242 (9.53)	195 (7.68)	205 (8.07)	350 (13.78)	315 (12.40)	7.4
4BC21-2EA0	6.8	**E**	3	645 (25.39)	270 (10.63)	175 (6.89)	210 (8.27)	242 (9.53)	195 (7.68)	205 (8.07)	480 (18.90)	315 (12.40)	10.6
4BC22-5FA0	3.3	**F**	3	650 (25.59)	395 (15.55)	315 (12.40)	350 (13.78)	382 (15.04)	335 (13.19)	270 (10.63)	510 (20.08)	435 (17.13)	16.7
4BD11-0AA0	390	**A**	1	230 (9.06)	72 (2.83)	43.5 (1.71)	–	–	–	–	217 (8.54)	56 (2.20)	1.0
4BD12-0BA0	160	**B**	2	239 (9.41)	149 (5.87)	43.5 (1.71)	–	–	–	–	226 (8.90)	133 (5.24)	1.6
4BD16-5CA0	56	**C**	3	285 (11.22)	185 (7.28)	150 (5.91)	185 (7.28)	217 (8.54)	170 (6.69)	145 (5.71)	200 (7.87)	230 (9.06)	3.8
4BD21-2DA0	27	**D**	3	515 (20.28)	270 (10.63)	175 (6.89)	210 (8.27)	242 (9.53)	195 (7.68)	205 (8.07)	350 (13.78)	315 (12.40)	7.4
4BD22-2EA0	15	**E**	3	645 (25.39)	270 (10.63)	175 (6.89)	210 (8.27)	242 (9.53)	195 (7.68)	205 (8.07)	480 (18.90)	315 (12.40)	10.6
4BD24-0FA0	8.2	**F**	3	650 (25.59)	395 (15.55)	315 (12.40)	350 (13.78)	382 (15.04)	335 (13.19)	270 (10.63)	510 (20.08)	435 (17.13)	16.7
4BE14-5CA0	120	**C**	3	285 (11.22)	185 (7.28)	150 (5.91)	185 (7.28)	217 (8.54)	170 (6.69)	145 (5.71)	200 (7.87)	230 (9.06)	3.8
4BE16-5CA0	82	**C**	3	285 (11.22)	185 (7.28)	150 (5.91)	185 (7.28)	217 (8.54)	170 (6.69)	145 (5.71)	200 (7.87)	230 (9.06)	3.8
4BE21-3DA0	39	**D**	3	515 (20.28)	270 (10.63)	175 (6.89)	210 (8.27)	242 (9.53)	195 (7.68)	205 (8.07)	350 (13.78)	315 (12.40)	7.4
4BE21-8EA0	27	**E**	3	645 (25.39)	270 (10.63)	175 (6.89)	210 (8.27)	242 (9.53)	195 (7.68)	205 (8.07)	480 (18.90)	315 (12.40)	10.6
4BE24-2FA0	12	**F**	3	650 (25.59)	395 (15.55)	315 (12.40)	350 (13.78)	382 (15.04)	335 (13.19)	270 (10.63)	510 (20.08)	435 (17.13)	16.7

Brake resistors for inverters of frame sizes **A** to **F**

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

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Notes

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MICROMASTER 420/430/440

Appendix

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Appendix

Environment, resources and recycling

Siemens AG feels a responsibility to play a role in protecting our environment and saving our valuable natural resources. This is true for both our production and our products.

Even during development, we consider any possible environmental impact of future products/systems. Our aim is to prevent harmful environmental effects or at least to reduce them to an absolute minimum – beyond present regulations and legislation.

The most important activities for protecting our environment are as follows:

- We are constantly endeavoring to reduce the environmental impact of our products as well as their consumption of energy and resources over and above the statutory environmental protection regulations.
- We take every possible step to prevent damage to the environment.
- Environmental impact is assessed and considered at the earliest possible stage of product and process planning.
- Our optimized environmental management strategy ensures that our environmental policy is put into practice effectively. The necessary technical and organizational procedures are reviewed at regular intervals and continuously updated.
- An awareness for environmental problems is expected of all our employees. Establishing and furthering a sense of responsibility for the environment on all levels represents a permanent challenge for the corporate management.
- We urge our business partners to act according to the same environmental principles as ourselves. We cooperate with the responsible public authorities.
- We inform interested members of the public about the consequences of our corporate policies for the environment as well as our achievements to the benefit of the environment.
- Our complete documentation is printed on chlorine-free bleached paper.

Certificates

IQNet

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

IQNet and
DQS GmbH Deutsche Gesellschaft zur Zertifizierung von Managementsystemen
hereby certifies that the company

Siemens AG
Automation and Drives,
Standard Drives
Frauenauracher Straße 80
91056 Erlangen

with the organizational units/sites as listed in the annex

for the scope

Design / development, production, sales / marketing and service of standard drives, customer-specific design and decentralized Drive solutions

has implemented and maintains a

Quality and Environmental Management System.

An audit, documented in a report, has verified that this management system fulfills the requirements of the following standards:

ISO 9001 : 2000 and ISO 14001 : 2004

This certificate is valid until 2008-08-24
Frankfurt am Main 2006-08-14

Registration Number: DE-000357 QM UM

Dr. Fabio Roversi, President of IQNet — *Ass. iur. M. Drechsel, S. Heinloth, Managing Directors of DQS GmbH*

IQNet Partners*:
AENOR *Spain* AFAQ AFNOR *France* AIB-Vincotte International *Belgium* ANCE *Mexico* APCER *Portugal* CISQ *Italy* CQC *China* CQM *China* CQS *Czech Republic* Cro Cert *Croatia* DQS *Germany* DS *Denmark* ELOT *Greece* FCAV *Brazil* FONDONORMA *Venezuela* HKQAA *China* ICONTEC *Colombia* IMNC *Mexico* IRAM *Argentina* JQA *Japan* KFQ *Korea* MSZT *Hungary* Nemko AS *Norway* NSAI *Ireland* PCBC *Poland* PSB Certification *Singapore* QMI *Canada* Quality Austria *Austria* RR *Russia* SAI Global *Australia* Inspecta Certification *Finland* SII *Israel* SIQ *Slovenia* SQS *Switzerland* SRAC *Romania* TEST St Petersburg *Russia* YUQS *Serbia and Montenegro*

IQNet is represented in the USA by: AFAQ AFNOR, AIB-Vincotte International, CISQ, DQS, NSAI, QMI and SAI Global

* The list of IQNet partners is valid at the time of issue of this certificate. Updated information is available under www.iqnet-certification.com

CERTIFICATE

DQS GmbH
Deutsche Gesellschaft zur Zertifizierung von Managementsystemen
hereby certifies that the company

Siemens AG
Automation and Drives,
Standard Drives
Frauenauracher Straße 80
91056 Erlangen

with the organizational units/sites as listed in the annex

for the scope

Design / development, production, sales / marketing and service of standard drives, customer-specific design and decentralized Drive solutions

has implemented and maintains a

Quality and Environmental Management System.

Audits, documented in a report, have verified that this management system fulfills the requirements of the following standards:

ISO 9001 : 2000
December 2000 edition

ISO 14001 : 2004
November 2004 edition

This certificate is valid until 2008-08-24
Certificate Registration No. 000357 QM UM
Frankfurt am Main 2006-08-14

Ass. iur. M. Drechsel — Dipl.-Ing. S. Heinloth
MANAGING DIRECTORS
D-60433 Frankfurt am Main, August-Schanz-Straße 21

TGA-ZM-02-90

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Certificates (continued)

SIEMENS

EG-Konformitätserklärung
664.20001.21

Hersteller: **Siemens AG**
Automation and Drives
Standard Drives

Anschrift: **Frauenauracherst. 80**
91056 Erlangen
Germany

Produktbezeichnung: **MICROMASTER 410 / 6SE6410-.....-.X*..**
MICROMASTER 420 / 6SE6420-.....-.X*..
MICROMASTER 430 / 6SE6430-.....-.X*..
MICROMASTER 440 / 6SE6440-.....-.X*..

*** Baugrößen A bis G**

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinie überein:

73/23/EWG Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen, geändert durch RL 93/68/EWG des Rates

Die Übereinstimmung mit den Vorschriften dieser Richtlinie wird nachgewiesen durch die Einhaltung folgender Normen:

EN 61800-5-1: 2003[1)] EN 60204-1: 1998

[1)]Abweichungen zu den Forderungen der EN 61800-5-1 sind in einem technischen Bericht zur Risikobewertung dokumentiert.

Das bezeichnete Produkt ist zum Einbau in eine andere Maschine bestimmt. Die Inbetriebnahme ist solange untersagt, bis die Konformität des Endproduktes mit der Richtlinie 98/37/EG festgestellt ist.

Erstausgabe: 30.10.2002
Erlangen, 31.07.2006

G. Bock
Head of Research and Development Drives & Motors

H.-J. Friese
Head of Quality Management

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie nach §443 BGB. Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

Legend for EC declaration of conformity:

The named product is in conformity with the requirements of the following European Directive:

73/23/EEC Council Directive on the approximation of the laws of the Member States relating to electrical equipment for use within certain voltage limits, amended by Council Directive RL 93/68/EEC

Conformity with the requirements of this Directive is testified by adherence to the following standards:

EN 61800-5-1: 2003 [1)]

The named product is intended for fitting in another machine. Commissioning is prohibited until such time as the end product has been proved to conform to the provisions of Directive 98/37/EC. This declaration certifies compliance with the Directives named above, but does not guarantee any specific properties or durability according to §443 BGB. The safety information and instructions in the supplied product documentation must be carefully observed.

1) Deviations to the requirements listed in EN 61800-5-1 must be documented in a technical report on the risk assessment.

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Compliance with standards

CE marking

CE

The MICROMASTER inverters meet the requirements of the Low-Voltage Directive 73/23/EEC.

Low-voltage directive

The inverters comply with the following standards listed in the Official Journal of the European Communities:

- **EN 60 204**

Safety of machinery, electrical equipment of machines

- **EN 61 800-5-1**

Electrical power drive systems with variable speed – Part 5-1: Requirements regarding safety - electrical, thermal and energy requirements

Machine directive

The inverters are suitable for installation in machines. Compliance with the machine directive 89/392/EEC requires a separate certificate of conformity. This must be furnished by the plant constructor or the installer of the machine.

EMC directive

- **EN 61 800-3**

Variable-speed electric drives Part 3: EMC product standard including special test procedure.

The new EMC product standard EN 61 800-3 applies to electrical drive systems as of July 1, 2005. The transition period for the preceding standard EN 61 800-3/A11 dated February 2001 ends on October 1, 2007. The following explanations apply to frequency inverters of the 6SE6 series from Siemens:

- The EMC product standard EN 61 800-3 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.
- As a rule, frequency inverters are only supplied to qualified technical specialists for installation in machines or plants. A frequency inverter must therefore only be considered as a component which, as such, is not subject to the EMC product standard EN 61 800-3. However, the inverter's instruction manual specifies the conditions under which the product standard can be complied with if the frequency inverter is expanded to become a PDS. For a PDS, the EMC directive in the EU is complied with through observance of the product standard EN 61 800-3 for variable-speed electrical drive systems. The frequency inverters on their own do not generally require marking according to the EMC directive.
- The new EN 61 800-3 of July 2005 no longer distinguishes between “general availability” and “restricted availability”. Instead, different categories, namely C1 to C4, are defined according to the environment of the PDS at the place of use:
  - Category C1:
    Drive systems for rated voltages of < 1000 V for use in the first environment
  - Category C2:
    Fixed-location drive systems which are not connected by means of plug-in devices, for rated voltages of < 1000 V. If used in the first environment, installation and start-up may only be carried out by qualified EMC personnel. Warning information must be provided.
  - Category C3:
    Drive systems for rated voltages of < 1000 V, solely for use in the second environment. Warning information must be provided.
  - Category C4:
    Drive systems for rated voltages of ≥ 1000 V or for rated currents of ≥ 400 A or for use in complex systems in the second environment. An EMC plan must be drawn up.
- In the EMC product standard EN 61 800-3, limits for conducted interference voltages and radiated interference are also indicated for the so-called “second environment” (= industrial power supply systems which do not supply households). These limits are lower than the limits of filter class A according to EN 55 011. The use of unfiltered inverters in an industrial environment is permissible provided they are part of a system that is equipped with line filters on the higher-level infeed side.
- With MICROMASTER, power drive systems (PDS) which comply with EMC product standard EN 61 800-3 can be installed (see the installation instructions in the product documentation). The table entitled “Overview of MICROMASTER components and PDS categories” and the MICROMASTER ordering documents show which components the respective PDS installation supports directly.
- In general, a distinction must be made between the product standards for electrical drive systems (PDS) of the EN 61 800 series of standards (of which Part 3 covers EMC topics) and the product standards for devices/systems/machines etc. This will probably not result in any changes in the practical use of frequency inverters. Since frequency inverters are always part of a PDS and the latter is part of a machine, the manufacturer of the machine must observe various standards depending on the type of machine and the environment, e.g. EN 61 000-3-2 for power supply harmonics and EN 55 011 for radio interference. The PDS product standard alone is therefore inadequate or irrelevant.
- With regard to compliance with limits for power supply harmonics, the EMC product standard EN 61 800-3 for PDS refers to compliance with the EN 61 000-3-2 and EN 61 000-3-12 standards.
- Irrespective of configuration with MICROMASTER and its components, the machine builder can also modify the machines in other ways in order to comply with the EMC directive of the EU. As a rule, the EMC directive of the EU is observed through compliance with the EMC product standards applicable to the machine. If they are not available, the generic standards such as DIN EN 61 000-x-x can be used instead. What is important is that the conducted interference and the radiated interference voltages at the power-supply connection point and outside the machine remain below the corresponding limits. What technical means are used to ensure this is not prescribed.

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Overview of MICROMASTER components and PDS categories

<table>
<tr><td rowspan="4">First environment
(residential, commercial)</td><td colspan="2">Category C1
Unfiltered devices plus external Class B filter with low leakage currents</td><td rowspan="4">Second environment
(industrial)</td></tr>
<tr><td colspan="2">Category C2</td></tr>
<tr><td>Devices with an integrated Class B filter
or devices with an integrated Class A filter plus external supplementary filter Class B
or devices with an integrated Class A filter plus warning information
or unfiltered devices plus external Class A filter plus warning information</td><td>Devices with an integrated Class B filter
or devices with an integrated Class A filter plus external supplementary filter Class B
or devices with an integrated Class A filter
or unfiltered devices plus external Class A filter
Note: The requirements of EN 61 800-3 are considerably exceeded if Class B filters are used.</td></tr>
<tr><td colspan="2">Category C3
Devices with integrated Class A filter
or unfiltered devices plus external Class A filter
Warning information is necessary.
Note: The requirements of EN 61 800-3 are considerably exceeded if Class A filters are used.</td></tr>
<tr><td colspan="2">Category C4
Unfiltered devices plus external Class A filter
An EMC plan must be drawn up.
Note: The requirements of EN 61 800-3 are considerably exceeded if Class A filters are used.</td></tr>
</table>

Electromagnetic compatibility

No inadmissible electromagnetic emissions occur if the installation instructions specific to the product are correctly observed.

The table below lists the results of measurements relating to the emissions and immunity to interference of MICROMASTER inverters.

The inverters were installed with shielded motor cables and shielded control cables in accordance with the directives.

EMC phenomenon Standard/test		Relevant criteria	Limit value
Emitted interference EN 61 800-3	Conducted via mains cable	150 kHz to 30 MHz	Unfiltered devices, not tested. All devices with an internal/external filter: Depending on the type of filter and on the envisaged PDS installation: Category C1: Limit value complies with EN 55 011, Class B Category C2: Limit value complies with EN 55 011, Class A, Group 1. In addition, all devices with an internal/external filter comply with the limit value for category C3 installations. Limit value complies with EN 55 011, Class A, Group 2.
	Emitted by the drive	30 MHz to 1 GHz	All devices. Limit value complies with EN 55 011, Class A, Group 1.
ESD immunity EN 61 000-4-2	ESD through air discharge ESD through contact discharge	Test severity level 3 Test severity level 3	8 kV 6 kV
Immunity to electrical fields EN 61 000-4-3	Electrical field applied to unit	Test severity level 3 80 MHz to 1 GHz	10 V/m
Immunity to burst interference EN 61 000-4-4	Applied to all cable terminations	Test severity level 4	4 kV
Surge immunity EN 61 000-4-5	Applied to mains cables	Test severity level 3	2 kV
Immunity to RFI emissions, conducted EN 61 000-4-6	Applied to mains, motor and control cables	Test severity level 3 0.15 MHz to 80 MHz 80 % AM (1 kHz)	10 V

UL listing

c UL us LISTED

Ⓤ and cⓊ listed power conversion equipment of Ⓤ category NMMS, in accordance with UL508C.

Ⓤ list number E121068 and E192450

For use in environments with pollution degree 2.

Also refer to the Internet at
http://www.ul.com

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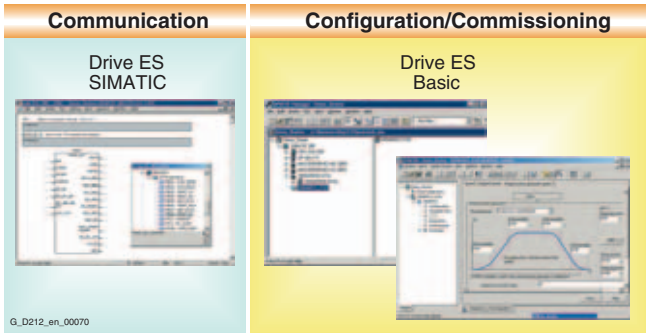
Appendix

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.

Various software packages are available for MICROMASTER:

- **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 the automated system and drives on the interface of the SIMATIC Manager. 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 engineering tools for the new motion control functions – peer-to-peer data traffic, equidistance and isochronous operation with PROFIBUS DP.

- **Drive ES SIMATIC**
  Simply parameterize 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, thereby 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 – Load – Finished.
  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
  - Complete parameter sets are automatically downloaded into the drive from the SIMATIC CPU – e.g. when a device has to be replaced
  - Part parameter sets (e.g. for recipe and product change) are automatically downloaded into the drive from the SIMATIC-CPU
  - Complete parameterization or part parameter sets are uploaded from the drive into the SIMATIC-CPU, i.e. updated.
- **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 5.2 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

Description		Software	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 de, en, fr, es, it with electronic documentation	Single 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 de, en, fr, es, 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 • Supply format: on CD-ROM de, en, fr, es, 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**

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Demonstration case

SIDEMO demonstration case system

The SIDEMO range of modular demonstration case systems also includes cases for the MICROMASTER inverters.

The MICROMASTER demonstration cases can be operated on 230 V supplies on their own or together with other demonstration systems such as LOGO!, SIMATIC S7-200, SITOP DC-UPS.

The demonstration systems are fitted in dark blue transport cases (400 x 300 x 210 mm). The transport cases can be stacked.

If the MICROMASTER 420/440 demonstration case is expanded with a PROFIBUS module (not included in scope of supply of the case), it is also possible to demonstrate incorporation into TIA in combination with the SIMATIC S7-300 Compact and Touchpanel TP170B demonstration systems.

SIDEMO demonstration case	Order No.	Weight, approx. kg
MICROMASTER 420 • including **BOP** operator panel	**6AG1062-1AA02-0AA0**	10
MICROMASTER 440 • including **BOP** operator panel	**6AG1062-1AA02-1AA1**	10
MICROMASTER 440 • including **BOP** operator panel • the motor is equipped with a **load unit**	**6AG1062-1AA06-0AA0**	10
MICROMASTER 440 • including **BOP** operator panel and **pulse encoder evaluation module** • the motor is equipped with an **encoder** and a **load unit**	**6AG1062-1AA07-0AA0**	10

Further information, e.g. **110 V versions**, is available on the Internet at: http://www.siemens.de/sidemo

Standard conversion factors: metric to US units

Unit	US to metric standard units	Metric to US standard units
Length	1 in. = 25.40 mm 1 ft. = 30.48 cm 1 yd. = 0.91 m 1 mi. = 1.61 km	1 mm = 0.03937 in. 1 cm = 0.39370 in. 1 m = 3.28084 ft. 1 km = 0.62137 mi.
Temperature	°C = 5/9 (°F – 32)	°F = (9 x °C)/5 + 32
Weight	1lbs = 0.454 kg	1 kg = 2.205 lbs
Torque	1lb.ft. = 1.356 Nm	1 Nm = 0.738 lb.ft.
Power	1 hp = 0.746 kW	1 kW = 1.341 hp

Note:

For kW and hp specifications in the Selection and Ordering tables, we do not use calculated hp values but the corresponding standardized hp motor ratings.

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Appendix

Faster and more applicable know-how: Hands-on training from the manufacturer

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

Training by the market leader in automation and plant engineering enables you to make independent decisions with confidence. 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.

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Overview of frequency inverters/converters for SIMATIC ET 200 distributed I/O

Frequency inverters are available for the SIMATIC ET 200 distributed I/O that are fully system-integrated modules. Inverters are available for the finely modular SIMATIC ET 200S FC system to the IP20 degree of protection as well as for the cabinet-free SIMATIC ET 200pro FC system to the IP65 degree of protection.

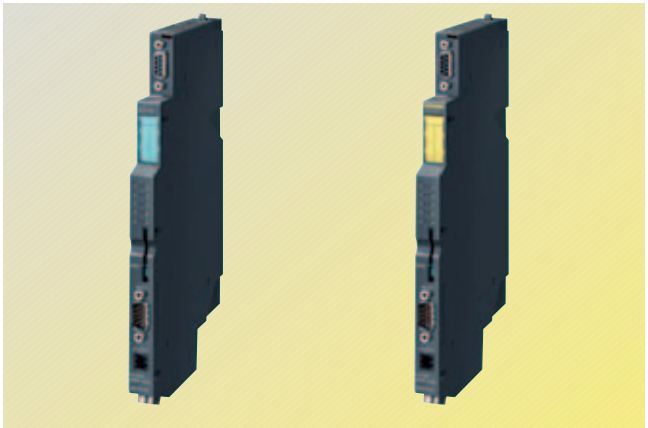
With a broad range of possibilities, the frequency inverters expand the functional scope of the modular modules that are available in both systems (e.g. inputs and outputs, technology modules, direct and soft starters). With suitable interface modules, connection to PROFIBUS and PROFINET is possible via the ET 200 system bus as well as integration of PLC functionality into the system. Fail-safe frequency inverter functions can be activated locally or via PROFIsafe.

An overview of the features of the SIMATIC ET 200S FC frequency inverter series is given in the table below.

The complete product spectrum including ordering data, technical data and explanations can be found in Catalog IK PI "Industrial Communication for Automation and Drives" and on the Internet at

http://www.siemens.com/et200s-fc

	SIMATIC ET 200S FC
Main features	• Complete embedding of a frequency inverter into a distributed I/O system to IP20 degree of protection • Easy assembly and low susceptibility to errors thanks to self-assembling energy and communications bus • Space-saving assembly thanks to compact dimensions and common protection • Fast, tool-free replacement of the frequency inverter for a servicing requirement (hot swapping) • Frequency control (*V/f*), vector control with and without encoders • Line-commutated regenerative feedback by power electronics of the latest generation • Modular structure with Control Unit (closed-loop control module) and Power Module (power section) • Frequency inverter variant with integrated, autonomous, fail-safe functions without the need for complex external wiring
Rated outputs	0.75 kW, 2.2 kW, 4.0 kW
Input voltage	3 AC 380 … 480 V ±10%
Overall width	Control Unit + Power Module up to 0.75 kW: 80 mm, otherwise 145 mm
Mains frequency	47 … 63 Hz
Overload capability	• Overload current 1.5 × rated output current (i.e. 150% overload) over 60 s, cycle time 300 s • Overload current 2 × rated output current (i.e. 200% overload) over 3 s, cycle time 300 s
Output frequency	0 … 650 Hz
Pulse frequency	8 kHz (standard), 2 … 16 kHz (in steps of 2 kHz)
Frequency bands that can be skipped	1, programmable
Efficiency	≥ 96%
Interfaces	• Connection to PROFIBUS via IM151 interface module • Connection to PROFINET via IM151-3PN interface module • Integration of PLC functionality through IM151 CPU and IM151-7 F CPU interface modules • RS232 interface with USS protocol for commissioning on the PC with the STARTER commissioning software • Slot for an optional Micro Memory Card for uploading or downloading parameter settings • PTC/KTY84 interface for motor monitoring • Speed sensor interface (Sub-D connector) for unipolar HTL incremental encoder • Activation of the integrated safety functions over PROFIsafe (using the PM-D F PROFIsafe Power Module) or terminals (using the Safety Local Power Module PM-D F X1)
Standards conformance	UL, cUL, CE and c-tick, Low-Voltage Directive 73/23/EEC, EMC Directive 89/336/EEC
Functional safety	Closed-loop control module with integral safety functions to Category 3 of EN 954-1 and SIL 2 of IEC 61508: • Safety torque off • Safely limited speed • Safe stop 1 The safety functions "Safely limited speed" and "Safe stop 1" are certified for encoderless asynchronous motors. These safety functions are not approved for pull-through loads as in the case of lifting gear and winders
Degree of protection	IP20



SIMATIC ET 200S FC
Control Units

SIMATIC ET 200S FC
Power Modules

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Appendix

Overview of frequency inverters/converters for SIMATIC ET 200 distributed I/O (continued)

Frequency inverters are available for the SIMATIC ET 200 distributed I/O that are fully system-integrated modules. Inverters are available for the finely modular SIMATIC ET 200S FC system to the IP20 degree of protection as well as for the cabinet-free SIMATIC ET 200pro FC system to the IP65 degree of protection.

With a broad range of possibilities, the frequency inverters expand the functional scope of the modular modules that are available in both systems (e.g. inputs and outputs, technology modules, direct and soft starters). With suitable interface modules, connection to PROFIBUS and PROFINET is possible via the ET 200 system bus as well as integration of PLC functionality into the system. Fail-safe frequency inverter functions can be activated locally or via PROFIsafe.

An overview of the features of the SIMATIC ET 200pro FC frequency inverter series is given in the table below.

The complete product spectrum including ordering data, technical data and explanations can be found in Catalog IK PI "Industrial Communication for Automation and Drives" (SIMATIC ET 200pro FC will be available soon) and on the Internet at

http://www.siemens.com/et200pro-fc

	SIMATIC ET 200pro FC
Main features	• Complete embedding of a frequency inverter into a distributed I/O system to IP65 degree of protection • Easy assembly and low susceptibility to errors thanks to self-assembling energy and communications bus • Fast replacement of the frequency inverter during servicing without interruption of the bus communication to other modules within the SIMATIC ET 200pro FC • Frequency control (*V/f*), vector control without encoders • Line-commutated regenerative feedback by power electronics of the latest generation • Frequency inverter variant with integrated, autonomous, fail-safe functions without the need for complex external wiring
Rated outputs	1.1 kW (at 0 … 55 °C ambient temperature) 1.5 kW (at 0 … 45 °C ambient temperature)
Input voltage	3 AC 380 … 480 V ±10%
Overall width	155 mm
Mains frequency	47 … 63 Hz
Overload capability	• Overload current 1.5 × rated output current (i.e. 150% overload) over 60 s, cycle time 300 s • Overload current 2 × rated output current (i.e. 200% overload) over 3 s, cycle time 300 s
Output frequency	0 … 650 Hz
Pulse frequency	4 kHz (standard) 2 … 16 kHz (in steps of 2 kHz)
Frequency bands that can be skipped	1, programmable
Efficiency	≥ 96%
Interfaces	• Connection to PROFIBUS through IM154-1 and IM154-2 interface modules • Available soon connection to PROFINET over IM154-4PN interface modules and connection to IM154-8 CPU interface modules • Optical interface with USS protocol for fiber-optic RS232 connecting cable • Control signal for 180 V DC electromagnetic motor brake • Slot for an optional memory card (MMC) for uploading or downloading parameter settings • PTC/KTY84 interface for motor temperature monitoring • Activation of the integrated safety functions through the Safety Local Isolator Module F RSM or through F-Switch PROFIsafe
Standards conformance	UL, cUL, CE, Low-Voltage Directive 73/23/EEC, EMC Directive 89/336/EEC
Functional safety	Variant with integral safety functions to Category 3 of EN 954-1 and SIL 2 of IEC 61508: • Safety torque off • Safely limited speed • Safe stop 1 The safety functions "Safely limited speed" and "Safe stop 1" are certified for encoderless asynchronous motors. These safety functions are not approved for pull-through loads as in the case of lifting gear and winders
Degree of protection	IP20

SIMATIC ET 200pro FC
Standard frequency inverter

SIMATIC ET 200pro FC Failsafe
Frequency inverter with integrated safety functions

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Overview of SINAMICS G110 inverter chassis units

The SINAMICS G110 inverter chassis unit is a versatile drive. The table provides an overview of the features of this product. The complete range of products together with ordering data, technical data and explanations are indicated in the D 11.1 Catalog "SINAMICS G110/SINAMICS G120 Inverter Chassis Units and SINAMICS G120D Distributed Frequency Inverters" and in the Internet under: http://www.siemens.com/sinamics-g110

	SINAMICS G110
Main features	As **"a versatile drive for small outputs"**, the frequency inverter of the SINAMICS G110 inverter chassis units can be used for a wide range of industrial drive applications with variable speeds. The especially compact SINAMICS G110 inverter works with voltage-frequency control (*V*/*f*) and is the ideal frequency inverter in the lower output and performance range of the SINAMICS family of products. The inverter is available in three frames for connection to single-phase power supply systems.
Electrical data	
Supply voltages, output range	1 AC 200 V ... 240 V, ±10%; 0.12 kW ... 3.0 kW
Network types	IT, TN, TT
Mains frequency	50/60 Hz
Output frequency	0 Hz ... 650 Hz
Control method	*V*/*f* control, linear (*M*~*n*) *V*/*f* control, quadratic (*M*~n^2) *V*/*f* control, programmable
Fixed frequencies	3, programmable
Skip frequency ranges	1, programmable
Digital inputs	3 programmable digital inputs 24 V DC
Analog input (for the analog version)	1 analog input for setpoints from 0 V to 10 V, scalable or usable as 4th digital input
Digital output	1 digital output 24 V DC
Communication interface (for USS version)	RS485 serial interface for operation with USS protocol
Software functions	• Automatic restart after interruption of operation due to supply failure • Jerk-free connection of inverter to rotating motor • Programmable ramp-up/ramp-down times • Ramp rounding
Functions	
Protection functions	• Undervoltage • Overvoltage • Earth fault • Short-circuit • Stall prevention • I^2t motor thermal protection • Inverter overtemperature • Motor overtemperature
Connectable motors	Asynchronous motors
Mechanical data	
Degree of protection	IP20
Type of cooling for ≤ 0.75 kW inverters > 0.75 kW inverters	 Ribbed heat sink with convection cooling; version with flat heat sink also available Internal air cooling (integrated fan)
Standards	
Standards complied with	CE, UL, cUL, c-tick

SINAMICS G110 inverter chassis units

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Appendix

Overview of SINAMICS G120 inverter chassis units

The SINAMICS G120 inverter chassis unit is a modular drive. The table provides an overview of the features of this product. The complete range of products together with ordering data, technical data and explanations are indicated in the D 11.1 Catalog "SINAMICS G110/SINAMICS G120 Inverter Chassis Units and SINAMICS G120D Distributed Frequency Inverters" and in the Internet under: http://www.siemens.com/sinamics-g120

	SINAMICS G120
Main features	As **"a modular single drive for low and medium outputs"**, the frequency inverter of the SINAMICS G120 inverter chassis units can be used for a wide range of industrial drive applications. The SINAMICS G120 frequency inverter distinguishes itself through its modular design (Power Module and Control Unit), and the globally unique integration of numerous innovative functions in safety technology and regenerative feedback into the line supply. There are extensive system components available in the range from 0.37 to 90 kW. This means that the drive units are suitable for a multitude of drive applications.
Electrical data	
Supply voltages, output range	3 AC 380 V ... 480 V, ±10%; 0.37 kW ... 90 kW
Network types	IT, TN, TT
Mains frequency	47 ... 63 Hz
Output frequency	0 Hz ... 650 Hz
Control method	*V/f* control, linear ($M \sim n$) *V/f* control, quadratic ($M \sim n^2$) and parameterizable sensorless vector control, vector control with encoder (closed control loop) Torque control
Fixed frequencies	16, programmable
Digital inputs	up to 9 digital inputs, depending on the Control Unit 24 V DC
Analog input (for the analog version)	up to 2 analog inputs (0 V to 10 V)
Digital output	3 digital inputs
Communication interface	RS485/USS; PROFIBUS; PROFINET
Functions	
Software functions	• Programmable ramp-up times 0 … 650 s, ramp rounding • Automatic restart after interruption of operation due to supply failure • Flying restart • Signals are locally pre-processed using free function blocks • 3 selectable motor data sets • High-quality internal PID controller for simple process control • Positioning ramp down • Kinetic buffering
Protection functions	• Motor temperature (PTC/KTY, I^2t) • Power unit and load cycle monitoring • Overvoltage and undervoltage • Earth fault • Stall prevention • System protection functions
Safety Integrated Functions	STO, SS1, SLS, SBC
Connectable motors	Asynchronous motors
Mechanical data	
Degree of protection	IP20
Cooling method	Innovative cooling concept; the power electronics are cooled by means of heat sinks with an external fan; open-loop and closed-loop control electronics are cooled by convection
Standards	
Standards complied with	CE, UL, cUL, c-tick, Safety Integrated IEC 61508/SIL 2

SINAMICS G120 inverter chassis units

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Overview of SINAMICS G120D distributed frequency inverter

The SINAMICS G120D frequency inverter is a modular drive. The table provides an overview of the features of this product. The complete range of products together with ordering data, technical data and explanations are indicated in the D 11.1 Catalog "SINAMICS G110/SINAMICS G120 Inverter Chassis Units and SINAMICS G120D Distributed Frequency Inverters" and in the Internet under: http://www.siemens.com/sinamics-g120d

	SINAMICS G120D
Main features	**"The modular drive for low and medium outputs"** – the SINAMICS G120D distributed frequency inverter can be especially used for sophisticated conveyor applications in industry as for many other high-performance applications. The SINAMICS G120 frequency inverter distinguishes itself through its modular design (Power Module and Control Unit) as well as through its extremely flat type of construction, an identical drilling template for all outputs and a high degree of safety. It offers safety functions that are unique in its class. It helps to save significant amounts of energy as a result of its line-commutated regenerative feedback capability. It goes without saying that the frequency inverter is also capable of communications.
Electrical data	
Supply voltages, output range	3 AC 380 V ... 480 V, ±10%; 0.75 kW ... 7.5 kW
Network types	IT, TN, TT
Mains frequency	47 ... 63 Hz
Output frequency	0 Hz ... 650 Hz
Control method	*V/f* control, linear (*M*~*n*) *V/f* control, quadratic (*M*~n^2) and parameterizable sensorless vector control, vector control with encoder (closed control loop) Torque control
Fixed frequencies	16, programmable
Digital inputs	up to 6 digital inputs, depending on the Control Unit 24 V DC
Analog input (for the analog version)	up to 2 analog inputs (0 V to 10 V)
Digital output	3 digital inputs
Communication interface	PROFIBUS; PROFINET
Functions	
Software functions	• Programmable ramp-up times 0 … 650 s, ramp rounding • Automatic restart after interruption of operation due to supply failure • Flying restart • Signals are locally pre-processed using free function blocks • 3 selectable motor data sets • High-quality internal PID controller for simple process control • Positioning ramp down • Kinetic buffering
Protection functions	• Motor temperature (PTC/KTY, I^2t) • Power unit and load cycle monitoring • Overvoltage and undervoltage • Earth fault • Stall prevention • System protection functions
Safety Integrated Functions	STO, SS1, SLS
Connectable motors	Asynchronous motors
Mechanical data	
Degree of protection	IP65
Cooling method	Convection cooling, for higher outputs with fan
Standards	
Standards complied with	CE, UL, cUL, c-tick, Safety Integrated IEC 61508/SIL 2

SINAMICS G120D distributed frequency inverter

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Appendix

Overview of IEC squirrel-cage motors

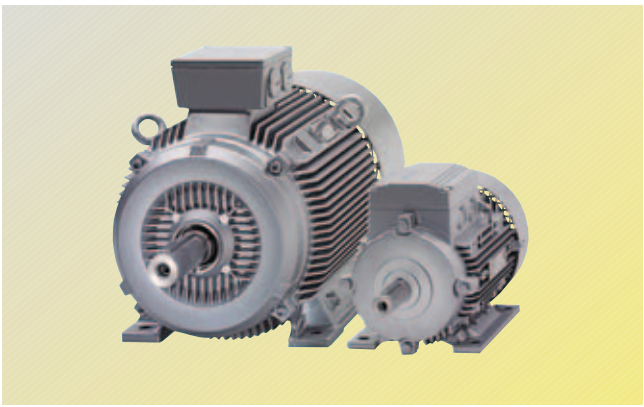
With an output range from 0.06 to 1250 kW, low-voltage motors are available for the widest range of requirements and applications that are harmonized and coordinated with the MICROMASTER and SINAMICS frequency inverters.

In addition to energy-saving motors and explosion-proof motors, there are also sector and customer-specific motors such as smoke extraction motors.

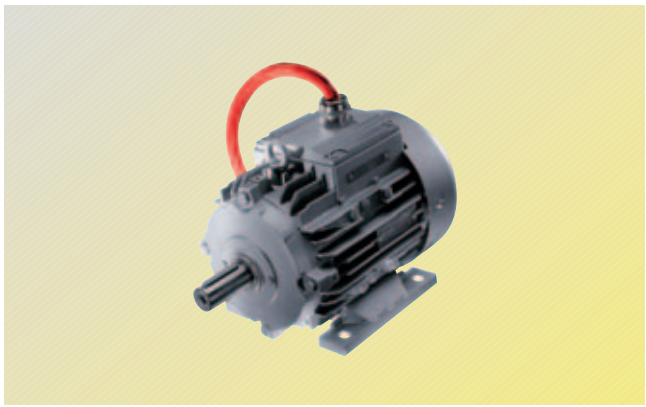
The table shows an overview of the technical features of these motors. You will find the available product range with ordering data, technical data and detailed explanations in Catalog D 81.1 “Low-Voltage Motors – IEC Squirrel-Cage Motors – Frame Sizes 56 to 450” and

in the Internet under: http://www.siemens.com/motors

Versions	IEC Squirrel-Cage Motors		
	Energy-saving motors		**Smoke extraction motors**
	Aluminum housing	**Gray cast housing**	**Temp.-time classes F200/F300/F400**
Rated power	0.06 ... 45 kW	0.75 ... 1250 kW	0.37 ... 200 kW
Frame sizes	56 M to 225	100 L to 450	80 M to 315 L
Type of construction	All common types of construction	All common types of construction	All common types of construction
Speed	750 ... 3000 rpm	750 ... 3000 rpm	1000 ... 3000 rpm
Rated torque	0.3 ... 292 Nm	9.9 ... 10300 Nm	2.5 ... 1546 Nm
Rated voltages	All commonly used voltages	All commonly used voltages	230VΔ/400 VY, 500 VΔ, 400VΔ/690 VY, 500 VY
Designation	EFF1, EFF2	EFF1, EFF2	EFF1, EFF2
Degree of protection	IP55	IP55	IP55
Housing	Aluminum	Gray iron	Aluminum Gray iron
Cooling type	Surface-cooled	Surface-cooled	Surface-cooled
Temperature class	155 (F) utilized to 130 (B) / 155 (F)	155 (F) utilized to 130 (B) / 155 (F)	155 (F) utilized to 130 (B)
Approvals	CE, CCC, UL, CSA	CE, CCC, UL, CSA	CE
Approvals for marine propulsion drives	Below deck use: BV, DNV, GL, LR	Below deck use: BV, DNV, GL, LR	No
Explosion protection (incl. temp. class)	Ex nA II T3 (Zone 2), Dust-ex (Zone 21, 22)	Ex nA II T3 (Zone 2), Dust-ex (Zone 21, 22)	No



Examples, energy-saving motors



Example, smoke extraction motors

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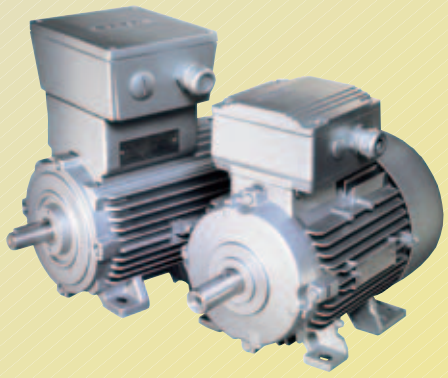
Overview of IEC squirrel-cage motors

Versions	IEC Squirrel-Cage Motors Explosion-proof motors			
	Type of protection "e"	**Type of protection "d"**	**Type of protection "n"**	**Dust explosion protection**
Rated power	0.12 ... 165 kW	0.25 ... 950 kW	0.09 ... 1000 kW	0.06 ... 1000 kW
Frame sizes	63 M to 315 L	71 M to 450	63 M to 450	Zone 21: 56 M to 315 L Zone 22: 56 M to 450
Type of construction	All common types of construction	All common types of construction	All common types of construction	All common types of construction
Speed	1000 ... 3000 rpm	750 ... 3000 rpm	750 ... 3000 rpm	750 ... 3000 rpm
Rated torque	0.61 ... 1300 Nm	1 ... 8579 Nm	1 ... 8090 Nm	0.3 ... 8090 Nm
Rated voltages	All commonly used voltages	All commonly used voltages	All commonly used voltages	All commonly used voltages
Designation	See Catalog D 81.1	See Catalog D 81.1	Analog energy-saving motors EFF1/EFF2	Analog energy-saving motors EFF1/EFF2
Degree of protection	IP55, IP56 (non-heavy-sea), IP65	IP55, IP56 (non-heavy-sea)	IP55, IP56 (non-heavy-sea), IP65	Zone 21: IP65 Zone 22: IP55
Housing	FS 63 ... 160 L Aluminum FS 100 L ... 315 L Gray iron	FS 71 M ... 315 L Gray iron FS 355 ... 450 Steel	FS 63 M ... 160L Aluminum FS 100 L ... 450 Gray iron	FS 63 M ... 225 M Aluminum FS 100 L ... 450 Gray iron
Cooling type	Surface-cooled	Surface-cooled	Surface-cooled	Surface-cooled
Temperature class	155 (F) utilized to 130 (B) / 155 (F)	155 (F) utilized to 130 (B) (line operation) 155 (F) utilized to 155 (F) (frequency inverter operation)	155 (F) utilized to 130 (B)	155 (F) utilized to 130 (B)
Approvals	CE, CCC, GOST, ATEX	CE, CCC, GOST, ATEX, NEPSI	CE, CCC, GOST, ATEX, NEPSI	CE, CCC, GOST, ATEX
Approvals for marine propulsion drives	Below deck use: BV, DNV, GL, LR	Below deck use: BV, DNV, GL, LR	Below deck use: BV, DNV, GL, LR	Below deck use: BV, DNV, GL, LR
Explosion protection (incl. temp. class)	II 2G Ex e II T1-T3	II 2G Ex de IIC T1-T4	II 3G Ex nA II T3	Zone 21: II 2D Ex tD A21 IP65 T125 °C Zone 22: II 3D Ex tD A22 IP55 T125 °C



Examples, explosion-proof motors

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Appendix

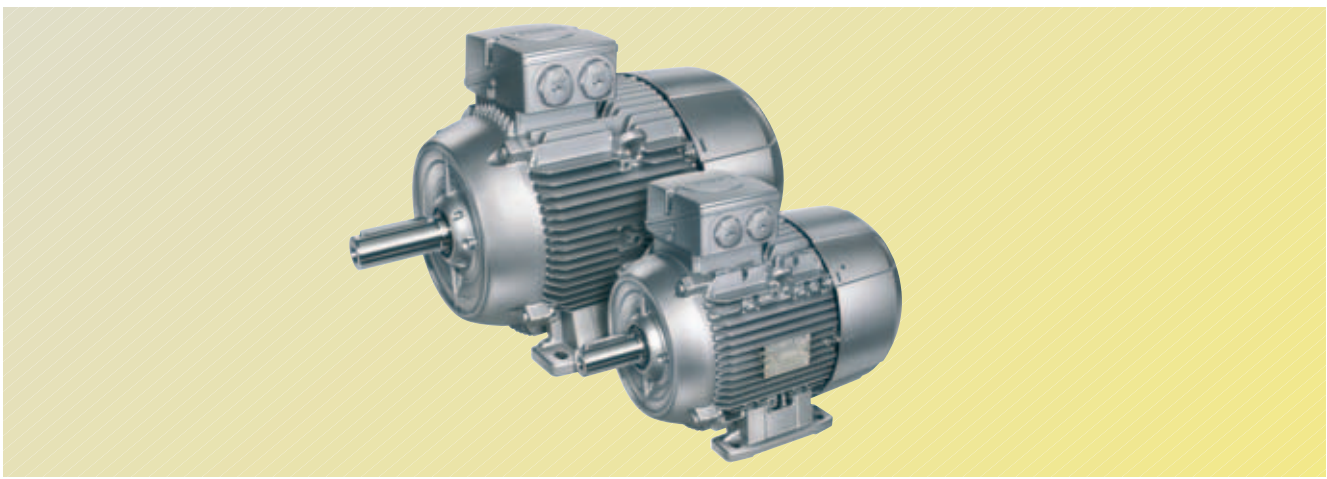
Overview of IEC squirrel-cage motors – new generation 1LE1

Increasing energy costs have resulted in greater emphasis on the power consumption of drive systems. It is extremely important to utilize the full potential for minimization here to secure competitiveness today and in the future. This is the reason that already today, Siemens is developing a new generation of low-voltage motors. Innovative copper rotors create the best requisites for motors with high efficiencies. The new motors for EFF1 (High Efficiency) offer considerable energy savings and protect our environment.

The table shows an overview of the technical features of these motors. The presently available product range with ordering data, technical data and detailed explanations are provided in the new Catalog News D 81.1 N "Low-Voltage Motors – IEC Squirrel-Cage Motors – New Generation 1LE1 – Frame Size 100 to 160" and

in the Internet under: http://www.siemens.com/motors

	IEC Squirrel-Cage Motors – new generation 1LE1
Versions	**Self-cooled energy-saving motors with:** • Improved efficiency (EFF2) • High efficiency (EFF1) **Self-cooled motors with increased output and:** • Improved efficiency (EFF2) • High efficiency (EFF1) **Forced-air-cooled motors without external fan and fan cover with:** • Improved efficiency (EFF2) • High efficiency (EFF1)
Rated power	0.75 ... 22 kW
Frame sizes	100 L to 160 L
Type of construction	**Without flange:** IM B3, IM B6, IM B7, IM B8, IM V5 without protective cover, IM V6, IM V5 with protective cover **With flange:** IM B5, IM V1 without protective cover, IM V1 with protective cover, IM V3, IM B35 **With standard flange:** IM B14, IM V19, IM V18 without protective cover, IM V18 with protective cover, IM B34
Speed	750 ... 3000 rpm
Rated torque	9.9 ... 150 Nm
Rated voltages	All commonly used voltages
Designation	EU/CEMEP efficiency classification: EFF1: 2-, 4-pole, EFF2: 2-, 4-pole US Energy Policy Act EPACT: 2-, 4-, 6-pole (available soon)
Degree of protection	IP55 as standard
Housing	Aluminum
Cooling type	**Self-cooled:** Frame size 100 L to 160 L (IC 411), **Forced-air cooled:** Frame size 100 L to 160 L (IC 416)
Temperature class	Temperature class 155 (F), utilized to temperature class 130 (B)
Approvals	CE



Examples, IEC squirrel-cage motors – new generation 1LE1, aluminum housing

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Overview of distributed drive solutions – MICROMASTER 411 and COMBIMASTER 411 inverters

The MICROMASTER 411 and COMBIMASTER 411 inverters from Siemens are available as distributed drive solutions. The table provides an overview of the features of these products. The complete range of products together with ordering data, technical data and explanations are indicated in the Catalog DA 51.3 MICROMASTER 411 and COMBIMASTER 411. The latest information on MICROMASTER 411 and COMBIMASTER 411 is available in the Internet under: http://www.siemens.com/combimaster

	MICROMASTER 411	COMBIMASTER 411
Main features	"The distributed inverter" for a wide range of drive applications – for simple individual applications from pumps and fans to multiple conveyor-belt drives in networked control systems.	
Output range	0.37 kW ... 3 kW	
Voltage range	3 AC 380 V ... 480 V	
Frame sizes/ unit sizes	CS B CS C	71 ...100 90/100
Types of construction		IM B3 IM B5 IM V1 (without protective cover) IM V1 (with protective cover) IM B14 (with normal flange) IM B14 (with special flange) IM B35
Degree of protection	IP65	IP55
Other technical features	• *V/f* characteristic • Multipoint characteristic (programmable *V/f* characteristic) • FCC (flux current control) • Internal PI controller • 3 digital inputs • 1 analog input • 1 relay output • Compound braking for controlled rapid braking • ECOFAST versions with plug-in connectors for power-supply, communication interface and motor connections in order to enable fast and problem-free information exchange in applications where time is a critical factor. The ECOFAST versions are completely compatible with the ECOFAST technology systems.	

Examples MICROMASTER 411

Examples COMBIMASTER 411

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Appendix

Overview of NEMA motors

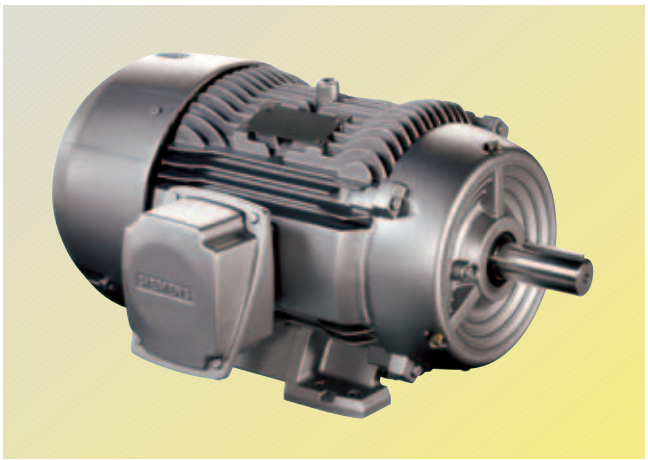
For compliance with the local specifications of the NAFTA markets (USA, Canada and Mexico), we manufacture low-voltage motors acc. to the NEMA standard for a wide range of different application areas.

This includes motors designed in accordance with the US act, EPACT (specified minimum efficiency levels), as well as motors with NEMA premium efficiency levels: Our NEMA motor series provide the highest operating reliability and maximum service life.

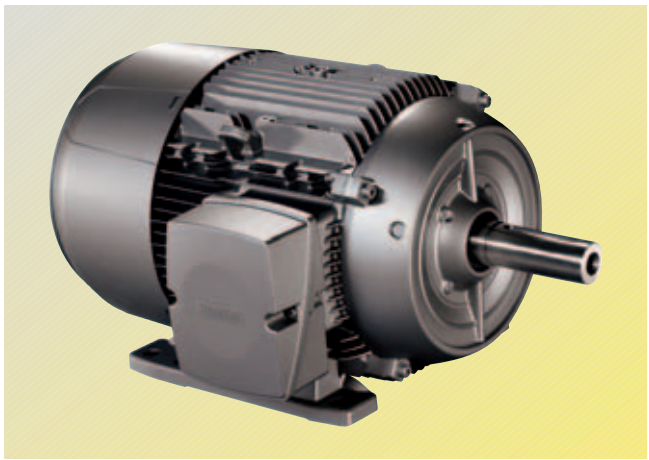
Designed and manufactured for rugged operation, our NEMA motors conquer even the harshest industrial conditions strictly in accordance with the ISO 9001 international quality standard; with maximum performance, reliability and efficiency.

You will find the complete range of products together with ordering data, technical data and explanations in Catalog D 81.2 U.S./Canada on the Internet at http://www.sea.siemens.com/motors

	NEMA motors (NEMA = National Electrical Manufacturers Association)
Frame size	NEMA frame size 56 ... 449
Output range	0.25 HP ... 500 HP
Number of poles	2/4/6/8
Voltages	3 AC 230/460/575 V
Frequency	60 Hz, 50 Hz on request
Type of construction	Foot-mounted, D flange, C flange, P flange
Casing	Cast-iron, aluminium or steel depending on the version
Cooling method	Surface-cooling or internal ventilation depending on the version
Temperature class	F used acc. to B
Type spectrum	**General purpose motors**
	• Legally specified minimum efficiency levels or NEMA premium efficiency levels
	• Standard motors for general industrial use
	• Aluminium or cast-iron case depending on the version
	Severe duty motors
	• Legally specified minimum efficiency levels or NEMA premium efficiency levels
	• Cast-iron case
	• Motors for use under extremely difficult environmental conditions
	Severe duty IEEE841 motors
	• Efficiency levels required by IEEE that exceed the EPACT act
	• Motors with increased requirements for use in the petrochemical industry (according to IEEE841)
	• Cast-iron case
	Explosion-proof motors
	• Efficiency levels better than or equal to EPACT
	• Multi label according to Division 1, Class I, Group D and Class II, Groups F&G
	• Single label according to Division 1, Class I, Groups C&D



Example of NEMA motor, Severe Duty SD100, cast-iron case



Example of NEMA motor, General Purpose GP10A, aluminium case

A

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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.

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Appendix

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.

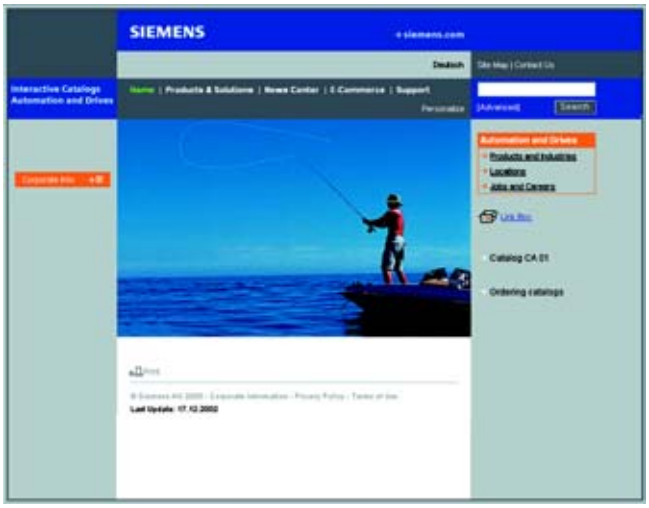
The Siemens Automation and Drives Group (A&D) has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

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 in 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 in 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

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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
(0.14 €/min. from the German fixed network)
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)]
(0.14 €/min. from the German fixed network)

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)]
(0.14 €/min. from the German fixed network)

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)]

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

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

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Notes on ordering

Versions/variants

The last digit of the complete Order No. for the inverters represents the release version.

When ordering, a different digit from the one specified may be present as a result of further technical development.

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Appendix

Terms and Conditions of Sale and Delivery

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following terms. Please note! The scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside of Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following terms apply exclusively for orders placed with Siemens AG.

For customers with a seat or registered office in Germany

The "General Terms of Payment" as well as the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry" shall apply.

For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office in Germany" shall apply.

For customers with a seat or registered office outside of Germany

The "General Terms of Payment" as well as the "General Conditions for Supplies of Siemens, Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

General

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches only apply to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the corresponding pages, - especially with regard to data, dimensions and weights given - these are subject to change without prior notice.

The prices are in € (Euro) ex works, exclusive packaging.

The sales tax (value added tax) is not included in the prices. It shall be debited separately at the respective rate according to the applicable legal regulations.

Prices are subject to change without prior notice. We will debit the prices valid at the time of delivery.

Surcharges will be added to the prices of products that contain silver, copper, aluminum, lead and/or gold if the respective basic official prices for these metals are exceeded. These surcharges will be determined based on the official price and the metal factor of the respective product.

The surcharge will be calculated on the basis of the official price on the day prior to receipt of the order or prior to the release order.
The metal factor determines the official price as of which the metal surcharges are charged and the calculation method used. The metal factor, provided it is relevant, is included with the price information of the respective products.

An exact explanation of the metal factor and the text of the Comprehensive Terms and Conditions of Sale and Delivery are available free of charge from your local Siemens business office under the following Order Nos.:

- 6ZB5310-0KR30-0BA1
  (for customers based in Germany)
- 6ZB5310-0KS53-0BA1
  (for customers based outside Germany)

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

Export regulations

The products listed in this catalog may be subject to European / German and/or US export regulations.

Therefore, any export requiring a license is subject to approval by the competent authorities.

According to current provisions, the following export regulations must be observed with respect to the products featured in this catalog:

AL	Number of the German Export List Products marked other than "N" require an export license. In the case of software products, the export designations of the relevant data medium must also be generally adhered to. Goods labeled with an "AL" not equal to "N" are subject to a European or German export authorization when being exported out of the EU.
ECCN	Export Control Classification Number Products marked other than "N" are subject to a reexport license to specific countries. In the case of software products, the export designations of the relevant data medium must also be generally adhered to. Goods labeled with an "ECCN" not equal to "N" are subject to a US re-export authorization.

Even without a label or with an "AL: N" or "ECCN: N", authorization may be required due to the final destination and purpose for which the goods are to be used.

The deciding factors are the AL or ECCN export authorization indicated on order confirmations, delivery notes and invoices.

Errors excepted and subject to change without prior notice.

A&D/VuL_ohne MZ/En 05.09.06

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Catalogs of the Automation and Drives Group (A&D)

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

	Catalog
Automation and Drives	
Interactive catalog on CD-ROM and on DVD	
• The Offline Mall of Automation and Drives	CA 01
Automation Systems for Machine Tools	
SINUMERIK & SIMODRIVE	NC 60
SINUMERIK & SINAMICS	NC 61
Drive Systems	
Variable-Speed Drives	
SINAMICS G110/SINAMICS G120 Inverter Chassis Units SINAMICS G120D Distributed Frequency Inverters	D 11.1
SINAMICS G130 Drive Converter Chassis Units, SINAMICS G150 Drive Converter Cabinet Units	D 11
SINAMICS GM150/SINAMICS SM150 Medium-Voltage Converters	D 12
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IEC Squirrel-Cage Motors	D 81.1
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• Converter Systems SIMODRIVE 611/POSMO	
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• Main Spindle/Feed Motors	
• Drive System SINAMICS S120	
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Electrical Installation Technology	
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PDF: *ALPHA 8HP Molded-Plastic Distribution System*	*ET A3*
PDF: *BETA Low-Voltage Circuit Protection*	*ET B1*
PDF: *DELTA Switches and Socket Outlets*	*ET D1*
GAMMA Building Controls	ET G1
Human Machine Interface Systems SIMATIC HMI	ST 80

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SIWAREX Weighing Systems	WT 01
Continuous Weighing and Process Protection	WT 02
Process Analytical Instruments	PA 01
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SIMATIC Industrial Automation Systems	
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SIMATIC PCS 7 Process Control System	ST PCS 7
Add-ons for the SIMATIC PCS 7 Process Control System	ST PCS 7.1
Migration solutions with the SIMATIC PCS 7 Process Control System	ST PCS 7.2
pc-based Automation	ST PC
SIMATIC Control Systems	ST DA
SIMATIC Sensors	
Sensors for Factory Automation	FS 10
Systems Engineering	
Power supplies SITOP power	KT 10.1
System cabling SIMATIC TOP connect	KT 10.2
System Solutions	
Applications and Products for Industry are part of the interactive catalog CA 01	
TELEPERM M Process Control System	
PDF: *AS 488/TM automation systems*	*PLT 112*

PDF: *These catalogs are only available as pdf files.*

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