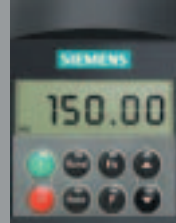




# micromaster



MICROMASTER 410/420/430/440  
Inverters  
0.12 kW to 250 kW



**SIEMENS**

## Other catalogs for "Standard Drives"

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



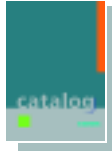
**SIVOLT A/V** DA 68  
Alternating current and three-phase current controller

Order No.:  
German: E20002-K4068-A101-A1



**Low-Voltage Motors** M 11

Order No.:  
German: E86060-K1711-A101-A3  
English: E86060-K1711-A101-A3-7600



**Components for automation** CA 01

Order No.:  
German: E86060-D4001-A100-C1  
English: E86060-D4001-A110-C1-7600



### A&D Mail

Internet  
<http://www.siemens.com/automation/mail>



### Catalog CA 01 – SD configurator selection aid

In future the **SD configurator** selection aid will be available in combination with the CA 01 electronic catalog and no longer on a separate CD.



On CD 2 of the selection and configuration aids you will find the SD configurator for low-voltage motors, MICROMASTER 4 inverters and SINAMICS G110 including:

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

#### Hardware and software requirements

- PC with Pentium II or comparable processor
- Operating systems
  - Windows 98/ME
  - Windows 2000
  - Windows XP
  - Windows NT (Service Pack 5 upwards)
- Minimum of 128 RAM
- 1024 x 768 graphics with more than 256 colors / small fonts
- CD-ROM drive
- Windows-compatible sound card
- Windows-compatible mouse

#### Installation

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

#### Hotline:

For technical advice and hotline support concerning our CA 01 catalog:

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

E-Mail: [adsupport@siemens.com](mailto:adsupport@siemens.com)

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# MICROMASTER 410/420/430/440 Inverters 0.12 kW to 250 kW Catalog DA 51.2 2003/2004



Supersedes:  
Catalog DA 51.2 · 2002

The products in this catalog are also included  
in the CD-ROM catalog CA 01.  
Order No.:  
E86060-D4001-A110-C1-7600

Contact your local Siemens representative  
for further information

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*The products and systems described in this catalog are manufactured under application of a certified quality management system in accordance with DIN EN ISO 9001 (Certificate Registration No. DE-000357 QM). The certificate is recognized in all IQNet countries.*



# SIEMENS

## Overview

Welcome to  
Automation and Drives  
Selection guide  
MICROMASTER inverters  
Overview of options

### MICROMASTER 410 “The low-priced”

0.12 kW to 0.75 kW

### MICROMASTER 420 “The universal”

0.12 kW to 11 kW

### MICROMASTER 430 “The specialist for pumps and fans”

7.5 kW to 250 kW

### MICROMASTER 440 “The all-purpose”

0.12 kW to 250 kW

## Appendix

Certificates/Standards  
Demonstration case/  
Training  
Overview of motors and  
inverters  
Siemens contacts  
Online services  
Service & Support  
Conditions of sale and  
delivery  
Export regulations

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A

## Welcome to Automation and Drives

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

With integrated automation blocks, powerful engineering tools and innovative concepts such as Totally Integrated Automation and Totally Integrated Power, we deliver solution platforms based on standards that offer you a considerable savings potential.

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

They will be glad to assist you.







**Selection guide**

	MICROMASTER 410	MICROMASTER 420
Main characteristics	<p><b>“The low-priced”</b> for variable speeds with three-phase motors on single-phase networks, e.g. with pumps, fans, billboards, barriers, gate drives and automatic machines</p>	<p><b>“The universal”</b> for three-phase networks and optional fieldbus interfacing, e.g. for conveyor belts, material transport, pumps, fans and machine tools</p>
Power ranges	0.12 kW to 0.75 kW	0.12 kW to 11 kW
Voltage ranges	1 AC 100 V to 120 V 1 AC 200 V to 240 V	1 AC 200 V to 240 V 3 AC 200 V to 240 V 3 AC 380 V to 480 V
Control methods	<ul style="list-style-type: none"> <li>• V/f characteristic</li> <li>• Multipoint characteristic (programmable V/f characteristic)</li> <li>• FCC (flux current control)</li> </ul>	<ul style="list-style-type: none"> <li>• V/f characteristic</li> <li>• Multipoint characteristic (programmable V/f characteristic)</li> <li>• FCC (flux current control)</li> </ul>
Process control	–	Internal PI controller
Inputs	3 digital inputs 1 analog input	3 digital inputs 1 analog input
Outputs	1 relay output	1 analog output 1 relay output
Interfacing to automation system	The PLC partner for LOGO! and SIMATIC S7-200	The ideal partner for your automation tasks, whether with SIMATIC S7-200, SIMATIC S7-300/400 (TIA) or SIMOTION
Additional features	<ul style="list-style-type: none"> <li>• Natural ventilation (no fan unit)</li> <li>• Position of connections as with conventional switching elements (e.g. contactors)</li> <li>• Variant with flat plate heatsink</li> </ul>	<ul style="list-style-type: none"> <li>• BICO technology</li> <li>• Compound braking for controlled rapid braking</li> </ul>
		
	<b>Section 1</b>	<b>Section 2</b>

## 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



## 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



# MICROMASTER 410/420/430/440

## 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.

Assignment of operator panels and modules to the inverter ranges

Options	Order No.	MICROMASTER			
		410	420	430	440
<b>Operator panels</b>					
OP	6SE6400-0SP00-0AA0	●			
BOP	6SE6400-0BP00-0AA0		●		●
BOP-2	6SE6400-0BE00-0AA0			●	
AOP	6SE6400-0AP00-0AA1		●		●
AAOP	6SE6400-0AP00-0AB0		●		●
<b>Modules</b>					
PROFIBUS	6SE6400-1PB00-0AA0		●	●	●
DeviceNet	6SE6400-1DN00-0AA0		●	●	●
CANopen	6SE6400-1CB00-0AA0		●	●	●
Pulse encoder evaluation	6SE6400-0EN00-0AA0				●

● Possible combination



Operator panels



Modules



# Inverter

## MICROMASTER 410



1/2	Description
1/4	Circuit diagrams
1/6	Technical data
1/7	Selection and ordering data
1/8	Options
1/10	Dimension drawings

1



# MICROMASTER 410

## Description



Inverter  
Frame size AA



Inverter  
Frame size AB



Inverter  
with flat heat sink

### Application

The MICROMASTER 410 inverter is suitable for a variety of variable-speed drive applications.

It is especially suitable for use with pumps and fans, as a drive in various sectors, e.g. food, textile and packaging industries as well as for conveyor systems, factory gate and garage door drives and as a universal drive for moving billboards.

It is the ideal low-cost frequency inverter solution for the low-end performance range of the MICROMASTER product family.

The inverter is especially characterized by its customer-oriented performance and ease-of-use.

Versions for connecting to 230 V and 115 V single-phase networks enable it to be used all over the world.

### Design

The MICROMASTER 410 inverter has a compact design.

Heatsinks provide natural cooling for the inverter. A fan unit is not used.

The position of the connections has been selected as for conventional contactors.

The operator panel available as an option can be easily fitted without requiring any tools.

The design with flat plate heat-sink offers space-saving and favorable heat dissipation since an additional heatsink can be installed outside the control cabinet.

### Main characteristics

- Simple selection from minimum range of types (only a few options)
- Compact design
- Natural cooling with heat sinks (no fan unit)
- Simple connection similar to conventional switching elements (e.g. contactors)
- Versions with internal EMC filter Class B
- Fast, simple commissioning with input of only a few parameters (fast commissioning mode)
- Integrated RS-485 communications interface
- Three programmable digital inputs, non-floating (the analog input can be used as a fourth binary input)
- One analog input (0 V to 10 V)
- One programmable relay output (30 V DC/5 A resistive load; 250 V AC/2A inductive load)
- Low-noise motor operation resulting from high pulse frequency
- Integrated protection for motor and inverter.

### Options (overview)

- Line commutating chokes
- Adapter for standardized mounting on DIN rails
- OP (Operator Panel) for user-friendly parameterization of an inverter
- Connection kit for PC to inverter
- PC startup program.

### International standards

- The MICROMASTER 410 inverter complies with the requirements of the EU low-voltage guideline
- The MICROMASTER 410 inverter has the **CE** marking
- **®** and **©** listed (not for versions with flat heat sinks)
- **c-tick**

#### Note:

See Appendix for standards.

### Mechanical features

- Compact design
- Heat dissipation through self-ventilation (convection)
- Operating temperature -10 °C to +50 °C (+14 °F to +122 °F)
- Easy cable connection, mains and motor connections are separated for optimal electromagnetic compatibility and clear connection
- Detachable, optional operator panels
- Screwless control terminals
- Side mounting possible, thus also usable with low cabinet depth.

### Performance features

- Latest IGBT technology
- Digital microprocessor control
- Linear  $V/f$  characteristic, with programmable voltage boosting
- Quadratic  $V/f$  characteristic
- Multipoint characteristic (programmable  $V/f$  characteristic)
- Flying restart
- Automatic restart after mains failure or fault
- Programmable ramp generator (0 s to 650 s) with possible rounding
- Fast current limit (FCL) for trip-free operation

### Protection features

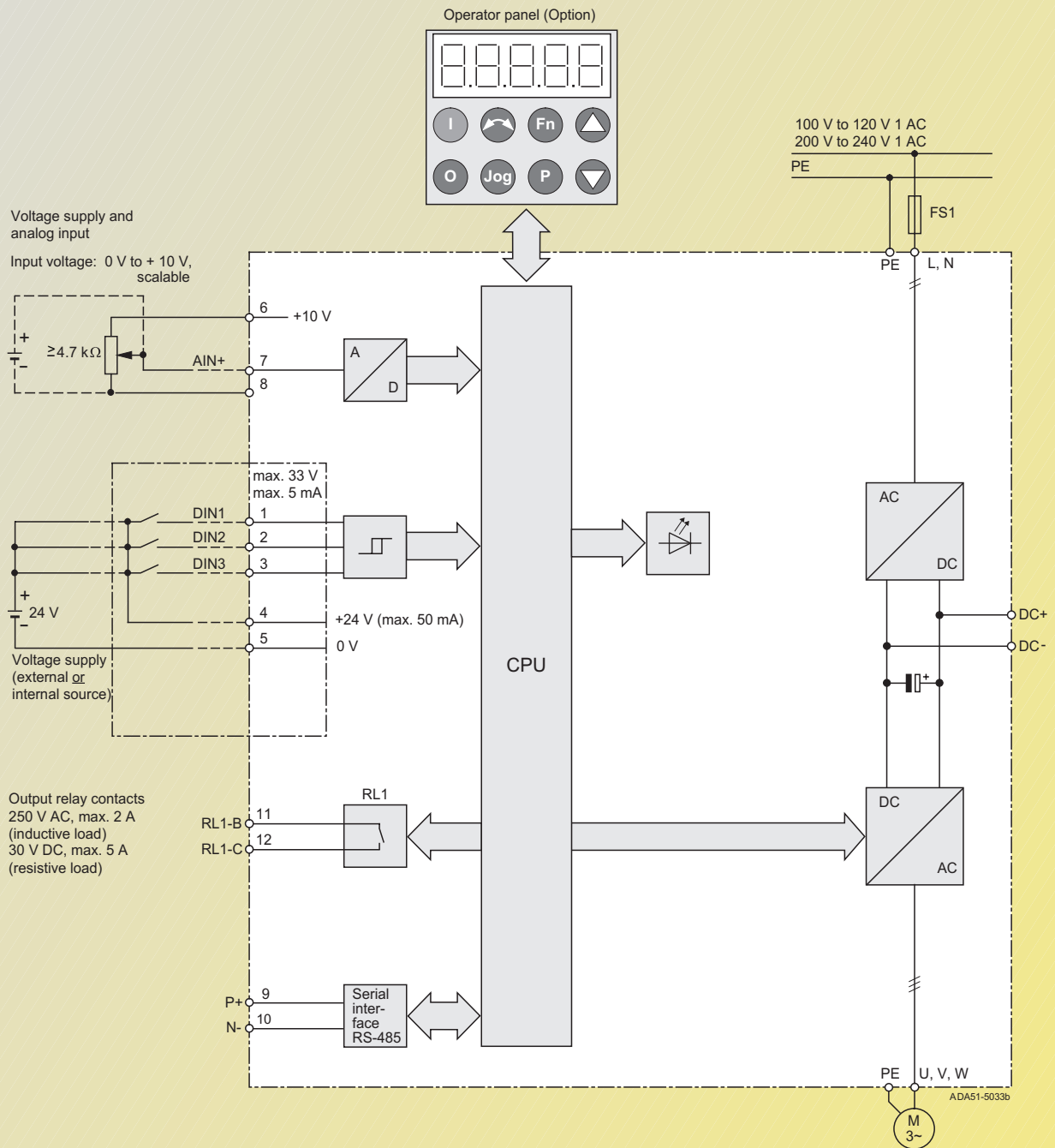
- Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, then 0.85 x rated output current for 240 s, cycle time 300 s
- Overvoltage/undervoltage protection
- Inverter overtemperature protection
- Earth fault protection
- Short-circuit protection
- $I^2t$  motor thermal protection
- Stall prevention.

# MICROMASTER 410

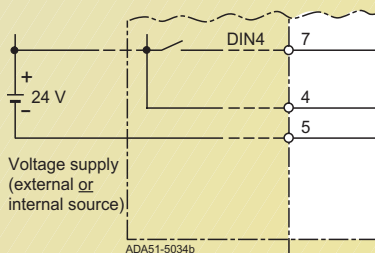
## Circuit diagrams

### General circuit diagram

1

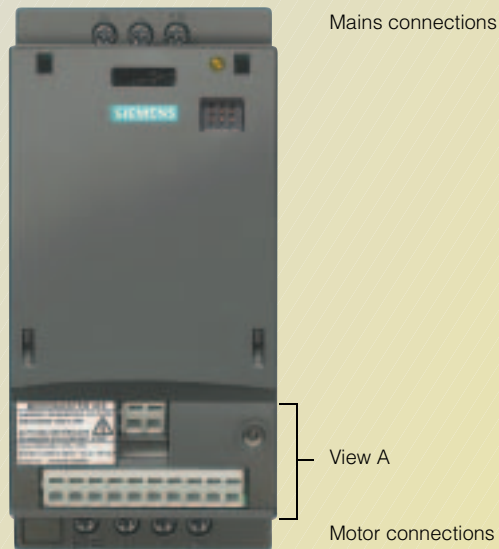


For an additional digital input (DIN 4) external connections should be made:

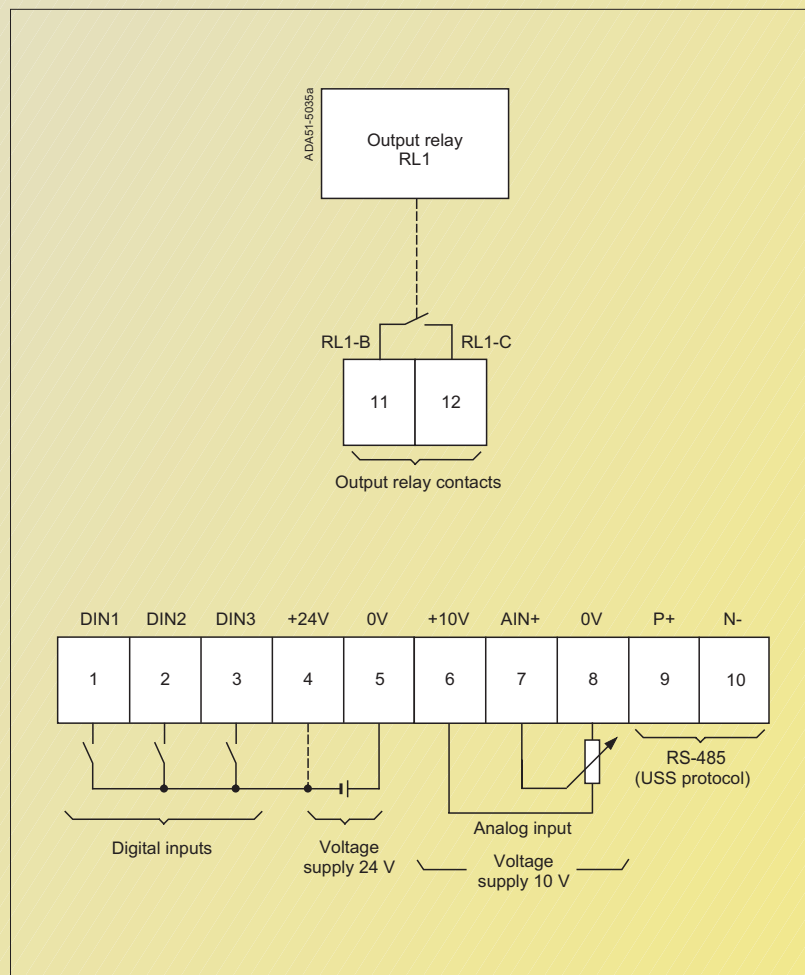




## Terminal connection diagram



View A



# MICROMASTER 410

## Technical data

### MICROMASTER 410 inverter

Input voltages and power ranges	1 AC 200 V to 240 V $\pm$ 10 % 1 AC 100 V to 120 V $\pm$ 10 %	0.12 to 0.75 kW 0.12 to 0.55 kW
Power frequency	47 to 63 Hz	
Output frequency	0 Hz to 650 Hz	
Power factor	$\geq$ 0.95	
Inverter efficiency	96 % to 97 %	
Overload capability	Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s; then 0.85 x rated output current for 240 s, cycle time 300 s	
Precharge current	Not higher than rated input current	
Control method	Linear V/f characteristic; quadratic V/f characteristic; multipoint characteristic (programmable V/f characteristic)	
Pulse frequency	8 kHz (standard)/2 kHz to 16 kHz (in 2 kHz steps)	
Fixed frequencies	3, programmable	
Skip frequency ranges	1, programmable	
Setpoint resolution	10 bit analog/0.01 Hz serial	
Digital inputs	3 programmable digital inputs, non-floating, PNP, SIMATIC-compatible	
Analog input	1, for setpoint (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)	
Serial interface	RS-485, for operation with USS protocol	
Motor cable lengths	Max. 30 m (shielded)/max. 50 m (unshielded)	
Electromagnetic compatibility	Inverter available with internal EMC filter to EN 61 800-3 (defined limits to EN 55 011, 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)	
Site altitude	Up to 1000 m above sea level without derating	
Protection features for	Undervoltage, overvoltage, overload, earth faults, short circuits, stall prevention, I <sup>2</sup> t motor thermal protection, inverter overtemperature	
Typical power losses (heatsink) at full load and maximum operating temperature as specified	20 W (with 0.37 kW inverter with flat plate heatsink) 37 W (with 0.75 kW inverter with flat plate heatsink)	
Line-side and control electronics losses (at 230 V, 50 Hz, 8 kHz)	18 W (with 0.37 kW inverter with flat plate heatsink) 34 W (with 0.75 kW inverter with flat plate heatsink)	
Recommended thermal resistance of heatsink	1.8 K/W (with 0.37 kW inverter with flat plate heatsink) 1.2 K/W (with 0.75 kW inverter with flat plate heatsink)	
Compliance with standards	Ⓜ, cⓂ (not for versions with flat plate heatsink) CE, c-tick	
CE marking	Conformity with low-voltage directive 73/23/EC	
Dimensions and weights (without options)	Frame size (FS)	H x W x D (mm) Weight, approx. (kg)
	AA	150 x 69 x 118 0.8
	AB	150 x 69 x 138 1.0
	0.37 kW inverter with flat plate heatsink	175 x 69 x 102 0.78
	0.75 kW inverter with flat plate heatsink	175 x 69 x 102 0.8

### Derating data

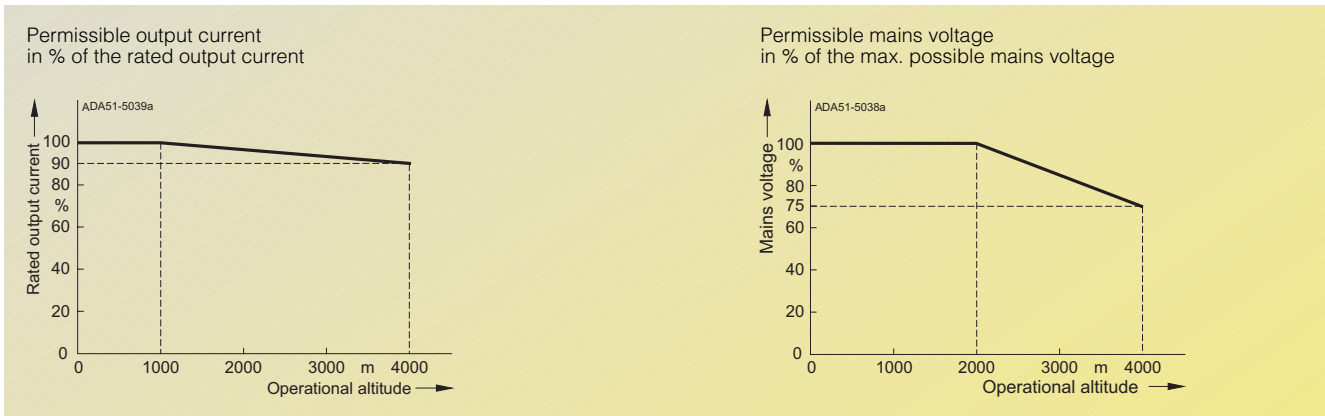
#### Pulse frequency

Output kW	Rated output current in A for a pulse frequency of						
	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
0.12	0.9	0.9	0.9	0.8	0.7	0.6	0.5
0.25	1.7	1.7	1.7	1.5	1.3	1.1	0.9
0.37	2.3	2.3	2.3	2.0	1.7	1.5	1.3
0.55	3.2	3.2	3.2	2.9	2.6	2.3	2.0
0.55, 115 V (at 50 °C/122 °F)	3.0	3.0	2.7	2.5	2.2	2.0	1.7
0.55, 115 V (at 40 °C/104 °F)	3.2	3.2	3.2	2.9	2.6	2.3	2.0
0.75 (at 50 °C/122 °F)	3.9	3.9	3.6	3.2	2.9	2.6	2.3
0.75 (at 40 °C/104 °F)	4.2	4.2	4.2	3.8	3.4	3.0	2.7

The current data apply to an ambient temperature of 50 °C/122 °F unless specified otherwise.

## Derating data (continued)

### Installation height above sea level



## Selection and ordering data

### MICROMASTER 410 inverter

Output		Rated input current <sup>1)</sup> A	Rated output current A	Frame size (FS)	Order No.	
kW	hp				MICROMASTER 410 without filter <sup>2)</sup>	MICROMASTER 410 with internal filter Class B
<b>Mains voltage 1 AC 100 V to 120 V, output voltage 200 V to 240 V 3-phase</b>						
0.12	0.16	4.6	0.9	AA	6SE6410-2UA11-2AA0	–
0.25	0.33	7.5	1.7	AA	6SE6410-2UA11-2AA0	–
0.37	0.50	10.1	2.3	AA	6SE6410-2UA11-2AA0	–
0.55	0.75	13.4	2.7 (3.2 at 40 °C/104 °F)	AB	6SE6410-2UA11-2AA0	–
<b>Mains voltage 1 AC 200 V to 240 V, output voltage 200 V to 240 V 3-phase</b>						
0.12	0.16	1.5	0.9	AA	6SE6410-2UB11-2AA0	6SE6410-2BB11-2AA0
0.25	0.33	3.0	1.7	AA	6SE6410-2UB12-5AA0	6SE6410-2BB12-5AA0
0.37	0.50	4.4	2.3	AA	6SE6410-2UB13-7AA0	6SE6410-2BB13-7AA0
0.55	0.75	5.8	3.2	AB	6SE6410-2UB15-5BA0	6SE6410-2BB15-5BA0
0.75	1.0	7.8	3.6 (4.2 at 40 °C/104 °F)	AB	6SE6410-2UB17-5BA0	6SE6410-2BB17-5BA0
<b>Inverter with flat plate heatsink</b>						
0.37	0.5	4.4	2.3	AA	6SE6410-2UB13-7AB0	6SE6410-2BB13-7AB0
0.75	1	7.8	4.2 (at 40 °C/104 °F)	AB	6SE6410-2UB17-5BB0	6SE6410-2BB17-5BB0

The current data apply to an ambient temperature of 50 °C/122 °F unless specified otherwise.

1) The values apply to rated mains voltages of 115 V or 230 V.

2) Generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.



See Appendix for note on ordering.

All MICROMASTER 410 inverters are supplied without an Operator Panel (OP). An OP or other options must be ordered separately (see Page 1/9).

### Motors for MICROMASTER 410

Catalog M 11 contains selection and ordering data for motors which are particularly suitable for operation with the MICROMASTER 410 inverters (see Appendix for overview). This catalog is suitable for IEC motors. For motors according to US standards (NEMA) please refer to: <http://www.sea.siemens.com/motors>

## Options Inverter dependent options

### Overview

#### EMC filter, Class B

Variants with **internal** EMC filter Class B are available for inverters with a mains operating voltage of 1 230 V AC.

- The requirements are satisfied using: shielded cables with a max. length of 5 m, or 10 m with a low-capacitance motor cable (core/core < 75 pF/m, core/shield < 150 pF/m). The limits comply with EN 55 011 Class B.

An inverter with internal filter can be used with a 30 mA residual current operated circuit-breaker, and is only suitable for hardwired installation.

A non-filtered inverter together with the optional filter "Filter Class B with low leakage currents" has a leakage current  $\leq 3.5$  mA (shielded motor cable up to 5 m).

#### 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 ratio of inverter rated power to mains short-circuit

power is less than 1 %, a line commutating choke must be used in order to reduce the current peaks.

The line commutating chokes are designed as footprint chokes and are fitted between the inverter and the mounting plate.

In line with EN 61 000-3-2 regulations "Limits for harmonic currents with device input current  $\leq 16$  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  $\geq 0.75$  kW comply with the EN 61 000-3-2 standard.

### Selection and ordering data

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

The inverter and the associated options have the same voltage ratings.

**All variant dependent options and the operator panel are certified to <sup>®</sup> except fuses. Fuses of Type 3NA3 are recommended for Europe.**

Use in America requires <sup>®</sup>-listed fuses such as the Class NON range from Bussmann.

Mains voltage	Output		Inverter without filter	Order No. of the options				
	kW	hp		Filter Class B with low leakage currents	Line commutating choke	Fuse (see Catalog LV 10)	Circuit-breaker (see Catalog LV 10)	
1 AC 100 V to 120 V	0.12	0.16	6SE6410-2UA11-2AA0	–	6SE6400-3CC01-0AB3	3NA3803	3RV1021-1GA10	
	0.25	0.33	6SE6410-2UA11-2AA0	–			3RV1021-1JA10	
	0.37	0.50	6SE6410-2UA13-7AA0 *)	–	6SE6400-3CC02-6BB3	3NA3805	3RV1021-1KA10	
	0.55	0.75	6SE6410-2UA15-5BA0 *)	–		3NA3807	3RV1021-4AA10	
1 AC 200 V to 240 V	0.12	0.16	6SE6410-2UB11-2AA0	6SE6400-2FL01-0AB0	6SE6400-3CC00-4AB3	3NA3803	3RV1021-1BA10	
	0.25	0.33	6SE6410-2UB12-5AA0				3RV1021-1EA10	
	0.37	0.50	6SE6410-2UB13-7AA0		6SE6400-3CC01-0AB3		3RV1021-1FA10	
	0.55	0.75	6SE6410-2UB15-5BA0				3RV1021-1HA10	
	0.75	1.0	6SE6410-2UB17-5BA0			3NA3805	3RV1021-1JA10	
			<b>Inverter with flat plate heatsink</b>					
	0.37	0.50	6SE6410-2UB13-7AB0 *)	6SE6400-2FL01-0AB0	6SE6400-3CC01-0AB3	3NA3803	3RV1021-1FA10	
0.75	1.0	6SE6410-2UB17-5BB0 *)			3NA3805	3RV1021-1JA10		
1 AC 200 V to 240 V	Inverter with internal filter Class B							
	0.12	0.16	6SE6410-2BB11-2AA0	–	6SE6400-3CC00-4AB3	3NA3803	3RV1021-1BA10	
	0.25	0.33	6SE6410-2BB12-5AA0	–			3RV1021-1EA10	
	0.37	0.50	6SE6410-2BB13-7AA0	–	6SE6400-3CC01-0AB3		3RV1021-1FA10	
	0.55	0.75	6SE6410-2BB15-5BA0	–			3RV1021-1HA10	
	0.75	1.0	6SE6410-2BB17-5BA0	–		3NA3805	3RV1021-1JA10	
			<b>Inverter with flat plate heatsink</b>					
0.37	0.50	6SE6410-2BB13-7AB0 *)	–	6SE6400-3CC01-0AB3	3NA3803	3RV1021-1FA10		
0.75	1.0	6SE6410-2BB17-5BB0 *)	–		3NA3805	3RV1021-1JA10		

\*) With these inverters, the filter or choke cannot be mounted in the substructure. This option must be mounted upright.



## Overview

### Operator Panel (OP)

With the OP, individual parameter settings can be made.

Values and units are shown on a 5-digit display.

An OP can be used for several inverters. It is directly plugged into the inverter.



Inverter with Operator Panel (OP)

### Connection kit for PC to inverter

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

The connection kit includes an RS-485/RS-232 interface converter with a 9-pin Sub-D connector.

### Start-up tools

- **STARTER** is a graphic start-up software for guided start-up for MICROMASTER 410/420/430/440 frequency inverters under Windows NT/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 95/98/NT/2000/XP Professional.

1

## Selection and ordering data

The options listed here are suitable for all MICROMASTER 410 inverters.

Options	Order No.
Operator Panel (OP)	<b>6SE6400-0SP00-0AA0</b>
Connection kit for PC to inverter	<b>6SE6400-0PL00-0AA0</b>
Adapter for mounting on DIN rails	<b>6SE6400-0DR00-0AA0</b>
Start-up tools STARTER and DriveMonitor, as well as multilanguage documentation on CD-ROM	<b>6SE6400-5EA00-1AG0</b>

## Documentation

## Selection and ordering data

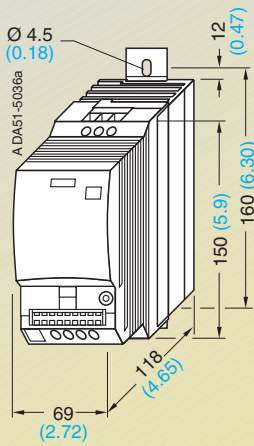
Type of documentation	Language	Order No.
<b>Operating instructions</b> <sup>1)</sup> (paper version)	German	<b>6SE6400-5EA00-0AP0</b>
	English	<b>6SE6400-5EA00-0BP0</b>
	French	<b>6SE6400-5EA00-0DP0</b>
	Italian	<b>6SE6400-5EA00-0CP0</b>
	Spanish	<b>6SE6400-5EA00-0EP0</b>
<b>Parameter list</b> <sup>1)</sup> (paper version)	German	<b>6SE6400-5EB00-0AP0</b>
	English	<b>6SE6400-5EB00-0BP0</b>
	French	<b>6SE6400-5EB00-0DP0</b>
	Italian	<b>6SE6400-5EB00-0CP0</b>
	Spanish	<b>6SE6400-5EB00-0EP0</b>
<b>Getting Started Guide</b> <sup>1)</sup> (paper version), included with every inverter	Multilanguage	–

1) Available on the Internet at <http://www.siemens.com/micro-master>

# MICROMASTER 410

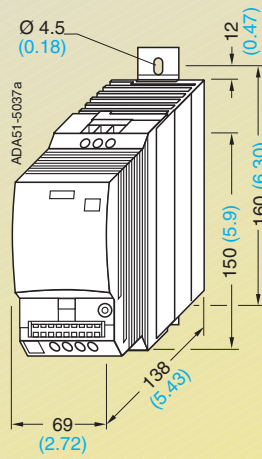
## Dimension drawings

### MICROMASTER 410 inverter



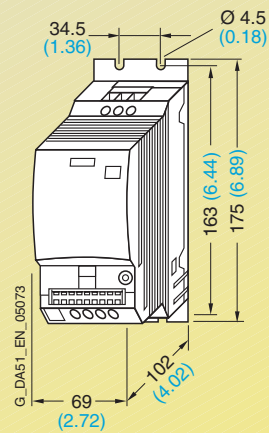
#### Inverter frame size AA

6SE6410-2 . . . 11-2AA0  
6SE6410-2 . . . 12-5AA0  
6SE6410-2 . . . 13-7AA0



#### Inverter frame size AB

6SE6410-2 . . . 15-5BA0  
6SE6410-2 . . . 17-5BA0

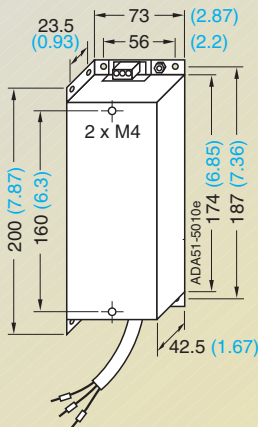


#### Inverter with flat plate heatsink

6SE6410-2 . B13-7AB0  
6SE6410-2 . B17-5BB0

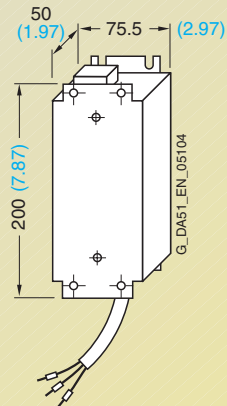
All dimensions in mm (values in brackets are in inches)

### Filters and chokes



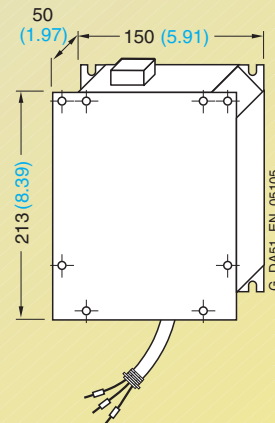
#### Filter

6SE6400-2FL01-0AB0



#### Footprint chokes

6SE6400-3CC00-4AB3  
6SE6400-3CC01-0AB3



#### Choke for upright mounting

6SE6400-3CC02-6BB3

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

# Inverter

## MICROMASTER 420



- 2/2 Description
- 2/4 Circuit diagrams
- 2/6 Technical data
- 2/8 Selection and ordering data
- 2/9 Options
- 2/17 Dimension drawings



# MICROMASTER 420

## Description



2

### Applications

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
- 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 95/98 and NT/2000/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.



### 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

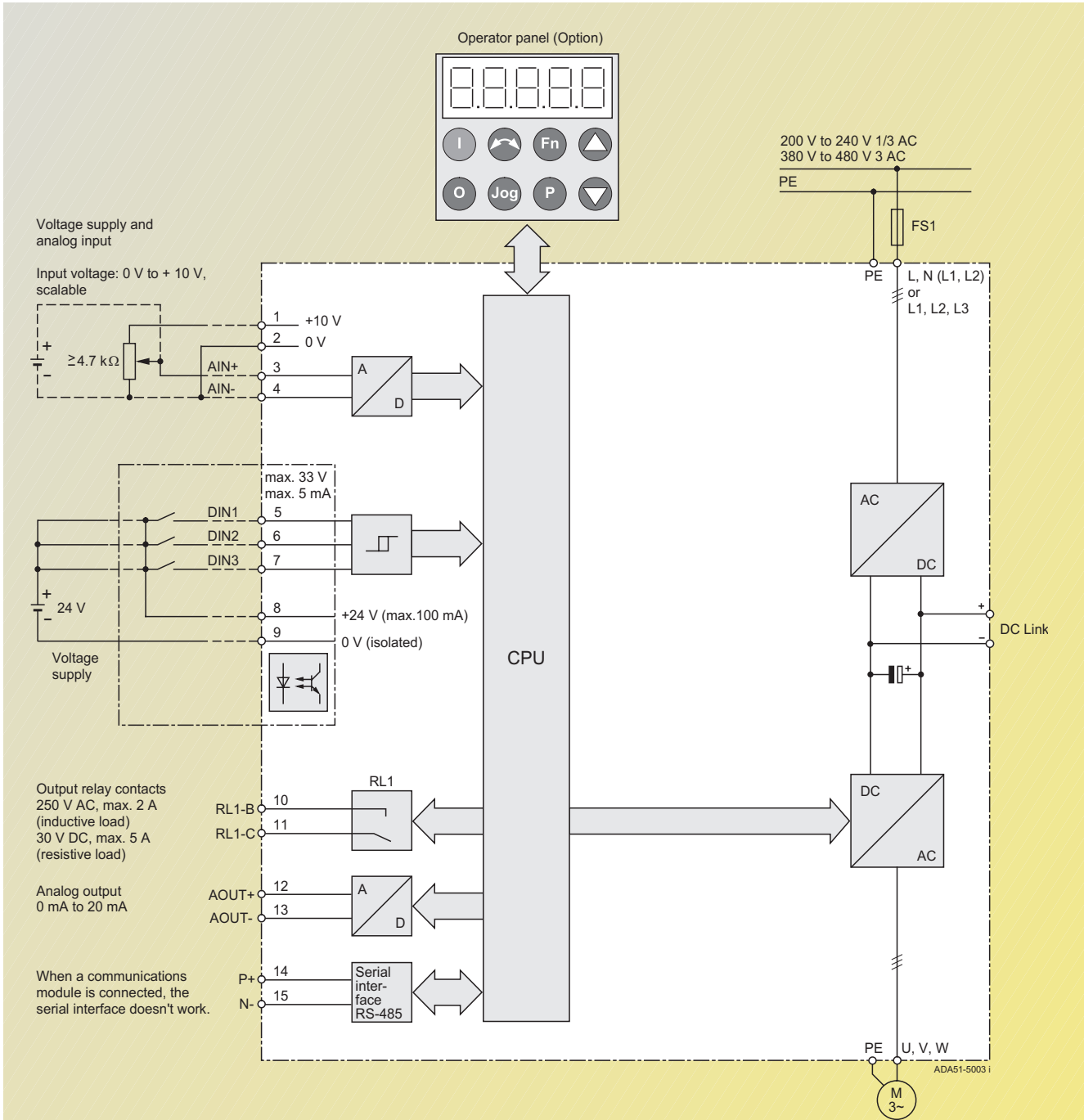
- Programmable acceleration/deceleration times from 0 s to 650 s
- Ramp smoothing
- Fast Current Limit (FCL) for trip-free operation
- Fast, repeatable digital input response time
- Fine adjustment using a high-resolution 10-bit analog input
- Compound braking for controlled rapid braking
- Four skip 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

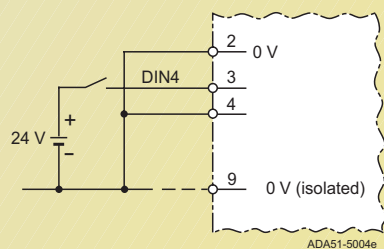
- Overload current 1.5 x rated output current (i.e. 150 % overload capability) for 60 s, cycle time 300 s
- Overvoltage/undervoltage protection
- Inverter overtemperature protection
- Motor protection using PTC via digital input (possible with supplementary circuit)
- Earth fault protection
- Short-circuit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

## Circuit diagrams

### General circuit diagram

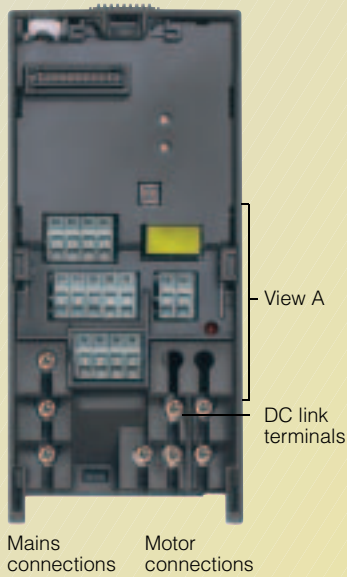


For an additional digital input (DIN4) external connections should be made:

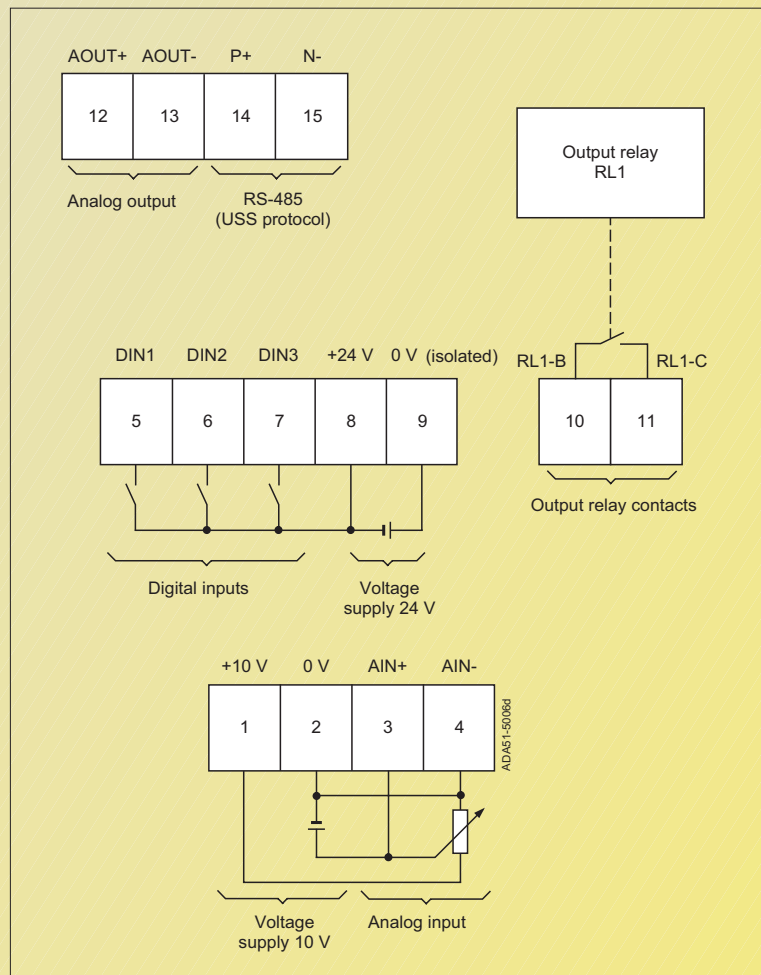


### Terminal connection diagram

Example frame size A



View A



# MICROMASTER 420

## Technical data

### MICROMASTER 420 inverter

Mains voltage and power ranges	1 AC 200 V to 240 V $\pm$ 10 % 3 AC 200 V to 240 V $\pm$ 10 % 3 AC 380 V to 480 V $\pm$ 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	$\geq$ 0.95		
Inverter efficiency	96 % to 97 %		
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 max. 50 m (shielded) max. 100 m (unshielded) without output choke (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)		
Site altitude	Up to 1000 m above sea level without derating		
Protection features for	<ul style="list-style-type: none"> <li>• Undervoltage</li> <li>• Overvoltage</li> <li>• Overload</li> <li>• Earth faults</li> <li>• Short circuit</li> <li>• Stall prevention</li> <li>• Locked motor protection</li> <li>• Motor overtemperature</li> <li>• Inverter overtemperature</li> <li>• Parameter interlock</li> </ul>		
Compliance with standards	®, c®, CE, c-tick		
CE marking	Conformity with low-voltage directive 73/23/EEC		
Dimensions and weights (without options)	Frame size (FS)	H x W x D (mm)	Weight, approx. (kg)
	A	173 x 73 x 149	1.0
	B	202 x 149 x 172	3.3
	C	245 x 185 x 195	5.0

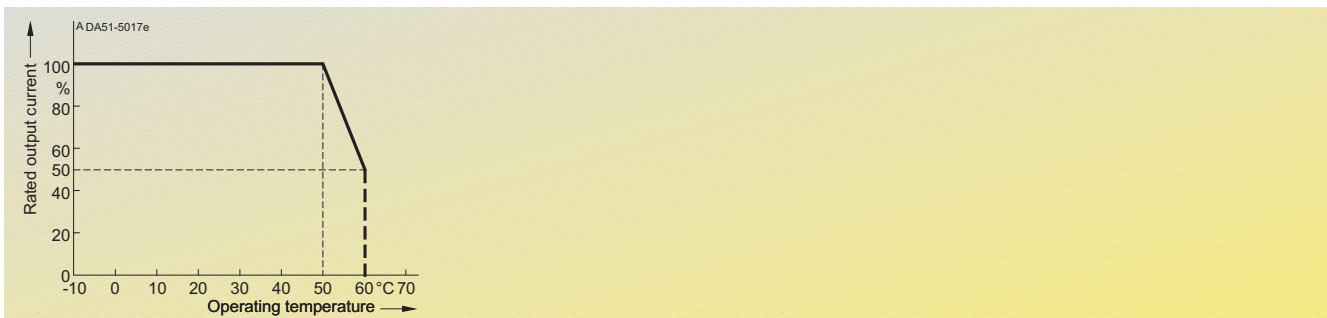


### Derating data

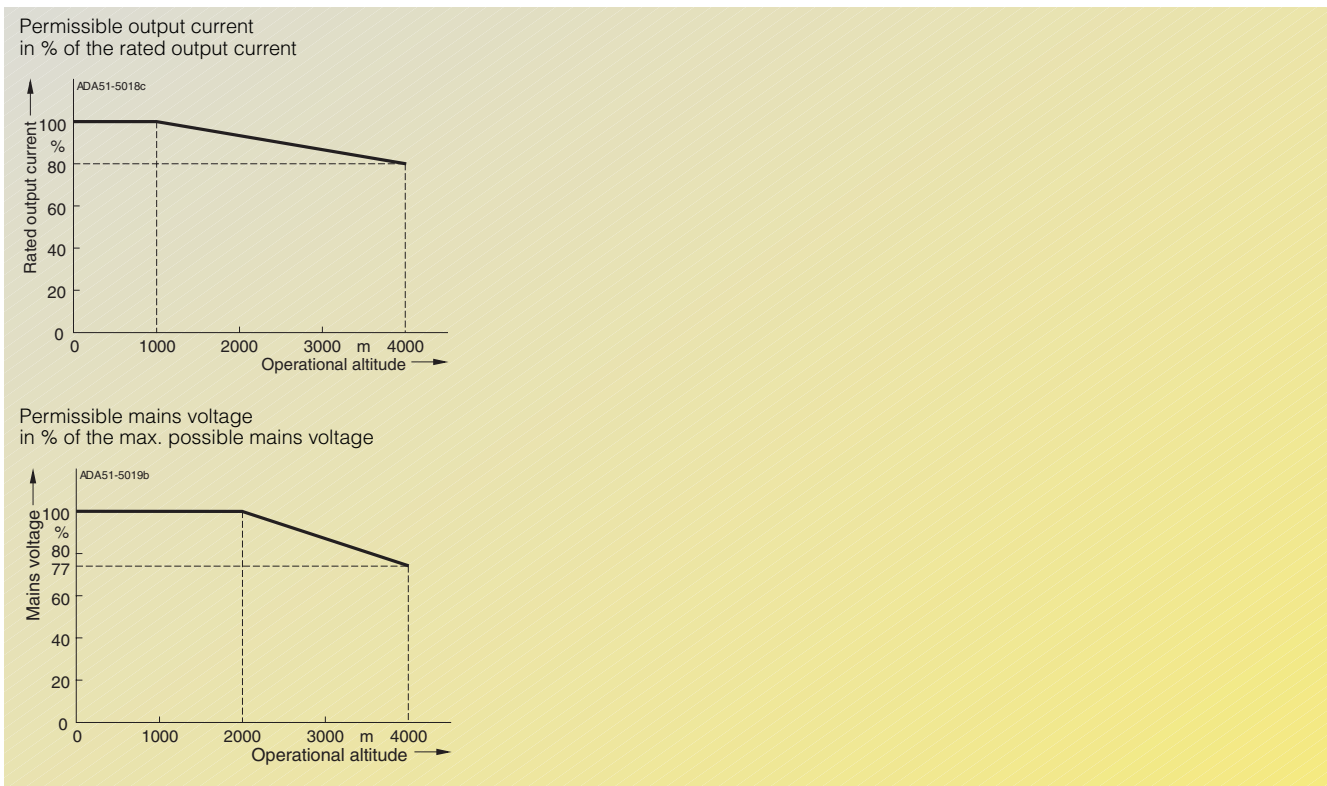
#### PWM frequency

Output (for 3 AC 400 V) kW	Rated output current in A for a pulse frequency of						
	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	18.4	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 height above sea level



# MICROMASTER 420

## Selection and ordering data

### MICROMASTER 420 inverter

Output		Rated input current <sup>1)</sup>	Rated output current	Frame size	Order No.	
kW	hp	A	A	(FS)	MICROMASTER 420 without filter <sup>3)</sup>	MICROMASTER 420 with internal filter Class A <sup>2)</sup>
<b>Mains operating voltage 1 AC 200 V to 240 V</b>						
0.12	0.16	2.3	0.9	A	6SE6420-2UC11-2AA1	6SE6420-2AB11-2AA1
0.25	0.33	4.3	1.7	A	6SE6420-2UC12-5AA1	6SE6420-2AB12-5AA1
0.37	0.50	5.9	2.3	A	6SE6420-2UC13-7AA1	6SE6420-2AB13-7AA1
0.55	0.75	7.7	3.0	A	6SE6420-2UC15-5AA1	6SE6420-2AB15-5AA1
0.75	1.0	10.1	3.9	A	6SE6420-2UC17-5AA1	6SE6420-2AB17-5AA1
1.1	1.5	15.0	5.5	B	6SE6420-2UC21-1BA1	6SE6420-2AB21-1BA1
1.5	2.0	18.6	7.4	B	6SE6420-2UC21-5BA1	6SE6420-2AB21-5BA1
2.2	3.0	26.8	10.4	B	6SE6420-2UC22-2BA1	6SE6420-2AB22-2BA1
3.0	4.0	35.9	13.6	C	6SE6420-2UC23-0CA1	6SE6420-2AB23-0CA1
<b>Mains operating voltage 3 AC 200 V to 240 V</b>						
0.12	0.16	1.1	0.9	A	6SE6420-2UC11-2AA1	–
0.25	0.33	2.2	1.7	A	6SE6420-2UC12-5AA1	–
0.37	0.50	3.0	2.3	A	6SE6420-2UC13-7AA1	–
0.55	0.75	3.9	3.0	A	6SE6420-2UC15-5AA1	–
0.75	1.0	5.2	3.9	A	6SE6420-2UC17-5AA1	–
1.1	1.5	7.6	5.5	B	6SE6420-2UC21-1BA1	–
1.5	2.0	10.2	7.4	B	6SE6420-2UC21-5BA1	–
2.2	3.0	14.1	10.4	B	6SE6420-2UC22-2BA1	–
3.0	4.0	18.4	13.6	C	6SE6420-2UC23-0CA1	6SE6420-2AC23-0CA1
4.0	5.0	23.3	17.5	C	6SE6420-2UC24-0CA1	6SE6420-2AC24-0CA1
5.5	7.5	28.0	22.0	C	6SE6420-2UC25-5CA1	6SE6420-2AC25-5CA1
<b>Mains operating voltage 3 AC 380 V to 480 V</b>						
0.37	0.50	1.5	1.2	A	6SE6420-2UD13-7AA1	–
0.55	0.75	1.9	1.6	A	6SE6420-2UD15-5AA1	–
0.75	1.0	2.4	2.1	A	6SE6420-2UD17-5AA1	–
1.1	1.5	3.7	3.0	A	6SE6420-2UD21-1AA1	–
1.5	2.0	4.8	4.0	A	6SE6420-2UD21-5AA1	–
2.2	3.0	6.5	5.9	B	6SE6420-2UD22-2BA1	6SE6420-2AD22-2BA1
3.0	4.0	8.6	7.7	B	6SE6420-2UD23-0BA1	6SE6420-2AD23-0BA1
4.0	5.0	11.6	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 2/11 to 2/15).

#### Motors for MICROMASTER 420

Catalog M 11 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: <http://www.sea.siemens.com/motors>

1) Supplementary conditions: Input current at rated operating point, applicable at short-circuit voltage of the supply  $U_{sc} = 1\%$  with reference to the inverter rated power and rated mains voltage of 240 V or 400 V

without a line commutating choke. If a line commutating choke is used, the specified values at 200 V to 240 V are reduced to between 55% and 70% and 380 V – 480 V to between 70% and 80%.

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

3) Generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.

**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.

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.

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. 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.

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

- Frame sizes A and B: A maximum of two footprint components plus inverter are permissible. The LC filter must be mounted as the lowest component.
- Frame size C: Only one footprint component is permissible for frame size C. If a line choke and LC filter are used, the line choke must be located on the left of the inverter. Required spacing: 75 mm.

Please note when using LC filters:

- Only V/f, FCC control permissible
- Increased inverter load: approx. 10% to 15%
- Operation only permissible with 4 kHz pulse frequency
- The output frequency is limited to 150 Hz.

**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  $\leq 16$  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  $\geq 0.75$  kW comply with the EN 61 000-3-2 standard.

**Output choke**

Output chokes can be supplied for reducing the capacitive currents and  $dV/dt$  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 ensure optimum EMC performance.

# MICROMASTER 420

## 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	4.5 A/ 4.1 A	
	for frame size B	11.2 A/10.2 A	
	for frame size C	32.6 A/29.7 A	
Limiting of motor overvoltage	≤ 1078 V		
dV/dt limiting	≤ 500 V/μs		
Pulse frequency	4 kHz		
Max. motor frequency	150 Hz		
Max. permissible motor cable lengths	Shielded	200 m	
	Unshielded	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	-10 °C to +40 °C (+14 °F to +104 °F) to +50 °C (to +122 °F)	100 % $P_n$ 80 % $P_n$
	Storage	-25 °C to +70 °C (-13 °F to +158 °F)	
Operational altitude	up to 2000 m	100 % $P_n$	
	2000 to 4000 m	62.5 % $P_n$	
Mounting position	Vertical		
Free space	Top	100 mm	
	Bottom	100 mm	
	Side	100 mm	
Connection system	Input, litz wire or terminal	1U1, 1V1, 1W1	
	Output, terminals	1U2, 1V2, 1W2	
Torque for power conductor connections	1.5 Nm to 1.8 Nm		
Weight, approx.	for frame size A	7 kg	
	for frame size B	11 kg	
	for frame size C	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 (FS)	Output choke Type	Max. permissible motor cable lengths (shielded/unshielded) for a mains voltage of		
		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



## 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.

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

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

Mains voltage	Output		Inverter without filter	Order No. of the options		
	kW	hp		EMC filter Class A	EMC filter Class B	Additional EMC filter, Class B
<b>1 AC 200 V to 240 V</b>	0.12	0.16	6SE6420-2UC11-2AA1	–	–	–
	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	–	–	–
	1.5	2.0	6SE6420-2UC21-5BA1	–	–	–
	2.2	3.0	6SE6420-2UC22-2BA1	–	–	–
	3.0	4.0	6SE6420-2UC23-0CA1	–	–	–
<b>3 AC 200 V to 240 V</b>	0.12	0.16	6SE6420-2UC11-2AA1	<b>6SE6400-2FA00-6AD0</b>	<b>6SE6400-2FB00-6AD0</b>	–
	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	<b>6SE6400-2FA01-4BC0</b>	<b>6SE6400-2FB01-4BC0</b>	–
	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	–	–	–
	<b>3 AC 380 V to 480 V</b>	0.37	0.50	6SE6420-2UD13-7AA1	<b>6SE6400-2FA00-6AD0</b>	<b>6SE6400-2FB00-6AD0</b>
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			
<b>1 AC 200 V to 240 V</b>	0.12	0.16	6SE6420-2AB11-2AA1	–	–	<b>6SE6400-2FS01-0AB0</b>
	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	–	–	<b>6SE6400-2FS02-6BB0</b>
	1.5	2.0	6SE6420-2AB21-5BA1	–	–	–
	2.2	3.0	6SE6420-2AB22-2BA1	–	–	–
	3.0	4.0	6SE6420-2AB23-0CA1	–	–	<b>6SE6400-2FS03-5CB0</b>
<b>3 AC 200 V to 240 V</b>	3.0	4.0	6SE6420-2AC23-0CA1	–	–	<b>6SE6400-2FS03-8CD0</b>
	4.0	5.0	6SE6420-2AC24-0CA1	–	–	–
	5.5	7.5	6SE6420-2AC25-5CA1	–	–	–
<b>3 AC 380 V to 480 V</b>	2.2	3.0	6SE6420-2AD22-2BA1	–	–	<b>6SE6400-2FS01-6BD0</b>
	3.0	4.0	6SE6420-2AD23-0BA1	–	–	–
	4.0	5.0	6SE6420-2AD24-0BA1	–	–	–
	5.5	7.5	6SE6420-2AD25-5CA1	–	–	<b>6SE6400-2FS03-8CD0</b>
	7.5	10.0	6SE6420-2AD27-5CA1	–	–	–
	11	15.0	6SE6420-2AD31-1CA1	–	–	–



# MICROMASTER 420

## Options Variant dependent options

### Selection and ordering data (continued)

Mains voltage	Output		Inverter without filter	Order No. of the options			
	kW	hp		Filter Class B with low leakage currents	LC filter	Line commutating choke	
<b>1 AC 200 V to 240 V</b>	0.12	0.16	6SE6420-2UC11-2AA1	<b>6SE6400-2FL01-0AB0</b>	–	<b>6SE6400-3CC00-4AB3</b>	
	0.25	0.33	6SE6420-2UC12-5AA1	–	–	–	
	0.37	0.50	6SE6420-2UC13-7AA1	–	–	<b>6SE6400-3CC01-0AB3</b>	
	0.55	0.75	6SE6420-2UC15-5AA1	–	–	–	
	0.75	1.0	6SE6420-2UC17-5AA1	–	–	–	
	1.1	1.5	6SE6420-2UC21-1BA1	<b>6SE6400-2FL02-6BB0</b>	–	<b>6SE6400-3CC02-6BB3</b>	
	1.5	2.0	6SE6420-2UC21-5BA1	–	–	–	
	2.2	3.0	6SE6420-2UC22-2BA1	–	–	–	
	3.0	4.0	6SE6420-2UC23-0CA1	–	–	<b>6SE6400-3CC03-5CB3</b>	
<b>3 AC 200 V to 240 V</b>	0.12	0.16	6SE6420-2UC11-2AA1	–	–	<b>6SE6400-3CC00-3AC3</b>	
	0.25	0.33	6SE6420-2UC12-5AA1	–	–	–	
	0.37	0.50	6SE6420-2UC13-7AA1	–	–	<b>6SE6400-3CC00-5AC3</b>	
	0.55	0.75	6SE6420-2UC15-5AA1	–	–	–	
	0.75	1.0	6SE6420-2UC17-5AA1	–	–	–	
	1.1	1.5	6SE6420-2UC21-1BA1	–	–	<b>6SE6400-3CC00-8BC3</b>	
	1.5	2.0	6SE6420-2UC21-5BA1	–	–	<b>6SE6400-3CC01-4BD3</b>	
	2.2	3.0	6SE6420-2UC22-2BA1	–	–	–	
	3.0	4.0	6SE6420-2UC23-0CA1	–	–	<b>6SE6400-3CC01-7CC3</b>	
	4.0	5.0	6SE6420-2UC24-0CA1	–	–	<b>6SE6400-3CC03-5CD3</b>	
<b>3 AC 380 V to 480 V</b>	0.37	0.50	6SE6420-2UD13-7AA1	–	<b>6SE6400-3TD00-4AD0</b>	<b>6SE6400-3CC00-2AD3</b>	
	0.55	0.75	6SE6420-2UD15-5AA1	–	–	–	
	0.75	1.0	6SE6420-2UD17-5AA1	–	–	<b>6SE6400-3CC00-4AD3</b>	
	1.1	1.5	6SE6420-2UD21-1AA1	–	–	–	
	1.5	2.0	6SE6420-2UD21-5AA1	–	–	<b>6SE6400-3CC00-6AD3</b>	
	2.2	3.0	6SE6420-2UD22-2BA1	–	<b>6SE6400-3TD01-0BD0</b>	<b>6SE6400-3CC01-0BD3</b>	
	3.0	4.0	6SE6420-2UD23-0BA1	–	–	–	
	4.0	5.0	6SE6420-2UD24-0BA1	–	–	<b>6SE6400-3CC01-4BD3</b>	
	5.5	7.5	6SE6420-2UD25-5CA1	–	<b>6SE6400-3TD03-2CD0</b>	<b>6SE6400-3CC02-2CD3</b>	
<b>1 AC 200 V to 240 V</b>	0.12	0.16	6SE6420-2AB11-2AA1	–	–	<b>6SE6400-3CC00-4AB3</b>	
	0.25	0.33	6SE6420-2AB12-5AA1	–	–	–	
	0.37	0.50	6SE6420-2AB13-7AA1	–	–	<b>6SE6400-3CC01-0AB3</b>	
	0.55	0.75	6SE6420-2AB15-5AA1	–	–	–	
	0.75	1.0	6SE6420-2AB17-5AA1	–	–	–	
	1.1	1.5	6SE6420-2AB21-1BA1	–	–	<b>6SE6400-3CC02-6BB3</b>	
	1.5	2.0	6SE6420-2AB21-5BA1	–	–	–	
	2.2	3.0	6SE6420-2AB22-2BA1	–	–	–	
	3.0	4.0	6SE6420-2AB23-0CA1	–	–	<b>6SE6400-3CC03-5CB3</b>	
	<b>3 AC 200 V to 240 V</b>	3.0	4.0	6SE6420-2AC23-0CA1	–	<b>6SE6400-3TD01-0BD0</b>	<b>6SE6400-3CC01-7CC3</b>
		4.0	5.0	6SE6420-2AC24-0CA1	–	–	<b>6SE6400-3CC03-5CD3</b>
		5.5	7.5	6SE6420-2AC25-5CA1	–	–	–
	<b>3 AC 380 V to 480 V</b>	2.2	3.0	6SE6420-2AD22-2BA1	–	<b>6SE6400-3TD03-2CD0</b>	<b>6SE6400-3CC01-0BD3</b>
		3.0	4.0	6SE6420-2AD23-0BA1	–	–	–
4.0		5.0	6SE6420-2AD24-0BA1	–	–	<b>6SE6400-3CC01-4BD3</b>	
5.5		7.5	6SE6420-2AD25-5CA1	–	–	<b>6SE6400-3CC02-2CD3</b>	
7.5		10.0	6SE6420-2AD27-5CA1	–	–	–	
11		15.0	6SE6420-2AD31-1CA1	–	–	<b>6SE6400-3CC03-5CD3</b>	

## Selection and ordering data (continued)

Mains voltage	Output		Inverter without filter	Output choke	Gland plate	Order No. of the options			
	kW	hp				Fuse (see Cata- log LV 10)	Circuit-breaker		
<b>1 AC 200 V to 240 V</b>	0.12	0.16	6SE6420-2UC11-2AA1	<b>6SE6400-3TC00-4AD3</b>	<b>6SE6400-0GP00-0AA0</b>	<b>3NA3803</b>	<b>3RV1021-1DA10</b>		
	0.25	0.33	6SE6420-2UC12-5AA1				<b>3RV1021-1GA10</b>		
	0.37	0.50	6SE6420-2UC13-7AA1				<b>3RV1021-1HA10</b>		
	0.55	0.75	6SE6420-2UC15-5AA1						<b>3RV1021-1JA10</b>
	0.75	1.0	6SE6420-2UC17-5AA1					<b>3NA3805</b>	<b>3RV1021-4AA10</b>
	1.1	1.5	6SE6420-2UC21-1BA1			<b>6SE6400-3TC01-0BD3</b>	<b>6SE6400-0GP00-0BA0</b>	<b>3NA3807</b>	<b>3RV1021-4BA10</b>
	1.5	2.0	6SE6420-2UC21-5BA1						<b>3RV1021-4DA10</b>
	2.2	3.0	6SE6420-2UC22-2BA1					<b>3NA3812</b>	<b>3RV1031-4FA10</b>
	3.0	4.0	6SE6420-2UC23-0CA1			<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-0GP00-0CA0</b>	<b>3NA3817</b>	<b>3RV1031-4HA10</b>
<b>3 AC 200 V to 240 V</b>	0.12	0.16	6SE6420-2UC11-2AA1	<b>6SE6400-3TC00-4AD3</b>	<b>6SE6400-0GP00-0AA0</b>	<b>3NA3803</b>	<b>3RV1021-1AA10</b>		
	0.25	0.33	6SE6420-2UC12-5AA1				<b>3RV1021-1DA10</b>		
	0.37	0.50	6SE6420-2UC13-7AA1				<b>3RV1021-1EA10</b>		
	0.55	0.75	6SE6420-2UC15-5AA1						<b>3RV1021-1GA10</b>
	0.75	1.0	6SE6420-2UC17-5AA1						<b>3RV1021-1HA10</b>
	1.1	1.5	6SE6420-2UC21-1BA1			<b>6SE6400-3TC01-0BD3</b>	<b>6SE6400-0GP00-0BA0</b>	<b>3NA3805</b>	<b>3RV1021-1KA10</b>
	1.5	2.0	6SE6420-2UC21-5BA1						<b>3RV1021-4AA10</b>
	2.2	3.0	6SE6420-2UC22-2BA1					<b>3NA3807</b>	<b>3RV1021-4BA10</b>
	3.0	4.0	6SE6420-2UC23-0CA1			<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-0GP00-0CA0</b>	<b>3NA3810</b>	<b>3RV1021-4CA10</b>
4.0	5.0	6SE6420-2UC24-0CA1			<b>3NA3812</b>	<b>3RV1031-4EA10</b>			
5.5	7.5	6SE6420-2UC25-5CA1			<b>3NA3814</b>	<b>3RV1031-4FA10</b>			
<b>3 AC 380 V to 480 V</b>	0.37	0.50	6SE6420-2UD13-7AA1	<b>6SE6400-3TC00-4AD2</b>	<b>6SE6400-0GP00-0AA0</b>	<b>3NA3803</b>	<b>3RV1021-1CA10</b>		
	0.55	0.75	6SE6420-2UD15-5AA1				<b>3RV1021-1DA10</b>		
	0.75	1.0	6SE6420-2UD17-5AA1				<b>3RV1021-1EA10</b>		
	1.1	1.5	6SE6420-2UD21-1AA1						<b>3RV1021-1GA10</b>
	1.5	2.0	6SE6420-2UD21-5AA1						<b>3RV1021-1HA10</b>
	2.2	3.0	6SE6420-2UD22-2BA1			<b>6SE6400-3TC01-0BD3</b>	<b>6SE6400-0GP00-0BA0</b>	<b>3NA3805</b>	<b>3RV1021-1JA10</b>
	3.0	4.0	6SE6420-2UD23-0BA1						<b>3RV1021-1KA10</b>
	4.0	5.0	6SE6420-2UD24-0BA1					<b>3NA3807</b>	<b>3RV1021-4AA10</b>
	5.5	7.5	6SE6420-2UD25-5CA1			<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-0GP00-0CA0</b>		<b>3RV1021-4CA10</b>
7.5	10.0	6SE6420-2UD27-5CA1			<b>3NA3810</b>	<b>3RV1031-4EA10</b>			
11	15.0	6SE6420-2UD31-1CA1			<b>3NA3814</b>	<b>3RV1031-4GA10</b>			
			Inverter with internal filter Class A						
<b>1 AC 200 V to 240 V</b>	0.12	0.16	6SE6420-2AB11-2AA1	<b>6SE6400-3TC00-4AD3</b>	<b>6SE6400-0GP00-0AA0</b>	<b>3NA3803</b>	<b>3RV1021-1DA10</b>		
	0.25	0.33	6SE6420-2AB12-5AA1				<b>3RV1021-1GA10</b>		
	0.37	0.50	6SE6420-2AB13-7AA1				<b>3RV1021-1HA10</b>		
	0.55	0.75	6SE6420-2AB15-5AA1						<b>3RV1021-1JA10</b>
	0.75	1.0	6SE6420-2AB17-5AA1					<b>3NA3805</b>	<b>3RV1021-4AA10</b>
	1.1	1.5	6SE6420-2AB21-1BA1			<b>6SE6400-3TC01-0BD3</b>	<b>6SE6400-0GP00-0BA0</b>	<b>3NA3807</b>	<b>3RV1021-4BA10</b>
	1.5	2.0	6SE6420-2AB21-5BA1						<b>3RV1021-4DA10</b>
	2.2	3.0	6SE6420-2AB22-2BA1					<b>3NA3812</b>	<b>3RV1031-4FA10</b>
	3.0	4.0	6SE6420-2AB23-0CA1			<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-0GP00-0CA0</b>	<b>3NA3817</b>	<b>3RV1031-4HA10</b>
<b>3 AC 200 V to 240 V</b>	3.0	4.0	6SE6420-2AC23-0CA1	<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-0GP00-0CA0</b>	<b>3NA3810</b>	<b>3RV1021-4CA10</b>		
	4.0	5.0	6SE6420-2AC24-0CA1			<b>3NA3812</b>	<b>3RV1031-4EA10</b>		
	5.5	7.5	6SE6420-2AC25-5CA1			<b>3NA3814</b>	<b>3RV1031-4FA10</b>		
<b>3 AC 380 V to 480 V</b>	2.2	3.0	6SE6420-2AD22-2BA1	<b>6SE6400-3TC01-0BD3</b>	<b>6SE6400-0GP00-0BA0</b>	<b>3NA3805</b>	<b>3RV1021-1JA10</b>		
	3.0	4.0	6SE6420-2AD23-0BA1				<b>3RV1021-1KA10</b>		
	4.0	5.0	6SE6420-2AD24-0BA1						<b>3NA3807</b>
	5.5	7.5	6SE6420-2AD25-5CA1			<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-0GP00-0CA0</b>		<b>3RV1021-4CA10</b>
	7.5	10.0	6SE6420-2AD27-5CA1					<b>3NA3810</b>	<b>3RV1031-4EA10</b>
	11	15.0	6SE6420-2AD31-1CA1					<b>3NA3814</b>	<b>3RV1031-4GA10</b>

## Options Variant independent options

### 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)

#### PROFIBUS module

For a complete PROFIBUS connection with up to  $\leq 12$  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<sup>1)</sup>.

#### 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<sup>2)</sup>.

#### Start-up tools

- **STARTER** is a graphic start-up software for guided start-up for MICROMASTER 410/420/430/440 frequency inverters under Windows NT/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 95/98/NT/2000/XP Professional.

Both programs are included on the Docu CD 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 8/32 (28 AWG) is recommended. The maximum cable length is 10 m for RS-485.




## Selection and ordering data

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

Options	Order No.
Basic Operator Panel (BOP)	<b>6SE6400-0BP00-0AA0</b>
Advanced Operator Panel (AOP)	<b>6SE6400-0AP00-0AA1</b>
Asian Advanced Operator Panel (AAOP)	<b>6SE6400-0AP00-0AB0</b>
PROFIBUS module	<b>6SE6400-1PB00-0AA0</b>
DeviceNet module	<b>6SE6400-1DN00-0AA0</b>
CANopen module	<b>6SE6400-1CB00-0AA0</b>
RS485/PROFIBUS bus connector	<b>6GK1500-0FC00</b>
Connection kit for PC to inverter	<b>6SE6400-1PC00-0AA0</b>
Connection kit for PC to AOP	<b>6SE6400-0PA00-0AA0</b>
Operator panel door mounting kit for single inverter	<b>6SE6400-0PM00-0AA0</b>
AOP door mounting kit for multiple inverters (USS)	<b>6SE6400-0MD00-0AA0</b>

## 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	to DIN IEC 60068-2-6 (if module is installed correctly)	
• Stationary	Deflection	0.15 mm in the frequency range of 10 Hz to 58 Hz
	Acceleration	19.6 m/s <sup>2</sup> in the frequency range of 58 Hz to 500 Hz
• Transport	Deflection	3.5 mm in the frequency range of 5 Hz to 9 Hz
	Acceleration	9.8 m/s <sup>2</sup> 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	-10 °C to +50 °C (+14 °F to +122 °F)	
• Storage and transport	-25 °C to +70 °C (-13 °F to +158 °F)	
Relative humidity (permissible humidity rating)		
• Operation	≤ 85 % (non-condensing)	
• Storage and transport	≤ 95 %	
Electromagnetic compatibility	Emission	to EN 55011 (1991) Class A
	Interference	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

## 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 60 664-1 (DIN VDE 0110/T1), no condensation permitted during operation
Strain resistance	to IEC 60 068-2-6 (if module is installed correctly)
• Stationary	Deflection Acceleration 0.15 mm in the frequency range of 10 Hz to 58 Hz 19.6 m/s <sup>2</sup> in the frequency range of 58 Hz to 500 Hz
• Transport	Deflection Acceleration 3.5 mm in the frequency range of 5 Hz to 9 Hz 9.8 m/s <sup>2</sup> 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	-10 °C to +50 °C (+14 °F to +122 °F)
• Storage	-40 °C to +70 °C (-40 °F to +158 °F)
• Transport	-25 °C to +70 °C (-13 °F to +158 °F)
Relative humidity (permissible humidity rating)	
• Operation	≤ 85 % (non-condensing)
• Storage and transport	≤ 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

## Documentation

### Selection and ordering data

Type of documentation	Language	Order No.
<b>Docu pack</b> , supplied with each inverter, containing CD-ROM <sup>1)</sup> and Getting Started Guide <sup>2)</sup> (paper version)	Multilanguage	<b>6SE6400-5AB00-1AP0</b>
<b>Operating instructions<sup>2)</sup></b> (paper version)	German	<b>6SE6400-5AA00-0AP0</b>
	English	<b>6SE6400-5AA00-0BP0</b>
	French	<b>6SE6400-5AA00-0DP0</b>
	Italian	<b>6SE6400-5AA00-0CP0</b>
	Spanish	<b>6SE6400-5AA00-0EP0</b>
<b>Parameter list<sup>2)</sup></b> (paper version)	German	<b>6SE6400-5BA00-0AP0</b>
	English	<b>6SE6400-5BA00-0BP0</b>
	French	<b>6SE6400-5BA00-0DP0</b>
	Italian	<b>6SE6400-5BA00-0CP0</b>
	Spanish	<b>6SE6400-5BA00-0EP0</b>

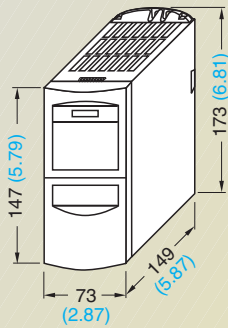
1) The CD-ROM contains operating instructions, parameter list, commissioning tools STARTER

and DriveMonitor, multilanguage

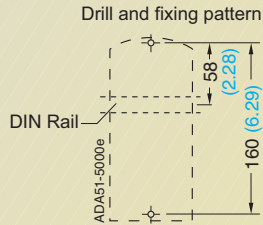
2) Available on Internet at <http://www.siemens.com/micromaster>

### MICROMASTER 420 inverter

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



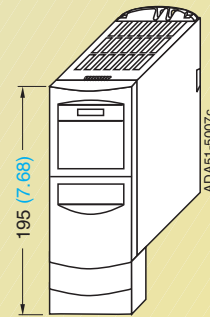
Inverter frame size **A**



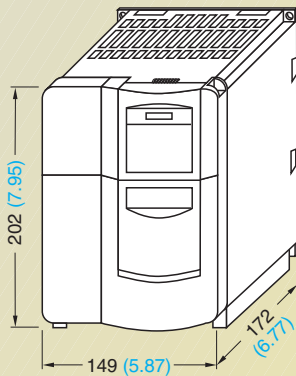
Fixing with  
2 x M4 bolts, 2 x M4 nuts, 2 x M4 washers,  
or snap onto the DIN rail

Tightening torque with washers fitted:  
2.5 Nm

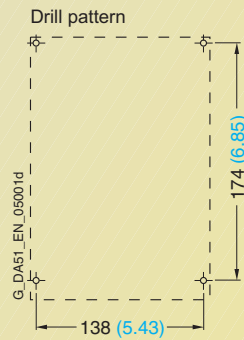
Ventilation clearance required at top and  
bottom: 100 mm



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



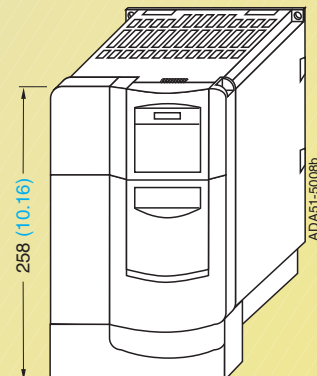
Inverter frame size **B**



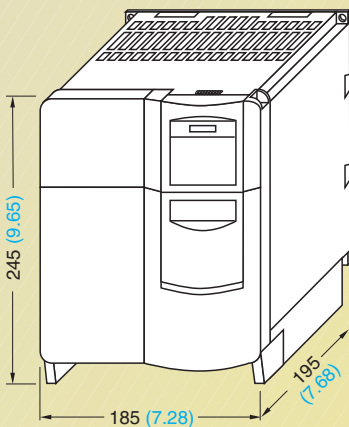
Fixing with  
4 x M4 bolts, 4 x M4 nuts, 4 x M4 washers

Tightening torque with washers fitted:  
2.5 Nm

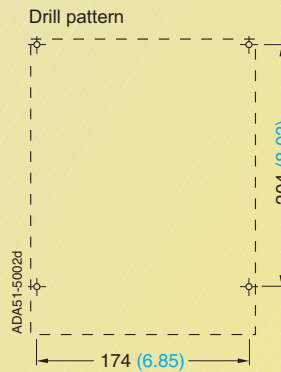
Ventilation clearance required at top and  
bottom: 100 mm



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



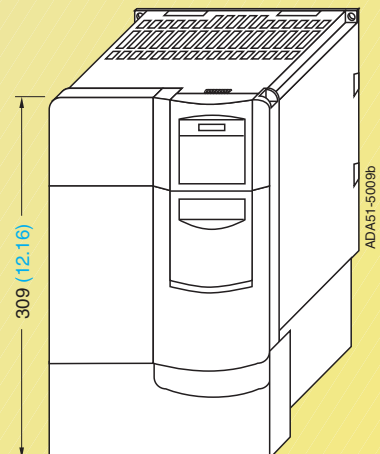
Inverter frame size **C**



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**

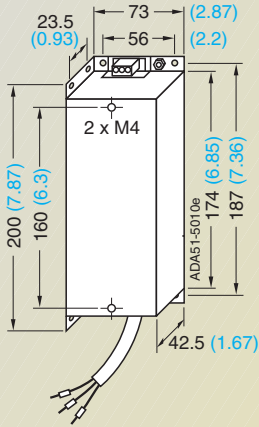
With the communications module, the mounting depth  
increases by 23 mm (0.91 inches).

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

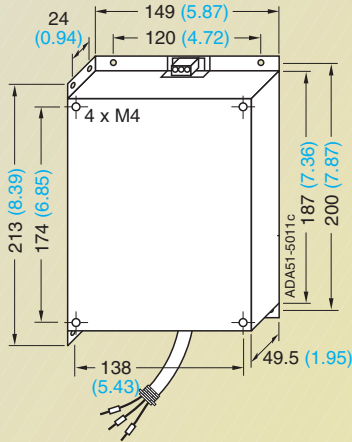
# MICROMASTER 420

## Dimension drawings

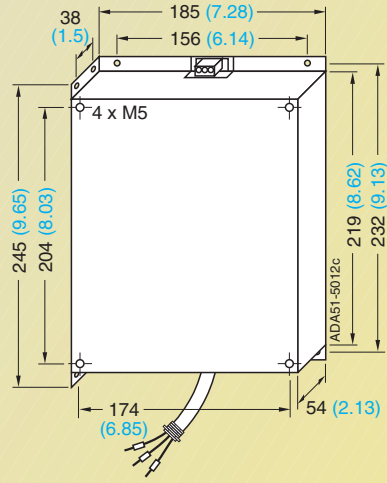
### Filters and chokes



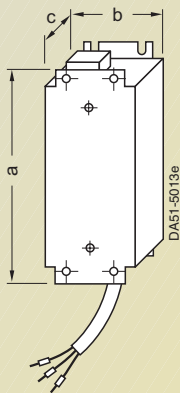
Filter frame size **A**



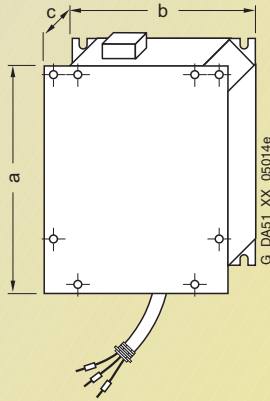
For frame size **B**



For frame size **C**

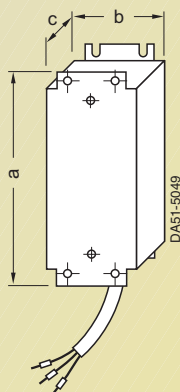


Line commutating choke for frame size **A**

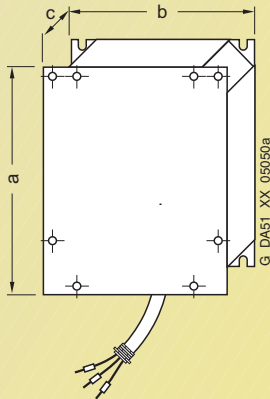


For frame sizes **B** and **C**

Line commutating choke for	Dimensions			Weight (max.) kg
	a	b	c	
Frame size <b>A</b>	200 (7.87)	75.5 (2.97)	50 (1.97)	0.8
Frame size <b>B</b>	213 (8.39)	150 (5.91)	50 (1.97)	1.3
Frame size <b>C</b>	245 (9.65)	185 (7.28)	50 (1.97)	2.3



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



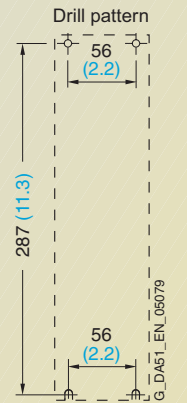
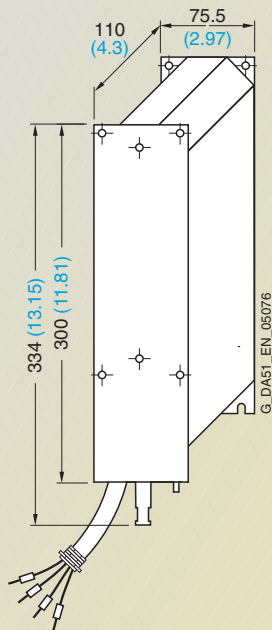
For frame sizes **B** and **C**  
6SE6400-3TC01-0BD3  
6SE6400-3TC03-2CD3

Output choke type 6SE6400-	Dimensions			Weight (max.) kg
	a	b	c	
3TC00-4AD2	200 (7.87)	75.5 (2.97)	110 (4.33)	1.95
3TC00-4AD3	200 (7.87)	75.5 (2.97)	50 (1.97)	0.8
3TC01-0BD3	213 (8.39)	150 (5.91)	70 (2.76)	3.4
3TC03-2CD3	245 (9.65)	185 (7.28)	80 (3.15)	5.6

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

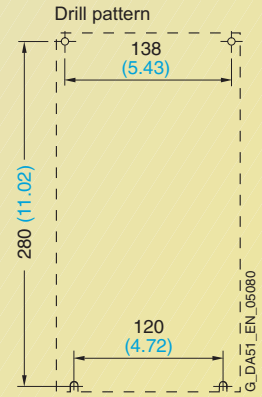
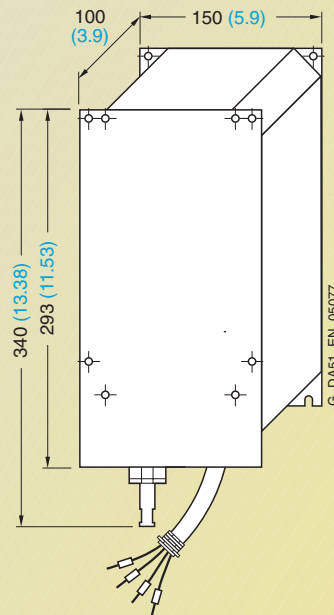


### LC filter



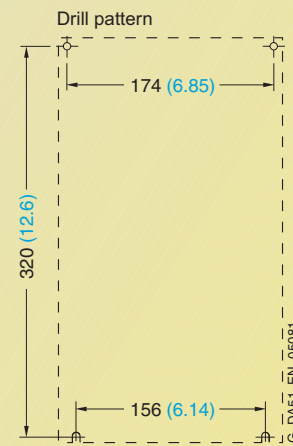
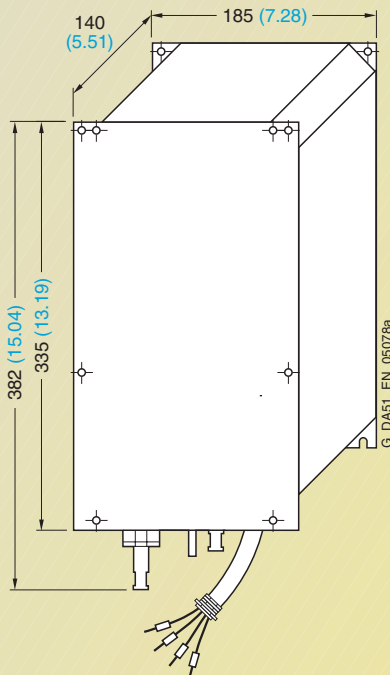
Fixing with M4 bolts

LC filter for frame size **A**



Fixing with M4 bolts

LC filter for frame size **B**



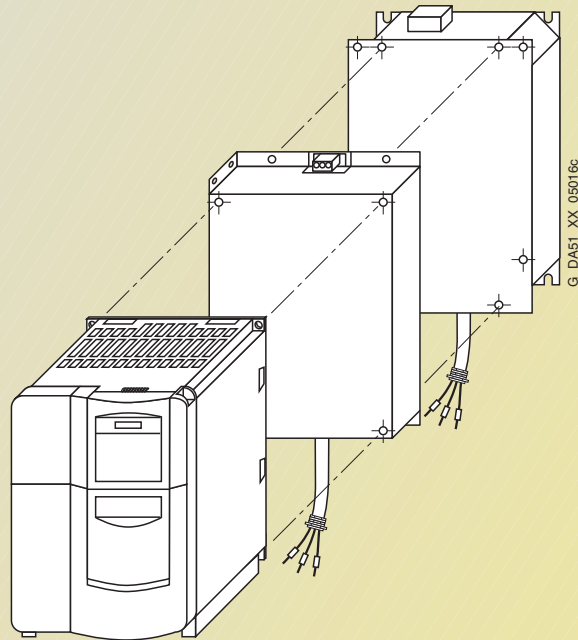
Fixing with M5 bolts

LC filter for frame size **C**

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

## Dimension drawings

### Assembly of inverter and options



Example:  
Assembly of  
inverter, filter and choke  
If additional options are  
required, they must be mounted  
at the side.

2

# Inverter

## MICROMASTER 430



- 3/2 Description
- 3/4 Circuit diagrams
- 3/6 Technical data
- 3/9 Selection and ordering data
- 3/10 Options
- 3/17 Dimension drawings

## Description



### Applications

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
- 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 95/98 and NT/2000/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.



**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 (detects dry run of pumps)

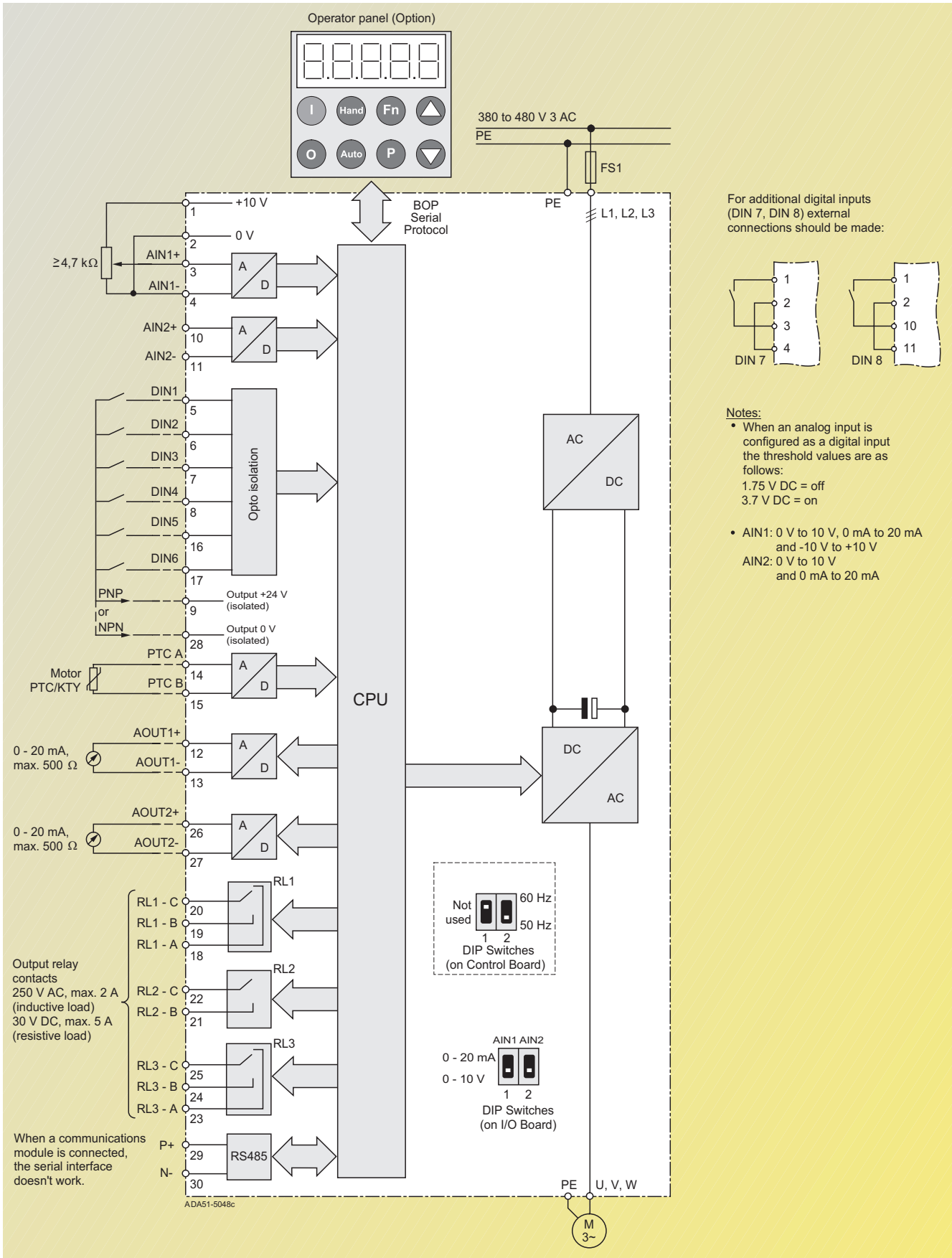
**Protection features**

- 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



## Circuit diagrams

### General circuit diagram

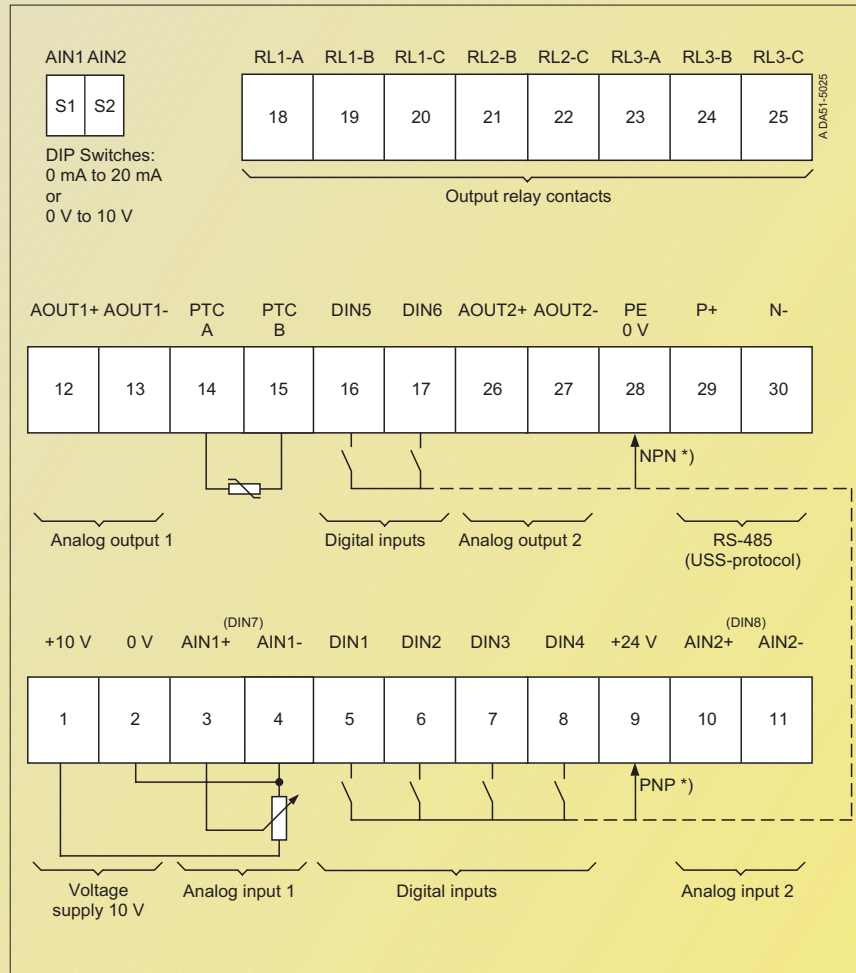


### Terminal connection diagram

Example, frame size C



View A




\*) PNP or NPN possible

# MICROMASTER 430

## Technical data

### MICROMASTER 430 inverter

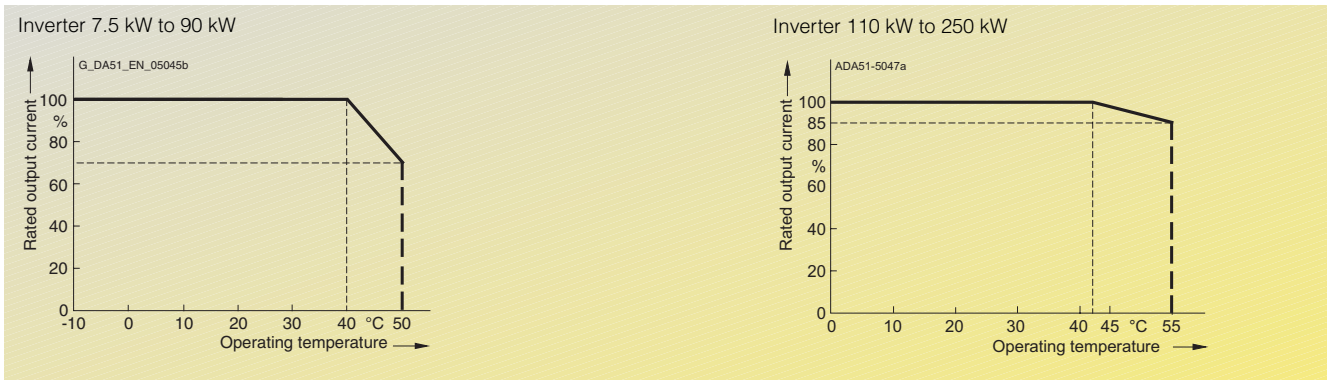
Mains voltage and Power ranges	3 AC 380 V to 480 V ± 10%	7.5 kW to 250 kW (variable torque)
Power frequency	47 Hz to 63 Hz	
Output frequency	7.5 kW to 90 kW 110 kW to 250 kW	0 Hz to 650 Hz 0 Hz to 267 Hz
Power factor	≥ 0.95	
Inverter efficiency	7.5 kW to 90 kW 110 kW to 250 kW	96 % to 97 % 97 % to 98 %
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  without 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. 100 m (shielded) max. 150 m (unshielded) Available soon
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
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	Ⓜ, cⓂ, CE, c-tick  Ⓜ available soon, cⓂ available soon, CE
CE marking	Conformity with low-voltage directive 73/23/EEC	
Dimensions and weights (without options)	Frame size (FS)	H x W x D (mm) Weight, approx. (kg)
	C	245 x 185 x 195 5.7
	D	520 x 275 x 245 17
	E	650 x 275 x 245 22
	F without filter	850 x 350 x 320 56
	F with filter	1150 x 350 x 320 75
	FX	1400 x 326 x 356 116
	GX	1533 x 326 x 545 176

### Derating data

#### Pulse frequency

Output (for 3 AC 400 V) kW	Rated output current in A for a pulse frequency of							
	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

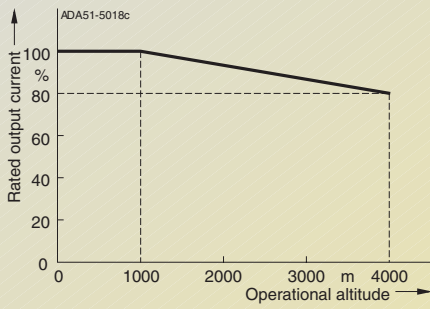


## Technical data

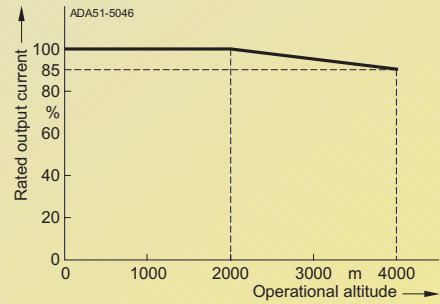
### Derating data (continued)

#### Installation height above sea level

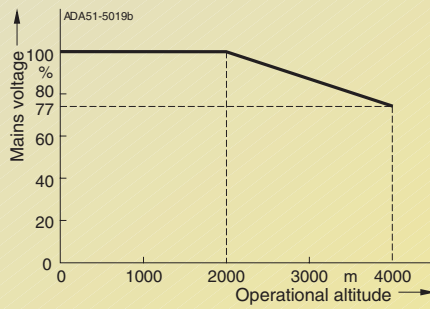
Permissible output current  
in % of the rated output current  
Inverter 7.5 kW to 90 kW



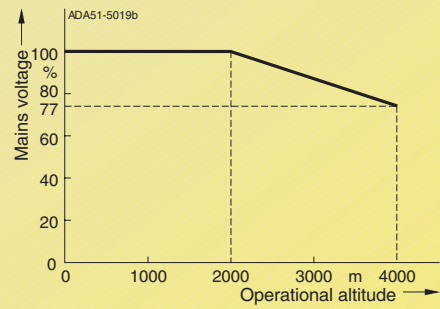
Inverter 110 kW to 250 kW



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



Inverter 110 kW to 250 kW



3



### MICROMASTER 430 inverter

Output		Rated input current	Rated output current	Frame size	Order No.	
kW	hp	A	A	(FS)	MICROMASTER 430 without filter <sup>4)</sup>	MICROMASTER 430 with internal filter Class A <sup>3)</sup>
<b>Mains operating voltage 3 AC 380 V to 480 V</b>						
7.5	10	20.2 <sup>1)</sup>	19	C	6SE6430-2UD27-5CA0	6SE6430-2AD27-5CA0
11.0	15	29.0 <sup>1)</sup>	26	C	6SE6430-2UD31-1CA0	6SE6430-2AD31-1CA0
15.0	20	39.0 <sup>1)</sup>	32	C	6SE6430-2UD31-5CA0	6SE6430-2AD31-5CA0
18.5	25	45.2 <sup>1)</sup>	38	D	6SE6430-2UD31-8DA0	6SE6430-2AD31-8DA0
22	30	54.7 <sup>1)</sup>	45	D	6SE6430-2UD32-2DA0	6SE6430-2AD32-2DA0
30	40	74.8 <sup>1)</sup>	62	D	6SE6430-2UD33-0DA0	6SE6430-2AD33-0DA0
37	50	91.0 <sup>1)</sup>	75	E	6SE6430-2UD33-7EA0	6SE6430-2AD33-7EA0
45	60	111.0 <sup>1)</sup>	90	E	6SE6430-2UD34-5EA0	6SE6430-2AD34-5EA0
55	75	143.0 <sup>1)</sup>	110	F	6SE6430-2UD35-5FA0	6SE6430-2AD35-5FA0
75	100	190.0 <sup>1)</sup>	145	F	6SE6430-2UD37-5FA0	6SE6430-2AD37-5FA0
90	120	223.0 <sup>1)</sup>	178	F	6SE6430-2UD38-8FA0	6SE6430-2AD38-8FA0
110	150	204.5 <sup>2)</sup>	205	FX	6SE6430-2UD41-1FA0	–
132	200	244.5 <sup>2)</sup>	250	FX	6SE6430-2UD41-3FA0	–
160	250	296.4 <sup>2)</sup>	302	GX	6SE6430-2UD41-6GA0	–
200	300	354.0 <sup>2)</sup>	370	GX	6SE6430-2UD42-0GA0	–
250	350	442.0 <sup>2)</sup>	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 3/11 to 3/13).

### Motors for MICROMASTER 430

Catalog M 11 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: <http://www.sea.siemens.com/motors>

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

If a line commutating choke is used, the specified values at 380 V to 480 V are reduced to between 70% and 80%

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) Generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.

## 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.

#### 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

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.

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

- Frame size C:  
Only one footprint component is permissible for frame size C. If a line choke and LC filter are used, the line choke must be located on the left of the inverter. Required spacing: 75 mm.

- 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.

Please note when using LC filters:

- Only V/f, FCC control permissible
- Increased inverter load: approx. 10% to 15%
- Operation only permissible with 4 kHz pulse frequency
- The output frequency is limited to 150 Hz.

#### 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  $\geq 0.75$  kW comply with the EN 61 000-3-2 standard.

#### Output choke

Output chokes can be supplied for reducing the capacitive compensation currents and  $dV/dt$  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. In frame sizes D, E and F, the gland plates are integrated.

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

## Technical data

### LC 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/ 29.7 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		
Limiting of motor overvoltage	≤ 1078 V		
dV/dt limiting	≤ 500 V/μs		
Pulse frequency	4 kHz		
Max. motor frequency	150 Hz		
Max. permissible motor cable lengths	Shielded	200 m	
	Unshielded	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	Frame size C	IP20 (to EN 60 529)	
	Frame sizes D to F	IP00 / IP20 (to EN 60 529 with terminal covers)	
Insulation class	H (180 °C)		
Temperature range	Operation	-10 °C to +40 °C (+14 °F to +104 °F) to +50 °C (to +122 °F)	100 % P <sub>n</sub> 80 % P <sub>n</sub>
	Storage	-25 °C to +70 °C (-13 °F to +158 °F)	
Installation altitude	Frame size C	Up to 2000 m: 100 % P <sub>n</sub> 2000 to 4000 m: 62.5 % P <sub>n</sub>	
	Frame sizes D to F	to 1000 m: 100 % P <sub>n</sub> 1000 to 4000 m: 12.5 % derating for each 1000 m	
Mounting position	Vertical		
Free space	100 mm 100 mm 100 mm		
Connection system	Input, litz wire or terminal	1U1, 1V1, 1W1	
	Output, terminals	1U2, 1V2, 1W2	
Torque for conductor connections	Frame size C	Terminal cross-section	Torque
	Frame sizes D to F		
		16 mm <sup>2</sup>	1.5 Nm to 1.8 Nm
		35 mm <sup>2</sup>	2.0 Nm to 4.0 Nm
		50 mm <sup>2</sup>	2.5 Nm to 5.0 Nm
		95 mm <sup>2</sup>	3.0 Nm to 6.0 Nm
		150 mm <sup>2</sup>	6.0 Nm to 12.0 Nm
			10.0 Nm to 20.0 Nm
Weight, approx.	for frame size C	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	

### 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	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/GX	Available soon		




# MICROMASTER 430


## 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.


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

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

Mains voltage	Output		Inverter without filter	Order No. of the options		
	kW	hp		EMC filter, Class A	EMC filter, Class B	LC filter
<b>3 AC 380 V to 480 V</b>	7.5	10	6SE6430-2UD27-5CA0	–	–	<b>6SE6400-3TD03-2CD0</b>
	11.0	15	6SE6430-2UD31-1CA0	–	–	
	15.0	20	6SE6430-2UD31-5CA0	–	–	
	18.5	25	6SE6430-2UD31-8DA0	–	EMC filter, Class B, available from Schaffner	<b>6SE6400-3TD03-7DD0</b>
	22	30	6SE6430-2UD32-2DA0	–		<b>6SE6400-3TD04-8DD0</b>
	30	40	6SE6430-2UD33-0DA0	–		<b>6SE6400-3TD06-1DD0</b>
	37	50	6SE6430-2UD33-7EA0	–		<b>6SE6400-3TD07-2ED0</b>
	45	60	6SE6430-2UD34-5EA0	–		<b>6SE6400-3TD11-5FD0</b>
	55	75	6SE6430-2UD35-5FA0	–		
	75	100	6SE6430-2UD37-5FA0	–		<b>6SE6400-3TD15-0FD0</b>
	90	120	6SE6430-2UD38-8FA0	–		<b>6SE6400-3TD18-0FD0</b>
	110	150	6SE6430-2UD41-1FA0	<b>6SL3000-0BE32-5AA0 *)</b>	–	Available soon
	132	200	6SE6430-2UD41-3FA0	<b>6SL3000-0BE34-4AA0 *)</b>	–	
	160	250	6SE6430-2UD41-6GA0	–	–	
	200	300	6SE6430-2UD42-0GA0	–	–	
250	350	6SE6430-2UD42-5GA0	<b>6SL3000-0BE36-0AA0 *)</b>	–		

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

Mains voltage	Output		Inverter without filter	Order No. of the options		
	kW	hp		Line commutating choke	Output choke	Gland plate
<b>3 AC 380 V to 480 V</b>	7.5	10	6SE6430-2UD27-5CA0	<b>6SE6400-3CC02-2CD3</b>	<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-0GP00-0CA0</b>
	11.0	15	6SE6430-2UD31-1CA0			
	15.0	20	6SE6430-2UD31-5CA0	<b>6SE6400-3CC03-5CD3</b>		
	18.5	25	6SE6430-2UD31-8DA0	<b>6SE6400-3CC04-4DD0</b>	<b>6SE6400-3TC05-4DD0</b>	Integrated as standard
	22	30	6SE6430-2UD32-2DA0		<b>6SE6400-3TC03-8DD0</b>	
	30	40	6SE6430-2UD33-0DA0	<b>6SE6400-3CC05-2DD0</b>	<b>6SE6400-3TC05-4DD0</b>	
	37	50	6SE6430-2UD33-7EA0	<b>6SE6400-3CC08-3ED0</b>	<b>6SE6400-3TC08-0ED0</b>	
	45	60	6SE6430-2UD34-5EA0		<b>6SE6400-3TC07-5ED0</b>	
	55	75	6SE6430-2UD35-5FA0	<b>6SE6400-3CC11-2FD0</b>	<b>6SE6400-3TC14-5FD0</b>	
	75	100	6SE6430-2UD37-5FA0		<b>6SE6400-3TC15-4FD0</b>	
	90	120	6SE6430-2UD38-8FA0	<b>6SE6400-3CC11-7FD0</b>	<b>6SE6400-3TC14-5FD0</b>	
	110	150	6SE6430-2UD41-1FA0	<b>6SL3000-0CE32-3AA0</b>	Available soon	
	132	200	6SE6430-2UD41-3FA0	<b>6SL3000-0CE32-8AA0</b>		
	160	250	6SE6430-2UD41-6GA0	<b>6SL3000-0CE33-3AA0</b>		
	200	300	6SE6430-2UD42-0GA0	<b>6SL3000-0CE35-1AA0</b>		
250	350	6SE6430-2UD42-5GA0				

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

## Selection and ordering data (continued)

Mains voltage	Output		Inverter with internal filter Class A	Order No. of the options		
	kW	hp		LC filter	Line commutating choke	Output choke
<b>3 AC 380 V to 480 V</b>	7.5	10	6SE6430-2AD27-5CA0	<b>6SE6400-3TD03-2CD0</b>	<b>6SE6400-3CC02-2CD3</b>	<b>6SE6400-3TC03-2CD3</b>
	11.0	15	6SE6430-2AD31-1CA0			
	15.0	20	6SE6430-2AD31-5CA0	<b>6SE6400-3CC03-5CD3</b>		
	18.5	25	6SE6430-2AD31-8DA0	<b>6SE6400-3TD03-7DD0</b>	<b>6SE6400-3CC04-4DD0</b>	<b>6SE6400-3TC05-4DD0</b>
	22	30	6SE6430-2AD32-2DA0	<b>6SE6400-3TD04-8DD0</b>	<b>6SE6400-3TC03-8DD0</b>	
	30	40	6SE6430-2AD33-0DA0	<b>6SE6400-3TD06-1DD0</b>	<b>6SE6400-3CC05-2DD0</b>	<b>6SE6400-3TC05-4DD0</b>
	37	50	6SE6430-2AD33-7EA0	<b>6SE6400-3TD07-2ED0</b>	<b>6SE6400-3CC08-3ED0</b>	<b>6SE6400-3TC08-0ED0</b>
	45	60	6SE6430-2AD34-5EA0	<b>6SE6400-3TD11-5FD0</b>	<b>6SE6400-3TC07-5ED0</b>	
	55	75	6SE6430-2AD35-5FA0	<b>6SE6400-3CC11-2FD0</b>		<b>6SE6400-3TC14-5FD0</b>
	75	100	6SE6430-2AD37-5FA0	<b>6SE6400-3TD15-0FD0</b>	<b>6SE6400-3TC15-4FD0</b>	
90	120	6SE6430-2AD38-8FA0	<b>6SE6400-3TD18-0FD0</b>	<b>6SE6400-3CC11-7FD0</b>	<b>6SE6400-3TC14-5FD0</b>	

Mains voltage	Output		Inverter with internal filter Class A	Order No. of the options	
	kW	hp		Additional EMC filter, Class B	Gland plate
<b>3 AC 380 V to 480 V</b>	7.5	10	6SE6430-2AD27-5CA0	<b>6SE6400-2FS03-8CD0</b>	<b>6SE6400-0GP00-0CA0</b>
	11.0	15	6SE6430-2AD31-1CA0		
	15.0	20	6SE6430-2AD31-5CA0	An inverter <b>without</b> 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.	
	18.5	25	6SE6430-2AD31-8DA0		
	22	30	6SE6430-2AD32-2DA0		
	30	40	6SE6430-2AD33-0DA0		
	37	50	6SE6430-2AD33-7EA0		
	45	60	6SE6430-2AD34-5EA0		
	55	75	6SE6430-2AD35-5FA0		
	75	100	6SE6430-2AD37-5FA0		
90	120	6SE6430-2AD38-8FA0	Integrated as standard		

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

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



## 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  $\leq 12$  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 <sup>1)</sup>.

##### Start-up tools

- **STARTER** is a graphic start-up software for guided start-up for MICROMASTER 410/420/430/440 frequency inverters under Windows NT/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 95/98/NT/2000/XP Professional.

Both programs are included on the Docu CD 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)	<b>6SE6400-0BE00-0AA0</b>
PROFIBUS module	<b>6SE6400-1PB00-0AA0</b>
DeviceNet module	<b>6SE6400-1DN00-0AA0</b>
CANopen module	<b>6SE6400-1CB00-0AA0</b>
RS485/PROFIBUS bus connector	<b>6GK1500-0FC00</b>
Connection kit for PC to inverter	<b>6SE6400-1PC00-0AA0</b>
Operator panel door mounting kit for single inverter	<b>6SE6400-0PM00-0AA0</b>

## 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 60 664-1 (DIN VDE 01 10/T1), no condensation permitted during operation	
Strain resistance	to IEC 60068-2-6 (if module is installed correctly)	
• Stationary	Deflection	0.15 mm in the frequency range of 10 Hz to 58 Hz
	Acceleration	19.6 m/s <sup>2</sup> in the frequency range of 58 Hz to 500 Hz
• Transport	Deflection	3.5 mm in the frequency range of 5 Hz to 9 Hz
	Acceleration	9.8 m/s <sup>2</sup> 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	-10 °C to +50 °C (+14 °F to +122 °F)	
• Operation	-25 °C to +70 °C (-13 °F to +158 °F)	
• Storage and transport		
Relative humidity (permissible humidity rating)	≤ 85 % (non-condensing)	
• Operation	≤ 95 %	
• Storage and transport		
Electromagnetic compatibility	Emission	to EN 55 011 (1991) Class A
	Interference	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

## 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 60 664-1 (DIN VDE 0110/T1), no condensation permitted during operation
Strain resistance	to IEC 60 068-2-6 (if module is installed correctly)
• Stationary	Deflection Acceleration 0.15 mm in the frequency range of 10 Hz to 58 Hz 19.6 m/s <sup>2</sup> in the frequency range of 58 Hz to 500 Hz
• Transport	Deflection Acceleration 3.5 mm in the frequency range of 5 Hz to 9 Hz 9.8 m/s <sup>2</sup> 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	-10 °C to +50 °C (+14 °F to +122 °F)
• Storage	-40 °C to +70 °C (-40 °F to +158 °F)
• Transport	-25 °C to +70 °C (-13 °F to +158 °F)
Relative humidity (permissible humidity rating)	
• Operation	≤ 85 % (non-condensing)
• Storage and transport	≤ 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

## Documentation

### Selection and ordering data

Type of documentation	Language	Order No.
<b>Docu pack</b> , supplied with each inverter, containing CD-ROM <sup>1)</sup> and Getting Started Guide <sup>2)</sup> (paper version)	Multilanguage	<b>6SE6400-5AE00-1AP0</b>
<b>Operating instructions<sup>2)</sup></b> (paper version)	German	<b>6SE6400-5AE00-0AP0</b>
	English	<b>6SE6400-5AE00-0BP0</b>
	French	<b>6SE6400-5AE00-0DP0</b>
	Italian	<b>6SE6400-5AE00-0CP0</b>
	Spanish	<b>6SE6400-5AE00-0EP0</b>
<b>Parameter list<sup>2)</sup></b> (paper version)	German	<b>6SE6400-5AF00-0AP0</b>
	English	<b>6SE6400-5AF00-0BP0</b>
	French	<b>6SE6400-5AF00-0DP0</b>
	Italian	<b>6SE6400-5AF00-0CP0</b>
	Spanish	<b>6SE6400-5AF00-0EP0</b>

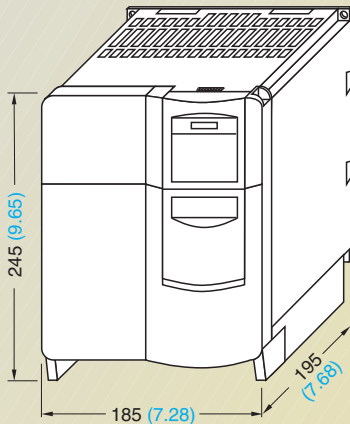
1) The CD-ROM contains operating instructions, parameter list, commissioning tools STARTER

and DriveMonitor, multilanguage

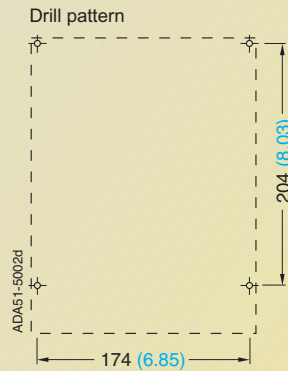
2) Available on Internet at <http://www.siemens.com/micromaster>

### MICROMASTER 430 inverter

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



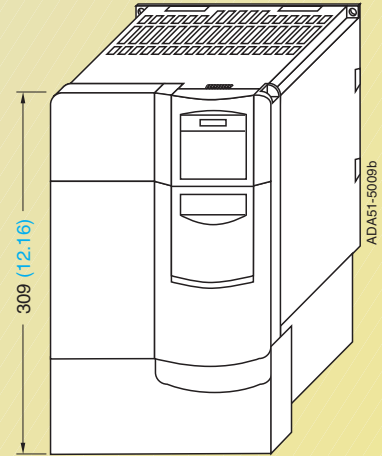
**Inverter frame size C**



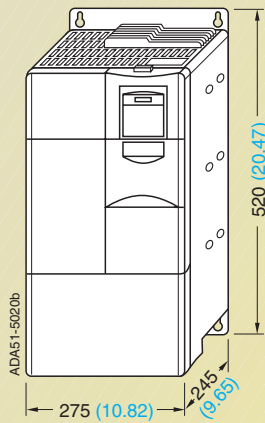
Fixing with  
4 x M5 bolts  
4 x M5 nuts  
4 x M5 washers

Tightening torque with washers fitted:  
3.0 Nm

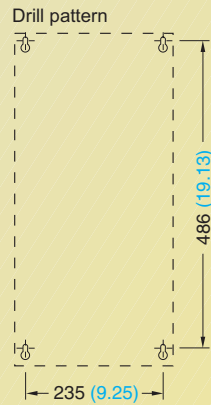
Ventilation clearance required at top  
and bottom: 100 mm



**Inverter frame size C  
with gland plate**

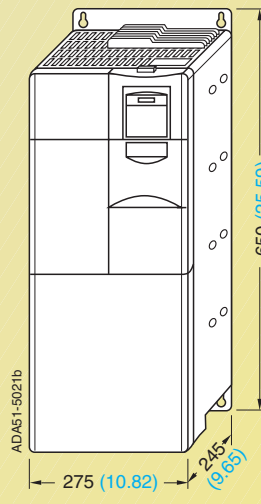


**Inverter frame size D**

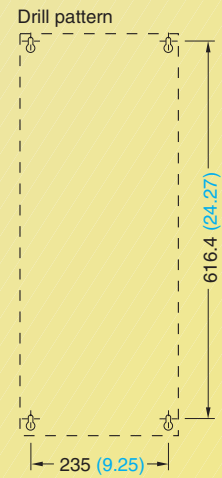


Fixing with  
4 x M8 bolts  
4 x M8 nuts  
4 x M8 washers

Tightening torque with  
washers fitted: 3.0 Nm  
Ventilation clearance  
required at 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: 3.0 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).

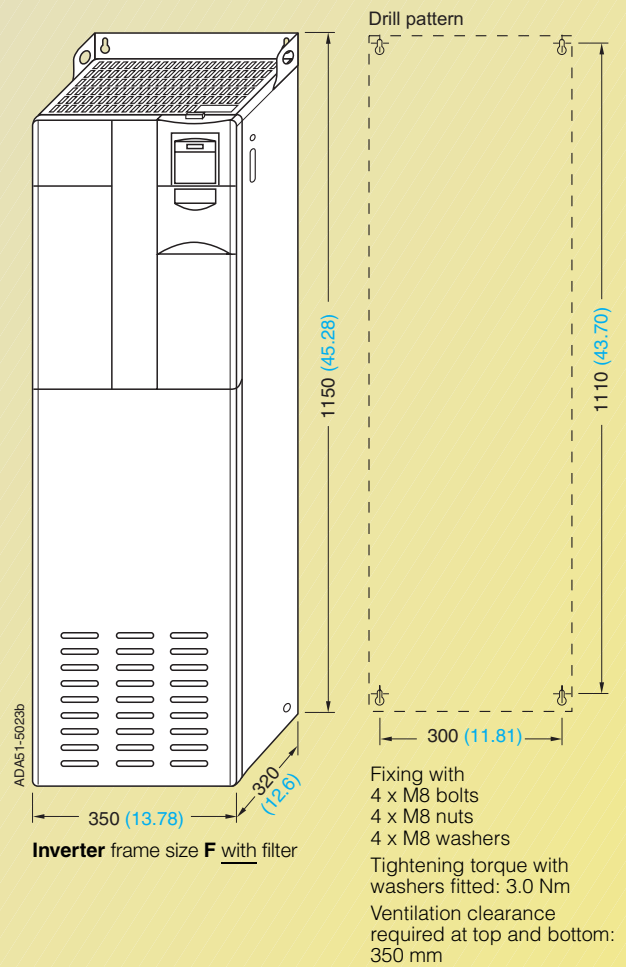
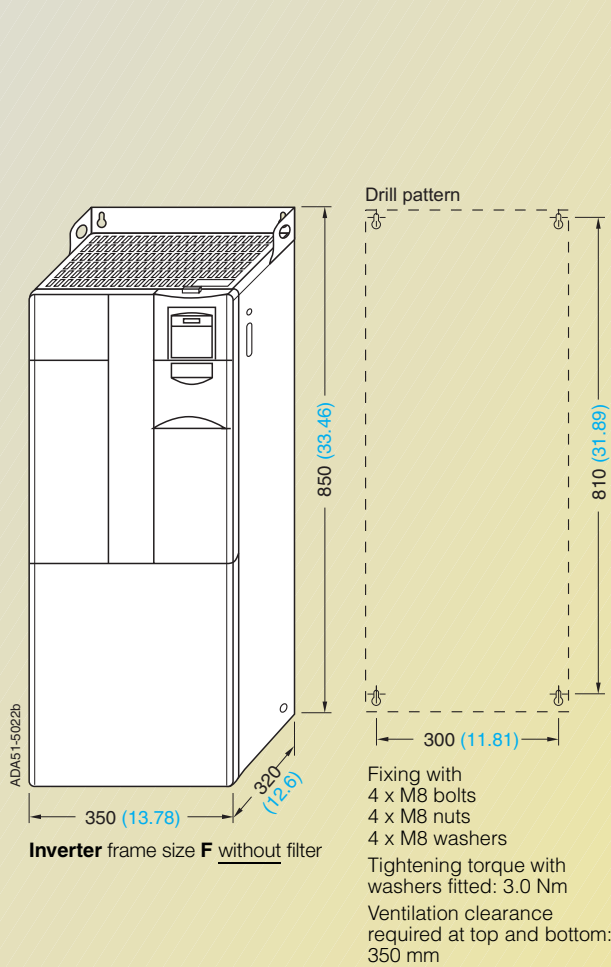
All dimensions in mm (values in brackets are in inches)

# MICROMASTER 430

## Dimension drawings

### MICROMASTER 430 inverter

Frame size	3 AC 380 V to 480 V
<b>F</b>	55 kW to 90 kW

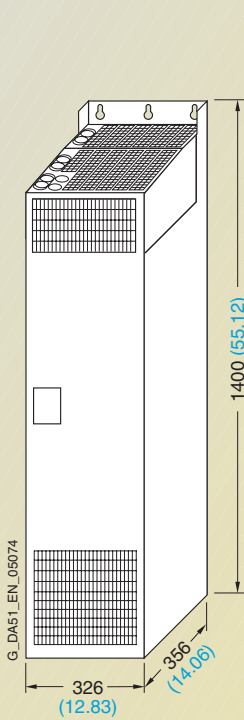


All dimensions in mm (values in brackets are in inches)



### MICROMASTER 430 inverter

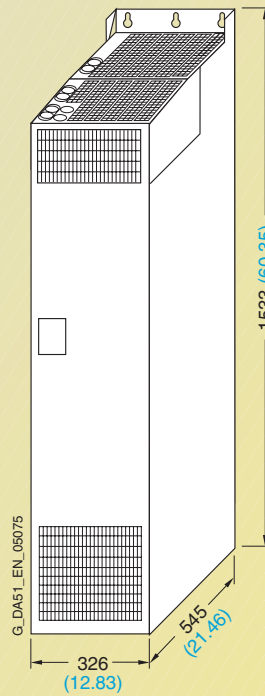
Frame size	3 AC 380 V to 480 V
<b>FX</b>	110 kW to 132 kW
<b>GX</b>	160 kW to 250 kW



**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: 100 mm



**Inverter frame size GX**



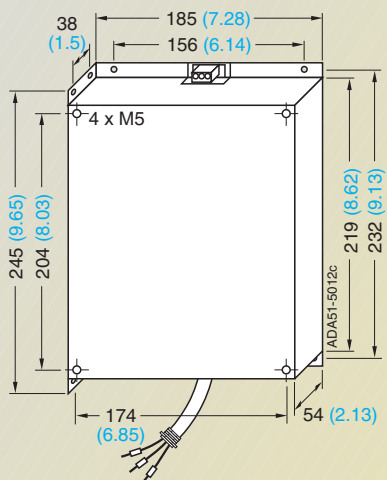
Fixing with  
 6 x M8 bolts  
 6 x M8 nuts  
 6 x M8 washers  
 Tightening torque  
 with washers  
 fitted: 13.0 Nm  
 Ventilation clearance  
 required:  
 at top: 250 mm  
 at bottom: 150 mm  
 in front: 100 mm

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

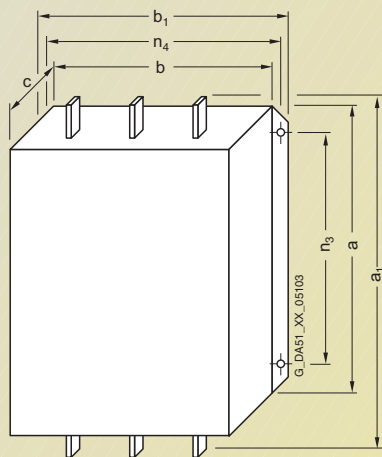
# MICROMASTER 430

## Dimension drawings

### EMC filter



EMC filter for frame size **C**

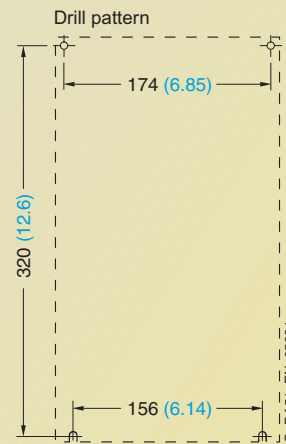
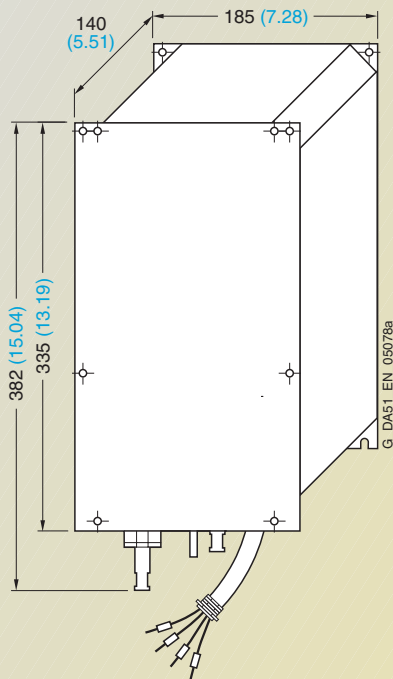


EMC filter Class A Type 6SL3000-	for inverter Frame size (FS)	Dimensions							Weight, approx. kg
		a	a <sub>1</sub>	b	b <sub>1</sub>	c	n <sub>3</sub>	n <sub>4</sub>	
0BE32-5AA0	<b>FX</b>	270 (10.63)	360 (14.17)	200 (7.87)	240 (9.45)	116 (4.57)	210 (8.27)	220 (8.66)	12.3
0BE34-4AA0	<b>FX/GX</b>	270 (10.63)	360 (14.17)	200 (7.87)	240 (9.45)	116 (4.57)	210 (8.27)	220 (8.66)	12.3
0BE36-0AA0	<b>GX</b>	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**

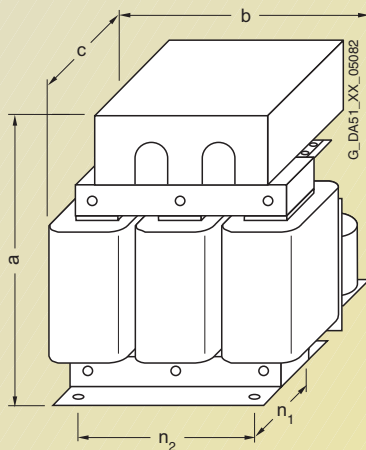
All dimensions in mm (values in brackets are in inches)

### 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

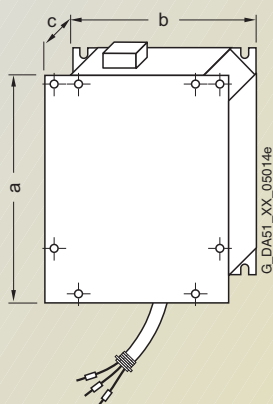
LC filter Type	for inverter Frame size (FS)	Dimensions				
		a	b	c	n <sub>1</sub>	n <sub>2</sub>
6SE6400-3TD03-7DD0	<b>D</b>	278 (10.94)	240 (9.45)	230 (9.06)	115 (4.53)	190 (7.48)
6SE6400-3TD04-8DD0	<b>D</b>	290 (11.42)	240 (9.45)	240 (9.45)	125 (4.92)	190 (7.48)
6SE6400-3TD06-1DD0	<b>D</b>	345 (13.58)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

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

# MICROMASTER 430

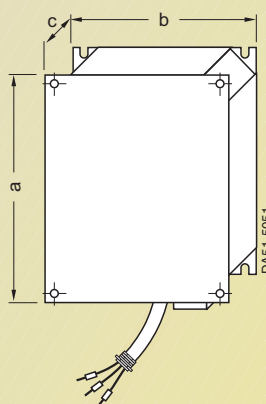
## Dimension drawings

### Line commutating chokes



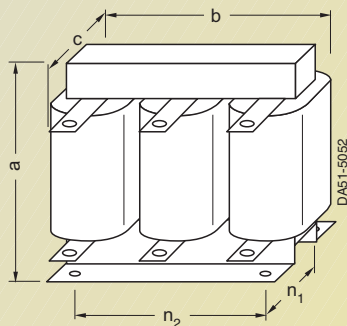
Line commutating choke for	Dimensions			Weight (max.) kg
	a	b	c	
Frame size <b>C</b>	245 (9.65)	185 (7.28)	50 (1.97)	2.3

Line commutating choke for frame size **C**



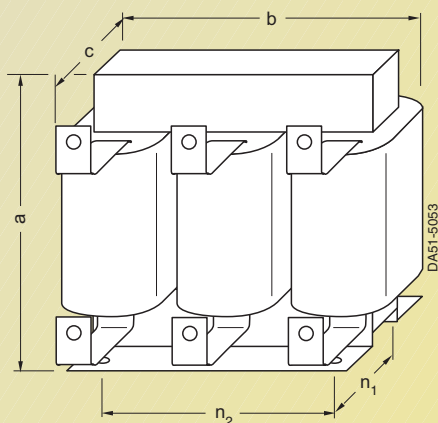
Line commutating choke for	Dimensions			Weight (max.) kg
	a	b	c	
Frame size <b>D</b>	520 (20.47)	275 (10.83)	85 (3.35)	9.5
Frame size <b>E</b>	650 (25.59)	275 (10.83)	95 (3.74)	17.0

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



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

Line commutating choke type	for inverter Frame size	Dimensions					Weight (max.) kg
		a	b	c	n <sub>1</sub>	n <sub>2</sub>	
3CC11-....	<b>F</b>	210 (8.27)	240 (9.45)	141 (5.55)	109 (4.29)	190 (7.48)	25.0

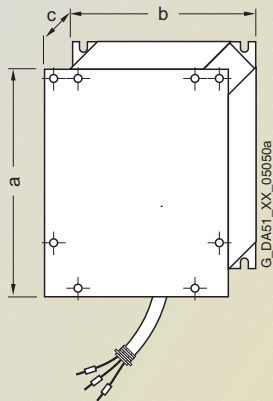


Line commutating choke for inverters of frame sizes **FX** and **GX**

Line commutating choke type	for inverter Frame size (FS)	Dimensions					Weight (max.) kg
		a	b	c	n <sub>1</sub>	n <sub>2</sub>	
0CE32-....	<b>FX</b>	248 (9.76)	255 (10.04)	203 (7.99)	101 (3.98)	200 (7.87)	24.0
0CE33-....	<b>GX</b>	248 (9.76)	255 (10.04)	203 (7.99)	101 (3.98)	200 (7.87)	25.0
0CE35-....	<b>GX</b>	269 (10.59)	275 (10.83)	210 (8.27)	118 (4.65)	224 (8.82)	35.0

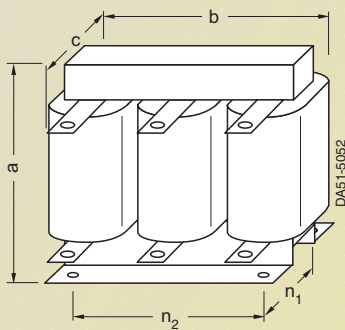
All dimensions in mm (values in brackets are in inches)

### Output chokes



**Line commutating choke**  
for frame size **C**

Output chokes for	Dimensions			Weight (max.) kg
	a	b	c	
Frame size <b>C</b>	245 (9.65)	185 (7.28)	80 (3.15)	5.6



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

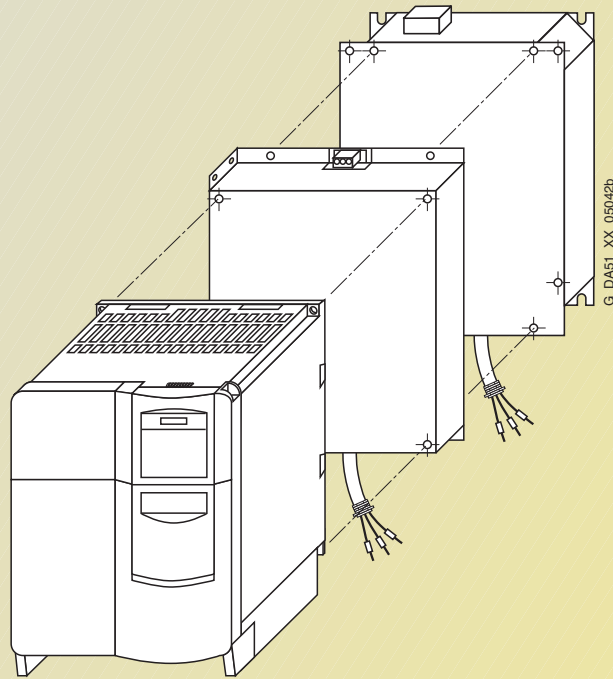
Output choke type 6SE6400-	for inverter Frame size (FS)	Dimensions			$n_1$ (to DIN 41308)	$n_2$	Weight (max.) kg
		a	b	c			
3TC03-8DD0	<b>D</b>	210 (8.27)	225 (8.86)	179 (7.05)	76 (2.99)	176 (6.93)	16.1
3TC05-4DD0	<b>D</b>	210 (8.27)	225 (8.86)	150 (5.91)	76 (2.99)	176 (6.93)	10.7
3TC07-5ED0	<b>E</b>	248 (9.76)	270 (10.63)	209 (8.23)	88 (3.46)	200 (7.87)	24.9
3TC08-0ED0	<b>E</b>	210 (8.27)	225 (8.86)	150 (5.91)	76 (2.99)	176 (6.93)	10.4
3TC14-5FD0	<b>F</b>	321 (12.64)	350 (13.78)	288 (11.34)	120 (4.72)	264 (10.39)	51.5
3TC15-4FD0	<b>F</b>	210 (8.27)	225 (8.86)	150 (5.91)	76 (2.99)	176 (6.93)	11.2

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



## Dimension drawings

### Assembly of inverter and options



Example:  
Assembly of  
inverter, filter and choke  
If additional options are  
required, they must be  
mounted on the side.

# Inverter

## MICROMASTER 440



4/2	Description
4/4	Circuit diagrams
4/6	Technical data
4/9	Selection and ordering data
4/12	Options
4/24	Dimension drawings

## Description



### Applications

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 **®** and **c®** 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
- 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
- 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 95/98 and NT/2000/XP Professional.
- TIA integration with Drive ES

**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).

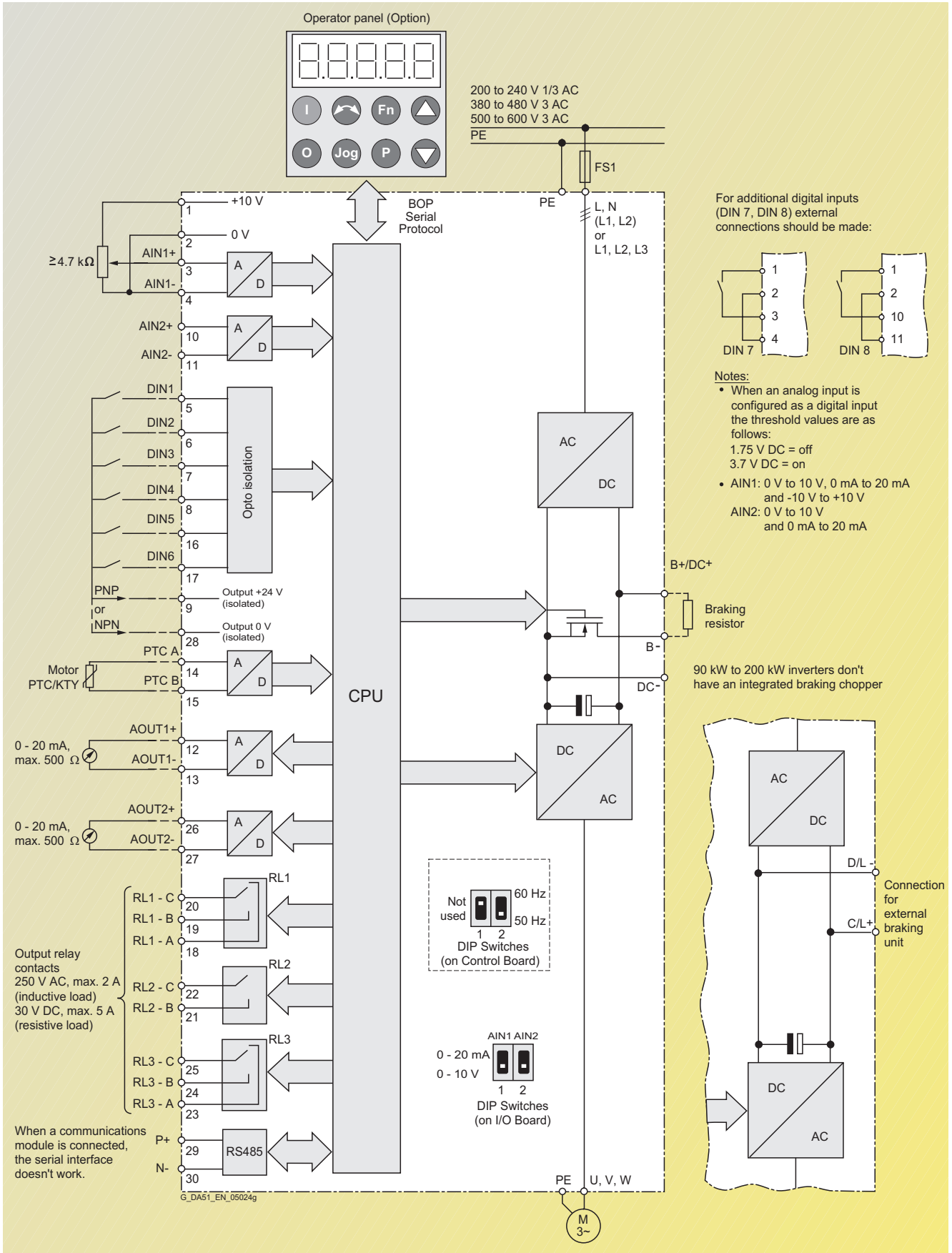
**Protection features**

- 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
- $\beta t$  motor thermal protection
- Locked motor protection
- Stall prevention
- Parameter interlock.

# MICROMASTER 440

## Circuit diagrams

### General circuit diagram

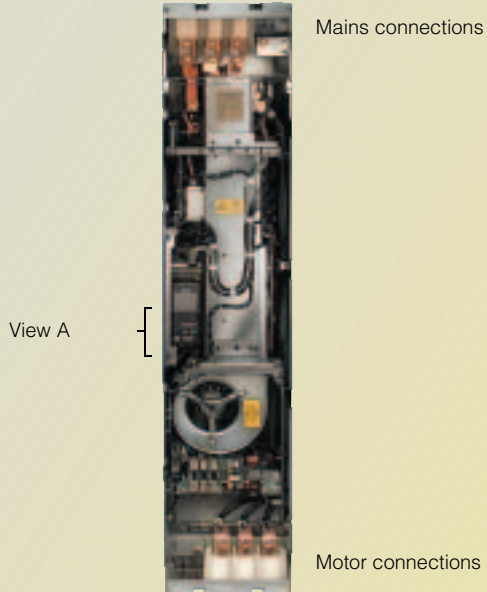


4

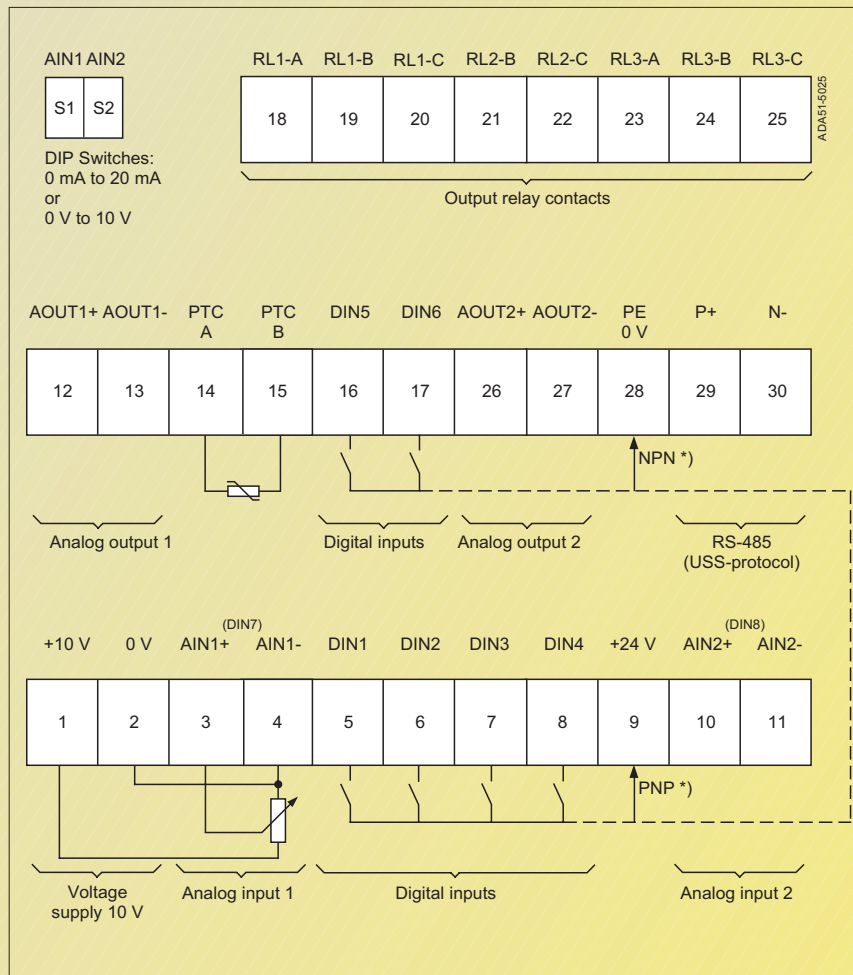


## Terminal connection diagram

Example, frame size FX



View A



\*) PNP or NPN possible

# MICROMASTER 440

## Technical data

### MICROMASTER 440 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 % 3 AC 500 V to 600 V ± 10 %	<b>CT</b> (constant torque) 0.12 kW to 3 kW 0.12 kW to 45 kW 0.37 kW to 200 kW 0.75 kW to 75 kW	<b>VT</b> (variable torque) – 5.5 kW to 45 kW 7.5 kW to 250 kW 1.5 kW to 90 kW
Input frequency	47 Hz to 63 Hz		
Output frequency	0.12 kW to 75 kW 90 kW to 200 kW	0 Hz to 650 Hz (in <i>V/f</i> mode) 0 Hz to 267 Hz (in <i>V/f</i> mode)	0 Hz to 200 Hz (in vector mode) 0 Hz to 200 Hz (in vector mode)
Power factor	≥ 0.95		
Inverter efficiency	96 % to 97 %		
Overload capability – CT mode	0.12 kW to 75 kW 90 kW to 200 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 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 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 59 s, cycle time 300 s	
Inrush current	not higher than rated input current		
Control method	Vector control, torque control, linear <i>V/f</i> characteristic; quadratic <i>V/f</i> characteristic; Multipoint characteristic (programmable <i>V/f</i> characteristic); flux current control (FCC)		
Pulse frequency	0.12 kW to 75 kW 90 kW to 200 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) 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 90 – 250 kW	max. 50 m (shielded), max. 100 m (unshielded) max. 100 m (shielded), max. 150 m (unshielded) (see variant dependent options)	
with output choke			
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 90 kW to 200 kW	CT: –10 °C to +122.00 °F (+14 °F to +122 °F) VT: –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	0.12 kW to 75 kW 90 kW to 200 kW	up to 1000 m above sea level without derating up to 2000 m above sea level without derating	
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		
Dimensions and weights (without options)	Frame size (FS)	H x W x D, max. (mm)	Weight, approx. (kg)
	A	173 x 73 x 149	1.3
	B	202 x 149 x 172	3.4
	C	245 x 185 x 195	5.7
	D	520 x 275 x 245	17
	E	650 x 275 x 245	22
	F without filter	850 x 350 x 320	56
	F with filter	1150 x 350 x 320	75
	FX	1400 x 326 x 356	116
	GX	1533 x 326 x 545	176

### Derating data

#### Pulse frequency

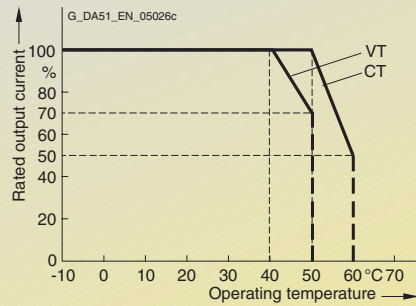
Output kW	Rated output current in A for a pulse frequency of						
	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
<b>Mains voltage 1/3 AC 200 V</b>							
0.12 to 5.5	Values correspond to the 4 kHz standard values. No derating, since 16 kHz standard.						
7.5	28.0	26.6	25.2	22.4	19.6	16.8	14.0
11	42.0	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
<b>Mains operating voltage 3 AC 400 V</b>							
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	-	-	-	-	-	-
<b>Mains operating voltage 3 AC 500 V</b>							
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

## Technical data

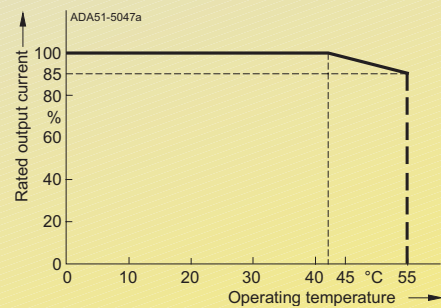
### Derating data (continued)

#### Operating temperature

Inverter 0.12 kW to 75 kW



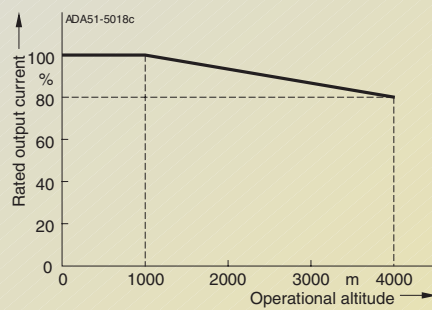
Inverter 90 kW to 200 kW



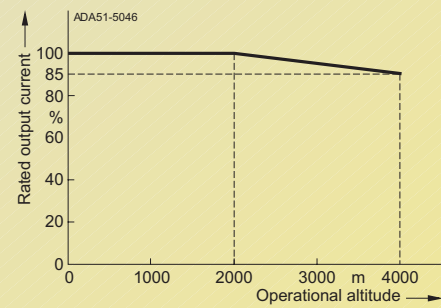
#### Installation height above sea level

Permissible output current  
in % of the rated output current

Inverter 0.12 kW to 75 kW

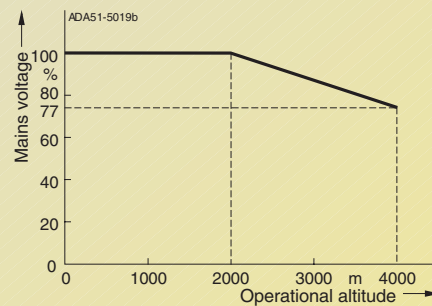


Inverter 90 kW to 200 kW

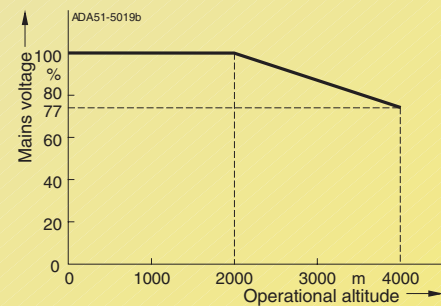


Permissible mains voltage  
in % of the max. possible mains voltage

Inverter 0.12 kW to 75 kW



Inverter 90 kW to 200 kW



### MICROMASTER 440 inverter without filter<sup>2)</sup>

CT (constant torque)				VT (variable torque)				MICROMASTER 440 without filter <sup>2)</sup>		
Output		Rated input current <sup>1)</sup>	Rated output current	Output		Rated input current <sup>1)</sup>	Rated output current	Frame size (FS)	Weight, approx. kg	Order No.
kW	hp	A	A	kW	hp	A	A			
<b>Mains voltage 1 AC 200 V to 240 V</b>										
0.12	0.16	2.3	0.9	-	-	-	-	A	1.3	6SE6440-2UC11-2AA1
0.25	0.33	4.3	1.7	-	-	-	-	A	1.3	6SE6440-2UC12-5AA1
0.37	0.50	5.9	2.3	-	-	-	-	A	1.3	6SE6440-2UC13-7AA1
0.55	0.75	7.7	3.0	-	-	-	-	A	1.3	6SE6440-2UC15-5AA1
0.75	1.0	10.1	3.9	-	-	-	-	A	1.3	6SE6440-2UC17-5AA1
1.1	1.5	15.0	5.5	-	-	-	-	B	3.3	6SE6440-2UC21-1BA1
1.5	2	18.6	7.4	-	-	-	-	B	3.3	6SE6440-2UC21-5BA1
2.2	3	26.8	10.4	-	-	-	-	B	3.3	6SE6440-2UC22-2BA1
3.0	4	35.9	13.6	-	-	-	-	C	5.5	6SE6440-2UC23-0CA1
<b>Mains operating voltage 3 AC 200 V to 240 V</b>										
0.12	0.16	1.1	0.9	-	-	-	-	A	1.3	6SE6440-2UC11-2AA1
0.25	0.33	2.2	1.7	-	-	-	-	A	1.3	6SE6440-2UC12-5AA1
0.37	0.50	3.0	2.3	-	-	-	-	A	1.3	6SE6440-2UC13-7AA1
0.55	0.75	3.9	3.0	-	-	-	-	A	1.3	6SE6440-2UC15-5AA1
0.75	1.0	5.2	3.9	-	-	-	-	A	1.3	6SE6440-2UC17-5AA1
1.1	1.5	7.6	5.5	-	-	-	-	B	3.3	6SE6440-2UC21-1BA1
1.5	2.0	10.2	7.4	-	-	-	-	B	3.3	6SE6440-2UC21-5BA1
2.2	3.0	14.1	10.4	-	-	-	-	B	3.3	6SE6440-2UC22-2BA1
3.0	4.0	18.4	13.6	-	-	-	-	C	5.5	6SE6440-2UC23-0CA1
4.0	5.0	23.3	17.5	5.5	7.5	28.3	22	C	5.5	6SE6440-2UC24-0CA1
5.5	7.5	28.0	22	7.5	10	34.2	28	C	5.5	6SE6440-2UC25-5CA1
7.5	10	34.0	28	11.0	15	48.7	42	D	16	6SE6440-2UC27-5DA1
11.0	15	50.6	42	15.0	20	63.1	54	D	16	6SE6440-2UC31-1DA1
15.0	20	64.9	54	18.5	25	80.2	68	D	16	6SE6440-2UC31-5DA1
18.5	25	83.0	68	22	30	96.0	80	E	20	6SE6440-2UC31-8EA1
22	30	100.0	80	30	40	127.0	104	E	20	6SE6440-2UC32-2EA1
30	40	140.0	104	37	50	171.0	130	F	55	6SE6440-2UC33-0FA1
37	50	177.0	130	45	60	206.0	154	F	55	6SE6440-2UC33-7FA1
45	60	204.0	154	-	-	-	-	F	55	6SE6440-2UC34-5FA1
<b>Mains operating voltage 3 AC 380 V to 480 V</b>										
0.37	0.50	1.5	1.3	-	-	-	-	A	1.3	6SE6440-2UD13-7AA1
0.55	0.75	1.9	1.7	-	-	-	-	A	1.3	6SE6440-2UD15-5AA1
0.75	1.0	2.4	2.2	-	-	-	-	A	1.3	6SE6440-2UD17-5AA1
1.1	1.5	3.7	3.1	-	-	-	-	A	1.3	6SE6440-2UD21-1AA1
1.5	2.0	4.8	4.1	-	-	-	-	A	1.3	6SE6440-2UD21-5AA1
2.2	3.0	6.5	5.9	-	-	-	-	B	3.3	6SE6440-2UD22-2BA1
3.0	4.0	8.6	7.7	-	-	-	-	B	3.3	6SE6440-2UD23-0BA1
4.0	5.0	11.6	10.2	-	-	-	-	B	3.3	6SE6440-2UD24-0BA1
5.5	7.5	15.6	13.2	7.5	10	20.2	19	C	5.5	6SE6440-2UD25-5CA1
7.5	10	22.0	19	11.0	15	29.0	26	C	5.5	6SE6440-2UD27-5CA1
11.0	15	32.3	26	15.0	20	39.0	32	C	5.5	6SE6440-2UD31-1CA1
15.0	20	38.5	32	18.5	25	45.2	38	D	16	6SE6440-2UD31-5DA1
18.5	25	47.1	38	22	30	54.7	45	D	16	6SE6440-2UD31-8DA1
22	30	56.3	45	30	40	74.8	62	D	16	6SE6440-2UD32-2DA1
30	40	78.0	62	37	50	91.0	75	E	20	6SE6440-2UD33-0EA1
37	50	95.0	75	45	60	111.0	90	E	20	6SE6440-2UD33-7EA1
45	60	122.0	90	55	75	143.0	110	F	56	6SE6440-2UD34-5FA1
55	75	148.0	110	75	100	190.0	145	F	56	6SE6440-2UD35-5FA1
75	100	188.0	145	90	125	223.0	178	F	56	6SE6440-2UD37-5FA1

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

When a line commutating choke is used, the specified values are reduced in the case of 200 V–240 V to between 55% to 70% and in the case of 380 V–480 V to between 70% and 80%.

2) Generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.



# MICROMASTER 440

## Selection and ordering data

### MICROMASTER 440 inverter without filter<sup>3)</sup> (continued)

CT (constant torque)			VT (variable torque)				MICROMASTER 440 without filter <sup>3)</sup>			
Output		Rated input current	Rated output current	Output		Rated input current	Rated output current	Frame size (FS)	Weight, approx.	Order No.
kW	hp	A	A	kW	hp	A	A		kg	
<b>Mains operating voltage 3 AC 380 V to 480 V</b>										
<b>90</b>	125	168.5 <sup>1)</sup>	178	<b>110</b>	150	204.5 <sup>1)</sup>	205	FX	110	<b>6SE6440-2UD38-8FA1</b>
<b>110</b>	150	204.0 <sup>1)</sup>	205	<b>132</b>	200	244.5 <sup>1)</sup>	250	FX	116	<b>6SE6440-2UD41-1FA1</b>
<b>132</b>	200	244.5 <sup>1)</sup>	250	<b>160</b>	250	296.4 <sup>1)</sup>	302	GX	170	<b>6SE6440-2UD41-3GA1</b>
<b>160</b>	250	296.4 <sup>1)</sup>	302	<b>200</b>	300	354.0 <sup>1)</sup>	370	GX	174	<b>6SE6440-2UD41-6GA1</b>
<b>200</b>	300	354.0 <sup>1)</sup>	370	<b>250</b>	350	442.0 <sup>1)</sup>	477	GX	176	<b>6SE6440-2UD42-0GA1</b>
<b>Mains operating voltage 3 AC 500 V to 600 V</b>										
<b>0.75</b>	1.0	2.0 <sup>2)</sup>	1.4	<b>1.5</b>	2.0	3.8 <sup>2)</sup>	2.7	C	5.5	<b>6SE6440-2UE17-5CA1</b>
<b>1.5</b>	2.0	3.7 <sup>2)</sup>	2.7	<b>2.2</b>	3.0	5.3 <sup>2)</sup>	3.9	C	5.5	<b>6SE6440-2UE21-5CA1</b>
<b>2.2</b>	3.0	5.3 <sup>2)</sup>	3.9	<b>4.0</b>	5.0	8.2 <sup>2)</sup>	6.1	C	5.5	<b>6SE6440-2UE22-2CA1</b>
<b>4.0</b>	5.0	8.1 <sup>2)</sup>	6.1	<b>5.5</b>	7.5	11.2 <sup>2)</sup>	9	C	5.5	<b>6SE6440-2UE24-0CA1</b>
<b>5.5</b>	7.5	11.1 <sup>2)</sup>	9	<b>7.5</b>	10	13.3 <sup>2)</sup>	11	C	5.5	<b>6SE6440-2UE25-5CA1</b>
<b>7.5</b>	10	14.4 <sup>2)</sup>	11	<b>11.0</b>	15	21.7 <sup>2)</sup>	17	C	5.5	<b>6SE6440-2UE27-5CA1</b>
<b>11.0</b>	15	21.5 <sup>2)</sup>	17	<b>15.0</b>	20	26.8 <sup>2)</sup>	22	C	5.5	<b>6SE6440-2UE31-1CA1</b>
<b>15.0</b>	20	27.6 <sup>2)</sup>	22	<b>18.5</b>	25	32.7 <sup>2)</sup>	27	D	16	<b>6SE6440-2UE31-5DA1</b>
<b>18.5</b>	25	33.6 <sup>2)</sup>	27	<b>22</b>	30	39.9 <sup>2)</sup>	32	D	16	<b>6SE6440-2UE31-8DA1</b>
<b>22</b>	30	40.1 <sup>2)</sup>	32	<b>30</b>	40	50.5 <sup>2)</sup>	41	D	16	<b>6SE6440-2UE32-2DA1</b>
<b>30</b>	40	52.0 <sup>2)</sup>	41	<b>37</b>	50	64.0 <sup>2)</sup>	52	E	20	<b>6SE6440-2UE33-0EA1</b>
<b>37</b>	50	67.0 <sup>2)</sup>	52	<b>45</b>	60	78.0 <sup>2)</sup>	62	E	20	<b>6SE6440-2UE33-7EA1</b>
<b>45</b>	60	85.0 <sup>2)</sup>	62	<b>55</b>	75	103.0 <sup>2)</sup>	77	F	56	<b>6SE6440-2UE34-5FA1</b>
<b>55</b>	75	106.0 <sup>2)</sup>	77	<b>75</b>	100	132.0 <sup>2)</sup>	99	F	56	<b>6SE6440-2UE35-5FA1</b>
<b>75</b>	100	130.0 <sup>2)</sup>	99	<b>90</b>	120	160.0 <sup>2)</sup>	125	F	56	<b>6SE6440-2UE37-5FA1</b>



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 4/14 to 4/20).

### Motors for MICROMASTER 440

Catalog M 11 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:  
<http://www.sea.siemens.com/motors>

1) Supplementary conditions:  
 Input current at rated operating point, applicable at short-circuit voltage of the supply  $U_{sc} = 2.33\%$  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  $U_{sc} = 1\%$  with reference to the inverter rated power and rated mains operating voltage of 500 V without a line commutating choke.

If a line commutating choke is used, the specified values at 500 V to 600 V are reduced to between 80% and 90%.

3) Generally suited to heavy industrial applications. For details please refer to Appendix on page A/4.

### MICROMASTER 440 inverter with internal filter Class A

CT (constant torque)				VT (variable torque)				MICROMASTER 440 with internal filter Class A <sup>2)</sup>		
Output		Rated input current <sup>1)</sup>	Rated output current	Output		Rated input current <sup>1)</sup>	Rated output current	Frame size (FS)	Weight, approx.	Order No.
kW	hp	A	A	kW	hp	A	A	kg		
<b>Mains operating voltage 1 AC 200 V to 240 V</b>										
0.12	0.16	2.3	0.9	–	–	–	–	A	1.3	6SE6440-2AB11-2AA1
0.25	0.33	4.3	1.7	–	–	–	–	A	1.3	6SE6440-2AB12-5AA1
0.37	0.50	5.9	2.3	–	–	–	–	A	1.3	6SE6440-2AB13-7AA1
0.55	0.75	7.7	3.0	–	–	–	–	A	1.3	6SE6440-2AB15-5AA1
0.75	1.0	10.1	3.9	–	–	–	–	A	1.3	6SE6440-2AB17-5AA1
1.1	1.5	15.0	5.5	–	–	–	–	B	3.4	6SE6440-2AB21-1BA1
1.5	2	18.6	7.4	–	–	–	–	B	3.4	6SE6440-2AB21-5BA1
2.2	3	26.8	10.4	–	–	–	–	B	3.4	6SE6440-2AB22-2BA1
3.0	4	35.9	13.6	–	–	–	–	C	5.7	6SE6440-2AB23-0CA1

<b>Mains operating voltage 3 AC 200 V to 240 V</b>										
3.0	4.0	18.4	13.6	4.0	5.0	21.0	17.5	C	5.7	6SE6440-2AC23-0CA1
4.0	5.0	23.3	17.5	5.5	7.5	28.3	22	C	5.7	6SE6440-2AC24-0CA1
5.5	7.5	28.0	22.0	7.5	10.0	34.2	28	C	5.7	6SE6440-2AC25-5CA1

<b>Mains operating voltage 3 AC 380 V to 480 V</b>										
2.2	3.0	6.5	5.9	–	–	–	–	B	3.4	6SE6440-2AD22-2BA1
3.0	4.0	8.6	7.7	–	–	–	–	B	3.4	6SE6440-2AD23-0BA1
4.0	5.0	11.6	10.2	–	–	–	–	B	3.4	6SE6440-2AD24-0BA1
5.5	7.5	15.6	13.2	7.5	10	20.2	19	C	5.7	6SE6440-2AD25-5CA1
7.5	10	22.0	18.4	11.0	15	29.0	26	C	5.7	6SE6440-2AD27-5CA1
11.0	15	32.3	26	15.0	20	39.0	32	C	5.7	6SE6440-2AD31-1CA1
15.0	20	38.5	32	18.5	25	45.2	38	D	17	6SE6440-2AD31-5DA1
18.5	25	47.1	38	22	30	54.7	45	D	17	6SE6440-2AD31-8DA1
22	30	56.3	45	30	40	74.8	62	D	17	6SE6440-2AD32-2DA1
30	40	78.0	62	37	50	91.0	75	E	22	6SE6440-2AD33-0EA1
37	50	95.0	75	45	60	111.0	90	E	22	6SE6440-2AD33-7EA1
45	60	122.0	90	55	75	143.0	110	F	75	6SE6440-2AD34-5FA1
55	75	148.0	110	75	100	190.0	145	F	75	6SE6440-2AD35-5FA1
75	100	188.0	145	90	125	223.0	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 4/14 to 4/20).

#### Motors for MICROMASTER 440

Catalog M 11 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: <http://www.sea.siemens.com/motors>

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

When a line commutating choke is used, the specified values are reduced in the case of 200 V–240 V to between 55% to 70% and in the case of 380 V–480 V to between 70% and 80%.

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

### 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 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.

#### 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.

#### 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. 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.

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

- Frame sizes A and B:  
A maximum of two footprint components plus inverter are permissible. The LC filter must be mounted as the lowest component.

- Frame size C:  
Only one footprint component is permissible for frame size C. If a line choke and LC filter are used, the line choke must be located on the left of the inverter. Required spacing: 75 mm.
- 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.

Please note when using LC filters:

- Only V/f, FCC control permissible
- Increased inverter load: approx. 10 % to 15 %
- Operation only permissible with 4 kHz pulse frequency

The output frequency is limited to 150 Hz.

#### 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  $\leq 16$  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  $\geq 0.75$  kW comply with the EN 61 000-3-2 standard.

#### Output choke

Output chokes can be supplied for reducing the capacitive compensation currents and  $dV/dt$  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. In frame sizes D onwards, the gland plates are integrated.

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

## Technical data

### LC 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/29.7 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)		32.6 A/38 A	22.4 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
Limiting of motor overvoltage		≤ 1078 V	
dV/dt limiting		≤ 500 V/μs	
Pulse frequency		4 kHz	
Max. motor frequency		150 Hz	
Max. permissible motor cable lengths	Shielded	200 m	
	Unshielded	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	Frame sizes A to C	IP20 (to EN 60 529)	
	Frame sizes D to F	IP00 / IP20 (to EN 60 529 with terminal covers)	
Insulation class		H (180 °C)	
Temperature range	Operation	–10 °C to +40 °C (+14 °F to +104 °F) to +50 °C (to +122 °F)	100 % P <sub>n</sub> 80 % P <sub>n</sub>
	Storage	–25 °C to +70 °C (–13 °F to +158 °F)	
Installation altitude	Frame sizes A to C	Up to 2000 m: 100 % P <sub>n</sub> 2000 to 4000 m: 62.5 % P <sub>n</sub>	
	Frame sizes D to F:	Up to 1000 m: 100 % P <sub>n</sub> 1000 to 4000 m: 12.5 % derating for each 1000 m	
Mounting position		Vertical	
Ventilation clearances	Top	100 mm	
	Bottom	100 mm	
	Side	100 mm	
Connection system	Input, litz wire or terminal	1U1, 1V1, 1W1	
	Output, terminals	1U2, 1V2, 1W2	
Torque for conductor connections	Frame sizes A to C	Terminal cross-section	Torque
	Frame sizes D to F	–	1.5 Nm to 1.8 Nm
		16 mm <sup>2</sup>	2.0 Nm to 4.0 Nm
		35 mm <sup>2</sup>	2.5 Nm to 5.0 Nm
		50 mm <sup>2</sup>	3.0 Nm to 6.0 Nm
		95 mm <sup>2</sup>	6.0 Nm to 12.0 Nm
		150 mm <sup>2</sup>	10.0 Nm to 20.0 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 125.5 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 (FS)	Output choke Type	Max. permissible motor cable lengths (shielded/unshielded) for a mains voltage of			
		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	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	–
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/GX	Available soon				




# MICROMASTER 440

## 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.

**All options are certified to , except fuses.** \*) Must be used in combination with a line commutating choke.  
**The 3NE1 fuses are -listed (equivalent to ).**

Mains voltage	Output		Inverter without filter	Order No. of the options		
	kW	hp		EMC filter, Class A	EMC filter, Class B	LC filter
<b>1 AC 200 V to 240 V</b>	0.12	0.16	6SE6440-2UC11-2AA1	–	<b>6SE6400-2FL01-0AB0</b>	–
	0.25	0.33	6SE6440-2UC12-5AA1	–	with low leakage currents	–
	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	–	<b>6SE6400-2FL02-6BB0</b>	–
	1.5	2.0	6SE6440-2UC21-5BA1	–	with low leakage currents	–
	2.2	3.0	6SE6440-2UC22-2BA1	–	–	–
	3.0	4.0	6SE6440-2UC23-0CA1	–	–	–
	<b>3 AC 200 V to 240 V</b>	0.12	0.16	6SE6440-2UC11-2AA1	<b>6SE6400-2FA00-6AD0</b>	<b>6SE6400-2FB00-6AD0</b>
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	<b>6SE6400-2FA01-4BC0</b>	<b>6SE6400-2FB01-4BC0</b>	–
1.5		2.0	6SE6440-2UC21-5BA1	–	–	–
2.2		3.0	6SE6440-2UC22-2BA1	–	–	–
3.0		4.0	6SE6440-2UC23-0CA1	–	–	–
4.0		5.0	6SE6440-2UC24-0CA1	–	–	–
5.5		7.5	6SE6440-2UC25-5CA1	–	–	–
7.5		10	6SE6440-2UC27-5DA1	–	–	–
11.0		15	6SE6440-2UC31-1DA1	–	–	–
15.0		20	6SE6440-2UC31-5DA1	–	–	–
18.5		25	6SE6440-2UC31-8EA1	–	–	–
22		30	6SE6440-2UC32-2EA1	–	–	–
30		40	6SE6440-2UC33-0FA1	–	–	–
37		50	6SE6440-2UC33-7FA1	–	–	–
45	60	6SE6440-2UC34-5FA1	–	–	–	
<b>3 AC 380 V to 480 V</b>	0.37	0.50	6SE6440-2UD13-7AA1	<b>6SE6400-2FA00-6AD0</b>	<b>6SE6400-2FB00-6AD0</b>	<b>6SE6400-3TD00-4AD0</b>
	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	–	–	<b>6SE6400-3TD01-0BD0</b>
	3.0	4.0	6SE6440-2UD23-0BA1	–	–	–
	4.0	5.0	6SE6440-2UD24-0BA1	–	–	–
	5.5	7.5	6SE6440-2UD25-5CA1	–	–	<b>6SE6400-3TD03-2CD0</b>
	7.5	10	6SE6440-2UD27-5CA1	–	–	–
	11.0	15	6SE6440-2UD31-1CA1	–	–	–
	15.0	20	6SE6440-2UD31-5DA1	–	EMC filter, Class B, available from Schaffner	<b>6SE6400-3TD03-7DD0</b>
	18.5	25	6SE6440-2UD31-8DA1	–	–	<b>6SE6400-3TD04-8DD0</b>
	22	30	6SE6440-2UD32-2DA1	–	–	<b>6SE6400-3TD06-1DD0</b>
	30	40	6SE6440-2UD33-0EA1	–	–	<b>6SE6400-3TD07-2ED0</b>
	37	50	6SE6440-2UD33-7EA1	–	–	<b>6SE6400-3TD11-5FD0</b>
	45	60	6SE6440-2UD34-5FA1	–	–	–
	55	75	6SE6440-2UD35-5FA1	–	–	<b>6SE6400-3TD15-0FD0</b>
	75	100	6SE6440-2UD37-5FA1	–	–	<b>6SE6400-3TD18-0FD0</b>
	90	125	6SE6440-2UD38-8FA1	<b>6SL3000-0BE32-5AA0 *)</b>	–	Available soon
110	150	6SE6440-2UD41-1FA1	<b>6SL3000-0BE34-4AA0 *)</b>	–	–	
132	200	6SE6440-2UD41-3GA1	–	–	–	
160	250	6SE6440-2UD41-6GA1	–	–	–	
200	300	6SE6440-2UD42-0GA1	<b>6SL3000-0BE36-0AA0 *)</b>	–	–	
<b>3 AC 500 V to 600 V</b>	0.75	1.0	6SE6440-2UE17-5CA1	–	–	<b>6SE6400-3TD01-0CE0</b>
	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	–	–	<b>6SE6400-3TD02-3CE0</b>
	7.5	10	6SE6440-2UE27-5CA1	–	–	–
	11.0	15	6SE6440-2UE31-1CA1	–	–	–
	15.0	20	6SE6440-2UE31-5DA1	–	–	<b>6SE6400-3TD02-3DE0</b>
	18.5	25	6SE6440-2UE31-8DA1	–	–	<b>6SE6400-3TD03-2DE0</b>
	22	30	6SE6440-2UE32-2DA1	–	–	<b>6SE6400-3TD03-7DE0</b>
	30	40	6SE6440-2UE33-0EA1	–	–	<b>6SE6400-3TD04-8EE0</b>
	37	50	6SE6440-2UE33-7EA1	–	–	<b>6SE6400-3TD06-1EE0</b>
	45	60	6SE6440-2UE34-5FA1	–	–	<b>6SE6400-3TD07-1FE0</b>
	55	75	6SE6440-2UE35-5FA1	–	–	<b>6SE6400-3TD10-0FE0</b>
	75	100	6SE6440-2UE37-5FA1	–	–	<b>6SE6400-3TD11-5FE0</b>



## Selection and ordering data (continued)

Mains voltage	Output		Inverter without filter	Order No. of the options		
	kW	hp		Line commutating choke	Output choke	Brake resistors
<b>1 AC 200 V to 240 V</b>	0.12	0.16	6SE6440-2UC11-2AA1	<b>6SE6400-3CC00-4AB3</b>	<b>6SE6400-3TC00-4AD3</b>	<b>6SE6400-4BC05-0AA0</b>
	0.25	0.33	6SE6440-2UC12-5AA1			
	0.37	0.50	6SE6440-2UC13-7AA1	<b>6SE6400-3CC01-0AB3</b>		
	0.55	0.75	6SE6440-2UC15-5AA1			
	0.75	1.0	6SE6440-2UC17-5AA1			
	1.1	1.5	6SE6440-2UC21-1BA1	<b>6SE6400-3CC02-6BB3</b>	<b>6SE6400-3TC01-0BD3</b>	<b>6SE6400-4BC11-2BA0</b>
	1.5	2.0	6SE6440-2UC21-5BA1			
	2.2	3.0	6SE6440-2UC22-2BA1			
	3.0	4.0	6SE6440-2UC23-0CA1	<b>6SE6400-3CC03-5CB3</b>	<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-4BC12-5CA0</b>
	3.0	4.0	6SE6440-2UC11-2AA1	<b>6SE6400-3CC00-3AC3</b>	<b>6SE6400-3TC00-4AD3</b>	<b>6SE6400-4BC05-0AA0</b>
<b>3 AC 200 V to 240 V</b>	0.25	0.33	6SE6440-2UC12-5AA1			
	0.37	0.50	6SE6440-2UC13-7AA1	<b>6SE6400-3CC00-5AC3</b>		
	0.55	0.75	6SE6440-2UC15-5AA1			
	0.75	1.0	6SE6440-2UC17-5AA1			
	1.1	1.5	6SE6440-2UC21-1BA1	<b>6SE6400-3CC00-8BC3</b>	<b>6SE6400-3TC01-0BD3</b>	<b>6SE6400-4BC11-2BA0</b>
	1.5	2.0	6SE6440-2UC21-5BA1	<b>6SE6400-3CC01-4BD3</b>		
	2.2	3.0	6SE6440-2UC22-2BA1			
	3.0	4.0	6SE6440-2UC23-0CA1	<b>6SE6400-3CC01-7CC3</b>	<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-4BC12-5CA0</b>
	4.0	5.0	6SE6440-2UC24-0CA1	<b>6SE6400-3CC03-5CD3</b>		<b>6SE6400-4BC13-0CA0</b>
	5.5	7.5	6SE6440-2UC25-5CA1			
	7.5	10	6SE6440-2UC27-5DA1	<b>6SE6400-3CC05-2DD0</b>	<b>6SE6400-3TC05-4DD0</b>	<b>6SE6400-4BC18-0DA0</b>
	11.0	15	6SE6440-2UC31-1DA1			
	15.0	20	6SE6440-2UC31-5DA1			
	18.5	25	6SE6440-2UC31-8EA1	<b>6SE6400-3CC08-8EC0</b>	<b>6SE6400-3TC08-0ED0</b>	<b>6SE6400-4BC21-2EA0</b>
	22	30	6SE6440-2UC32-2EA1			
	30	40	6SE6440-2UC33-0FA1	<b>6SE6400-3CC11-7FD0</b>	<b>6SE6400-3TC15-4FD0</b>	<b>6SE6400-4BC22-5FA0</b>
37	50	6SE6440-2UC33-7FA1				
45	60	6SE6440-2UC34-5FA1				
<b>3 AC 380 V to 480 V</b>	0.37	0.50	6SE6440-2UD13-7AA1	<b>6SE6400-3CC00-2AD3</b>	<b>6SE6400-3TC00-4AD2</b>	<b>6SE6400-4BD11-0AA0</b>
	0.55	0.75	6SE6440-2UD15-5AA1			
	0.75	1.0	6SE6440-2UD17-5AA1	<b>6SE6400-3CC00-4AD3</b>		
	1.1	1.5	6SE6440-2UD21-1AA1			
	1.5	2.0	6SE6440-2UD21-5AA1	<b>6SE6400-3CC00-6AD3</b>		
	2.2	3.0	6SE6440-2UD22-2BA1	<b>6SE6400-3CC01-0BD3</b>	<b>6SE6400-3TC01-0BD3</b>	<b>6SE6400-4BD12-0BA0</b>
	3.0	4.0	6SE6440-2UD23-0BA1			
	4.0	5.0	6SE6440-2UD24-0BA1	<b>6SE6400-3CC01-4BD3</b>		
	5.5	7.5	6SE6440-2UD25-5CA1	<b>6SE6400-3CC02-2CD3</b>	<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-4BD16-5CA0</b>
	7.5	10	6SE6440-2UD27-5CA1			
	11.0	15	6SE6440-2UD31-1CA1	<b>6SE6400-3CC03-5CD3</b>		
	15.0	20	6SE6440-2UD31-5DA1	<b>6SE6400-3CC04-4DD0</b>	<b>6SE6400-3TC05-4DD0</b>	<b>6SE6400-4BD21-2DA0</b>
	18.5	25	6SE6440-2UD31-8DA1		<b>6SE6400-3TC03-8DD0</b>	
	22	30	6SE6440-2UD32-2DA1	<b>6SE6400-3CC05-2DD0</b>	<b>6SE6400-3TC05-4DD0</b>	
	30	40	6SE6440-2UD33-0EA1	<b>6SE6400-3CC08-3ED0</b>	<b>6SE6400-3TC08-0ED0</b>	<b>6SE6400-4BD22-2EA0</b>
	37	50	6SE6440-2UD33-7EA1		<b>6SE6400-3TC07-5ED0</b>	
	45	60	6SE6440-2UD34-5FA1	<b>6SE6400-3CC11-2FD0</b>	<b>6SE6400-3TC14-5FD0</b>	<b>6SE6400-4BD24-0FA0</b>
	55	75	6SE6440-2UD35-5FA1		<b>6SE6400-3TC15-4FD0</b>	
	75	100	6SE6440-2UD37-5FA1	<b>6SE6400-3CC11-7FD0</b>	<b>6SE6400-3TC14-5FD0</b>	
	90	125	6SE6440-2UD38-8FA1	<b>6SL3000-0CE32-3AA0</b>	Available soon	-
110	150	6SE6440-2UD41-1FA1	<b>6SL3000-0CE32-8AA0</b>		-	
132	200	6SE6440-2UD41-3GA1	<b>6SL3000-0CE33-3AA0</b>		-	
160	250	6SE6440-2UD41-6GA1	<b>6SL3000-0CE35-1AA0</b>		-	
200	300	6SE6440-2UD42-0GA1			-	
<b>3 AC 500 V to 600 V</b>	0.75	1.0	6SE6440-2UE17-5CA1	<b>6SE6400-3CC00-4CE3</b>	<b>6SE6400-3TC01-8CE3</b>	<b>6SE6400-4BE14-5CA0</b>
	1.5	2.0	6SE6440-2UE21-5CA1			
	2.2	3.0	6SE6440-2UE22-2CA1	<b>6SE6400-3CC00-8CE3</b>		
	4.0	5.0	6SE6440-2UE24-0CA1			
	5.5	7.5	6SE6440-2UE25-5CA1	<b>6SE6400-3CC02-4CE3</b>		
	7.5	10	6SE6440-2UE27-5CA1			<b>6SE6400-4BE16-5CA0</b>
	11.0	15	6SE6440-2UE31-1CA1			
	15.0	20	6SE6440-2UE31-5DA1	<b>6SE6400-3CC04-4DD0</b>	<b>6SE6400-3TC03-2DE0</b>	<b>6SE6400-4BE21-3DA0</b>
	18.5	25	6SE6440-2UE31-8DA1			
	22	30	6SE6440-2UE32-2DA1			
	30	40	6SE6440-2UE33-0EA1	<b>6SE6400-3CC08-3ED0</b>	<b>6SE6400-3TC06-2FE0</b>	<b>6SE6400-4BE21-8EA0</b>
	37	50	6SE6440-2UE33-7EA1			
	45	60	6SE6440-2UE34-5FA1	<b>6SE6400-3CC11-2FD0</b>		<b>6SE6400-4BE24-2FA0</b>
	55	75	6SE6440-2UE35-5FA1		<b>6SE6400-3TC08-8FE0</b>	
75	100	6SE6440-2UE37-5FA1				

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## Options Variant dependent options

### Selection and ordering data (continued)

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

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

## Selection and ordering data (continued)

Mains voltage	Output		Inverter with internal filter Class A	Order No. of options Additional EMC filter, Class B	LC filter	Line commutating choke
	kW	hp				
<b>1 AC 200 V to 240 V</b>	0.12	0.16	6SE6440-2AB11-2AA1	<b>6SE6400-2FS01-0AB0</b>	–	<b>6SE6400-3CC00-4AB3</b>
	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	<b>6SE6400-2FS02-6BB0</b>	–	<b>6SE6400-3CC02-6BB3</b>
	1.5	2.0	6SE6440-2AB21-5BA1		–	
	2.2	3.0	6SE6440-2AB22-2BA1		–	
3.0	4.0	6SE6440-2AB23-0CA1	–			
<b>3 AC 200 V to 240 V</b>	3.0	4.0	6SE6440-2AC23-0CA1	<b>6SE6400-2FS03-8CD0</b>	–	<b>6SE6400-3CC01-7CC3</b>
	4.0	5.0	6SE6440-2AC24-0CA1		–	
	5.5	7.5	6SE6440-2AC25-5CA1		–	
<b>3 AC 380 V to 480 V</b>	2.2	3.0	6SE6440-2AD22-2BA1	<b>6SE6400-2FS01-6BD0</b>	<b>6SE6400-3TD01-0BD0</b>	<b>6SE6400-3CC01-0BD3</b>
	3.0	4.0	6SE6440-2AD23-0BA1			
	4.0	5.0	6SE6440-2AD24-0BA1			
	5.5	7.5	6SE6440-2AD25-5CA1	<b>6SE6400-2FS03-8CD0</b>	<b>6SE6400-3TD03-2CD0</b>	<b>6SE6400-3CC02-2CD3</b>
	7.5	10	6SE6440-2AD27-5CA1			
	11.0	15	6SE6440-2AD31-1CA1			
	15.0	20	6SE6440-2AD31-5DA1	An inverter <b>without</b> 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.	<b>6SE6400-3TD03-7DD0</b>	<b>6SE6400-3CC03-5CD3</b>
	18.5	25	6SE6440-2AD31-8DA1		<b>6SE6400-3TD04-8DD0</b>	
	22	30	6SE6440-2AD32-2DA1		<b>6SE6400-3TD06-1DD0</b>	
	30	40	6SE6440-2AD33-0EA1		<b>6SE6400-3TD07-2ED0</b>	
	37	50	6SE6440-2AD33-7EA1		<b>6SE6400-3TD11-5FD0</b>	
	45	60	6SE6440-2AD34-5FA1		<b>6SE6400-3CC11-2FD0</b>	
	55	75	6SE6440-2AD35-5FA1		<b>6SE6400-3TD15-0FD0</b>	
75	100	6SE6440-2AD37-5FA1	<b>6SE6400-3TD18-0FD0</b>	<b>6SE6400-3CC11-7FD0</b>		

Mains voltage	Output		Inverter with internal filter Class A	Order No. of options Output choke	Brake resistors	Gland plate
	kW	hp				
<b>1 AC 200 V to 240 V</b>	0.12	0.16	6SE6440-2AB11-2AA1	<b>6SE6400-3TC00-4AD3</b>	<b>6SE6400-4BC05-0AA0</b>	<b>6SE6400-0GP00-0AA0</b>
	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	<b>6SE6400-3TC01-0BD3</b>	<b>6SE6400-4BC11-2BA0</b>	<b>6SE6400-0GP00-0BA0</b>
	1.5	2.0	6SE6440-2AB21-5BA1			
	2.2	3.0	6SE6440-2AB22-2BA1			
3.0	4.0	6SE6440-2AB23-0CA1				
<b>3 AC 200 V to 240 V</b>	3.0	4.0	6SE6440-2AC23-0CA1	<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-4BC12-5CA0</b>	<b>6SE6400-0GP00-0CA0</b>
	4.0	5.0	6SE6440-2AC24-0CA1			
	5.5	7.5	6SE6440-2AC25-5CA1			
	7.5	10	6SE6440-2AD27-5CA1			
<b>3 AC 380 V to 480 V</b>	2.2	3.0	6SE6440-2AD22-2BA1	<b>6SE6400-3TC01-0BD3</b>	<b>6SE6400-4BD12-0BA0</b>	<b>6SE6400-0GP00-0BA0</b>
	3.0	4.0	6SE6440-2AD23-0BA1			
	4.0	5.0	6SE6440-2AD24-0BA1			
	5.5	7.5	6SE6440-2AD25-5CA1	<b>6SE6400-3TC03-2CD3</b>	<b>6SE6400-4BD16-5CA0</b>	<b>6SE6400-0GP00-0CA0</b>
	7.5	10	6SE6440-2AD27-5CA1			
	11.0	15	6SE6440-2AD31-1CA1			
	15.0	20	6SE6440-2AD31-5DA1	<b>6SE6400-3TC05-4DD0</b>	<b>6SE6400-4BD21-2DA0</b>	Integrated as standard
	18.5	25	6SE6440-2AD31-8DA1			
	22	30	6SE6440-2AD32-2DA1			
	30	40	6SE6440-2AD33-0EA1			
	37	50	6SE6440-2AD33-7EA1			
	45	60	6SE6440-2AD34-5FA1			
	55	75	6SE6440-2AD35-5FA1			
75	100	6SE6440-2AD37-5FA1	<b>6SE6400-3TC14-5FD0</b>	<b>6SE6400-4BD24-0FA0</b>		

# MICROMASTER 440

## Options Variant dependent options

### Selection and ordering data (continued)

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

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

### 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 upload 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)

#### PROFIBUS module

For a complete PROFIBUS connection with up to  $\leq 12$  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).



## 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 <sup>1)</sup>.

##### 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 <sup>2)</sup>.

- 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 8/32 (28 AWG) is recommended. The maximum cable length is 10 m for RS-485.

##### Start-up tools

- **STARTER**  
Starter is graphic start-up software for guided start-up for MICROMASTER 410/420/430/440 frequency inverters under Windows NT/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 95/98/NT/2000/XP Professional.

Both programs are included on the Docu CD 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)	<b>6SE6400-0BP00-0AA0</b>
Advanced Operator Panel (AOP)	<b>6SE6400-0AP00-0AA1</b>
Asian Advanced Operator Panel (AAOP)	<b>6SE6400-0AP00-0AB0</b>
PROFIBUS module	<b>6SE6400-1PB00-0AA0</b>
DeviceNet module	<b>6SE6400-1DN00-0AA0</b>
CANopen module	<b>6SE6400-1CB00-0AA0</b>
Pulse encoder evaluation module	<b>6SE6400-0EN00-0AA0</b>
RS485/PROFIBUS bus connector	<b>6GK1500-0FC00</b>
Connection kit for PC to inverter	<b>6SE6400-1PC00-0AA0</b>
Connection kit for PC to AOP	<b>6SE6400-0PA00-0AA0</b>
Operator panel door mounting kit for single inverter	<b>6SE6400-0PM00-0AA0</b>
AOP door mounting kit for multiple inverters (USS)	<b>6SE6400-0MD00-0AA0</b>

## 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 60664-1 (DIN VDE 0110/T1), no condensation permitted during operation	
Strain resistance	to IEC 60068-2-6 (if module is installed correctly)	
• Stationary	Deflection	0.15 mm in the frequency range of 10 Hz to 58 Hz
	Acceleration	19.6 m/s <sup>2</sup> in the frequency range of 58 Hz to 500 Hz
• Transport	Deflection	3.5 mm in the frequency range of 5 Hz to 9 Hz
	Acceleration	9.8 m/s <sup>2</sup> 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	-10 °C to +50 °C (+14 °F to +122 °F)	
• Storage and transport	-25 °C to +70 °C (-13 °F to +158 °F)	
Relative humidity (permissible humidity rating)		
• Operation	≤ 85 % (non-condensing)	
• Storage and transport	≤ 95 %	
Electromagnetic compatibility	Emission	to EN 55011 (1991) Class A
	Interference	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

# MICROMASTER 440

## 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	to IEC 60068-2-6 (if module is installed correctly)	
• Stationary	Deflection	0.15 mm in the frequency range of 10 Hz to 58 Hz
	Acceleration	19.6 m/s <sup>2</sup> in the frequency range of >58 Hz to 500 Hz
• Transport	Deflection	3.5 mm in the frequency range of 5 Hz to 9 Hz
	Acceleration	9.8 m/s <sup>2</sup> 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	-10 °C to +50 °C (+14 °F to +122 °F)	-10 °C to +50 °C (+14 °F to +122 °F)
• Storage	-40 °C to +70 °C (-40 °F to +158 °F)	-20 °C to +70 °C (-14 °F to +158 °F)
• Transportation	-25 °C to +70 °C (-13 °F to +158 °F)	-20 °C to +70 °C (-14 °F to +158 °F)
Electromagnetic compatibility	Emission	to EN 55011 (1991) Class A
	Interference	to IEC 60801-3 and EN 61000-4-3
Relative humidity (permissible humidity rating)		
• Operation	≤ 85% (non-condensing)	
• Storage and transport	≤ 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

## Selection and ordering data

Type of documentation	Language	Order No.
<b>Docu pack</b> , supplied with each inverter, containing CD-ROM <sup>1)</sup> and Getting Started Guide <sup>2)</sup> (paper version)	Multilanguage	<b>6SE6400-5AD00-1AP0</b>
<b>Operating instructions<sup>2)</sup></b> (paper version)	German	<b>6SE6400-5AW00-0AP0</b>
	English	<b>6SE6400-5AW00-0BP0</b>
	French	<b>6SE6400-5AW00-0DP0</b>
	Italian	<b>6SE6400-5AW00-0CP0</b>
	Spanish	<b>6SE6400-5AW00-0EP0</b>
<b>Parameter list<sup>2)</sup></b> (paper version)	German	<b>6SE6400-5BB00-0AP0</b>
	English	<b>6SE6400-5BB00-0BP0</b>
	French	<b>6SE6400-5BB00-0DP0</b>
	Italian	<b>6SE6400-5BB00-0CP0</b>
	Spanish	<b>6SE6400-5BB00-0EP0</b>

1) The CD-ROM contains operating instructions, parameter list, commissioning tools STARTER and DriveMonitor, multilanguage

2) Available on the Internet at <http://www.siemens.com/micromaster>

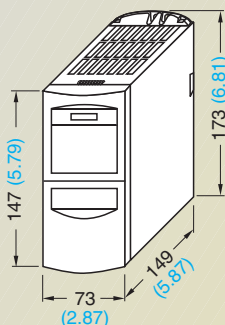
# MICROMASTER 440

## Dimension drawings

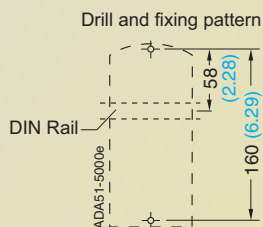
### MICROMASTER 440 inverter

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

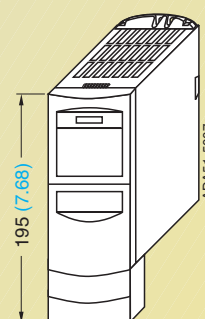
The specified outputs are valid for CT mode.



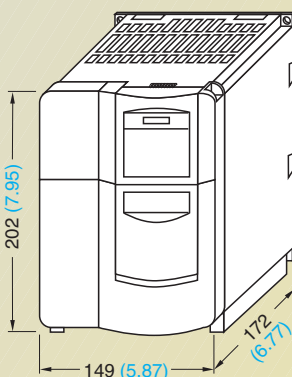
Inverter frame size **A**



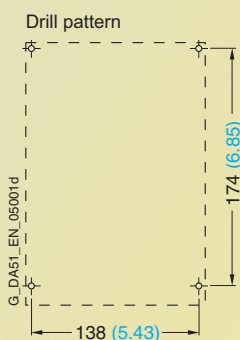
Fixing with  
2 x M4 bolts, 2 x M4 nuts,  
2 x M4 washers  
or by snapping onto a rail  
Tightening torque with washers fitted:  
2.5 Nm  
Ventilation clearance required  
Top and bottom: 100 mm



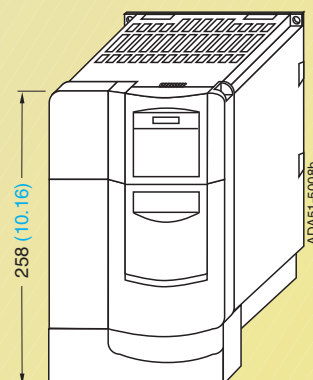
Inverter frame size **A** with **gland plate**



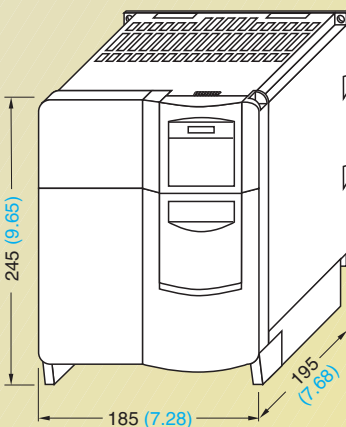
Inverter frame size **B**



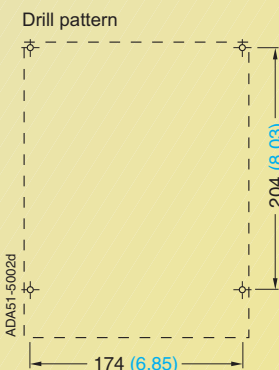
Fixing with  
4 x M4 bolts, 4 x M4 nuts,  
4 x M4 washers  
Tightening torque with washers fitted:  
2.5 Nm  
Ventilation clearance required  
Top and bottom: 100 mm



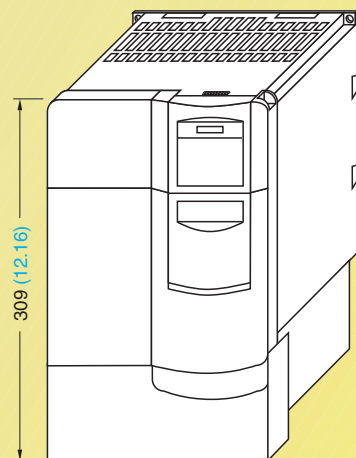
Inverter frame size **B** with **gland plate**



Inverter frame size **C**



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).

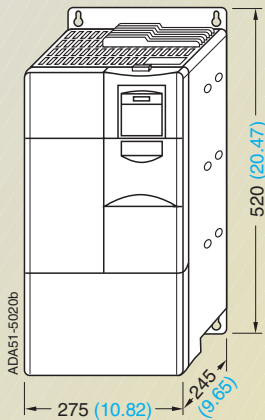
All dimensions in mm (values in brackets are in inches)



### 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
<b>D</b>	7.5 kW to 15 kW	15 kW to 22 kW	15 kW to 22 kW
<b>E</b>	18.5 kW to 22 kW	30 kW to 37 kW	30 kW to 37 kW
<b>F</b>	30 kW to 45 kW	45 kW to 75 kW	45 kW to 75 kW

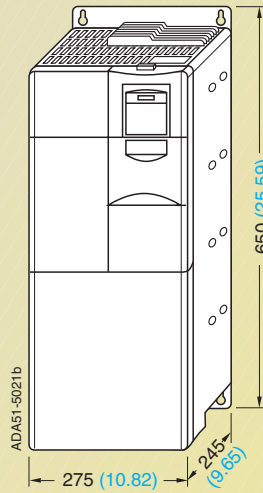
The specified outputs are valid for CT mode.



**Inverter frame size D**



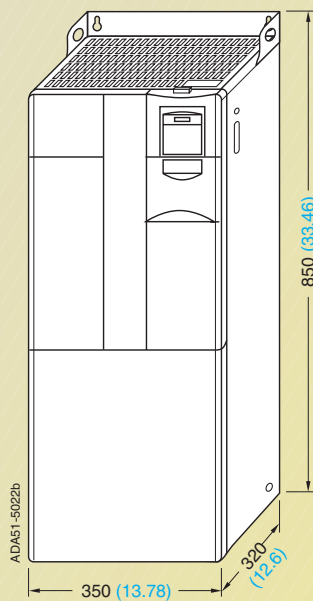
Fixing with  
4 x M8 bolts, 4 x M8 nuts,  
4 x M8 washers  
Tightening torque with washers  
fitted: 3.0 Nm  
Ventilation clearance required  
Top and bottom: 300 mm



**Inverter frame size E**



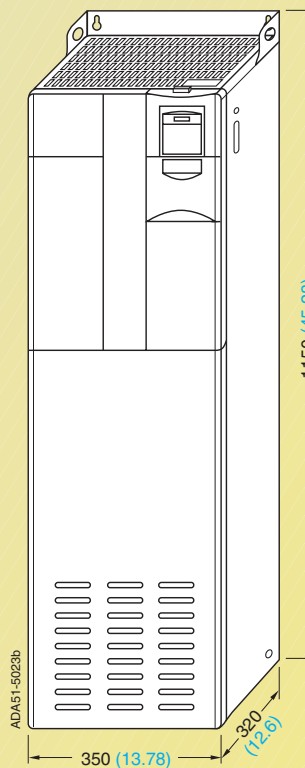
Fixing with  
4 x M8 bolts, 4 x M8 nuts,  
4 x M8 washers  
Tightening torque with washers fitted:  
3.0 Nm  
Ventilation clearance required  
Top and bottom: 300 mm



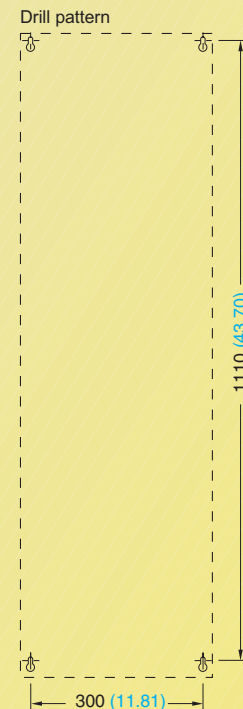
**Inverter frame size F  
without filter**



Fixing with  
4 x M8 bolts, 4 x M8 nuts,  
4 x M8 washers  
Tightening torque with washers  
fitted: 3.0 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: 3.0 Nm  
Ventilation clearance required  
Top and bottom: 350 mm

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

# MICROMASTER 440

## Dimension drawings

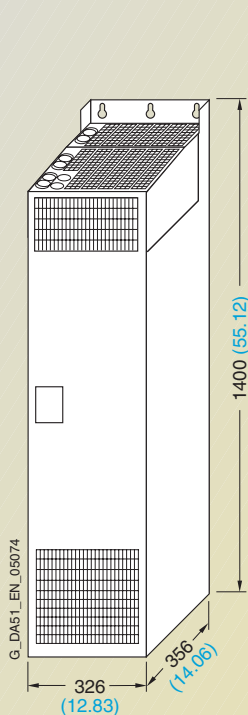
### MICROMASTER 440 inverter (continued)

Frame size 3 AC 380 V to 480 V

**FX** 90 kW to 110 kW

**GX** 132 kW to 200 kW

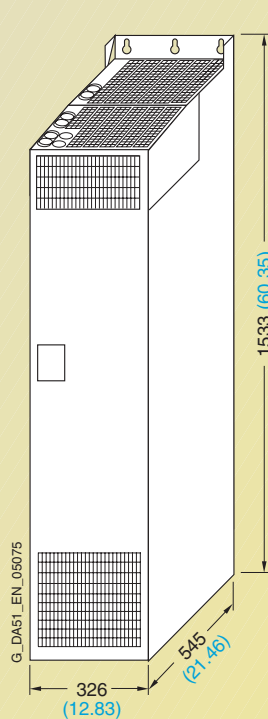
The specified outputs are valid for CT mode.



**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



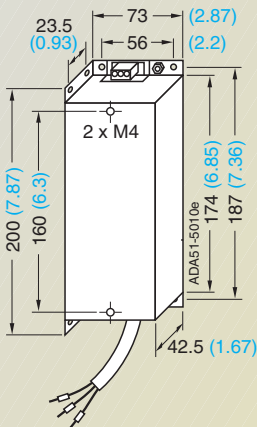
**Inverter frame size GX**



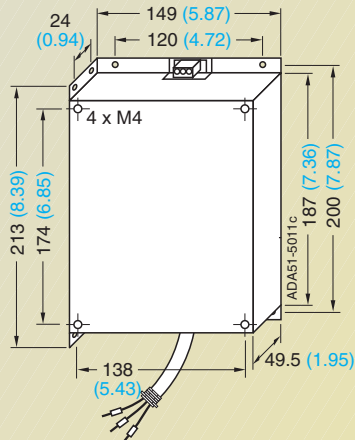
Fixing with  
6 x M8 bolts  
6 x M8 nuts  
6 x M8 washers  
Tightening torque  
with washers  
fitted: 13.0 Nm  
Ventilation clearance  
required:  
at top: 250 mm  
at bottom: 150 mm  
in front: 50 mm

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

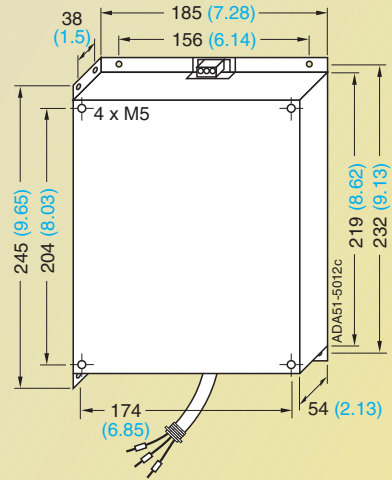
### EMC filter



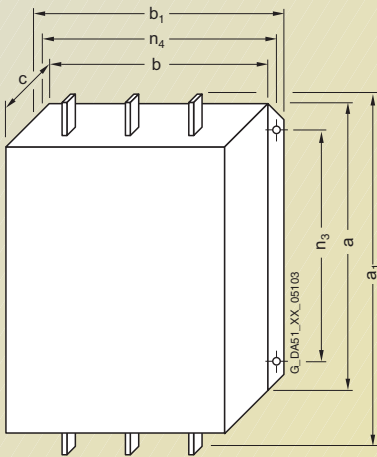
EMC filter for frame size **A**



For frame size **B**



For frame size **C**



EMC filter Class A Type 6SL3000-	for inverter Frame size (FS)	Dimensions							Weight, approx kg
		a	a <sub>1</sub>	b	b <sub>1</sub>	c	n <sub>3</sub>	n <sub>4</sub>	
OBE32-5AA0	<b>FX</b>	270 (10.63)	360 (14.17)	200 (7.87)	240 (9.45)	116 (4.57)	210 (8.27)	220 (8.66)	12.3
OBE34-4AA0	<b>GX/GX</b>	270 (10.63)	360 (14.17)	200 (7.87)	240 (9.45)	116 (4.57)	210 (8.27)	220 (8.66)	12.3
OBE36-0AA0	<b>GX</b>	310 (12.2)	400 (15.75)	215 (8.46)	265 (10.43)	140 (5.51)	250 (9.84)	240 (9.45)	19.0

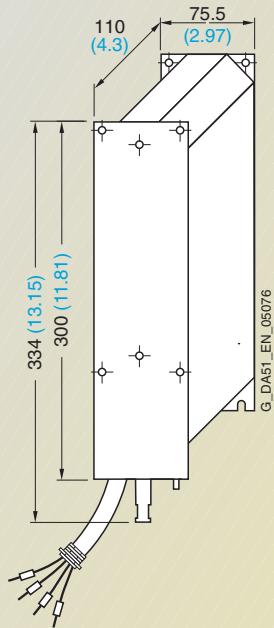
EMC filter for frame sizes **FX** and **GX**

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

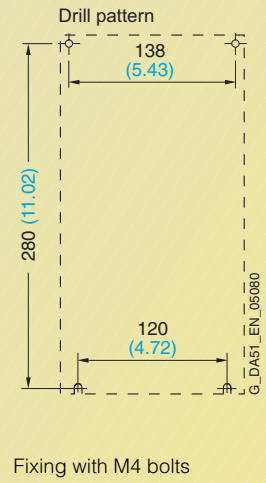
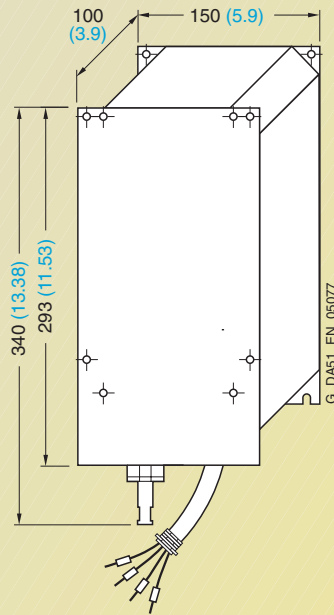
# MICROMASTER 440

## Dimension drawings

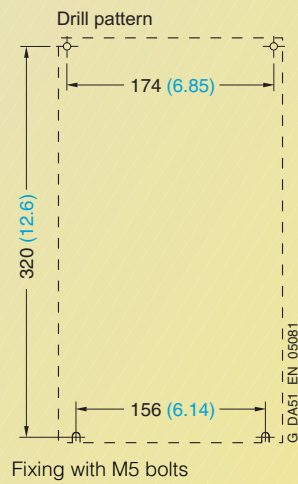
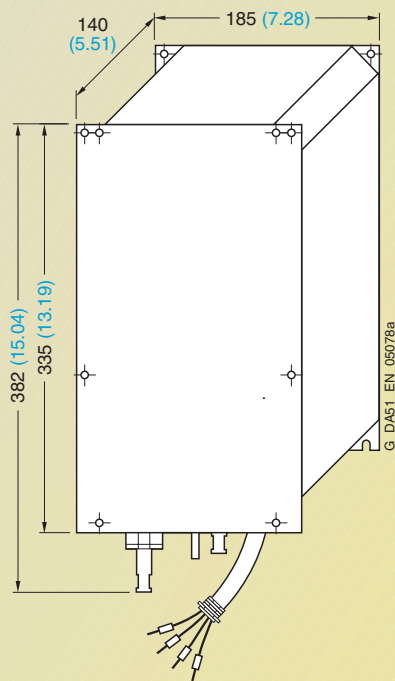
### LC filter



LC filter for frame size A



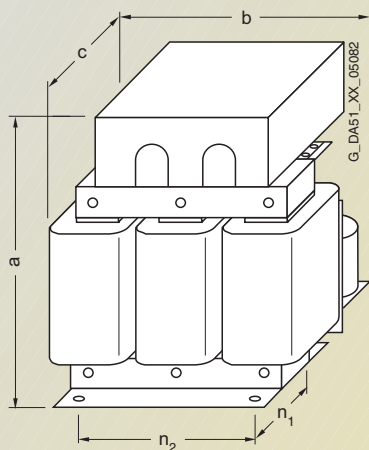
For frame size B



LC filter for frame size C

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

### LC filter



Fixing with M10 bolts

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

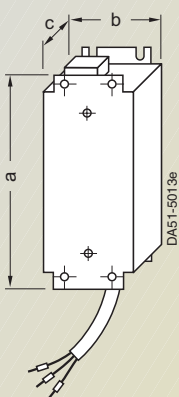
LC filter Type	for inverter Frame size (FS)	Dimensions				
		a	b	c	n <sub>1</sub>	n <sub>2</sub>
6SE6400-3TD03-7DD0	<b>D</b>	278 (10.94)	240 (9.45)	230 (9.06)	115 (4.53)	190 (7.48)
6SE6400-3TD04-8DD0	<b>D</b>	290 (11.42)	240 (9.45)	240 (9.45)	125 (4.92)	190 (7.48)
6SE6400-3TD06-1DD0	<b>D</b>	345 (13.58)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

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

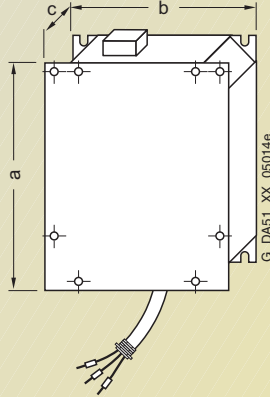


## Dimension drawings

### Line commutating chokes

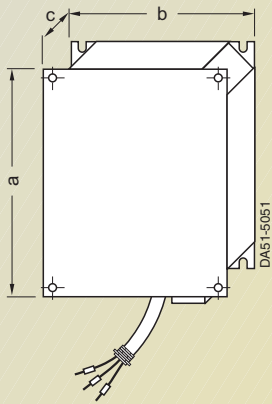


Line commutating choke for frame size **A**



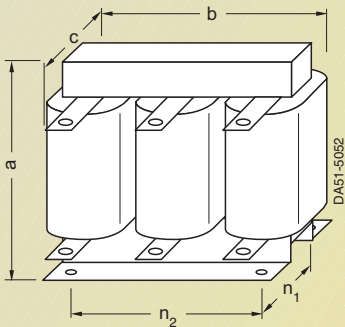
For frame sizes **B** and **C**

Line commutating choke for	Dimensions			Weight (max.) kg
	a	b	c	
Frame size <b>A</b>	200 (7.87)	75.5 (2.97)	50 (1.97)	0.8
Frame size <b>B</b>	213 (8.39)	150 (5.91)	50 (1.97)	1.3
Frame size <b>C</b> (380–480 V)	245 (9.65)	185 (7.28)	50 (1.97)	2.3
Frame size <b>C</b> (500–600 V, 0.75–1.5 kW)	245 (9.65)	185 (7.28)	50 (1.97)	4.4
Frame size <b>C</b> (500–600 V, 2.2–4 kW)	245 (9.65)	185 (7.28)	50 (1.97)	5.0
Frame size <b>C</b> (500–600 V, 5.5–11 kW)	245 (9.65)	185 (7.28)	80 (3.15)	6.8



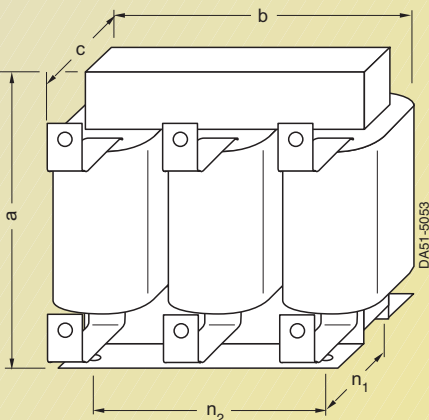
Line commutating choke for frame sizes **D** and **E**

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



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

Line commutating choke Type	for inverter Frame size (FS)	Dimensions					Weight (max.) kg
		a	b	c	n <sub>1</sub>	n <sub>2</sub>	
6SE6400-3CC11-....	<b>F</b>	210 (8.27)	240 (9.45)	141 (5.55)	109 (4.29)	190 (7.48)	25.0

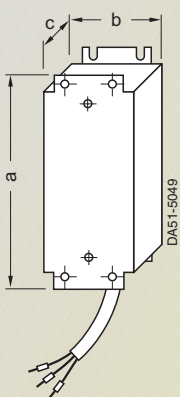


Line commutating choke for inverters of frame sizes **FX** and **GX**

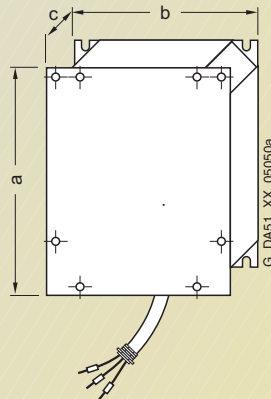
Line commutating choke Type	for inverter Frame size (FS)	Dimensions					Weight (max.) kg
		a	b	c	n <sub>1</sub>	n <sub>2</sub>	
0CE32-....	<b>FX</b>	248 (9.76)	255 (10.04)	203 (7.99)	101 (3.98)	200 (7.87)	24.0
0CE33-....	<b>GX</b>	248 (9.76)	255 (10.04)	203 (7.99)	101 (3.98)	200 (7.87)	25.0
0CE35-....	<b>GX</b>	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)

### Output chokes

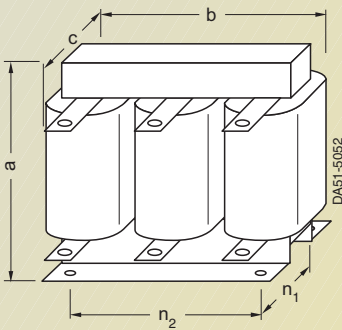


**Output choke**  
for frame size **A**  
6SE6400-3TC00-4AD2  
6SE6400-3TC00-4AD3



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

Output choke Type 6SE6400-	Dimensions			Weight (max.) kg
	a	b	c	
3TC00-4AD2	200 (7.87)	75.5 (2.97)	110 (4.33)	1.95
3TC00-4AD3	200 (7.87)	75.5 (2.97)	50 (1.97)	0.8
3TC01-0BD3	213 (8.39)	150 (5.91)	70 (2.76)	3.4
3TC01-8CE3	245 (9.65)	185 (7.28)	150 (5.91)	9.6
3TC03-2CD3	245 (9.65)	185 (7.28)	80 (3.15)	5.6



Output choke Type 6SE6400-	for inverter Frame size (FS)	Dimensions					Weight (max.)	
		a	b	c	to DIN 41 308		kg	
					n <sub>1</sub>	n <sub>2</sub>		
3TC03-2DE0	<b>D</b>	210 (8.27)	225 (8.86)	179 (7.05)	76 (2.99)	176 (6.93)	19.2	
3TC03-8DD0	<b>D</b>	210 (8.27)	225 (8.86)	179 (7.05)	76 (2.99)	176 (6.93)	19.1	
3TC05-4DD0	<b>D</b>	210 (8.27)	225 (8.86)	150 (5.91)	76 (2.99)	176 (6.93)	11.3	
3TC06-2FE0	<b>F</b>	269 (10.59)	300 (11.81)	220 (8.66)	100 (3.94)	224 (8.82)	37.2	
3TC07-5ED0	<b>E</b>	248 (9.76)	270 (10.63)	209 (8.23)	88 (3.46)	200 (7.87)	26.7	
3TC08-0ED0	<b>E</b>	210 (8.27)	225 (8.86)	150 (5.91)	76 (2.99)	176 (6.93)	12.2	
3TC08-8FE0	<b>F</b>	321 (12.64)	350 (13.78)	288 (11.34)	120 (4.72)	264 (10.39)	53.2	
3TC14-5FD0	<b>F</b>	321 (12.64)	350 (13.78)	288 (11.34)	120 (4.72)	264 (10.39)	55.9	
3TC15-4FD0	<b>F</b>	210 (8.27)	225 (8.86)	150 (5.91)	76 (2.99)	176 (6.93)	24.0	

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

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

# MICROMASTER 440

## Dimension drawings

### Brake resistors

Fig. 1:

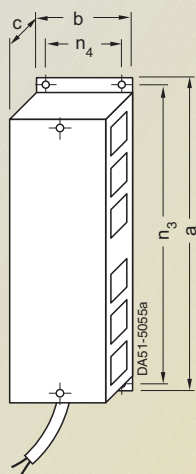


Fig. 2:

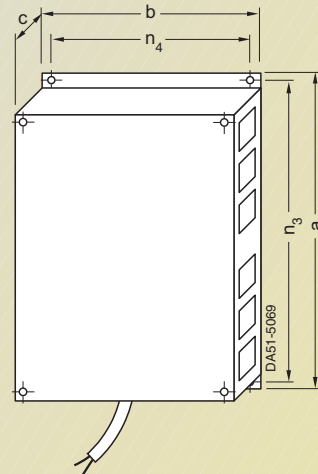
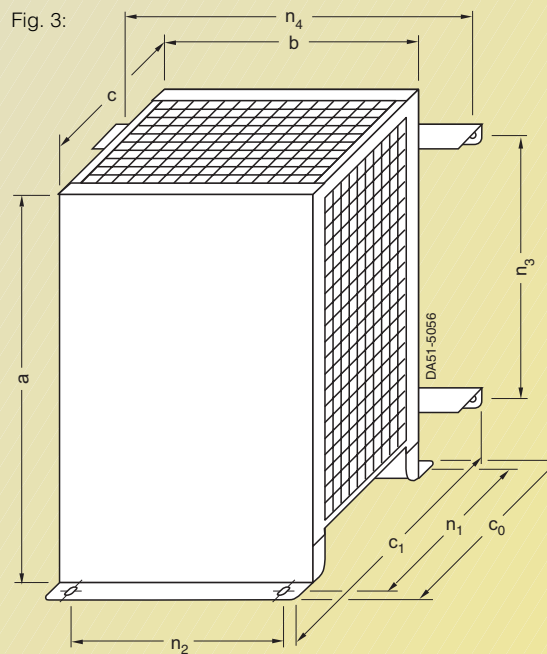


Fig. 3:

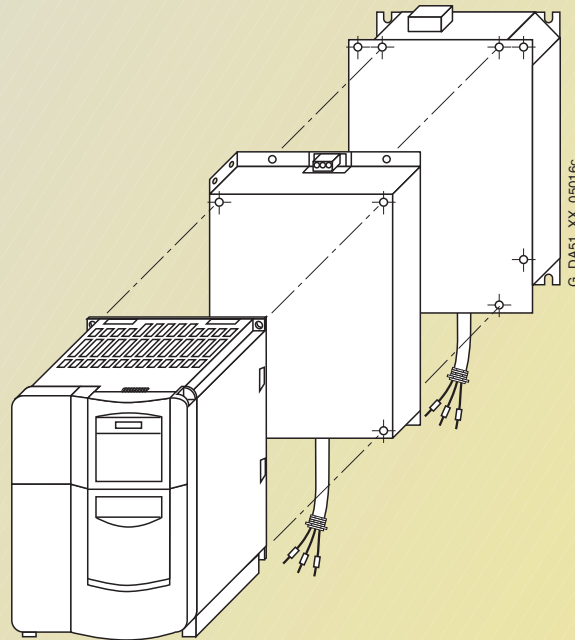


Brake resistors Type 6SE6400-	Resistor Ohm	for inverter Frame size (FS)	Figure No.	Dimensions					For floor mounting		For wall mounting		Weight (max.) kg
				a	b	c	c <sub>0</sub>	c <sub>1</sub>	n <sub>1</sub>	n <sub>2</sub>	n <sub>3</sub>	n <sub>4</sub>	
4BC05-0AA0	180	<b>A</b>	1	230 (9.06)	72 (2.83)	43.5 (1.71)	-	-	-	-	217 (8.54)	56 (2.20)	1.0
4BC11-2BA0	68	<b>B</b>	2	239 (9.41)	149 (5.87)	43.5 (1.71)	-	-	-	-	226 (8.90)	138 (5.43)	1.6
4BC12-5CA0	39	<b>C</b>	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	<b>C</b>	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	<b>D</b>	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	<b>E</b>	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	<b>F</b>	3	650 (25.59)	400 (15.75)	315 (12.40)	382 (15.04)	382 (15.04)	335 (13.19)	270 (10.63)	510 (20.08)	435 (17.13)	16.7
4BD11-0AA0	390	<b>A</b>	1	230 (9.06)	72 (2.83)	43.5 (1.71)	-	-	-	-	217 (8.54)	56 (2.20)	1.0
4BD12-0BA0	160	<b>B</b>	2	239 (9.41)	149 (5.87)	43.5 (1.71)	-	-	-	-	226 (8.90)	138 (5.43)	1.6
4BD16-5CA0	56	<b>C</b>	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	<b>D</b>	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	<b>E</b>	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	<b>F</b>	3	650 (25.59)	400 (15.75)	315 (12.40)	382 (15.04)	382 (15.04)	335 (13.19)	270 (10.63)	510 (20.08)	435 (17.13)	16.7
4BE14-5CA0	120	<b>C</b>	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	<b>C</b>	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	<b>D</b>	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	<b>E</b>	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	<b>F</b>	3	650 (25.59)	400 (15.75)	315 (12.40)	382 (15.04)	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)

### Assembly of inverter and options



Example:  
 Assembly of inverter,  
 filter and choke  
 If additional options are  
 required, they must be  
 mounted on the side.

# MICROMASTER 440

Notes

4







# MICROMASTER 410/420/430/440

## Appendix

A/2	Environment, resources and recycling
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A/4	Compliance with standards
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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



**Certificates (continued)**



**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 these Directives is testified by complete adherence to the following standards:**

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 does not give assurance of properties within the meaning of product liability. The safety instructions provided in the product documentation must be observed.



### 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 mm = 0.03937 in.
	1 ft. = 30.48 cm	1 cm = 0.39370 in.
	1 yd. = 0.91 m	1 m = 3.28084 ft.
	1 mi. = 1.61 km	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.

### Compliance with standards

#### CE marking



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

The inverters comply with the following standards listed in the EU gazette:

#### Low-voltage directive

##### • EN 60 204

Safety of machinery, electrical equipment of machines

##### • EN 50 178

Electrical equipment in electrical power installations.

#### 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 modified EMC product standard EN 61 800-3/A11 for electrical drive systems is valid since 01.01.2002. The following comments apply to the series 6SE6 frequency inverters from Siemens:

- The EMC product standard EN 61 800-3/A11 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.

- A frequency inverter must therefore only be considered as a component which, on its own, is not subject to the EMC product standard EN 61 800-3/A11. However the inverter's Instruction Manual specifies the conditions on how the product standard can be complied with if the frequency inverter is expanded to a PDS. The EMC directive in the EU is complied with for a PDS by observance of the product standard EN 61 800-3/A11 for PDS. The frequency inverters on their own do not generally require identification according to the EMC directive.

- The frequency inverters as components on their own are only classified as "Limited availability" for persons and users with the necessary EMC knowledge. They are not envisaged for unlimited sale or as "General availability" for users.

At this point it is necessary to exactly differentiate between the frequency inverter and the PDS. A PDS can certainly be envisaged by the vendor for general availability and the standard must be

applied accordingly. On the other hand, the components used in the PDS may possibly not be for "general availability".

- Since 01.01.2002, the EMC product standard EN 61 800-3/A11 also defines for the first time, limits for conducted interference and radiated interference for the so-called "Second environment" (i.e. industrial power supply systems which do not supply households). Although these limits lie below those of filter Class A according to EN 55 011, a PDS with an unfiltered frequency inverter of series 6SE6 nevertheless does not comply with these values and therefore does not meet the standard EN 61 800-3/A11. However, the use of unfiltered inverters in an industrial installation is possible, if it forms part of a system which includes power-line filtering at the "system level".

- Using internal or external filters and the installation instructions included in the documentation, the PDS designed using the frequency inverters complies with the product standard EN 61 800-3/A11:

- Unlimited sale with filters with low leakage currents of Class B to EN 55 011 in the first environment (domestic and light industrial areas)

- Limited sale and installation by EMC experts with filters of Class A to EN 55 011 in the first environment plus warning information

- Limited sale with filters of Class B to EN 55 011 in the first environment
- With filters of Class A to EN 55 011 in the second environment (industrial areas), where these filters even significantly exceed the requirements of EN 61 800-3/A11.

- A differentiation must be made between the product standards for electrical drive systems (PDS) of the range of standards EN 61 800-3/A11 (of which Part 3/A11 covers EMC topics) and the product standards for the 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 these are part of a machine, the machine vendor must observe various standards depending on their type and environment, e.g. EN 61 000-3-2 for power supply harmonics and EN 55 011 for radio interferences. The product standard for PDS on its own is therefore either insufficient there or irrelevant.

With respect to the compliance with limits for power supply harmonics, the EMC product standard EN 61 800-3/A11 for PDS refers to compliance with the EN 61 000-3-2 and EN 61 000-3-12 standards.



### Compliance with standards (continued)

#### Electromagnetic compatibility

No impermissible electromagnetic irradiation occurs if the installation guidelines specific to the product are correctly observed.

The table below lists the measured results for emissions of and immunity to interference for the MICROMASTER inverters.

The inverters were installed according to the guidelines with shielded motor cables and shielded control cables.

EMC phenomenon Standard/test	Relevant criteria	Limit value	
Emitted interference EN 61 800-3 (1st environment <sup>1)</sup> )	Conducted via mains cable	150 kHz to 30 MHz	Unfiltered: not tested Internal/external filter: General availability <sup>2)</sup> (Category C1): limit complies with EN 55 011 Class B (only applies to MICROMASTER 410) Limited availability <sup>3)</sup> (Category C2): limit complies with EN 55 011, Class A, Group 1
	Emitted by the drive	30 MHz to 1 GHz	All devices: Limited availability <sup>3)</sup> : limit complies with EN 55 011, Class A, Group 1
ESD immunity EN 61 000-4-2	ESD through air discharge	Test level 3	8 kV
	ESD through contact discharge	Test level 3	6 kV
Electrical fields immunity EN 61 000-4-3	Electrical field applied to unit	Test level 3 26 MHz to 1 GHz	10 V/m
Burst interference immunity EN 61 000-4-4	Applied to all cable terminations	Test level 4	4 kV
Surge immunity EN 61 000-4-5	Applied to mains cables	Test level 3	2 kV
Immunity to RFI emissions, conducted EN 61 000-4-6	Applied to mains, motor and control cables	Test level 4 0.15 MHz to 80 MHz 80 % AM (1 kHz)	10 V

#### UL listing



® and c® listed power conversion equipment Type 5B33, in accordance with UL508C.

For use in pollution degree 2 environment.

**1) 1st environment**  
(domestic, business and commercial areas): environment which includes living accommodation and also equipment which is directly connected to a low-voltage power supply system without intermediate transformers, where this system also supplies living accommodation.

**2) General availability**  
Sales channel where installation is independent of the customer's or user's EMC knowledge.  
**Category C1:**  
Power Drive System (PDS) with rated voltage < 1000 V.  
When used in 1st environment.

**3) Limited availability:**  
Sales channel where installation is limited to dealers, customers or users who, either individually or together, have technical EMC knowledge.  
**Category C2:**  
Power Drive System (PDS) with rated voltage < 1000 V.  
When used in 1st environment, installation and start-up by EMC experts only.

### Integration of drives into the SIMATIC S7 automation system with Drive ES

**Drive ES Basic** supports user-friendly start-up, service and diagnostics of all Siemens drives.

For integrated installation as a STEP 7 option, it is important to note the version of STEP 7 that is being used with regard to the ordering information.

**Drive ES SIMATIC** makes libraries available that contain SIMATIC function blocks so that the communication between the SIMATIC S7 CPU and the Siemens drive (e.g. MICROMASTER 4) can be reduced to simple parameterization. Drive ES SIMATIC replaces the software package DVA\_S7 for all STEP 7 Versions 5.x and can also be installed and implemented as stand-alone software, i.e. without Drive ES Basic.

#### Contents of the package Drive ES SIMATIC:

- Communications software "USS protocol" for
  - SIMATIC S7-300 with CPUs with integrated DP interface (function block libraries DRVDPS7, POSMO)
  - SIMATIC S7-400 with CPUs with integral DP interface or with CP443-5 (function block library DRVDPS7, POSMO)
  - SIMATIC S7-300 with CP342-5 (function block library DRVDPS7C)
- Communications software "USS protocol" for
  - SIMATIC S7-200 with CPU 214/CPU 215/ CPU216 (driver program DRVUSS2 for programming tool STEP 7-Micro)
  - SIMATIC S7-300 with CP 340/341 and SIMATIC S7-400 with CP 441 (function block library DRVUSSS7)

- STEP 7 slave object manager
  - For easy configuration of drives
  - For acyclic PROFIBUS DP communication with the drives
  - Support for converting DVA\_S7 to Drive ES projects (from V5.1)
- SETUP program
  - For installing the software in the STEP 7 environment

**Drive ES PCS7** provides a function block library complete with picture and control blocks that can be used to integrate a Siemens drive (e.g. MICROMASTER 4) based on a speed interface into the SIMATIC PCS7 process control system. Operation and monitoring of the drive is then possible from the Operator Station (OS) using the drive faceplates.

The PCS7 library can be implemented stand-alone, i.e. even without Drive ES Basic, under PCS7 Versions 5.0 and 5.1.

Content of the package Drive ES PCS7 (the PCS7 package can be used with the PCS7 Versions V5.0, V5.1 and V6.0):

- Function block library for SIMATIC PCS7
  - Picture and control blocks for SIMOVERT MASTERDRIVES VC and MC as well as MICROMASTER 3/ MIDIMASTER 3 and MICROMASTER 4
- STEP 7 slave object manager
  - For easy configuration of drives
  - For acyclic PROFIBUS DP communication with the drives
- SETUP program
  - For installing the software in the PCS7 environment.

Software package DriveES Installation as an integrated option to STEP7 V5.2 and higher	Supply format	Documentation	Order No.
Drive ES Basic V5.2 *) single license	CD-ROM	Five standard languages	6SW1700-5JA00-2AA0
Drive ES Basic Upgrade *) from V5.x to V5.2 single license	CD-ROM	Five standard languages	6SW1700-5JA00-2AA4
Drive ES Basic V5.2 *) copy license (60 installations)	CD-ROM and copy license	Five standard languages	6SW1700-5JA00-2AA1
Drive ES SIMATIC V5.3 single license	CD-ROM	Five standard languages	6SW1700-5JC00-3AA0
Drive ES SIMATIC Upgrade from V5.x to V5.3 single license	CD-ROM	Five standard languages	6SW1700-5JC00-3AA4
Drive ES SIMATIC V5.x copy license/runtime license	Product license only (without software and documentation)	Five standard languages	6SW1700-5JC00-1AC0
Drive ES PCS7 V5.2 single license	CD-ROM	Five standard languages	6SW1700-5JD00-2AA0
Drive ES PCS7 V6.0 single license	CD-ROM	Five standard languages	6SW1700-6JD00-0AA0
Drive ES PCS7 Upgrade from V5.x to V6.0 single license	CD-ROM	Five standard languages	6SW1700-6JD00-0AA4
Drive ES PCS7 V5.x/V6.x copy license/runtime license	Product license only (without software and documentation)	Five standard languages	6SW1700-5JD00-1AC0

\*) Drive ES Basic can also be installed stand-alone without STEP 7.



## Software update service for Drive ES

For the Drive ES software, a software update service can also be purchased. The user always receives the latest software, service packs and complete versions automatically without the need for prompting.

The update service can only be ordered to customers who have previously purchased a complete version.

Duration of the update service: 1 year.

The update service is automatically extended by a further year when it is not cancelled at least 6 weeks before expiry.

Software update service	Order No.
DriveES Basic	<b>6SW1700-0JA00-0AB2</b>
DriveES SIMATIC	<b>6SW1700-0JC00-0AB2</b>
DriveES PCS7	<b>6SW1700-0JD00-0AB2</b>

## Drive technology for the chemicals industry



Even more so than in other sectors, drive technology and automation technology in the chemicals industry must comply with the most exacting safety standards in order to protect persons, machines and the environment. Our comprehensive drive portfolio – ranging from frequency inverters through distributed drive systems as far as gear motors, standard low-voltage motors and even tailor-made special versions – take these requirements into account.

You will find information about this on our industry site:

<http://www.ad.siemens.de/chemicals>



Example: Mounting plate to NAMUR standard based on MICROMASTER 440

## Appendix

### 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
<b>MICROMASTER 410</b> • including <b>OP</b> operator panel	<b>6AG1062-1AA08-0AA0</b>	10
<b>MICROMASTER 420</b> • including <b>BOP</b> operator panel	<b>6AG1062-1AA02-0AA0</b>	10
<b>MICROMASTER 440</b> • including <b>BOP</b> operator panel	<b>6AG1062-1AA02-1AA1</b>	10
<b>MICROMASTER 440</b> • including <b>BOP</b> operator panel • the motor is equipped with a <b>load unit</b>	<b>6AG1062-1AA06-0AA0</b>	10
<b>MICROMASTER 440</b> • including <b>BOP</b> operator panel and <b>pulse encoder evaluation module</b> • the motor is equipped with an <b>encoder</b> and a <b>load unit</b>	<b>6AG1062-1AA07-0AA0</b>	10

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

### Training center

The Siemens A&D Training Centers are located worldwide and offer the courses listed below for MICROMASTER. Individual course contents, or training on site at customers, can also be carried out.

#### Contact:

Every A&D Information and Training Center in the regions and the regional companies in Germany:  
Tel.: 0 18 05-23 56 11

#### Headquarters:

Siemens AG  
Automation and Drives  
Training Center  
PO Box 48 48  
90327 Nuremberg

E-Mail:  
A&D.Kursbuero@nbgm.  
siemens.de  
Tel.:  
+49 (0) 9 11-8 95-32 00  
Fax:  
+49 (0) 9 11-8 95-32 75



### Training courses

#### MICROMASTER 4 servicing and commissioning

##### SD-MM4 (2 days)

This course is aimed at commissioning and servicing engineers for the MICROMASTER 4 drives. It covers proper utilization of the MICROMASTER 440 inverter functionality. The MICROMASTER 420 is also included. The basics are taught with more in-depth knowledge as required. The course is therefore also suitable for beginners.

#### Course targets/contents:

- Fundamentals of asynchronous motors
- Fundamentals of inverters
- Programming using BOP, AOP
- PC programs DriveMonitor/STARTER
- Commissioning using V/f characteristic and vector control
- Optional programming of input and output terminals

- Use of special functions such as flying restart, DC braking
- Alarms and fault signals
- Practical exercises using the field-proven demonstration cases.

#### MICROMASTER 4 communication

##### SD-MM4-COM (2 days)

This course is aimed at commissioning and servicing engineers working with the MICROMASTER 4 on the PROFIBUS DP. Knowledge of MICROMASTER and SIMATIC S7 are prerequisites.

It explains the concept of Totally Integrated Automation (TIA).

#### Course targets/contents:

- Fundamentals of PROFIBUS DP with emphasis on drive technology
- Design of the PROFIBUS DP bus system
- Configuration of a PROFIBUS DP network in Step 7

- Commissioning of the MICROMASTER inverter on PROFIBUS DP
- Transmission of process data and parameter values (protocol, PNO profile)
- PROFIBUS DP with Motion Control expansion (lateral communication, equidistance, isochrone mode)
- Block library
- Drive ES SIMATIC
- Fault diagnostics of the drive via the bus system
- Practical exercises on the MICROMASTER 440 demonstration cases and the SIMATIC S7 demonstration cases with CPU 315-2 DP.

#### Tip:

The course sometimes directly follows the SD-MM4 course. Participants need then only travel once.

#### Note:

This course handles the DriveES SIMATIC block library. The SD-MD-COM course provides comprehensive information on alternatives such as loading/transfer commands, system functions, DVA-S7 blocks.

#### Computer based training (CBT) and Web based training (WBT)

Commissioning is carried out in interactive mode using the MICROMASTER 420 frequency inverter. In particular, handling of the parameter keyboard is practically identical to the original. The training time is 3 to 4 hours depending on the level of knowledge

#### Contents:

- Asynchronous motors connected to power supply and inverter
- Overview of MICROMASTER inverter
- Electrical installation
- Parameter input, structure of the parameter kit
- Rating plate of motor
- Simple commissioning
- Assignment of different functions to the terminals.

You can find further information in Catalog ITC or at <http://www.sitrain.com>.

## Appendix

### Overview of motors

Siemens motors are ideally matched to the MICROMASTER inverters. The table provides an overview of the most common types of motors from Siemens.

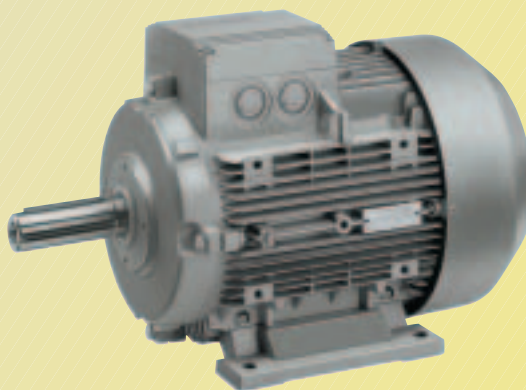
In addition to the motors listed in the table, explosion-proof motors, marine motors and combustion gas motors are also available.

Catalog M 11 contains the complete range of products with ordering data, technical details and explanations.

This catalog is suitable for IEC motors. For motors according to US standards (NEMA) please refer to:

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

Main characteristics	Squirrel-cage motors						
	Motors with gray cast iron casing			Motors with aluminium casing			
	1LG6	1LG4	1LA8	1LA9	1LA9	1LA7	1LA5
Efficiency class	(EFF 1) <sup>*)</sup>	(EFF 2) <sup>*)</sup>		(EFF 1) <sup>*)</sup>	EPACT	(EFF 2) <sup>*)</sup>	
Rating (4-pole)	18.5 – 200 kW	18.5 – 200 kW	250 – 1000 kW	0.06 – 30 kW	0.08 – 40 hp	0.06 – 15 kW	18.5 – 45 kW
Speeds	3000 rpm 1500 rpm 1000 rpm 750 rpm			3000 rpm 1500 rpm 1000 rpm	3600 rpm 1800 rpm 1200 rpm	3000 rpm 1500 rpm 1000 rpm 750 rpm	
Voltage (at 50 Hz if not specified otherwise)	230/400 V Δ/Υ 400/690 V Δ/Υ		400/690 V Δ/Υ	230/400 V Δ/Υ 400/690 V Δ/Υ	60 Hz 460 V Δ	230/400 V Δ/Υ 400/690 V Δ/Υ	
Size	180 – 315		315 – 450	56 – 200		56 – 160	180 – 225
Design	IM B3 IM B5 IM V1 IM B14 (Sizes 100 to 160) IM B35		IM B3 IM V1 IM B35	IM B3 IM B5 IM V1 IM B14 (Sizes 56 to 160) IM B35			
Casing	Gray cast iron			Aluminum			
Degree of protection	IP55 (IP65, IP56)		IP55 (IP56)	IP55 (IP65, IP56)			



Example of 1 LA7 motor

<sup>\*)</sup> 1.1 kW to 90 kW, 2-pole and 4-pole



## Overview of MICROMASTER 411/COMBIMASTER 411

The MICROMASTER 411/ COMBIMASTER 411 inverters from Siemens are available as a distributed drives solution. The table shows an overview of the features of these

products. For the full range of products complete with ordering data, technical details and explanations, see Catalog DA 51.3 MICROMASTER – COMBIMASTER.

Up-to-date information about MICROMASTER 411 and COMBIMASTER 411 can be found on the Internet at

<http://www.siemens.com/combimaster>

	MICROMASTER 411	COMBIMASTER 411
Main characteristics	<b>“The distributed”</b> for a wide drive range – for simple individual applications for pumps and fans through to multiple drives for conveyor systems in networked control systems.	
Power range	0.37 kW to 3 kW	
Voltage ranges	3 AC 380 V to 480 V	
Casing/Size	CS B CS C	71 – 100 90/100
Design	–	IM B 3 IM B 5 IM V 1 (without protective cover) IM V 1 (with protective cover) IM B 14 (with standard flange) IM B 14 (with special flange) IM B 35
Degree of protection	IP66	IP55
Further technical characteristics	V/f characteristic Multipoint characteristic (parameterizable 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 NEW: ECOFAST variants with plug connector for power supply, communication interfaces and motor connections to support quick and problem-free replacement. The ECOFAST variants are totally compatible with the ECOFAST technology systems.	



Examples for MICROMASTER

Examples for COMBIMASTER



## Appendix

### Siemens companies and representatives worldwide



At

[www.siemens.com/automation/partner](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.

#### Need more Information?

Then fax us!

Under the fax no.

**0 08 00-74 62 84 27**

you will find further information.

## 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 Interactive Catalog



Detailed information together with convenient interactive functions: The interactive catalog 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 interactive catalog can be found in the Internet under

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

or on CD-ROM:

- Automation & Drives CA 01,  
Order No.: E86060-D4001-A110-C1-7600

## 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>



## Appendix



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 startup 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.

### Configuration and Software Engineering



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

### Service On Site



With Service On Site we offer services for startup and maintenance, essential for ensuring system availability.

In Germany  
**0180 50 50 444 <sup>2)</sup>**

### 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>

### 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  
**0180 50 50 448 <sup>2)</sup>**

### Technical Support



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

**Tel.: +49 (0)180 50 50 222**

**Fax: +49 (0)180 50 50 223**

E-Mail:  
adsupport@siemens.com

### Optimization and Upgrading



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

### 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. <sup>1)</sup>

<sup>1)</sup> Get in touch with the sales contact in your region for questions about these services. Our Helpline (tel.: +49 (0) 180 50 50 111) will also put you through to the right contact or just visit our Internet site.

<sup>2)</sup> For country-specific telephone numbers go to our Internet site at:  
<http://www.siemens.com/automation/service&support>

## Knowledge Base on CD-ROM



For locations without online connections to the Internet there are excerpts of the free part of the information sources available on CD-ROM (Service & Support Knowledge Base). This CD-ROM contains all the latest product information at the time of production (FAQs, Downloads, Tips and Tricks, Updates) as well as general information on Service and Technical Support.

The CD-ROM also includes a full-text search and our Knowl-

edge Manager for targeted searches for solutions. The CD-ROM will be updated every 4 months.

Just the same as our online offer in the Internet, the Service & Support Knowledge Base on CD comes complete in 5 languages (German, English, French, Italian, Spanish).

You can order the Service & **Support Knowledge Base** CD from your Siemens contact.

Order no. **6ZB5310-0EP30-0BA2**

Orders via the Internet (with Automation Value Card or credit card) at:

<http://www.siemens.com/automation/service&support> in the Shop domain.

## Automation Value Card



### Small card – great support

The Automation Value Card is an integral component of the comprehensive service concept with which Siemens Automation and Drives will accompany you in each phase of your automation project.

It doesn't matter whether you want just specific services from our Technical Support or want to purchase high-quality Support Tools in our Online Shop, you can always pay with your Automation Value Card. No invoicing, transparent and safe. With your personal card number and associated PIN you can view the state of your account and all transactions at any time.

Services on card. This is how it's done.

Card number and PIN are on the back of the Automation Value Card. When delivered, the PIN is covered by a scratch field, guaranteeing that the full credit is on the card.

By entering the card number and PIN you have full access to the Service & Support services being offered. The charge for the services procured is debited from the credits on your Automation Value Card.

All the services offered are marked in currency-neutral credits, so you can use the Automation Value Card worldwide.

### Automation Value Card order numbers

Credits	Order no.
200	<b>6ES7 997-0BA00-0XA0</b>
500	<b>6ES7 997-0BB00-0XA0</b>
1000	<b>6ES7 997-0BC00-0XA0</b>
10000	<b>6ES7 997-0BG00-0XA0</b>

Detailed information on the services offered is available on our Internet site at:

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

Service & Support à la Card: Examples

### Technical Support

"Priority"	Priority processing for urgent cases
"24 h"	Availability round the clock
"Extended"	Technical consulting for complex questions

### Support Tools in the Support Shop

"System Utilities"	Tools that can be used directly for configuration, analysis and testing
"Applications"	Complete topic solutions including ready-tested software
"Functions & Samples"	Adaptable blocks for accelerating your developments



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**MICROMASTER**

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