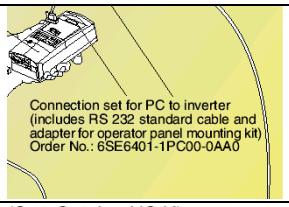
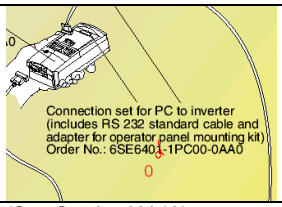
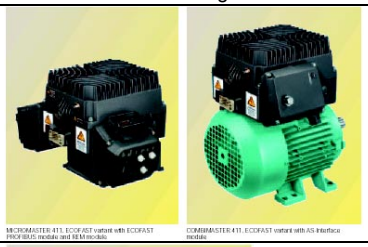
SIEMENS

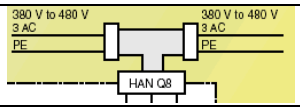
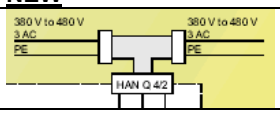
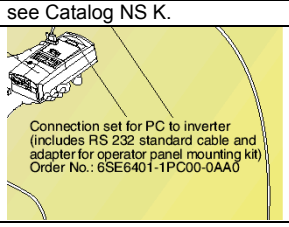
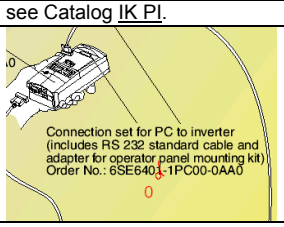
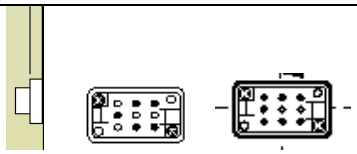
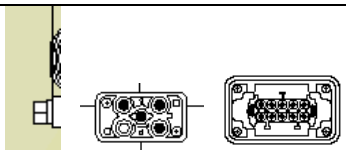
MICROMASTER 411 / COMBIMASTER 411

Distributed Drive Solutions 0.37 kW to 3 kW

Changes to the catalog DA51.3 2003

Please consider the following changes within the english catalog (Order No. E86060-K5251-A131-A2-7600):

Page	Date	Changes	Still now	NEW
Titel inside	25/03/04	Update order numbers for following catalogues DA51.2, M11 and Offline-Mall CA01.	DA51.2: E86060-K5151-A121-A3 E86060-K5151-A121-A3-7600 M11: E86060-K1711-A101-A2 E86060-K1711-A101-A2-7600 CA01: E86060-D4001-A100-B9 E86060-D4001-A100-B9-7600	DA51.2: E86060-K5151-A121-A4 E86060-K5151-A121-A4-7600 M11: E86060-K1711-A101-A3 E86060-K1711-A101-A3-7600 CA01: E86060-D4001-A100-C2 E86060-D4001-A100-C2-7600
Titel inside	26/03/04	Delete catalogue M15 – this catalogue is only in German available.	M15	~~M15~~
Table of contents	25/03/04	Update order number for the Offline-Mall CA01.	CA01: E86060-D4001-A100-B9-7600	CA01: E86060-D4001-A100-C2-7600
1/8	26/03/04	Inserting of the short detail **K35** external metal fan for all COMBIMASTER 1UA1 and 1UA2.		**K35** External metal fan
1/10	12/12/03	Correct order number for the connection set for PC to inverter in R/H figure. Adjustment of figure with ident number **G_DA51_EN_05102** in Image database is already done.		
1/12	14/04/04	Update catalogue note at fuses and circuit breakers.	(See Catalog NS K)	(See Catalog LV 10)
2/2	14/04/04	Update catalogue note for ECOFAST-system.	... see SIEMENS Catalog NS K ...	... see SIEMENS Catalog IK PI ...
2/2	26/04/04	Update MM411/CM411-pictures. The modifications refer to the new connector HAN Q4/2, which substitutes HAN Q 8 on the side of the net. The new connector is touch sure.		
2/3	26/04/04	Update CM411-pictures. The modification refers to the new connector HAN Q4/2, which substitutes HAN Q 8 on the side of the net. The new connector is touch sure.		

Page	Date	Changes	Still now	NEW
2/4	26/04/04	Update general circuit diagram. The modification refers to the new connector HAN Q4/2, which substitutes HAN Q 8 on the side of the net. The new connector is touch sure.		
2/7	27/04/2004	Delete the sentence „They can be adapted to many different types of motor“.		
2/7	26/04/04	Update MM411/CM411-pictures. The modification refers to the new connector HAN Q4/2, which substitutes HAN Q 8 on the side of the net. The new connector is touch sure.	 	 
2/8	26/03/04	Inserting of the short detail **K35** external metal fan for all COMBIMASTER 1UA1 and 1UA2.		**K35** External metal fan
2/9	16/04/04	Update of catalogue note at ECOFAST-options.	see Catalog NS K.	see Catalog IK PI.
2/10	12/12/03	Correct order number for the connection set for PC to inverter in R/H figure. Adjustment of figure with ident number **G_DA51_EN_05102** in Image database is already done.		
2/11	14/04/04	Update catalogue note at fuses and circuit breakers.	(See Catalog NS K)	(See Catalog LV 10)
2/12-2/16	26/04/04	Update MM411/CM411-dimension drawings. The modification refers to the new connector HAN Q4/2, which substitutes HAN Q 8 on the side of the net. The new connector is touch sure. Additonal correction of connector HAN 10E on the side of the drive.		
3/2	07/06/04	Insert DQS-TIP-certificate (TIP – Trust Improvement Program) of higher quality instead of DQS-certificate.		
3/11	26/03/04	Update of order number for the Offline-Mall CA01.	CA01: E86060-D4001-A100-B9	CA01: E86060-D4001-A100-C2
Second to the last page	26/03/04	Update A&D-catalogue overview.		
Back side	14/04/04	Insert A&D-„law of obligation“-text.		The information provided in this catalog contains descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract. Availability and technical specifications are subject to change without notice.

The above-mentioned changes have been already considered on the concerning Internet sites.
http://www.siemens.com/combimaster

Catalog DA 51.3 • 2003 Online-Version June 2004

micromaster COMBIMASTER

MICROMASTER 411 Inverters
COMBIMASTER 411 Distributed Drive Solutions
0.37 kW to 3 kW

SIEMENS

Related Catalogs

MICROMASTER DA 51.2
MICROMASTER 410/420/430/440 Inverters
0.12 kW to 250 kW
Order No.:
German E86060-K5151-A121-A4
English E86060-K5151-A121-A4-7600

MICROMASTER, MICROMASTER Vector
MIDIMASTER Vector, COMBIMASTER DA 64

You can download the catalog in the Internet under the following address:
www.siemens.com/micromaster

Wechsel- und Drehstromsteller
SIVOLT A/V DA 68

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-C2
English E86060-D4001-A110-C2-7600

A&D Mall

Internet:
www.siemens.com/automation/mall

Trademarks

MICROMASTER 411
COMBIMASTER 411
0.37 kW to 3 kW

Catalog DA 51.3 · 2003

Online-Version June 2004

Supersedes:
Catalog DA 51.3 · 2002

The products contained in this catalog are also part of the CD-ROM Catalog CA 01.
Order No.:
E86060-D4001-A110-C2-7600

Please contact your Siemens branch office for further information.

The products and systems described in this catalog are sold under application of a quality management system certified by DQS in accordance with DIN EN ISO 9001 (Reg. No. 00357 QM). The DQS Certificate is recognized in all IQ Net countries.

SIEMENS

Welcome to Automation and Drives

We would like to cordially 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.

MICROMASTER 411
COMBIMASTER 411

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1

Description

MICROMASTER 411

COMBIMASTER 411

Applications

The MICROMASTER 411/COMBIMASTER 411 products are ideally suited to decentralized drive applications which have the requirement for high IP protection rating. It has been designed for use in a broad range of drive applications from simple individual pump or fan applications up to multiple drive conveyor applications incorporating networked control systems.

The products have been based on the MICROMASTER 420 general purpose drive product range.

The MICROMASTER 411 and the COMBIMASTER 411 are characterized by their customer-oriented performance and ease of use.

Main Characteristics

- The MICROMASTER 411 and the COMBIMASTER 411 supplement the MICROMASTER Integrated/ COMBIMASTER 1UA7 product range
- Degree of protection IP66 (MICROMASTER 411), convection cooling
- The MICROMASTER 411 and the COMBIMASTER 411 are characterized by their simple case design
- Electrical isolation between the electronics section in the top part of the case and the terminals in the bottom part of the case
- Parameter sets for reduced commissioning time and cost
- Modular construction with many options
- Operation possible without the need for an operator panel (using jumpers/control potentiometer)
- Integrated, externally accessible control potentiometer
- Compound braking

Design

The modular design of the MICROMASTER 411/ COMBIMASTER 411 allows the user to select the product components individually, including options. All the modules, starting from the series of basic units, are easy to install and wire up.

Various communication modules are available, such as the PROFIBUS and AS-Interface module. Braking functions are implemented by the EM module (electromechanical brake control module) and an REM module (resistor and electromechanical brake control module).

Options (overview)

Software and operator control

- BOP basic operator panel for parameterising an inverter
- Plain text operator panel
  Advanced Operator Panel (AOP) for the MICROMASTER 411/ COMBIMASTER 411, with multilingual display
- Mounting kits for mounting the operator panels
- PC commissioning programs (STARTER, DriveMonitor)

Communication modules

- PROFIBUS module
- AS-Interface module
- DeviceNet module

Brake function modules

- REM module (resistor and electromechanical brake control module)
- EM module (electromechanical brake control module)

Wall mounting kit for MICROMASTER 411

Mechanical Features

- IP66 protection (MICROMASTER 411), suited to harsh industrial environments
- Special design for heat dissipation
- Modular construction
- Simple cable connection, separate connections for power supply and motor for optimum electromagnetic compatibility
- Operating temperature –10 °C to +40 °C
- Cage clamp terminals for simple input/output wiring

Operating Data

- For basic mode of operation, inverter can be operated using integrated externally mounted potentiometer to set frequency setpoint
- Ramp time settings can be fixed using jumpers (1 – 240 second ramps)
- Switchover to fan/pump (quadratic *V/f* control) using jumper
- Switchover to DC braking mode using jumper

Performance Features

- Latest IGBT technology
- Digital microprocessor control
- Flux current control (FCC) for improved dynamic response and optimised motor control
- Linear *V/f* control
- Quadratic *V/f* control
- Multipoint characteristic (parameterizable *V/f* characteristic)
- Flying restart
- Slip compensation
- Automatic restart facility following power failure or fault
- PI feedback for simple process control
- Programmable acceleration/deceleration
- Ramp smoothing
- Fast current limit (FCL) for trip free operation
- Fast, repeatable digital input response time
- Fine speed adjustment using a high resolution 10-bit analog input
- Compound braking for rapid controlled braking
- Four skip frequencies

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 additional protective circuit)
- Short circuit protection
- I^2t motor thermal protection
- Stall prevention
- Parameter interlock

COMBIMASTER 411

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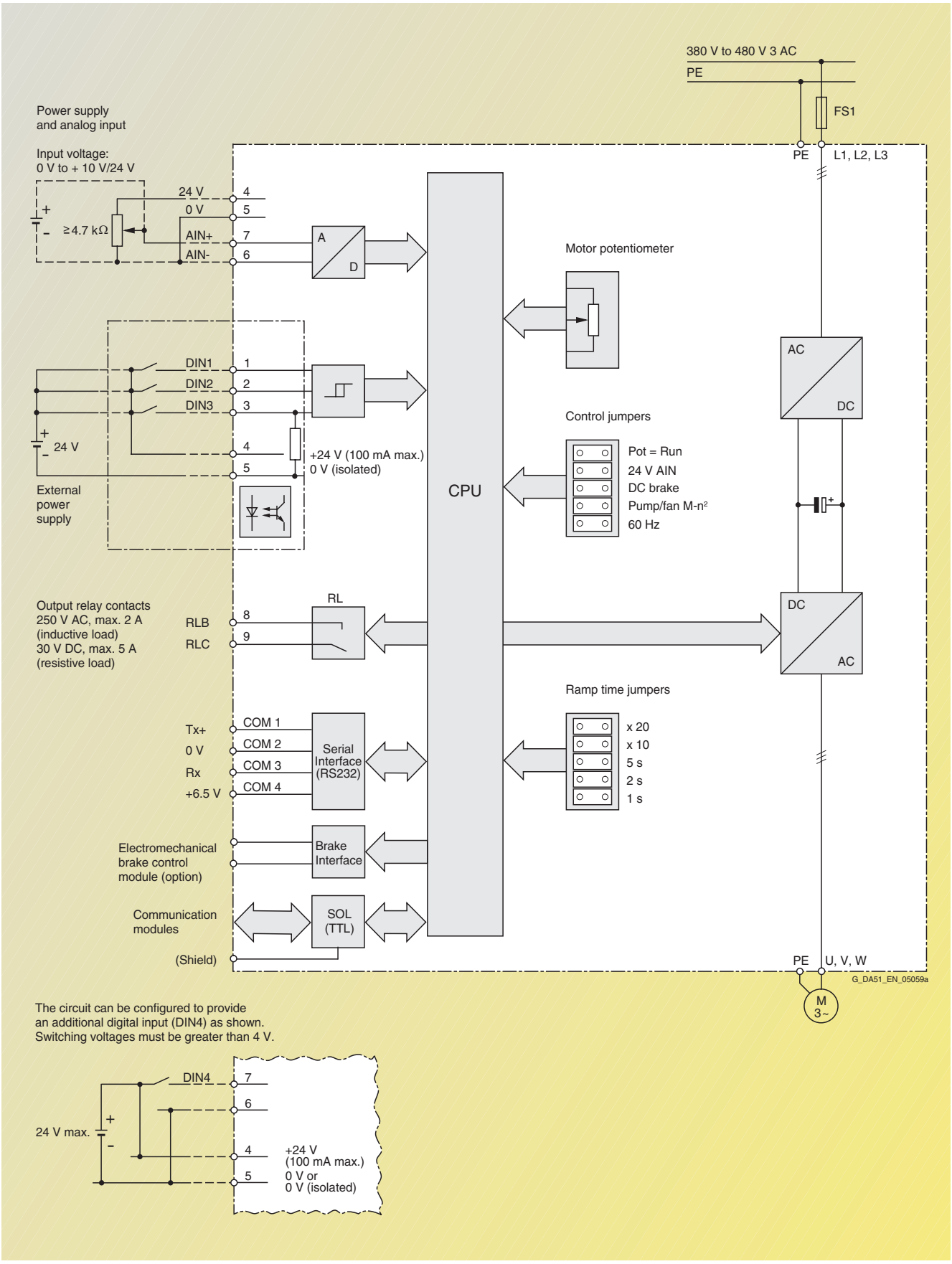
Circuit Diagram

General Circuit Diagram



Shared Data

Line voltage	380 V to 480 V 3 AC ± 10%		
Power range	0.37 kW to 3.0 kW		
Case sizes and frame sizes	Case size (inverter) CS B: 0.37 kW to 1.5 kW CS C: 2.2 kW/3.0 kW	Frame size (motor) 71 M to 90 S/L 90 L/100 L	
Input frequency	47 Hz to 63 Hz		
Output frequency	0 Hz to 650 Hz (standard)		
Power factor	≥ 0.95		
Inverter efficiency	94% to 97% at maximum power		
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 4 A for CS B and 7.7 A for CS C		
Control method	linear *V/f*; quadratic *V/f*; multipoint *V/f* (parameterizable); flux current control (FCC)		
Pulse frequency	4 kHz (standard) 2 kHz to 16 kHz (in 2 kHz steps – with derating)		
Fixed frequencies	7, programmable		
Skip frequency bands	4, programmable		
Setpoint resolution	0.01 Hz digital 0.01 Hz serial 10 bit analog		
Digital inputs	3, programmable		
Analog input	1 for setpoint or PI input (0 to 10 V/24 V), scalable or for use as 4th digital input		
Relay output	1 programmable, 30 V DC/5 A (resistive load), 250 V AC/2 A (inductive load)		
Serial interface	RS 232		
Electromagnetic compatibility	Optional EMC filter to EN 55 011 Class B (radiated emissions : Class A)		
Braking	DC braking, Compound braking: EM module (electromechanical brake control module) and REM module (resistor and electromechanical brake control module) available as options		
Degree of protection	MICROMASTER 411 : IP66 COMBIMASTER 411 : IP55		
Operating temperature	–10 °C to +40 °C (50° C with derating)		
Storage temperature	–40 °C to +70 °C		
Relative humidity	99 % (non-condensing)		
Standard paint finish (motor)	Special paint finish in RAL 7030 stone grey		
Installation altitude	up to 1000 m above sea level without derating		
Protection features	• undervoltage • overvoltage • overload • short circuit • stall prevention • motor overtemperature I^2t, PTC • inverter overtemperature • parameter PIN protection		
Conformance with standards	CE		
CE-labeled	Complies with the European low-voltage directive 73/23/EEC and the electromagnetic compatibility directive 89/336/EEC		
Dimensions (MICROMASTER 411 inverters only)	Case size (CS) CS B CS C	H x L x W (mm) 135 x 222 x 154 170 x 255 x 177	Weight, approx. (kg) 4.9 7.4

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Technical Data

Motor Data

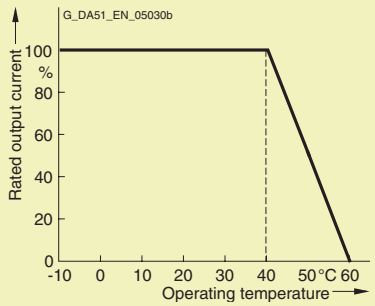
Rated output	Speed		Torque		Frame size	
kW	2-pole rpm	4-pole rpm	2-pole Nm	4-pole Nm	2-pole	4-pole
380 V to 480 V 3 AC						
0.37	2740	1370	1.3	2.6	71 M	71 M
0.55	2800	1395	1.9	3.8	71 M	80 M
0.75	2855	1395	2.5	5.1	80 M	80 M
1.1	2845	1415	3.7	7.4	80 M	90 S
1.5	2860	1420	5.0	10	90 S	90 L
2.2	2880	1420	7.3	15	90 L	100 L
3.0	2890	1420	9.9	20	100 L	100 L

Derating Data

Pulse frequency

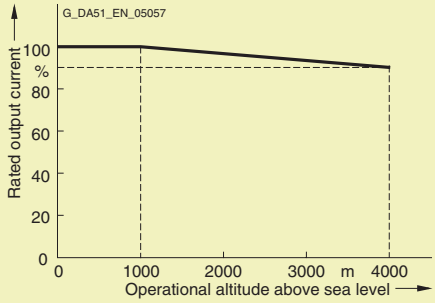
Rated output (for 400 V 3 AC)	Rated output current in A for a pulse frequency of						
kW	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
0.37	1.2	1.2	1.2	1.2	1.2	1.2	1.2
0.55	1.6	1.6	1.6	1.6	1.6	1.6	1.2
0.75	2.1	2.1	2.1	2.1	1.8	1.8	1.2
1.1	3.0	3.0	2.7	2.7	1.8	1.8	1.2
1.5	4.0	4.0	2.7	2.7	1.8	1.8	1.2
2.2	5.9	5.9	5.1	5.1	3.5	3.5	2.3
3.0	7.7	7.7	5.1	5.1	3.5	3.5	2.3

Operating temperature

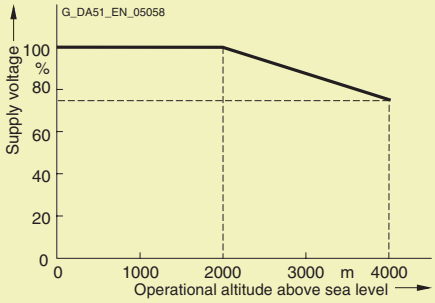


Operational altitude

Permissible output current
in % of the rated output current



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



MICROMASTER 411

MICROMASTER 411 inverters can be ordered individually. They can be adapted to many different types of motor.

For the MICROMASTER 411 and the COMBIMASTER 411 the same options can be ordered (see page 1/11).

Rated output kW	Case size (inverter)	Order No. MICROMASTER 411 without filter	MICROMASTER 411 with Class B filter
Mains operating voltage 380 V to 480 V 3 AC			
0.37	B	**6SE6411-6UD13-7BA1**	**6SE6411-6BD13-7BA1**
0.55	B	**6SE6411-6UD15-5BA1**	**6SE6411-6BD15-5BA1**
0.75	B	**6SE6411-6UD17-5BA1**	**6SE6411-6BD17-5BA1**
1.1	B	**6SE6411-6UD21-1BA1**	**6SE6411-6BD21-1BA1**
1.5	B	**6SE6411-6UD21-5BA1**	**6SE6411-6BD21-5BA1**
2.2	C	**6SE6411-6UD22-2CA1**	**6SE6411-6BD22-2CA1**
3.0	C	**6SE6411-6UD23-0CA1**	**6SE6411-6BD23-0CA1**

COMBIMASTER 411 Using Energy-saving Motors with Efficiency Classification

Basictype motor 1LA7

Rated output kW	Case size (inverter)	Order No. COMBIMASTER 411 without filter 2-pole	4-pole	COMBIMASTER 411 with Class B filter 2-pole	4-pole
Mains operating voltage 380 V to 480 V 3 AC					
0.37	B	**1UA1070-2AU2□**	**1UA1073-4AU2□**	**1UA1070-2AB2□**	**1UA1073-4AB2□**
0.55	B	**1UA1073-2AU2□**	**1UA1080-4AU2□**	**1UA1073-2AB2□**	**1UA1080-4AB2□**
0.75	B	**1UA1080-2AU2□**	**1UA1083-4AU2□**	**1UA1080-2AB2□**	**1UA1083-4AB2□**
1.1	B	**1UA1083-2AU2□**	**1UA1090-4AU2□**	**1UA1083-2AB2□**	**1UA1090-4AB2□**
1.5	B	**1UA1090-2AU2□**	**1UA1096-4AU2□**	**1UA1090-2AB2□**	**1UA1096-4AB2□**
2.2	C	**1UA1096-2AU2□**	**1UA1106-4AU2□**	**1UA1096-2AB2□**	**1UA1106-4AB2□**
3.0	C	**1UA1106-2AU2□**	**1UA1107-4AU2□**	**1UA1106-2AB2□**	**1UA1107-4AB2□**

Motor design:

IM B 3	**0**
IM B 5	**1**
IM V 1 (without canopy)	**1**
IM V 1 (with canopy)	**4**
IM B 14 (with standard flange)	**2**
IM B 14 (with custom flange)	**3**
IM B 35	**6**

For further information on the motors, their types of construction, and order codes for special motor designs, see page 1/8 and Catalog M 11.

Example

A variable-speed drive is required, 0.75 kW, 400 V 3 AC, 4-pole, Class B filter, IM B 3 motor design, with electromechanical brake control module (for option, see pages 1/8 to 1/11).

The Order No. is: **1UA1083-4AB20-Z M55**

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Selection and Ordering Data

Order Codes for Special Features (COMBIMASTER only)

Additional Order No. suffix **-Z** with Order Code	Special features	Motor type – frame size 71 M	80 M	90 S/L	100 L
Winding and motor protection					
A11	Motor protected by PTC thermistor with 3 built-in temperature sensors for switch-off	●	●	●	●
Paint finish (motor)					
M16	Special paint finish in RAL 1002 sand yellow	●	●	●	●
M17	Special paint finish in RAL 1013 pearl white	●	●	●	●
M18	Special paint finish in RAL 3000 flame red	●	●	●	●
K27	Special paint finish in RAL 6011 mignorette green	●	●	●	●
M19	Special paint finish in RAL 6021 pale green	●	●	●	●
M20	Special paint finish in RAL 7001 silver gray	●	●	●	●
K28	Special paint finish in RAL 7031 bluish grey	●	●	●	●
L42	Special paint finish in RAL 7032 pebble grey	●	●	●	●
M21	Special paint finish in RAL 7035 light grey	●	●	●	●
M22	Special paint finish in RAL 9001 cream	●	●	●	●
M23	Special paint finish in RAL 9002 grey white	●	●	●	●
L43	Special paint finish in RAL 9005 jet black	●	●	●	●
Y54 and special paint finish RAL .... (additional plain text is required)	Special paint finish in other colors: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7011, 7016, 7022, 7033	●	●	●	●
K23	Unpainted (only cast iron parts primed)	●	●	●	●
K24	Unpainted, only primed	●	●	●	●
Modular technology [1]					
G17	Mounting of separately driven motor fan	–	–	–	●
G26+C01	Mounting of brake (brake supply voltage AC 400 V, 50 Hz)	●	●	●	●
H62+C01	Mounting of brake and pulse generator 1XP8 001-1 (brake supply voltage AC 400 V, 50 Hz)	–	–	–	●
H63+C01	Mounting of brake and separately driven motor fan (brake supply voltage AC 400 V, 50 Hz)	–	–	–	●
H64+C01	Mounting of brake, separately driven motor fan and pulse generator 1 XP8 001-1 (brake supply voltage AC 400 V, 50 Hz)	–	–	–	●
Mechanical features					
L13	External earthing	●	●	●	●
K31	Extra rating plate, loose	●	●	●	●
K35	External metal fan	●	●	●	●
Y82 (additional plain text is required)	Extra rating plate	●	●	●	●
L99	Wire-lattice pallet	●	●	●	●
Communication modules [1]					
M53	AS-Interface module	●	●	●	●
M54	PROFIBUS module	●	●	●	●
M56	DeviceNet module	●	●	●	●
Brake function modules [1]					
M55	EM module (electromechanical brake control module)	●	●	●	●
M79	REM module (resistor and electromechanical brake control module)	●	●	●	●

● possible
– not possible

1) Order codes cannot be combined with each other.

Variant Independent Options

Software and operator control

Basic Operator Panel (BOP)

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

A BOP can be used for several inverters. It is mounted in the operator panel mounting kit, for connection to the external communication interface of the inverter.

Advanced Operator Panel (AOP) for MICROMASTER 411/ COMBIMASTER 411

This AOP is used specifically for the MICROMASTER 411/ COMBIMASTER 411 products.

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

It is mounted in the operator panel mounting kit, for connection to the external communication interface of the inverter.

Basic Operator Panel (BOP) and Advanced Operator Panel (AOP)

Commissioning Tools

- STARTER
  is start-up software for guided commissioning of the MICROMASTER 4 series under Windows NT/2000/ XP Professional [1]). Parameter lists can be read out, altered, stored, entered and printed.
- DriveMonitor
  is start-up software for list-oriented parameterization of frequency inverters. This program can run under Windows 95/ 98/NT/2000/XP Professional. Both programs are part of the Docu-CD supplied with each unit.

Communication modules

PROFIBUS Module

For a complete PROFIBUS connection with ≤ 12 Mbaud. The PROFIBUS module can be powered from an internal or external 24 V DC supply so that the bus is active when the power is removed from the inverter.

The PROFIBUS module in the form of a separate module can be screwed onto the case of the MICROMASTER 411/ COMBIMASTER 411.

AS-Interface Module

This module enables the COMBIMASTER 411/ MICROMASTER 411 inverter to communicate as a slave in an AS-Interface (actuator-sensor interface) communications network. In a standard AS-Interface system, up to 31 slaves can be connected, whereby each slave has up to 4 inputs and up to 4 outputs.

The module uses an external housing.

AS-Interface module and PROFIBUS module

DeviceNet Module

This module enables the COMBIMASTER 411/ MICROMASTER 411 inverters to communicate as nodes in a DeviceNet communications network.

The DeviceNet module allows transmission speeds of 125, 250 and 500 kbps.

The module uses an external housing.

DeviceNet module

1) STARTER Version 3.0 and higher

Variant Independent Options (continued)

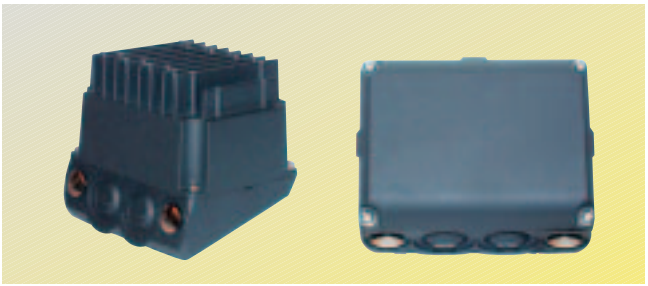
Brake function module

EM Module (electromechanical brake control module)

This module controls an electromechanical brake mounted on the motor. The module is for mounting on the casing of the MICROMASTER 411/COMBIMASTER 411. For more information on the motor brake, see Catalog M11 "Technical Information", "Brakes".

REM Module (resistor and electromechanical brake control module)

This module contains a brake chopper with brake resistor and controls an external electromechanical motor brake. The module is enclosed in an external housing with the same degree of protection as the product series.



REM module and EM module

Additional options

Operator Panel Mounting Kit

The mounting kit is used to mount the operator panel BOP/AOP for connection to the inverter.

Interface Link Cable, serial

This cable is for connecting the serial interfaces of a MICROMASTER 411/COMBIMASTER 411 (M12 connector) to a PC (9-pin, D-type).

Connection Set for PC to Inverter

This kit allows the inverter to be controlled directly from a PC with installed software (eg. STARTER). Includes an isolated RS 232 adapter board for reliable point-to-point connection to a PC. It is used in conjunction with an operator panel mounting kit.

Connection Set for PC to AOP

This kit allows a PC to be connected to an AOP. Offline programming of inverters and archiving of parameter sets are possible. Includes a desktop attachment kit for an AOP, 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

This mounting kit is for fixing an operator panel in the door of a control cabinet. Degree of protection IP56. The mounting kit contains a cable adapter module with screwless terminals for a 5 m cable assembly.

5 m Cable Assembly for Door Mounting Kit

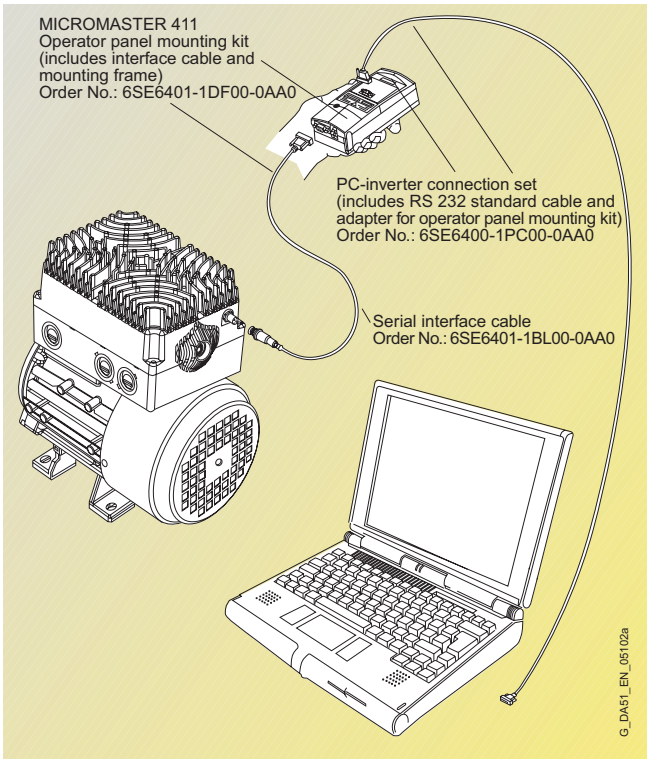
This 5 m cable acts as the serial connection between COMBIMASTER 411/MICROMASTER 411 inverters and a door-mounted operator panel.

Wall Mounting Kit for MICROMASTER 411

This option enables the MICROMASTER 411 to be mounted near the motor (max. motor cable length: 5 m).

Motor Adaptation Gasket for non-Siemens Motor

This gasket enables a MICROMASTER 411 inverter to be mounted on a flat surface or on non-Siemens motors.



Parameterization with operator panel mounting kit or PC-inverter connection kit (see also section "Key to programming options").

Variant Independent Options (continued)

Key to Programming Options

	Operator Panel Programming	PC Programming	PC Programming (with Isolation)	PC Programming of AOP, loading data in inverter	Operator Panel Door Mounting Kit Programming
Operator Panel Mounting Kit (includes: Desktop Frame + Interface Link Cable)	●		●		
Interface Link Cable, serial		●		●	
Connection Set for PC to Inverter			●		
Operator Panel Door Mounting Kit					●
Operator Panel BOP	●[1])				●[1])
Operator Panel AOP	●[1])			●	●[1])
5 m Cable Assembly (M 12)					●

1) Either BOP or AOP required.

Ordering Data for Variant Independent Options

Option	Order No.	Order Code (additional order code **"-Z"**) COMBIMASTER only
Basic Operator Panel (BOP)	**6SE6400-0BP00-0AA0**	–
Advanced Operator Panel (AOP) for MICROMASTER 411/COMBIMASTER 411	**6SE6400-0AC00-0AA0**	–
AS-Interface Module	**6SE6401-1AS00-0AA0**	**M53**
PROFIBUS Module	**6SE6401-1PB00-0AA0**	**M54**
DeviceNet Module	**6SE6401-1DN00-0AA0**	**M56**
EM module (electromechanical brake control module)	**6SE6401-1EM00-0AA0**	**M55**
REM Module (resistor and electromechanical brake control module)	**6SE6401-1RB00-0AA0**	**M79**
Motor adaptation gasket for non-Siemens Motor (13 gaskets per package)	**6SE6401-0MG00-0AA0**	–
Operator Panel Mounting Kit (includes: Desktop Frame + Interface Link Cable)	**6SE6401-1DF00-0AA0**	–
Interface Link Cable, serial	**6SE6401-1BL00-0AA0**	–
Connection Set for PC to Inverter (includes: RS 232 standard cable and adapter for operator panel mounting kit)	**6SE6400-1PC00-0AA0**	–
Connection Set for PC to AOP	**6SE6400-0PA00-0AA0**	–
Operator Panel Door Mounting Kit for Single Inverter	**6SE6400-0PM00-0AA0**	–
5 m Cable Assembly for Door Mounting Kit	**6SE6401-1CA00-0AA0**	–
Wall Mounting Kit for MICROMASTER 411	**6SE6401-0WM00-0AA0**	–

1

Options

Ordering Data for Variant Dependent Options

The options listed here:
- Fuses
- Circuit breakers

are inverter specific.

Use of MICROMASTER 4 line commutating chokes

Inverters generate non-sinusoidal harmonics. The amplitudes of these harmonics can be reduced with line commutating chokes.

If the line impedance is < 1 %, a line commutating choke is necessary. The various line commutating chokes available are shown in Catalog DA 51.2. The line commutating choke must be installed in a housing in accordance with the necessary ambient conditions.

	Rated output kW	Case size (inverter)	Order No. of the options **Fuse** (see Catalog LV 10)	 **Circuit breaker** (see Catalog LV 10)
Mains operating voltage 380 V to 480 V 3 AC				
MICROMASTER 411/COMBIMASTER 411 without filter	0.37	B	**3NA3803**	**3RV1021-1CA10**
	0.55	B		**3RV1021-1DA10**
	0.75	B		**3RV1021-1EA10**
	1.1	B		**3RV1021-1GA10**
	1.5	B		**3RV1021-1HA10**
	2.2	C	**3NA3805**	**3RV1021-1JA10**
	3.0	C		**3RV1021-1KA10**
MICROMASTER 411/COMBIMASTER 411 with Class B filter	0.37	B	**3NA3803**	**3RV1021-1CA10**
	0.55	B		**3RV1021-1DA10**
	0.75	B		**3RV1021-1EA10**
	1.1	B		**3RV1021-1GA10**
	1.5	B		**3RV1021-1HA10**
	2.2	C	**3NA3805**	**3RV1021-1JA10**
	3.0	C		**3RV1021-1KA10**

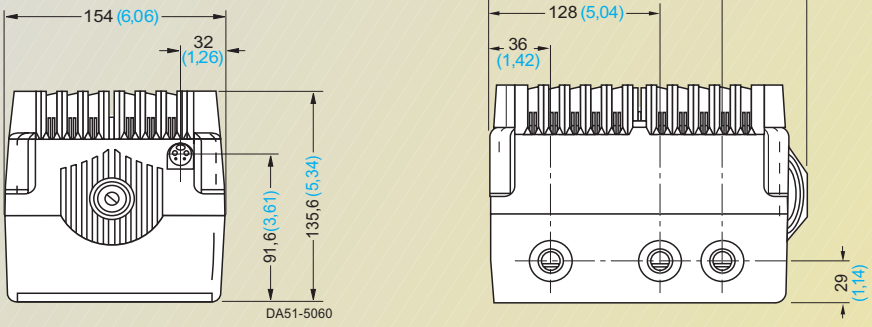
Documentation

Type of documentation	Language	Order No.
Docu-Pack, supplied with each MICROMASTER 411/ COMBIMASTER 411, containing CD-ROM[1]) and Getting-Started-Guide[2]) (paper version)	Multilanguage	**6SE6400-5FC00-1AP0**
Operating instructions[2]) (paper version)	German	**6SE6400-5CA00-0AP0**
	English	**6SE6400-5CA00-0BP0**
	French	**6SE6400-5CA00-0DP0**
	Italian	**6SE6400-5CA00-0CP0**
	Spanish	**6SE6400-5CA00-0EP0**
Parameter list[2])	German	**6SE6400-5CE00-0AP0**
	English	**6SE6400-5CE00-0BP0**
	French	**6SE6400-5CE00-0DP0**
	Italian	**6SE6400-5CE00-0CP0**
	Spanish	**6SE6400-5CE00-0EP0**

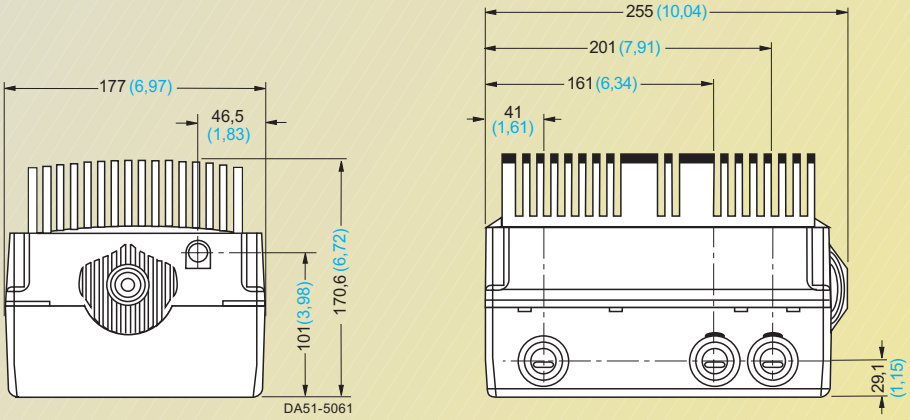
1) The CD-ROM contains operating instructions, parameter list and commissioning tools STARTER and DriveMonitor, multilanguage

2) Available on Internet at http://www.siemens.com/combimaster

MICROMASTER 411 Inverters



Inverter Case Size **B**



Inverter Case Size **C**

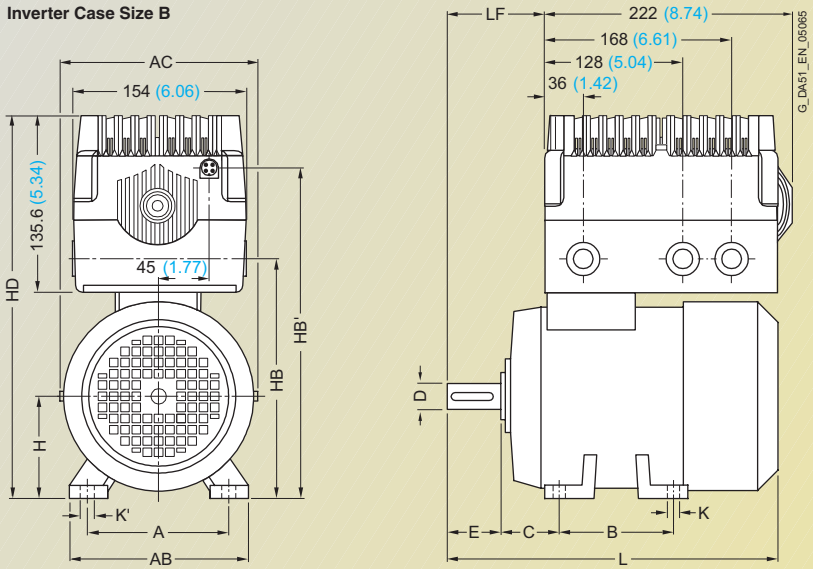
All dimensions are in mm (values in brackets are in inches)

1

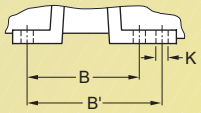
Dimension Drawings

COMBIMASTER 411 – Motor Design IM B 3

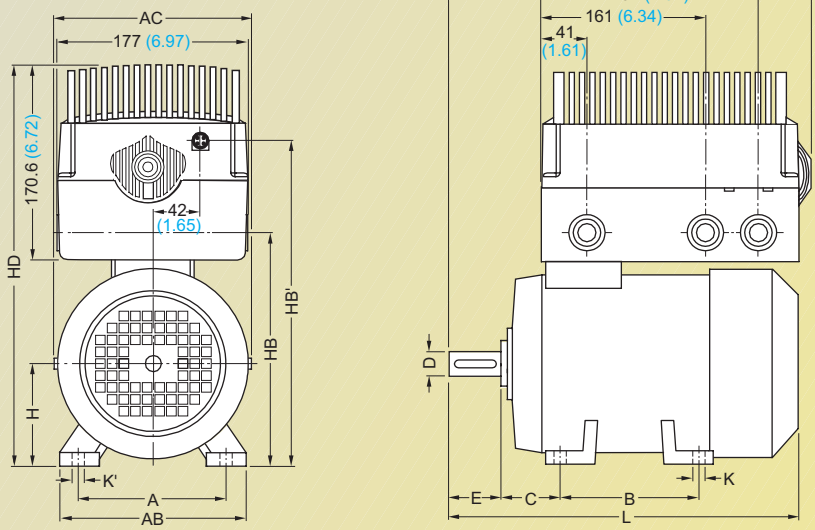
Inverter Case Size B



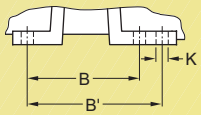
Frame size 90 S/L has feet with 2 holes each at the non-drive end



Inverter Case Size C



Frame size 90 L has feet with 2 holes each at the non-drive end

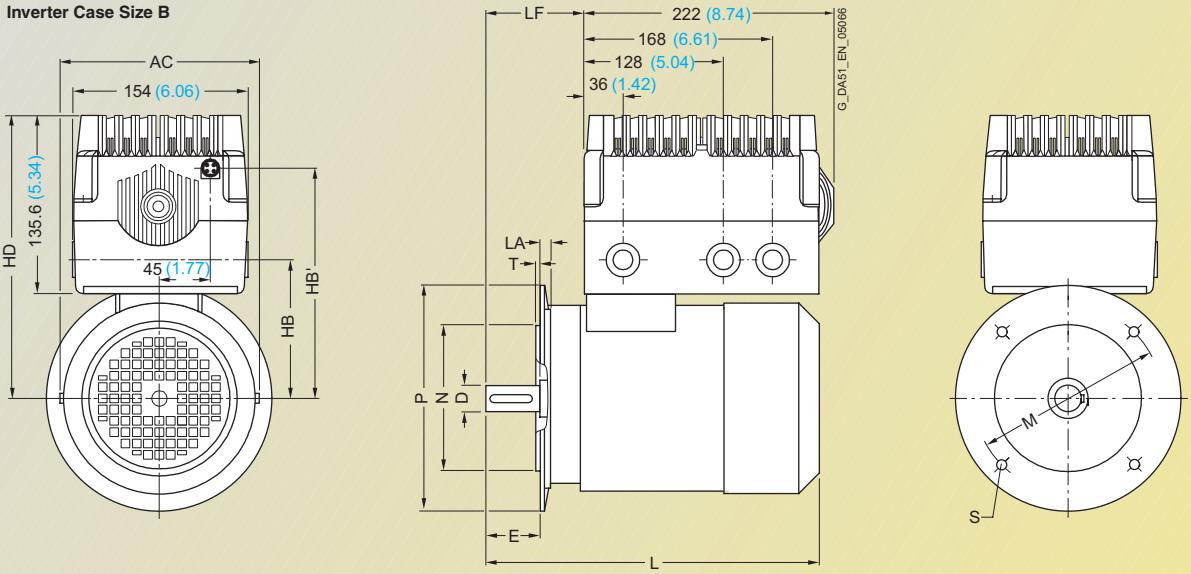


Motor Frame size	Type	Dimension symbol to IEC / DIN	A / b	AB / f	AC / g	B / a	B' / a'	C / w_1	D / d	E / l	H / h	HB / v	HB' / v'	HD / p	K / s	K' / s_1	L / k	LF / q
Case Size B																		
71	1UA1 07 .		**112**	132	145	**90**	–	**45**	**14**	**30**	**71**	172	234.6	278.6	**7**	10	240	54
			(4.41)	(5.20)	(5.71)	**(3.54)**	–	**(1.77)**	**(0.55)**	**(1.18)**	**(2.80)**	(6.77)	(9.24)	(10.97)	**(0.28)**	(0.39)	(9.45)	(2.13)
80	1UA1 08 .		**125**	150	163	**100**	–	**50**	**19**	**40**	**80**	190	252.6	296.6	**9.5**	13.5	273.5	64
			(4.92)	(5.91)	(6.42)	**(3.94)**	–	**(1.97)**	**(0.75)**	**(1.57)**	**(3.15)**	(7.48)	(9.94)	(11.68)	**(0.37)**	(0.53)	(10.77)	(2.52)
90 S	1UA1 090		**140**	165	180	**100**	**125**	**56**	**24**	**50**	**90**	208	270.6	314.6	**10**	14	331	89.5
90 L	1UA1 096-4		**(5.51)**	(6.50)	(7.09)	**(3.94)**	**(4.92)**	**(2.20)**	**(0.94)**	**(1.97)**	**(3.54)**	(8.19)	(10.65)	(12.39)	**(0.39)**	(0.55)	(13.03)	(3.52)
Case Size C																		
90 L	1UA1 096-2		**140**	165	180	**100**	**125**	**56**	**24**	**50**	**90**	208	280	349.5	**10**	14	331	88.5
			(5.51)	(6.50)	(7.09)	**(3.94)**	**(4.92)**	**(2.20)**	**(0.94)**	**(1.97)**	**(3.54)**	(8.19)	(11.02)	(13.76)	**(0.39)**	(0.55)	(13.07)	(3.48)
100 L	1UA1 10 .		**160**	196	203	**140**	–	**63**	**28**	**60**	**100**	225	300	370	**12**	16	372	98
			(6.30)	(7.72)	(7.99)	**(5.51)**	–	**(2.48)**	**(1.10)**	**(2.36)**	**(3.94)**	(8.86)	(11.81)	(14.57)	**(0.47)**	(0.63)	(14.69)	(3.86)

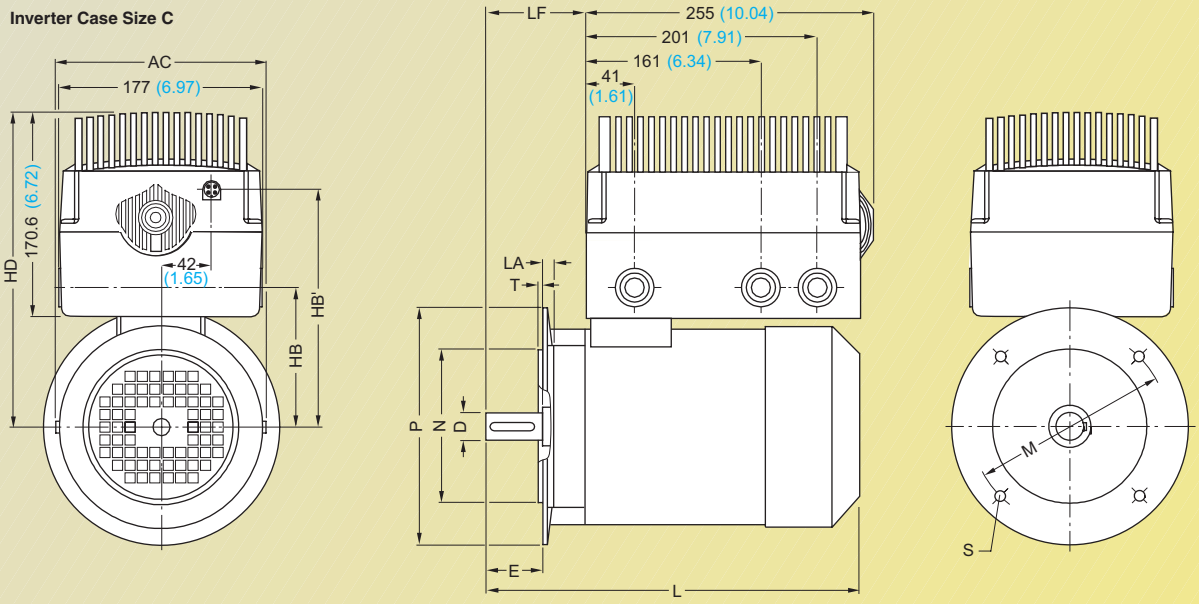
All of the dimensions are in mm (values in brackets are in Inches)

COMBIMASTER 411 – Motor Design IM B 5

Inverter Case Size B



Inverter Case Size C

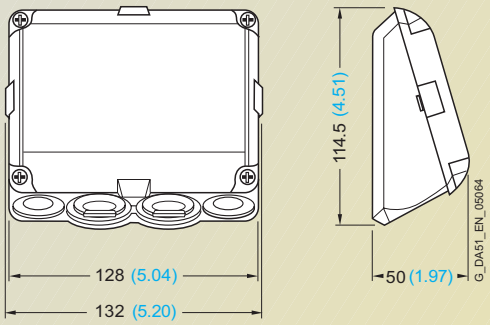


Motor Frame size	Type	Dimension symbol to IEC DIN	AC g	D d	E l	HB v	HB' v_1	HD p	L k	LA c_1	LF q	M e_1	N b_1	P a_1	S s_2	T f_1
Case Size B																
71	1UA1 07 .		145 (5.71)	**14 (0.55)**	**30 (1.18)**	101 (3.98)	163.6 (6.44)	207.6 (8.17)	240 (9.45)	9 (0.35)	54 (2.13)	**130 (5.12)**	**110 (4.33)**	**160 (6.30)**	**10 (0.39)**	3.5 (0.14)
80	1UA1 08 .		163 (6.42)	**19 (0.75)**	**40 (1.57)**	110 (4.33)	172.6 (6.80)	216.6 (8.53)	273.5 (10.77)	10 (0.39)	64 (2.52)	**165 (6.50)**	**130 (5.12)**	**200 (7.87)**	**12 (0.47)**	3.5 (0.14)
90 S 90 L	1UA1 090 1UA1 096-4		180 (7.09)	**24 (0.94)**	**50 (1.97)**	118 (4.65)	180.6 (7.11)	224.6 (8.84)	331 (13.03)	10 (0.39)	89,5 (3.52)	**165 (6.50)**	**130 (5.12)**	**200 (7.87)**	**12 (0.47)**	3.5 (0.14)
Case Size C																
90 L	1UA1 096-2		180 (7.09)	**24 (0.94)**	**50 (1.97)**	118 (4.65)	190 (7.48)	259.5 (10.22)	331 (13.03)	10 (0.39)	88.5 (3.48)	**165 (6.50)**	**130 (5.12)**	**200 (7.87)**	**12 (0.47)**	3.5 (0.14)
100 L	1UA1 10 .		203 (7.99)	**28 (1.10)**	**60 (2.36)**	125 (4.92)	200 (7.87)	270 (10.63)	372 (14.65)	11 (0.43)	64 (2.52)	**215 (8.46)**	**180 (7.09)**	**250 (9.84)**	**14.5 (0.57)**	4 (0.16)

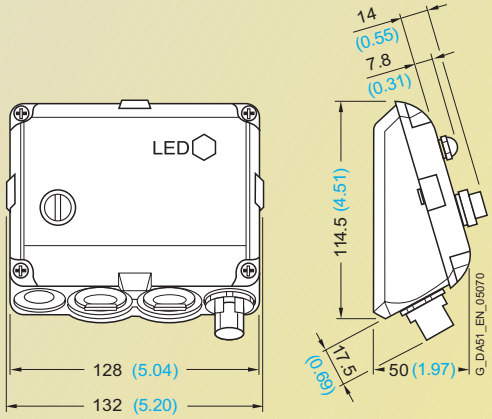
All of the dimensions are in mm (values in brackets are in Inches)

Dimension Drawings

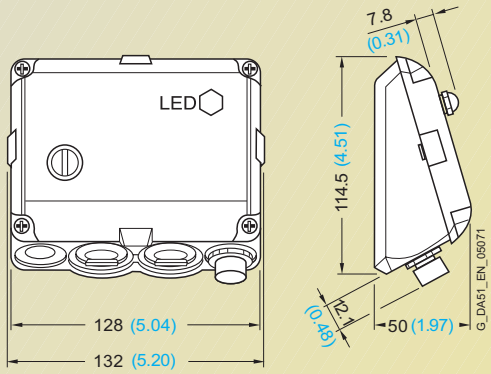
Options



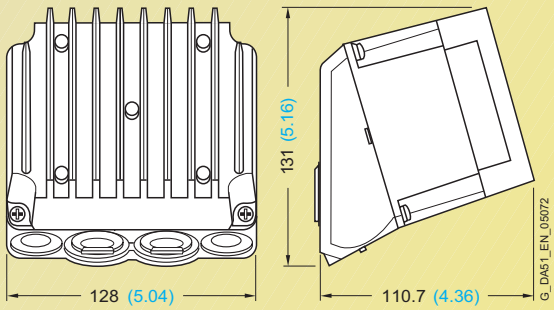
External housing for options PROFIBUS module or EM module



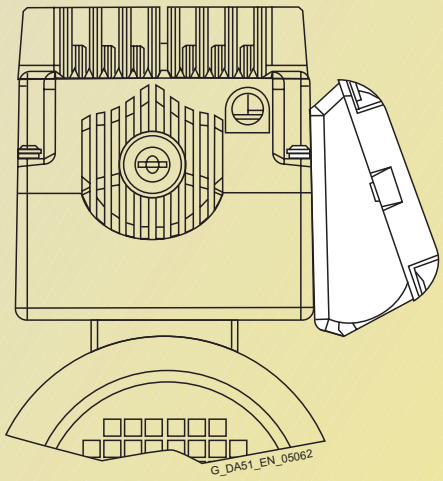
AS-Interface module



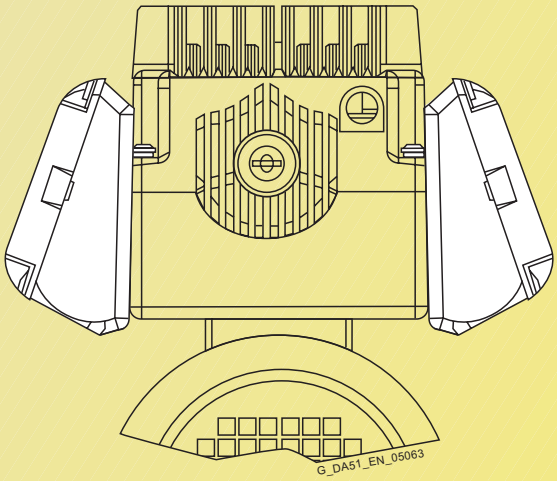
DeviceNet module



REM module



External housing on inverter e.g. with PROFIBUS module



Two external housings on inverter e.g. with EM module and PROFIBUS module

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

MICROMASTER 411 ECOFAST
COMBIMASTER 411 ECOFAST

2

ECOFAST Variants

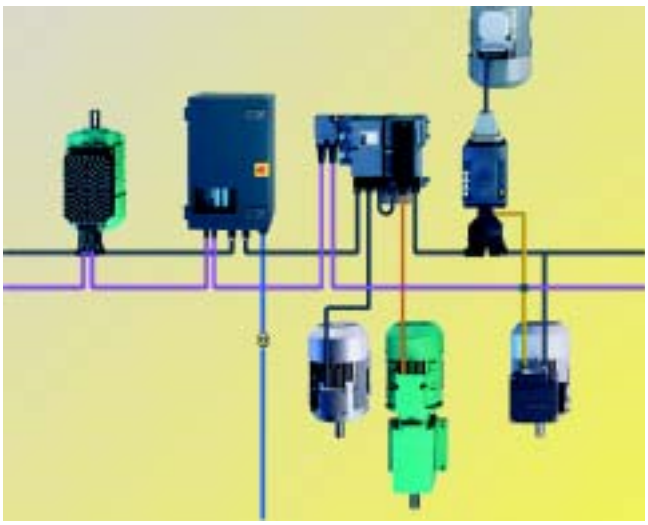
Description

MICROMASTER 411, ECOFAST variant with ECOFAST PROFIBUS module and REM module

COMBIMASTER 411, ECOFAST variant with AS-Interface module

ECOFAST

ECOFAST (***E***nergy and ***Co***mmunication ***F***ield Inst***a***llation ***S***ys***t***em) is a system for decentralization without control cabinets.



The ECOFAST variants of the MICROMASTER 411/ COMBIMASTER 411 series of frequency inverters contain plug-in connectors for power-supply, communication-interface and motor connections in order to enable fast and problem-free replacement in time-critical applications and are completely compatible with ECOFAST technical systems.

MICROMASTER 411 ECOFAST and COMBIMASTER 411 ECOFAST inverters are available for the following power ranges:

- 0.37 kW to 3.0 kW, 380 V to 480 V 3 AC (MICROMASTER),
- 0.37 kW to 2.2 kW, 380 V to 480 V 3 AC (COMBIMASTER).

The MICROMASTER 411 ECOFAST and COMBIMASTER 411 ECOFAST can be used for single applications or integrated into automation systems.

For more information on technical features of the ECOFAST system, see Siemens Catalog IK PI and on the Internet under: http://www.siemens.com/ecofast.

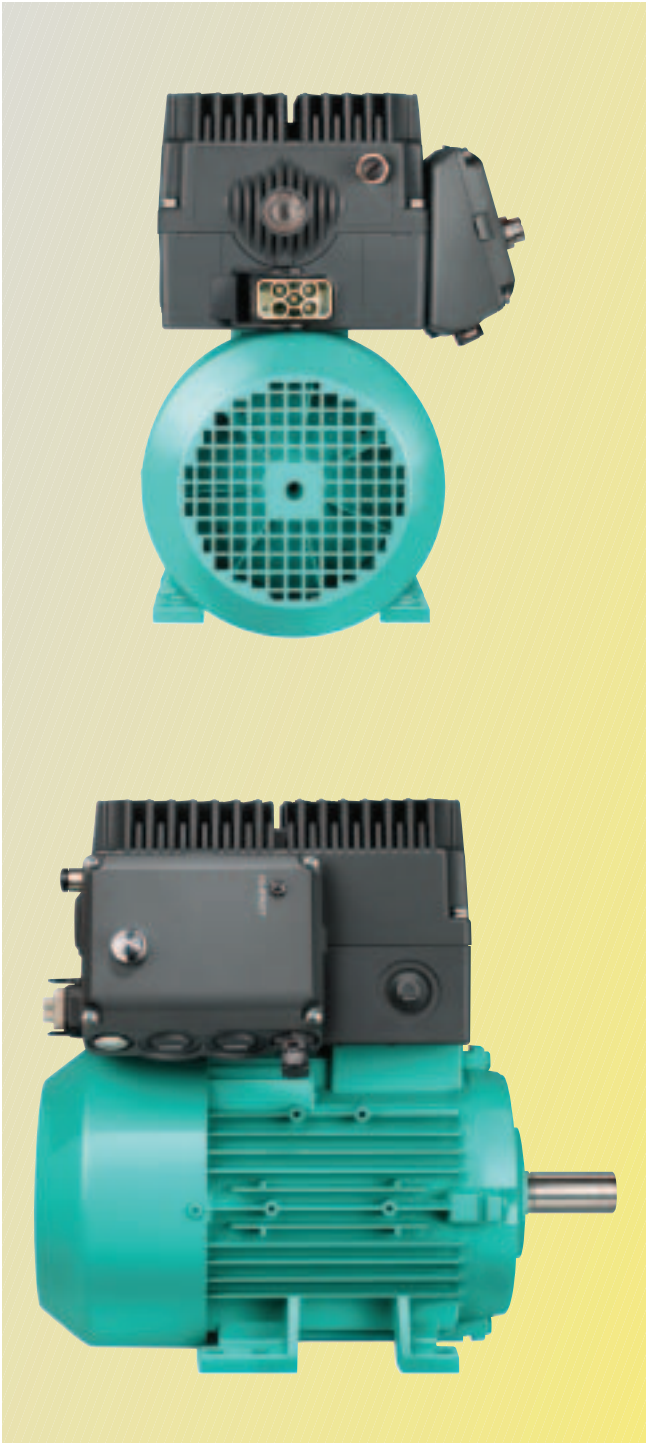
Description

Mechanical Features
- IP65 protection (MICROMASTER 411 ECOFAST), suited to harsh industrial environments
- Special design for heat dissipation
- Modular construction
- Operating temperature –10 °C to +40 °C
- Plug-in connector technology for power and communication connections

Operating Data
- For basic mode of operation, inverter can be operated using integrated externally mounted potentiometer to set frequency setpoint

Performance Features
- Latest IGBT technology
- Digital microprocessor control
- Flux current control (FCC) for improved dynamic response and optimised motor control
- Linear *V/f* control
- Quadratic *V/f* control
- Multipoint characteristic (parameterizable *V/f* characteristic)
- Flying restart
- Slip compensation
- Automatic restart facility following power failure or fault
- PI feedback for simple process control
- Programmable acceleration/deceleration
- Ramp smoothing
- Fast current limit (FCL) for trip free operation
- Fast, repeatable digital input response time
- Fine speed adjustment using a high resolution 10-bit analog input
- Compound braking for rapid controlled braking
- Four skip frequencies

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 additional protective circuit)
- Short circuit protection
- I^2t motor thermal protection
- Stall prevention
- Parameter interlock

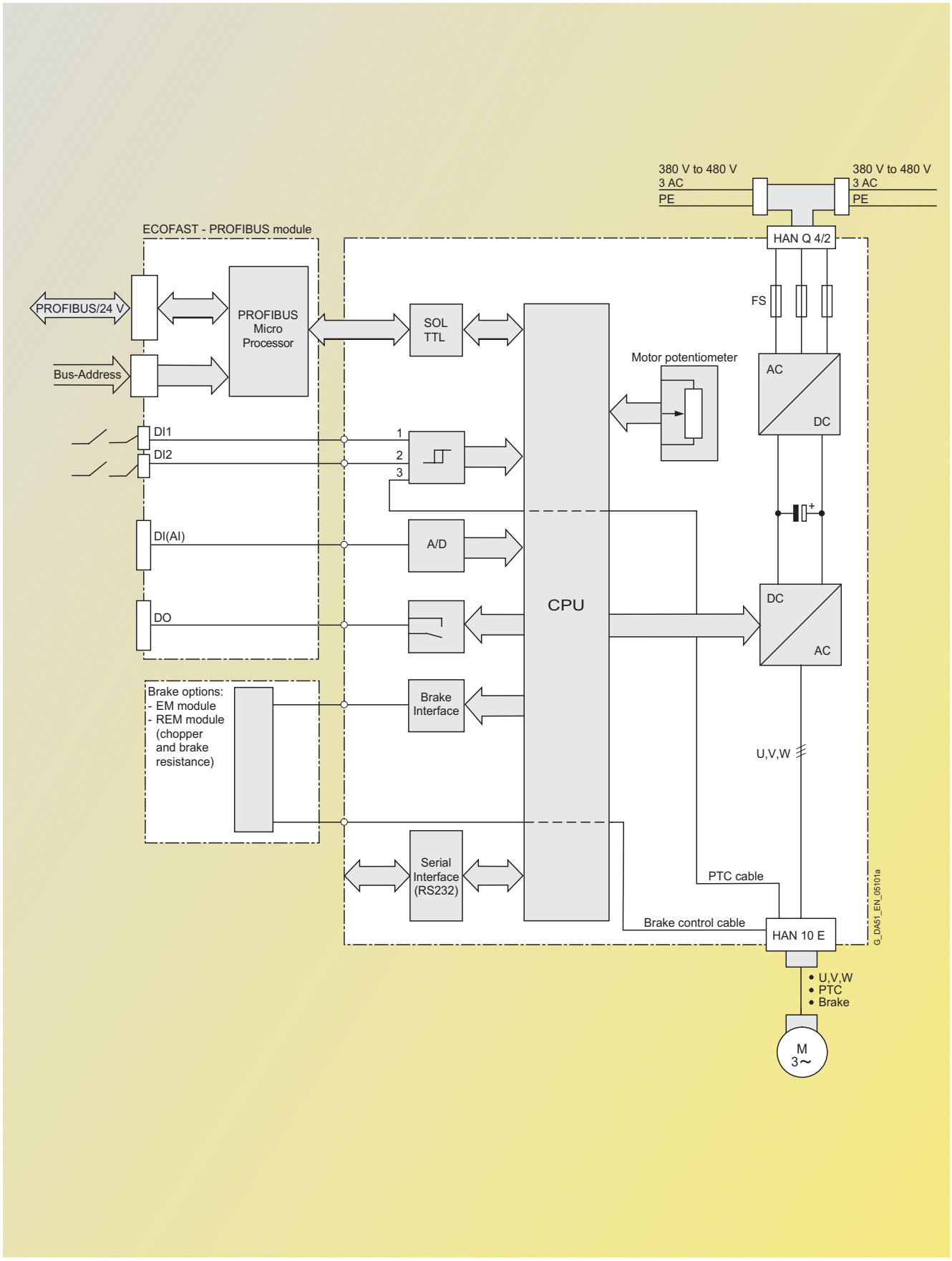


COMBIMASTER 411
ECOFAST variant with AS-Interface module

ECOFAST Variants

Circuit Diagram

General Circuit Diagram



Shared Data

Line voltage and power ranges	380 V to 480 V 3 AC ± 10%		0.37 kW to 3.0 kW (MICROMASTER 411 ECOFAST) 0.37 kW to 2.2 kW (COMBIMASTER 411 ECOFAST)	
Case sizes and frame sizes	Case size (inverter) CS B: 0.37 kW to 1.5 kW CS C: 2.2 kW/3.0 kW		Frame size (motor) 71 M to 90 S/L 90 L/100 L	
Input frequency	47 Hz to 63 Hz			
Output frequency	0 Hz to 650 Hz (standard)			
Power factor	≥ 0.95			
Inverter efficiency	94% to 97% at maximum power			
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 4 A for CS B and 7.7 A for CS C			
Control method	linear *V/f*; quadratic *V/f*; multipoint *V/f* (parameterizable); flux current control (FCC)			
Pulse frequency	4 kHz (standard) 2 kHz to 16 kHz (in 2 kHz steps – with derating)			
Fixed frequencies	7, programmable			
Skip frequency bands	4, programmable			
Setpoint resolution and output frequency resolution	0.01 Hz digital 0.01 Hz serial 10 bit analog			
Digital inputs (only with PROFIBUS module)	2, programmable			
Analog input (only with PROFIBUS module)	1 for setpoint or PI input (0 to 10 V), scalable or for use as 3rd digital input			
Relay output (only with PROFIBUS module)	1 programmable, DC 24 V/0.5 A (resistive load)			
Serial interface	RS 232			
Electromagnetic compatibility	EMC filter integrated to EN 55 011 Class A (radiated emissions : Class A)			
Braking	DC braking, Compound braking: EM module (electromechanical brake control module) and REM module (resistor and electromechanical brake control module) available as options			
Degree of protection	MICROMASTER 411 : IP65 COMBIMASTER 411 : IP55			
Operating temperature	–10 °C to +40 °C (50 °C with derating)			
Storage temperature	–40 °C to +70 °C			
Relative humidity	99 % (non-condensing)			
Standard paint finish (motor)	Special paint finish in RAL 7030 stone grey			
Installation altitude	up to 1000 m above sea level without derating			
Protection features	• undervoltage • overvoltage • overload • short circuit • stall prevention • motor overtemperature I^2t, PTC • inverter overtemperature • parameter interlocking			
Conformance with standards	CE			
CE-labeled	Complies with the European low-voltage directive 73/23/EEC and the electromagnetic compatibility directive 89/336/EEC			
Dimensions (MICROMASTER 411 ECOFAST inverters only)	Case size (CS)	Variant with	H x L x W (mm)	Weight, approx. (kg)
	CS B	PROFIBUS module	212 x 246 x 224	7.9
		PROFIBUS and EM module	212 x 246 x 274	8.8
		PROFIBUS and REM module	212 x 246 x 337	9.0
		AS-Interface module	212 x 246 x 224	7.6
		AS-Interface and EM module	212 x 246 x 274	8.5
		AS-Interface and REM module	212 x 246 x 337	8.7
	CS C	PROFIBUS module	247 x 279 x 247	10.4
		PROFIBUS and EM module	247 x 279 x 297	11.3
		PROFIBUS and REM module	247 x 279 x 360	11.5
		AS-Interface module	247 x 279 x 247	10.1
		AS-Interface and EM module	247 x 279 x 297	11.0
		AS-Interface and REM module	247 x 279 x 360	11.2

ECOFAST Variants

Technical Data

Motor Data

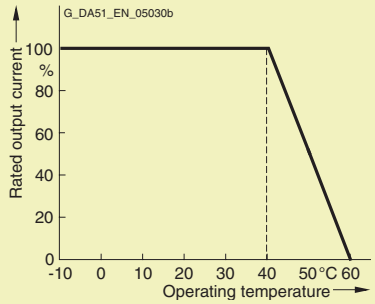
Rated output	Speed		Torque		Frame size	
kW	2-pole rpm	4-pole rpm	2-pole Nm	4-pole Nm	2-pole	4-pole
380 V to 480 V 3 AC						
0.37	2740	1370	1.3	2.6	71 M	71 M
0.55	2800	1395	1.9	3.8	71 M	80 M
0.75	2855	1395	2.5	5.1	80 M	80 M
1.1	2845	1415	3.7	7.4	80 M	90 S
1.5	2860	1420	5.0	10	90 S	90 L
2.2	2880	1420	7.3	15	90 L	100 L

Derating Data

Pulse frequency

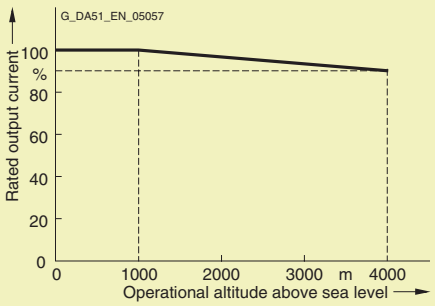
Rated output (for 400 V 3 AC)	Rated output current in A for a pulse frequency of						
kW	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
0.37	1.2	1.2	1.2	1.2	1.2	1.2	1.2
0.55	1.6	1.6	1.6	1.6	1.6	1.6	1.2
0.75	2.1	2.1	2.1	2.1	1.8	1.8	1.2
1.1	3.0	3.0	2.7	2.7	1.8	1.8	1.2
1.5	4.0	4.0	2.7	2.7	1.8	1.8	1.2
2.2	5.9	5.9	5.1	5.1	3.5	3.5	2.3
3.0	7.7	7.7	5.1	5.1	3.5	3.5	2.3

Operating temperature

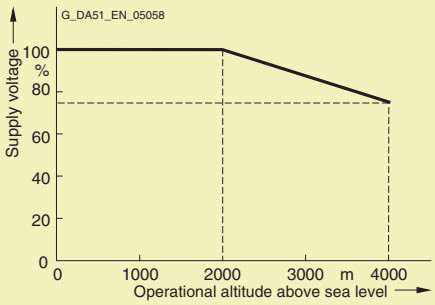


Operational altitude

Permissible output current
in % of the rated output current



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



ECOFAST variant of MICROMASTER 411 with integrated EMC filter, class A

MICROMASTER 411 inverters can be ordered individually.

For the MICROMASTER 411 and the COMBIMASTER 411 the same options can be ordered (see page 2/10).

MICROMASTER 411, ECOFAST variant with ECOFAST PROFIBUS module and REM module

Rated output kW	Case size (inverter)	Order No. **MICROMASTER 411 ECOFAST variant**	**MICROMASTER 411 ECOFAST variant**
Mains operating voltage 380 V to 480 V 3 AC			
		with PROFIBUS option	with AS-Interface option
0.37	B	**6SE6411-6AD13-7VP7**	**6SE6411-6AD13-7VP3**
0.55	B	**6SE6411-6AD15-5VP7**	**6SE6411-6AD15-5VP3**
0.75	B	**6SE6411-6AD17-5VP7**	**6SE6411-6AD17-5VP3**
1.1	B	**6SE6411-6AD21-1VP7**	**6SE6411-6AD21-1VP3**
1.5	B	**6SE6411-6AD21-5VP7**	**6SE6411-6AD21-5VP3**
2.2	C	**6SE6411-6AD22-2WP7**	**6SE6411-6AD22-2WP3**
3.0	C	**6SE6411-6AD23-0WP7**	**6SE6411-6AD23-0WP3**
		with PROFIBUS and EM module options	with AS-Interface and EM module options
0.37	B	**6SE6411-6AD13-7VS7**	**6SE6411-6AD13-7VS3**
0.55	B	**6SE6411-6AD15-5VS7**	**6SE6411-6AD15-5VS3**
0.75	B	**6SE6411-6AD17-5VS7**	**6SE6411-6AD17-5VS3**
1.1	B	**6SE6411-6AD21-1VS7**	**6SE6411-6AD21-1VS3**
1.5	B	**6SE6411-6AD21-5VS7**	**6SE6411-6AD21-5VS3**
2.2	C	**6SE6411-6AD22-2WS7**	**6SE6411-6AD22-2WS3**
3.0	C	**6SE6411-6AD23-0WS7**	**6SE6411-6AD23-0WS3**
		with PROFIBUS and REM module options	with AS-Interface and REM module options
0.37	B	**6SE6411-6AD13-7VS8**	**6SE6411-6AD13-7VS4**
0.55	B	**6SE6411-6AD15-5VS8**	**6SE6411-6AD15-5VS4**
0.75	B	**6SE6411-6AD17-5VS8**	**6SE6411-6AD17-5VS4**
1.1	B	**6SE6411-6AD21-1VS8**	**6SE6411-6AD21-1VS4**
1.5	B	**6SE6411-6AD21-5VS8**	**6SE6411-6AD21-5VS4**
2.2	C	**6SE6411-6AD22-2WS8**	**6SE6411-6AD22-2WS4**
3.0	C	**6SE6411-6AD23-0WS8**	**6SE6411-6AD23-0WS4**

ECOFAST variant of COMBIMASTER 411 with integrated EMC filter, class A, with energy-saving motors, efficiency class

Basictype motor 1LA7

COMBIMASTER 411, ECOFAST variant with AS-Interface module

For further information on the motors, their designs and order codes for special motor designs, see page 2/8 and Catalog M11.

Rated output kW	Case size (inverter)	Order No. **COMBIMASTER 411 ECOFAST variant** 2-pole	Order code	4-pole	Order code
Mains operating voltage 380 to 480 V 3 AC					
0.37	B	**1UA2070-2AA2□-Z□□□**		**1UA2073-4AA2□-Z□□□**	
0.55	B	**1UA2073-2AA2□-Z□□□**		**1UA2080-4AA2□-Z□□□**	
0.75	B	**1UA2080-2AA2□-Z□□□**		**1UA2083-4AA2□-Z□□□**	
1.1	B	**1UA2083-2AA2□-Z□□□**		**1UA2090-4AA2□-Z□□□**	
1.5	B	**1UA2090-2AA2□-Z□□□**		**1UA2096-4AA2□-Z□□□**	
2.2	C	**1UA2096-2AA2□-Z□□□**		**1UA2106-4AA2□-Z□□□**	

Motor Design:

IM B 3 IM B 5	**0** **1**
IM V 1 (without canopy) IM V 1 (with canopy)	**1** **4**
IM B 14 (with standard flange) IM B 14 (with custom flange)	**2** **3**
IM B 35	**6**

Communication modules:

with ECOFAST PROFIBUS module	**M80**
or with AS-Interface module	**M53**

Example

A variable-speed drive is required, 0.75 kW, 400 V 3 AC, 4-pole, Class A filter, IM B 3 motor design, with ECOFAST PROFIBUS module. The Order No. is:
1UA2083-4AA20-Z M80

ECOFAST Variants

Selection and Ordering Data

Order Codes for Special Features (only for COMBIMASTER)

Additional Order No. suffix **-Z** with Order code	Special features	Motor type – frame size 71 M	80 M	90 S/L	100 L
Winding and motor protection					
A11	Motor protected by PTC thermistor with 3 built-in temperature sensors for switch-off	●	●	●	●
Paint finish (motor)					
M16	Special paint finish in RAL 1002 sand yellow	●	●	●	●
M17	Special paint finish in RAL 1013 pearl white	●	●	●	●
M18	Special paint finish in RAL 3000 flame red	●	●	●	●
K27	Special paint finish in RAL 6011 mignorette green	●	●	●	●
M19	Special paint finish in RAL 6021 pale green	●	●	●	●
M20	Special paint finish in RAL 7001 silver grey	●	●	●	●
K28	Special paint finish in RAL 7031 bluish grey	●	●	●	●
L42	Special paint finish in RAL 7032 pebble grey	●	●	●	●
M21	Special paint finish in RAL 7035 light grey	●	●	●	●
M22	Special paint finish in RAL 9001 cream	●	●	●	●
M23	Special paint finish in RAL 9002 grey white	●	●	●	●
L43	Special paint finish in RAL 9005 jet black	●	●	●	●
Y54 and special paint finish RAL .... (additional plain text is required)	Special paint finish in other colors: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7011, 7016, 7022, 7033	●	●	●	●
K23	Unpainted (only cast iron parts primed)	●	●	●	●
K24	Unpainted, only primed	●	●	●	●
Modular technology [1])					
G17	Mounting of seperately driven fan	–	–	–	●
G26+C01	Mounting of brake (brake supply voltage AC 400 V, 50 Hz)	●	●	●	●
H62+C01	Mounting of brake and pulse generator 1XP8 001-1 (brake supply voltage AC 400 V, 50 Hz)	–	–	–	●
H63+C01	Mounting of brake and seperately driven fan (brake supply voltage AC 400 V, 50 Hz)	–	–	–	●
H64+C01	Mounting of brake, seperately driven fan and pulse generator 1XP8 001-1 (brake supply voltage AC 400 V, 50 Hz)	–	–	–	●
Mechanical features					
L13	External earthing	●	●	●	●
K31	Extra rating plate, loose	●	●	●	●
K35	External metal fan	●	●	●	●
Y82 (additional plain text is required)	Extra rating plate	●	●	●	●
L99	Wire-lattice pallet	●	●	●	●
Brake function modules[1])					
M55	EM module (electromechanical brake control module)	●	●	●	●
M79	REM module (resistor and electromechanical brake control module)	●	●	●	●

● possible

– not possible

1) Order codes cannot be combined with each other.

Options

Variant Independent Options (continued)

Additional options

Operator Panel Mounting Kit

A BOP or AOP is used in the operator panel mounting kit, thus enabling connection to the inverter.

Interface Link Cable, serial

This cable is for connecting the serial interfaces of an inverter (M12 connector) to a PC (9-pin, D-type).

Connection Set for PC to Inverter

For controlling an inverter directly from a PC if the appropriate software (e.g. STARTER) has been installed in the PC. This connection set includes a floating RS 232 adapter module for reliable point-to-point connection to a PC. It is used in conjunction with an operator panel mounting kit.

Connection Set for PC to AOP

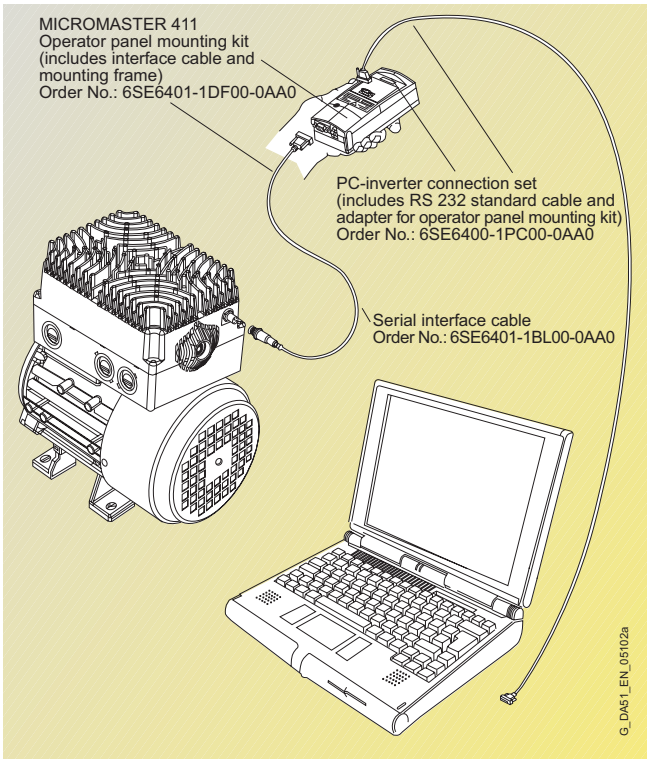
For connection of a PC to an AOP. Offline programming of inverters and archiving of parameter sets possible. Includes a desktop attachment kit for an AOP, an RS 232 standard cable (3 m) with Sub-D connectors and a universal power supply.

Operator Panel Door Mounting Kit for Single Inverter

This mounting kit is for fixing an operator panel in the door of a control cabinet. Degree of protection IP56. The mounting kit contains a cable adapter module with screwless terminals for a 5 m cable assembly.

5 m Cable Assembly for Door Mounting Kit

This 5 m cable acts as the serial connection between COMBIMASTER 411/MICROMASTER 411 inverters and a door-mounted operator panel.



Parameterization with operator panel mounting kit or PC-inverter connection kit (see also section "Key to programming options")

Key to programming options

	Operator Panel Programming	PC Programming	PC Programming (with Isolation)	PC Programming of AOP, loading data in inverter	Operator Panel Door Mounting Kit Programming
Operator Panel Mounting Kit (includes: Desktop Frame + Interface Link Cable)	●		●		
Interface Link Cable, serial		●		●	
Connection Set for PC to Inverter			●		
Operator Panel Door Mounting Kit					●
Operator Panel BOP	●[1])				●[1])
Operator Panel AOP	●[1])			●	●[1])
5 m Cable Assembly (M 12)					●

Ordering Data for Variant Independent Options

Option	Order No.
Basic Operator Panel (BOP)	**6SE6400-0BP00-0AA0**
Advanced Operator Panel (AOP)	**6SE6400-0AC00-0AA0**
Operator Panel Mounting Kit (includes: Desktop Frame + Interface Link Cable)	**6SE6401-1DF00-0AA0**
Interface Link Cable, serial	**6SE6401-1BL00-0AA0**
Connection Set for PC to Inverter (includes RS 232 standard cable and adapter for operator panel mounting kit)	**6SE6400-1PC00-0AA0**
Connection Set for PC to AOP	**6SE6400-0PA00-0AA0**
Operator Panel Door Mounting Kit for Single Inverter	**6SE6400-0PM00-0AA0**
5 m Cable Assembly for Door Mounting Kit	**6SE6401-1CA00-0AA0**
PROFIBUS Addressing Connector	**6ES7194-1KB00-0XA0**

1) Either BOP or AOP required.

Variant Independent Options

Software and operator control

Basic Operator Panel (BOP)

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

A BOP can be used for several inverters. It is mounted in the operator panel mounting kit, for connection to the external communication interface of the inverter.

Advanced Operator Panel (AOP) for MICROMASTER 411/ COMBIMASTER 411

This AOP is used specifically for the MICROMASTER 411/ COMBIMASTER 411 products.

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

It is mounted in the operator panel mounting kit, for connection to the external communication interface of the inverter.

Basic Operator Panel (BOP) and Advanced Operator Panel (AOP)

Commissioning Tools

- STARTER
  is start-up software for guided commissioning of the MICROMASTER 4 series under Windows NT/2000/XP Professional [1]). Parameter lists can be read out, altered, stored, entered and printed.
- DriveMonitor
  is start-up software for list-oriented parameterization of frequency inverters. This program can run under Windows 95/ 98/NT/2000/XP Professional. Both programs are part of the Docu-CD supplied with each unit.

Communication modules

ECOFAST PROFIBUS Module

This module enables the ECOFAST variants of the COMBIMASTER 411 and MICROMASTER 411 inverters to communicate in a PROFIBUS communications network. The transmission speed is 12 Mbps. The module also enables connection to three external inputs (2 digital and 1 analog) and 1 digital output via M12 connectors. The ECOFAST PROFIBUS module is enclosed in an external housing.

ECOFAST Options (especially for Addressing Connectors)

The ECOFAST PROFIBUS module has an addressing socket so that the PROFIBUS address can be set with the PROFIBUS addressing connector (Order No.: 6ES7194-1KB00-0XA0), which is available as an option.

For more information on ECOFAST cables, connectors and options, see Catalog IK PI.

AS-Interface Module

This module enables COMBIMASTER 411 and MICROMASTER 411 inverters to communicate as a slave in an AS-Interface (actuator sensor interface) communications network. In a standard AS-Interface system, up to 31 slaves can be connected, whereby each slave has up to 4 inputs and up to 4 outputs.

The module is enclosed in an external housing.

AS-Interface Module and PROFIBUS Module

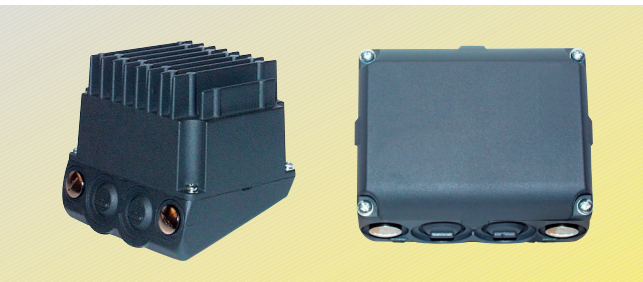
Brake function module

EM Module (Electromechanical Brake Control Module)

This module controls an electromechanical brake mounted on the motor. The module is for mounting on the case of the MICROMASTER 411/COMBIMASTER 411. For more information on the motor brake, see Catalog M11 "Technical Information", "Brakes".

REM Module (Resistor and Electromechanical Brake Control Module)

This module contains a brake chopper with brake resistor and controls an external electromechanical motor brake. The module is enclosed in an external housing with the same degree of protection as the product series.



REM Module and EM Module

1) STARTER version 3.0 and higher.

Ordering Data for Variant Dependent Options

External fuses and circuit breakers

The ECOFAST system incorporates a system fuse for 40 A.

In the case of single inverter applications, the fuses or circuit breakers listed in the following table can be used for cable and wiring protection.

Use of MICROMASTER 4 input chokes

Inverters generate non-sinusoidal harmonics. The amplitudes of these harmonics can be reduced with input chokes.

If the line impedance is < 1 %, an input choke is necessary. Use of standard MICROMASTER 4 input chokes is recommended for this (see Catalog DA 51.2). The choke must be installed in a housing in accordance with the necessary ambient conditions.

	Rated output kW	Case size (inverter)	Order No. of the options **Fuse** (see Catalog LV 10)	 **Circuit breaker** (see Catalog LV 10)
Mains operating voltage 380 V to 480 V 3 AC				
MICROMASTER 411 ECOFAST/ COMBIMASTER 411 ECOFAST without filter	0.37	B	**3NA3803**	**3RV1021-1CA10**
	0.55	B		**3RV1021-1DA10**
	0.75	B		**3RV1021-1EA10**
	1.1	B		**3RV1021-1GA10**
	1.5	B		**3RV1021-1HA10**
	2.2	C	**3NA3805**	**3RV1021-1JA10**
	3.0	C		**3RV1021-1KA10**
MICROMASTER 411 ECOFAST/ COMBIMASTER 411 ECOFAST with filter class B	0.37	B	**3NA3803**	**3RV1021-1CA10**
	0.55	B		**3RV1021-1DA10**
	0.75	B		**3RV1021-1EA10**
	1.1	B		**3RV1021-1GA10**
	1.5	B		**3RV1021-1HA10**
	2.2	C	**3NA3805**	**3RV1021-1JA10**
	3.0	C		**3RV1021-1KA10**

Documentation

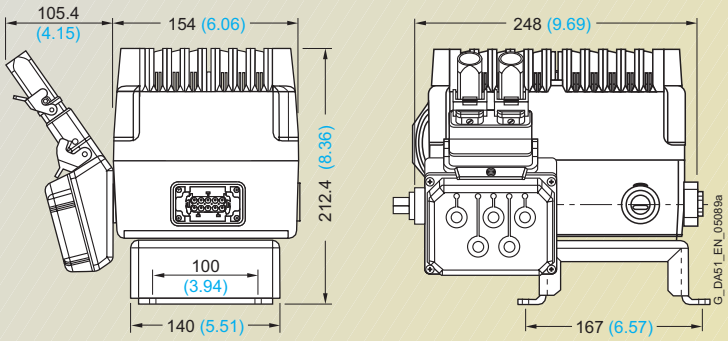
Type of documentation	Language	Order No.
Docu-Pack, supplied with each MICROMASTER 411/ COMBIMASTER 411, containing CD-ROM [1]) and Getting-Started-Guide [2]) (paper version)	Multilanguage	**6SE6400-5FC00-1AP0**
ECOFAST operating instructions [2]) (paper version)	German	**6SE6400-5CC00-0AP0**
	English	**6SE6400-5CC00-0BP0**
	French	**6SE6400-5CC00-0DP0**
	Italian	**6SE6400-5CC00-0CP0**
	Spanish	**6SE6400-5CC00-0EP0**
Parameter list [2])	German	**6SE6400-5CE00-0AP0**
	English	**6SE6400-5CE00-0BP0**
	French	**6SE6400-5CE00-0DP0**
	Italian	**6SE6400-5CE00-0CP0**
	Spanish	**6SE6400-5CE00-0EP0**

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

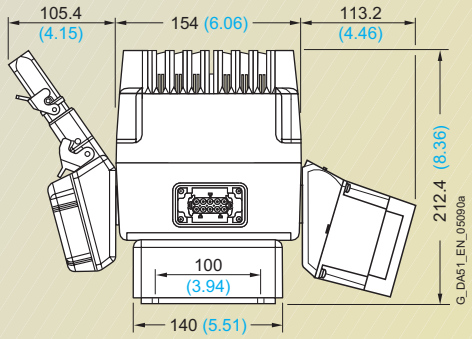
2) Available on Internet at http://www.siemens.com/combimaster

Dimension Drawings

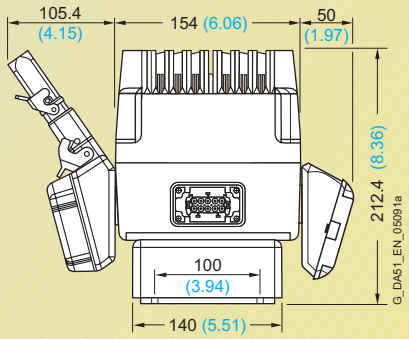
ECOFAST variant of MICROMASTER 411 Inverters – Case Size B



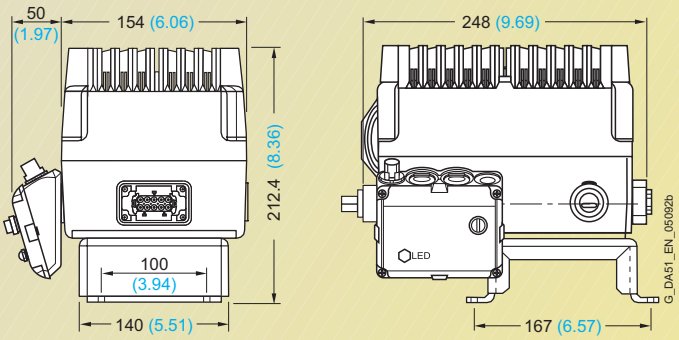
Inverter with PROFIBUS module (including PROFIBUS connector and T-piece - neither is included in the scope of supply)



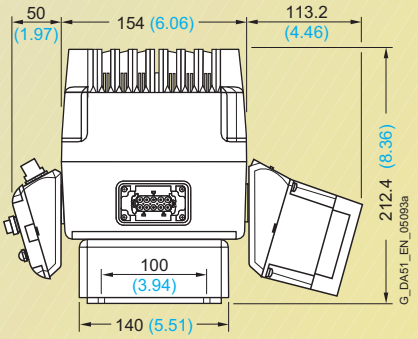
Inverter with PROFIBUS module (including PROFIBUS connector and T-piece - neither is included in the scope of supply) and REM module



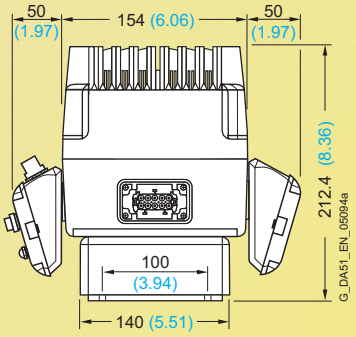
Inverter with PROFIBUS module (including PROFIBUS connector and T-piece - neither is included in the scope of supply) and EM module



Inverter with AS-Interface module



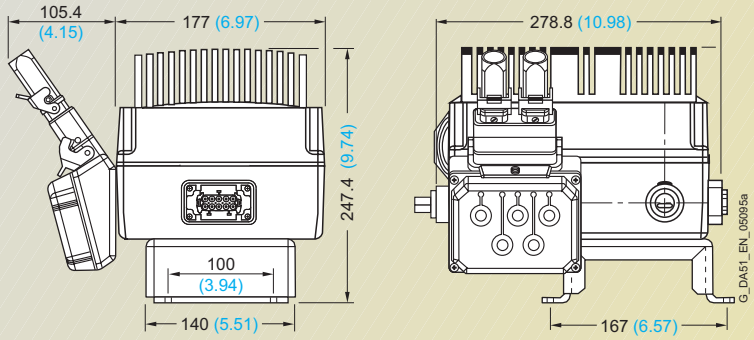
Inverter with AS-Interface module and REM module



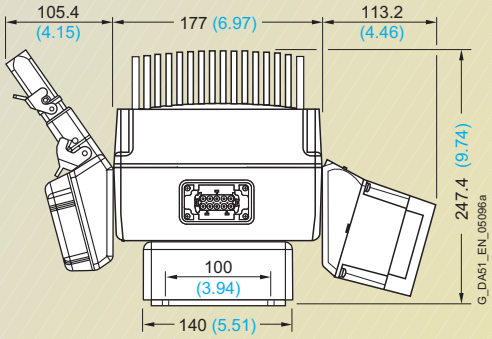
Inverter with AS-Interface module and EM module

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

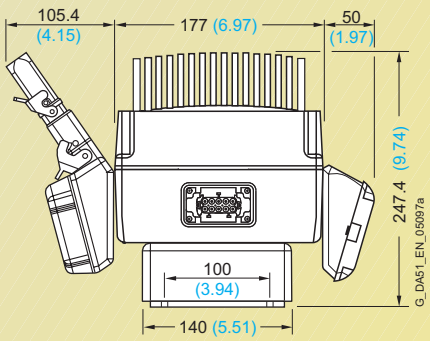
ECOFAST variant of MICROMASTER 411 Inverters – Case Size C



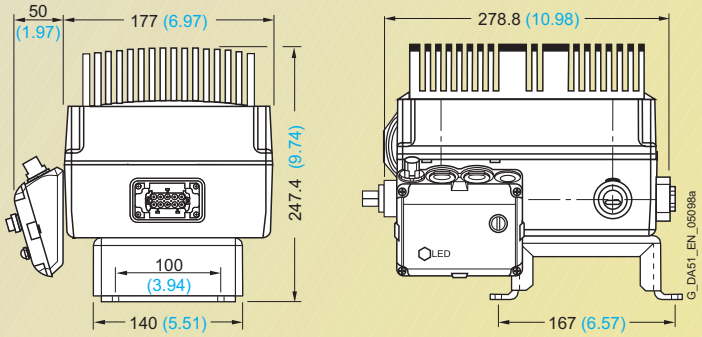
Inverter with PROFIBUS module (including PROFIBUS connector and T-piece - neither is included in the scope of supply)



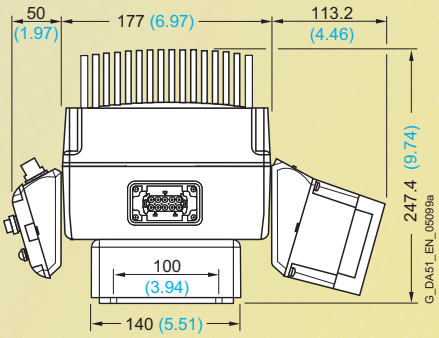
Inverter with PROFIBUS module (including PROFIBUS connector and T-piece - neither is included in the scope of supply) and REM module



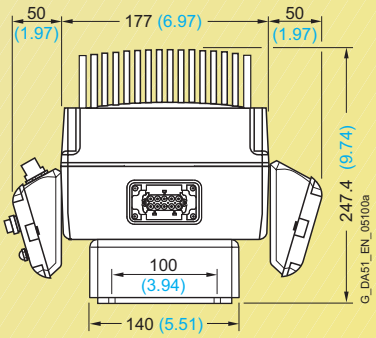
Inverter with PROFIBUS module (including PROFIBUS connector and T-piece - neither is included in the scope of supply) and EM module



Inverter with AS-Interface module



Inverter with AS-Interface module and REM module



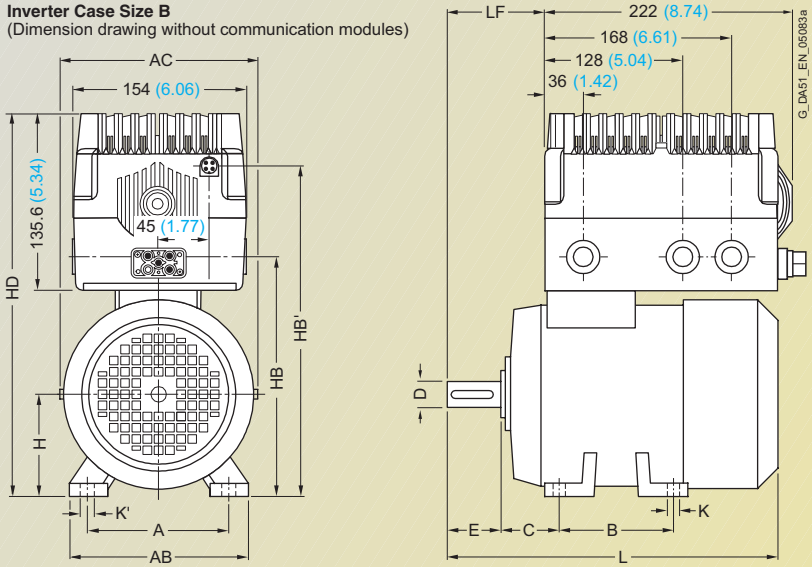
Inverter with AS-Interface module and EM module

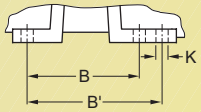
All dimensions are in mm (values in brackets are in inches)

Dimension Drawings

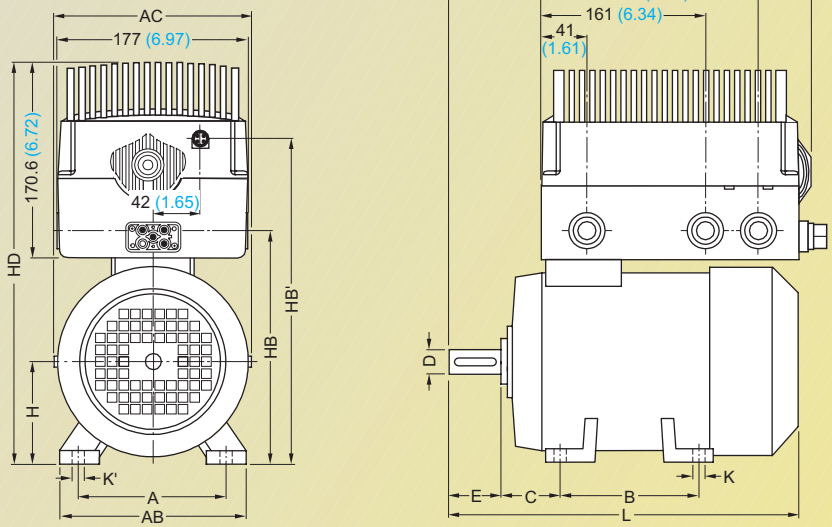
ECOFAST variant of COMBIMASTER 411 – Motor Design IM B 3 (Dimensions communication modules see page 2/16)

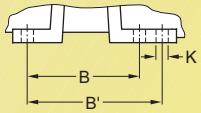
Inverter Case Size B
(Dimension drawing without communication modules)





Inverter Case Size C
(Dimension drawing without communication modules)



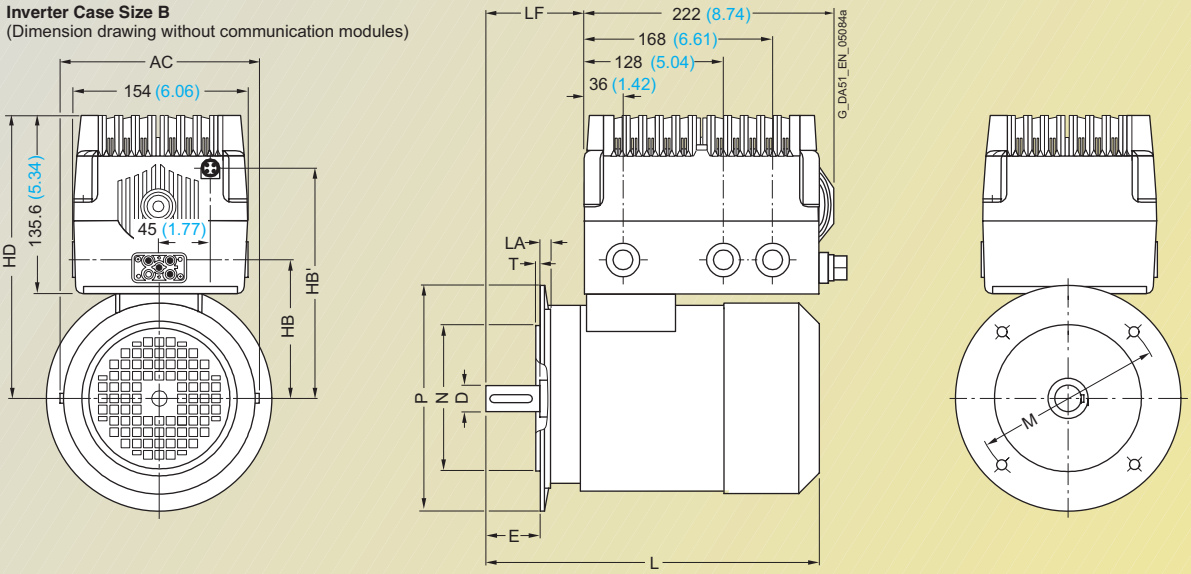


Motor Frame size	Type	Dimension symbol to IEC / DIN	A / b	AB / f	AC / g	B / a	B' / a'	C / w_1	D / d	E / l	H / h	HB / v	HB' / v'	HD / p	K / s	K' / s_1	L / k	LF / q
Case Size B																		
71	1UA2 07 .		**112**	132	145	**90**	–	**45**	**14**	**30**	**71**	172	234.6	278.6	**7**	10	240	54
			(4.41)	(5.20)	(5.71)	**(3.54)**	–	**(1.77)**	**(0.55)**	**(1.18)**	**(2.80)**	(6.77)	(9.24)	(10.97)	**(0.28)**	(0.39)	(9.45)	(2.13)
80	1UA2 08 .		**125**	150	163	**100**	–	**50**	**19**	**40**	**80**	190	252.6	296.6	**9.5**	13.5	273.5	64
			(4.92)	(5.91)	(6.42)	**(3.94)**	–	**(1.97)**	**(0.75)**	**(1.57)**	**(3.15)**	(7.48)	(9.94)	(11.68)	**(0.37)**	(0.53)	(10.77)	(2.52)
90 S	1UA2 090		**140**	165	180	**100**	**125**	**56**	**24**	**50**	**90**	208	270.6	314.6	**10**	14	331	89.5
90 L	1UA2 096-4		**(5.51)**	(6.50)	(7.09)	**(3.94)**	**(4.92)**	**(2.20)**	**(0.94)**	**(1.97)**	**(3.54)**	(8.19)	(10.65)	(12.39)	**(0.39)**	(0.55)	(13.03)	(3.52)
Case Size C																		
90 L	1UA2 096-2		**140**	165	180	**100**	**125**	**56**	**24**	**50**	**90**	208	280	349.5	**10**	14	331	88.5
			(5.51)	(6.50)	(7.09)	**(3.94)**	**(4.92)**	**(2.20)**	**(0.94)**	**(1.97)**	**(3.54)**	(8.19)	(11.02)	(13.76)	**(0.39)**	(0.55)	(13.07)	(3.48)
100 L	1UA2 106		**160**	196	203	**140**	–	**63**	**28**	**60**	**100**	225	300	370	**12**	16	372	98
			(6.30)	(7.72)	(7.99)	**(5.51)**	–	**(2.48)**	**(1.10)**	**(2.36)**	**(3.94)**	(8.86)	(11.81)	(14.57)	**(0.47)**	(0.63)	(14.69)	(3.86)

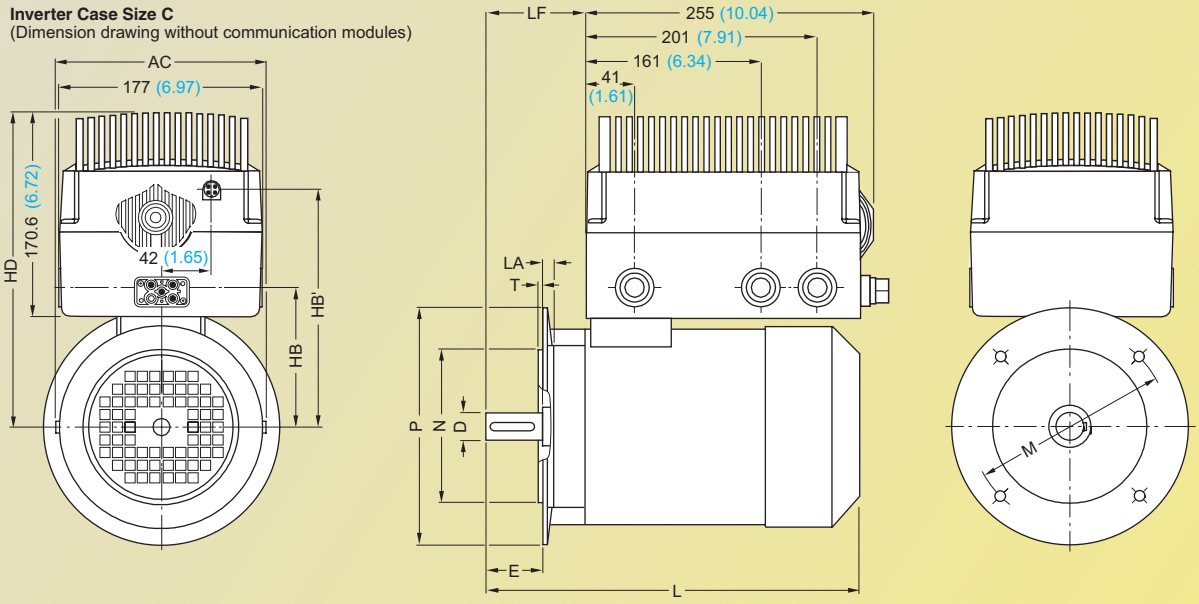
All of the dimensions are in mm (values in brackets are in Inches)

ECOFAST variant of COMBIMASTER 411 – Motor Design IM B 5 (Dimensions communication modules see page 2/16)

Inverter Case Size B
(Dimension drawing without communication modules)



Inverter Case Size C
(Dimension drawing without communication modules)



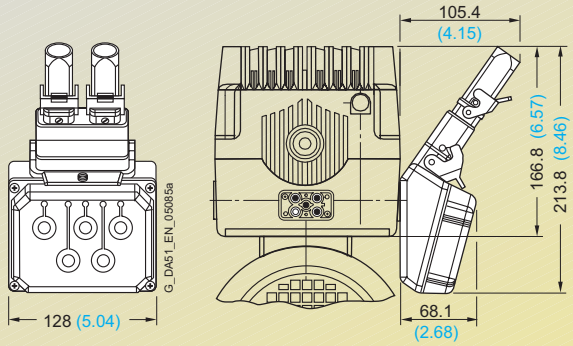
Motor Frame size	Type	Dimension symbol to IEC DIN	AC g	D d	E l	HB v	HB' v_1	HD p	L k	LA c_1	LF q	M e_1	N b_1	P a_1	S s_2	T f_1
Case Size B																
71	1UA2 07 .		145 (5.71)	**14 (0.55)**	**30 (1.18)**	101 (3.98)	163.6 (6.44)	207.6 (8.17)	240 (9.45)	9 (0.35)	54 (2.13)	**130 (5.12)**	**110 (4.33)**	**160 (6.30)**	**10 (0.39)**	3.5 (0.14)
80	1UA2 08 .		163 (6.42)	**19 (0.75)**	**40 (1.57)**	110 (4.33)	172.6 (6.80)	216.6 (8.53)	273.5 (10.77)	10 (0.39)	64 (2.52)	**165 (6.50)**	**130 (5.12)**	**200 (7.87)**	**12 (0.47)**	3.5 (0.14)
90 S 90 L	1UA2 090 1UA2 096-4		180 (7.09)	**24 (0.94)**	**50 (1.97)**	118 (4.65)	180.6 (7.11)	224.6 (8.84)	331 (13.03)	10 (0.39)	89,5 (3.52)	**165 (6.50)**	**130 (5.12)**	**200 (7.,87)**	**12 (0.47)**	3.5 (0.14)
Case Size C																
90 L	1UA2 096-2		180 (7.09)	**24 (0.94)**	**50 (1.97)**	118 (4.65)	190 (7.48)	259.5 (10.22)	331 (13.03)	10 (0.39)	88.5 (3.48)	**165 (6.50)**	**130 (5.12)**	**200 (7.87)**	**12 (0.47)**	3.5 (0.14)
100 L	1UA2 106		203 (7.99)	**28 (1.10)**	**60 (2.36)**	125 (4.92)	200 (7.87)	270 (10.63)	372 (14.65)	11 (0.43)	64 (2.52)	**215 (8.46)**	**180 (7.09)**	**250 (9.84)**	**14.5 (0.57)**	4 (0.16)

All of the dimensions are in mm (values in brackets are in Inches)

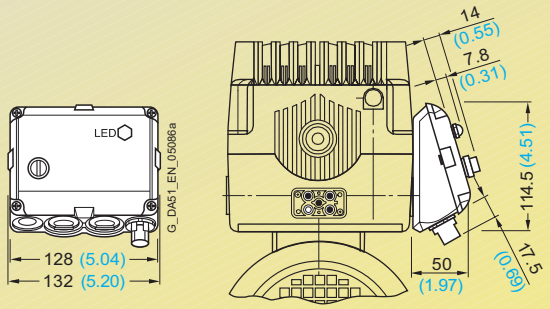
ECOFAST Variants

Dimension Drawings

ECOFAST variant of COMBIMASTER 411 – Dimensions Communication Modules [1])



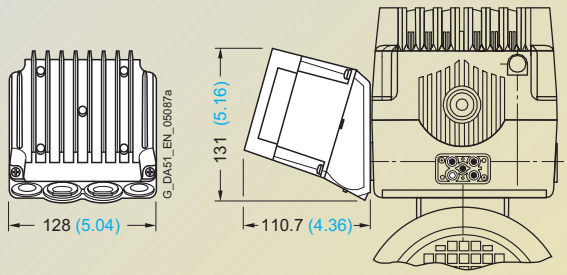
PROFIBUS module (including PROFIBUS connector and T-piece - neither is included in the scope of supply)



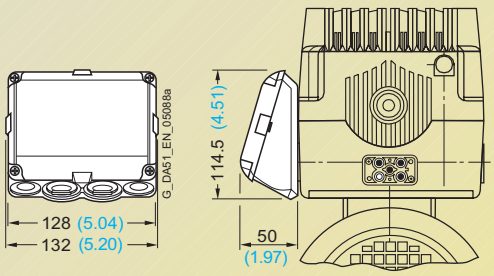
AS-Interface module

1) Drawings are exemplary for case size B

Special variants of ECOFAST variants of COMBIMASTER 411



REM module

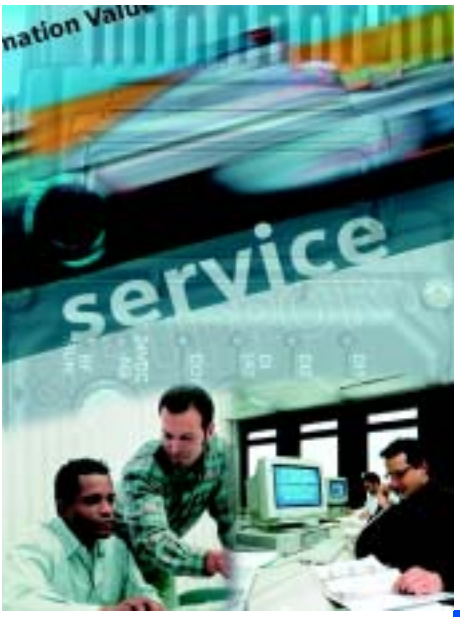


EM module

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

Appendix

3



Appendix

Environment, Resources and Recycling Certificates ISO 9001

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 environment 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 endeavouring 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 from 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.

3

Certificates ISO 9001

DQS-TIP DIPLOMA

DQS GmbH
Deutsche Gesellschaft zur Zertifizierung von Managementsystemen

hereby certifies that the company

Siemens AG
Automation and Drives
Standard Drives
Frauenauracher Straße 80
D-91056 Erlangen

with the locations as listen in the annex

has effectively implemented progressive and outstanding measures of its certified management system based on

DIN EN ISO 9001 : 2000

which is stated in the
Manufacturer's Declaration of its Management System

Date: 08 / 2003

Valid with DQS certificate registration No. 000357 QM

The audits as basis for this diploma were performed according to the DQS Trust Improvement Program Process (DQS-TIP).

Berlin, Frankfurt am Main, 2003-08-21

Dr.-Ing. K. Petrick MANAGING DIRECTORS Dipl.-Ing. S. Heinloth

D-60433 Frankfurt am Main, August-Schanz-Straße 21
D-10787 Berlin, Burggrafenstraße 6

SEAL SUPPLIER'S DECLARATION

Diploma No. E 000357 TP

Annex to the DQS-TIP-DIPLOMA No.: 000357 TP

Siemens AG
Automation and Drives
Standard Drives
Frauenauracher Straße 80
D-91056 Erlangen
Germany

Elektromotorenwerk
Siemensstraße 15
D-97616 Bad Neustadt
Germany

Siemens Elektromotory s.r.o.
Nadrazni 25
CZ-78985 Mohelnice
Czech Republic

Siemens Elektromotory s.r.o.
Markovo 952
CZ-74411 Frenstat
Czech Republic

Siemens House
Varley Road
Congleton
GB-Cheshire CW12 1PH
Great Britain

This annex (Date: 2003-08-21) is only valid in connection with the above-mentioned diploma.

Conformity with Standards

CE Marking

The MICROMASTER 411 inverters and the COMBIMASTER 411 distributed drive solution comply with the requirements of the low-voltage directive 73/23/EEC and – with correct installation and selection – with the requirements of the EMC directive 89/336/EEC. A certificate can be provided on request.

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**

Electronic equipment in electrical power installations.

Machinery Directive

The inverters are suitable for installation in machines. Compliance with the machine directive 89/39/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 integrated into 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 indentification according to the EMC directive.
- The frequency inverters as components on their own are only classified as "Limited availablility" for persons and users with the necessary EMC knowledge. They are not envisaged for unlimited sale or as "General availablility" 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" (= 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.
- Using internal 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 of Class B to EN 55 011 in the first environment (living accommodation and 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
  - 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. No changes will probably result 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 the 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 or irrelevant.

With respect to the compliance of 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.

Appendix

Conformity with Standards

Electromagnetic Compatibility

The MICROMASTER 411/COMBIMASTER 411 will, when correctly installed and put to their intended use, satisfy the requirements of the EEC directive 89/336/EEC concerning electromagnetic compatibility.
If the guidelines on installation to reduce the effects of electromagnetic interference are followed, the devices are suitable for installation in machines. According to the machinery directive, these machines must be separately certified.

The table below lists the measured results for emissions of and immunity to interference for MICROMASTER 411/ COMBIMASTER 411.

The inverters were installed according to the guidelines detailed within the Operating Instructions for the MICROMASTER 411/ COMBIMASTER 411.

EMC-phenomenon Standard/test		**Relevant criterion**	**Limit value**
Emitted interference EN 61 800-3	Conducted via mains cable	150 kHz to 30 MHz	Unfiltered – not tested Internal filter Class B
	Emitted by the drive	30 MHz to 1 GHz	All devices – Class A
ESD immunity EN 61 000-4-2 ESD through air discharge ESD through contact discharge		 Test level 3 Test level 3	 8 kV 6 kV
Electrical fields immunity EN 61 000-4-3 Electrical field applied to unit		Test level 3 26 MHz to1 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

Overview of MICROMASTER 410/420/430/440

The MICROMASTER inverters from Siemens ideally complement the motors. The table gives an overview of the features of these inverters. The complete product spectrum with ordering data, technical details and designs is included in Catalog DA 51.2.

You will find up-to-date information about AC inverters on the Internet at
http://www.siemens.com/micromaster

	MICROMASTER 410	MICROMASTER 420	MICROMASTER 430	MICROMASTER 440
Main features	**"The low cost"** For variable speeds with 3-phase motors on single-phase supply systems, e.g. for pumps, fans, advertising panels, cabinets, gate drives and dispensing machines	**"The universal"** For 3-phase supply systems as well as optional fieldbus interfacing, e.g. in conveyor belts, material transport, pumps, fans and machine tools	**"The specialist for pumps and fans"** With optimized operator panel (manual/automatic switchover) adapted software functions and optimized power efficiency	**"The all purpose"** With finely tuned vector control (with and without sensor feedback) for numerous applications in sectors such as conveyor systems, textiles, elevators, hoisting gear and machine construction
Output range	0.12 kW to 0.75 kW	0.12 kW to 11 kW	7.5 kW to 250 kW	0.12 kW to 250 kW
Voltage ranges	100 V to 120 V 1 AC 200 V to 240 V 1 AC	200 V to 240 V 1 AC 200 V to 240 V 3 AC 380 V to 480 V 3 AC	380 V to 480 V 3 AC	200 V to 240 V 1 AC 200 V to 240 V 3 AC 380 V to 480 V 3 AC 500 V to 600 V 3 AC
Control	*V/f* characteristic Multipoint characteristic (programmable *V/f* characteristic) FCC (flux current control)	*V/f* characteristic Multipoint characteristic (programmable *V/f* characteristic) FCC (flux current control)	*V/f* characteristic Multipoint characteristic (programmable *V/f* characteristic) FCC (flux current control)	*V/f* characteristic Multipoint characteristic (programmable *V/f* characteristic) FCC (flux current control) Vector Control
Process control	–	Internal PI controller	Internal PI controller (auto tuning)	Internal PI controller (auto tuning)
Inputs	3 digital inputs 1 analog input	3 digital inputs 1 analog input	6 digital inputs 2 analog inputs 1 PTC/KTY input	6 digital inputs 2 analog inputs 1 PTC/KTY input
Outputs	1 relay output	1 analog output 1 relay output	2 analog outputs 3 relay outputs	2 analog outputs 3 relay outputs
Automation link	The PLC partner for LOGO®! and SIMATIC® S7-200	The ideal partner for your automation tasks, for SIMATIC S7-200 as well as for SIMATIC S7-300/400 (TIA) and SIMOTION®	The ideal partner for your automation tasks, for SIMATIC S7-200 as well as for SIMATIC S7-300/400 (TIA) and SIMOTION	The ideal partner for your automation tasks, for SIMATIC S7-200 as well as for SIMATIC S7-300/400 (TIA) and SIMOTION
Other features	Natural ventilation (no fan) Terminals are in the same locations as for conventional switching elements (e.g. contactors) Also available with flat heat sink	BICO technology	Energy-saving mode Load torque monitoring (detects dry running of pumps) Motor staging	3 selectable drive data sets Integrated brake chopper (up to 75 kW) Torque control

Appendix

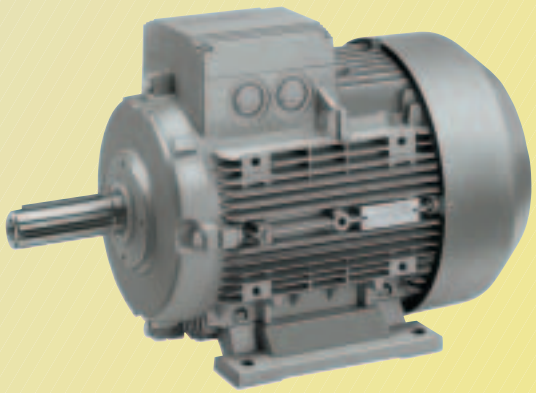
Overview of Motors

Siemens motors are an ideal supplement 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.

Main features	Squirrel-cage motors						
	Motors with cast iron housing			Motors with aluminium housing			
	1LG6	**1LG4**	**1LA8**	**1LA9**	**1LA9**	**1LA7**	**1LA5**
Efficiency class	EFF 1 *)	EFF 2 *)		EFF 1 *)	EPACT	EFF 2 *)	
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
Speed/torque	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/Y 400/690 V Δ/Y		400/690 V Δ/Y	230/400 V Δ/Y 400/690 V Δ/Y	60 Hz 460 V Δ	230/400 V Δ/Y 400/690 V Δ/Y	
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			
Housing	Cast iron			Aluminium			
Degree of protection	IP55 (IP65, IP56)		IP55 (IP56)	IP55 (IP65, IP56)			



Example of 1LA7 motor

*) 1.1 kW to 90 kW, 2-pole and 4-pole

Overview of Geared Motors

Siemens geared motors are the supplement to the motors and MICROMASTER 411/COMBIMASTER 411 inverters. The MICROMASTER 411 inverters can be combined with the 2KG geared motors as an option.
The table gives an overview of the features of these products. The complete product spectrum with ordering data, technical details and explanations can be found in catalogs M 15 geared motors and M 15.1 helical gear motors.

You will find up-to-date information on gears motors on the Internet at
http://www.siemens.com/gearedmotors

	Geared motors			
Main features	**Helical gearbox** **2KG11**	**Offset shaft gearbox** **2KG12**	**Angular gearbox** **2KG13**	**Helical worm gearbox** **2KG14**
Output range	0.09 kW to 45 kW			0.12 kW to 7.5 kW
Voltage range	230/400 V Δ/Y; 500 V Y; 400/690 V Δ/Y			
Housing/ frame sizes	63 – 225			63 – 132
Types of construction	Foot-mounted type Flange-mounted type	Foot-mounted type Flange-mounted type Universal type		
Degree of protection	IP55 (IP65, IP56)			
Other technical features	Aluminium or cast-iron housing Torque 80 – 5800 Nm	Aluminium or cast-iron housing Torque 130 – 11500 Nm	Aluminium or cast-iron housing Torque 120 – 12000 Nm	Aluminium or cast-iron housing Torque 70 – 1400 Nm

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Appendix

Siemens Contacts Worldwide

At

www.siemens.com/automation/partner

you can find details of Siemens worldwide contact partners responsible for specific 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 their respective expertise:

A&D in the WWW

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

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

Under the address

http://www.siemens.com/automation

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

Product Selection Using the Interactive Catalogs

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-C2-7600

Easy Shopping with the A&D Mall

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

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

Numerous functions are available to support you.

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

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

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

Our Services for Every Phase of Your Project

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 – at every phase.
Service & Support from Siemens provides this support with a complete range of different services for automation and drives.

At 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.

Online Support

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

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

Technical Support

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

In Europe/Africa:
Tel.: +49 (0)180 50 50 222
Fax: +49 (0)180 50 50 223
E-Mail:
adsupport@siemens.com

In the Americas:
Tel.: +1 423 262-2522
Fax: +1 423 262 2231
E-Mail: simatic.hotline@sea.siemens.com

In Asia/Pacific Rim:
Tel.: +86 1064 757 575
Fax: +86 1064 757 474
E-Mail:
adsupport.asia@siemens.com

Technical Consulting

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

Configuration and Software Engineering

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

Service On Site

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

In Germany
0180 50 50 444 [1])

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 [1])

Optimization and Upgrading

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

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

Knowledge Base on CD-ROM

For locations without online connections to the Internet there are extracts 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 Knowledge 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	**6ES7 997-0BA00-0XA0**
500	**6ES7 997-0BB00-0XA0**
1000	**6ES7 997-0BC00-0XA0**
10000	**6ES7 997-0BG00-0XA0**

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

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

Service & Support à la Carte: 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

Appendix

Conditions of Sale and Delivery Export Regulations

Terms and Conditions of Sale and Delivery in the Federal Republic of Germany

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

for customers based in the Federal Republic of Germany

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

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

for customers with a seat or registered office outside the Federal Republic of Germany

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

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

General

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

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

In addition to the prices of products which include silver and/or copper, surcharges may be calculated if the respective limits of the notes are exceeded.

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

The dimensions are in mm. Illustrations are not binding.

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

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

- 6ZB5310-0KR30-0BA0
  (for customers based in the Federal Republic of Germany)
- 6ZB5310-0KS53-0BA0
  (for customers based outside of the Federal Republic of Germany)

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

Export regulations

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

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

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

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

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

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

Subject to change and errors excepted without prior notice.

Responsible for

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Siemens AG
Automation & Drives
Standard Drives
Postfach 32 69
D-91050 Erlangen

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

Further information can be obtained from our branch offices listed in the appendix of this catalog

	Catalog
Automation & Drives	
Interactive catalog on CD-ROM	
• Components for Automation & Drives	CA 01
Automation Systems for Machine Tools	
SINUMERIK & SIMODRIVE	NC 60
Cables, Connectors and System Components	NC Z
Drive Systems	
Variable-Speed Drives	
DC Motors	DA 12
DC Drives Preferred Series up to 500 kW	DA 12.1
DC Drives Preferred Series 215 kW to 1500 kW	DA 12.2
SIMOREG DC MASTER 6RA70 Digital Chassis Converters	DA 21.1
SIMOREG K 6RA22 Analog Chassis Converters	DA 21.2
SIMOREG DC MASTER 6RM70 Digital Converter Cabinet Units	DA 22
SIMOVERT PM Modular Converter Systems	DA 45
SIEMOSYN Motors	DA 48
MICROMASTER 410/420/430/440 Inverters	DA 51.2
MICROMASTER 411/COMBIMASTER 411	DA 51.3
SIMOVERT MV Medium-Voltage Drives	DA 63
SIMOVERT MASTERDRIVES Vector Control	DA 65.10
SIMOVERT MASTERDRIVES Motion Control	DA 65.11
Synchronous and asynchronous servomotors for SIMOVERT MASTERDRIVES	DA 65.3
SIMODRIVE 611 universal and POSMO	DA 65.4
Low-Voltage Three-Phase-Motors	
Project Manual	M 10
Squirrel-Cage Motors, Totally Enclosed, Fan-Cooled	M 11
Automation Systems for Machine Tools SIMODRIVE	NC 60
• AC Main Spindle Motors 1PM, 1FE, 1PH	
• AC Servomotors 1FT, 1FK	
• AC Linear motors 1FN	
• Converter System SIMODRIVE 611	
• Converter Systems SIMODRIVE POSMO A/CD/CA/SI	
Drive and Control Components for Hoisting Equipment	HE 1
Electrical Installation Technology	
PDF: ALPHA Small Distribution Boards and Distribution Boards	*ET A1*
PDF: ALPHA Side-by-Side Switchgear Cabinets	*ET A3*
PDF: BETA Modular Installation Devices	*ET B1*
PDF: DELTA Switches and Outlets	*ET D1*
PDF: GAMMA Building Management Systems	*ET G1*
Human Machine Interface Systems SIMATIC HMI	ST 80
Industrial Communication and Field Devices	IK PI

	Catalog
Low-Voltage Controls and Distribution	
Low-Voltage Controlgear, Switchgear and Systems	NS K
Communication-Capable Controlgear, Controlgear with SIRIUS, SIGUARD Safety Systems, Control and Signalling Devices, Switchgear, Transformers and DC Power Supplies, Main- and EMERGENCY-STOP Switches, Control Switches, Terminal Blocks	
BERO - Sensors for Automation	NS BERO
Products and Systems for Low-Voltage Power Distribution	NS PS
SENTRON WL	NS WL
Motion Control System SIMOTION	PM 10
Process Instrumentation and Analytics	
Field Instruments for Process Automation Measuring Instruments for Pressure, Differential Pressure, Flow, Level and Temperature, Positioners and Liquid Meters	FI 01
PDF: Indicators for panel mounting	*MP 12*
SIREC Recorders and Accessories	MP 20
SIPART, Controllers and Software	MP 31
SIWAREX Weighing Systems	WT 01
Continuous Weighing and Process Protection	WT 02
Gas Analysis Equipment for the Process Industry	PA 10
PDF: Process Analytics, Components for the System Integration	*PA 11*
SIPAN Liquid Analysis	PA 20
SIMATIC Industrial Automation Systems	
SIMATIC PCS Process Control System	ST 45
PDF: SIMATIC S5/505 Automation Systems	*ST 50*
Components for Totally Integrated Automation and Micro Automation	ST 70
SIMATIC PCS 7 Process Control System	ST PCS 7
PDF: Add-ons for the SIMATIC PCS 7 Process Control System	*ST PCS 7.A*
SIMATIC Control Systems	ST DA
SIPOS Electric Actuators	
Electric Rotary, Linear and Part-turn Actuators	MP 35
Electric Rotary Actuators for Nuclear Plants	MP 35.1/.2
Systems Engineering	
Power supplies SITOP power	KT 10.1
System cabling SIMATIC TOP connect	KT 10.2
MOBY Identification Systems	KT 21
Industrial Microcomputers SICOMP	KT 51
System Solutions	
Applications and Products for Industry are part of the interactive catalog CA 01	
TELEPERM M Process Control System	
AS 235, AS 235H and AS 235K automation systems	PLT 111
PDF: AS 488/TM automation systems	*PLT 112*
Operating and monitoring with WinCC/TM	PLT 123
CS 275 bus system	PLT 130

PDF: These catalogs are only available as pdf files.

The information provided in this catalog contains descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract. Availability and technical specifications are subject to change without notice.

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www.siemens.com/micromaster
www.siemens.com/combimaster