

<h1>MBC1400</h1> <h2>Datasheet</h2>	
Validity:	BG13000-xxN
Purpose:	Technical information about the MBC1400
Additional:	



KEY FEATURES

- ◊ 1400VA magnetic bearing control unit
- ◊ 525W internal power supply with 140V DC-link voltage
- ◊ 5 axis power amplifier: 10A radial / 20A axial
- ◊ Multi-core controller board for advanced control including force control
- ◊ Up to 8 sensor channels
- ◊ Digital I/O, UPS I/O, CAN and Ethernet service interface
- ◊ Anybus® CompactCom™ interface for fieldbus / industrial Ethernet
- ◊ Designed for high MTBF

FEATURES

- Power Amplifier

Energy efficient PWM amplifier with passive cooling design

Integrated output filter to reduce EMC and losses in magnetic bearings

Output current radial: 10A, axial: 20A

Short circuit protection

- Power Supply

High efficient and high reliable internal power supply

525W power rating

Optional: 1050W power rating

- Controller Board

Powerful multi-core controller board featuring fully digital control

High-order MIMO position control with underlying force control

Advanced unbalance rejection control (UFRC) and synchronous damping control (UFCC)

Ethernet service interface allowing for real time measurements

UPS and CAN interface

Optional: Extendable with customer interface (e.g. field buses, temperature module)

Optional: Trend and event logger

- Sensor Interface

Up to 8 sensor channels (e.g. 4 radial, 2 axial, sin/cos resolver)

10kHz ... 1MHz sinusoidal excitation

Digital processing of the sensor signals

Optional: Cable length up to 300m by use of a sensor amplifier close to the machine

- Standards

Developed according to IEC61010-1 / UL61010-1

UL recognition on request

CE marking

TECHNICAL SPECIFICATION

• General Data	
Operating temperature	0 ... +55°C, non-condensing
Storage temperature	-20 ... +60°C, non-condensing
Dimensions (L x W x H)	387 x 135 x 330mm
Weight	12.5kg
Degree of protection	IP 20
• Power Supply	
Input connector	IEC C14 inlet including fuse and line filter
Input voltage (nominal)	100 ... 240V _{AC} (50/60Hz) or 140 ... 340V _{DC}
Power rating	525W at 55°C ambient temperature
Reliability	< 1 fault per million hours (FPMH)
• Power Amplifier	
DC-Link Voltage / Capacity	140V / 3600µF, optional up to 6600µF possible
Power rating	1400VA radial, 2800VA axial
Switching frequency	80kHz
Radial bearing current	10A for 10 seconds (7A continuous, 12A trip)
Axial bearing current	20A for 10 seconds (14A continuous, 24A trip)
Max. power dissipation	All channels 3A: 125W, 5A: 170W, 7A: 240W, 10A: 400W
Bearing inductivity	Total max. 500mH, optional up to 920mH possible. See note ¹
• Interface	
Digital inputs	6 isolated inputs with common ground; max. 30V
Digital outputs	6 isolated outputs with common supply; max. 30V
UPS interface	Isolated: 4 digital inputs, 1 digital output; max. 30V Recommended UPS: GE Digital Energy VH 1000
Isolated supply	24V isolated supply for digital I/O, short-circuit-proof
CAN	Additional serial interface including 12V supply (max. 1A)
Ethernet service interface	Based on MECOS' MATLAB toolbox
Customer interface	Anybus® CompactCom™ interface (modular)
Additional I/O	2 outputs for relays (12V, 1A, 490mJ), 2 NTC inputs (10kΩ)
Status indicators	LED for power, error, warning, levitating and rotating

¹ Total allowed bearing energy (more convenient than the inductance specification): 16.7J (optional up to 30J possible)

OPTIONS

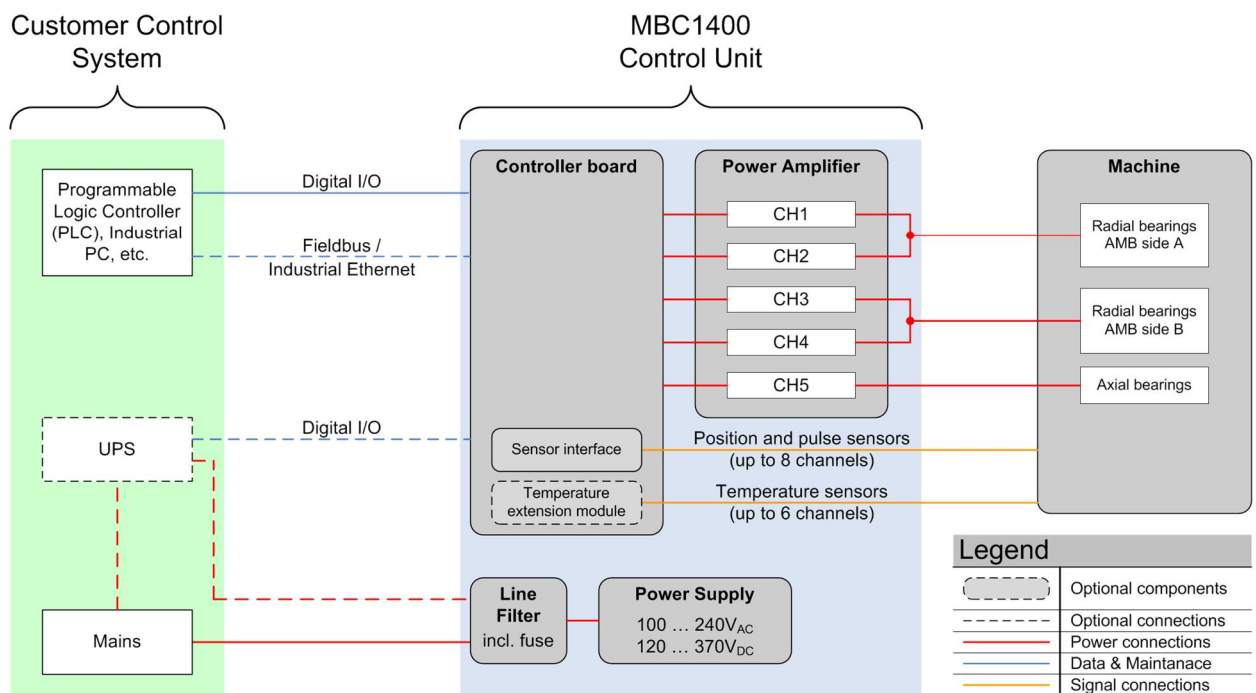
Internal Options

- Extension Module for Temperature Measurement ITB6
 - 6 channel thermistor input (2- or 4-wire configuration)
 - Measurement range 0 ... 1.8k Ω (PT100: -50 ... +850°C, PT1000: -50 ... +210°C)
 - Anybus® CompactCom™ interface for fieldbus / industrial Ethernet
- Extension Module for Fieldbus / Industrial Ethernet IBP262
 - Anybus® CompactCom™ interface for fieldbus / industrial Ethernet

External Options

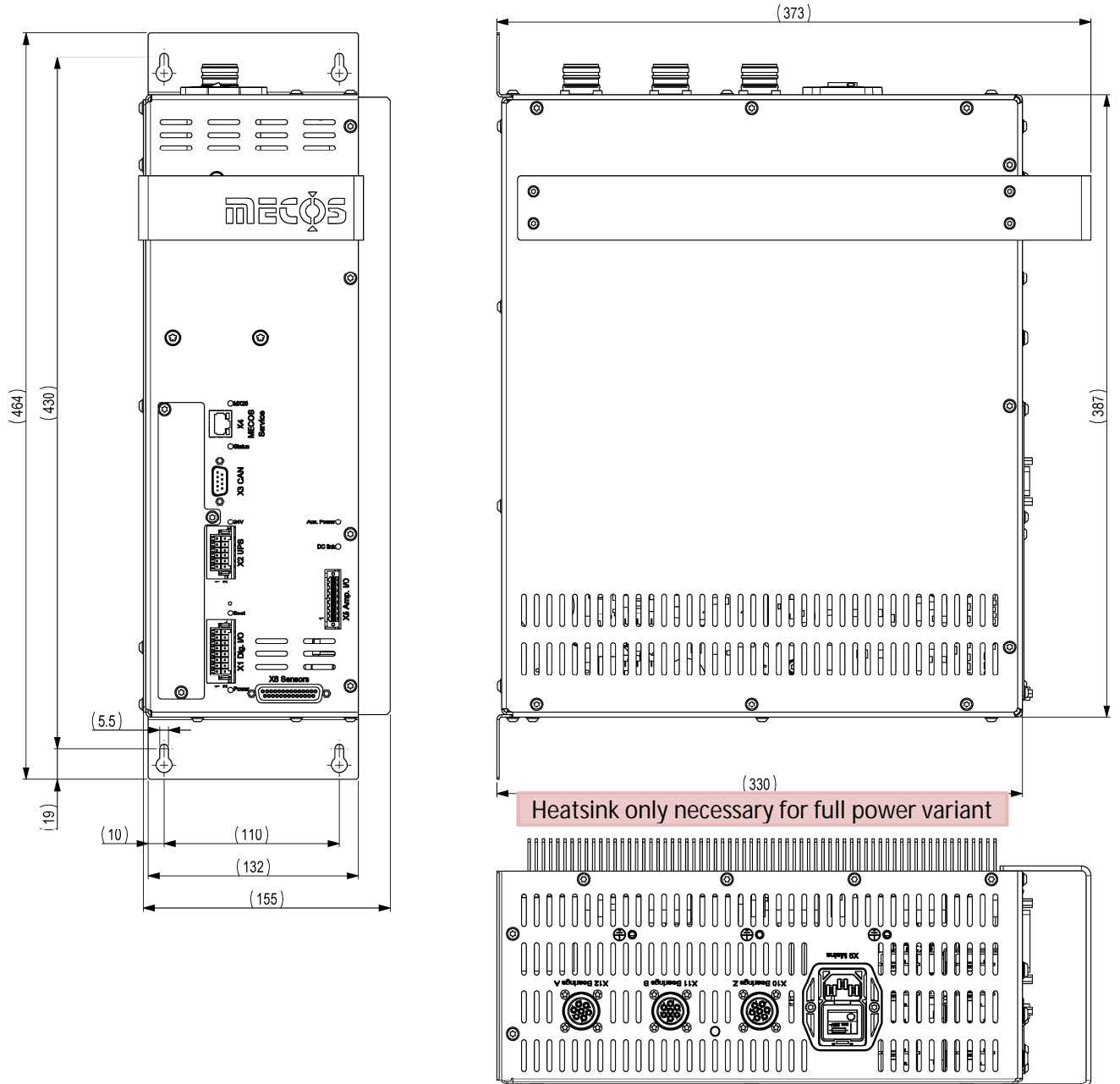
- Sensor Amplifier Box SMX8
 - External sensor amplifier box for 8 channels
 - Sensor cable length up to 300m possible
 - Directly mounted on the machine side (short sensor cable between SMX8 and machine)

TYPICAL APPLICATION



DIMENSIONS

Dimensions are in mm



Cabinet installation instructions

- The MBC1400 is to be fixed with four M5 screws
- The distance to other devices must not be less than 60mm
- Full Power requires minimal ventilation (≥ 1 m/s) on the heatsink side (no stagnant air)

CONNECTORS

Standard Configuration

X12 Bearings A	7-pole Hummel M23 signal connector, socket, code S
X11 Bearings B	7-pole Hummel M23 signal connector, socket, code N
X10 Bearings Z	7-pole Hummel M23 signal connector, socket, code H
X9 Mains	IEC C14 inlet
X6 Sensors	25-pole sub-D socket
X5 Amp. I/O	8-pole Weidmüller plug type SL 3.50/08/90F 3.2SN OR BX
X4 MECOS Service	RJ45 socket
X3 CAN	9-pole sub-D plug
X2 UPS	12-pole WAGO plug type 713-1426/116-000
X1 Dig. I/O	16-pole WAGO plug type 713-1428/116-000

Optional Configuration

X14 Temp.	26-pole Weidmüller plug type S2L-SMT 3.50/26/90LF 3.2SN BK BX
X13	Anybus® CompactCom™ interface for fieldbus / industrial Ethernet
X12 Bearings A	6-pole Weidmüller socket type BLL 5.08/10/90FI 3.2SN OR BX
X11 Bearings B	6-pole Weidmüller socket type BLL 5.08/10/90FI 3.2SN OR BX
X10 Bearings Z	6-pole Weidmüller socket type BLL 5.08/10/90FI 3.2SN OR BX
X8 Sensors B	12-pole Hummel M23 signal connector, socket, code N
X7 Sensors A	12-pole Hummel M23 signal connector, socket, code X

VERSIONS

The following versions of the MBC1400 are basically possible

DC-link voltage	40 ... 90V or 100 ... 140V
Reduced Power Rating	No heatsink. Continuous current: 5A radial / 10A axial
Sensor connector	Possibility for customer-specific sensor connector
Bearings connectors	Possibility for customer-specific bearing connector
Customer interface	By use of an Anybus® CompactCom™ module, a large number of fieldbus / industrial Ethernet interfaces are supported. For details, refer to the Anybus Website
Additional I/O	By design of a customer-specific module, the available I/O possibility can be extended by other analogue or digital I/O

