

# Technical specifications

## CIBANO 500

### Power output of integrated power supply

Frequency	DC / 15 Hz ... 400 Hz		
Power	Vmains	P30s	P2h
	> 100 V	1500 W	1000 W
	> 190 V	3200 W	2400 W

### Current / voltage output<sup>1</sup> of integrated power supply

Source	Range	I <sub>max</sub> , 30 s1	I <sub>max</sub> , 2 h1
DC	0 ... ±300 V	27.5 A	12 A
DC	0 ... ±150 V	55 A	24 A
AC	0 ... 240 V	20 A	12 A
AC	0 ... 120 V	40 A	24 A

### Commands for control of trip or close coils

Current per channel <sup>5</sup>	Duty cycle
6 Aeff AC or DC	continuous
15 Aeff AC or DC	20 s on 80 s off
30 Aeff AC or DC	10 s on 190 s off
40 Aeff AC or 55 A DC	200 ms

### Commands for motor supply

Current per channel <sup>5</sup>	Duty cycle
24 Aeff AC or DC	continuous
40 Aeff AC or DC	20 s on 80 s off
55 A DC	10 s on 190 s off

### Voltage input from station battery (CAT III<sup>2</sup>)

Source	Range	Accuracy <sup>3</sup>
DC	0 ... 420 V	0.5 % rd + 0.5 % fs
AC	0 ... 300 V	0.5 % rd + 0.5 % fs

### Voltage measurements (CAT III<sup>4</sup>)

Source	Range	Accuracy <sup>3</sup>
DC	0 ... 300 V	0.1 % rd + 0.05 % fs
AC	0 ... 300 V	0.03 % rd + 0.01 % fs
DC	0 ... 3 V	0.1 % rd + 0.05 % fs
DC	0 ... 300 mV	0.1 % rd + 0.1 % fs
DC	0 ... 30 mV	0.1 % rd + 0.1 % fs

### Current measurements

Source	Range	Accuracy <sup>3</sup>
DC	0 ... 55 A	0.1 % rd + 0.2 % fs
AC	0 ... 40 A	0.1 % rd + 0.1 % fs

### Resistance measurements

Range	Voltage range	Injected current	Accuracy <sup>3</sup>
0.1 μΩ ... 300 μΩ	30 mV	100 A	0.2 % rd + 0.1 μΩ
0.5 μΩ ... 3 mΩ	300 mV	100 A	0.2 % rd + 0.5 μΩ
5 μΩ ... 30 mΩ	3 V	100 A	0.2 % rd + 5 μΩ
50 μΩ ... 300 mΩ	3 V	10 A	0.2 % rd + 50 μΩ

### Inputs for auxiliary contacts (CAT III<sup>4</sup>)

Auxiliary input type	Toggleing with potential-free (dry) contacts or voltages (wet) up to 300 V DC
Maximum sample rate	40 kHz
Minimum resolution	25 μs

### Mains supply

Voltage	Nominal: 100 V ... 240 V AC Permitted: 85 V ... 264 V AC
Current	Nominal: 16 A
Frequency	Nominal: 50 Hz / 60 Hz Permitted: 45 Hz ... 65 Hz
Power fuse	Automatic circuit breaker with magnetic overcurrent tripping at I > 16 A
Power consumption	Continuous: < 3.5 kW Peak: < 5.0 kW



## Interfaces

Digital	1 × Ethernet, 1 × Serial, 2 × Safety Optional EtherCAT® module: 4 × EtherCAT® Optional auxiliary module: 1 × EtherCAT®
Analog	1 × analog input (V IN) 3 × analog input/ analog output/ binary input (A) 4 × analog input / analog output (B) Optional auxiliary module: 3 × binary input (C)

## Environmental conditions

Temperature	Operating: -10 °C ... +55 °C / +14 °F ... +131 °F Storage: -30 °C ... +70 °C / -22 °F ... +158 °F
Relative humidity	5 % ... 95 %, non-condensing
Maximum altitude	Operating: 2 000 m / 6 550 ft, up to 5 000 m / 16 400 ft (with limited specifications, according to footnotes 2 and 4) Storage: 12 000 m / 40 000 ft

## Mechanical data

Dimensions (W × H × D)	580 × 386 × 229 mm / 22.9 × 15.2 × 9.0 inch (W = 464 mm / 18.3 inch without handles)
Weight	20 kg / 44.1 lbs (main unit including power supply)

## Equipment reliability

Shock	IEC / EN 60068-2-27, 15 g / 11 ms, half-sinusoid, 3 shocks in each axis
Vibration	IEC / EN 60068-2-6, frequency range from 10 Hz to 150 Hz, continuous acceleration 2 g (20 m/s <sup>2</sup> / 65 ft/s <sup>2</sup> ), 20 cycles per axis

## PC Requirements

Operating system	Windows 10™ 64-bit Windows 8.1™ 64-bit Windows 8™ 64-bit Windows 7™ SP1 64-bit
CPU	Multicore system with 2 GHz Single-core system with 2 GHz
RAM	4 GB
Hard disk	5 GB of available space
Storage device	DVD-ROM drive
Graphics adapter	Super VGA (1280 × 768) or higher-resolution video adapter and monitor
Interface	Ethernet NIC / USB 2.0
Microsoft® software	Microsoft Office® 2016, 2013, 2010, or 2007

<sup>1</sup> Maximum power rating cannot be exceeded. Maximum voltage and current cannot be supplied at the same time

<sup>2</sup> From 2 000 m to 5 000 m altitude CAT III compliance only with half voltage

<sup>3</sup> Means "typical accuracy"; at typical temperatures of 23 °C, 98 % of all units have an accuracy which is greater than specified

<sup>4</sup> From 2 000 m to 5 000 m altitude only CAT II compliance or CAT III compliance with half voltage

<sup>5</sup> Valid while using one channel. Thermal derating when 2 or 3 channels are used in parallel

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# Technical specifications

## CB MC2



### Current output

Channels	2
Current	0 ... 100 A DC

### Static contact resistance measurement

Range	0.1 $\mu\Omega$ ... 1000 $\mu\Omega$
Accuracy <sup>2</sup>	0.2 % rd + 0.1 $\mu\Omega$
Measuring current	100 A

### Dynamic contact resistance measurement<sup>1</sup>

Range	10 $\mu\Omega$ ... 200 m $\Omega$
Accuracy <sup>2</sup>	0.2 % rd + 10 $\mu\Omega$
Maximum sample rate	40 kHz

### Pre-insertion resistance (PIR) measurement

Range	0 ... 10 k $\Omega$
Accuracy <sup>2</sup> (< 500 $\Omega$ )	0.5 % rd + 10 m $\Omega$
Accuracy <sup>2</sup> (500 $\Omega$ ... 10 k $\Omega$ )	3 % rd

### Timing measurement

Maximum sample rate	40 kHz
Minimum resolution	25 $\mu\text{s}$

### Interface

EtherCAT® interface to CIBANO 500
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### Environmental conditions

Temperature	Operating: -30 °C ... +70 °C / -22 °F ... +158 °F Storage: -30 °C ... +70 °C / -22 °F ... +158 °F
Relative humidity	5 % ... 95 %, non-condensing
Maximum altitude	Operating: 5000 m / 16400 ft Storage: 12000 m / 40000 ft

### Mechanical data

Dimensions (W × H × D)	109 × 272 × 63 mm / 4.3 × 10.7 × 2.5 inch
Weight	1.2 kg / 2.6 lbs

### Equipment reliability

Please see CIBANO 500 parameters.
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## CB TN3



### Analog interface

<b>Output</b>	
Channels <sup>3</sup>	3
Voltage	5 ... 30 V DC
Current	10 ... 50 mA

### Voltage Input

Channels	3
Range	30 V
Accuracy <sup>2</sup>	0.1 % rd + 20 mV
Maximum sample rate	40 kHz

### Current input

Channels	3
Range	50 mA
Accuracy <sup>2</sup>	0.1 % rd + 20 $\mu\text{A}$
Maximum sample rate	40 kHz

### Digital interface

<b>Output</b>	
Channels <sup>3</sup>	3
Voltage	5 ... 30 V DC
Current	10 ... 200 mA
Maximum power	5 W per channel
<b>Input</b>	
Signal type	2 square-wave signals according to EIA-422/485 standard
Maximum input frequency	10 MHz

### Interface

EtherCAT® interface to CIBANO 500
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### Environmental conditions

Please see CB MC2 parameters
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### Mechanical data

Dimensions (W × H × D)	109 × 272 × 63 mm / 4.3 × 10.7 × 2.5 inch
Weight	0.76 kg / 1.7 lbs

### Equipment reliability

Please see CIBANO 500 parameters.
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<sup>1</sup> Valid for test currents  $\geq 10$  A

<sup>2</sup> Means "typical accuracy"; at typical temperatures of 23 °C, 98 % of all units have an accuracy which is greater than specified

<sup>3</sup> 3 channels of CB TN3 can be used at a time. They can be freely configured as digital or analog channels

<sup>4</sup> Valid while using one channel. Thermal derating when 2 or 3 channels are used in parallel

## IOB1



### Voltage measurements

Source	Range	Accuracy <sup>2</sup>
DC	0 ... 300 V	0.05 % rd + 0.05 % fs
AC	0 ... 300 V	0.05 % rd + 0.02 % fs

### Current measurements

Source	Range	Accuracy <sup>2</sup>
DC	0 ... 40 A	0.1 % rd + 0.2 % fs
AC	0 ... 40 A	0.1 % rd + 0.05 % fs

### Commands for control of trip/close coils or motors

Channels	6 (can alternatively be configured for measuring wet auxiliary contacts)
Voltage per channel <sup>4</sup>	Duty cycle
± 300 V DC or AC	continuous
± 500 V	transient peak
Current per channel <sup>4</sup>	Duty cycle
24 A <sub>RMS</sub> AC or DC	continuous
40 A <sub>RMS</sub> AC or 55 A DC	200 ms on 5s off
± 85 A	transient peak

### Timing accuracy

Timing accuracy <sup>2</sup>	± 1 sample interval ± 0.01 % rd
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### Inputs for auxiliary contacts

Channels	6
Auxiliary input type	Toggling with potential-free (dry) contacts or voltages (wet) up to 300 V DC
Maximum sample rate	40 kHz
Minimum resolution	25 μs

### Mechanical data

Dimensions (W × H × D)	381 × 190 × 90 mm / 15 × 7.5 × 3.5 inch
Weight	3.0 kg / 6.6 lbs

### Environmental conditions and equipment reliability

Please see CIBANO 500 parameters.

## EHB1



### Output

Channels	4
Devices per channel	optionally 1 × CB MC2, 1 × CB TN3 or 1 × IOB1
Maximum cable length	100 m / 328 ft

### Input

Channels	1
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### Interface

EtherCAT® interface to CIBANO 500 or to additional EHB1 modules

### Mains supply

Voltage	Nominal:	100 V ... 240 V AC
	Permitted:	85 V ... 264 V AC
Maximum current	2.5 A	
Frequency	Nominal:	50 Hz / 60 Hz
	Permitted:	45 Hz ... 65 Hz

### Mechanical data

Dimensions (W × H × D)	265 × 80 × 180 mm / 10.4 × 3.1 × 7.1 inch
Weight	1.8 kg / 4.0 lbs

### Environmental conditions and equipment reliability

Please see CIBANO 500 parameters.