Monitoring system MSENSE® BM

Technical data

8123065/00 EN

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1 Design

The complete system consists of the following subassemblies:

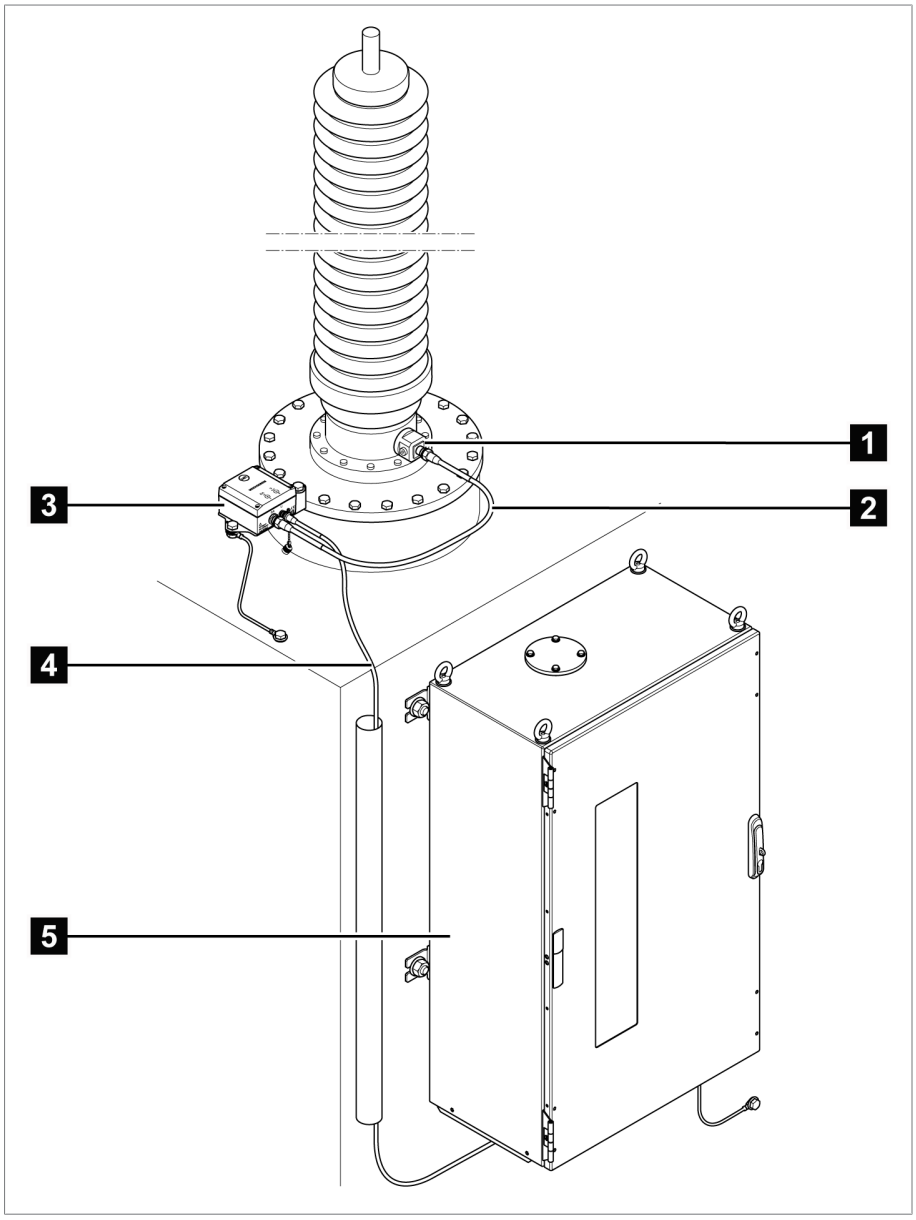


Figure 1: Design

1	Bushing adapter	2	Connection cable for the bushing adapter and bushing coupling unit
3	Bushing coupling unit	4	Connection cable for the bushing coupling unit and control cabinet
5	Control cabinet with monitoring system		

2 Technical data

2.1 Bushing adapter

Bushing adapter		A001
Bushing type		Micafil RTKF, RTKG
Dimensions		Ø 50 x 64 mm
Input	Test tap	Ø 4 mm (female)
	Thread	Inner, G¾"
	Gasket	O-ring, 40 x 2 NBR 70
Output		N female connector
Permitted ambient temperature during operation		-40 °C...+90 °C
Degree of protection (IEC 60529)		IP 66
Weight		approx. 170 g

Table 1: Technical data for the bushing adapter A001

Bushing adapter		A002
Bushing type		HSP SETFt 1550/420-1800, SETFt 600/123-2000
Dimensions		Ø 50 x 60 mm
Input	Test tap	Ø 4 mm (female)
	Thread	Outer, M30 x 1.5
	Gasket	Flat gasket, 26 x 35 x 2, 65 Shore
Output		N female connector
Permitted ambient temperature during operation		-40 °C...+90 °C
Degree of protection (IEC 60529)		IP 66
Weight		approx. 180 g

Table 2: Technical data for the bushing adapter A002

Bushing adapter		A003
Bushing type		ABB GOB 1050-750-1100-0.6-B GSA 123-OA/1600/0.5 GSA 52-OA/2000/0.5
Dimensions		Ø 40 x 82 mm
Input	Test tap	Ø 4 mm (female)
	Thread	Outer, M30 x 2
	Gasket	O-ring, 32 x 2 NBR 70
Output		N female connector
Permitted ambient temperature during operation		-40 °C...+90 °C
Degree of protection (IEC 60529)		IP 66
Weight		approx. 190 g

Table 3: Technical data for the bushing adapter A003

Bushing adapter		A004
Bushing type		Trench COT 750-800
Dimensions		Ø 25 x 61 mm
Input	Test tap	Ø 4 mm (female)
	Thread	Outer, M16 x 1.5
	Gasket	O-ring, 14 x 2 NBR 70
Output		N female connector
Permitted ambient temperature during operation		-40 °C...+90 °C
Degree of protection (IEC 60529)		IP 66
Weight		approx. 60 g

Table 4: Technical data for the bushing adapter A004

Bushing adapter		A005
Bushing type		HSP SETFt 750-170-4000 SETFt 1200/245-1250 SETFt 1425-420-1600 SESTFt 1050-245-B E6 B SESTFt 1425-420-B E6 B-1600A EKTG 72.5-800 kV
Dimensions		Ø 45 x 71 mm
Input	Test tap	Ø 4 mm (female)
	Thread	Outer, M24 x 1.5
	Gasket	O-ring, 22 x 2.5 NBR 70

Bushing adapter		A005
Output		N female connector
Permitted ambient temperature during operation		-40 °C...+90 °C
Degree of protection (IEC 60529)		IP 66
Weight		approx. 100 g

Table 5: Technical data for the bushing adapter A005

Bushing adapter		A006
Bushing type		PCORE CSA standard POC series II ABB GOE, GSB (245...550 kV)
Dimensions		Ø 80 x 104 mm
Input	Test tap	Ø 8 mm (female)
	Thread	Outer, 2¼" – 12 UNF
	Gasket	O-ring, 64 x 3 NBR 70
Output		N female connector
Permitted ambient temperature during operation		-40 °C...+90 °C
Degree of protection (IEC 60529)		IP 66
Weight		approx. 190 g

Table 6: Technical data for the bushing adapter A006

Bushing adapter		A007
Bushing type		PCORE B-81515-57-70
Dimensions		Ø 40 x 60 mm
Input	Test tap	Ø 5 mm (contact spring)
	Thread	Outer, 1¼" – 12 UNF
	Gasket	O-ring, 32 x 2 NBR 70
Output		N female connector
Permitted ambient temperature during operation		-40 °C...+90 °C
Degree of protection (IEC 60529)		IP 66
Weight		approx. 190 g

Table 7: Technical data for the bushing adapter A007

Bushing adapter		A008
Bushing type		Passoni Villa PNO, POBO, PCTO, PAO < 110 kV
Dimensions		Ø 45 x 70 mm
Input	Test tap	Ø 8 mm (female)
	Thread	Outer, 1⅛" – 12 UNF
	Gasket	O-ring, 25 x 2.5 NBR 70
Output		N female connector
Permitted ambient temperature during operation		-40 °C...+90 °C
Degree of protection (IEC 60529)		IP 66
Weight		approx. 150 g

Table 8: Technical data for the bushing adapter A008

2.2 Connection cable to bushing coupling unit

Connection cable	Bushing adapter - bushing coupling unit
Cable type	RG142/U
Length	1 m
Connector	N connector (both sides)
Minimum permitted bending radius	50 mm

Table 9: Technical data for the connection cable

2.3 Bushing coupling unit

Bushing coupling unit		C002
Dimensions (width x height x depth)		117 x 100 x 60 mm
Input		N female connector
Output	Voltage measurement (U)	TNC female connector
	Partial discharge measurement (PD); is not used	
Capacitance		In accordance with order: 0.33...4.5 µF (± 5 %)
Output voltage		Typ. (RMS): 75 V AC Max. (RMS): 100 V AC
Permitted ambient temperature during operation		- 40...+ 80 °C
Degree of protection (IEC 60529)		IP 66
Weight		approx. 1.2 kg

Table 10: Technical data for the bushing coupling unit

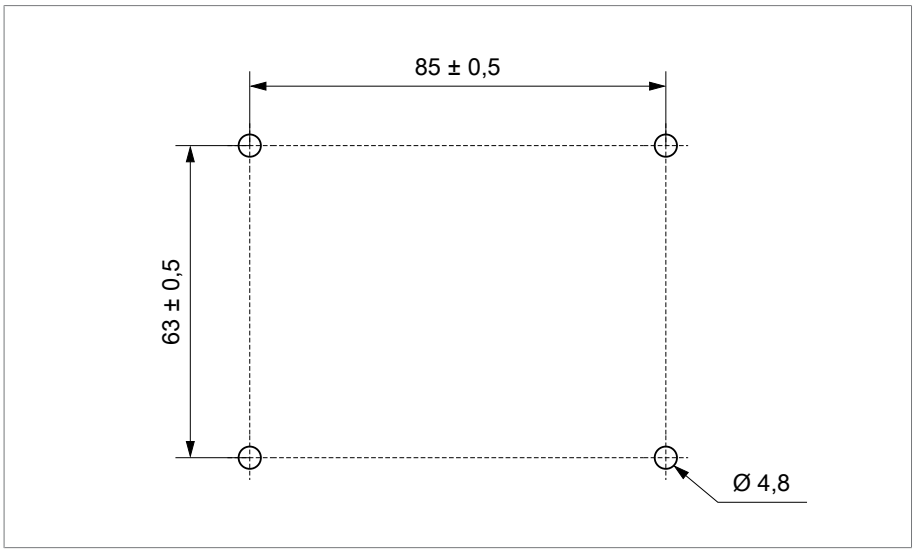


Figure 2: Dimensional drawing for holes in the bushing coupling unit's retaining plate (dimensions in mm)

2.4 Connection cable to control cabinet

Connection cable	Bushing coupling unit - control cabinet
Cable type	RG142/U
Length	10 m, 15 m or 20 m based on order
Connector	TNC connector (one side)
Minimum permitted bending radius	50 mm

Table 11: Technical data for the connection cable

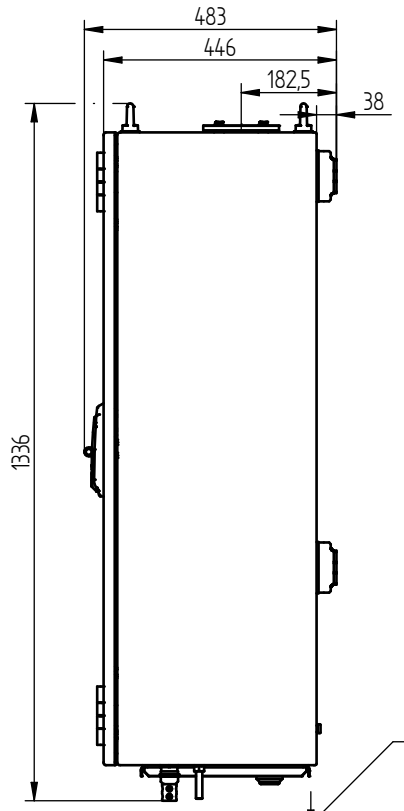
2.5 Control cabinet

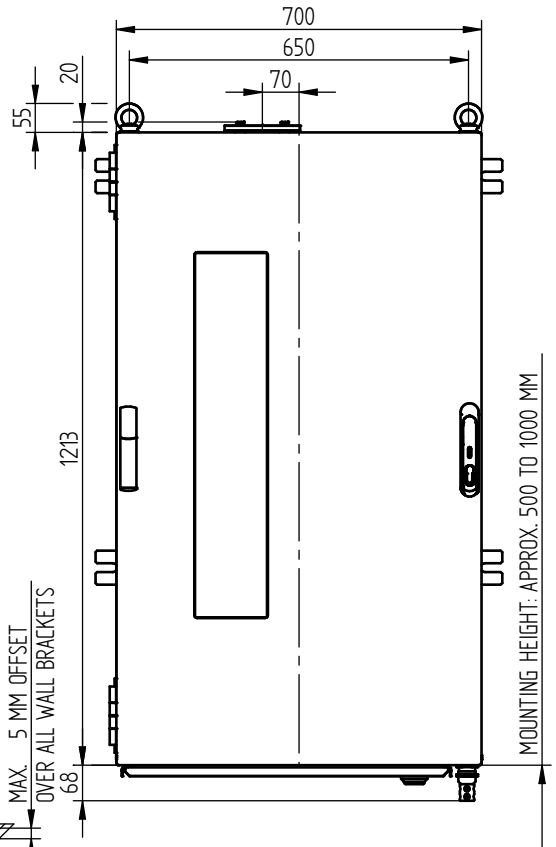
Control cabinet	MSENSE® BM
For dimensions (width x height x depth), see the Dimensional drawing.	780 x 1,370 x 500 mm
Power consumption	See nameplate
Power supply	See nameplate
Frequency	See nameplate
Heating power	100 W
Plug socket	220...240 V AC, max. 10 A

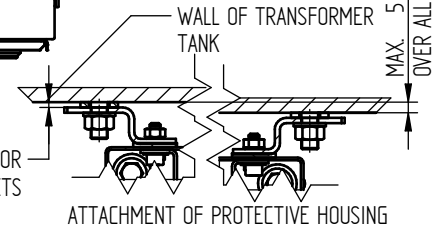
Control cabinet	MSENSE® BM
Degree of protection (DIN EN 60529)	IP 66
Permissible total weight	150 kg

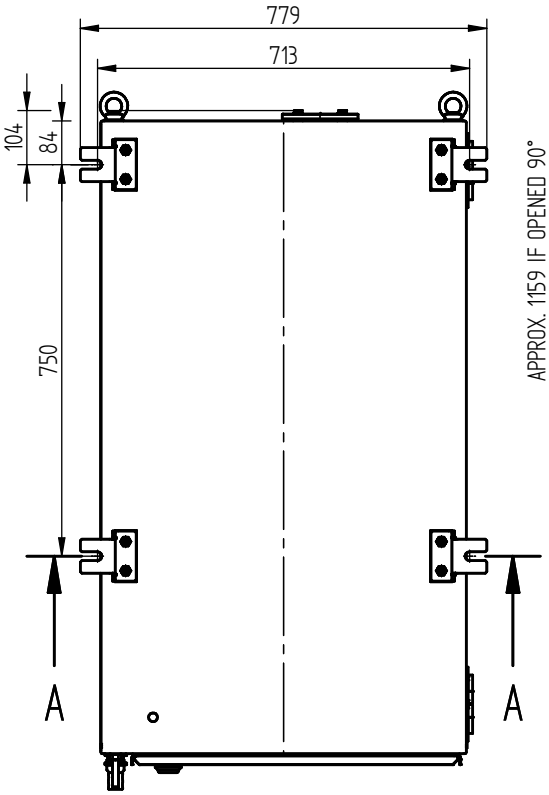
Table 12: Technical data for the control cabinet

2.5.1 Dimensional drawing

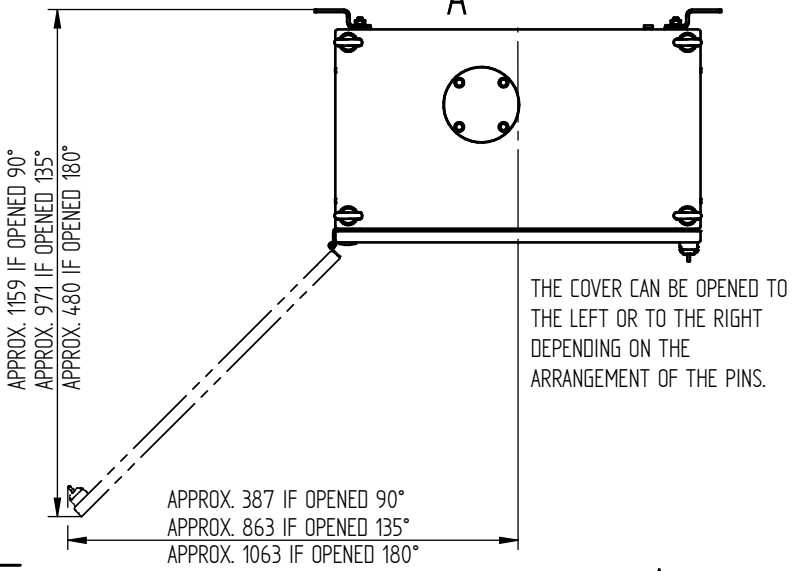


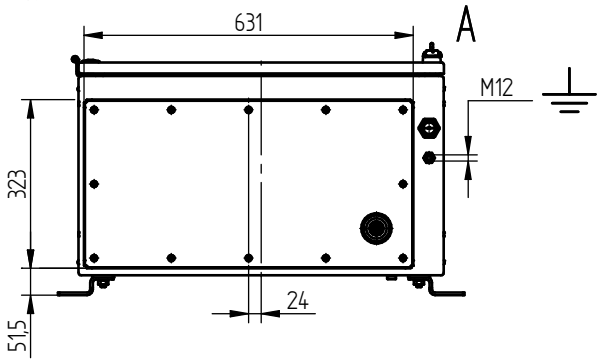






ARRANGEMENT OF FIXING HOLES ON PROTECTIVE HOUSING
(VIEWED FROM BEHIND)





	Datum	Name	Dokumentnummer	
Gez.	09.11.2020	NOVACKJ	SED 7754572 000 00	
Gepr.	12.11.2020	STEMPFHUBERJ	Änderungsnummer	Maßstab
Norm.	13.11.2020	WANNINGER	1104191	1:10

Maßangaben in mm, soweit nicht anders angegeben

MR

MOTOR-DRIVE UNIT ETOS®
ETOS TOP DRIVE 1200
DIMENSION DRAWING

Serialnummer
–

Materialnummer 101335000E

Blatt 1 / 1

A3

2.5.2 Assemblies

2.5.2.1 Connection terminals

Terminal block	Maximum permitted operating voltage
X1	Max. 250 VAC
X10	Max. 150 VAC

Table 13: Maximum permitted operating voltage of the connection terminals for external circuits

2.5.2.2 Voltage measurement UI 5-3

	UI 5-3
Measurement	3-phase
Voltage measurement	U_N (RMS): 100 VAC Measuring range (RMS): 19.6...150 V AC Measuring accuracy (at U_N, -25...+70 °C): < ±0.3% Intrinsic consumption: < 1 VA Measurement category III in accordance with IEC 61010-2-30

Table 14: Technical data of the UI 5-3 assemblies

Interfaces

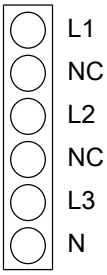
Interface	Pin	Description
	L1	Voltage input for phase L1
	NC	Not used
	L2	Voltage input for phase L2
	NC	Not used
	L3	Voltage input for phase L3
	N	Voltage input for neutral conductor

Table 15: Voltage measurement

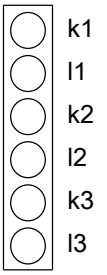
Interface	Pin	Description
	k1, I1, k2, I2, k3, I3	No function

Table 16: Current measurement

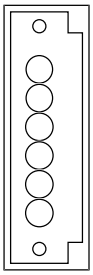
Interface	Pin	Description
	1A, 1B, 1C, 2A, 2B, 2C	No function

Table 17: Relay

2.5.2.3 DIO 28-15

		DIO 28-15
Inputs (plug-based electrical isolation)	Quantity	28
	Logical 0	0...10 V AC (RMS) 0 to 10 V DC
	Logical 1	18...260 V AC (RMS) 18...260 V DC (RMS)
	Input current	min. 1.3 mA
	Simultaneity factor (at 70°C ambient temperature and input voltage ≥ 230 V)	max. 50%
Outputs (floating relay outputs)	Number (number of change-over contacts in parentheses)	15 (9)
	Contact load capacity	Alternating current mode: U_N: 230 V AC; I_N: 5 A Direct current mode: See diagram
	Simultaneity factor (if output is loaded with 5 A)	Up to 60°C: 100%, > 60°C: -5%/K

Table 18: Technical data for the DIO 28-15 assembly

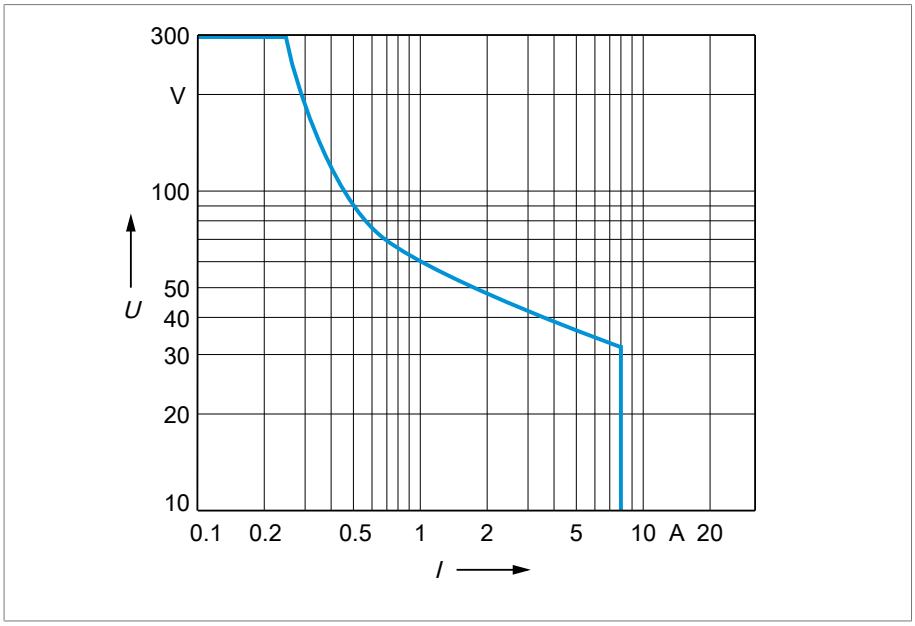


Figure 3: Contact load capacity DIO

⚠ CAUTION

Electric shock!

The inputs of the DIO assembly have plug-based electrical isolation. A mixture of voltage ranges (e.g. extra low voltage and low voltage) or various phases within a plug can lower the protection against electric shock.

► Use the same voltage ranges within a plug.

► Use the same phase within a plug.

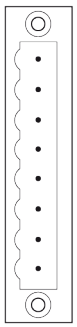
Interface	Pin				Description
	1	9	17	25	Input
	2	10	18	26	Input
	3	11	19	27	Input
	4	12	20	28	Input
	5	13	21	29	Input
	6	14	22	30	Input
	7	15	23	31	Input
	8	16	24	32	Common

Table 19: Digital inputs

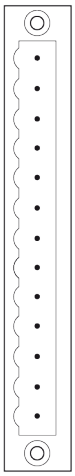
Interface	Pin			Description
	1A	6A	11A	Break contact
	1C	6C	11C	Source contact
	1B	6B	11B	Make contact
	2A	7A	12A	Break contact
	2C	7C	12C	Source contact
	2B	7B	12B	Make contact
	3A	8A	13A	Break contact
	3C	8C	13C	Source contact
	3B	8B	13B	Make contact
	4C	9C	14C	Source contact
	4B	9B	14B	Make contact
	5C	10C	15C	Source contact
	5B	10B	15B	Make contact

Table 20: Digital outputs

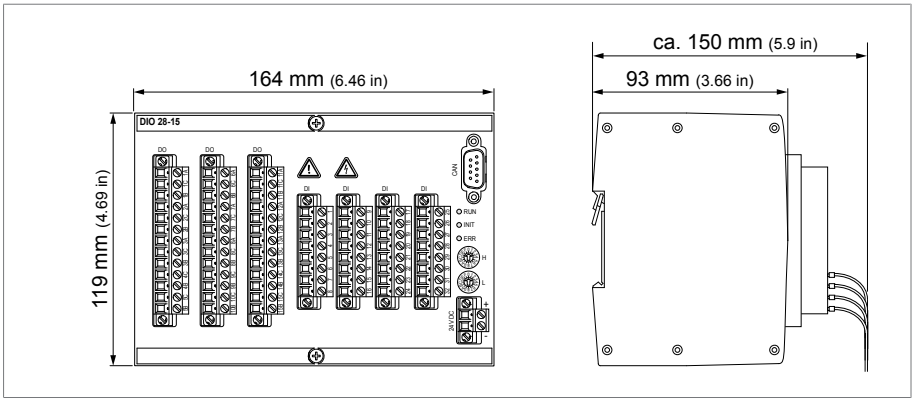


Figure 4: DIO 28-15 dimensions

2.5.2.4 CPU I

	CPU I
Processor	266 MHz
RAM	256 MB
Interfaces	1x serial RS232/485 (electrically isolated) 3x Ethernet 10/100 Mbps 1x USB 2.0 1x CAN (electrically isolated) 1x CAN
NVRAM (SRAM with battery backup)	256 kB

	CPU I
Application memory	1 GB
Power supply	+24 V DC (18...36 V DC)

Table 21: Technical data for the CPU I assembly

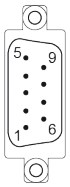
Interface	Pin	Description
	2	RXD (RS232)
	3	TXD (RS232)
	5	GND (RS232, RS485)
	6	RXD+/TXD+ (RS485)
	9	RXD-/TXD- (RS485)

Table 22: COM2 (RS232, RS485)

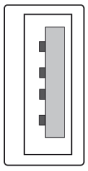
Interface	Pin	Description
	1	VCC
	2	D-
	3	D+
	4	GND

Table 23: USB 2.0

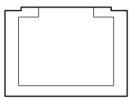
Interface	Pin	Description
	1	TxD+
	2	TxD-
	3	RxD+
	4	NC
	5	NC
	6	RxD-
	7	NC
	8	NC-

Table 24: ETH1, ETH 2.1, ETH 2.2 (RJ45)

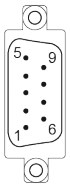
Interface	Pin	Description
	2	CAN-L
	3	CAN-GND
	7	CAN-H

Table 25: CAN1, CAN2

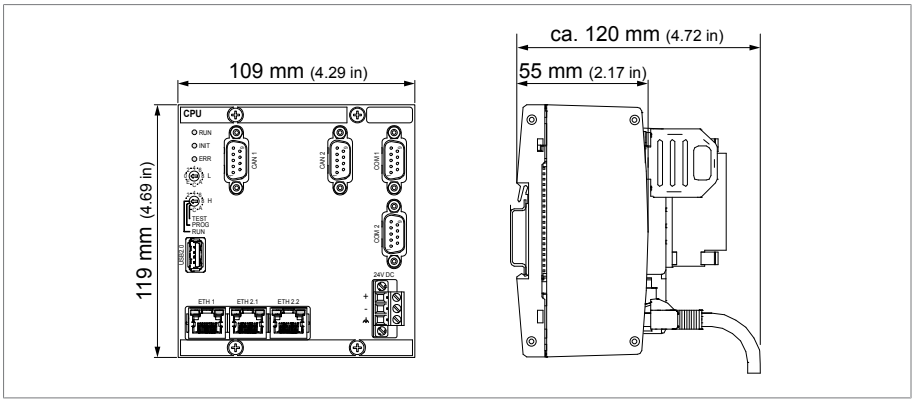


Figure 5: CPU dimensions

Optional accessories	
CAN bus	Terminating resistor ▪ D-SUB plug connector (9-pole) ▪ R = 120 Ω
	Connector with terminal strip for directly connecting CAN lines
Media converter for COM2 interface (only RS232)	Adapter from D-SUB (9-pole) to fiber-optic cable: ▪ ACF660/ST: F-ST, 660 nm, range max. 60 m at 40 kBd ▪ ACF660/SMA: F-SMA, 660 nm, range max. 60 m at 40 kBd ▪ ACF850/ST: F-ST, 850 nm, range max. 1,000 m at 40 kBd ▪ ACF850/SMA: F-SMA, 850 nm, range max. 1,000 m at 40 kBd

Table 26: Optional accessories

2.5.2.5 MC 2-2 and SW 3-3

	MC 2-2
Description	Media converter
Interfaces	2x RJ45 2x duplex LC (SFP)
RJ45	Max. 100 m (per section) 10/100 Mbit/s Cable impedance 100 Ω
Fiber-optic cable	Max. 2,000 m 100 Mbit/s Light-emitting diode: class 1 Wave length: 1310 nm Max. optical output power: <1 mW (in accordance with IEC 60825-1:2014)

Table 27: Technical data for the MC 2-2 assembly

	SW 3-3
Description	Managed fast Ethernet switch per IEEE 802.3, store-and-forward switching
Interfaces	Media converters: ▪ 1x RJ45 ▪ 1x duplex LC (SFP) Managed switch with redundancy function: ▪ 2x RJ45 ▪ 2x duplex LC (SFP)
Redundancy protocols	PRP[1], RSTP
Time synchronization	PTPv2 (IEEE 1588-2008)
RJ45	Max. 100 m (per section) 10/100 Mbps Cable impedance 100 Ω
Fiber-optic cable	Max. 2,000 m 100 Mbps Light-emitting diode: class 1 Wavelength: 1,310 nm Max. optical output power: <1 mW (in accordance with IEC 60825-1:2014)

Table 28: Technical data for the SW 3-3 assembly

[1)] Factory setting

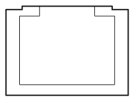
Interface	Pin	Description
	1	TxD+
	2	TxD-
	3	RxD+
	4	NC
	5	NC
	6	RxD-
	7	NC
	8	NC-

Table 29: ETHxx (RJ45)

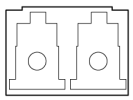
Interface	Description
	Fiber glass 50/125 and 62.5/125 multimode

Table 30: ETHxx (duplex LC SFP)

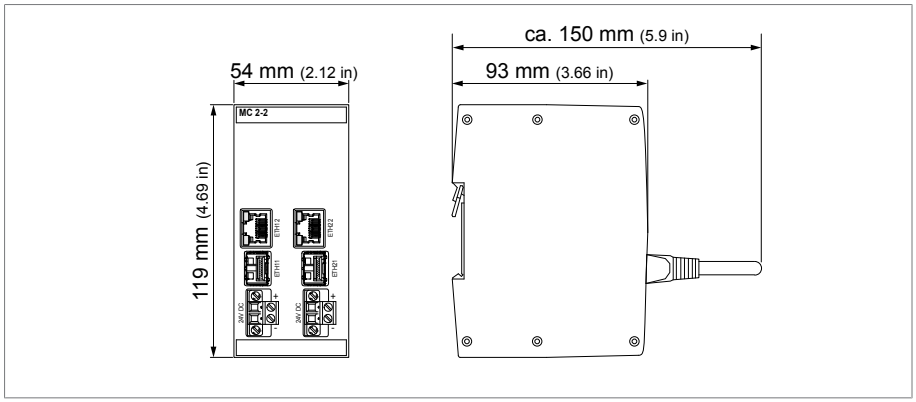


Figure 6: MC2-2 and SW3-3 dimensions

2.5.2.6 BEM 1/BES 1

	BEM 1	BES 1
Description	Master	Slave
Interfaces	1 fiber-optic cable	
Fiber-optic cable	Max. length: 40 m	
(Polymeric optical fiber)	Min. bending radius: 30 mm	
Integrated power supply	No	Yes

	BEM 1	BES 1
Permissible voltage range	-	18...34 V DC U_N: 24 VDC
Power consumption	-	14 W

Table 31: Technical data for the BEM 1 and BES 1 assemblies

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93059 Regensburg

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sales@reinhausen.com

www.reinhausen.com

8123065/00 EN - MSENSE® BM -

THE POWER BEHIND POWER.