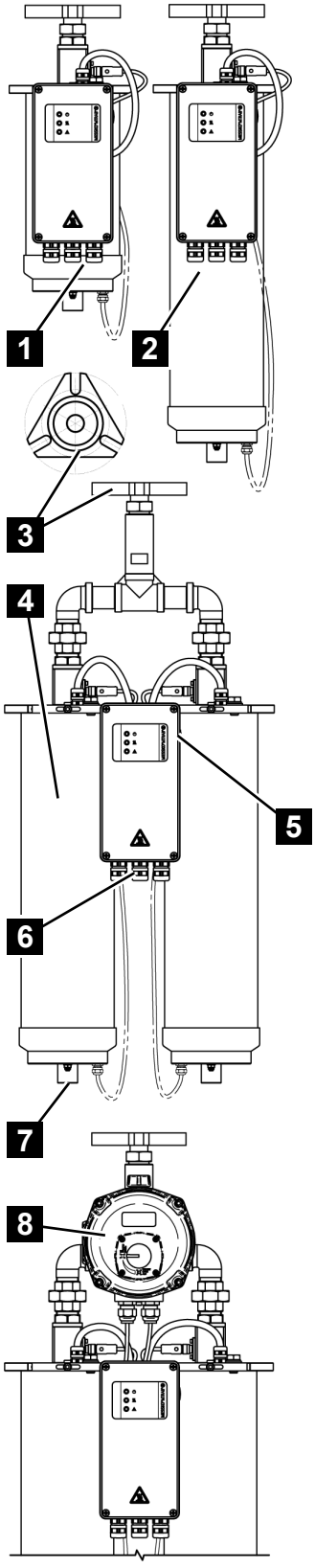
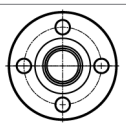
MESSKO® MTRAB®
Dehydrating Breather
Technical data



Product variants

This technical document contains detailed information about the technical properties of the product. If you would like to place an order, please use the MESSKO inquiry and order specification, which you can also find on our website http://www.reinhausen.com below the respective product.

MESSKO® MTRAB® product line (see application table page 4)		
1 DB100 / DB100T		
2 DB200T		
4 DB200D-T (duplicate)		
8 DB200G (duplicate) gamma controller		Not available in offshore version
Protective coating color	RAL 7033 standard cement gray with C4H coating in accordance with DIN EN ISO 12944-9	
	RAL 7038 standard agate gray with C4H coating in accordance with DIN EN ISO 12944-9	
Offshore version	Includes: – Flange in offshore version – Connection box in offshore version with CX coating in accordance with DIN EN ISO 12944-9 – Cable screw connection in stainless steel version (1.4404)	
	Further designs available upon request	

MESSKO® MTRAB® connection requirements		
6 Cable screw connections	3x M20x1.5	Nickel-plated brass
	3x M20x1.5	Stainless steel
	3x 1/2“ - 14 NPT	Nickel-plated brass
Analog output 1	4...20 mA	Temperature -50...+80 °C
	0...20 mA	Temperature -50...+80 °C
Analog output 2	4...20 mA	Humidity 0...100%
	0...20 mA	Humidity 0...100%
Mounting flange	**3** DIN flange; similar to DIN 42 562-3; see Appendix 1 No. 1 [► 5]	
	RM flange; in accordance with DIN 2558; only for type DB100; see Appendix 1 No. 2 [► 5] 	
	Flange for 1/2" screws; see Appendix 1 No. 3 [► 5] 	
	Customer-specific flanges on request	
Supply voltage	100...127 V DC	100...127 V AC, 50/60 Hz
or	200...240 V DC	200...240 V AC, 50/60 Hz

Accessories	
Insect grille for stainless steel filters	See Appendix 7 [► 5]; not together with filter heater
Spiral coiled hose for protection of electric lines against damage (e.g. animal biting)	
7 Filter heater (in HT version for applications in cold regions, see technical data [► 2])	
Lateral mounting	See Appendix 2 and 3 [► 5]
Protective grate	See Appendix 7 [► 5]
RS485 interface	Control system connection via Modbus protocol
Data logger software	For the evaluation of the MTRAB data

Technical data

Operating conditions	
Site of operation	Indoors and outdoors
Contamination level	4
Relative humidity (operation and storage)	Inside the connection box: 5 to 95% (non-condensing)
Ambient temperature	DB100/200/200D: 0...+70°C / as HT version* -50...+70°C DB200G: 0...+70°C / as HT version* -20...+70°C *) HT version for applications in cold regions, i.e. ambient temperature is continuously below 0°C over a time period of 20 days.
Storage temperature	-50°C...+70°C
Degree of protection	IP66/IP67 in accordance with IEC 60 529
Overvoltage category	III
Protection class	I
Installation altitude	2,000 m above sea level
General	
Materials	All exterior parts weather-proof, transformer-oil-resistant and UV-resistant; saltwater-resistant version (offshore) optional
Color	Flange and metal parts: anodized (aluminum); Connection box: powder-coated (C4H or, as an option, CX in accordance with DIN EN ISO 12944-9) RAL 7033 (cement gray) or RAL 7038 (agate gray)
Weight	DB100: approx. 8 kg; DB200: approx. 12 kg; DB200D: approx. 23 kg; DB200G: approx. 31 kg
Dimensions	See appendices [► 5]
Flange connection	See Appendix 1 [► 5]
Desiccant	Colorless, nontoxic silica gel; Quantity in accordance with the following application table [► 4]
Power supply	
Nominal voltage	200...240 V AC 50/60 Hz; 200...240 V DC; Pmax. 2,500 W or 100...127 V AC 50/60 Hz or 100...127 V DC; Pmax. 2,500 W
Power consumption	Max. 100 mA (in normal operation); Increased power consumption during regeneration; [1]) Heating current in accordance with the following application table [► 4]
Heating current	Current during the heat-drying process (approx. 1-2 min. after activation of heating). Values in accordance with the following application table [► 4]
External fuse protection	Miniature circuit breaker characteristic C, K, Z with nominal current of 16 A or 20 A
Rated insulation voltage	500 V DC (in accordance IEC 61010-1) (L to ⏚, N to ⏚)
RTC buffer battery	CR2032 (recommendation CR2032 from Renata or CR2032W from Murata Electronics)
Terminal box	
	Ventilated to prevent water condensation
Cable glands	M20x1.5 or 1/2" – 14 NPT nickel-plated brass M20x1.5 also available as an option in stainless steel for offshore applications
Connection terminals	Supply connection, relay, analog outputs: 1.5...4 mm^2, AWG11-15 (solid or flexible), tightening torque 0.5...0.6 Nm RS485 interface: 0.14...1.5 mm^2, AWG15-26 (solid or flexible), tightening torque 0.25 Nm
Status display	3 LEDs visible from outside
Test button	For the device function test
Fuse	5x20 mm; T2A; 400 V DC/500 V AC
Signaling contacts	
Type of contact	1 x changeover contact, silica gel regeneration signaling relay
	1 x changeover contact, device error signaling relay (failsafe)
Contact material	Hard-gold-plated gold contacts to ensure reliable function in applications with low switched currents. Minimum load: ≥ 1 mV/1 mA

Signaling contacts	
Dielectric strength	Between circuits and ground: ≥ 2 kV, 50 Hz, duration 1 minute; Between contacts in the open position: ≥ 1 kV, 50 Hz, duration 1 minute; Impulse voltage withstand strength between contacts: ≥ 3 kV, 1.2/50 µs
Reliable switching capacity	240 V AC, 8 A (IEC 61810, 100,000 switching cycles); 240 V AC, 10 A, 2,000 VA (UL 508, 30,000 switching cycles); 30 V DC, 8 A, 240 W; 240 V DC, 300 mA
Maximum switching capacity	In accordance with IEC 60076-22-7, 1,000 switching cycles: 230 V AC, 1,840 VA / cos phi > 0.5 250 V AC, 2,500 W / resistive load 24 V DC, 192 W / resistive load

Analog outputs (active)	
Output Analog 1 in the upper air spout	Temperature: -50...+80°C 4...20 mA: 7.5°C/mA or optionally 0...20 mA: 6.0°C/mA Measuring error: 4...20 mA: +/- 2.3°C 0...20 mA: +/- 1.8°C
Analog output 2 in the upper air spout	Humidity: 0...100% 4...20 mA: 6.25% R.H./mA or optionally 0...20 mA: 5.0% R.H./mA Measuring error: 4...20 mA: +/- 1.9% R.H. 0...20 mA: +/- 1.5% R.H.
Error signal in the event of sensor failure	< 3.6 mA (with 4...20 mA output signal); > 22 mA (with 0...20 mA output signal)
Load resistance	0...600 Ω

Options	
Offshore	As per the requirements in accordance with DIN EN ISO 12944-9 with corrosion-protection class CX
Insect grille	Use in the dust protection tube, not together with filter heater, see Appendix 7 [► 5]
Cable protection	Protection of the cable against damage such as animal biting, designed as a spiral coiled hose (stainless steel, suitable for offshore applications); See Appendices 4 and 5 [► 5]
Filter heater	HT version: With heated stainless-steel filter; recommended for cold regions with an ambient temperature that is continuously below 0°C for more than 20 days in order to guarantee proper functioning
	Switching point: < 5°C (switch on)
Lateral mounting	See Appendices 2 and 3 [► 5]
Protective grate	See Appendix 7 [► 5]
Data logger software	For the evaluation of the MTRAB data
RS485 interface	For connection to a control system via Modbus protocol
Overvoltage protection	For protection against overvoltages

Standards and directives

Electrical safety	
IEC 61010-1:2010 UL 61010-1 CAN/CSA-C22.2 No. 61010-1:2012	Safety requirements for electrical measurement, control and regulation equipment and laboratory instruments ▪ Protection class I ▪ Overvoltage category III ▪ Contamination level 2

Electromagnetic compatibility
IEC 61000-6-5, IEC/KC 61000-6-2, IEC/KC 61000-6-4, FCC 47 CFR Part 15B, ICES-003

Environmental durability tests	
IEC 60529	IP66, IP67
IEC 60068-2-1	Dry cold -25°C / 96 hours
IEC 60068-2-2	Dry heat +70°C / 96 hours

Power transformer and reactor fittings	
IEC 60076-22-7	Accessories and fittings

Application table

Application	MTRAB type	Silica gel
Tap changer	DB100	1.1 kg
Arc suppression coil (Petersen coil)	DB100	1.1 kg
Air-filled cable boxes	DB100	1.1 kg
Vehicle transformers	DB100	1.1 kg
Network transformers ≤ 40 MVA	DB100T	1.1 kg
Network transformers and step-up transformers > 40 MVA ≤ 200 MVA	DB200T	2.2 kg
Network shell transformers > 200 MVA	DB200D-T or 2x DB200T[2)]	4.4 kg
Phase shifter ≤ 40 MVA	DB100T	1.1 kg
Phase shifter > 40 MVA ≤ 200 MVA	DB200T	2.2 kg
Phase shifter > 200 MVA	DB200D-T or 2x DB200T[2)]	4.4 kg
Reactors ≤ 40 Mvar	DB100T	1.1 kg
Reactors > 40 Mvar ≤ 200 Mvar	DB200T	2.2 kg
Reactors > 200 Mvar	DB200D-T or 2x DB200T[2)]	4.4 kg
High voltage DC transmission (HVDCT) transformers	DB200D-T or 2x DB200T[2)]	4.4 kg
Furnace transformers	DB200G	2.2 kg
Underground hall transformers	DB200G	2.2 kg
GSU machine transformers	DB200G	2.2 kg

Table 1:

MTRAB type	Heating current [1)]		Silica gel	Control[3)]
	U_V = 120 V	U_V = 230 V		
DB100	1.2 A	0.6 A	1.1 kg	Alpha
DB100T	1.2 A	0.6 A	1.1 kg	Beta
DB200T	2.3 A	1.2 A	2.2 kg	Beta
DB200D-T	4.7 A	2.4 A	4.4 kg	Beta
DB200G	2.3 A	1.2 A	4.4 kg	Gamma

[1)] Heating current during the heating process (approx. 1-2 min. After heating activation).

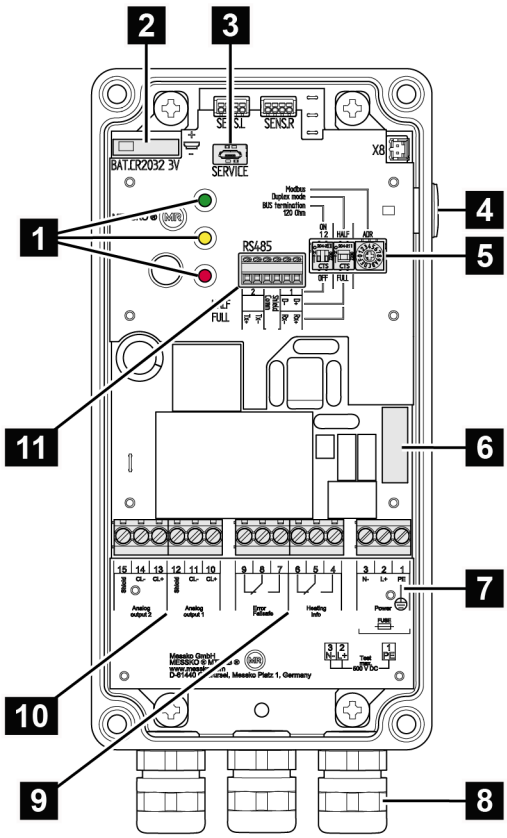
[2)] Mount individually on the conservator tank, no parallel mounting, see the MESSKO® MTRAB® Dehydrating Breather operating instructions.

[3)] **Alpha control:** Status-dependent control of the heat-drying process through humidity monitoring.

Beta control: Self-learning system with status-dependent control of the heat-drying procedure through humidity monitoring and temperature-dependent determination of the most advantageous time to perform heat-drying.

Gamma controller: System for applications with non-periodic breathing behavior. By monitoring the air humidity, the dehydrating chambers are alternately regenerated based on status.

MTRAB connection box



1	LEDs for status display	2	RTC buffer battery (type CR2032)
3	USB service interface (for MR Service)	4	Test button
5	Modbus settings	6	Fuse
7	Supply voltage	8	Cable screw connection M20x1.5 or 1/2" 14NPT
9	Signaling relay	10	Analog outputs
11	RS485 interface		

Appendix

For dimensional drawings, refer to the following pages.

Appen-dix	Drawing No.	Dehydrating breather	Version
1	SED 6653712 000 00	MTRAB®	Flange connections
2	SED 6356077 000 00	MTRAB® DB100/DB200	With additional fastening points on the side
3	SED 6367297 000 00	MTRAB® DB200D-T	With additional fastening points on the side
4	SED 6600056 000 00	MTRAB® DB100/DB200	With cable protection
5	SED 6600296 000 00	MTRAB® DB200D-T	With cable protection
6	SED 6368543 000 00	MTRAB® DB200G	With gamma control
7	SED 6356099 000 00	MTRAB®	With protective grate and insect grille

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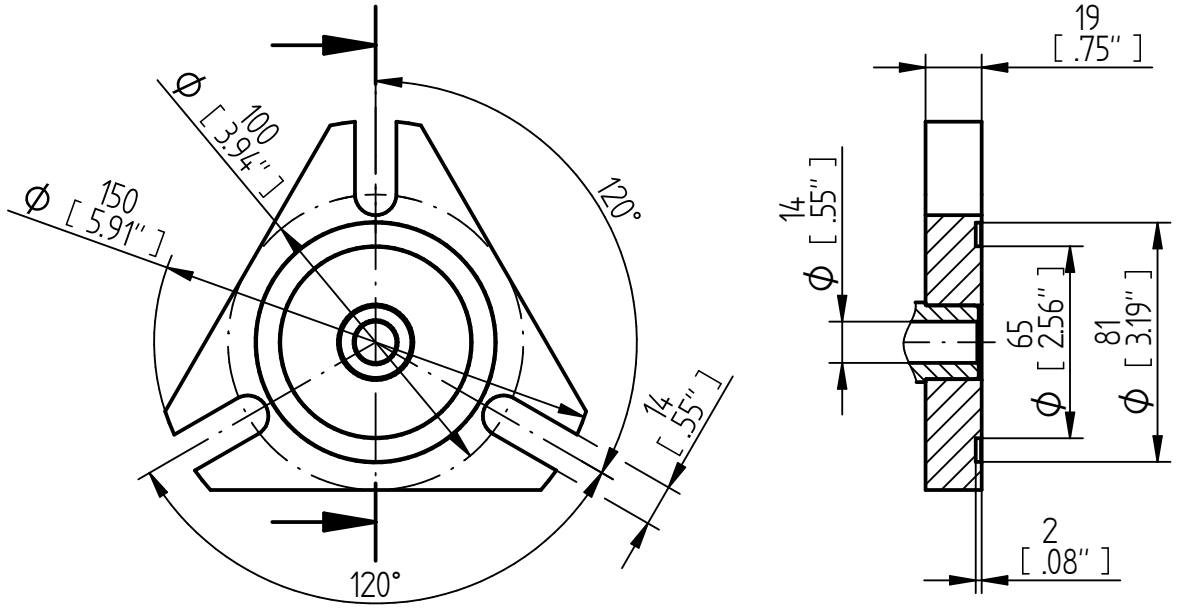
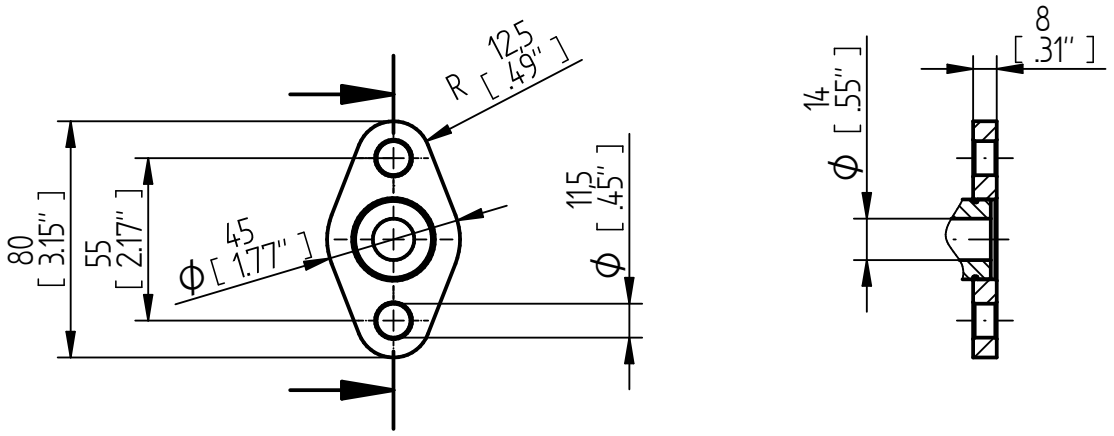
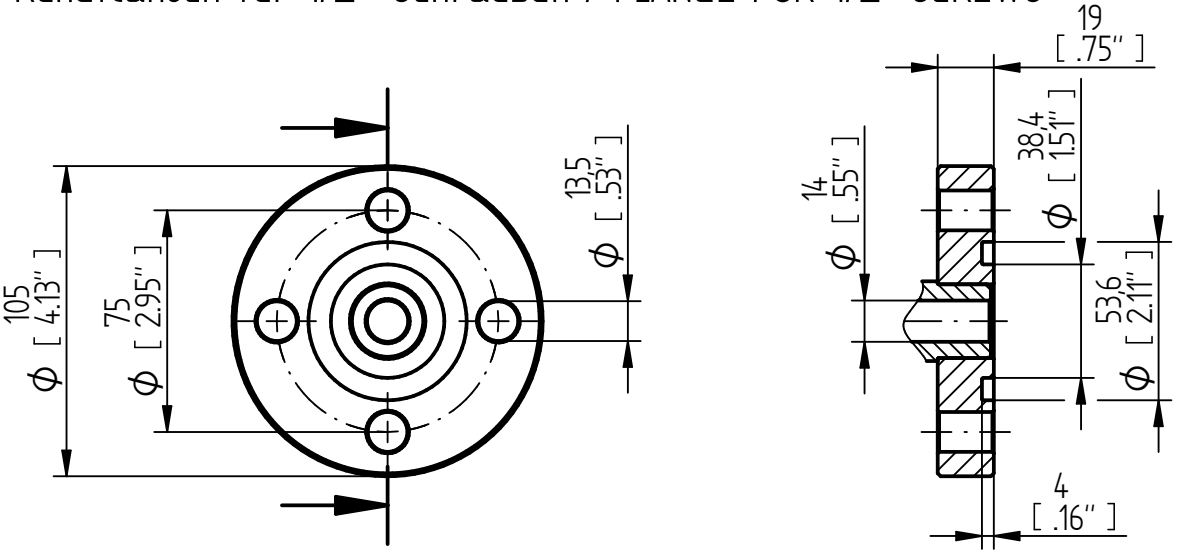
1 DIN-Flansch ähnlich / DIN FLANGE SIMILAR TO DIN 42562-3



2 RM-Flansch nach / RM FLANGE IN ACCORDANCE WITH DIN 2558



3 Rundflansch für 1/2"-Schrauben / FLANGE FOR 1/2" SCREWS



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Gez.	28.01.2019	RAEDLINGER	SED 6653712 000 00	
Gepr.	30.01.2019	HUBERTHO	Änderungsnummer	Maßstab
Norm.	30.01.2019	KLEYN	1090594	1:2,5

Maßangaben in mm, soweit nicht anders angegeben

MTRAB® Standard-Flanschanschlüsse
MTRAB® STANDARD FLANGE CONNECTIONS
Maßzeichnung / DIMENSION DRAWING

Serialnummer

Materialnummer 101227020M

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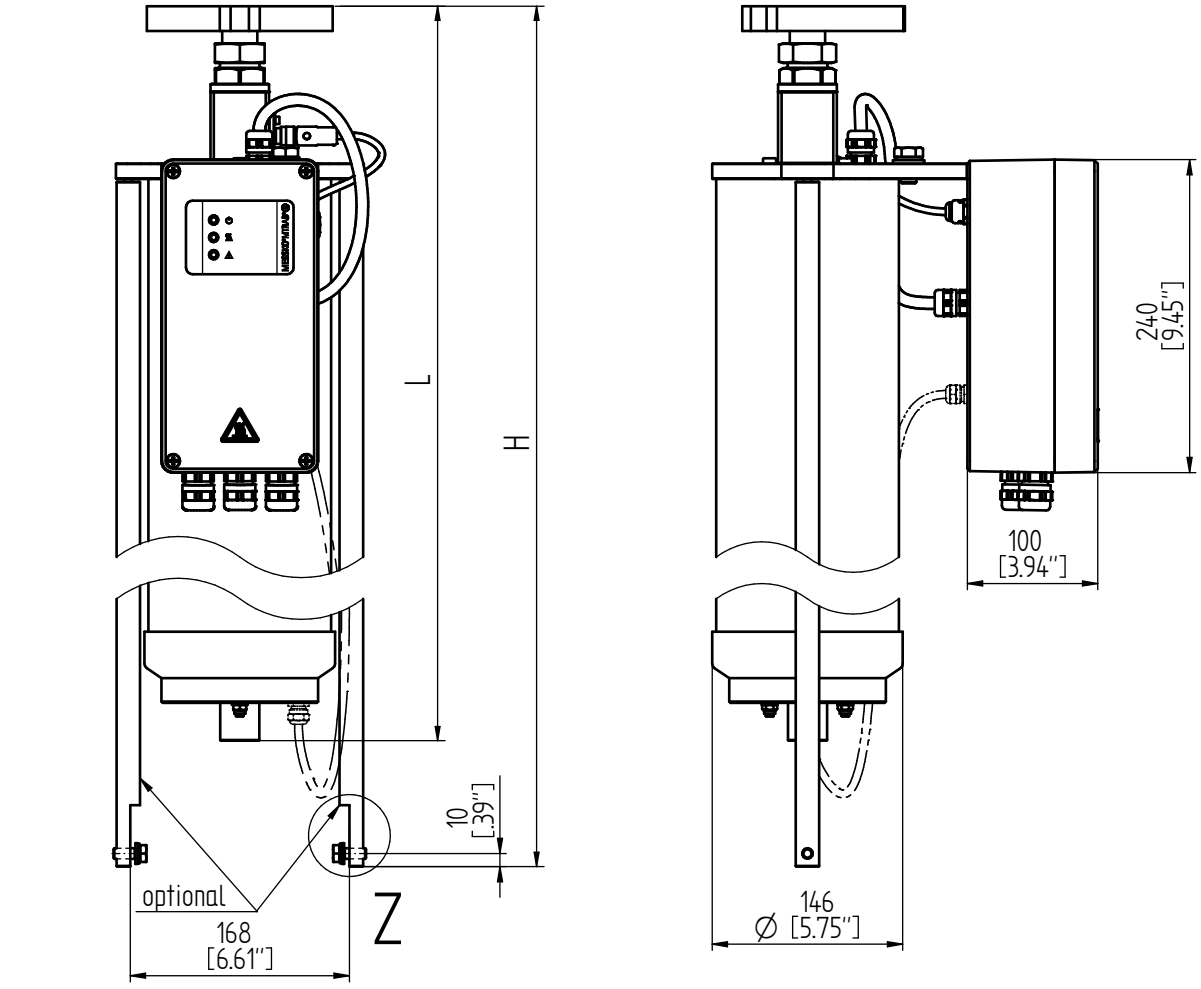

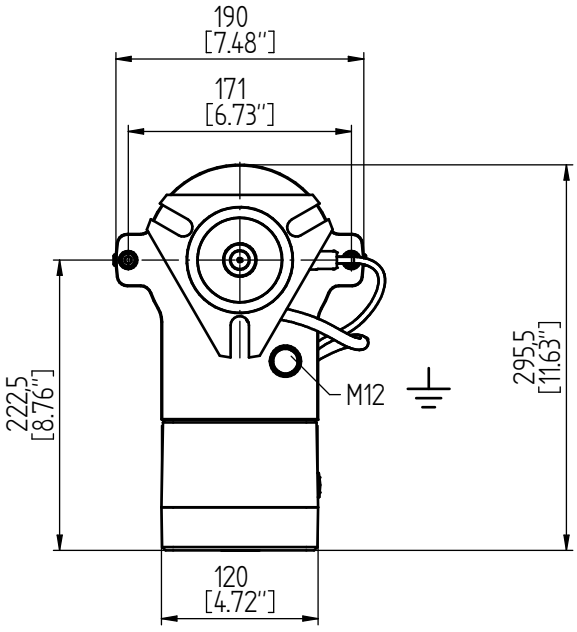

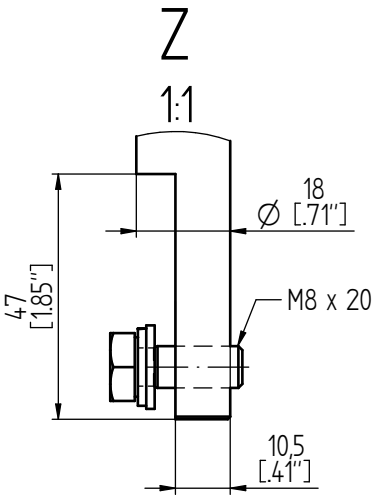

MTRAB-Abmessung mit Flansch / MTRAB DIMENSIONS WITH FLANGE	DB100 L	DB100 H	DB200 L	DB200 H
DIN-Flansch / DIN FLANGE	454,5 [17.89"]	634 [24.96"]	684,5 [27.11"]	781 [30.75"]
RM-Flansch / RM FLANGE	458,5 [18.05"]	638 [25.12"]	-	-
1/2"-Schrauben / 1/2" SCREWS	454,5 [17.89"]	634 [24.96"]	684,5 [27.11"]	781 [30.75"]

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CHKD.	17.12.2018	HUBERTHO	CHANGE NO.	SCALE
STAND	03.01.2019	KLEYN	1090594	1:4

DIMENSION IN mm EXCEPT AS NOTED

MTRAB® DB100/DB200 mit seitlicher Zusatzbefestigung /
MTRAB® DB100/DB200 WITH ADDITIONAL FASTENING POINTS
Maßzeichnung / DIMENSION DRAWING

SERIAL NUMBER

MATERIAL NUMBER 101213140M

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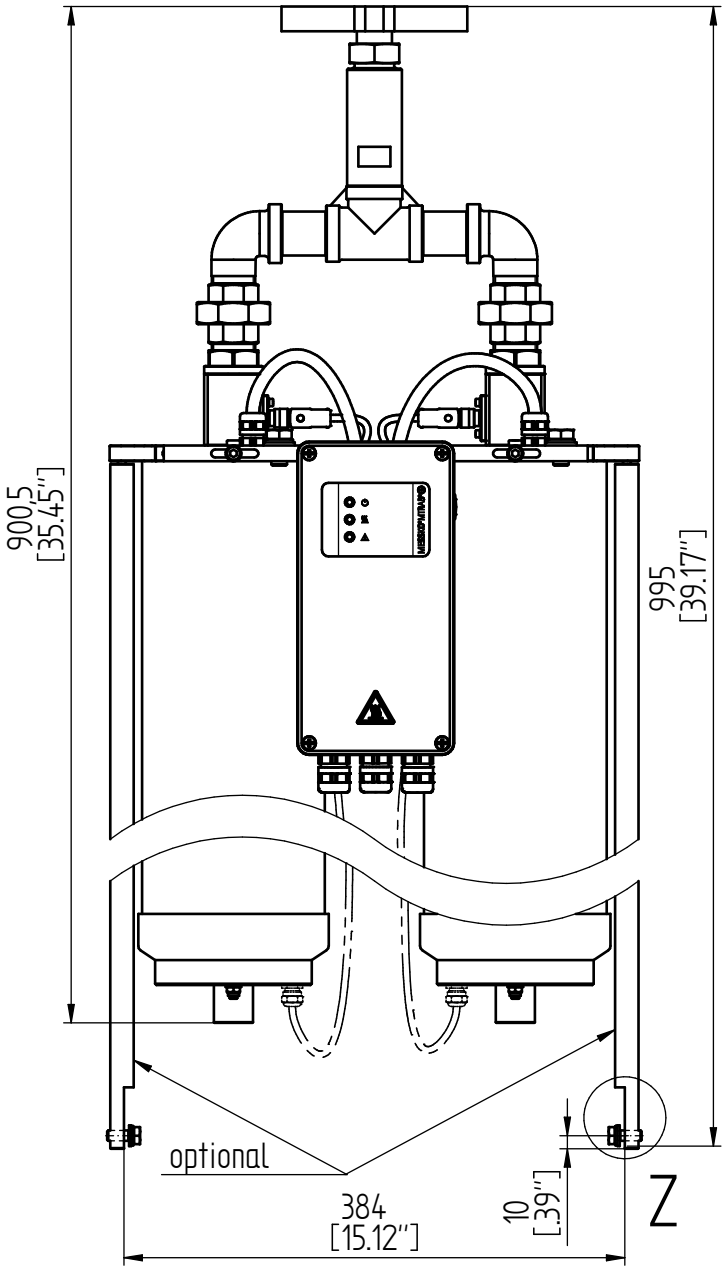

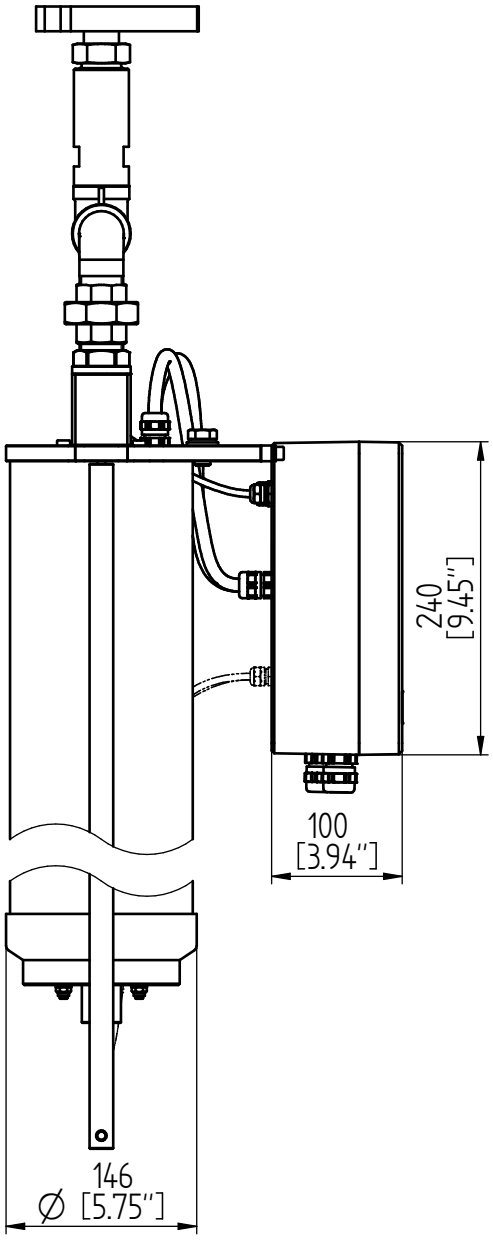

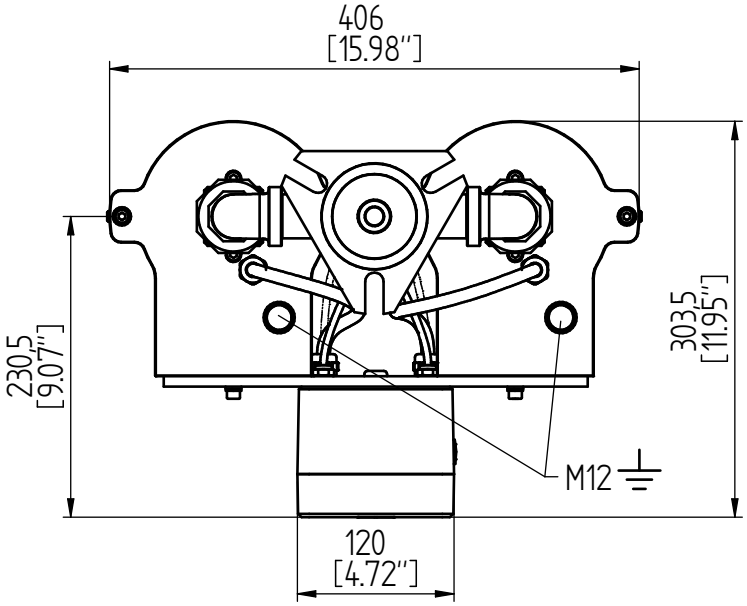

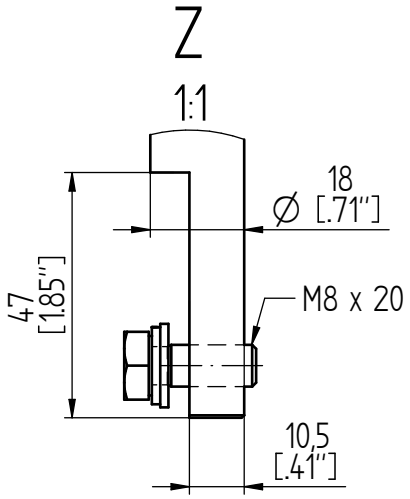

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EHKO.	17.12.2018	HUBERTHO	CHANGE NO.	SCALE
STAND	03.01.2019	KLEYN	1090594	1:4

DIMENSION IN mm EXCEPT AS NOTED

MTRAB® DB200D-T mit seitlicher Zusatzbefestigung /
MTRAB® DB200D-T WITH ADDITIONAL FASTENING POINTS
Maßzeichnung / DIMENSION DRAWING

SERIAL NUMBER

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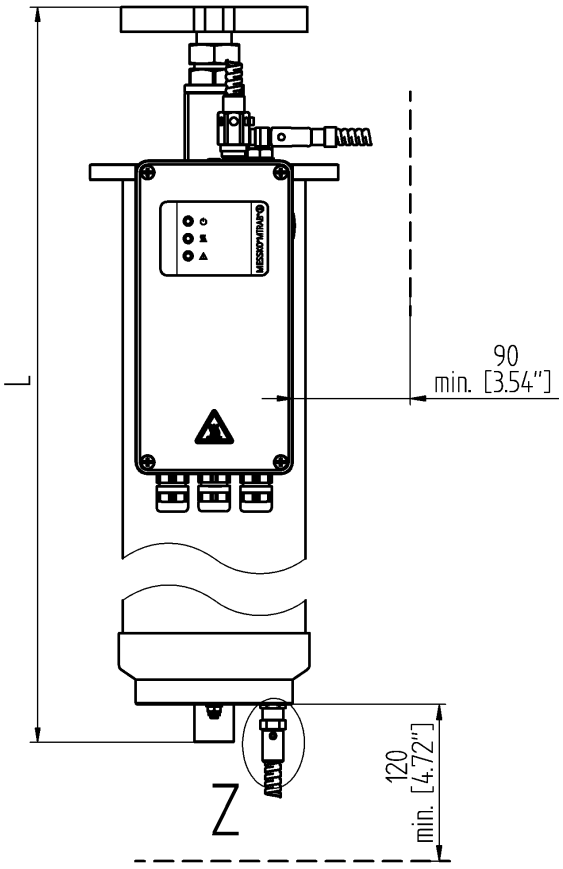
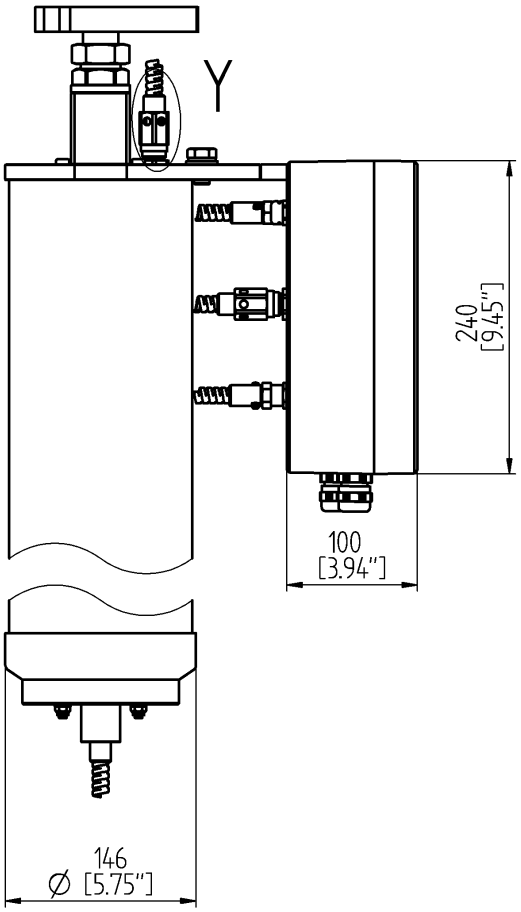
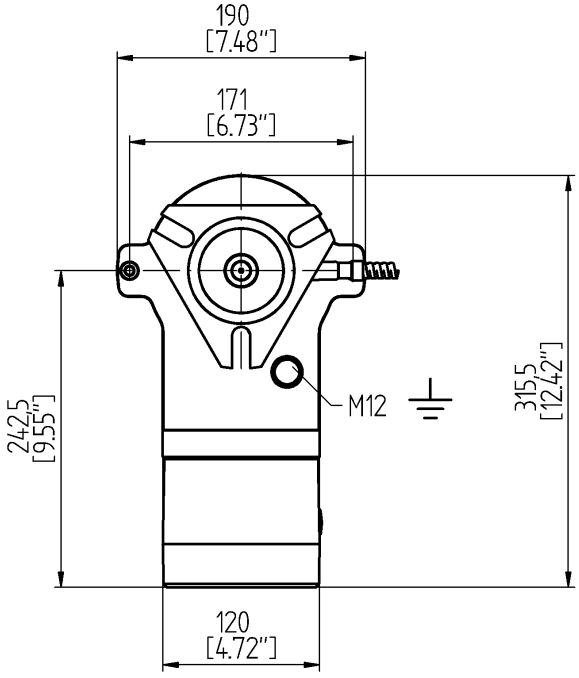
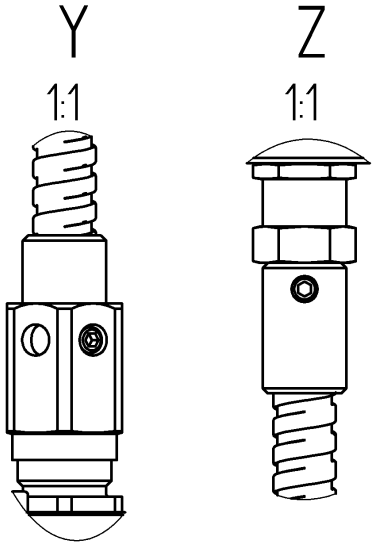






Kabelschutz / CABLE PROTECTION



MTRAB-Abmessung mit Flansch / MTRAB DIMENSIONS WITH FLANGE	DB100 L	DB200 L
DIN-Flansch / DIN FLANGE	454,5 [17.89"]	684,5 [27.11"]
RM-Flansch / RM FLANGE	458,5 [18.05"]	-
1/2"-Schrauben / 1/2" SCREWS	454,5 [17.89"]	684,5 [27.11"]

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EHKO.	01.03.2019	HUBERTHO	CHANGE NO.	SCALE
STAND	01.03.2019	GRADL	1090594	1:4

DIMENSION IN mm EXCEPT AS NOTED

MTRAB® DB100/DB200 mit Kabelschutz (optional) /
MTRAB® DB100/DB200 WITH CABLE PROTECTION (OPTIONAL)
Maßzeichnung / DIMENSION DRAWING

SERIAL NUMBER

MATERIAL NUMBER 101235300M

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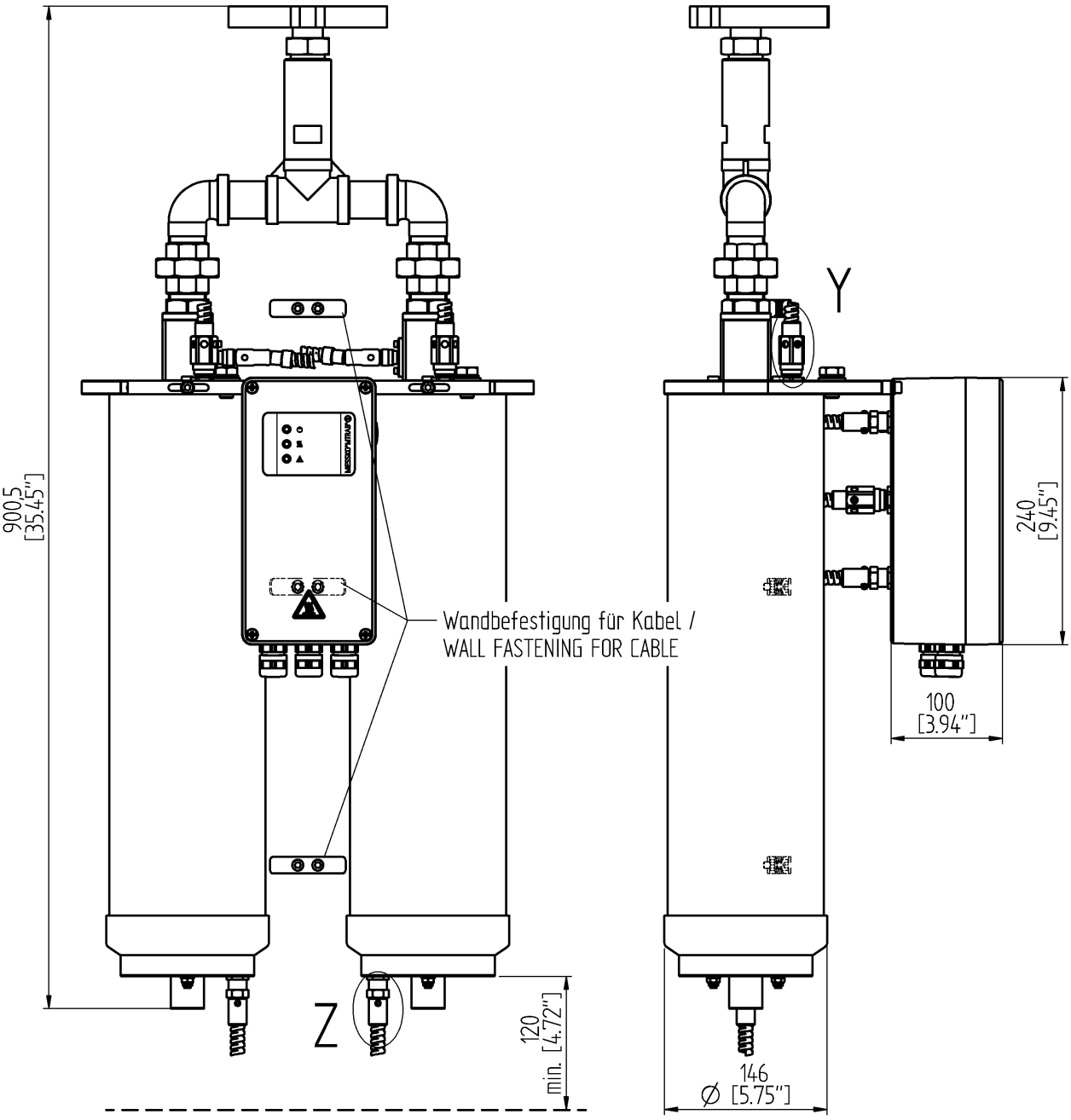

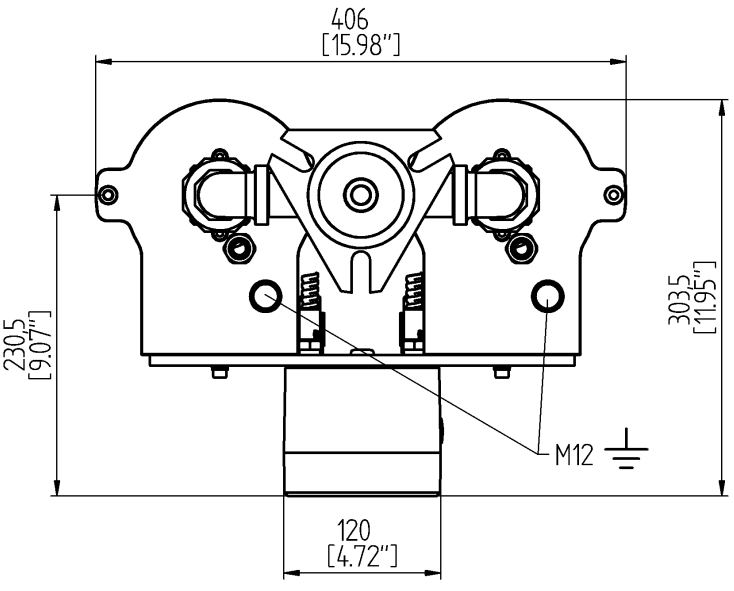

Kabelschutz / CABLE PROTECTION

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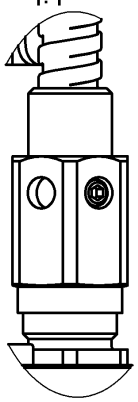

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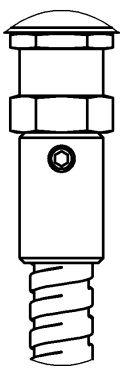

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STAND	01.03.2019	GRADL	1090594	1:4

DIMENSION IN mm EXCEPT AS NOTED

MTRAB® DB200D-T mit Kabelschutz (optional) /
MTRAB® DB200D-T WITH CABLE PROTECTION (OPTIONAL)
Maßzeichnung / DIMENSION DRAWING

SERIAL NUMBER

MATERIAL NUMBER 101235310M

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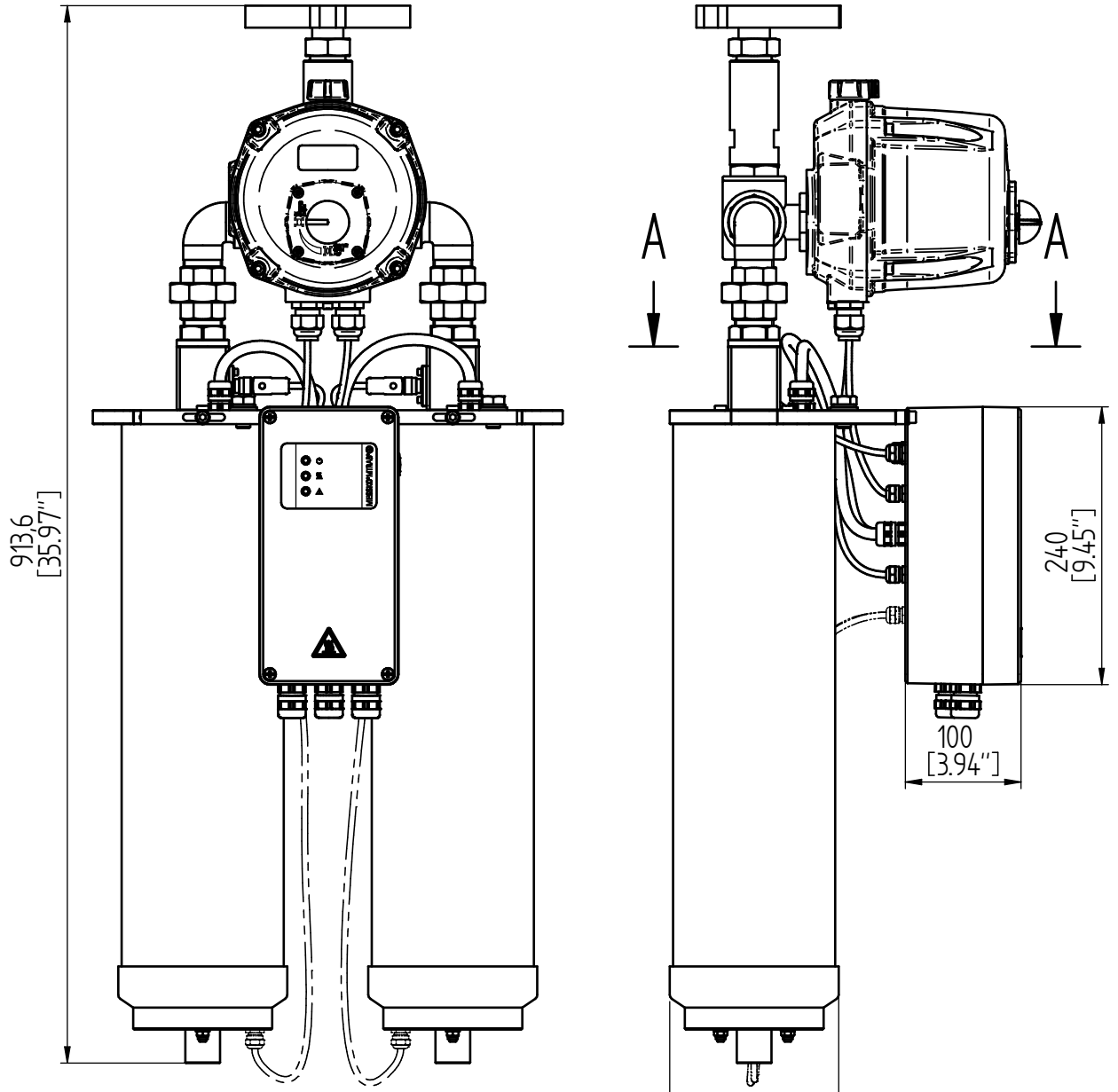

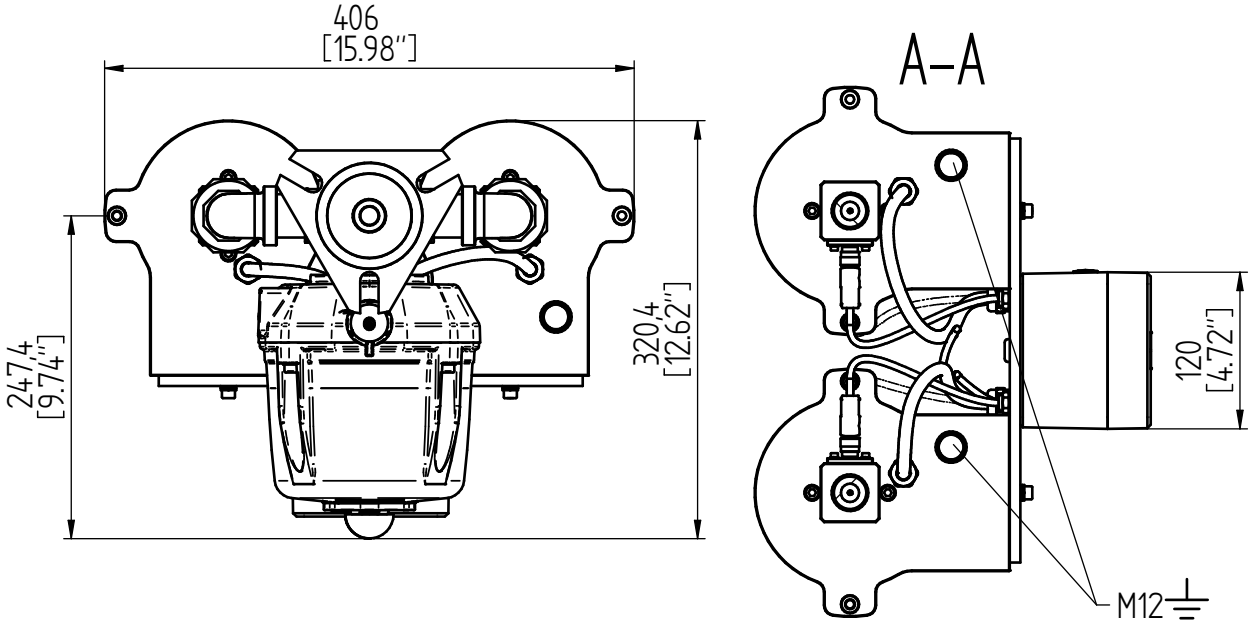

	DATE	NAME	DOCUMENT NO.	
DFTR.	12.12.2018	RAEDLINGER	SED 6368543 000 00	
CHKD.	17.12.2018	HUBERTHO	CHANGE NO.	SCALE
STAND	03.01.2019	KLEYN	1090594	1:4

DIMENSION IN mm EXCEPT AS NOTED

MTRAB® DB200G mit Gammasteuerung /
MTRAB® DB200G WITH GAMMA CONTROL
Maßzeichnung / DIMENSION DRAWING

SERIAL NUMBER

MATERIAL NUMBER 101213180M

SHEET 1 / 1

A3

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Maß / DIMENSION	DB100	DB200
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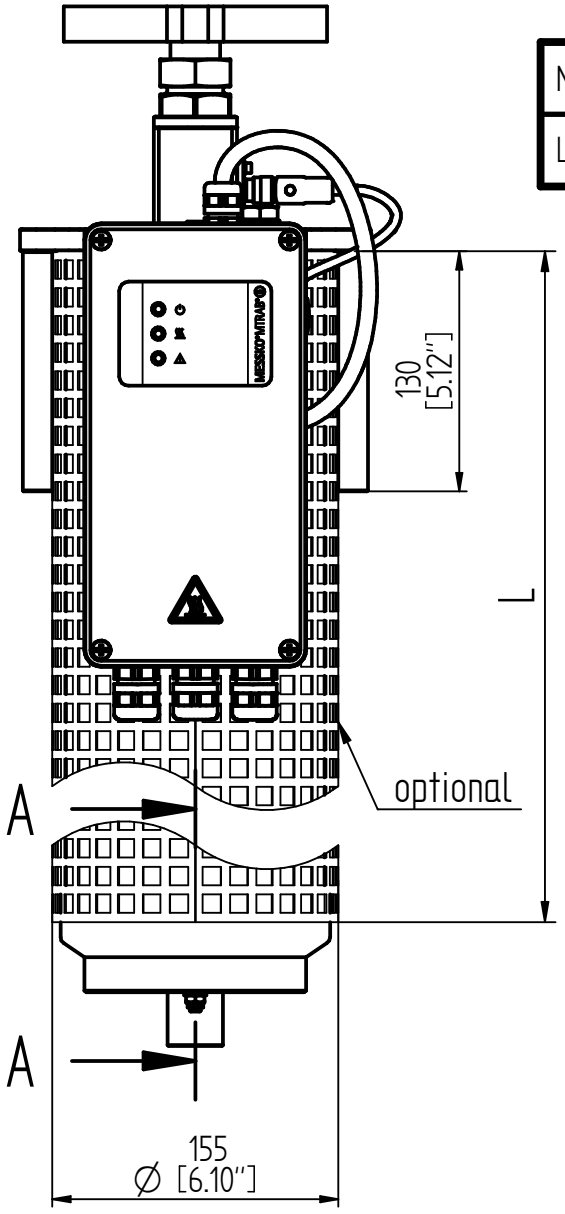

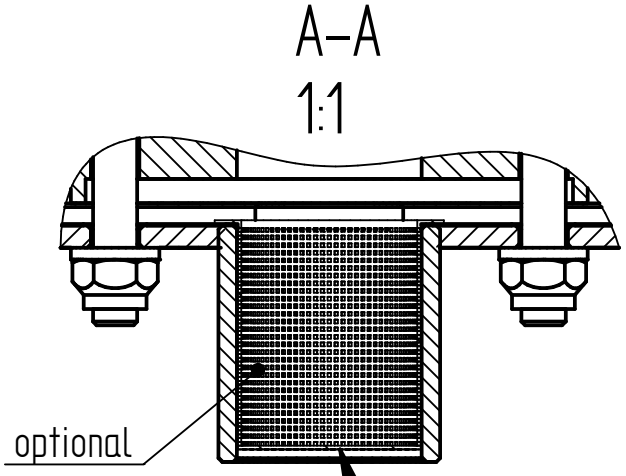

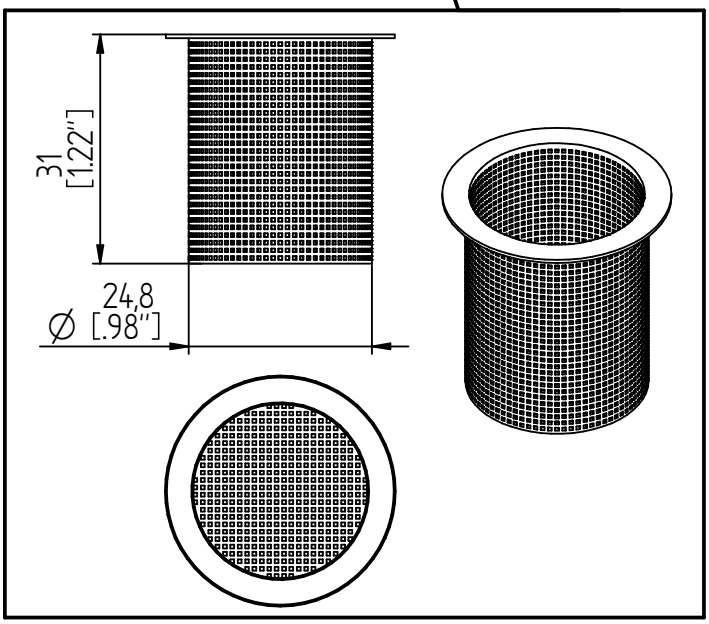

	DATE	NAME	DOCUMENT NO.	
DFTR.	12.12.2018	RAEDLINGER	SED 6356099 000 00	
CHKD.	17.12.2018	HUBERTHO	CHANGE NO.	SCALE
STAND.	03.01.2019	KLEYN	1090594	1:4

DIMENSION IN mm EXCEPT AS NOTED

MTRAB® mit Schutzgitter und Insektenschutzgitter / WITH PROTECTIVE GRATE AND INSECT PROTECTIVE GRATE
Maßzeichnung / DIMENSION DRAWING

SERIAL NUMBER

MATERIAL NUMBER 101213190M

SHEET 1 / 1

A4

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