

Design/versions

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.

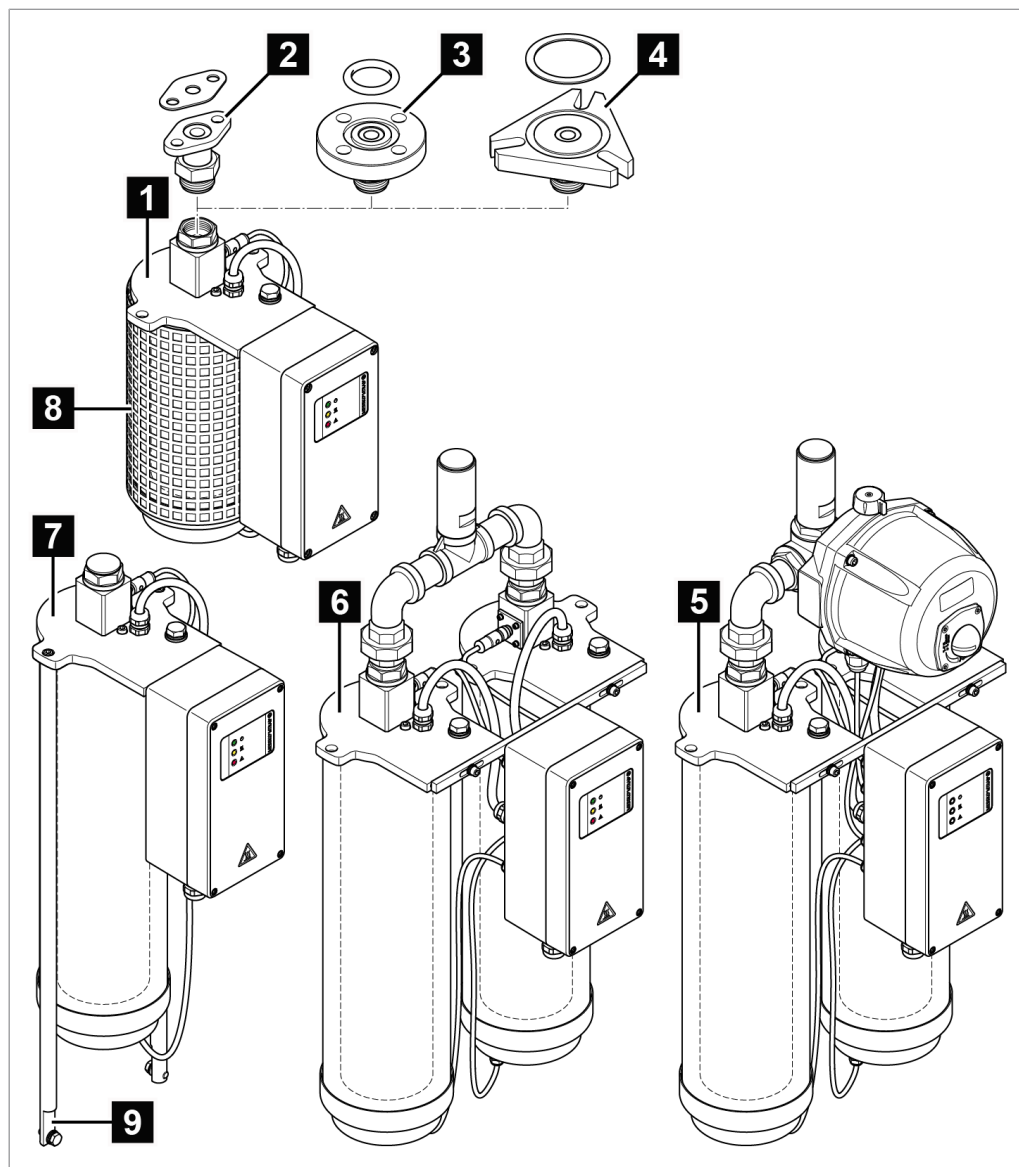


Figure 1: Design

1 DB100	2 2-hole RM flange*) (in accordance with DIN 2558) including Centellen WS3820 gasket; for DB100 only (optional)
3 4-hole circular flange*) for 1/2" screws including NBR75 gasket black (optional)	4 DIN flange *) (similar to DIN 42 562-3) including NBR70 gasket in accordance with DIN5305 and including mounting kit (optional)
5 DB200G (not offshore version)	6 DB200D
7 DB200	8 Protective grate (optional)
9 Additional fastening points on the side (optional)	



*) additional flanges can be delivered as an option

Function description

The dehydrating breather is used in oil-insulated transformers, reactors or tap changers for dehydrating the air sucked into oil conservators.

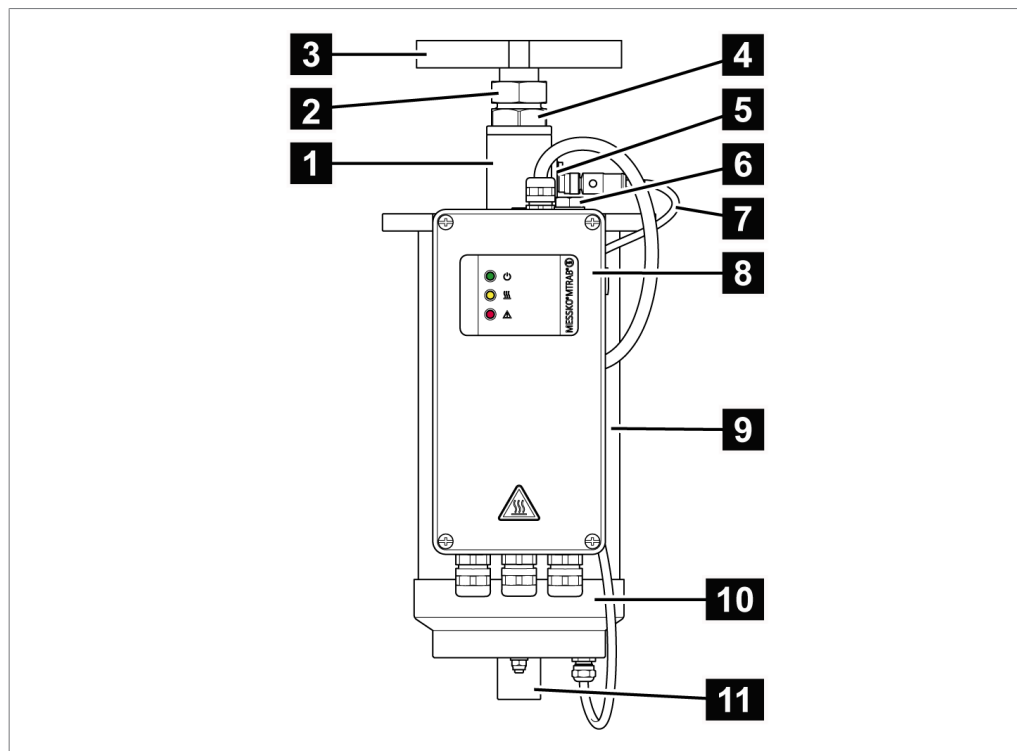


Figure 2: Overview

1 Upper air spout	2 Lock nut
3 Mounting flange (configurable)	4 Nut
5 Temperature and humidity sensor	6 Grounding screw
7 Sensor cable and cable protection (optional)	8 Connection box (lacquer color configurable)
9 Desiccant container	10 Lower metal flange
11 Dust protection tube with insect protection grille (optional) or with filter heating (optional HT version)	

For illustrations of the various designs, see Dimensional drawings.

Terminal box

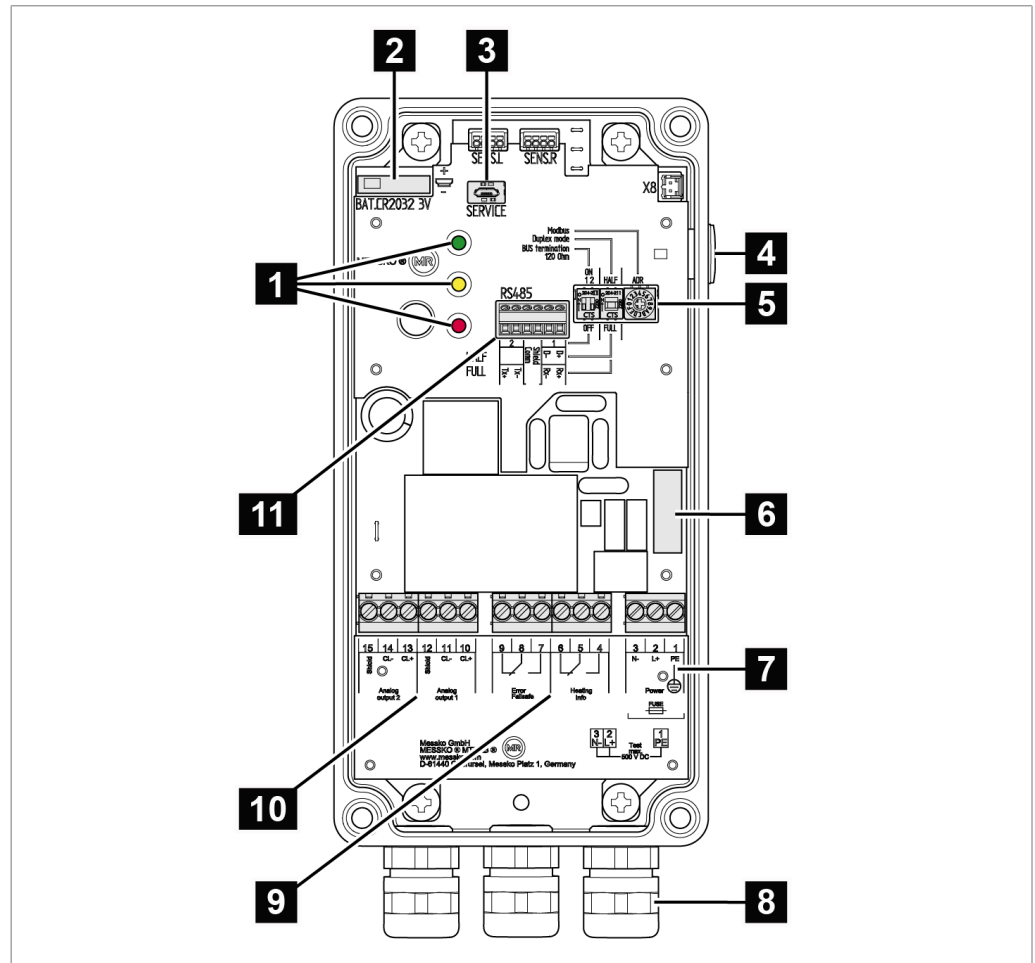




Figure 3: Connection box

1 LEDs for status display	2 RTC buffer battery (type CR2032)
3 USB service interface	4 Test button
5 Modbus settings (optional)	6 Fuse
7 Supply voltage 100...127 V DC / AC 50/60 Hz 200...240 V DC / AC 50/60 Hz	8 Cable gland M20x1.5 (brass/stainless steel) or 1/2" 14NPT (brass)
9 Signaling relay	10 Analog output 1 (temperature) Analog output 2 (humidity) 0...20 mA or 4...20 mA
11 RS485 interface (optional)	



Technical data

Operating conditions	
Location of use	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 / -50...+70°C HT version*; DB200G: 0...+70°C / -20...+70°C HT version*; It's will*) 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 (terminal box)	IP66/IP67 in accordance with IEC 60529
Overvoltage category	III
Protection class	I
Installation altitude	2,000 m above sea level
Design types	
Materials	All external parts are resistant to weathering and UV radiation; version with resistance to saltwater (offshore) optional
Color	Flanges and metal parts: anodized (aluminum) Connection box: Powder-coated (C4H or CX in accordance with DIN EN ISO 12944-9 as an option) or RAL7033 (cement gray) or RAL7038 (agate gray)
Weight (without flange)	DB100: approx. 8.6 kg DB200: approx. 12.6 kg DB200D: approx. 23.6 kg DB200G: approx. 31.6 kg
Dimensions	See section Dimensional drawings
Flange connection	Flange optional; see dimensional drawings and design; Further customer-specific flanges on request; 2-hole RM flange only for DB 100
Desiccant	Only use special colorless, non-toxic silica gel (silicon dioxide) sold by Messko GmbH; See application table for volume
Power supply	
Nominal voltage	200 ...240 V AC, 50/60 Hz, 200...240 V DC Pmax. 2500 W or 100...127 V AC, 50/60 Hz, 100...127 V DC Pmax. 2500 W
Power consumption	Max. 100 mA (in normal operation); Increased power consumption during regeneration; Refer to the heating current values in the application table
Heating current	Current during heating process (approx. 1-2 minutes after enabling the heating): Refer to heating current values in the application table
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 with IEC 61010-1), L to protective conductor  , N to protective conductor 
RTC buffer battery	CR2032 (recommendation CR2032 from Renata or CR2032W from Murata Electronics)



Connection box	
	Ventilated to prevent water condensation
Cable screw connections	M20x1.5 as nickel-plated brass or 1/2"-14NPT as nickel-plated brass or M20x1.5 stainless-steel rust-free
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 (green - operation indicator, yellow - regeneration heating, red - device malfunction) visible from the outside; refer to status messages for the status
Test button	For the device function test
Fuse	5x20 mm; T2A; 400 V DC/500 V AC (e.g. Littelfuse 477 se- ries 477002)

Signaling contacts	
Type of contact	1x changeover contact, silica gel regeneration signaling re- lay; 1x changeover contact, device error signaling relay (fail- safe)
Contact material	Hard-gold-plated gold contacts to ensure reliable function in applications with low switched currents. Minimum load: ≥1 mV/1 mA
Dielectric strength	Between circuits and ground: ≥2 kV, 50 Hz, duration 1 minute; Between contacts in the open position: ≥ 1 kV, 50 Hz, dura- tion 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, 2000 VA (UL 508, 30,000 switching cy- cles); 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, 1840 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 left in the upper air spout	Temperature: -40...+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
Output analog 2 right 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); > 23 mA (with 0...20 mA output signal)
Load resistance	0...600 Ω



Options	
Offshore	Connection box in accordance with the requirements of DIN EN ISO 12944-9 with corrosion class CX; Offshore flange version Cable gland stainless-steel version (grade 1.4404)
Insect grille	See dimensional drawings in attachment 7 SED 6356099
Cable protection	Protects the cable from damage such as animal bites, designed as a spiral coiled hose (stainless steel, suitable for offshore applications); refer to dimensional drawings in attachment 4 SED 6600056 and attachment 5 SED 6600296
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 dimensional drawings in attachment 2 SED 6356077 and attachment 3 SED 6367297
Protective grate	See dimensional drawings in attachment 7 SED 6356099
Data logger software	For the evaluation of the MTRAB data
RS485 interface	For connection to a SCADA system
Overvoltage protection	For protection against overvoltages

Standards and directives

Electrical safety	
IEC 61010-1:2010	Safety requirements for electrical measurement and control and regulation equipment and laboratory instruments
UL 61010-1	
CAN/CSA-C22.2 No. 61010-1:2012	
	<ul style="list-style-type: none"> ▪ 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	4.4 kg
Underground hall transformers	DB200G	4.4 kg
GSM machine transformers	DB200G	4.4 kg

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 mounting recommendations).

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

Beta controller (suffix T in the type designation): 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 cylinders are alternately regenerated based on status.



Dimensional drawings

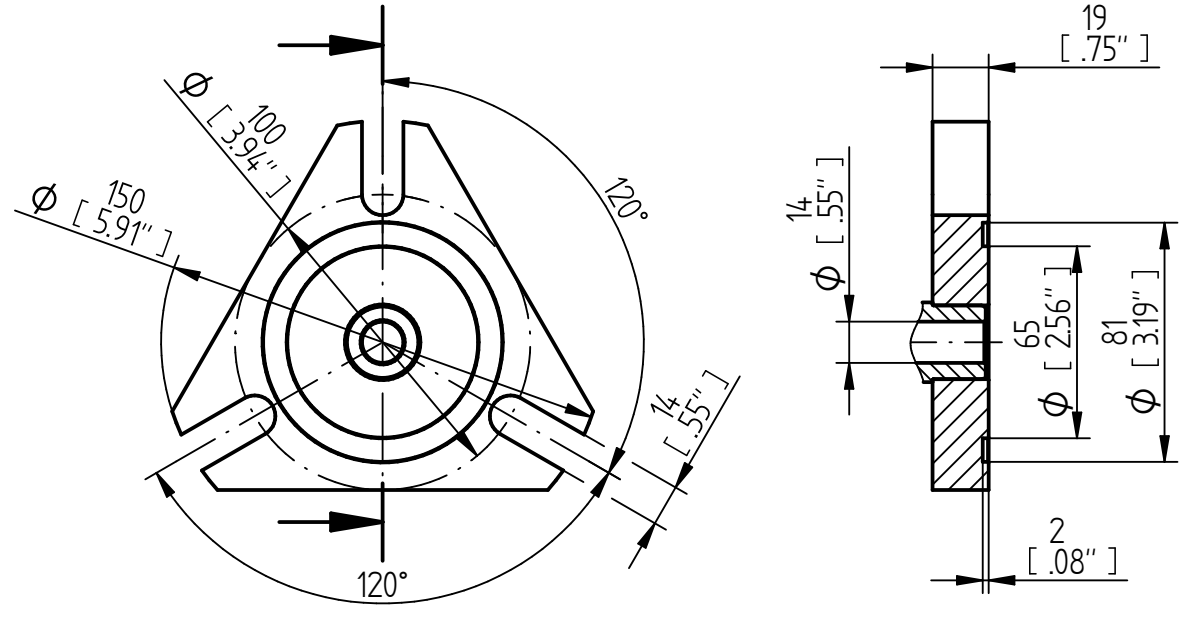
For dimensional drawings, refer to the following pages.

Appendix	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 01	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 01	MTRAB® DB200D-T	With cable protection
6	SED 6368543 000 01	MTRAB® DB200G	With gamma control
7	SED 6356099 000 00	MTRAB®	With protective grate and insect grille

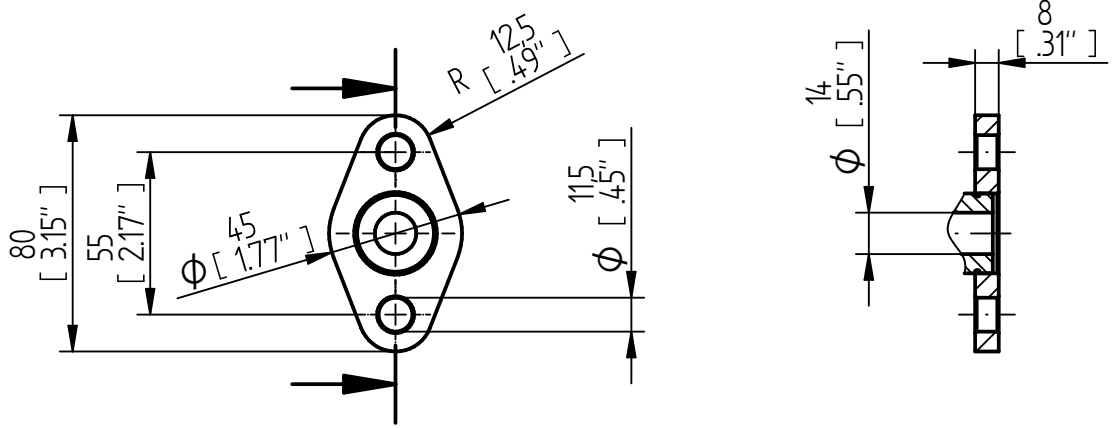
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Datum	Name	Dokurnummer
28.01.2019	RAEDLINGER	SED 6653712 000 00
Gepr. 30.01.2019	HUBERTHO	Änderungsnummer
Norml. 30.01.2019	KLEYN	1090594
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		1:2,5

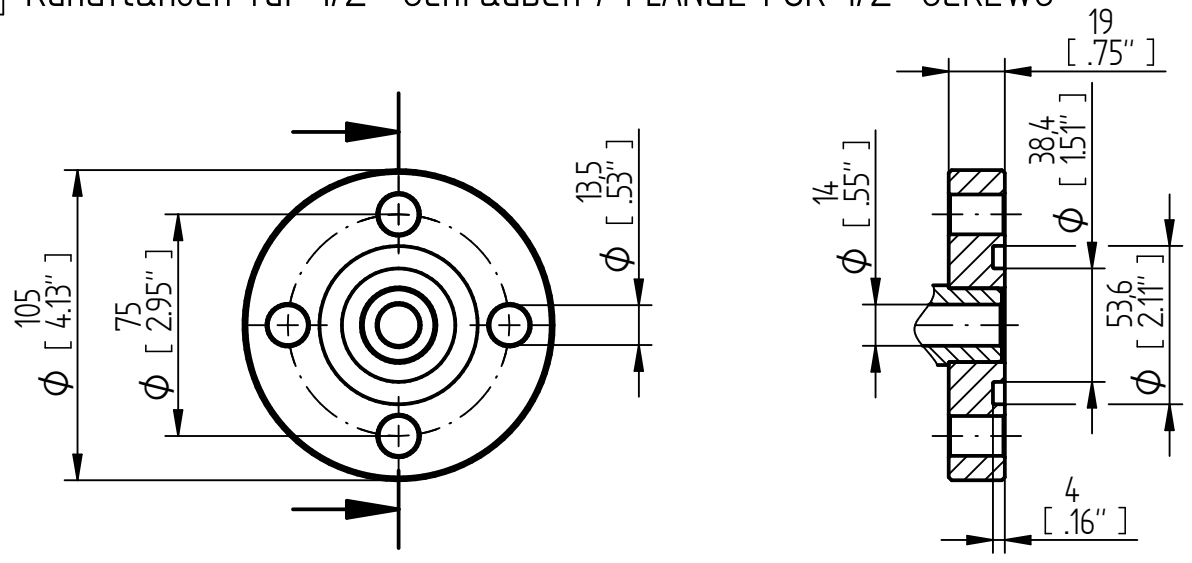
1 DIN-Flansch ähnlich / DIN FLANGE SIMILAR TO DIN 42562-3



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



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



Maßangaben
 in mm, soweit
 nicht anders
 angegeben

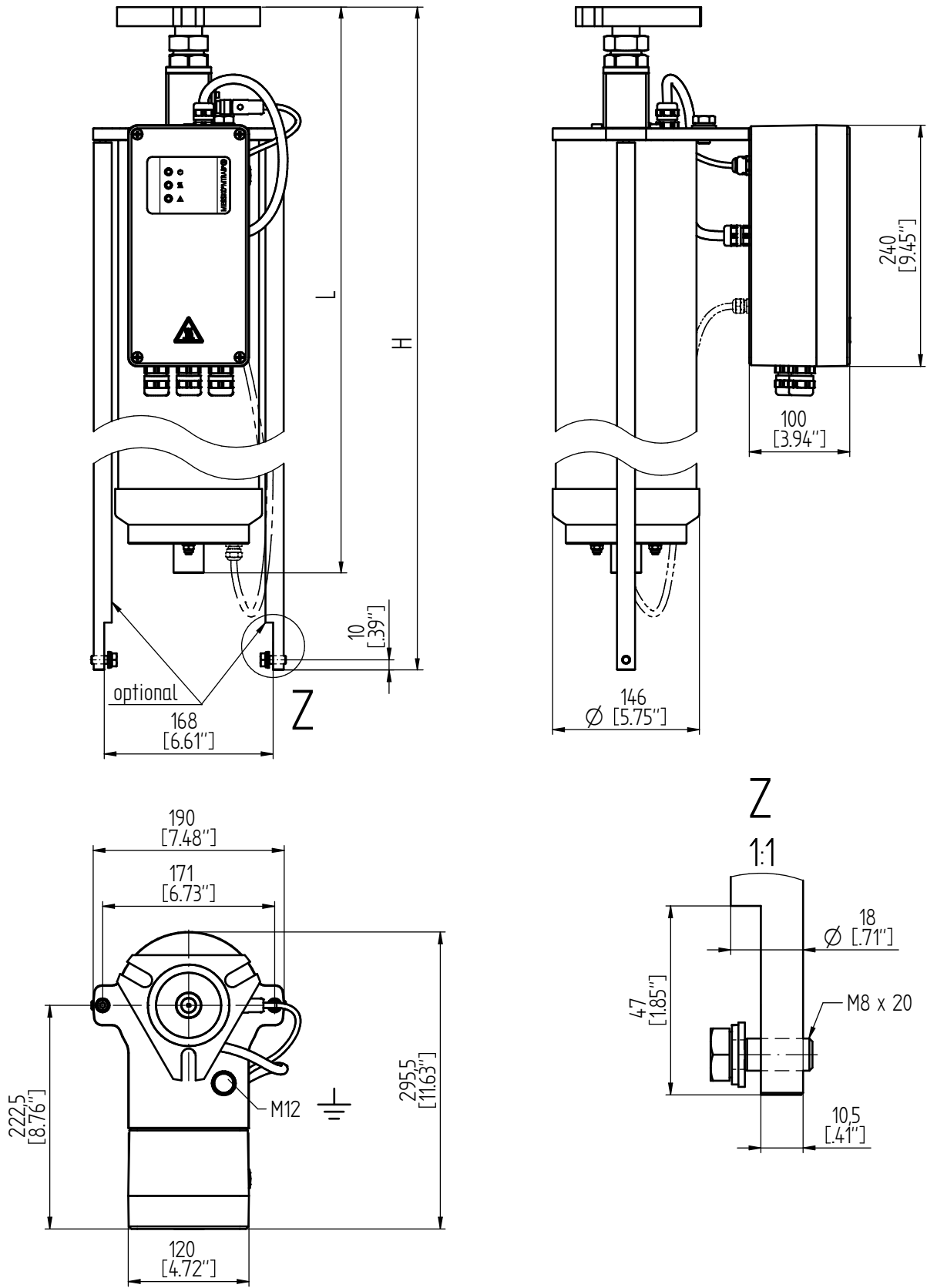


MTRAB® Standard-Flanschanschlüsse
 MTRAB® STANDARD FLANGE CONNECTIONS
 Maßzeichnung / DIMENSION DRAWING

Serialnummer	
Materialnummer	Blatt
101227020M	1 / 1

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DATE	DOCUMENT NO.
12.12.2018	SED 6356077 000 00
NAME	SCALE
RAEDLINGER	1:4
HUBERTHO	CHANGE NO.
KLEYN	1090594
STAND	
03.01.2019	



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"]

DIMENSION
 IN mm
 EXCEPT AS
 NOTED



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

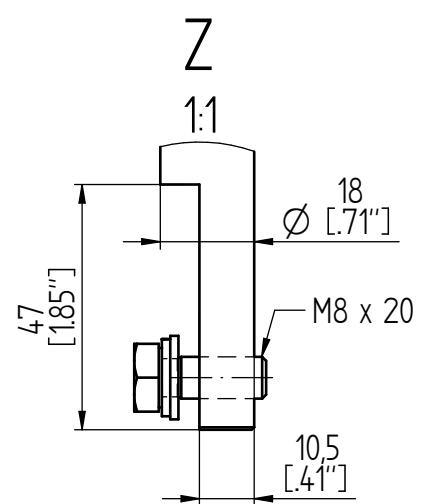
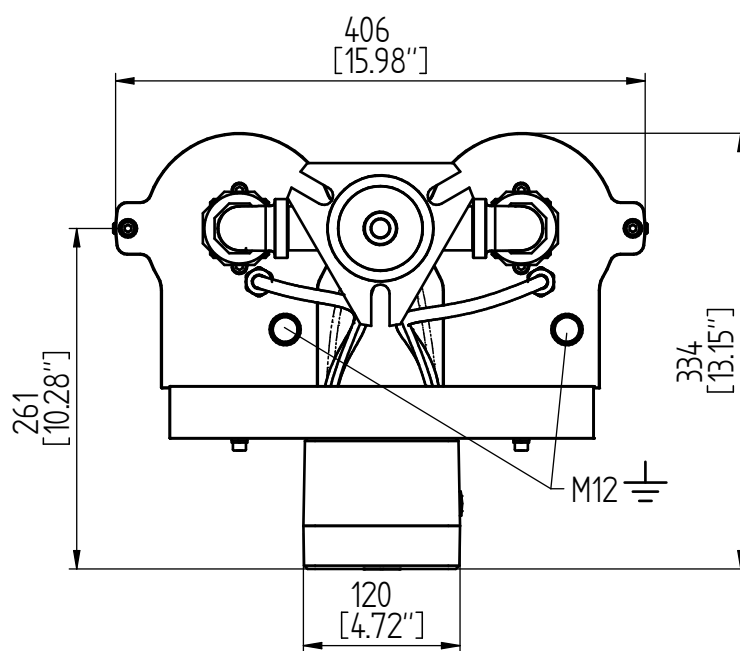
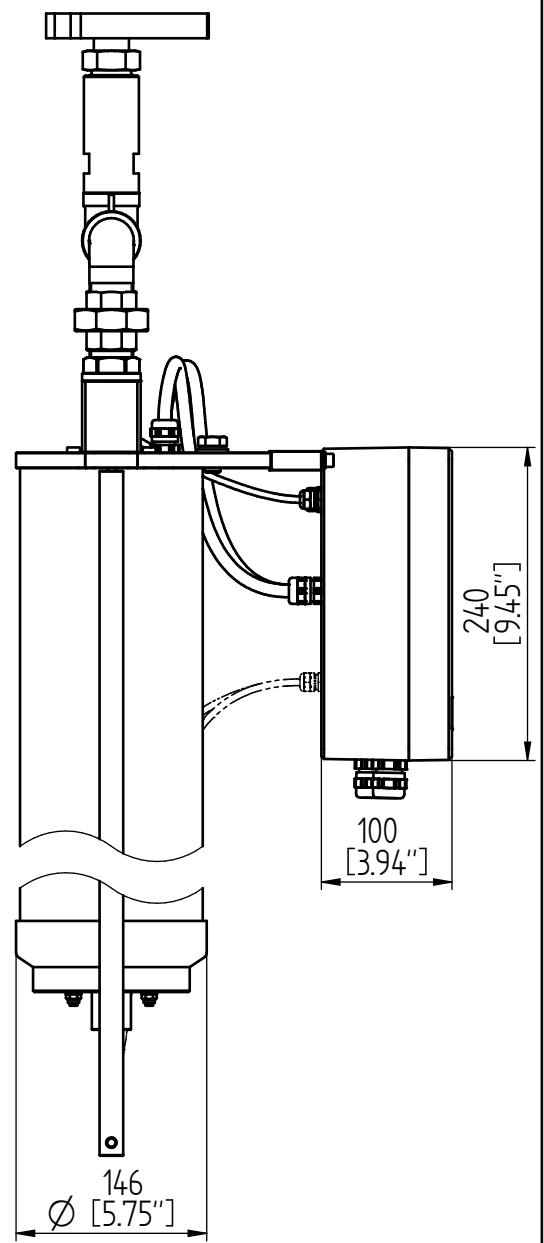
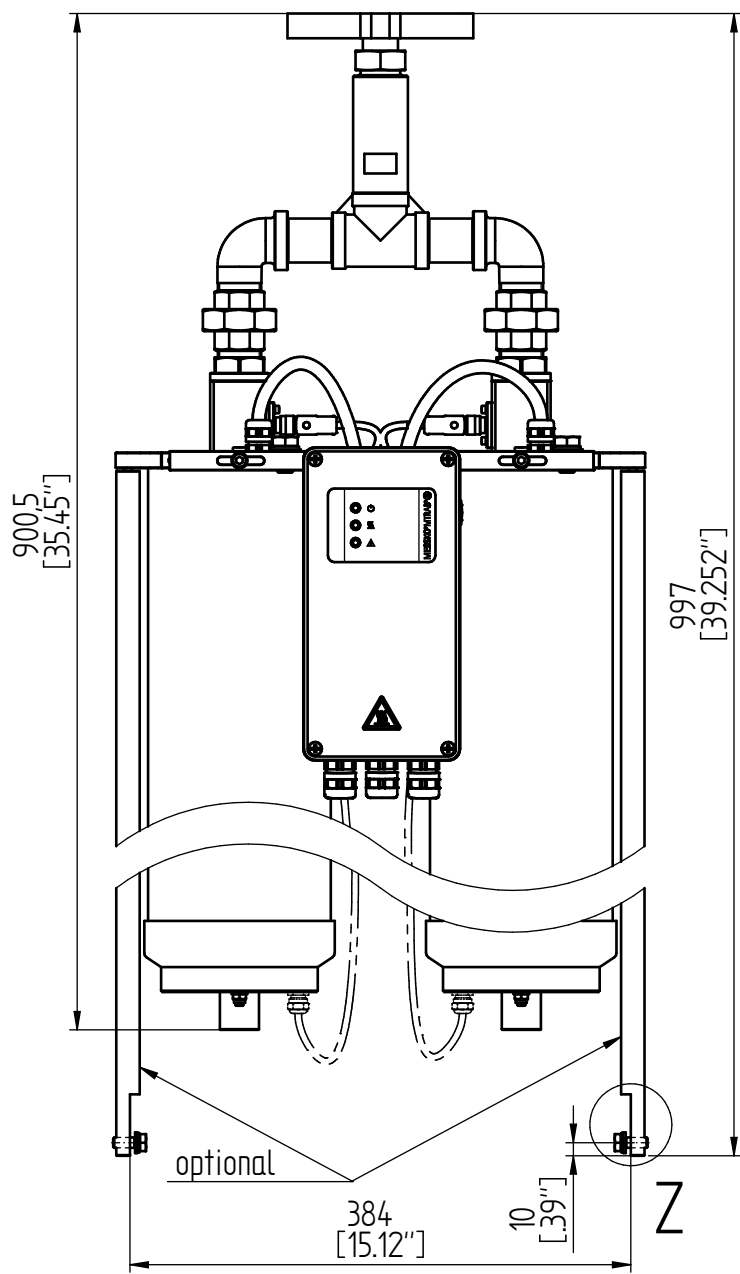
SERIAL NUMBER

MATERIAL NUMBER
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SHEET
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DATE	NAME	DOCUMENT NO.
01.10.2020	SCHAEFERB	SED 6367297 000 01
01.10.2020	REHNET	CHANGE NO.
01.10.2020	KLEYN	1098810
		SCALE
		1:4



DIMENSION
 IN mm
 EXCEPT AS
 NOTED



MTRAB® DB2000-T mit seitlicher Zusatzbefestigung /
 MTRAB® DB2000-T WITH ADDITIONAL FASTENING POINTS
 Maßzeichnung / DIMENSION DRAWING

SERIAL NUMBER

MATERIAL NUMBER
 101213171M

SHEET
 1 / 1

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CHKD. 0103.2019	HUBERTHO	CHANGE NO.
SCALE	GRADL	1090594
STAND		1:4

DIMENSION
 IN mm
 EXCEPT AS
 NOTED

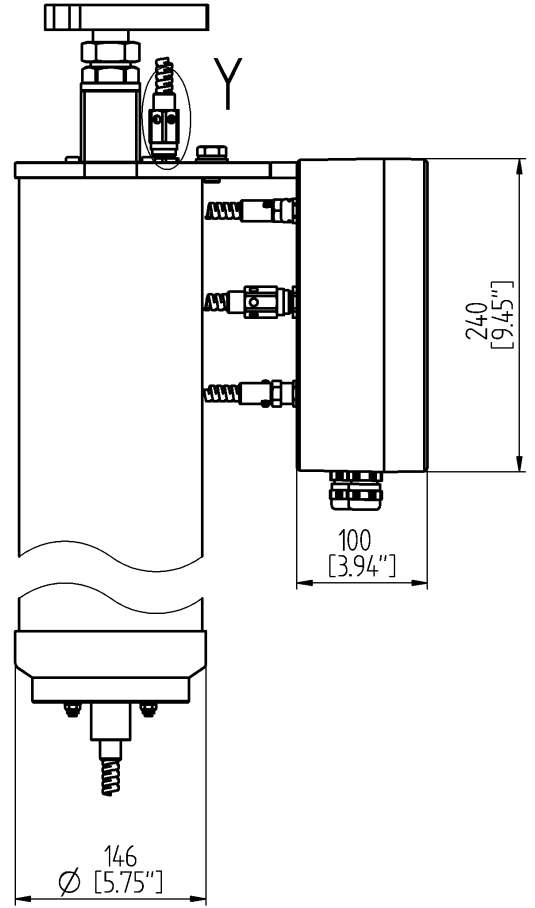
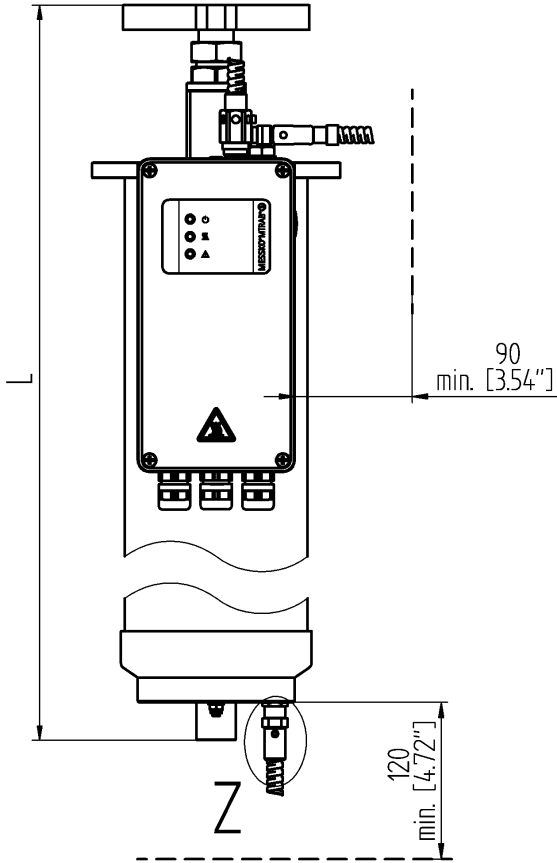
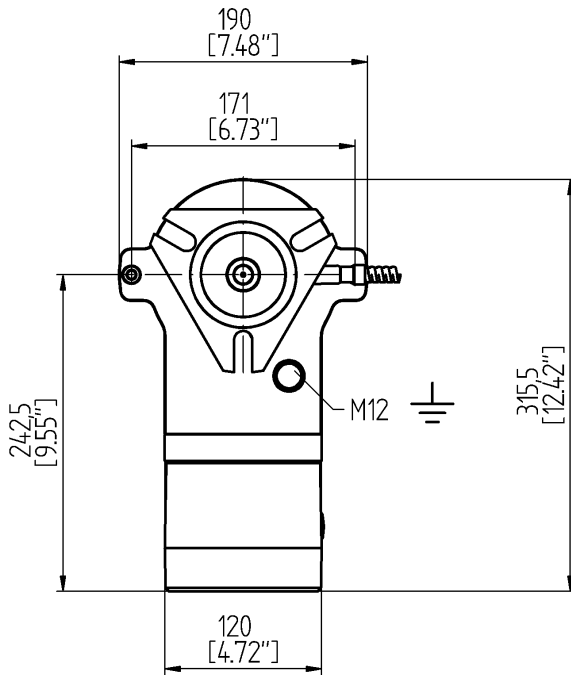


MTRAB® DB100/DB200 mit Kabelschutz (optional) /
 MTRAB® DB100/DB200 WITH CABLE PROTECTION (OPTIONAL)
 Maßzeichnung / DIMENSION DRAWING

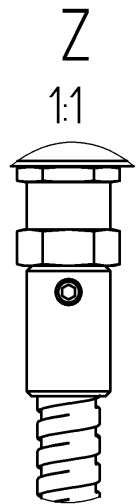
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MATERIAL NUMBER
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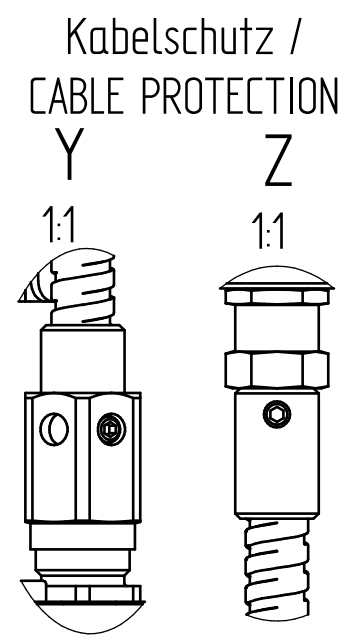
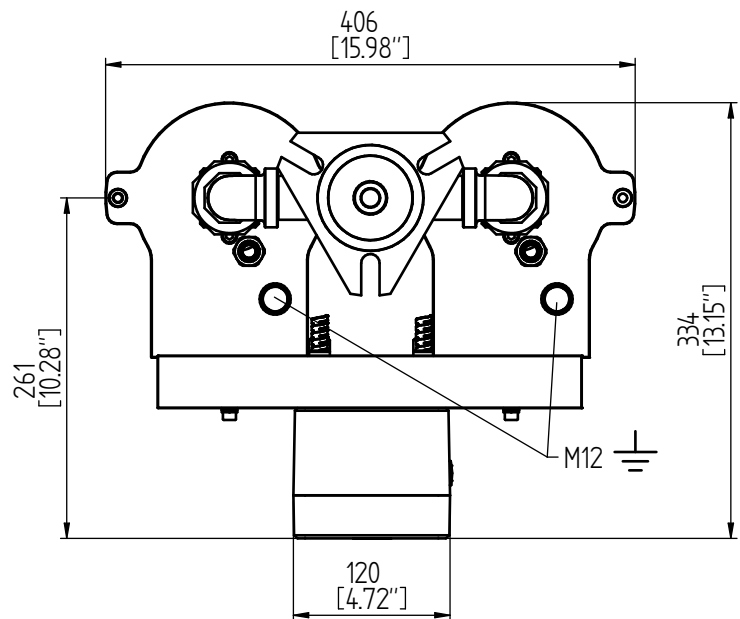
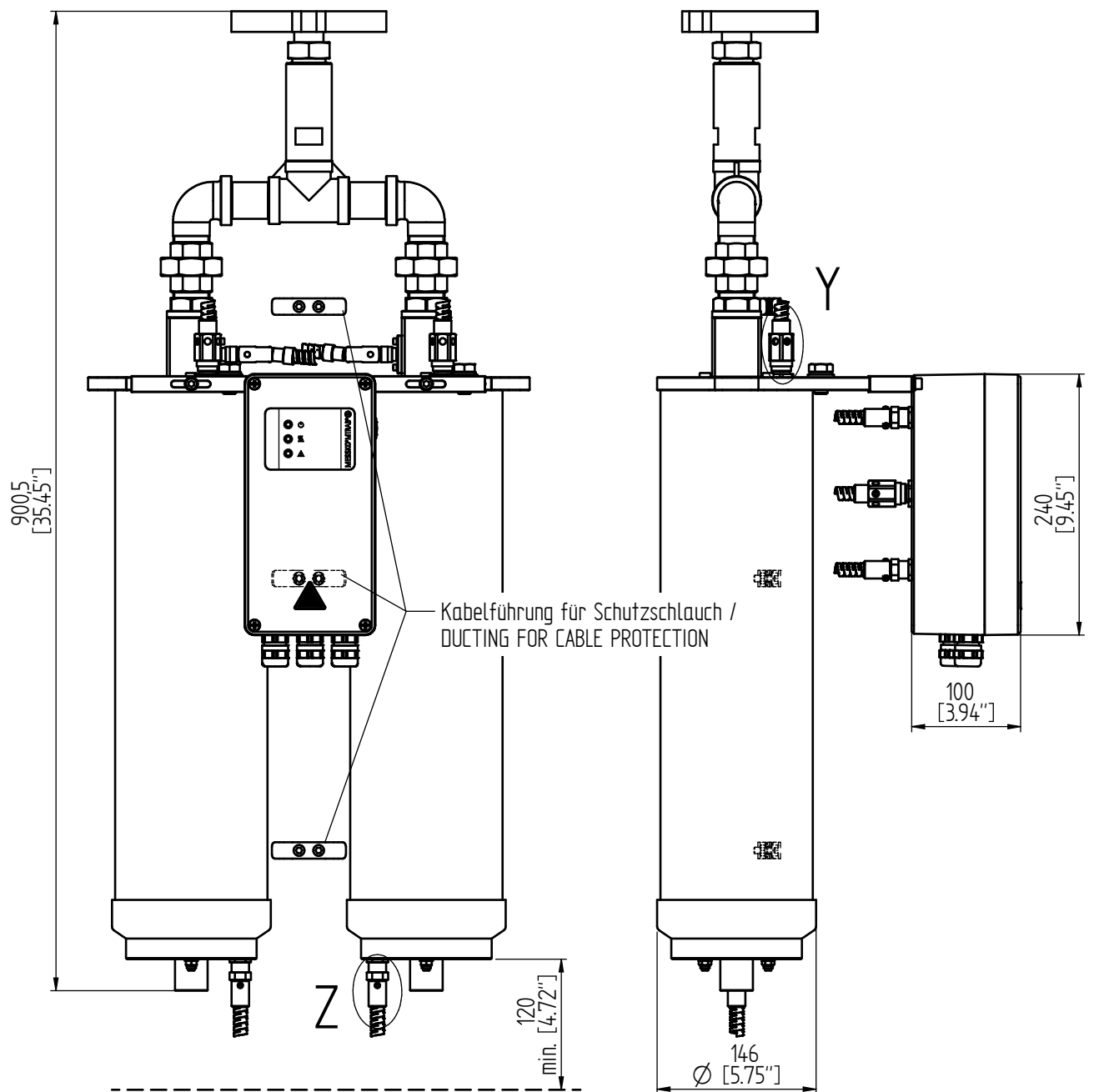
Kabelschutz /
 CABLE PROTECTION



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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21.01.2020	SCHAEFERB	SED 6600296 000 01
21.01.2020	REHNET	CHANGE NO.
22.01.2020	KLEYN	1098810
SCALE		1:4



DIMENSION
IN mm
EXCEPT AS
NOTED



MTRAB® DB2000-T mit Kabelschutz (optional) /
 MTRAB® DB2000-T WITH CABLE PROTECTION (OPTIONAL)
 Maßzeichnung / DIMENSION DRAWING

SERIAL NUMBER	
MATERIAL NUMBER	SHEET
101235311M	1 / 1

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DJFR. 20.01.2020	SCHAEFERB	SED 6368543_000_01
CHKD. 21.01.2020	REHNELT	CHANGE NO.
STAND. 22.01.2020	KLEYN	1098810
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DIMENSION
 IN mm
 EXCEPT AS
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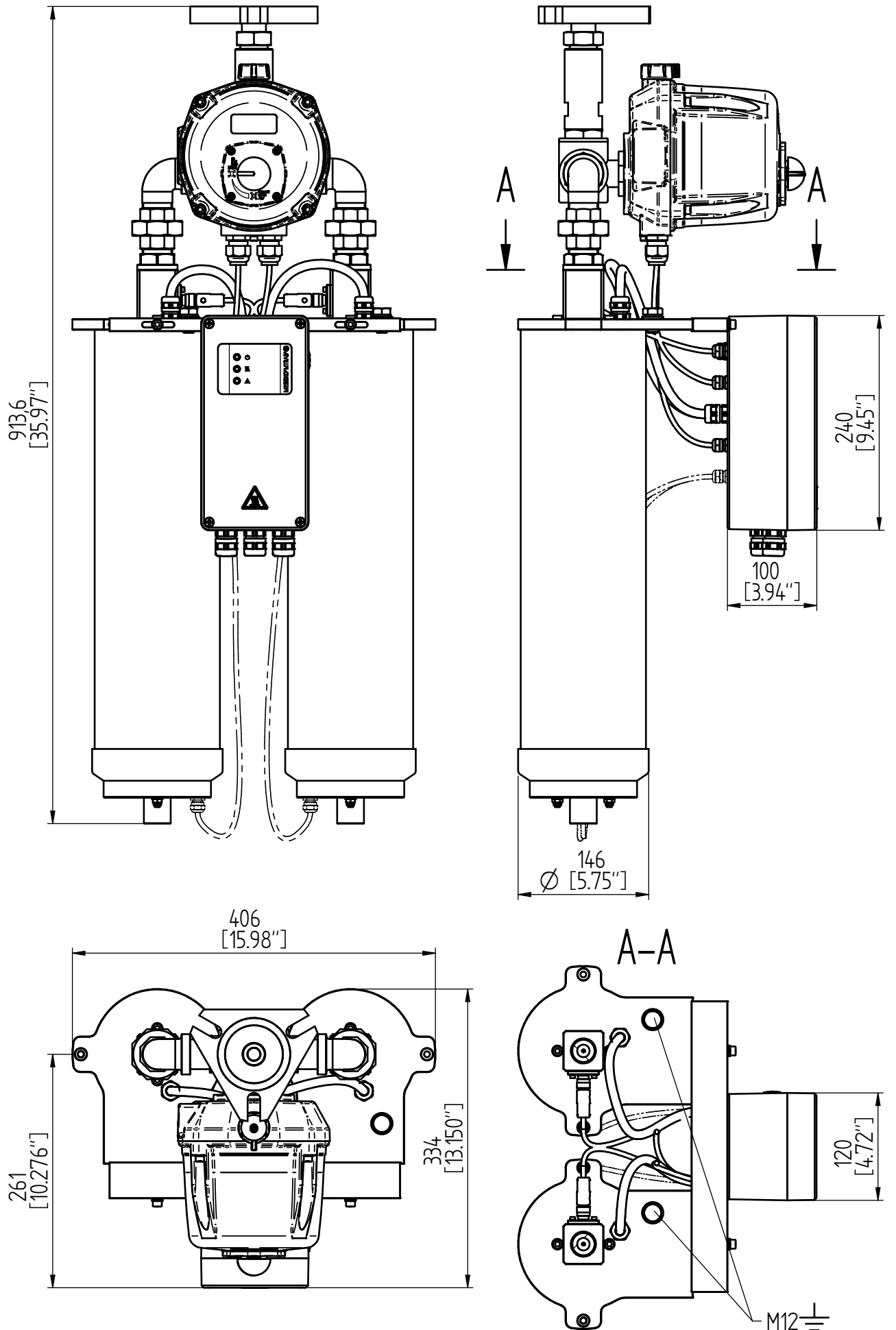


MTRAB® DB200G mit Gammasteuerung /
 MTRAB® DB200G WITH GAMMA CONTROL
 Maßzeichnung / DIMENSION DRAWING

SERIAL NUMBER

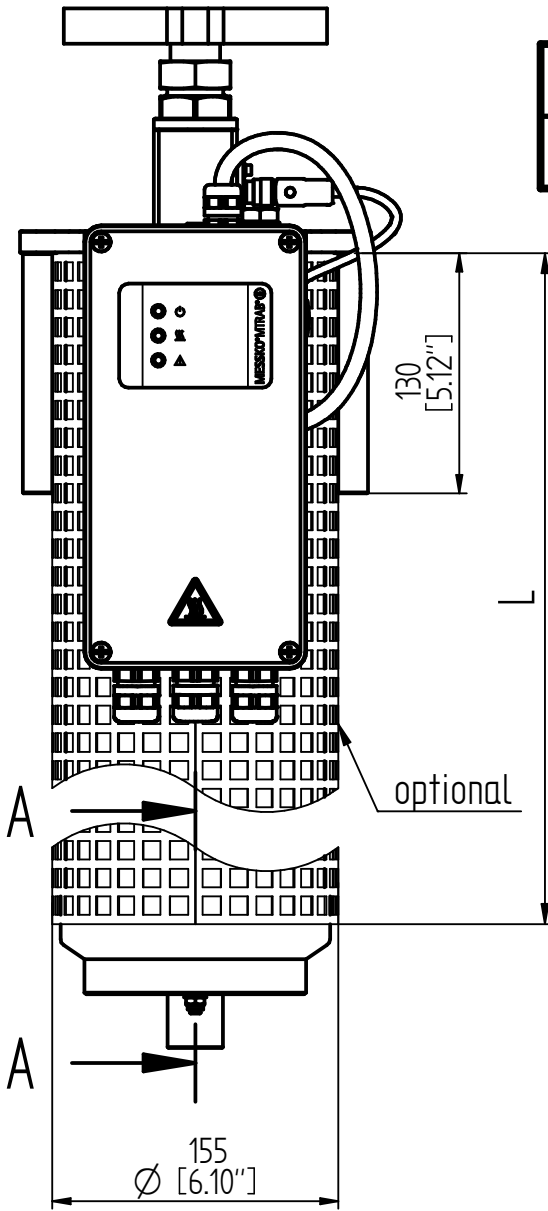
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SHEET
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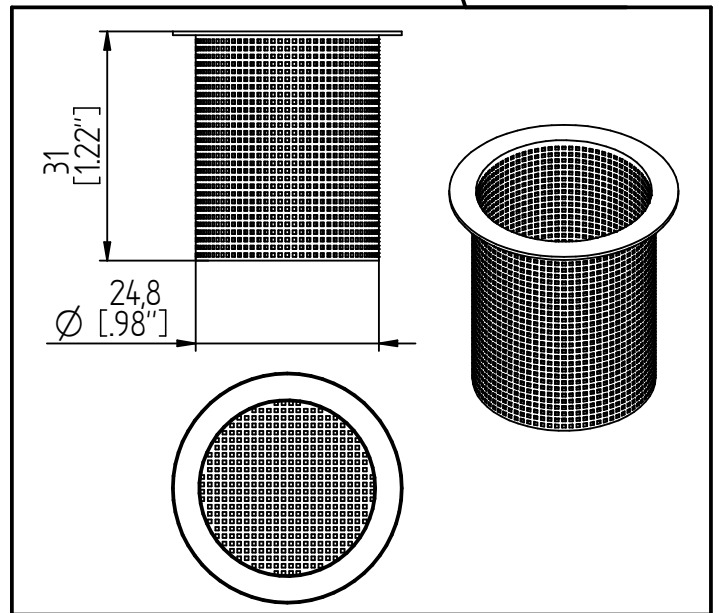
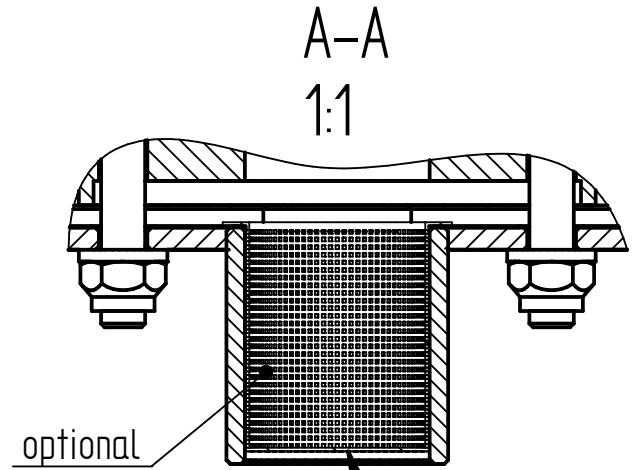


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DATE	NAME	DOCUMENT NO.
DFTR. 12.12.2018	RAEDLINGER	SED 6356099 000 00
CHKD. 17.12.2018	HUBERTHO	CHANGE NO. SCALE
STAND. 03.01.2019	KLEYN	1090594 1:4



Maß / DIMENSION	DB100	DB200
L	260 [10.24"]	485 [19.10"]



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

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✉ messko-info@reinhausen.com

www.reinhausen.com/messko

TD6822884-01 EN . Ver. 2.5 - MESSKO® MTRAB® -
F0380201 - 12/20 - Messko GmbH 2020

THE POWER BEHIND POWER.

