878x

Hybrid gas density monitor with analogue current loop output signal

Applications

- High voltage technology
- Medium voltage technology
- SF_6 and variety of alternative mixed gases

Features

- Exact switching output at all temperatures
- Fully temperature compensated by design
- No contact bouncing
- Continuous density measurement
- Long term drift free sensor output signal
- Maintenance free indoor and outdoor use

CE LVD: 2014/35/EU; EMC: 2014/30/EU

UKCA S.I. 2016 No. 1101; S.I. 2016 No. 1091

RoHS/Reach compliant

Product description

Swiss based Trafag offers precise, reliable and maintenance-free instruments, developed for density monitoring of SF_6 and alternative gases. Measurement is based on the gas density reference principle or the patented quartz tuning fork technology. Hybrid monitors combine both principles in one instrument. Thus offering the most reliable solution on the market by directly measuring the gas density.

Technical Data

Measuring principle	• Monitor: Absolute pressure reference gas measuring system • Sensor: Oscillating quartz
Measuring range	max. 0 ... 60 kg/m³ max. 0 ... 1250 kPa abs. @ 20°C
Output signal	• Monitor: Floating change-over contact (SPDT) • Sensor: 4 ... 20mA, 6.5 ... 20mA
Quantity of switchpoints	1 ... 3 microswitches
Ambient temperature	-40°C ... +80°C

Additional information

Data sheet www.trafag.com/H72515
Instructions www.trafag.com/H73515

Ordering information/Type code

		XXXX	XX	XXXX	XX	XX	XX
Custom build code	**Hybrid gas density monitor with microswitches and 2-wire current output**						
	One microswitch	**8781**					
	Two microswitches	**8782**					
	Three microswitches	**8783**					
Output signal	See table below: Output signal		**XX**				
Pressure connection	Threaded, axial and radial types			**1XXX**			
	Flanged and cap nut, axial and radial types			**2XXX**			
	Compartment immersion types [1]			**5XXX**			
Code number	Determined by Trafag				XX		
Options	Basic density indicator dial with two colour sectors without markings					**60**	
	Density indicator dial with scale according to customer specification					**61**	
	Low pressure indicator [4]					**66**	
	Process gas wetted O-rings composed of IIR					**C2**	
	Microswitch or combined microswitch / sensor outlet						
	EMC-cable gland M20x1.5, brass nickel-plated, for cable-ø 7 ... 12.5 [mm]					**10**	
	EMC-cable gland M20x1.5, brass nickel-plated, for cable-ø 8 ... 11 [mm]					**07**	
	EMC-cable gland M20x1.5, brass nickel-plated, for cable-ø 11 ... 14 [mm]					**08**	
	EMC-cable gland M25x1.5, brass nickel-plated, for cable-ø 8 ... 16 [mm]					**11**	
	EMC-cable gland M25x1.5, brass nickel-plated, for cable-ø 12.5 ... 20.5 [mm]					**17**	
	ITT Cannon connector					**12**	
	Blank plug M20x1.5, brass nickel-plated [2]					**13**	
	Blank plug M25x1.5, brass nickel-plated [3]					**04**	
	Blank plug M25x1.5, PA [2][3]					**05**	
	Separate sensor outlet						
	EMC-cable gland M20x1.5, brass nickel-plated, for cable-ø 4 … 10 [mm]					**U8**	
	EMC-cable gland M20x1.5, brass nickel-plated, for cable-ø 7 … 12.5 [mm]					**U1**	
	EMC-cable gland M20x1.5, brass nickel-plated, for cable-ø 8 … 11 [mm]					**U6**	
	EMC-cable gland M20x1.5, brass nickel-plated, for cable-ø 11 … 14 [mm]					**U3**	
	Blank plug M20x1.5, brass nickel-plated [3]					**U2**	
	Integrated valve for monitor test with DN8 coupling and M26x1.5 protective cap						
	Standard test port orientation					**W3**	
	Test port orientation 180°					**W0**	
	Test port orientation 270°					**W1**	
	Test port orientation 90°					**W2**	
	Integrated valve for process gas quality test and refilling with DN8 coupling and M26x1.5 protective cap						
	Standard filling port orientation					**F3**	
	Filling port orientation 180°					**F0**	
	Filling port orientation 270°					**F1**	
	Filling port orientation 90°					**F2**	

		XXXX	XX	XXXX	XX	XX	XX
Accessories	Thermal insulation ring for probe housing						**06**
	Thermal foam cover with drain holes						**37**
	Weather protection cover						**46**
	Pressure connection adapter 2300 - G1/2" male						**N1**

[1] Requires single-cable connection by microswitch outlet
[2] Select if EMC-cable gland is procured locally
[3] Without IP compatibility, not for use in operation
[4] Only for configurations with max. switchpoint range 0 ... 1100 kPa abs @ 20°C

Output signal

Analogue output signal	Output parameter	Measuring range	Code
4 … 20 mA	Density [kg/m³], gas specific linearised	0 … 60 kg/m³ 0 … 30 kg/m³ 0 … 15 kg/m³	A1 A2 A3
4 … 20 mA	Density [gas pressure@20 °C], gas specific linearised	0 … 60 kg/m³ 0 … 30 kg/m³ 0 … 15 kg/m³	B1 B2 B3
6.5 … 20 mA	Generic, non-linear (legacy) [1]	0 … 56.1 kg/m³ 0 … 28 kg/m³	20 M2

[1] Do not use for new designs

Further customised parameterisation to be indicated

Process gas	SF_6, SF_6- based mixed gas, customer specific alternative gas (gas mixtures to be indicated in mol-%)
Units for indicator dial	kPa, MPa, bar, psi, kg/m², kg/cm², absolute (standard) or relative (optional) units [1], optionally available dial indication dual units
Switchpoint @ 20°C	For each microswitch, indicate switching point p@20°C. Standard factory setting is for decreasing pressure. Optionally, factory setting for increasing pressure is available. Especially for outdoor installations in areas with high daily temperature fluctuations it is recommended to maintain a minimum switching point distance of 40-60 kPa from filling pressure to next higher and lower switching point(s). Please contact us for more information.
Gas pressure @ 20°C	Requirement for specific process gas if other than 100 % SF_6

[1] The monitoring principle is based on a density reference chamber system and is accordingly calibrated. When not using dials scaled to density expressed as "absolute pressure at 20°C of the respective gas mixture", additional environmental factors are required for correct interpretation of the dial reading. E.g. in case of using relative pressure units, local ambient pressure (e.g. altitude or weather derivations) as well as thermal effects have to be considered when comparing with a locally installed relative pressure gauge. The difference between relative and absolute pressure is calibrated to 1 bar

Mechanical density monitoring

Monitoring	Principle	Absolute pressure measuring system with sealed reference gas chamber, fully temperature compensated by design [1]
	Range	0 ... 1100 kPa abs. @ 20°C with low pressure indicator option 0 ... 1250 kPa abs. @ 20°C without low pressure indicator option
	Output	Floating change-over contact (SPDT)
	Accuracy	Refer to density indicator and microswitch sections
Microswitch	Output signal	Floating change-over contact (SPDT)
	Resistive load (Inductive load)	AC - 250 V/10 (1.5) A DC - 250 V/0.1 (0.05) A, 220 V/0.25 (0.2) A, 110 V/0.5 (0.3) A, 24 V/2 (1) A
	Resistance of insulation	>100 MΩ, 500 VDC, ex factory
	Dielectric strength	2 kVAC, 50Hz, terminal to ground (earth)
	Switching cycle capacity	Up to 1M mechanical, more than 10'000 with maximum load
	Effect of vibration	4 g, 20 … 100 Hz effects no contact bounce at 5 kPa minimum distance from set switchpoint
Switchpoint setting	Factory adjustment	According to customer specification, [2] standard setting is for decreasing pressure
	Lowest switchpoint setting	120 kPa abs. @ 20°C
	Highest switchpoint setting	0 ... 1100 kPa abs. @ 20°C with low pressure indicator option 0 ... 1250 kPa abs. @ 20°C without low pressure indicator option
	Distance from the lowest to the highest switchpoint	Up to 180 kPa @ 20°C [3]
	Switching differential	3 ... 7 kPa typ. (15 kPa max.) if lowest to highest switchpoint distance is up to 130 kPa 5 ... 10 kPa typ. (20 kPa max.) if lowest to highest switchpoint distance is 130 ... 180 kPa

[1] Depending on process gas requirements, the fully sealed reference gas chamber contains up to 0.001kg of SF_6. The relevant national regulations governing the disposal of hazardous waste apply and must be followed. Decommissioned or defective monitors can be returned to the manufacturer for disposal in a safe and environmentally appropriate manner

[2] Especially in areas with high daily temperature fluctuations it is recommended to maintain a minimum switchpoint distance of 40-60 kPa from filling pressure to surrounding switchpoint(s). Please contact us for more information

[3] Distance from lock-out to high-alarm pressure, or from lock-out to filling pressure (no high-alarm)

Switchpoint accuracy over temperature based on reference chamber pressure

		+20°C	-30°C ... +50°C	-40°C ... +60°C
First alarm switchpoint setting pressure abs. @ 20°C [1]				
≤ 650 kPa	[kPa max.]	± 8	± 10	± 12
> 650 kPa … 1000 kPa	[kPa max.]	± 8	± 12	± 14
> 1000 kPa	[kPa max.]	± 10	± 15	± 16
High pressure alarm [1] [2]	[kPa max.]			
≤ 1000 kPa	[kPa max.]	± 10	± 16	± 20
> 1000 kPa	[kPa max.]	± 10	± 17	± 21

[1] While no liquefaction occurs and the insulation gas is completely gaseous
[2] Only applicable if factory adjustment includes high-alarm switchpoint above filling pressure

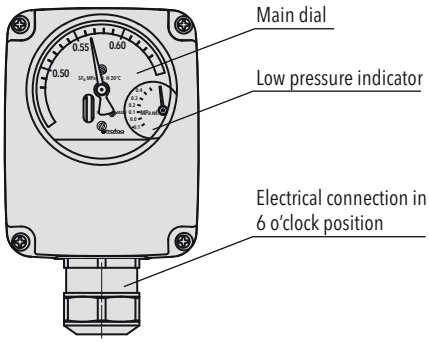
Density indicator

	Main dial	Low pressure indication option
Indicator principle	Absolute pressure, fully temperature compensated by means of sealed reference gas chamber	Indication of relative pressure, for safety reasons it is not temperature compensated
Scale	Colour sectors (standard red/yellow/green or red/green), switchpoint markings, single or dual units	Single unit, graduated range
Unit	See table „Further customised parameterisation to be indicated"	According to main dial unit (rel., g.)
Numbered range	Up to 180 kPa @ 20°C between lowest and highest indicated value [1]	Vacuum up to lowest switchpoint, 500 kPa rel. max.
Accuracy within numbered range	± 10 kPa @ 20°C	Up to 200 kPa rel.: ± 20 kPa Up to 500 kPa rel.: ± 10% MV

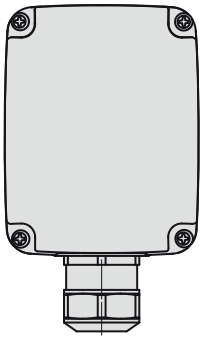
[1] Typically ranges are from lock-out switchpoint to filling pressure (no high-alarm), or from lock-out switchpoint to high-alarm switchpoint

Density indicator

Main dial and low pressure indicator

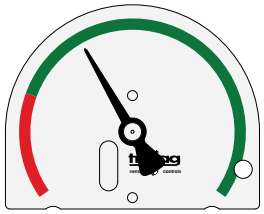


Hybrid monitor without indication dial



Density indicator dial according to customer specification

Availability of a full variety of units including dual range indication, this also includes dial rotated by 90°/180°/270°.



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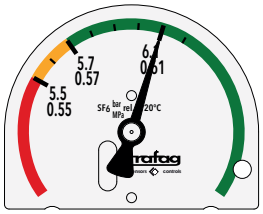

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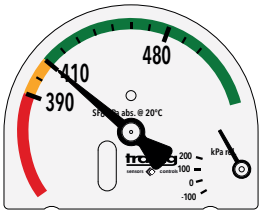

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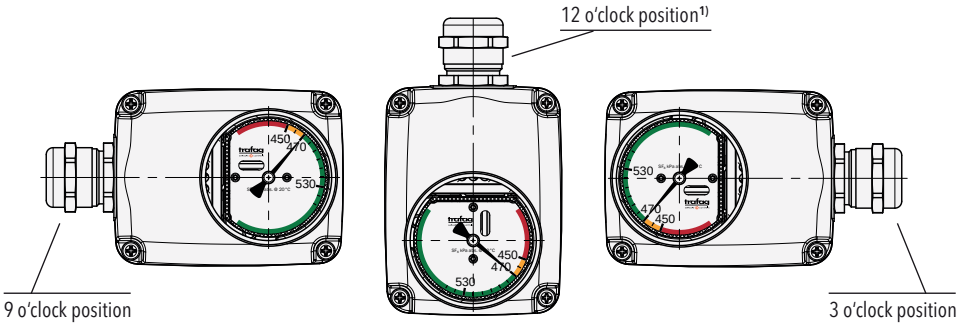
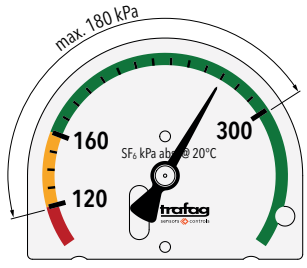
Customized dial orientation based on electrical connection position

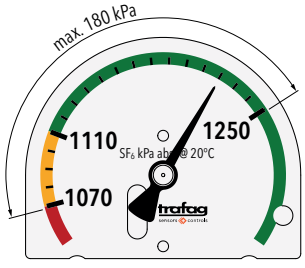


[1)] Should only be used for indoor applications while using neither a weather protection cover nor a thermal foam cover

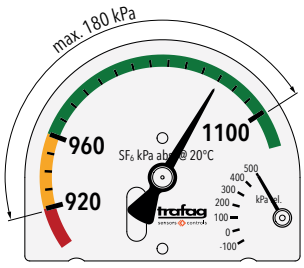
Maximum switchpoint range



Lowest switchpoint setting: 120 kPa abs. @ 20°C, distance from lowest to highest switchpoint: up to 180 kPa @ 20°C



Highest switchpoint setting: 1250 kPa abs. @ 20°C, distance from lowest to highest switchpoint: up to 180 kPa @ 20°C



Highest switchpoint setting with low pressure indicator: 1100 kPa abs. @ 20°C, distance from lowest to highest switchpoint: up to 180 kPa @ 20°C

Electronical density measuring

Sensor	Principle	Oscillating quartz sensor
	Range [1]	max. 0 ... 60 kg/m³ max. 0 ... 1250 kPa abs. @ 20°C
	Output	4 ... 20 mA, 6.5 ... 20 mA
Electrical data	Supply voltage	10 ... 30 VDC
	Earthing	Via process connection or wire terminal
	Resistance of insulation	>100 MΩ, 500 VDC, ex factory
	Dielectric strength	500 VAC, 50 Hz, terminal to ground (earth)
EMC protection	ESD	15 kV air, 8 kV contact, EN/IEC 61000-4-2
	Radiated immunity	10 V/m, 80 ... 6000 MHz, EN/IEC 61000-4-3
	Burst	2 kV, EN/IEC 61000-4-4
	Surge	Up to 2 kV, EN/IEC 61000-4-5
	Conducted immunity	10 Vrms, EN/IEC 61000-4-6
Accuracy	Density measurement	See table: Accuracy
	Repeatability density measurement	See table: Accuracy
	Transient response time required for signal output to reach accuracy tolerance band	Less than 1 h after connecting monitor to pressurised compartment Less than 1 min. when monitor is vacuumised together with compartment before gas filling

[1] Maximum value is either kg/m³ or kPa abs. @ 20°C, whichever is reached first

Accuracy

The indicated accuracy is validated for SF_6 and common SF_6 mixtures, common C4-FN (CAS No. 42532-60-5) mixtures and synthetic air. Please contact us for further information.

Density measuring range	**0 … 15 kg/m³**	**0 … 30 kg/m³**	**0 … 60 kg/m³** **0 … 56.1 kg/m³**
Total error band -40°C … +80°C [1]	± 1.8 % FS typ. ± 2.3 % FS max.	± 1.4 % FS typ. ± 2.0 % FS max.	± 1.0 % FS typ. ± 1.8 % FS max.
Repeatability	± 0.3 % FS typ.	± 0.3 % FS typ.	± 0.2 % FS typ.

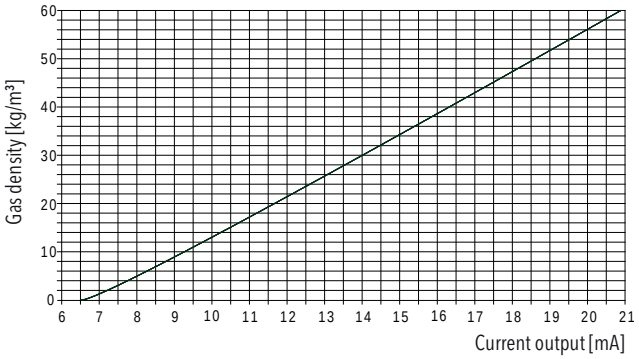
[1] Total error band (TEB) for defined ambient temperature range while the insulation gas is completely gaseous

Surge level details

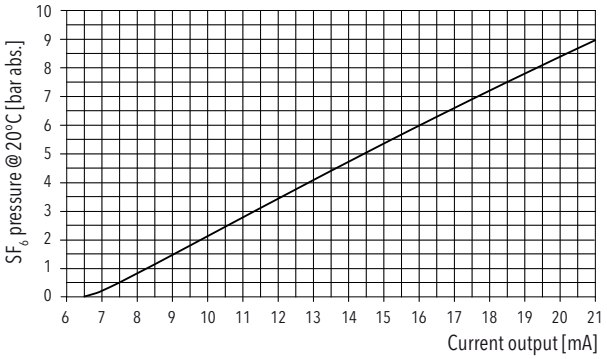
Maximum surge load level [kV]	**Coupling category**	**Coupling settings**	**Signal coupling**	**Severity level**
1	Line to Earth	L-PE	U_s+ to Earth	2
1	Line to Earth	N-PE	U_s– to Earth	2
2	Line to Earth	L-N	Shield to Earth	3

Conversion of output signal 6.5 ... 20 mA

Relation of current output to gas density



Relation of current output to SF_6 pressure @ 20°C



Gas density [kg/m³] = 4.651 * I[mA] - 1.898 *$\sqrt{\text{I[mA] - 6.475}}$ - 29.921

SF_6 pressure @ T [K] [bar abs.] =
{0.000569502 * T [K] *Density [kg/m³] +
(0.00250695 * 0.000569502 * T [K] –
0.00073822) * Density [kg/m³] ² –
(0.00000212238 * 0.000569502 * T [K] –
0.000000513) * Density [kg/m³] ³ }

SF_6 pressure @ 20°C [bar abs.] ≈ 0.6303 * I [mA] – 4.1419
(add. non-linearity ± 0.3 % FS between 9.5 and 19.25 mA)

The relation of current output to SF_6 pressure @ 20°C above applies only if 100 % SF_6 gas is used. Density and current to pressure @ 20°C correlations are defined by specific isochores. Please contact us for process gases other than 100 % SF_6.

Conversion of output signal 4 … 20 mA

In contrast to the 6.5 … 20 mA signal, the 4 … 20 mA signal is linearised for the specific gas, either to density [kg/m³] or to normalised pressure [kPa @ 20°C]. Thus, no additional conversion is required.

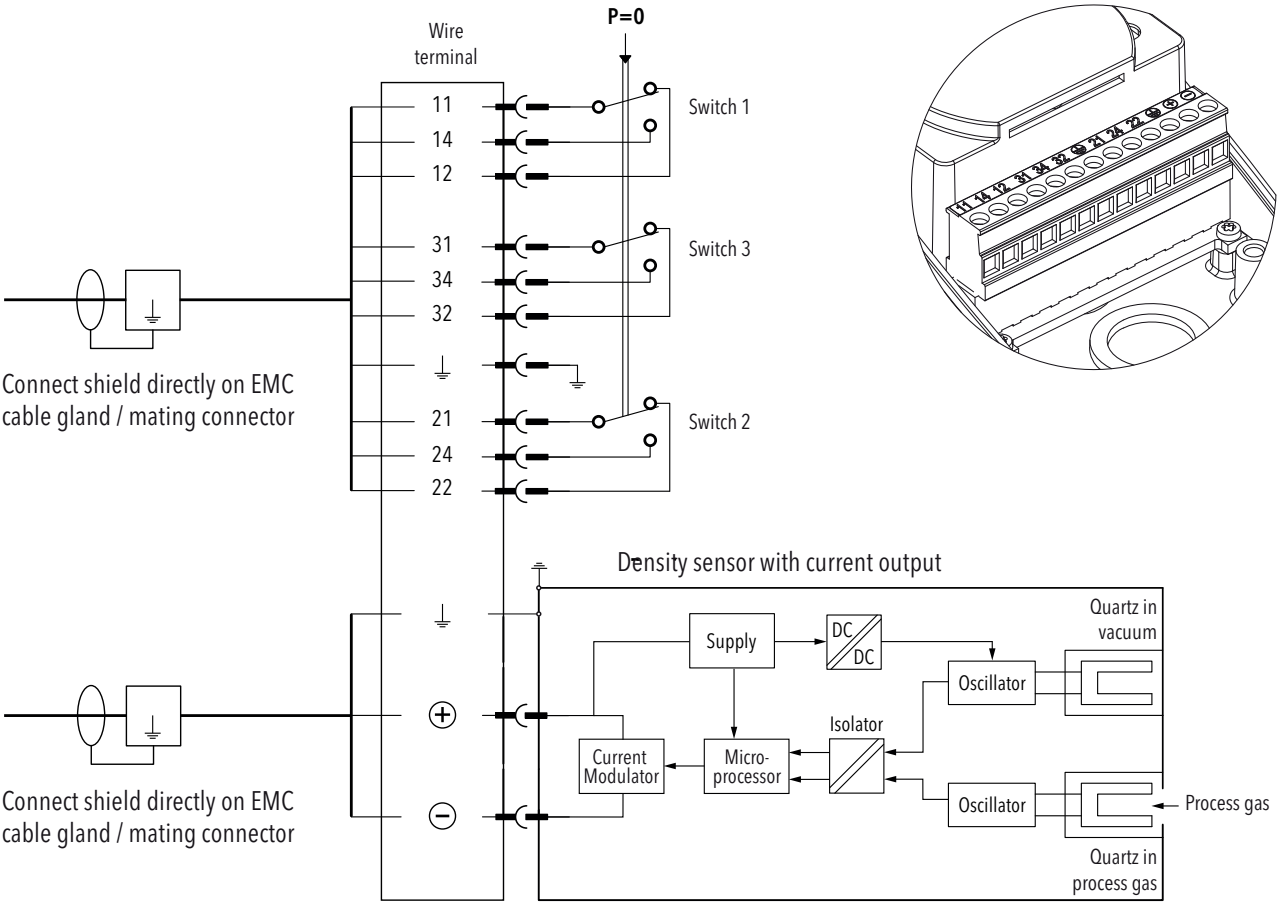
General specifications

Environmental conditions	Ambient temperature [1]	-40°C ... +80°C
	Protection [2]	IP65 and IP67
	Humidity	IEC 60068-2-30 (damp heat, cyclic, 100 % RH @ +55°C), membrane provides condensation compensation
	Overpressure	1300 kPa abs. with low pressure indicator option, without low pressure indicator option and lowest switchpoint setting ≤ 650 kPa abs. @ 20°C: 1300 kPa abs. > 650 kPa abs. @ 20°C: 1600 kPa abs.
	Shock	70 g, 3 ms, 10'000 times at all axes excited on process connection without damage to instrument
	Routine inspection of reference chamber gas tightness	Integral pressure testing with helium, leakage detection rate < $7 \cdot 10^{-8}$ mbar · l/s
Mechanical data	Process gas wetted material	Process connection and measuring system: 1.4404, 1.4435, 1.4571 (AISI316L, AISI316Ti) Test and re-filling valve: 1.4404 (AISI316L), CuZn39Pb3 (C38500) Sealing: IIR
	Housing	AlSi10Mg, powder coated
	Screwed cable gland	Brass nickel plated, PA as option
	Dial	Dial face and pointer: Aluminium sheet Window: PMMA

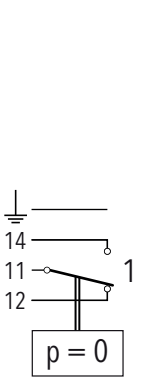
[1] Approved for extended temperature range –55°C … +80°C for max. 200h per year
[2] While using appropriate cable gland and/or mating connector mounted according to instruction

Electrical connections

Independent cabling for sensor is optional and can also be implemented with a combined microswitch / sensor outlet.



Microswitch in non-pressurised condition (p_{rel} = 0)



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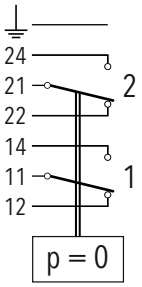

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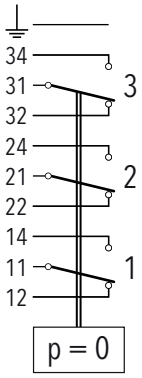

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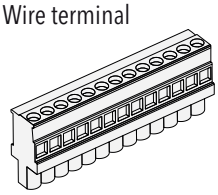
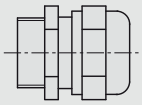
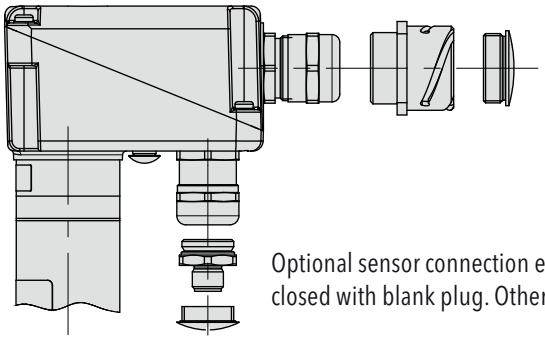
Connected with all electrically conductive elements of the density monitor

Connection via wire terminal in density monitor

The wires of the cable are connected to the wire terminal inside the density monitor housing.
The cable is fixed with the cable gland.

	Microswitch connection	Density sensor connection
Wire terminal 	Plugable, 0.2 ... 2.5 mm², 13-pins Contact assignment see section: Electrical Connections	
EMC-cable gland (Details see type code) 	M20x1.5 or M25x1.5 Material: Brass nickel-plated cable-ø min. 7 mm, max. 20.5 mm IP65, IP67	M20x1.5 Material: Brass nickel-plated cable-ø min. 4 mm, max. 14 mm IP65, IP67
Blank plug (Details see type code) 	M20x1.5 or M25x1.5 Material: Brass nickel-plated IP65, IP67	M20x1.5 Material: Brass nickel-plated IP65, IP67
Blank plug (Details see type code) 	M25x1.5 Material: Polyamide PA IP40	

IP protection only when cable / connector and plug are correctly mounted

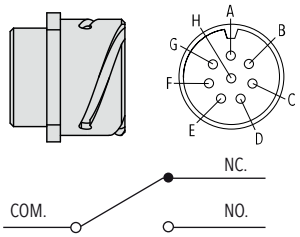


Microswitch or combined microswitch / sensor connection either with EMC-cable gland, ITT Cannon connector or closed with blank plug.

Optional sensor connection either with EMC-cable gland or closed with blank plug. Otherwise base plate is enclosed.

Connection via connector on density monitor housing

The cables are connected to the connector outside the housing.
The wiring inside the density monitor from the wire terminal to the connector is already provided for the options below.

	Microswitch connection		Density sensor connection
ITT Cannon [1]	Material: Shell aluminum alloy, insert neoprene, contacts copper alloy Pin assignment:		
	PIN B: COM_1 PIN C: COM_3 PIN D: NC_3	PIN E: COM_2 PIN F: NC_2 PIN H: NC_1	PIN A: (+) PIN G: (–)
e.g. switch 1: COM_1, NC_1, NO_1			

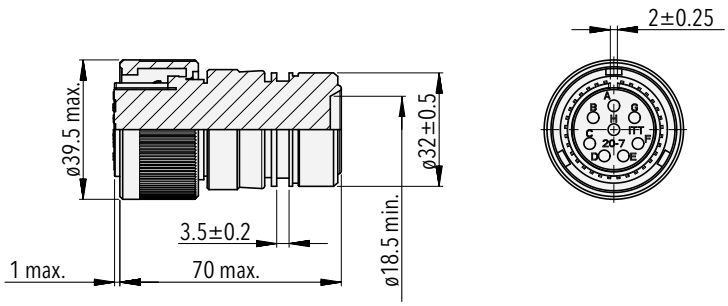
[1] Sheltering options are limited to weather protection cover (46) and/or thermal insulation ring (06) for probe housing

Accessories

Female electrical plug ITT Cannon

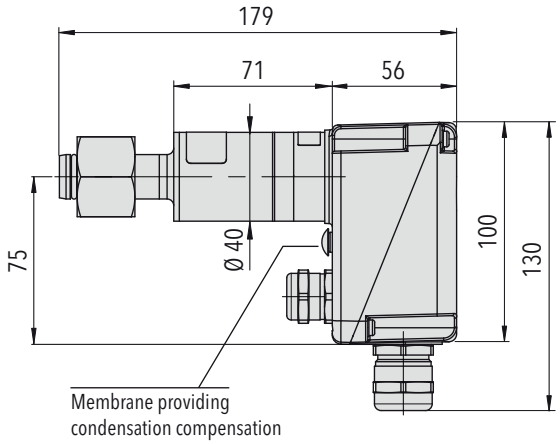
- Shell: Aluminum alloy with tin zinc plating
- Insulator: CR-elastomere
- Contact: copper alloy
- Contact plating: hard silver

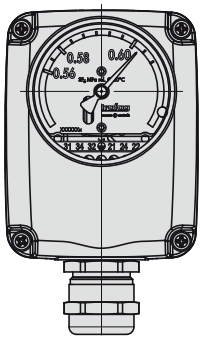
Ordering code as separate item, individually packed: F90156



Typical dimensions of hybrid density monitor

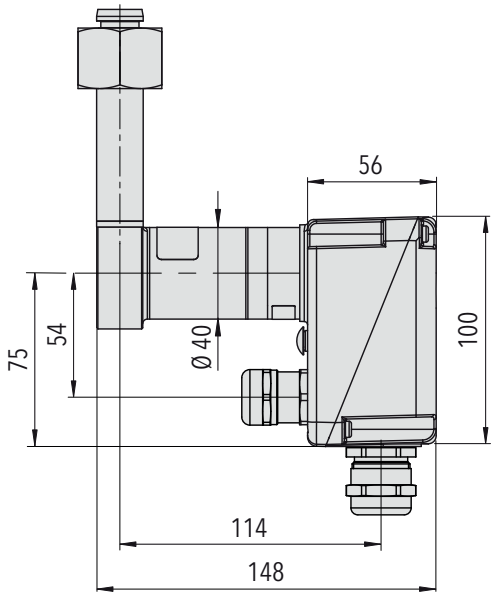
Example model with axial process connection

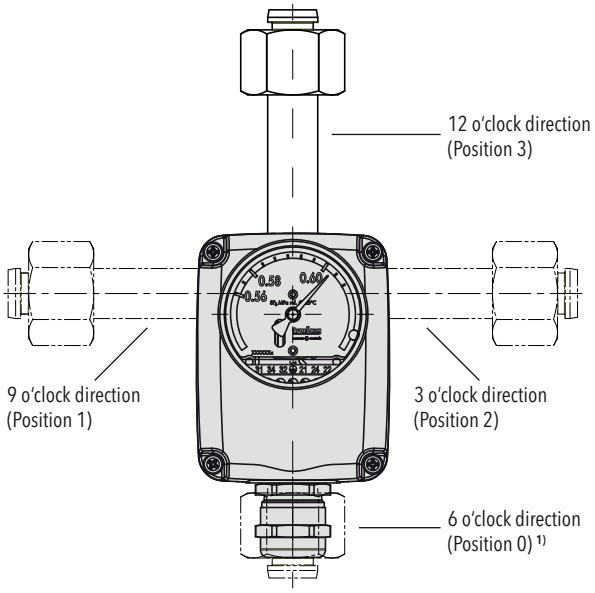




878x.20.2XXX.XX.XX.XX.XX

Example model with radial process connection





878x.20.2XXX.XX.XX.XX.XX

Radial process connection is configurable
for 12/3/6/9 o'clock direction

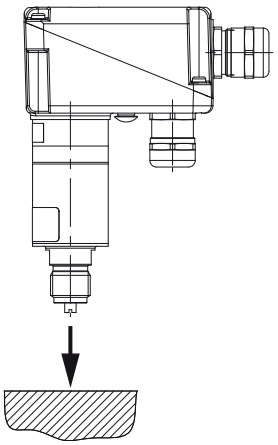
Position 0: 878x.XX.XXX**0**.XX.XX.XX.XX
Position 1: 878x.XX.XXX**1**.XX.XX.XX.XX
Position 2: 878x.XX.XXX**2**.XX.XX.XX.XX
Position 3: 878x.XX.XXX**3**.XX.XX.XX.XX

[1] Limited while using density sensor connection.
Please contact us for more details.

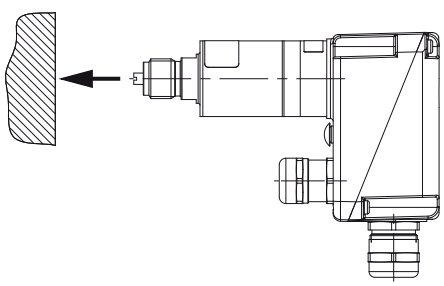
Installation

	Indoor application	Outdoor application	Outdoor application with rapidly changing or extreme weather conditions
Installation orientation	No limitations, any orientation possible	A, B, C [1)]	A, B, C [1)]
Recommended option	None	• Weather protection cover (46) • Thermal insulation for probe housing (06)	• Thermal foam cover (37) • Compartment immersion type process connection (5XXX)

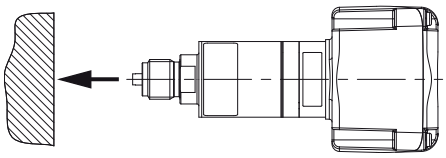
A



B

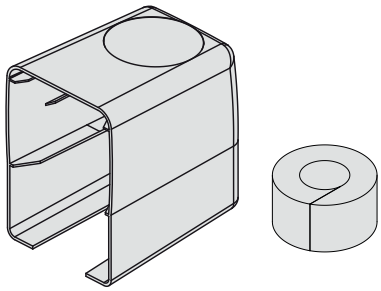


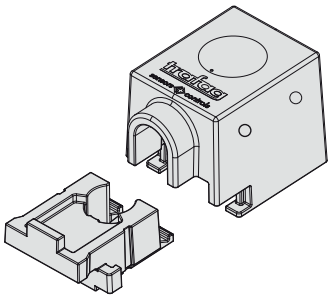
C



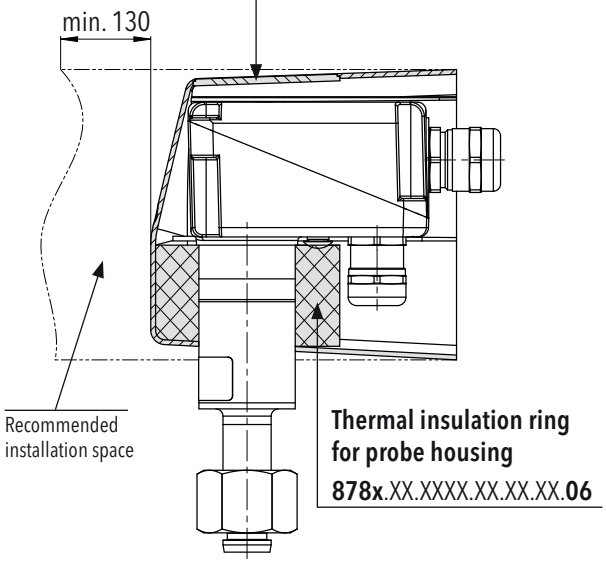
[1)] Or any orientation in between. A vertical upside down installation shall be avoided

Sheltering options

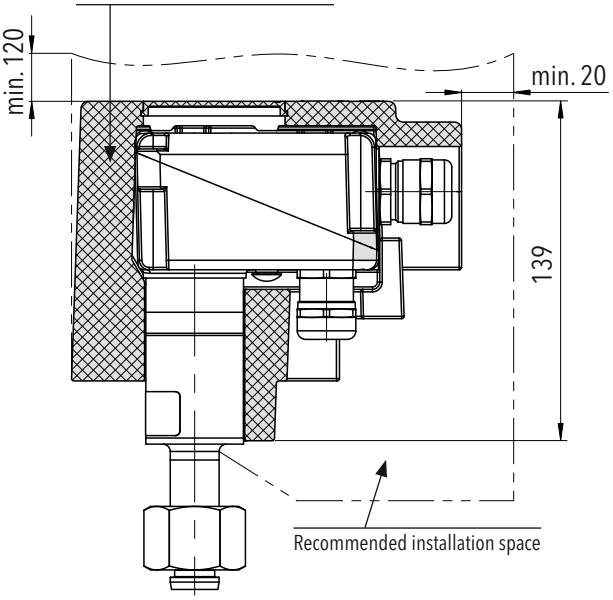


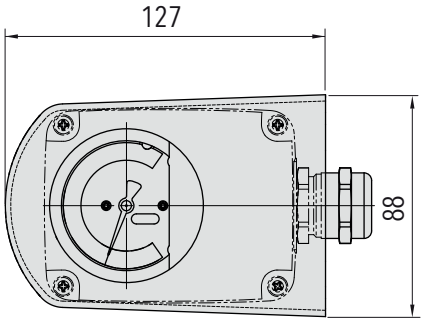


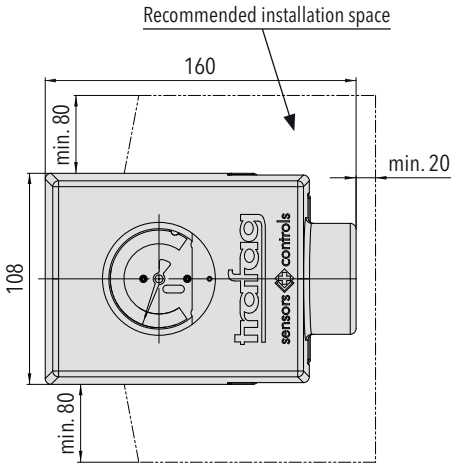
Weather protection cover
878x.XX.XXXX.XX.XX.XX.**46**



Thermal foam cover
878x.XX.XXXX.XX.XX.XX.**37**



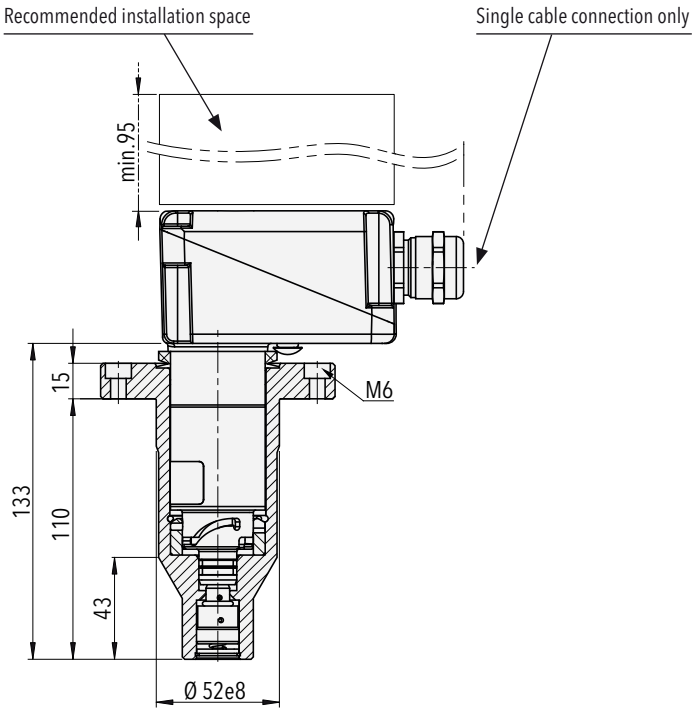


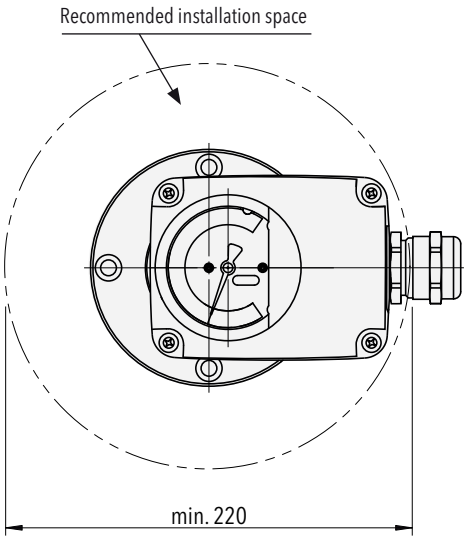


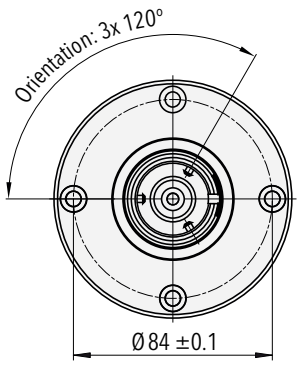
Weather protection cover (46) is aimed for long-term element protection. Insulation ring (06) for probe housing increases thermal inertia in moderate climates. Probe housing refers to the lower part of the monitor where reference chamber and oscillating quartz sensor are located.

Foam cover (37) increases thermal inertia of the hybrid density monitor. It is recommended in locations with high solar radiation or daily temperature fluctuations (high altitude, arctic, desert).

Compartment immersion process connection





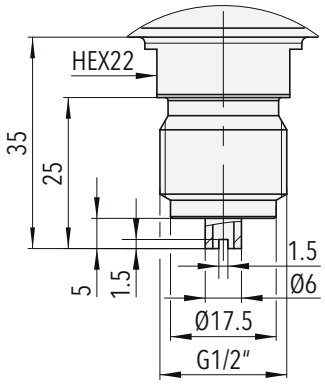


878x.XX.**5XXX**.XX.XX.XX.XX

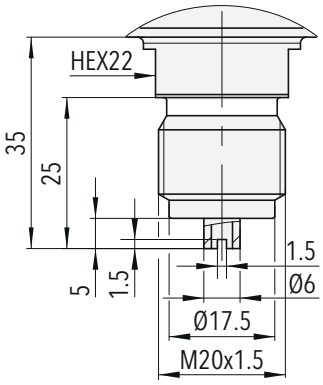
The in-compartment installation (5xxx) is aimed to match process gas and monitor probe temperature.
Bayonet fitting allows installation while process is pressurised.

Process connections

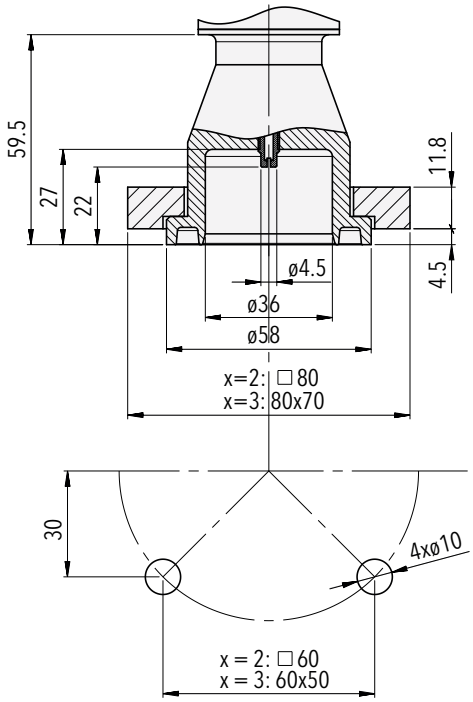
Axial process connections



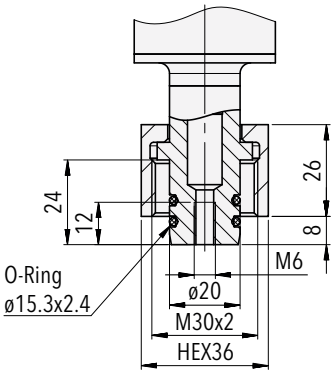
878x.XX.**1000**.XX.XX.XX.XX
Axial threaded connection G1/2"



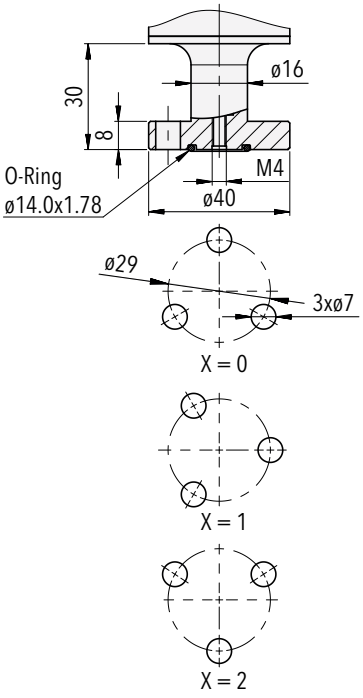
878x.XX.**1120**.XX.XX.XX.XX
Axial threaded connection M20x1.5



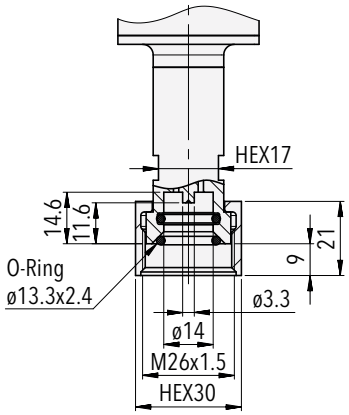
878x.XX.**2002**.XX.XX.XX.XX
Axial flanged connection



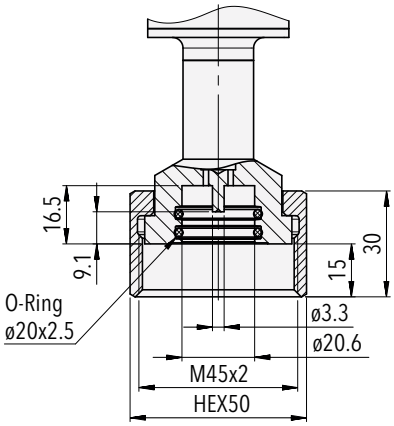
878x.XX.**2300**.XX.XX.XX.XX
Axial cap nut connection



878x.XX.**220x**.XX.XX.XX.XX
Axial flanged connection

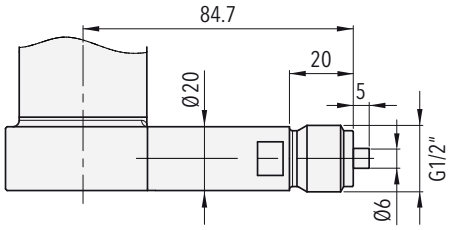


878x.XX.**2551**.XX.XX.XX.XX
Axial connection DN8

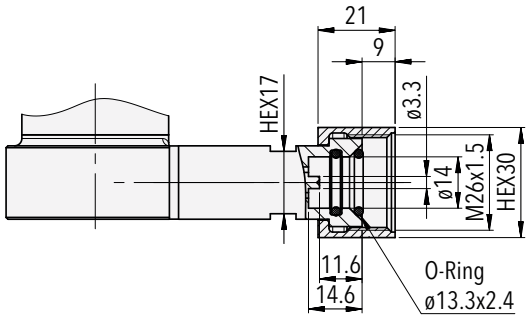


878x.XX.**2571**.XX.XX.XX.XX
Axial connection DN20

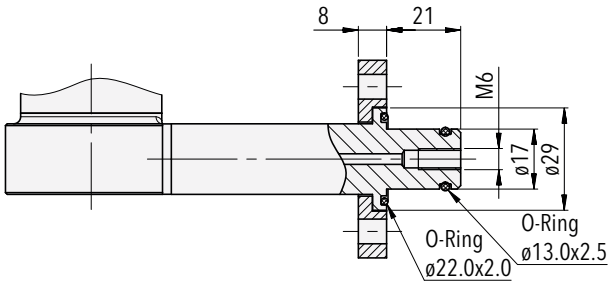
Radial process connections

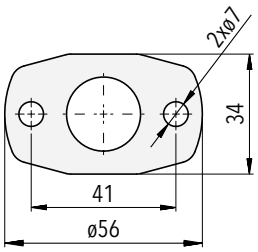


878x.XX.**1030**.XX.XX.XX.XX
Radial threaded connection G1/2"



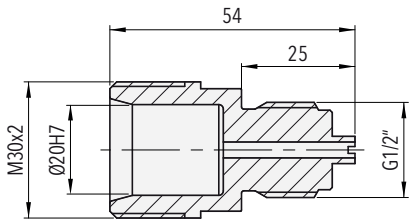
878x.XX.**2XE2**.XX.XX.XX.XX
Radial connection DN8





878x.XX.**2XP2**.XX.XX.XX.XX
Radial for two-hole flange connection

Adapter



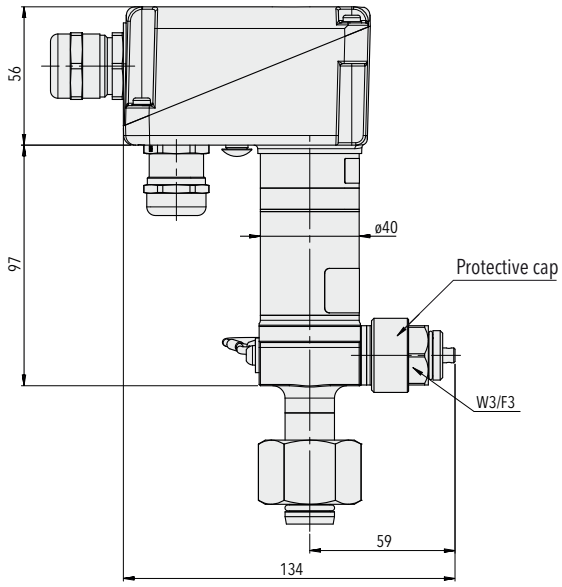
878x.XX.**2300**.XX.XX.XX.**N1**
Adapter 2300 - G1/2" male for rotatable G1/2" pressure connection

Delivery includes assembly kit and O-Ring set where applicable.

For full range of process connections and more details see data sheet www.trafag.com/H72502.

Integrated test valve DN8
Integrated maintenance and re-filling valve DN8

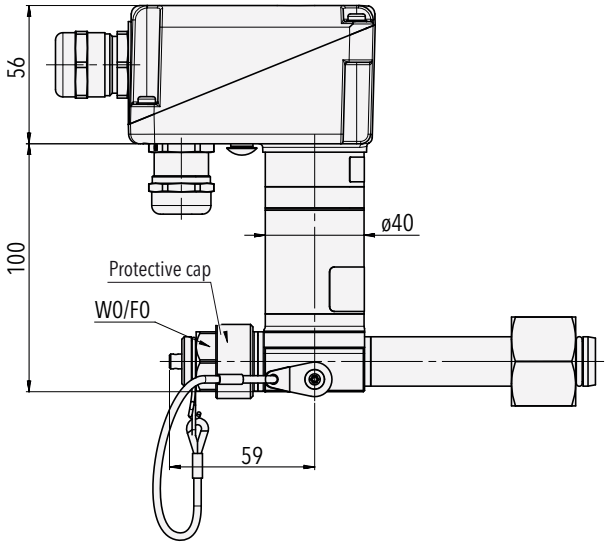
Example model with axial process connection



878x.XX.XXXX.XX.**W0**/**W1**/**W2**/**W3**.XX.XX

Test valve allows in-situ monitor and sensor verification without dismounting from pressure compartment. Test equipment is connected via DN8 port. Connection is configurable for direction W0/W1/W2/W3.

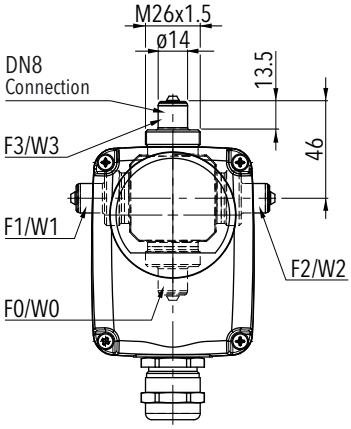
Example model with radial process connection



878x.XX.XXXX.XX.**F0**/**F1**/**F2**/**F3**.XX.XX

Valve allows in-situ analyzing of gas quality and direct insulating gas replenishment of pressure compartment via DN8 port on re-filling valve. Connection is configurable for direction F0/F1/F2/F3.

Orientation of valve connection [1)]
please specify when ordering

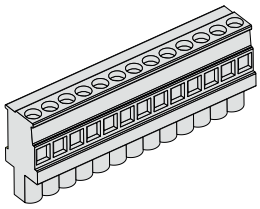


F3/W3 (12 o'clock, Standard orientation)
F0/W0 (6 o'clock, 180° orientation)
F1/W1 (9 o'clock, 270° orientation)
F2/W2 (3 o'clock, 90° orientation)

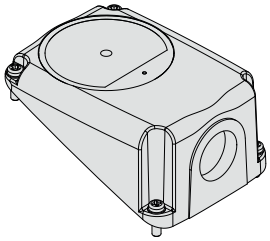
[1)] While using weather protection cover or thermal foam cover, the indicated installation spaces should be followed. See section installation and sheltering options

Operating specification for test and re-filling valve:
Opening and closing shall be limited to temperature range of -25°C ... +50°C.
Mechanical lifetime min. 250 actuation cycles.

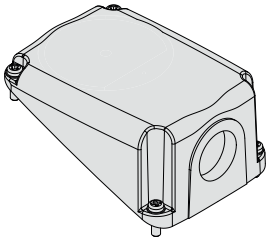
Spare parts



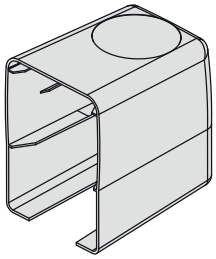
Microswitch wire terminal, 13-pins [1)]



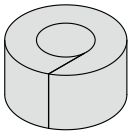
Housing cover with dial window [2)]



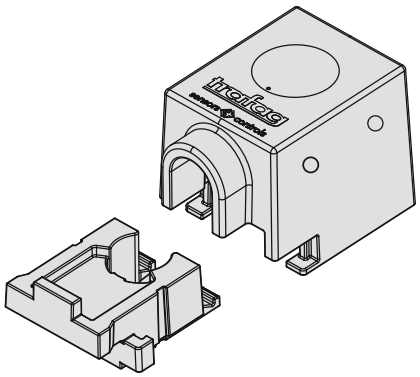
Housing cover without dial window [2)]



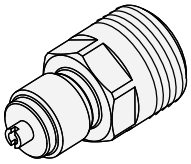
Weather protection cover
(Trafag part no.: C16354)



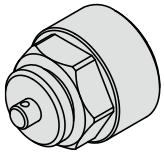
Thermal insulation ring for probe housing
(Trafag part no.: D34570)



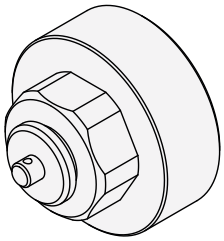
Thermal foam cover with drain holes
(Trafag part no.: C16421)



Pressure connection adapter 2300 - G1/2" male
(Trafag part no.: C30931)



M26x1.5 protective cap for test and re-filling valve
2 x O-Ring IIR mounted inside
(Trafag part no.: C30645)



M45x1.5 protective cap for filling valve
(Trafag part no.: C35800)

[1)] Please contact us for more details
[2)] Please identify if microswitch cable outlet is required. For options see ordering information

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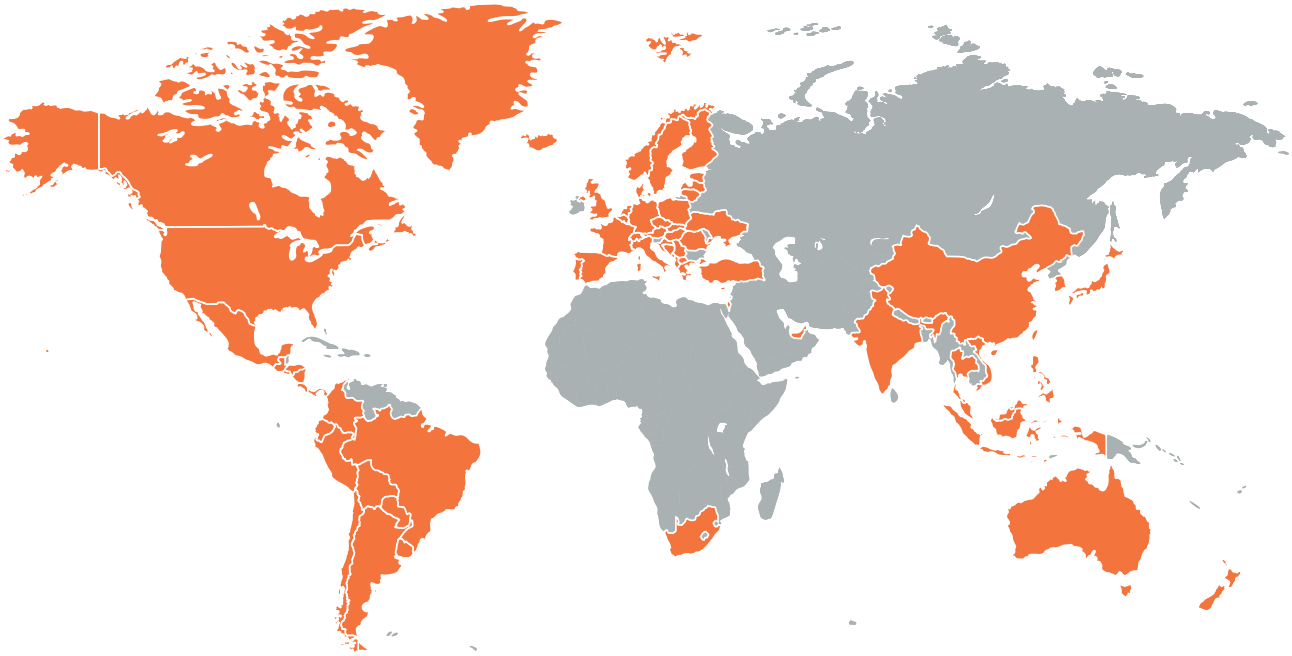

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