

Railway Pressure Transmitter



Product description

The EPR pressure transmitter was specifically designed for the high demand of the railway industry and offers reliable and accurate pressure measurement over a wide temperature range. Its excellent long-term stability is based on the leading thin-film-on-steel sensor technology from Trafag.

Applications

- Railways

Features

- Compact design
- Good temperature resistance
- Different accuracy classes
- Completely welded sensor system without additional seals
- Dielectrical strength: 750 VDC, meets EN 50155 (Railways)

 EMC: 2014/30/EU

 S.I. 2016 No. 1091

 RoHS/Reach compliant

 Conformity EN 50155

Technical Data

| | |
|---------------------|--|
| Measuring principle | Thin-film-on-steel |
| Measuring range | 0 ... 2.5 to 0 ... 600 bar 0 ... 30 to 0 ... 7500 psi |
| Output signal | 4 ... 20 mA |
| Media temperature | -40°C ... +125°C |
| Ambient temperature | -40°C ... +125°C |

Additional information

Data sheet www.trafag.com/H72319
Instructions www.trafag.com/H73317
Accessories www.trafag.com/H72258
Video https://youtu.be/M_rm0ZUaFlc

Ordering information/Type code

| Ordering information/Type code | | | | 8283 | XX | XX | XX | XX | XX | XX | |
|--|--|---------------------|------------------------|----------------------------------|---------------------|----------------------|-----------|-----------|-----------|----|--|
| Measuring range ¹⁾ | Pressure measurement range [bar] | Over pressure [bar] | Burst pressure [bar] | Pressure-measurement-range [psi] | Over pressure [psi] | Burst pressure [psi] | | | | | |
| | 0 ... 2.5 | 7.5 | 50 | 75 | 0 ... 30 | 90 | 700 | G5 | | | |
| | 0 ... 4 | 12 | 60 | 76 | 0 ... 50 | 150 | 850 | G6 | | | |
| | 0 ... 6 | 18 | 100 | 77 | 0 ... 100 | 300 | 1450 | G7 | | | |
| | 0 ... 10 | 30 | 200 | 78 | 0 ... 150 | 450 | 2500 | G8 | | | |
| | 0 ... 16 | 48 | 200 | 79 | 0 ... 200 | 600 | 2500 | GA | | | |
| | 0 ... 25 | 75 | 300 | 80 | 0 ... 250 | 750 | 2500 | G9 | | | |
| | 0 ... 40 | 120 | 300 | 81 | 0 ... 300 | 900 | 4000 | HA | | | |
| | 0 ... 60 | 180 | 400 | 82 | 0 ... 400 | 1200 | 4000 | H0 | | | |
| | 0 ... 100 | 300 | 500 | 83 | 0 ... 500 | 1500 | 4000 | H1 | | | |
| | 0 ... 160 | 480 | 750 | 85 | 0 ... 1000 | 3000 | 5000 | H2 | | | |
| | 0 ... 250 | 750 | 1000 | 74 | 0 ... 1500 | 4500 | 7000 | H3 | | | |
| | 0 ... 400 | 1000 | 2000 | 84 | 0 ... 2000 | 6000 | 10000 | H5 | | | |
| | 0 ... 600 | 1500 | 2500 | 86 | 0 ... 3000 | 9000 | 14500 | G4 | | | |
| | | | | | 0 ... 5000 | 12500 | 21750 | H4 | | | |
| | | | | | 0 ... 7500 | 18750 | 29000 | H6 | | | |
| Sensor | Relative pressure, accuracy class: 0.5 %; Material pressure connection and housing: 1.4542 (AISI 630) | | | | | | | 25 | | | |
| | Relative pressure, accuracy class: 0.5 %; Material pressure connection and housing: 1.4404 (AISI 316L) ²⁾³⁾⁴⁾ | | | | | | | 35 | | | |
| | Relative pressure, accuracy class: 0.3 %; Material pressure connection and housing: 1.4542 (AISI 630) | | | | | | | 23 | | | |
| | Relative pressure, accuracy class: 0.3 %; Material pressure connection and housing: 1.4404 (AISI 316L) ²⁾³⁾⁴⁾ | | | | | | | 33 | | | |
| Pressure connection | G1/4" female ²⁾ | | | | | | | | 10 | | |
| | G1/4" male, Seal: DIN 3869 | | | | | | | | 17 | | |
| | G1/4" male, with integrated damping Ø 0.5 mm, Seal: DIN 3869 | | | | | | | | 15 | | |
| | G1/4" male (Manometer) EN 837 ²⁾ | | | | | | | | 53 | | |
| | G1/2" male (Manometer) EN 837 ²⁾ | | | | | | | | 11 | | |
| | 1/4" NPT male | | | | | | | | 30 | | |
| | 1/4"- 18 NPT female ²⁾ | | | | | | | | 13 | | |
| | 1/2" NPT male ²⁾ | | | | | | | | 51 | | |
| | R1/4" male, DIN 3858 ²⁾ | | | | | | | | 19 | | |
| | M14x1.5 male, DIN 6149-2 ²⁾ | | | | | | | | 31 | | |
| | 7/16"-20UNF male, DIN 3866 ²⁾⁵⁾ | | | | | | | | 18 | | |
| | 7/16"-20UNF-2A male, SAE J1926-2 (Heavy Duty) ⁶⁾ | | | | | | | | 69 | | |
| 7/16"-20UNF female, SAE J512 with valve opener ⁵⁾ | | | | | | | | 24 | | | |
| Electrical connection | Male electrical connector EN 175301-803-A (DIN 43650-A), Material PA | | | | | | | | 05 | | |
| | Male electrical connector M12x1, 5-pole, Material PBT | | | | | | | | 35 | | |
| | Male electrical connector MIL-C 26482, 6-pole ⁷⁾ | | | | | | | | 02 | | |
| | Cable PUR (Screwed cable gland PA 6-3), -20°C ... +70°C ⁸⁾⁹⁾¹⁰⁾ | | | | | | | | 24 | | |
| | Cable PVC (Screwed cable gland PA 6-3), -5°C ... +60°C ⁸⁾⁹⁾¹⁰⁾¹¹⁾ | | | | | | | | 22 | | |
| | Cable Raychem (Screwed cable gland PA 6-3), -20°C ... +100°C ⁸⁾⁹⁾¹⁰⁾¹¹⁾ | | | | | | | | 08 | | |
| | 3 Way male Delphi MetriPack 1.5 sealed connector, Material PA66 | | | | | | | | 51 | | |
| Output signal | Output signal | | Load resistance | | U (supply) | | | | | | |
| | 4 ... 20 mA | | (Usupply-9 V) / 20 mA | | 9 ... 30 VDC | | 19 | | | | |

| Accessories | | |
|--|--|----|
| Female electrical plug M12x1, 5-pole | | 33 |
| Seal FKM, -18°C ... +125°C | | 61 |
| Seal EPDM, -40°C ... +125°C | | 63 |
| Seal NBR, -25°C ... +100°C | | 83 |
| Pressure peak damping element ø 1.0 mm, material 1.4305 ¹²⁾ | | 40 |
| Pressure peak damping element ø 0.4 mm, Material 1.4305 ¹²⁾ | | 44 |
| Female electrical plug EN 175301-803-A (DIN 43650-A)/NBR, -40°C ... +90°C For cable diameter 4 ... 9 mm, flammability standard UL94-V0 | | 46 |
| Female electrical plug EN 175301-803-A (DIN 43650-A)/silicone, -40°C ... +125°C For cable diameter 4 ... 9 mm, flammability standard UL94-V0 | | 56 |
| Female electrical plug EN 175301-803-A (DIN 43650-A)/NBR, -40°C ... +90°C For cable diameter 4 ... 9.5 mm, flammability standard UL94-V2 ¹⁰⁾ | | 58 |
| Housing nut for electrical connection EN 175301-803-A (DIN 43650-A) secured with Loctite (max. 85°C) | | L9 |
| Enhanced condensation protection | | CP |
| Multiple packaging ¹³⁾ | | VM |
| Pin configuration, see table: Electrical connection | | |

- ⁰¹⁾ Customized pressure ranges upon request
- ⁰²⁾ Upon request, whereas minimum order quantities may apply
- ⁰³⁾ Only with pressure connection 17 (G1/4") or 11 (G1/2")
- ⁰⁴⁾ Only for pressure ranges ≥ 10 bar
- ⁰⁵⁾ max. allowable pressure range 60 bar at 180 bar overpressure
- ⁰⁶⁾ Measuring range max. 630 bar according to SAE J1926-2 (Heavy Duty)
- ⁰⁷⁾ Only for pressure connections 13, 17, 19
- ⁰⁸⁾ Cable length see accessories (max. length 50 m, in 5-meter sections)
- ⁰⁹⁾ IP68, max. 3 m, Media +10°C ... +35°C
- ¹⁰⁾ Not according to standard EN 45545-2
- ¹¹⁾ Cable length max. 3 m for pressure ranges ≤ 16 bar
- ¹²⁾ Not for pressure connections 10, 11, 13, 15, 18, 24
- ¹³⁾ The order quantity must be a multiple of 50, only for electrical connections 05 and 35

Compatibility matrix pressure connection and accessories

| Code | Pressure connection | Damping | | Seal | | |
|------|---|-----------------------|-----------------------|------------------|-------------------|------------------|
| | | Ø 1.0 mm (Code 40) | Ø 0.4 mm (Code 44) | FKM (Code 61) | EPDM (Code 63) | NBR (Code 83) |
| 10 | G1/4" female | | | | | |
| 17 | G1/4" male, Seal: DIN 3869 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 15 | G1/4" male, with integrated damping Ø 0.5 mm, Seal: DIN 3869 | | | ✓ | ✓ | ✓ |
| 53 | G1/4" male (Manometer) EN 837 | | | | | |
| 11 | G1/2" male (Manometer) EN 837 | | | | | |
| 30 | 1/4" NPT male | ✓ | ✓ | | | |
| 13 | 1/4" - 18 NPT female | | | | | |
| 51 | 1/2" NPT male | ✓ | ✓ | | | |
| 19 | R1/4" male, DIN 3858 | ✓ | ✓ | | | |
| 31 | M14x1.5 male, DIN 6149-2 | ✓ | ✓ | ✓ | | |
| 18 | 7/16"-20UNF male, DIN 3866 | | | | | |
| 69 | 7/16"-20UNF-2A male, SAE J1926-2 (Heavy Duty) | ✓ | ✓ | ✓ | ✓ | |
| 24 | 7/16"-20UNF female, SAE J512 with valve opener | | | | | |

Specifications

| | | |
|---------------------------------|--|--|
| Electrical data | Output / supply voltage | 4 ... 20 mA: 24 (9 ... 32) VDC |
| | Power-on delay time | 100 ms |
| | Rise time of supply voltage | typ. 1 ms, 10 ... 90 % nominal pressure |
| | Inverse-polarity protection, short-circuit strength @ 25°C during 5 min. | 4 ... 20 mA: bis $U_s = 32$ VDC |
| | Resistance of insulation | > 100 M Ω , 500 VDC |
| | Dielectric strength | 750 VDC, 60 s |
| | Current limiting output signal | 4 ... 20 mA: 24 mA (Overload) |
| Environmental conditions | Media temperature | -40°C ... +125°C |
| | Ambient temperature | -40°C ... +125°C |
| | Storage temperature | -20°C ... +40°C |
| | Protection ¹⁾ | IP65, IP67, IP68 |
| | Humidity | max. 95 % relative |
| | Vibration | 15 g RMS (20 ... 2000 Hz) acc.to EN 60068-2-64 25 g sin (80 ... 2000 Hz), 1 oct./min, (1x @ 25°C) acc.to EN 60068-2-6 |
| | Shock | 500 g/1 ms acc.to EN 60068-2-27 |
| EMC protection | Emission | EN50121-3-2 |
| | Immunity | EN50121-3-2 ²⁾ |
| Mechanical data | Sensor (wetted parts) | 1.4542 (AISI630) |
| | Pressure connection (wetted parts) | 1.4542 (AISI630) or 1.4404 (AISI316L) ³⁾ |
| | Housing | 1.4542 (AISI630) or 1.4404 (AISI316L) ³⁾ |
| | Sealing | FPM, EPDM, NBR |
| | Male electrical connector | See ordering information |
| | Weight | ~ 80 ... 110 g |
| | Mounting torque | 25 Nm |

¹⁾ See electrical connection

²⁾ With power supply according to EN IEC 61326-1:2021 table (2), footnote (e). Surge test conducted on shield, in accordance with EN 61000-4-5:2014, 7.6. Device to be galvanically isolated and to be used in signal area protected against EMC interference (area C in accordance with EN 50155:2021, fig.5)

³⁾ See ordering information for sensor

Additional specifications railways

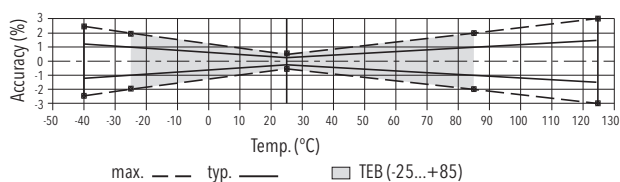
| | | | |
|---------------------------------------|---|-----------------|--|
| Environmental conditions | Cold | EN 60068-2-1 | Ab: -40°C, 2 h (not in operation) Ae: -40°C, 1 h (in operation) |
| | Dry heat | EN 60068-2-2 | Be: 85°C, 6 h (in operation) |
| | Damp heat, cyclic | EN 60068-2-30 | Db: 55°C, variant 1, 2 cycles (2 x 24 h) |
| | Class of altitude | EN 50125-1 | AX (max. 2000 m ASL) |
| | Class of air temperature | EN 50125-1 | Refer to the specified ambient temperature in table "Specification" |
| | Vibration and shock | EN 61373 | Vibration: category 3 ¹⁾ Shock: category 3 ¹⁾ |
| | Dielectric strength | EN 50155 | 750 VDC |
| | Resistance of insulation | EN 50155 | >100 MΩ, 500 VDC |
| | Behavior in case of fire (only electrical connections 05, 35) | EN 45545-2 | Weight: < 10 g Surface: < 0.2 m ² |
| | Supply | Nominal voltage | EN 50155 |
| Interruptions of the voltage supply | | EN 50155 | Class S1 |
| Switching between two supply voltages | | EN 50155 | Class C1 |

¹⁾ Male electrical connector EN 175301-803-A, cat. 2

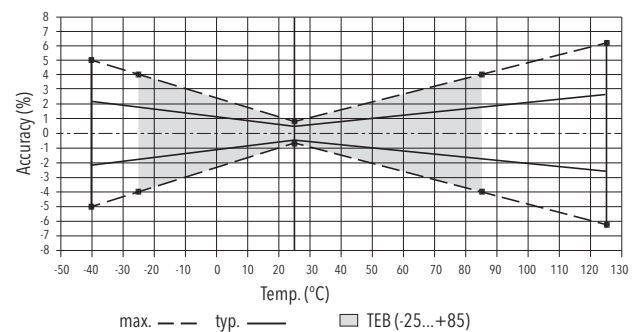
Accuracy

| | | Accuracy class 0.3% Ordering code 23 | Accuracy class 0.5% Ordering code 25 |
|--|---------------|---|---|
| TEB @ -25 ... +85°C | [% FS typ.] | ± 1.0 | ± 1.75 |
| Accuracy @ +25°C | [% FS typ.] | ± 0.3 | ± 0.5 |
| Measurement deviation during EMC (verified with 100 ms integration time) | [% FS max.] | ± 1.0 | ± 1.0 |
| NLH @ +25°C (BSL) | [% FS typ.] | ± 0.2 | ± 0.2 |
| TC zero point and span | [% FS/K typ.] | ± 0.01 | ± 0.03 |
| Long term stability 1 year @ +25°C | [% FS typ.] | ± 0.1 | ± 0.1 |

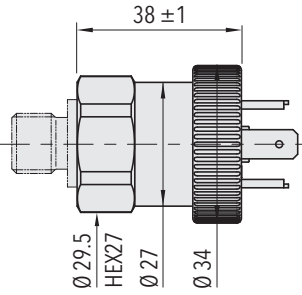
Accuracy class 0.3 %



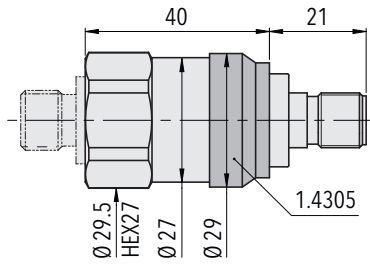
Accuracy class 0.5 %



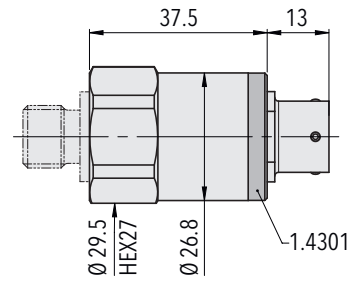
Dimensions



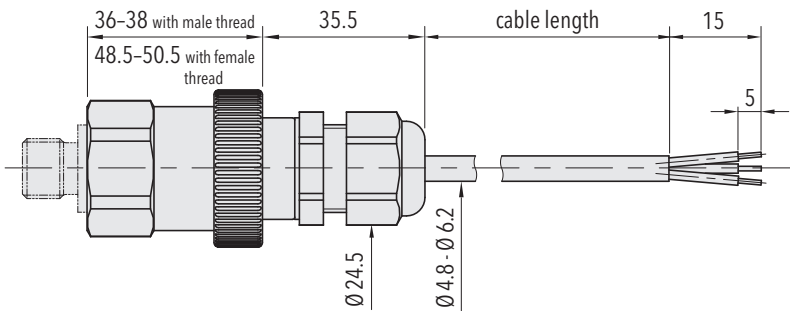
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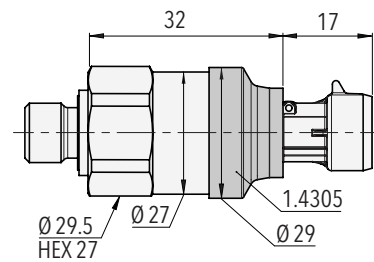
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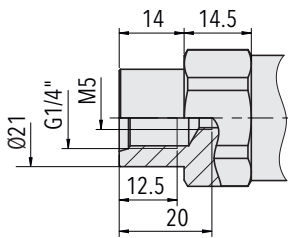
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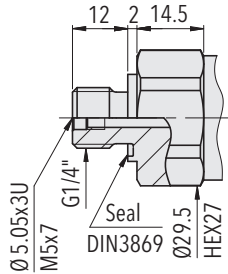
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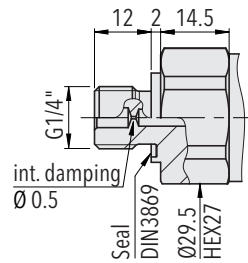
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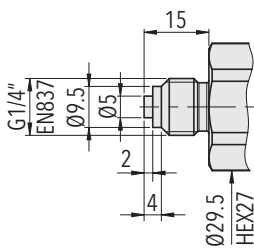
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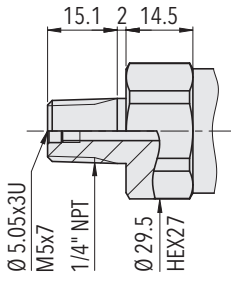


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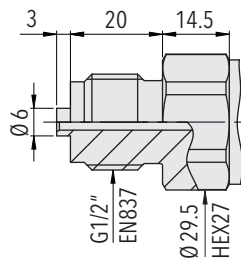


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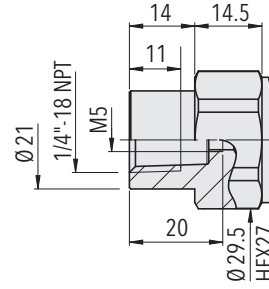
Dimensions



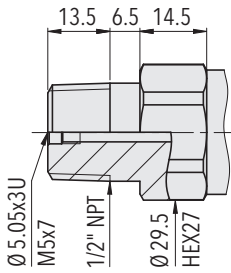
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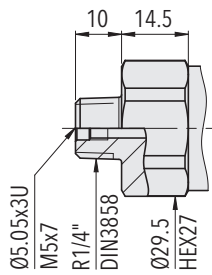
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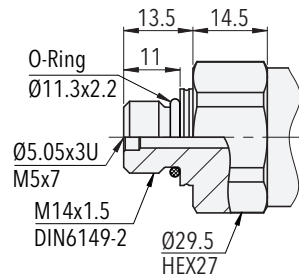
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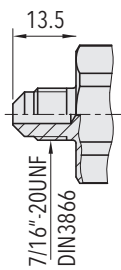
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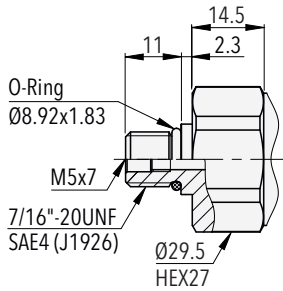
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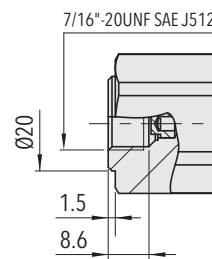
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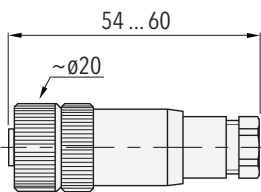
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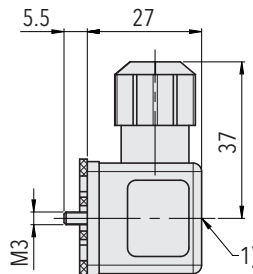
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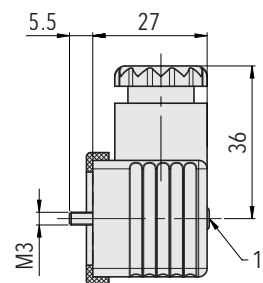


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1) Tightening torque 50 ... 60 Ncm

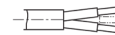
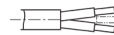
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Electrical connection

| | | | | | | |
|--|--------------------------------------|------------------------|-----------------------|-------------|-------------|-------------|
| | Industrial standard EN175301-803A | M12x1, 5-pole | MIL-C 26482 | | | |
| | | | | | | |
| | 05 | 35 | 02 | | | |
| IP protection | IP65 ^{1) 2)} | IP67 ^{1) 2)} | IP67 ^{1) 2)} | | | |
| Ambient temperature | -40°C ... +80°C | -40°C ... +125°C | -40°C ... +125°C | | | |
| Pin assignment type code | 92 | G9 | H1 | | | |
| Output signal 8283.xx.xxxx.xx.19 | 2 1 Earth | 1 2 Earth | 4 1 5 | 1 3 4 | 1 2 5 | A B E |
| | Cable ^{2) 3)} | Cable ^{2) 3)} | | | | |



| | | | |
|--|------------------------------|-----------------------|--|
| | 22/24 | 08 | |
| IP protection | IP68, max. 3m | IP68, max. 3m | |
| Ambient temperature | -30°C ... +80°C | -40°C ... +125°C | |
| Pin assignment type code | | | |
| Output signal 8283.xx.xxxx.xx.19 | White Brown Yellow | Red Black Green | |

¹⁾ Provided female electrical plug is mounted according to instructions

²⁾ Ventilation via male electric plug/cable end

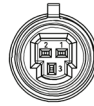
³⁾ Not according to standard EN 45545-2

⁴⁾ Only cable versions or female electrical plug with shield connection

i Empty 'Pin Assignment Type Code' field: Default pinout

Electrical connection

3 Way M MetriPack 1.5 sealed connector



| | | |
|--|--------------------|-------------|
| Electrical connection type code | 51 | |
| IP protection | IP67 ¹⁾ | |
| Ambient temperature | -40°C ... +125°C | |
| UL-rated ambient temperature | -20°C ... +80°C | |
| Pin assignment type code | E4 | |
| Output signal 8283.XX.XXXX.XX.19 | 1 2 | 1 3 |
| Pin assignment type code | 99 | |
| Output signal 8283: n/a | 1 3 2 | 1 2 3 |

¹⁾ Provided female electrical plug is mounted according to instructions

i Empty 'Pin Assignment Type Code' field: Default pinout

Reliable quality

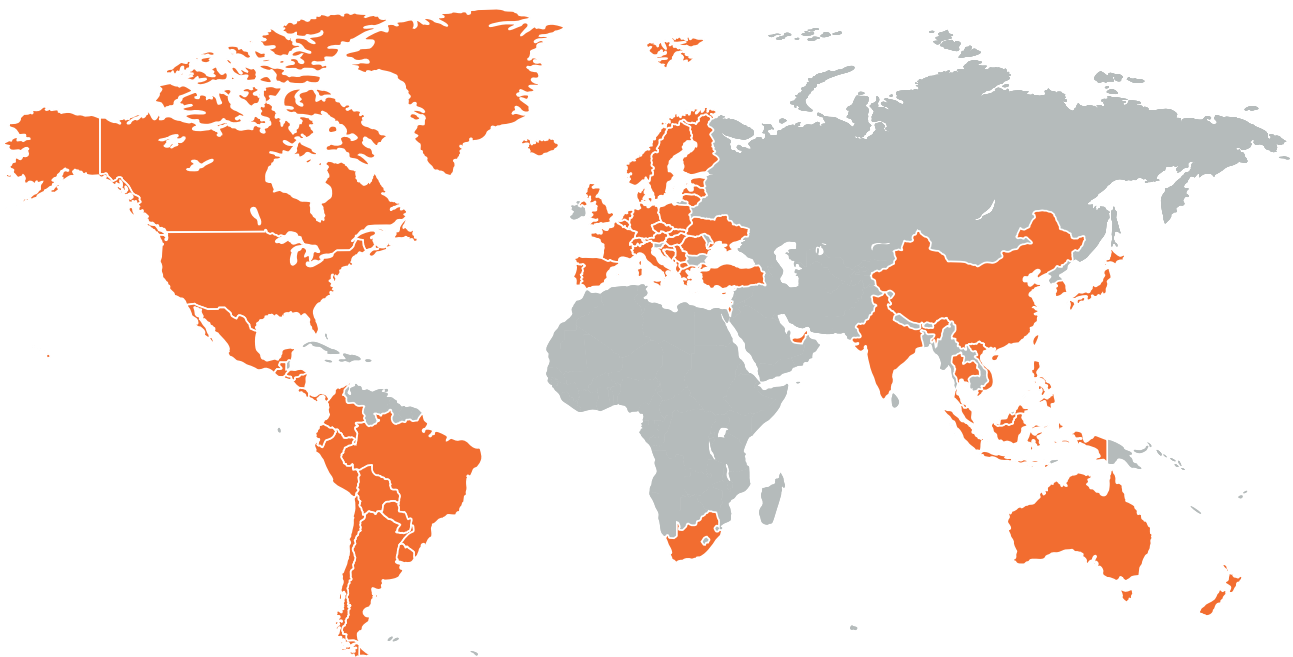
Worldwide represented, globally trusted, Swiss based

Trafag develops, produces and distributes robust, reliable and precise instruments for monitoring pressure, temperature and gas density.

The broad portfolio of pressure and temperature measuring instruments is tailored for use in test benches through to applications in harsh environments. The research and development departments in Switzerland and Germany develop all important components from the sensor to the application-specific microchip, which are

then manufactured in the production facilities in Switzerland, Germany, the Czech Republic, and India. Strict quality management according to ISO 9001 and ISO 14001 ensures that Trafag products meet the required quality and sustainability standards.

Trafag is headquartered in Switzerland, was founded in 1942 and has an extensive sales and service network in more than 40 countries worldwide.



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Pressure transmitters



Electronic pressure switches



Mechanical pressure switches



Pressure gauge



Thermostats



Temperature transmitters



Gas density