

PICOSTAT RAILWAY PRESSURE SWITCH

Swiss based Trafag is a leading international supplier of high quality sensors and monitoring instruments for measurement of pressure and temperature. The 9R5 of the Picostat series is based on our long lasting experience in the railway sector. The new Picostat generation with improved performance and new design meets the demanding requirements of rail vehicle applications.



Applications

- Railway

Features

- Stainless steel housing
- Stainless steel bellow sensor, welded
- Compact design
- Rugged housing
- Meets EN 50155 (Railway)

| Technical Data | | | |
|------------------------|---|-----------------------|---|
| Measuring principle | Steel bellow welded | Media temperature | -40°C ... +85°C |
| Setting range | -0.8 ... 2 to 7 ... 12 bar -11 ... 29 to 102 ... 174 psi | Ambient temperature | -40°C ... +85°C (EN 50155: OT6) |
| Output signal | 1 Floating change-over contact (SPDT) | Approval / conformity | EN 50155 (Railway) EN 45545-2 (Fire protection) EN 61373 (Shock, vibration) EN 60730-1/ EN 60730-2-6: type 2.B.H |
| Switching differential | Not adjustable | | |

Ordering information/type code

| | | | | | | | 9R5 . | XX | XX | XXX | XX | XX | XX | XX | | |
|------------------------------|--|---------------------------------|----------------------------|-----------------------------|---------------|--------------------|-------|----|----|-----|----|----|----|----|----|--|
| Microswitch | Standard, silver contacts ¹⁾ | | | | | | 3A | | | | | | | | | |
| | Standard with gold plated contacts ¹⁾ | | | | | | 8A | | | | | | | | | |
| Range ⁴⁾ | Setting range [bar] | Operating pressure [bar] | Over pressure [bar] | Burst pressure [bar] | Sensor | Sensor type | | | | | | | | | | |
| | -0.8 ... 2 | -1 ... 14 | 14 | 45 | B10 | Bellow | 10 | | | | | | | | | |
| | 1 ... 5 | -1 ... 14 | 14 | 45 | B10 | Bellow | 11 | | | | | | | | | |
| | 4 ... 8 | -1 ... 14 | 14 | 45 | B10 | Bellow | 12 | | | | | | | | | |
| | 7 ... 12 | -1 ... 23 | 23 | 45 | B10 | Bellow | 13 | | | | | | | | | |
| Sensor | Sensor type | | Sensor material | | | | | | | | | | | | | |
| | Bellow | | Stainless steel 1.4571 | | | | B10 | | | | | | | | | |
| Pressure connection | Flange connection with O-Ring ²⁾ | | | | | | | | | | 11 | | | | | |
| | G1/4" female with flange mounting holes ³⁾ | | | | | | | | | | 04 | | | | | |
| Electrical connection | Male electrical connector EN 175301-803-A (DIN 43650-A) | | | | | | | | | | | 05 | | | | |
| Pressure units | bar rel. | | | | | | | | | | | | | | UB | |
| | MPa rel. | | | | | | | | | | | | | | UM | |
| | kPa rel. | | | | | | | | | | | | | | UK | |
| | psi rel. | | | | | | | | | | | | | | UP | |
| | kg/cm ² rel. | | | | | | | | | | | | | | UC | |
| Accessories | Fixing set for flange mounting holes, M5x40, stainless steel A4-70 | | | | | | | | | | | | | | V2 | |
| | Fixing set for flange mounting holes, M5x40, galvanised steel, grade 8.8 | | | | | | | | | | | | | | V3 | |
| | Female electrical plug EN 175301-803-A (DIN 43650-A)/NBR, -40°C ... +90°C, for cable diameter 4 ... 9 mm, 4 x 1.5 mm ² /AWG16, flammability standard UL94-V0 | | | | | | | | | | | | | | 46 | |
| | Seal NBR, -25°C ... +125°C | | | | | | | | | | | | | | 83 | |
| | Seal FPM, -18°C ... +125°C | | | | | | | | | | | | | | 61 | |
| | Seal EPDM, -40°C ... +125°C | | | | | | | | | | | | | | 63 | |
| | Switching points preset according to customer requirements. Please indicate when ordering: - Switchpoint including measurement unit, relative (bar, MPa, kPa, psi, kg/cm ²) - Increasing or decreasing | | | | | | | | | | | | | | 87 | |
| | Fixed switching point adjustment according to customer requirements, manipulation protection with seal sticker. Please indicate when ordering: - Switchpoint including measurement unit, relative (bar, MPa, kPa, psi, kg/cm ²) - Increasing or decreasing | | | | | | | | | | | | | | 88 | |
| | Damping elements and snubber see data sheet H72258 | | | | | | | | | | | | | | | |

¹⁾ Switching differential not adjustable

²⁾ Sealing NBR, FPM EPDM selectable

³⁾ Without sealing

⁴⁾ For further pressure units see table "Range"

| Range | | | | | | |
|--------------------------------------|--------------------|---------------------|---------------|--------------------|--------------|----------------|
| [psi, MPa, kPa, kg/cm ²] | | | | | | |
| Pressure unit Code | Pressure unit | Pressure range Code | Setting range | Operating pressure | Overpressure | Burst pressure |
| UP | psi | 10 | -11 ... 29 | -14 ... 200 | 200 | 650 |
| | | 11 | 15 ... 72 | -14 ... 200 | 200 | 650 |
| | | 12 | 58 ... 116 | -14 ... 200 | 200 | 650 |
| | | 13 | 102 ... 174 | -14 ... 330 | 330 | 650 |
| UM | MPa | 10 | -0.08 ... 0.2 | -0.1 ... 1.4 | 1.4 | 4.5 |
| | | 11 | 0.1 ... 0.5 | -0.1 ... 1.4 | 1.4 | 4.5 |
| | | 12 | 0.4 ... 0.8 | -0.1 ... 1.4 | 1.4 | 4.5 |
| | | 13 | 0.7 ... 1.2 | -0.1 ... 2.3 | 2.3 | 4.5 |
| UK | kPa | 10 | -80 ... 200 | -100 ... 1400 | 1400 | 4500 |
| | | 11 | 100 ... 500 | -100 ... 1400 | 1400 | 4500 |
| | | 12 | 400 ... 800 | -100 ... 1400 | 1400 | 4500 |
| | | 13 | 700 ... 1200 | -100 ... 2300 | 2300 | 4500 |
| UC | kg/cm ² | 10 | -0.8 ... 2 | -1 ... 14 | 14 | 45 |
| | | 11 | 1 ... 5 | -1 ... 14 | 14 | 45 |
| | | 12 | 4 ... 8 | -1 ... 14 | 14 | 45 |
| | | 13 | 7 ... 12 | -1 ... 23 | 23 | 45 |

| Specifications | | |
|---------------------------------|------------------------------------|--|
| Environmental conditions | Ambient temperature | -40°C ... +85°C (EN 50155: OT6) |
| | Media temperature | -40°C ... +85°C |
| | Storage temperature | -40°C ... +85°C |
| | Protection ¹⁾ | IP65 / IP67 |
| | Humidity | Max. 95 % relative |
| | Vibration | EN61373, category 2 |
| | Shock | EN61373, category 2 |
| Mechanical data | Sensor | Steel bellow welded 1.4571 |
| | Pressure connection (wetted parts) | 1.4301, 1.4306, 1.4307 |
| | Housing | 1.4301, 1.4306, 1.4307 PA66 A3X2G5 UL94-V0 |
| | Sealing | See ordering information |
| | Housing seal | NBR |
| | Mounting torque | G 1/4" female: $M_A = 32 \dots 40$ Nm Flange: M5x40; $M_A 4.5 \dots 6$ Nm |
| | Installation | any position |
| | Weight | ~ 270 g |
| Microswitch | Rating | See table "Microswitch rating" |
| | Resistance of insulation | 500 VDC > 10 MΩ |
| | Dielectric strength | 1.5 kVAC/60 s terminal ground 500 VAC/60 s via open contacts |
| Electrical connection | Electrical connections | EN 175301-803-A (DIN 43650-A) |

¹⁾ Provided female electrical plug is mounted according to instructions

| Lifetime | | | |
|--------------------|------------|------------|---|
| Sensor | Bellow B10 | mechanical | 10 x 10 ⁶ cycles ³⁾ |
| Microswitch | 3A | mechanical | 2 x 10 ⁶ cycles |
| | 8A | mechanical | 2 x 10 ⁶ cycles |

³⁾ Max. switching frequency 3.5 Hz @ 25°C, up to 10 bar operating pressure

i The 9R5 with bellow sensor is suitable for gaseous and liquid media. Specification of compressed air quality according to ISO 8573-1:

- Particle class: 4
- Oil class: 4
- Dew point: dew point must be at least 15°C below inlet air temperature

| Accuracy | | | | | | |
|--|-----------------|------------------------|--------------------------------|----------------------------|-----------------------------|-------------------------------|
| Setting range | | Code [bar] [psi] | 10 -0.8 ... 2 -11 ... 29 | 11 1 ... 5 14 ... 72 | 12 4 ... 8 58 ... 116 | 13 7 ... 12 102 ... 174 |
| Switching differential @ 25°C | | [bar] [psi] | ≤ 0.3 ≤ 4.4 | ≤ 0.3 ≤ 4.4 | ≤ 0.4 ≤ 5.8 | ≤ 0.6 ≤ 8.7 |
| Switch point setting tolerance ²⁾ @ 25°C | | [bar] [psi] | ± 0.1 ± 1.45 | ± 0.1 ± 1.45 | ± 0.15 ± 2.17 | ± 0.15 ± 2.17 |
| Longterm stability ³⁾ @ 1 x 10 ⁶ cycles | | [bar] [psi] | ± 0.15 ± 2.18 | ± 0.15 ± 2.18 | ± 0.25 ± 3.63 | ± 0.25 ± 3.63 |
| Repeatability | | | ± 0.2 % operating range | | | |
| Temperature dependence switch point | -40°C ... +85°C | | -0.03 % operating range/°C | | | |

²⁾ With accessory 87, 88

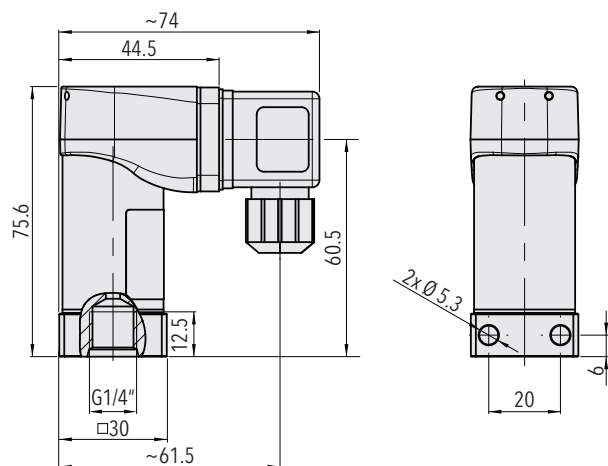
³⁾ Max. switching frequency 3.5 Hz, up to 10 bar operating pressure

| Detail railway specifications | | | |
|-------------------------------|--|---------------------------|---|
| Environmental conditions | Cold | EN 60068-2-1 | Ab: -40°C, 96 h |
| | Dry heat | EN 60068-2-2 | Bb: 85°C, 96 h |
| | Damp heat, cyclic | EN 60068-2-30 | Db: 55°C, 95 % @ 25°C (2 x 24 h) |
| | Thermal shock | EN 60068-2-14 | 240 h, -40°C/+85°C |
| | Salt mist | EN 60068-2-52 | 672 h |
| | Rapid temperature variations | EN 50155 | Class H1 |
| | Vibration and shock | EN 61373 EN 60068-2-64 | Vibration: category 2 Shock: category 2 Simulated long-life testing category 2 |
| | Behavior in case of fire, hazard level (electrical connection 05) | EN 45545-2 | HL1, HL2, HL3 |
| | External mechanical impacts | EN 62262 | IK07 |

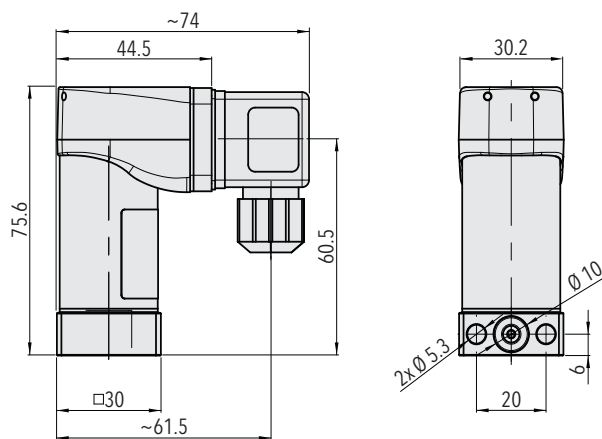
| Microswitch rating | | | |
|--------------------|--|---------------------------------|-----------------------|
| | | Rating | |
| | | Resistive Load (Inductive Load) | |
| Type | Features | AC | DC |
| 3A (Standard) | Silver contacts | 250 V, 6 (1.5) A | 220 V, 0.2 (0.1) A |
| | | 220 V, 6 (1.5) A | 110 V, 0.4 (0.2) A |
| | | 110 V, 6 (2) A | 48 V, 2 (0.75) A |
| | | 48 V, 6 (2) A | 24 V, 6 (2) A |
| | | 24 V, 6 (2) A | 12 V, 6 (6) A |
| | | min. 10 V, min. 0.1 A | min. 10 V, min. 0.1 A |
| 8A | If the Micro switch is only switched sporadically, e.g. once every six months, gold contacts should be used. | 250 V, 6 (1) A | 220 V, 0.2 (0.1) A |
| | | 220 V, 6 (1) A | 110 V, 0.4 (0.2) A |
| | | 110V, 6 (1) A | 48 V, 2 (1) A |
| | | 48 V, 6 (1.5) A | 24 V, 6 (3) A |
| | | 24 V, 6 (2) A | min. 5 V, min. 5 mA |
| | | min. 5 V, min. 5 mA | |

| Additional information | | |
|------------------------|--------------|--|
| Documents | Data sheet | www.trafag.com/H72370 |
| | Instructions | www.trafag.com/H73370 |
| | Flyer | www.trafag.com/H70370 |

Dimensions

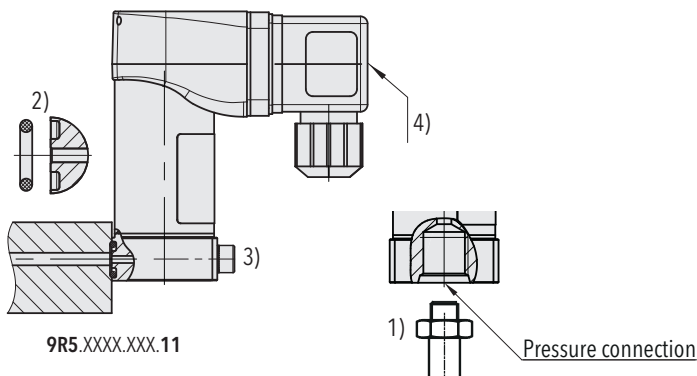


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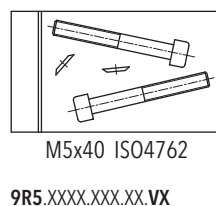


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Mounting instructions, accessories

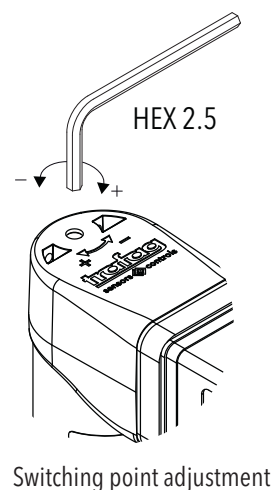


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M5x40 ISO4762

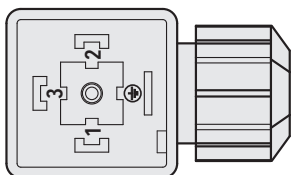
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Switching point adjustment

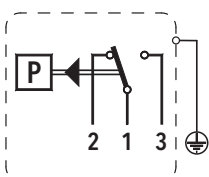
- 1) Torque: G 1/4" female: $M_A = 32 \dots 40 \text{ Nm}$
- 2) O-Ring: $\varnothing 6.75 \times 1.78$
- 3) Fixing screw: M5x40; torque: $4.5 \dots 6 \text{ Nm}$
- 4) Torque connector center screw: max. 0.6 Nm

Electrical connection



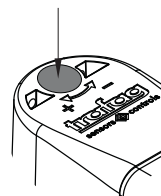
EN175301-803-A

Conductor size range:
Minimum 0.75 mm^2 - Maximum 1.5 mm^2 ,
Terminal tightening torque: 0.4 Nm



Manipulation protection

Manipulation protection with seal sticker.
Do not remove.



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