

Pressure Measurement

Transmitters for basic requirements

SITRANS P200
for gauge and absolute pressure

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Overview



The SITRANS P200 pressure transmitter measures the gauge and absolute pressure of liquids, gases and vapors.

- Ceramic measuring cell
- Gauge and absolute measuring ranges 1 to 60 bar (15 to 1000 psi)
- For general applications

Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

Application

The SITRANS P200 pressure transmitter for gauge and absolute pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

Design

Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a round plug M12 (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

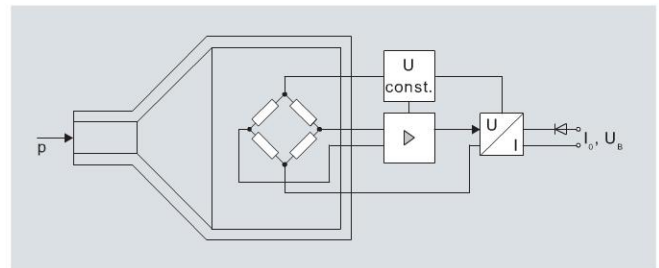
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a round plug M12 (IP67) connected electrically. The output signal is between 4 and 20 mA.

Function

The pressure transmitter measures the gauge and absolute pressure of liquids and gases as well as the level of liquids.

Mode of operation



SITRANS P200 pressure transmitters (7MF1565-...), functional diagram

The ceramic measuring cell has a thin-film resistance bridge to which the operating pressure p is transmitted through a ceramic diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

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Technical specifications

| Application | | Design | |
|--|---|--|--|
| Gauge and absolute pressure measurement | Liquids, gases and vapors | Weight | Approx. 0.090 kg (0.198 lb) |
| Mode of operation | | Process connections | See dimension drawings |
| Measuring principle | Piezo-resistive measuring cell (ceramic diaphragm) | Electrical connections | <ul style="list-style-type: none"> Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or ½-14 NPT or Pg 11 M12 connector 2 or 3-wire (0.5 mm²) cable (Ø ± 5.4 mm) Quickon cable quick screw connection |
| Measured variable | Gauge and absolute pressure | Wetted parts materials | <ul style="list-style-type: none"> Al₂O₃ - 96 % Stainless steel, mat. No. 1.4404 (SST 316 L) FPM (Standard) Neoprene Perbunan EPDM |
| Inputs | | Non-wetted parts materials | <ul style="list-style-type: none"> Stainless steel, mat. No. 1.4404 (SST 316 L) Plastic PVC |
| Measuring range | | Enclosure | |
| <ul style="list-style-type: none"> Gauge pressure <ul style="list-style-type: none"> - Metric: 1 ... 60 bar (15 ... 870 psi) - US measuring range: 15 ... 1000 psi Absolute pressure <ul style="list-style-type: none"> - Metric: 0.6 ... 16 bar a (10 ... 232 psia) - US measuring range: 10 ... 300 psia | | Rack | |
| Output | | Cables | |
| Current signal | 4 ... 20 mA | Certificates and approvals | |
| <ul style="list-style-type: none"> Load: (U_B - 10 V) / 0.02 A Auxiliary power U_B: DC 7 ... 33 V (10 ... 30 V for Ex) | | Classification according to pressure equipment directive (PED 97/23/EC) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) |
| Voltage signal | 0 ... 10 V DC | Lloyd's Register of Shipping (LR) | 12/20010 |
| <ul style="list-style-type: none"> Load: ≥ 10 kΩ Auxiliary power U_B: 12 ... 33 V DC Power consumption: < 7 mA at 10 kΩ | | Germanischer Lloyd (GL) | GL19740 11 HH00 |
| Characteristic curve | Linear rising | American Bureau of Shipping (ABS) | ABS_11_HG 789392_PDA |
| Measuring accuracy | | Bureau Veritas (BV) | BV 271007A0 BV |
| Error in measurement at limit setting incl. hysteresis and reproducibility | <ul style="list-style-type: none"> Typical: 0.25 % of full-scale value Maximum: 0.5 % of full-scale value | Det Norske Veritas (DNV) | A 12553 |
| Step response time T ₉₉ | < 5 ms | Drinking water approval (ACS) | ACS 11 ACC NY 055 |
| Long-term stability | | GOST | GOST-R |
| <ul style="list-style-type: none"> Lower range value and measuring span: 0.25 % of full-scale value/year | | Underwriters Laboratories (UL) | |
| Influence of ambient temperature | | <ul style="list-style-type: none"> for USA and Canada: UL 20110217 - E34453 worldwide: IEC UL DK 21845 | |
| <ul style="list-style-type: none"> Lower range value and measuring span: 0.25 %/10 K of full-scale value Influence of power supply: 0.005 %/V | | Explosion protection | |
| Conditions of use | | Intrinsic safety "i" (only with current output) | Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db |
| Process temperature with gasket made of: | | EC type-examination certificate | SEV 10 ATEX 0146 |
| <ul style="list-style-type: none"> FPM (Standard): -15 ... +125 °C (+5 ... +257 °F) Neoprene: -35 ... +100 °C (-31 ... +212 °F) Perbunan: -20 ... +100 °C (-4 ... +212 °F) EPDM: -40 ... +145 °C (-40 ... +293 °F), usable for drinking water | | Connection to certified intrinsically-safe resistive circuits with maximum values: | U _i ≤ 30 V DC; I _i ≤ 100 mA; P _i ≤ 0.75 W |
| Ambient temperature | -25 ... +85 °C (-13 ... +185 °F) | Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12 | L _i = 0 nH; C _i = 0 nF |
| Storage temperature | -50 ... +100 °C (-58 ... +212 °F) | | |
| Degree of protection (to EN 60529) | <ul style="list-style-type: none"> IP 65 with connector per EN 175301-803-A IP 67 with M12 connector IP 67 with cable IP 67 with cable quick screw connection | | |
| Electromagnetic compatibility | <ul style="list-style-type: none"> acc. EN 61326-1/-2/-3 acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation ≤ 1 % | | |

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| Selection and ordering data | | | | | Order No. | Order code |
|--|-------------------|----------------------|-------------------------|----------------------------|-----------|-------------|
| SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications | | | | | 7MF1565- | |
| Characteristic curve deviation typ. 0.25 % | | | | | | |
| Wetted parts materials: Ceramic and stainless steel + sealing material | | | | | | |
| Non-wetted parts materials: stainless steel | | | | | | |
| Measuring range | | Overload limit | | Burst pressure | | |
| | | Min. | Max. | | | |
| For gauge pressure | | | | | | |
| 0 ... 1 bar | (0 ... 14.5 psi) | -0.4 bar (-5.8 psi) | 2.5 bar (36.26 psi) | > 2.5 bar (> 36.3 psi) | ▶ | 3 BA |
| 0 ... 1.6 bar | (0 ... 23.2 psi) | -0.4 bar (-5.8 psi) | 4 bar (58.02 psi) | > 4 bar (> 58.0 psi) | ▶ | 3 BB |
| 0 ... 2.5 bar | (0 ... 36.3 psi) | -0.8 bar (-11.6 psi) | 6.25 bar (90.65 psi) | > 6.25 bar (> 90.7 psi) | ▶ | 3 BD |
| 0 ... 4 bar | (0 ... 58.0 psi) | -0.8 bar (-11.6 psi) | 10 bar (145 psi) | > 10 bar (> 145 psi) | ▶ | 3 BE |
| 0 ... 6 bar | (0 ... 87.0 psi) | -1 bar (-14.5 psi) | 15 bar (217 psi) | > 15 bar (> 217 psi) | ▶ | 3 BG |
| 0 ... 10 bar | (0 ... 145 psi) | -1 bar (-14.5 psi) | 25 bar (362 psi) | > 25 bar (> 362 psi) | ▶ | 3 CA |
| 0 ... 16 bar | (0 ... 232 psi) | -1 bar (-14.5 psi) | 40 bar (580 psi) | > 40 bar (> 580 psi) | ▶ | 3 CB |
| 0 ... 25 bar | (0 ... 363 psi) | -1 bar (-14.5 psi) | 62.5 bar (906 psi) | > 62.5 bar (> 906 psi) | ▶ | 3 CD |
| 0 ... 40 bar | (0 ... 580 psi) | -1 bar (-14.5 psi) | 100 bar (1450 psi) | > 100 bar (> 1450 psi) | ▶ | 3 CE |
| 0 ... 60 bar | (0 ... 870 psi) | -1 bar (-14.5 psi) | 150 bar (2175 psi) | > 150 bar (> 2175 psi) | ▶ | 3 CG |
| Other version, add order code and plain text: Measuring range: ... up to ... bar (psi) | | | | | | 9 AA |
| For absolute pressure | | | | | | |
| 0 ... 0.6 bar a | (0 ... 8.7 psia) | 0 bar a (0 psia) | 3 bar a (43.51 psia) | > 2.5 bar a (> 36.3 psia) | | 5 AG |
| 0 ... 1 bar a | (0 ... 14.5 psia) | 0 bar a (0 psia) | 2.5 bar a (36.26 psia) | > 2.5 bar a (> 36.3 psia) | ▶ | 5 BA |
| 0 ... 1.6 bar a | (0 ... 23.2 psia) | 0 bar a (0 psia) | 4 bar a (58.02 psia) | > 4 bar a (> 58.0 psia) | ▶ | 5 BB |
| 0 ... 2.5 bar a | (0 ... 36.3 psia) | 0 bar a (0 psia) | 6.25 bar a (90.65 psia) | > 6.25 bar a (> 90.7 psia) | ▶ | 5 BD |
| 0 ... 4 bar a | (0 ... 58.0 psia) | 0 bar a (0 psia) | 10 bar a (145 psia) | > 10 bar a (> 145 psia) | ▶ | 5 BE |
| 0 ... 6 bar a | (0 ... 87.0 psia) | 0 bar a (0 psia) | 15 bar a (217 psia) | > 15 bar a (> 217 psia) | ▶ | 5 BG |
| 0 ... 10 bar a | (0 ... 145 psia) | 0 bar a (0 psia) | 25 bar a (362 psia) | > 25 bar a (> 362 psia) | ▶ | 5 CA |
| 0 ... 16 bar a | (0 ... 232 psia) | 0 bar a (0 psia) | 40 bar a (580 psia) | > 40 bar a (> 580 psia) | ▶ | 5 CB |
| Other version, add order code and plain text: Measuring range: ... up to ... mbar a (psia) | | | | | | 9 AA |
| Measuring ranges for gauge pressure (only for US market) | | | | | | |
| (0 ... 15 psi) | | (-5.8 psi) | (35 psi) | (> 35 psi) | | 4 BB |
| (3 ... 15 psi) | | (-5.8 psi) | (35 psi) | (> 35 psi) | | 4 BC |
| (0 ... 20 psi) | | (-5.8 psi) | (50 psi) | (> 50 psi) | | 4 BD |
| (0 ... 30 psi) | | (-5.8 psi) | (80 psi) | (> 80 psi) | | 4 BE |
| (0 ... 60 psi) | | (-11.5 psi) | (140 psi) | (> 140 psi) | | 4 BF |
| (0 ... 100 psi) | | (-14.5 psi) | (200 psi) | (> 200 psi) | | 4 BG |
| (0 ... 150 psi) | | (-14.5 psi) | (350 psi) | (> 350 psi) | | 4 CA |
| (0 ... 200 psi) | | (-14.5 psi) | (550 psi) | (> 550 psi) | | 4 CB |
| (0 ... 300 psi) | | (-14.5 psi) | (800 psi) | (> 800 psi) | | 4 CD |
| (0 ... 500 psi) | | (-14.5 psi) | (1400 psi) | (> 1400 psi) | | 4 CE |
| (0 ... 750 psi) | | (-14.5 psi) | (2000 psi) | (> 2000 psi) | | 4 CF |
| (0 ... 1000 psi) | | (-14.5 psi) | (2000 psi) | (> 2000 psi) | | 4 CG |
| Other version, add order code and plain text: Measuring range: ... up to ... psi | | | | | | 9 AA |
| Measuring ranges for absolute pressure (only for US market) | | | | | | |
| (0 ... 10 psia) | | (0 psia) | (35 psia) | (> 35 psia) | | 6 AG |
| (0 ... 15 psia) | | (0 psia) | (35 psia) | (> 35 psia) | | 6 BA |
| (0 ... 20 psia) | | (0 psia) | (50 psia) | (> 50 psia) | | 6 BB |
| (0 ... 30 psia) | | (0 psia) | (80 psia) | (> 80 psia) | | 6 BD |
| (0 ... 60 psia) | | (0 psia) | (140 psia) | (> 140 psia) | | 6 BE |
| (0 ... 100 psia) | | (0 psia) | (200 psia) | (> 200 psia) | | 6 BG |
| (0 ... 150 psia) | | (0 psia) | (350 psia) | (> 350 psia) | | 6 CA |
| (0 ... 200 psia) | | (0 psia) | (550 psia) | (> 550 psia) | | 6 CB |
| (0 ... 300 psia) | | (0 psia) | (800 psia) | (> 800 psia) | | 6 CC |
| Other version, add order code and plain text: Measuring range: ... up to ... psia | | | | | | 9 AA |
| ▶ Available ex stock | | | | | | |

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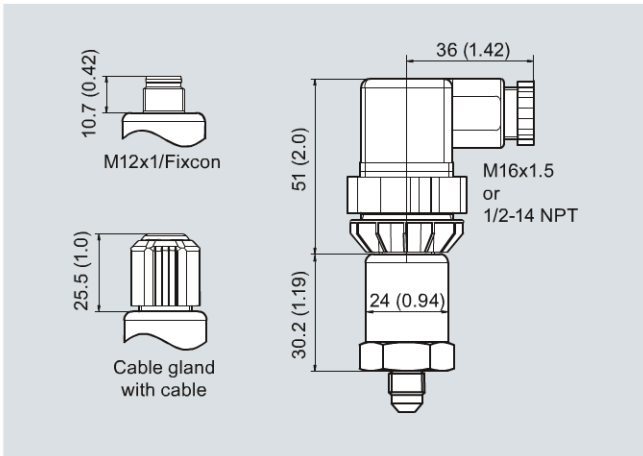
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| Selection and ordering data | Order No. | Order code |
|---|------------|---|
| SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications Accuracy typ. 0.25 % Wetted parts materials: Ceramic and stainless steel + sealing material Non-wetted parts materials: stainless steel | 7MF1565- | |
| Output signal 4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions) ▶ 0 ... 10 V; three-wire system; power supply 12 ... 33 V DC ▶ | | 0 10 |
| Explosion protection (only 4 ... 20 mA) None ▶ With explosion protection Ex ia IIC T4 ▶ | | 0 1 |
| Electrical connection Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling) ▶ Round connector M12 per DIN EN 60139-9 (not for gauge pressure ranges ≤ 16 bar) Connection via fixed mounted cable, 2m (not for type of protection "Intrinsic safety i") Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i") Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling) Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling) Special version | | 1 2 03 04 5 6 9 N1Y |
| Process connection G½" male per EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar) ▶ G½" male thread and G1/8" female thread G¼" male per EN 837-1 (¼" BSP male) 7/16"-20 UNF male ¼"-18 NPT male (standard for pressure ranges inH ₂ O and psi) ¼"-18 NPT female ½"-14 NPT male ½"-14 NPT female 7/16"-20 UNF female M20x1.5 male Special version | | A B C D E F G H J P Z P1Y |
| Sealing material between sensor and enclosure Viton (FPM, standard) ▶ Neoprene (CR) Perbunan (NBR) EPDM Special version | | A B C D Z Q1Y |
| Version Standard version ▶ | | 1 |
| Further designs Supplement the order no. with "-Z" and add order code. Manufacturer's test certificate M per IEC 60770-2 (calibration certificate) supplied Oxygen application, oil and grease-free cleaning (only in conjunction with the sealing material Viton between sensor and enclosure and not with explosion protection version) ▶ Available ex stock | C11 E10 | |

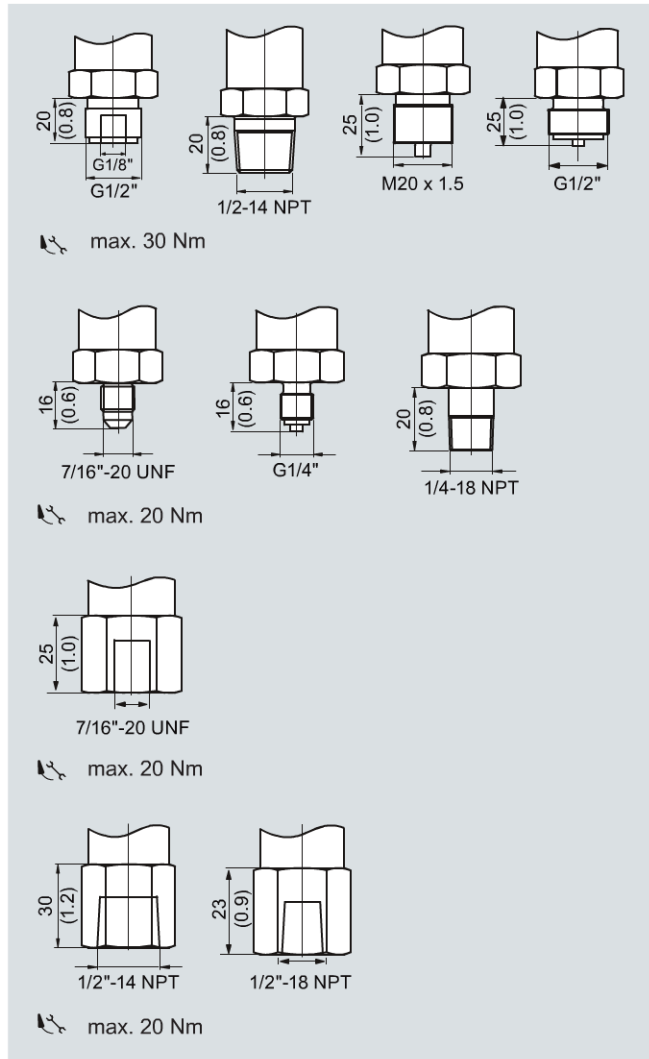
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Dimensional drawings



SITRANS P200, electrical connections, dimensions in mm (inch)



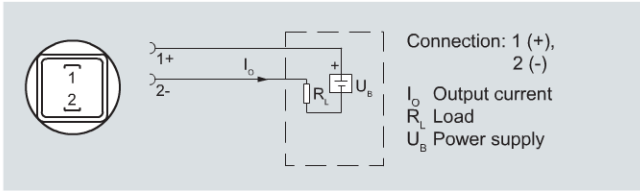
SITRANS P200, process connections, dimensions in mm (inch)

Pressure Measurement Transmitters for basic requirements

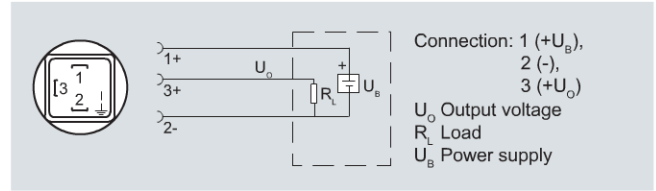
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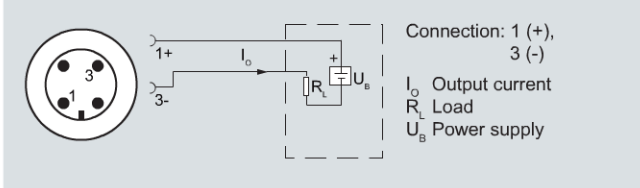
Schematics



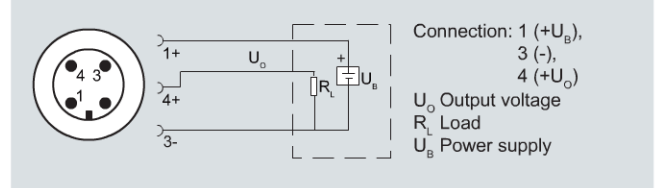
Connection with current output and connector per EN 175301



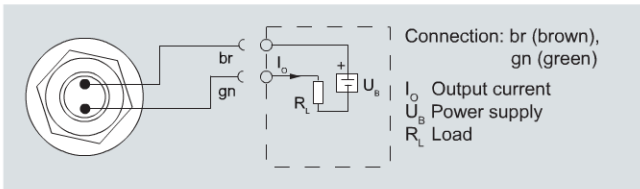
Connection with voltage output and connector per EN 175301



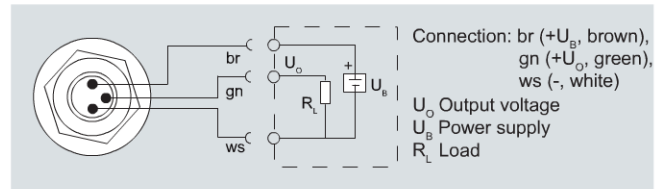
Connection with current output and connector M12x1



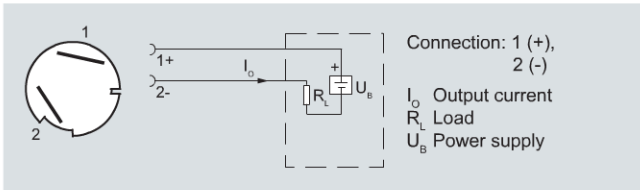
Connection with voltage output and connector M12x1



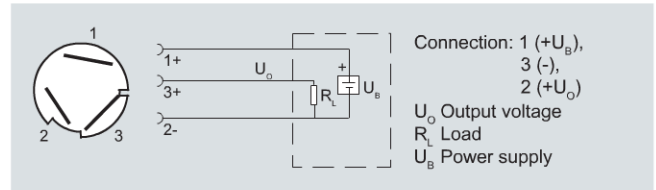
Connection with current output and cable



Connection with voltage output and cable



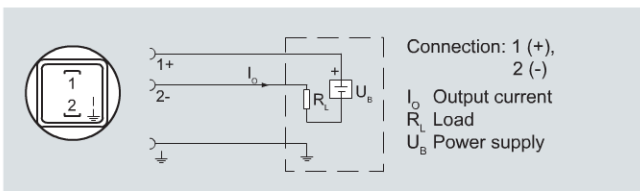
Connection with current output and Quickon cable quick screw connection



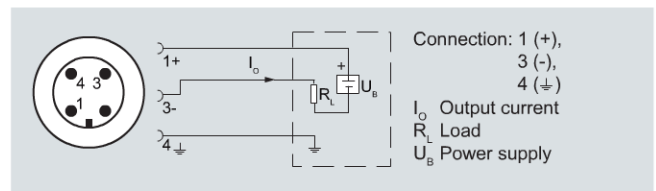
Connection with voltage output and Quickon cable quick screw connection

Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure



Connection with current output and connector per EN 175301 (Ex)



Connection with current output and connector M12x1 (Ex)