

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P200 for gauge and absolute pressure

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 device 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.

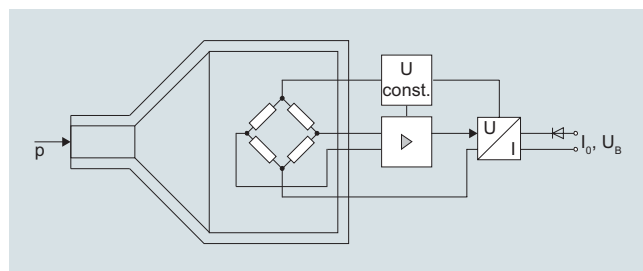
Device structure with explosion protection

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 device 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 thick-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 | Liquids, gases and vapors |
| Gauge and absolute pressure measurement | |
| Mode of operation | |
| Measuring principle | Piezo-resistive measuring cell (ceramic diaphragm) |
| Measured variable | Gauge and absolute pressure |
| Inputs | |
| Measuring range | |
| • Gauge pressure | |
| - Metric | 1 ... 60 bar (15 ... 870 psi) |
| - US measuring range | 15 ... 1000 psi |
| • Absolute pressure | |
| - Metric | 0.6 ... 16 bar a |
| - US measuring range | (10 ... 232 psi abs a) 10 ... 300 psi a |
| Output | |
| Current signal | 4 ... 20 mA |
| • Load | ($U_B - 10\text{ V}$)/0.02 A |
| • Auxiliary power U_B | DC 7 ... 33 V (10 ... 30 V for Ex) |
| Voltage signal | 0 ... 10 V DC |
| • Load | $\geq 10\text{ k}\Omega$ |
| • Auxiliary power U_B | 12 ... 33 V DC |
| • Power consumption | < 7 mA at 10 k Ω |
| Ratiometric output | 0 ... 90 % |
| • Load | $\geq 10\text{ k}\Omega$ |
| • Auxiliary power U_B | 5 V DC $\pm 10\%$ |
| • Power consumption | < 7 mA at 10 k Ω |
| Characteristic curve | Linear rising |
| Measuring accuracy | |
| Error in measurement at limit setting incl. hysteresis and reproducibility | • Typical: 0.25 % of measuring span • Maximum: 0.5 % of measuring span |
| Step response time T_{99} | < 5 ms |
| Long-term stability | |
| • Lower range value and measuring span | 0.25 % of measuring span/year |
| Influence of ambient temperature | |
| • Lower range value and measuring span | 0.25 %/10 K of measuring span |
| • Influence of power supply | 0.005 %/V |
| Operating conditions | |
| Process temperature with gasket made of: | |
| • FPM (Standard) | -15 ... +125 °C (+5 ... +257 °F) |
| • Neoprene | -35 ... +100 °C (-31 ... +212 °F) |
| • Perbunan | -20 ... +100 °C (-4 ... +212 °F) |
| • EPDM | -40 ... +125 °C (-40 ... +257 °F), usable for drinking water |
| Ambient temperature | -25 ... +85 °C (-13 ... +185 °F) |
| Storage temperature | -50 ... +100 °C (-58 ... +212 °F) |
| Degree of protection (to EN 60529) | • IP 65 with connector per EN 175301-803-A • IP 67 with device plug M12 • IP 67 with cable • IP 67 with cable quick screw connection |

| | |
|--|---|
| Electromagnetic compatibility | • acc. IEC 61326-1/-2/-3 • acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation $\leq 1\%$ |
| Design | |
| Weight | Approx. 0.090 kg (0.198 lb) |
| Process connections | See dimension drawings |
| Electrical connections | • Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11 • Device plug M12 • 2 or 3-wire (0.5 mm ²) cable ($\varnothing \pm 5.4\text{ mm}$) • Quickon cable quick screw connection |
| Wetted parts materials | |
| • Measuring cell | Al ₂ O ₃ - 96 % |
| • Process connection | Stainless steel, mat. No. 1.4404 (SST 316 L) |
| • Gasket | • FPM (Standard) • Neoprene • Perbunan • EPDM |
| Non-wetted parts materials | |
| • Enclosure | Stainless steel, mat. No. 1.4404 (SST 316 L) |
| • Rack | Plastic |
| • Cables | PVC |
| Certificates and approvals | |
| Classification according to pressure equipment directive (PED 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) |
| Lloyd's Register of Shipping (LR) ¹⁾ | 12/20010 |
| Germanischer Lloyd (GL) ¹⁾ | GL19740 11 HH00 |
| American Bureau of Shipping (ABS) ¹⁾ | ABS_11_HG 789392_PDA |
| Bureau Veritas (BV) ¹⁾ | BV 271007A0 BV |
| Det Norske Veritas (DNV) ¹⁾ | A 12553 |
| Drinking water approval (ACS) ¹⁾ | ACS 15 ACC NY 360 |
| EAC ¹⁾ | № TC RU C-DE.ГБ05.B.00732 OC НАННО «ЦБЭ» |
| Underwriters Laboratories (UL) ¹⁾ | |
| • for USA and Canada | UL 20110217 - E34453 |
| • worldwide | IEC UL DK 21845 |
| Explosion protection | |
| 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 |
| EC type-examination certificate | SEV 10 ATEX 0146 |
| Connection to certified intrinsically-safe resistive circuits with maximum values: | $U_i \leq 30\text{ V DC}$; $I_i \leq 100\text{ mA}$; $P_i \leq 0.75\text{ W}$ |
| Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12 | $L_i = 0\text{ nH}$; $C_i = 0\text{ nF}$ |

¹⁾ For variants with output signal 0 ... 5 V and ratiometric output available soon.

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Selection and ordering data

SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications ↗

Characteristic curve deviation typ. 0.25 %

Wetted parts materials: Ceramic and stainless steel + sealing material

Non-wetted parts materials: stainless steel

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Article No.

Order code

7MF1565 - - - - -

| Measuring range | Overload limit | | Burst pressure |
|-----------------|----------------|------|----------------|
| | Min. | Max. | |

| For gauge pressure | | | |
|--------------------------------|--------------------|----------------------|-------------------------|
| 0 ... 1 bar (0 ... 14.5 psi) | -1 bar (-14.5 psi) | 2.5 bar (36.26 psi) | > 2.5 bar (> 36.3 psi) |
| 0 ... 1.6 bar (0 ... 23.2 psi) | -1 bar (-14.5 psi) | 4 bar (58.02 psi) | > 4 bar (> 58.0 psi) |
| 0 ... 2.5 bar (0 ... 36.3 psi) | -1 bar (-14.5 psi) | 6.25 bar (90.65 psi) | > 6.25 bar (> 90.7 psi) |
| 0 ... 4 bar (0 ... 58.0 psi) | -1 bar (-14.5 psi) | 10 bar (145 psi) | > 10 bar (> 145 psi) |
| 0 ... 6 bar (0 ... 87.0 psi) | -1 bar (-14.5 psi) | 15 bar (217 psi) | > 15 bar (> 217 psi) |
| 0 ... 10 bar (0 ... 145 psi) | -1 bar (-14.5 psi) | 25 bar (362 psi) | > 25 bar (> 362 psi) |
| 0 ... 16 bar (0 ... 232 psi) | -1 bar (-14.5 psi) | 40 bar (580 psi) | > 40 bar (> 580 psi) |
| 0 ... 25 bar (0 ... 363 psi) | -1 bar (-14.5 psi) | 62.5 bar (906 psi) | > 62.5 bar (> 906 psi) |
| 0 ... 40 bar (0 ... 580 psi) | -1 bar (-14.5 psi) | 100 bar (1450 psi) | > 100 bar (> 1450 psi) |
| 0 ... 60 bar (0 ... 870 psi) | -1 bar (-14.5 psi) | 150 bar (2175 psi) | > 150 bar (> 2175 psi) |

Other version, add Order code and plain text: Measuring range: ... up to ... bar (psi)

| For absolute pressure | | | |
|------------------------------------|-------------------|--------------------------|-----------------------------|
| 0 ... 0.6 bar a (0 ... 8.7 psi a) | 0 bar a (0 psi a) | 2.5 bar a (36.26 psi a) | > 2.5 bar a (> 36.3 psi a) |
| 0 ... 1 bar a (0 ... 14.5 psi a) | 0 bar a (0 psi a) | 2.5 bar a (36.26 psi a) | > 2.5 bar a (> 36.3 psi a) |
| 0 ... 1.6 bar a (0 ... 23.2 psi a) | 0 bar a (0 psi a) | 4 bar a (58.02 psi a) | > 4 bar a (> 58.0 psi a) |
| 0 ... 2.5 bar a (0 ... 36.3 psi a) | 0 bar a (0 psi a) | 6.25 bar a (90.65 psi a) | > 6.25 bar a (> 90.7 psi a) |
| 0 ... 4 bar a (0 ... 58.0 psi a) | 0 bar a (0 psi a) | 10 bar a (145 psi a) | > 10 bar a (> 145 psi a) |
| 0 ... 6 bar a (0 ... 87.0 psi a) | 0 bar a (0 psi a) | 15 bar a (217 psi a) | > 15 bar a (> 217 psi a) |
| 0 ... 10 bar a (0 ... 145 psi a) | 0 bar a (0 psi a) | 25 bar a (362 psi a) | > 25 bar a (> 362 psi a) |
| 0 ... 16 bar a (0 ... 232 psi a) | 0 bar a (0 psi a) | 40 bar a (580 psi a) | > 40 bar a (> 580 psi a) |

Other version, add Order code and plain text: Measuring range: ... up to ... mbar a (psi a)

| Measuring ranges for gauge pressure | | | |
|-------------------------------------|-----------|----------|------------|
| 0 ... 15 psi | -14.5 psi | 35 psi | > 35 psi |
| 3 ... 15 psi | -14.5 psi | 35 psi | > 35 psi |
| 0 ... 20 psi | -14.5 psi | 50 psi | > 50 psi |
| 0 ... 30 psi | -14.5 psi | 80 psi | > 80 psi |
| 0 ... 60 psi | -14.5 psi | 140 psi | > 140 psi |
| 0 ... 100 psi | -14.5 psi | 200 psi | > 200 psi |
| 0 ... 150 psi | -14.5 psi | 350 psi | > 350 psi |
| 0 ... 200 psi | -14.5 psi | 550 psi | > 550 psi |
| 0 ... 300 psi | -14.5 psi | 800 psi | > 800 psi |
| 0 ... 500 psi | -14.5 psi | 1400 psi | > 1400 psi |
| 0 ... 750 psi | -14.5 psi | 2000 psi | > 2000 psi |
| 0 ... 1000 psi | -14.5 psi | 2000 psi | > 2000 psi |

Other version, add Order code and plain text: Measuring range: ... up to ... psi

| Measuring ranges for absolute pressure | | | |
|--|---------|-----------|-------------|
| 0 ... 10 psi a | 0 psi a | 35 psi a | > 35 psi a |
| 0 ... 15 psi a | 0 psi a | 35 psi a | > 35 psi a |
| 0 ... 20 psi a | 0 psi a | 50 psi a | > 50 psi a |
| 0 ... 30 psi a | 0 psi a | 80 psi a | > 80 psi a |
| 0 ... 60 psi a | 0 psi a | 140 psi a | > 140 psi a |
| 0 ... 100 psi a | 0 psi a | 200 psi a | > 200 psi a |
| 0 ... 150 psi a | 0 psi a | 350 psi a | > 350 psi a |
| 0 ... 200 psi a | 0 psi a | 550 psi a | > 550 psi a |
| 0 ... 300 psi a | 0 psi a | 800 psi a | > 800 psi a |

Other version, add Order code and plain text: Measuring range: ... up to ... psi a

3 BA
3 BB
3 BD
3 BE
3 BG
3 CA
3 CB
3 CD
3 CE
3 CG

9 AA

H 1 Y

5 AG
5 BA
5 BB
5 BD
5 BE
5 BG
5 CA
5 CB

9 AA

H 2 Y

4 BB
4 BC
4 BD
4 BE
4 BF
4 BG
4 CA
4 CB
4 CD
4 CE
4 CF
4 CG

9 AA

H 1 Y

6 AG
6 BA
6 BB
6 BD
6 BE
6 BG
6 CA
6 CB
6 CC

9 AA

H 2 Y

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| Selection and ordering data | Article 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 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 % | | 0 10 20 30 |
| 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) Device plug M12 per IEC 61076-2-101 Connection via fixed mounted cable, 2 m (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) Fixed mounted cable, length 5 m Special version | | 1 2 03 04 5 6 07 9 N1Y |
| Process connection G1/2" male per EN 837-1 (1/2" BSP male) (standard for metric pressure ranges mbar, bar) G1/2" male thread and G1/8" female thread G1/4" male per EN 837-1 (1/4" BSP male) 7/16"-20 UNF male 1/4"-18 NPT male (standard for pressure ranges inH ₂ O and psi) 1/4"-18 NPT female 1/2"-14 NPT male 1/2"-14 NPT female 7/16"-20 UNF female M20x1.5 male G1/4" to DIN 3852 Form E G1/2" to DIN 3852 Form E Special version | | A B C D E F G H J P Q R 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 Article No. with "-Z" and add Order code. Quality test certificate, 5-point factory calibration (IEC 60770-2) Oxygen version, free of oil and degreased, max. operating pressure 60 bar, max. temperature of medium +85 °C (only in conjunction with the sealing material Viton between sensor and enclosure and not with explosion protection version) | C11 E10 | |

Pressure Measurement

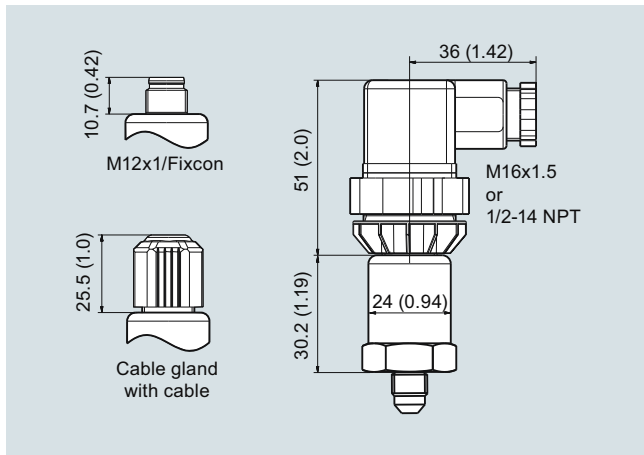
Pressure transmitters

Single-range transmitters for general applications

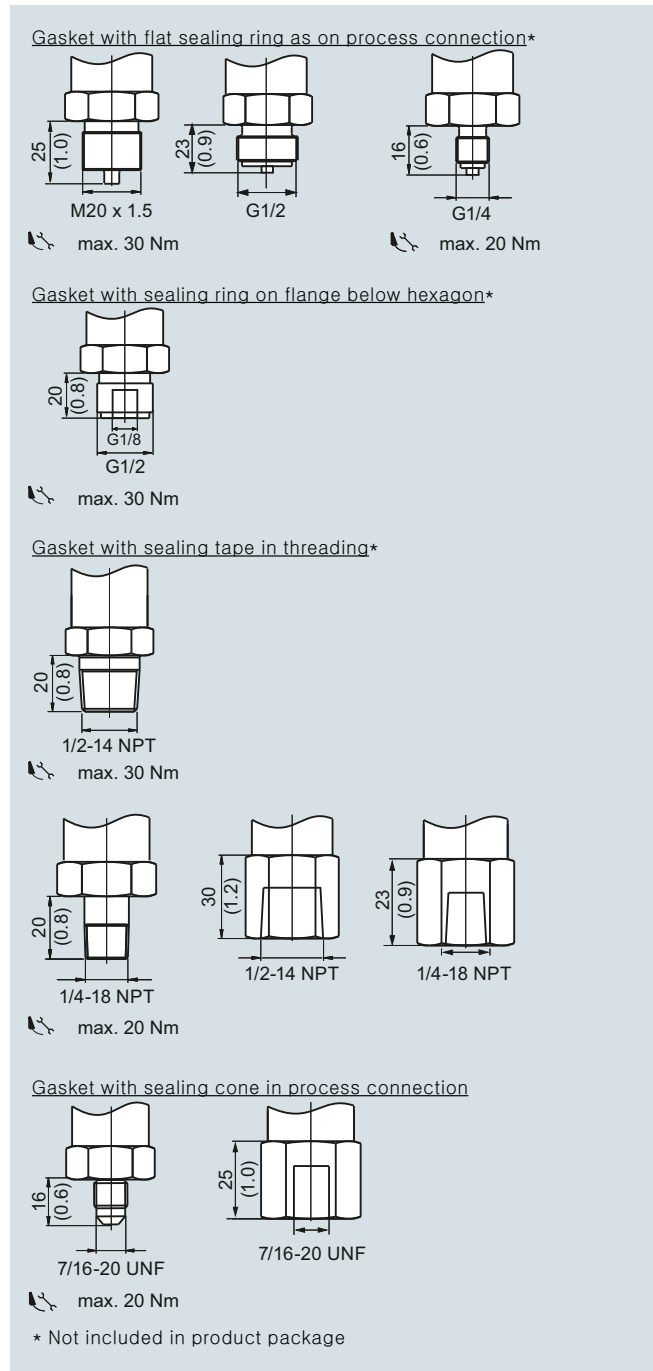
SITRANS P200 for gauge and absolute pressure

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Dimensional drawings



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



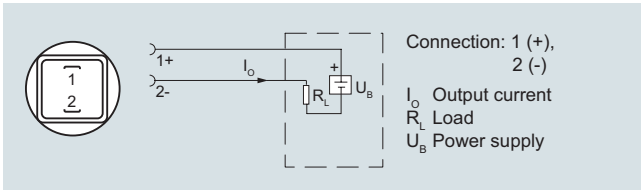
SITRANS P200, process connections, dimensions in mm (inch)

Pressure Measurement

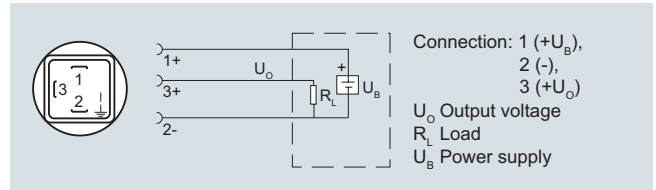
Pressure transmitters
Single-range transmitters for general applications

SITRANS P200 for gauge and absolute pressure

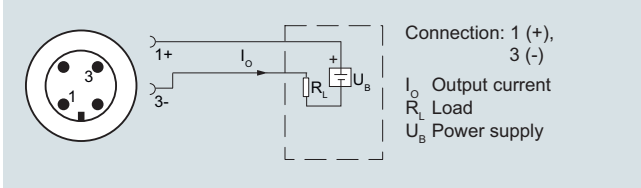
Schematics



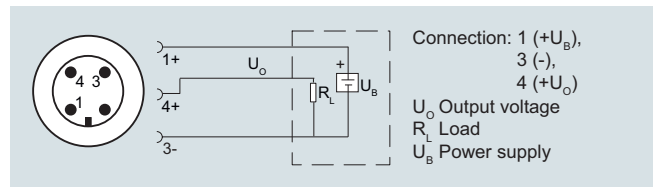
Connection with current output and connector per EN 175301



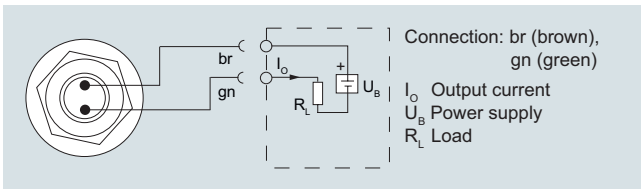
Connection with voltage output, ratiometric output and plug according to EN 175301



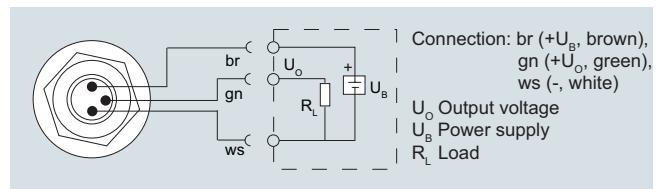
Connection with current output and device plug M12x1



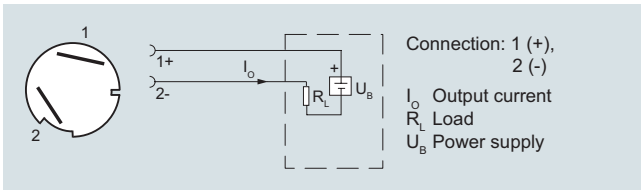
Connection with voltage output, ratiometric output and device plug M12x1



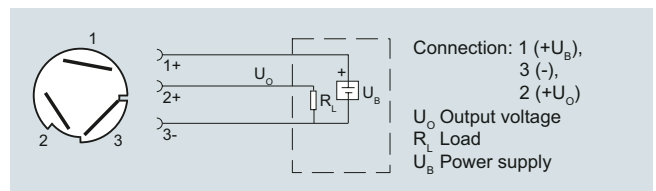
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



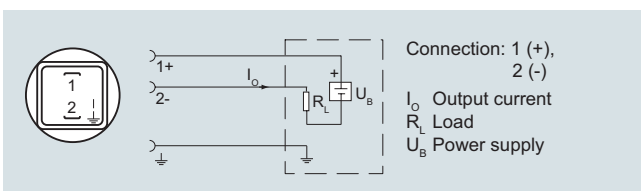
Connection with current output and Quickon cable quick screw connection



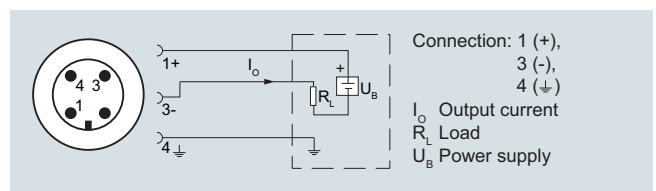
Connection with voltage output, ratiometric output and Quickon fast cable termination

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 device plug M12x1 (Ex)

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P210 for gauge pressure

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Overview



The pressure transmitter SITRANS P210 measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell
- Measuring ranges 100 to 600 mbar (1.45 to 8.7 psi) relative
- For low-pressure 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 pressure transmitter SITRANS P210 for gauge 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 device 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.

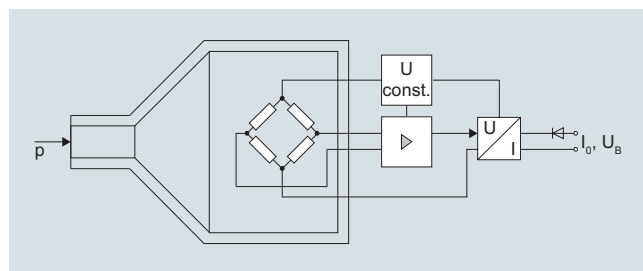
Device structure with explosion protection

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 device plug M12 (IP67) connected electrically. The output signal is between 4 and 20 mA.

Function

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

Mode of operation



SITRANS P210 pressure transmitters (7MF1566-...), functional diagram

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

Pressure Measurement

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SITRANS P210 for gauge pressure

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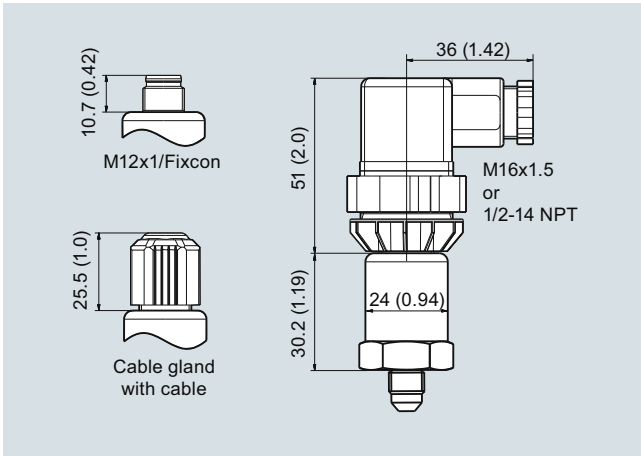
Technical specifications

| | | |
|--|--|---|
| Application | Gauge measurement | Liquids, gases and vapors |
| Mode of operation | Measuring principle | Piezoresistive measuring cell (stainless steel diaphragm) |
| Measured variable | | Gauge pressure |
| Inputs | Measuring range | 100 ... 600 mbar (1.5 ... 8.7 psi) |
| • Gauge pressure | | |
| Output | Current signal | 4 ... 20 mA |
| • Load | | $(U_B - 10 \text{ V})/0.02 \text{ A}$ |
| • Auxiliary power U_B | | DC 7 ... 33 V (10 ... 30 V for Ex) |
| Voltage signal | | 0 ... 10 V DC |
| • Load | | $\geq 10 \text{ k}\Omega$ |
| • Auxiliary power U_B | | 12 ... 33 V DC |
| • Power consumption | | < 7 mA at 10 k Ω |
| Ratiometric output | | 0 ... 90 % |
| • Load | | $\geq 10 \text{ k}\Omega$ |
| • Auxiliary power U_B | | 5 V DC $\pm 10 \%$ |
| • Power consumption | | < 7 mA at 10 k Ω |
| Characteristic curve | | Linear rising |
| Measuring accuracy | Error in measurement at limit setting incl. hysteresis and reproducibility | <ul style="list-style-type: none"> • Typical: 0.25 % of measuring span • Maximum: 0.5 % of measuring span |
| Step response time T_{99} | | < 5 ms |
| Long-term stability | | 0.25 % of measuring span/year span |
| • Lower range value and measuring span | | |
| Influence of ambient temperature | | 0.25 %/10 K of measuring span |
| • Lower range value and measuring span | | 0.5 %/10K of measuring span for a measuring range 100 ... 400 mbar |
| • Influence of power supply | | 0.005 %/V |
| Operating conditions | Process temperature with gasket made of: | |
| • FPM (Standard) | | -15 ... +125 °C (+5 ... +257 °F) |
| • Neoprene | | -35 ... +100 °C (-31 ... +212 °F) |
| • Perbunan | | -20 ... +100 °C (-4 ... +212 °F) |
| • EPDM | | -40 ... +125 °C (-40 ... +257 °F), usable for drinking water |
| Ambient temperature | | -25 ... +85 °C (-13 ... +185 °F) |
| 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 device plug M12 • IP 67 with cable • IP 67 with cable quick screw connection |
| Electromagnetic compatibility | | <ul style="list-style-type: none"> • acc. IEC 61326-1/-2/-3 • acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation $\leq 1 \%$ |
| Mounting position | | upright |

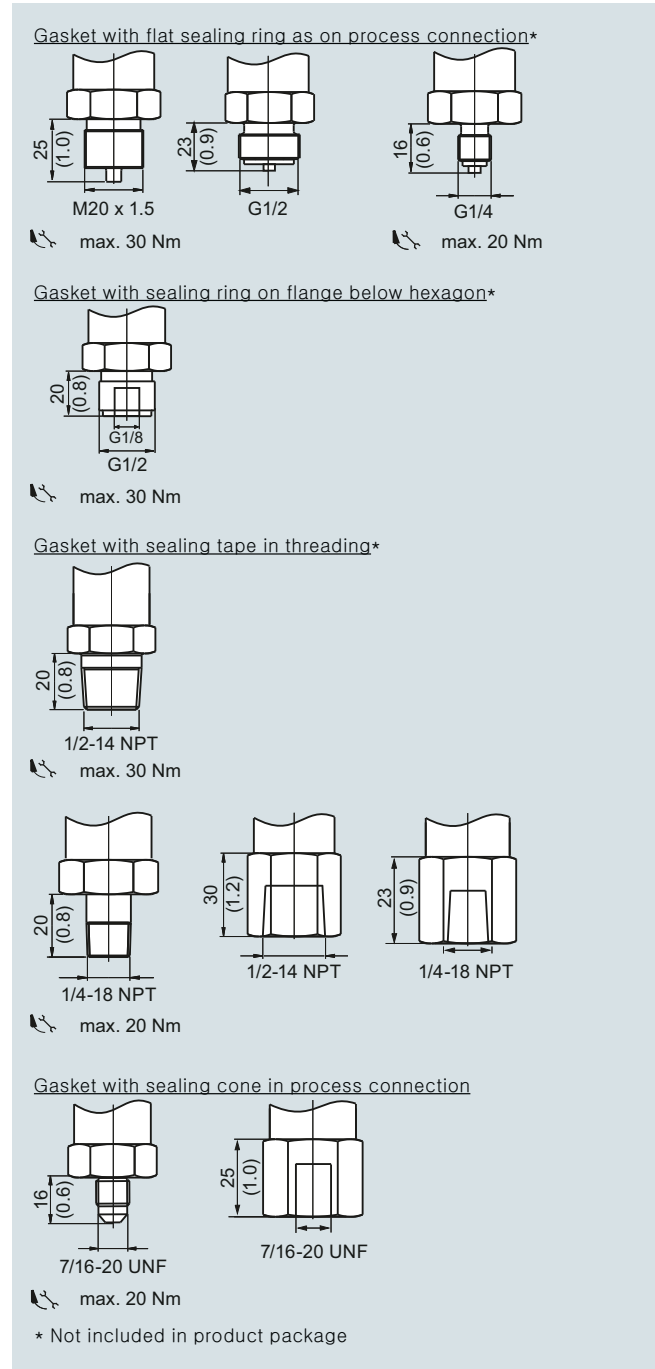
| | | |
|--|---|---|
| Design | Weight | Approx. 0.090 kg (0.198 lb) |
| Process connections | | See dimension drawings |
| Electrical connections | | <ul style="list-style-type: none"> • Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11 • Device plug M12 • 2 or 3-wire (0.5 mm²) cable ($\varnothing \pm 5.4 \text{ mm}$) • Quickon cable quick screw connection |
| Wetted parts materials | | |
| • Measuring cell | | Stainless steel, mat.-No. 1.4435 |
| • Process connection | | Stainless steel, mat. No. 1.4404 (SST 316 L) |
| • Gasket | | <ul style="list-style-type: none"> • FPM (Standard) • Neoprene • Perbunan • EPDM |
| Non-wetted parts materials | | |
| • Enclosure | | Stainless steel, mat. No. 1.4404 (SST 316 L) |
| • Rack | | Plastic |
| • cables | | PVC |
| Certificates and approvals | Classification according to pressure equipment directive (PED 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; meets requirements as per article 4, paragraph 3 (good engineering practice) |
| Lloyd's Register of Shipping (LR) ¹⁾ | | 12/20010 |
| Germanischer Lloyd (GL) ¹⁾ | | GL19740 11 HH00 |
| American Bureau of Shipping (ABS) ¹⁾ | | ABS_11_HG 789392_PDA |
| Bureau Veritas (BV) ¹⁾ | | BV 271007A0 BV |
| Det Norske Veritas (DNV) ¹⁾ | | A 12553 |
| Drinking water approval (ACS) ¹⁾ | | ACS 15 ACC NY 360 |
| EAC ¹⁾ | | № TC RU C-DE.ГБ05.В.00732 OC НАННО «ЦСВЭ» |
| Underwriters Laboratories (UL) ¹⁾ | | |
| • for USA and Canada | | UL 20110217 - E34453 |
| • worldwide | | IEC UL DK 21845 |
| Explosion protection | 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 |
| EC type-examination certificate | | SEV 10 ATEX 0146 |
| Connection to certified intrinsically-safe resistive circuits with maximum values: | | $U_i \leq 30 \text{ V DC}$; $I_i \leq 100 \text{ mA}$; $P_i \leq 0.75 \text{ W}$ |
| Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12 | | $L_i = 0 \text{ nH}$; $C_i = 0 \text{ nF}$ |

¹⁾ For variants with output signal 0 ... 5 V and ratiometric output available soon.

Dimensional drawings



SITRANS P210, electrical connections, dimensions in mm (inch)



SITRANS P210, process connections, dimensions in mm (inch)

Pressure Measurement

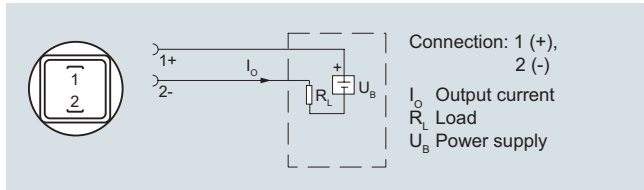
Pressure transmitters

Single-range transmitters for general applications

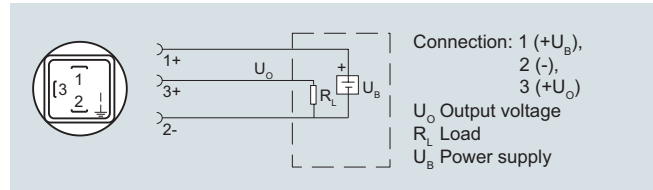
SITRANS P210 for gauge pressure

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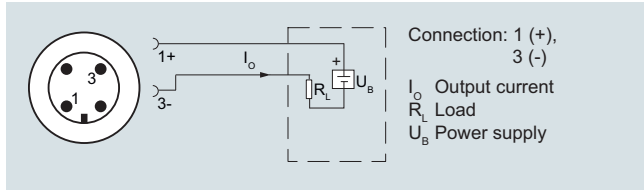
Schematics



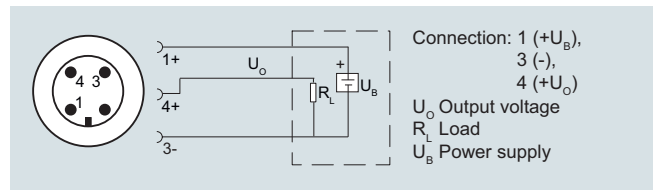
Connection with current output and connector per EN 175301



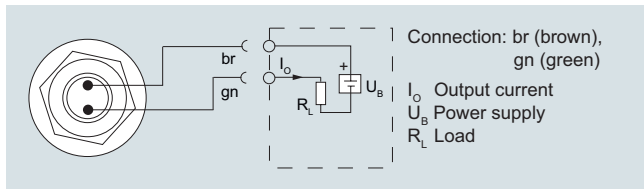
Connection with voltage output, ratiometric output and plug according to EN 175301



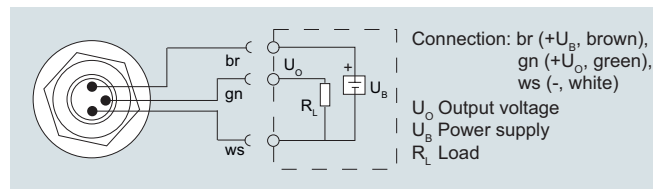
Connection with current output and device plug M12x1



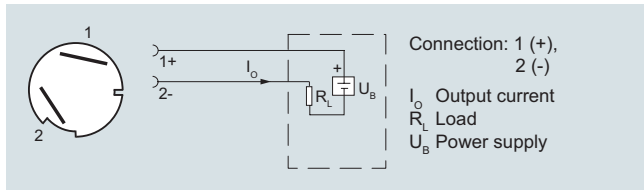
Connection with voltage output, ratiometric output and device plug M12x1



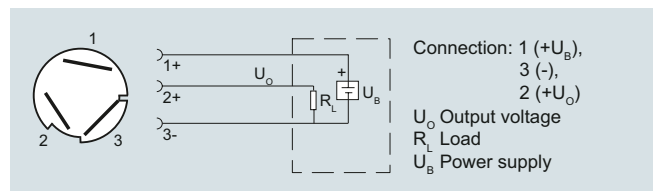
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



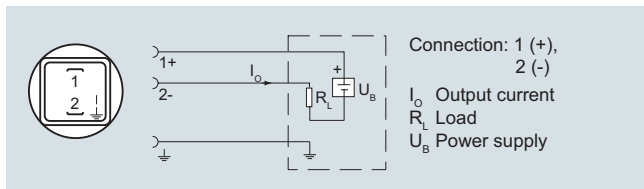
Connection with current output and Quickon cable quick screw connection



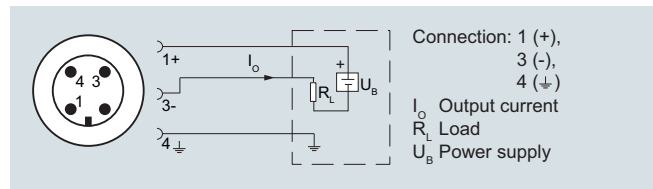
Connection with voltage output, ratiometric output and Quickon fast cable termination

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 device plug M12x1 (Ex)

Overview



The pressure transmitter SITRANS P220 measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell, fully welded
- Measuring ranges 2.5 to 1000 bar (36.3 to 14500 psi) relative
- For high-pressure applications and refrigeration technology division

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
- Gasket-less

Application

The pressure transmitter SITRANS P220 for gauge 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 device 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.

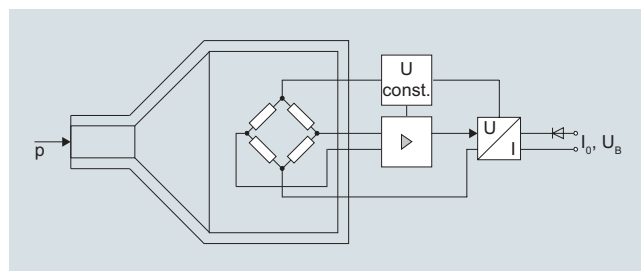
Device structure with explosion protection

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 device plug M12 (IP67) connected electrically. The output signal is between 4 and 20 mA.

Function

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

Mode of operation



SITRANS P220 pressure transmitters (7MF1567-...), functional diagram

The stainless steel measuring cell has a thick-film resistance bridge to which the operating pressure p is transmitted through a stainless steel 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.

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P220 for gauge pressure

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Technical specifications

| | | | | | |
|-----------------------------|---|---|--|------------------------|--|
| Application | Gauge pressure measurement | Liquids, gases and vapors | Design | Weight | Approx. 0.090 kg (0.198 lb) |
| Mode of operation | Measuring principle | Piezoresistive measuring cell (stainless steel diaphragm) | Process connections | Electrical connections | See dimension drawings |
| Measured variable | | Gauge pressure | | | <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 Device plug M12 2 or 3-wire (0.5 mm²) cable (∅ ± 5.4 mm) Quickon cable quick screw connection |
| Inputs | Measuring range | | Wetted parts materials | | Stainless steel, mat.-No. 1.4016 |
| | <ul style="list-style-type: none"> Gauge pressure - Metric - US measuring range | 2.5 ... 1000 bar (36 ... 14500 psi) 30... 14500 psi | <ul style="list-style-type: none"> Measuring cell Process connection | | Stainless steel, mat. No. 1.4404 (SST 316 L) |
| Output | Current signal | 4 ... 20 mA | Non-wetted parts materials | | Stainless steel, mat. No. 1.4404 (SST 316 L) |
| | <ul style="list-style-type: none"> Load Auxiliary power U_B | (U _B - 10 V)/0.02 A DC 7 ... 33 V (10 ... 30 V for Ex) | <ul style="list-style-type: none"> Enclosure | | Stainless steel, mat. No. 1.4404 (SST 316 L) |
| | Voltage signal | 0 ... 10 V DC | <ul style="list-style-type: none"> Rack cables | | Plastic |
| | <ul style="list-style-type: none"> Load Auxiliary power U_B Power consumption | ≥ 10 kΩ 12 ... 33 V DC < 7 mA at 10 kΩ | Certificates and approvals | | |
| | Ratiometric output | 0 ... 90 % | Classification according to pressure equipment directive (PED 2014/68/EU) | | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) |
| | <ul style="list-style-type: none"> Load Auxiliary power U_B Power consumption | ≥ 10 kΩ 5 V DC ± 10 % < 7 mA at 10 kΩ | Lloyd's Register of Shipping (LR) ¹⁾ | | 12/20010 |
| | Characteristic curve | Linear rising | Germanischer Lloyd (GL) ¹⁾ | | GL19740 11 HH00 |
| Measuring accuracy | Error in measurement at limit setting incl. hysteresis and reproducibility | <ul style="list-style-type: none"> Typical: 0.25 % of measuring span Maximum: 0.5 % of measuring span | American Bureau of Shipping (ABS) ¹⁾ | | ABS_11_HG 789392_PDA |
| | Step response time T ₉₉ | < 5 ms | Bureau Veritas (BV) ¹⁾ | | BV 271007A0 BV |
| | Long-term stability | | Det Norske Veritas (DNV) ¹⁾ | | A 12553 |
| | <ul style="list-style-type: none"> Lower range value and measuring span | 0.25 % of measuring span/year | Drinking water approval (ACS) ¹⁾ | | ACS 15 ACC NY 360 |
| | Influence of ambient temperature | | EAC ¹⁾ | | № TC RU C-DE.ГБ05.B.00732 OC НАНИО «ЦСВЭ» |
| | <ul style="list-style-type: none"> Lower range value and measuring span Influence of power supply | 0.25 %/10 K of measuring span 0.005 %/V | CRN ²⁾ | | 0F18659.5C |
| Operating conditions | Process temperature | -40 ... +120 °C (-40 ... +248 °F) | Underwriters Laboratories (UL) ¹⁾ | | UL 20110217 - E34453 |
| | Ambient temperature | -25 ... +85 °C (-13 ... +185 °F) | <ul style="list-style-type: none"> for USA and Canada worldwide | | IEC UL DK 21845 |
| | Storage temperature | -50 ... +100 °C (-58 ... +212 °F) | Explosion protection | | |
| | Degree of protection (to EN 60529) | <ul style="list-style-type: none"> IP 65 with connector per EN 175301-803-A IP 67 with device plug M12 IP 67 with cable IP 67 with cable quick screw connection | 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 |
| | Electromagnetic compatibility | <ul style="list-style-type: none"> acc. IEC 61326-1/-2/-3 acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation ≤ 1 % | EC type-examination certificate | | SEV 10 ATEX 0146 |
| | | | Connection to certified intrinsically-safe resistive circuits with maximum values: | | U _i ≤ 30 V DC; I _i ≤ 100 mA; P _i ≤ 0.75 W |
| | | | Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12 | | L _i = 0 nH; C _i = 0 nF |
| | | | CSA ²⁾ | | 70006348 |
| | | | | | Class I, Division I, Groups A, B, C and D; Class II, Division 1, Groups E, F and G, Class III Class I, Division 2, Groups A, B, C and D; Class II, Division 2, Groups F and G, Class III A/Ex ia IIC T4 Ga/Gb A/Ex ia IIIC T125°C Da/Db |

¹⁾ For variants with output signal 0 ... 5 V and ratiometric output available soon.

²⁾ See ordering data for available versions.

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P220 for gauge pressure

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| Selection and ordering data | | | | | Article No. | Order code |
|---|--------------------|----------------------|----------------------|---|-------------|------------|
| SITRANS P 220 pressure transmitters for gauge pressure, high-pressure and refrigeration applications, fully-welded version | | | | | 7MF1567- | -A |
| Accuracy typ. 0.25 % | | | | | | |
| Wetted parts materials: stainless steel | | | | | | |
| Non-wetted parts materials: stainless steel | | | | | | |
| Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | | | | | |
| Measuring range | Overload limit | | Burst pressure | | | |
| | Mini- mum | Max. | | | | |
| For gauge pressure | | | | | | |
| 0 ... 2.5 bar (0 ... 36.3 psi) | -1 bar (-14.5 psi) | 6.25 bar (90.7 psi) | 25 bar (363 psi) | | 3 BD | |
| 0 ... 4 bar (0 ... 58 psi) | -1 bar (-14.5 psi) | 10 bar (145 psi) | 40 bar (870 psi) | | 3 BE | |
| 0 ... 6 bar (0 ... 87 psi) | -1 bar (-14.5 psi) | 15 bar (217 psi) | 60 bar (522 psi) | | 3 BG | |
| 0 ... 10 bar (0 ... 145 psi) | -1 bar (-14.5 psi) | 25 bar (362 psi) | 60 bar (870 psi) | | 3 CA | |
| 0 ... 16 bar (0 ... 232 psi) | -1 bar (-14.5 psi) | 40 bar (580 psi) | 96 bar (1392 psi) | | 3 CB | |
| 0 ... 25 bar (0 ... 363 psi) | -1 bar (-14.5 psi) | 62.5 bar (906 psi) | 150 bar (2176 psi) | | 3 CD | |
| 0 ... 40 bar (0 ... 580 psi) | -1 bar (-14.5 psi) | 100 bar (1450 psi) | 240 bar (3481 psi) | | 3 CE | |
| 0 ... 60 bar (0 ... 870 psi) | -1 bar (-14.5 psi) | 150 bar (2175 psi) | 360 bar (5221 psi) | | 3 CG | |
| 0 ... 100 bar (0 ... 1450 psi) | -1 bar (-14.5 psi) | 250 bar (3625 psi) | 600 bar (8702 psi) | | 3 DA | |
| 0 ... 160 bar (0 ... 2320 psi) | -1 bar (-14.5 psi) | 400 bar (5801 psi) | 960 bar (13924 psi) | | 3 DB | |
| 0 ... 250 bar (0 ... 3625 psi) | -1 bar (-14.5 psi) | 625 bar (9064 psi) | 1500 bar (21756 psi) | | 3 DD | |
| 0 ... 400 bar (0 ... 5801 psi) | -1 bar (-14.5 psi) | 1000 bar (14503 psi) | 2400 bar (34809 psi) | | 3 DE | |
| 0 ... 600 bar (0 ... 8702 psi) | -1 bar (-14.5 psi) | 1500 bar (21755 psi) | 3600 bar (52200 psi) | | 3 DG | |
| 0 ... 1000 bar (0 ... 14500 psi) | -1 bar (-14.5 psi) | 1500 bar (21755 psi) | 5000 bar (72520 psi) | | 3 EA | |
| Other version, add Order code and plain text: Measuring range: ... up to ... bar (psi) | | | | | 9 AA | H 1 Y |
| Measuring ranges for gauge pressure | | | | | | |
| 0 ... 30 psi | -14.5 psi | 75 psi | 360 psi | * | 4 BE | |
| 0 ... 60 psi | -14.5 psi | 150 psi | 580 psi | * | 4 BF | |
| 0 ... 100 psi | -14.5 psi | 250 psi | 580 psi | * | 4 BG | |
| 0 ... 150 psi | -14.5 psi | 375 psi | 870 psi | * | 4 CA | |
| 0 ... 200 psi | -14.5 psi | 500 psi | 1390 psi | * | 4 CB | |
| 0 ... 300 psi | -14.5 psi | 750 psi | 2170 psi | * | 4 CD | |
| 0 ... 500 psi | -14.5 psi | 1250 psi | 3481 psi | * | 4 CE | |
| 0 ... 750 psi | -14.5 psi | 1875 psi | 5220 psi | * | 4 CF | |
| 0 ... 1000 psi | -14.5 psi | 2500 psi | 5220 psi | * | 4 CG | |
| 0 ... 1500 psi | -14.5 psi | 3750 psi | 8700 psi | * | 4 DA | |
| 0 ... 2000 psi | -14.5 psi | 5000 psi | 13920 psi | * | 4 DB | |
| 0 ... 3000 psi | -14.5 psi | 7500 psi | 21750 psi | * | 4 DD | |
| 0 ... 5000 psi | -14.5 psi | 12500 psi | 34800 psi | * | 4 DE | |
| 0 ... 6000 psi | -14.5 psi | 15000 psi | 34800 psi | * | 4 DF | |
| 0 ... 8700 psi | -14.5 psi | 21755 psi | 52200 psi | * | 4 DG | |
| 0 ... 14500 psi | -14.5 psi | 21755 psi | 72520 psi | * | 4 EA | |
| Other version, add Order code and plain text: Measuring range: ... up to ... psi | | | | | 9 AA | H 1 Y |
| Output signal | | | | | | |
| 4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions) | | | | | 0 | |
| 0 ... 10 V; three-wire system; power supply 12 ... 33 V DC | | | | | 10 | |
| 0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC | | | | | 20 | |
| Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 % | | | | | 30 | |
| Explosion protection (only 4 ... 20 mA) | | | | | | |
| None | | | | | 0 | |
| With explosion protection Ex ia IIC T4 | | | | | 1 | |
| Electrical connection | | | | | | |
| Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling) | | | | | * | 1 |
| Device plug M12 per IEC 61076-2-101 | | | | | | 2 |
| Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i") | | | | | | 0 3 |
| Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i") | | | | | | 0 4 |
| Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling) | | | | | * | 5 |
| Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling) | | | | | * | 6 |
| Fixed mounted cable, length 5 m | | | | | | 0 7 |
| Special version | | | | | | 9 |
| | | | | | | N 1 Y |
| * Order code E21 required for complete configuration with CRN and cCSA _{US} Ex approval. | | | | | | |

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P220 for gauge pressure

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Selection and ordering data

SITRANS P 220 pressure transmitters for gauge pressure, high-pressure and refrigeration applications, fully-welded version

Accuracy typ. 0.25 %

Wetted parts materials: stainless steel

Non-wetted parts materials: stainless steel

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 inH₂O and psi) *

¼"-18 NPT female

½"-14 NPT male

½"-14 NPT female (Only for measuring ranges ≤ 60 bar (870 psi))

7/16"-20 UNF female

M20x1.5 male

G1/4" to DIN 3852 Form E

G1/2" to DIN 3852 Form E

Special version

Version

Standard version *

Further designs

Supplement the Article No. with "-Z" and add Order code.

Quality test certificate, 5-point factory calibration (IEC 60770-2)
(not possible for measuring ranges > 0 ... 600 bar/0 ... 8 702 psi)

Oxygen version, free of oil and degreased (not in conjunction with explosion protection version)

With CRN and cCSA_{US} Ex approval (only for measuring ranges 0 ... 30 psi bis 0 ... 8 700 psi)

* Order code E21 required for complete configuration with CRN and cCSA_{US} Ex approval..

Article No. Order code

7MF1567 - - - - - A

A

B

C

D

E

F

G

H

J

P

Q

R

Z

P1Y

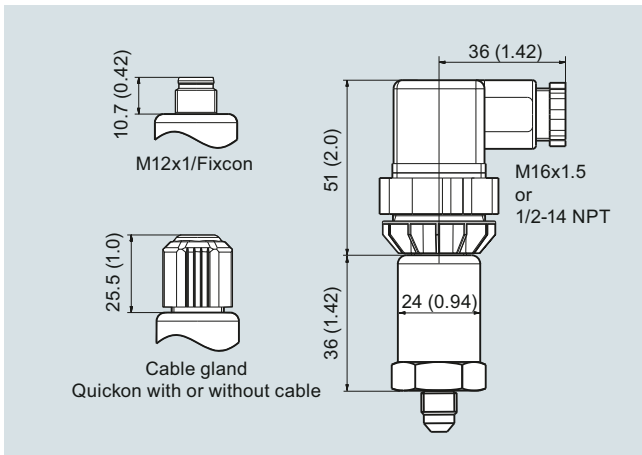
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C11

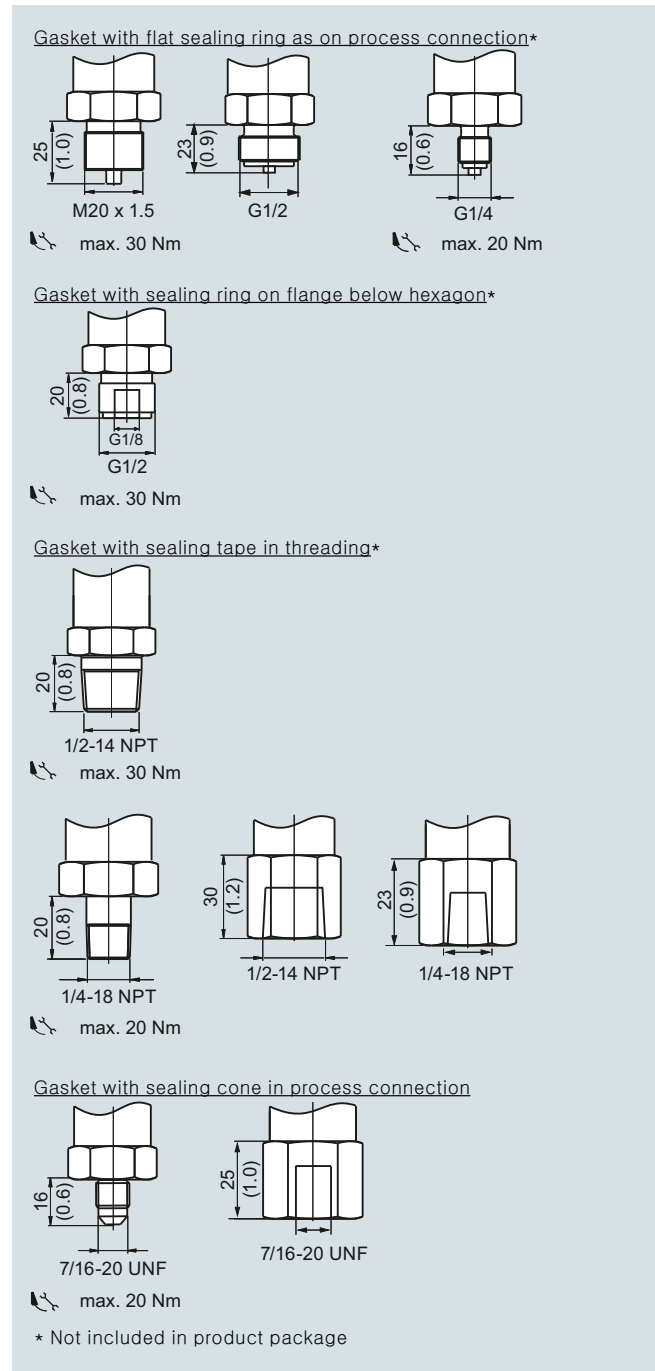
E10

E21

Dimensional drawings



SITRANS P220, electrical connections, dimensions in mm (inch)



SITRANS P220, process connections, dimensions in mm (inch)

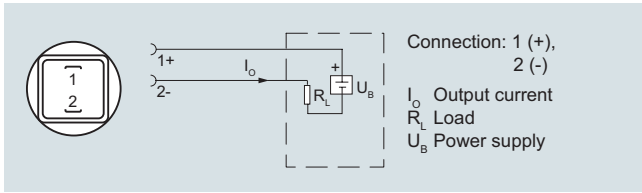
Pressure Measurement

Pressure transmitters
Single-range transmitters for general applications

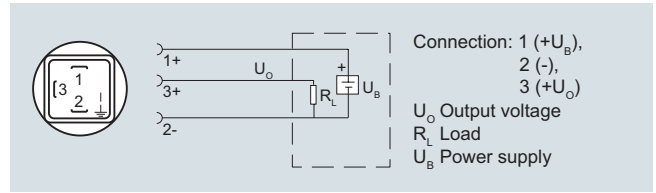
SITRANS P220 for gauge pressure

1

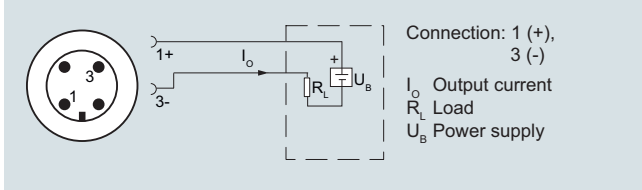
Schematics



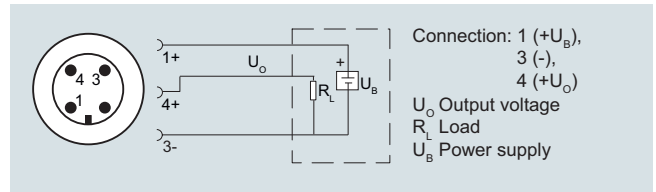
Connection with current output and connector per EN 175301



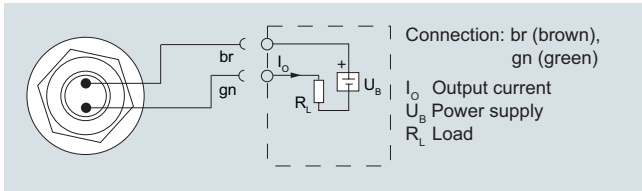
Connection with voltage output, ratiometric output and plug according to EN 175301



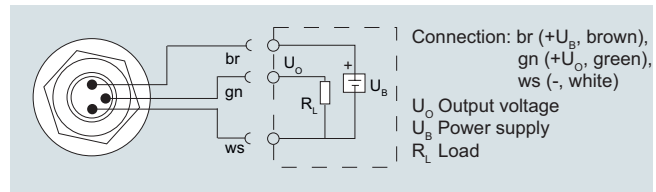
Connection with current output and device plug M12x1



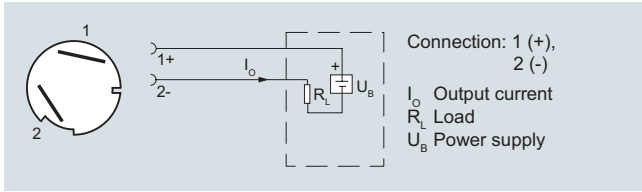
Connection with voltage output, ratiometric output and device plug M12x1



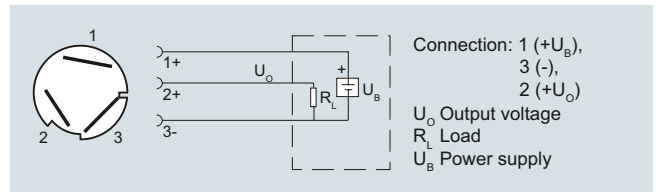
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



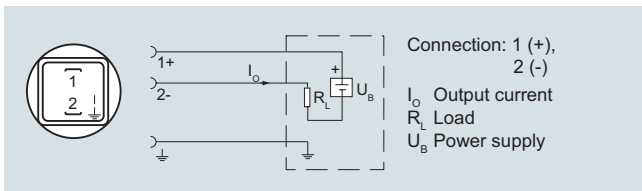
Connection with current output and cable quick screw connection Quick-on



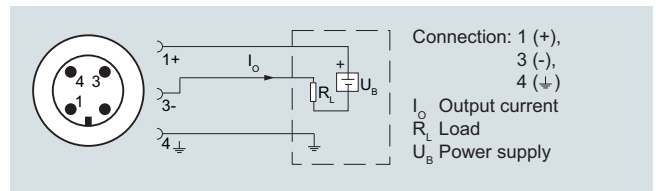
Connection with voltage output, ratiometric output and Quickon fast cable termination

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 device plug M12x1 (Ex)