

Pressure Measurement

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 M12 device plug (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.

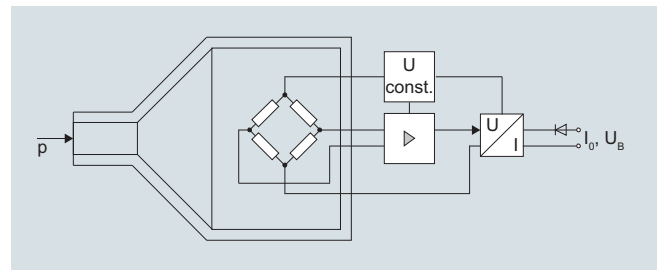
Device structure with explosion protection

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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.

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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		$< 7 \text{ mA}$ 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		$< 7 \text{ mA}$ 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}		$< 5 \text{ ms}$
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
Conditions of use	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 M12 device plug • 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 • M12 device plug • 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 «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 210 pressure transmitters for gauge pressure for low pressure applications

Accuracy typ. 0.25 %

Wetted parts materials: 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

➤ 7MF1566 - - - - -

Measuring range

Overload limit

min.

max.

Burst pressure

For gauge pressure

0...100 mbar (1.45 psi)	-400 mbar (-5.8 psi)	400 mbar (5.8 psi)	1 bar (14.5 psi)	3 AA	
0...160 mbar (2.32 psi)	-400 mbar (-5.8 psi)	400 mbar (5.8 psi)	1 bar (14.5 psi)	3 AB	
0...250 mbar (3.63 psi)	-800 mbar (-11.6 psi)	1000 mbar (14.5 psi)	2 bar (29.0 psi)	3 AC	
0...400 mbar (5.8 psi)	-800 mbar (-11.6 psi)	1000 mbar (14.5 psi)	2 bar (29.0 psi)	3 AD	
0...600 mbar (8.7 psi)	-1000 mbar (-14.5 psi)	2000 mbar (29.0 psi)	3 bar (43.5 psi)	3 AG	

Other version, add Order code and plain text:

Measuring range: ... up to ... mbar (psi)

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 %

Explosion protection (only 4 ... 20 mA)

None

With explosion protection Ex ia IIC T4

Electrical connection

Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)

M12 device plug 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

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 inH₂O 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

Sealing material between sensor and enclosure

Viton (FPM, standard)

Neoprene (CR)

Perbunan (NBR)

EPDM

Special version

Version

Standard version

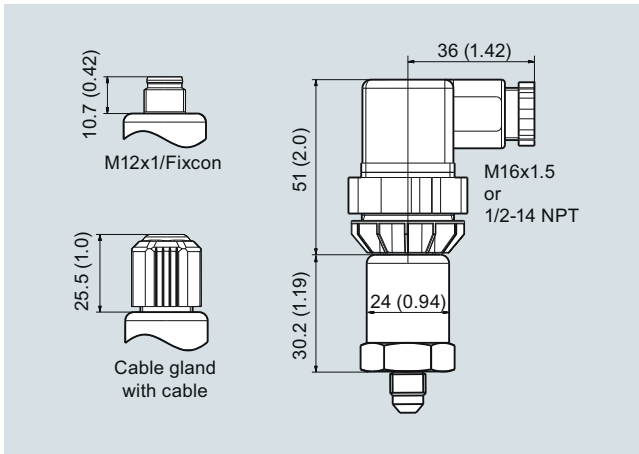
Further designs

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

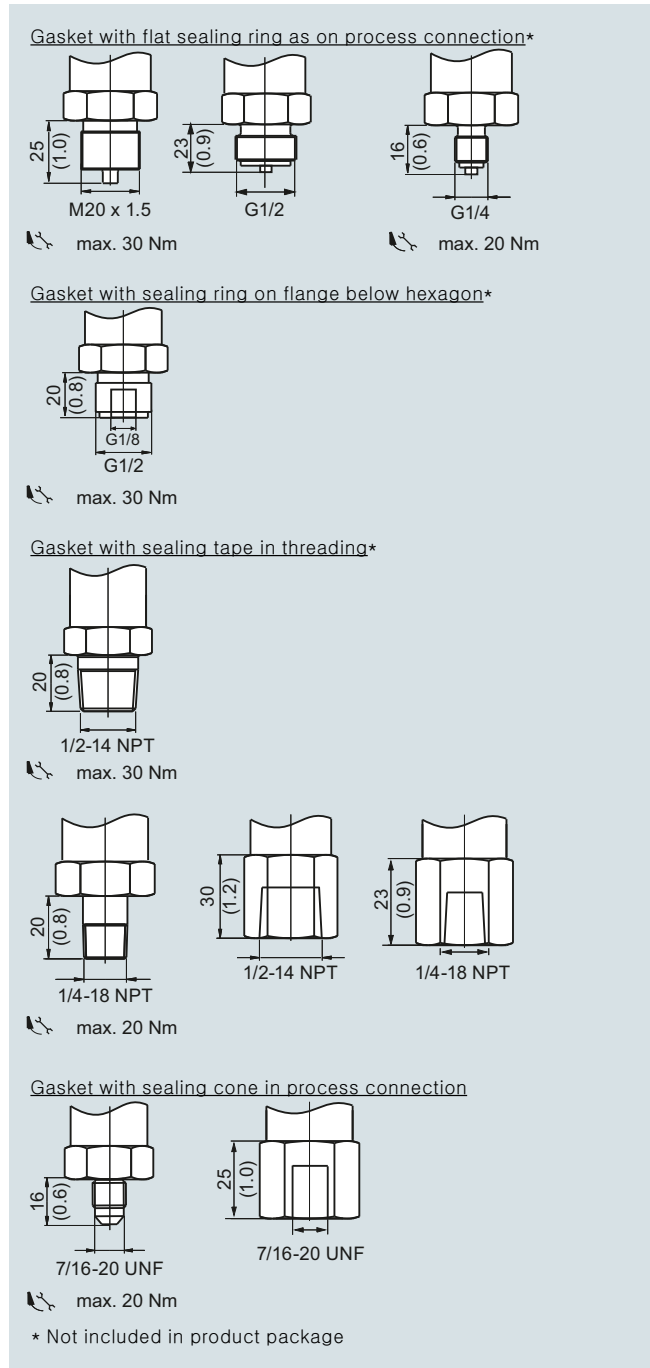
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2

C11

Dimensional drawings



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



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

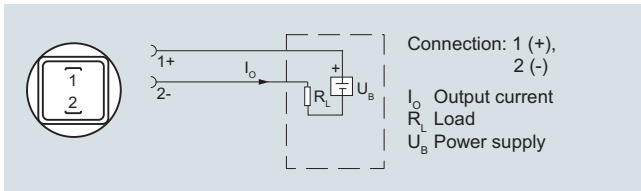
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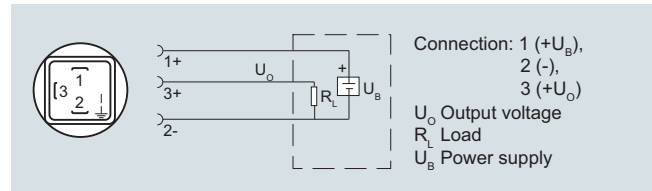
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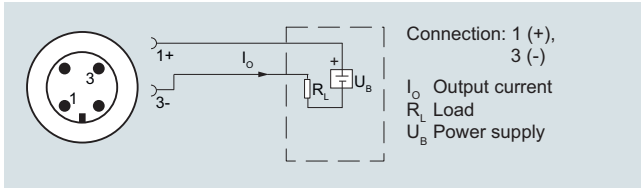
Schematics



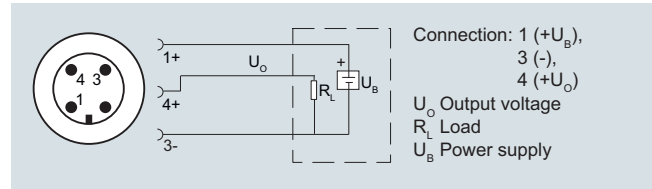
Connection with current output and connector per EN 175301



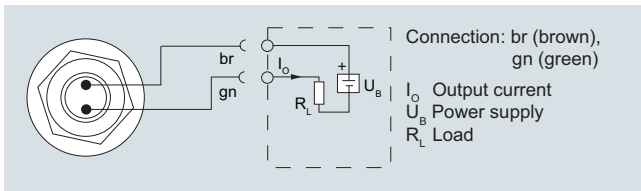
Connection with voltage output, ratiometric output and plug according to EN 175301



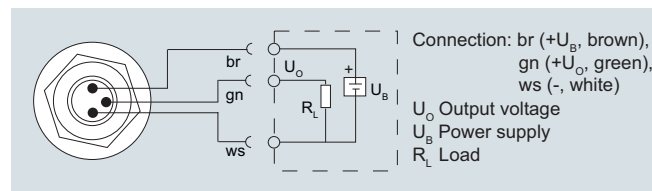
Connection with current output and M12x1 device plug



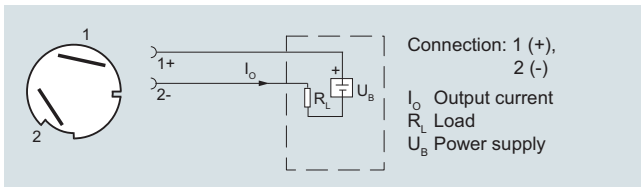
Connection with voltage output, ratiometric output and M12x1 device plug



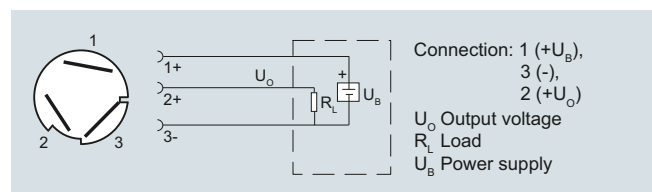
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



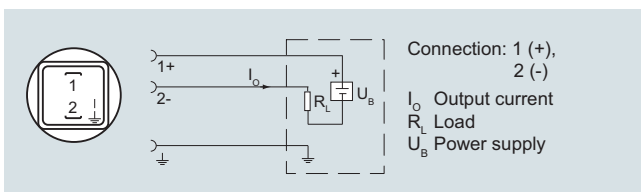
Connection with current output and Quickon cable quick screw connection



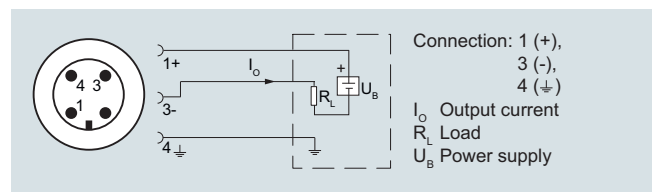
Connection with voltage output, ratiometric output and Quickon fast cable termination

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 M12x1 device plug (Ex)