

**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**

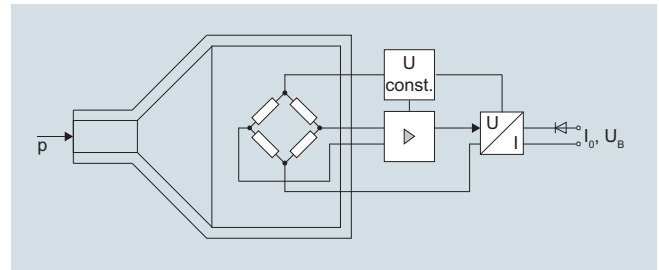
The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a round plug M12 (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically.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

## Single-range transmitters for general applications

### SITRANS P210 for gauge pressure

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#### Technical specifications

Application		Design	
Gauge measurement	Liquids, gases and vapors	Weight	Approx. 0.090 kg (0.198 lb)
<b>Mode of operation</b>		Process connections	See dimension drawings
Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)	Electrical connections	<ul style="list-style-type: none"> <li>Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11</li> <li>M12 connector</li> <li>2 or 3-wire (0.5 mm<sup>2</sup>) cable (Ø ± 5.4 mm)</li> <li>Quickon cable quick screw connection</li> </ul>
Measured variable	Gauge pressure	Wetted parts materials	
<b>Inputs</b>		<ul style="list-style-type: none"> <li>Measuring cell</li> <li>Process connection</li> <li>Gasket</li> </ul>	<ul style="list-style-type: none"> <li>Stainless steel, mat.-No. 1.4435</li> <li>Stainless steel, mat. No. 1.4404 (SST 316 L)</li> <li>FPM (Standard)</li> <li>Neoprene</li> <li>Perbunan</li> <li>EPDM</li> </ul>
Measuring range		Non-wetted parts materials	
<ul style="list-style-type: none"> <li>Gauge pressure</li> </ul>	100 ... 600 mbar (1.5 ... 8.7 psi)	<ul style="list-style-type: none"> <li>Enclosure</li> <li>Rack</li> <li>cables</li> </ul>	<ul style="list-style-type: none"> <li>Stainless steel, mat. No. 1.4404 (SST 316 L)</li> <li>Plastic</li> <li>PVC</li> </ul>
<b>Output</b>		<b>Certificates and approvals</b>	
Current signal	4 ... 20 mA	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)
<ul style="list-style-type: none"> <li>Load</li> <li>Auxiliary power U<sub>B</sub></li> </ul>	(U <sub>B</sub> - 10 V)/0.02 A DC 7 ... 33 V (10 ... 30 V for Ex)	Lloyd's Register of Shipping (LR) <sup>1)</sup>	12/20010
Voltage signal	0 ... 10 V DC	Germanischer Lloyd (GL) <sup>1)</sup>	GL19740 11 HH00
<ul style="list-style-type: none"> <li>Load</li> <li>Auxiliary power U<sub>B</sub></li> <li>Power consumption</li> </ul>	≥ 10 kΩ 12 ... 33 V DC < 7 mA at 10 kΩ	American Bureau of Shipping (ABS) <sup>1)</sup>	ABS_11_HG 789392_PDA
Ratiometric output	0 ... 90 %	Bureau Veritas (BV) <sup>1)</sup>	BV 271007A0 BV
<ul style="list-style-type: none"> <li>Load</li> <li>Auxiliary power U<sub>B</sub></li> <li>Power consumption</li> </ul>	≥ 10 kΩ 5 V DC ± 10 % < 7 mA at 10 kΩ	Det Norske Veritas (DNV) <sup>1)</sup>	A 12553
Characteristic curve	Linear rising	Drinking water approval (ACS) <sup>1)</sup>	ACS 15 ACC NY 360
<b>Measuring accuracy</b>		EAC <sup>1)</sup>	№ TC RU C-DE.ГБ05.В.00732 OC НАННО «ЦСВЭ»
Error in measurement at limit setting incl. hysteresis and reproducibility	<ul style="list-style-type: none"> <li>Typical: 0.25 % of full-scale value</li> <li>Maximum: 0.5 % of full-scale value</li> </ul>	Underwriters Laboratories (UL) <sup>1)</sup>	UL 20110217 - E34453
Step response time T <sub>99</sub>	< 5 ms	<ul style="list-style-type: none"> <li>for USA and Canada</li> <li>worldwide</li> </ul>	IEC UL DK 21845
Long-term stability		<b>Explosion protection</b>	
<ul style="list-style-type: none"> <li>Lower range value and measuring span</li> </ul>	0.25 % of full-scale value/year	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
Influence of ambient temperature		EC type-examination certificate	SEV 10 ATEX 0146
<ul style="list-style-type: none"> <li>Lower range value and measuring span</li> </ul>	<ul style="list-style-type: none"> <li>0.25 %/10 K of full-scale value</li> <li>0.5 %/10K of full-scale value for a measuring range 100 ... 400 mbar</li> </ul>	Connection to certified intrinsically-safe resistive circuits with maximum values:	U <sub>i</sub> ≤ 30 V DC; I <sub>i</sub> ≤ 100 mA; P <sub>i</sub> ≤ 0.75 W
<ul style="list-style-type: none"> <li>Influence of power supply</li> </ul>	0.005 %/V	Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	L <sub>i</sub> = 0 nH; C <sub>i</sub> = 0 nF
<b>Conditions of use</b>			
Process temperature with gasket made of:			
<ul style="list-style-type: none"> <li>FPM (Standard)</li> <li>Neoprene</li> <li>Perbunan</li> <li>EPDM</li> </ul>	-15 ... +125 °C (+5 ... +257 °F) -35 ... +100 °C (-31 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -40 ... +145 °C (-40 ... +293 °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"> <li>IP 65 with connector per EN 175301-803-A</li> <li>IP 67 with M12 connector</li> <li>IP 67 with cable</li> <li>IP 67 with cable quick screw connection</li> </ul>		
Electromagnetic compatibility	<ul style="list-style-type: none"> <li>acc. IEC 61326-1/-2/-3</li> <li>acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation ≤ 1 %</li> </ul>		
Mounting position	upright		

<sup>1)</sup> For variants with output signal 0 ... 5 V and ratiometric output available soon.

# Pressure Measurement

## Single-range transmitters for general applications

### SITRANS P210 for gauge pressure

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Selection and ordering data					Article No.	Order code
<b>SITRANS P 210 pressure transmitters for gauge pressure for low pressure applications</b>					7MF1566-	
Accuracy typ. 0.25 %						
Wetted parts materials: Stainless steel + sealing material						
Non-wetted parts materials: stainless steel						
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>						
Measuring range	Overload limit		Burst pressure			
	min.	max.				
<b>For gauge pressure</b>						
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)					9 AA	H 1 Y
<b>Output signal</b>						
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	
<b>Explosion protection (only 4 ... 20 mA)</b>						
None					0	
With explosion protection Ex ia IIC T4					1	
<b>Electrical connection</b>						
Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)					1	
Round connector 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
<b>Process connection</b>						
G1/2" male per EN 837-1 (1/2" BSP male) (standard for metric pressure ranges mbar, bar)					A	
G1/2" male thread and G1/8" female thread					B	
G1/4" male per EN 837-1 (1/4" BSP male)					C	
7/16"-20 UNF male					D	
1/4"-18 NPT male (standard for pressure ranges inH <sub>2</sub> O and psi)					E	
1/4"-18 NPT female					F	
1/2"-14 NPT male					G	
1/2"-14 NPT female					H	
7/16"-20 UNF female					J	
M20x1.5 male					P	
G1/4" to DIN 3852 Form E					Q	
G1/2" to DIN 3852 Form E					R	
Special version					Z	P 1 Y
<b>Sealing material between sensor and enclosure</b>						
Viton (FPM, standard)					A	
Neoprene (CR)					B	
Perbunan (NBR)					C	
EPDM					D	
Special version					Z	Q 1 Y
<b>Version</b>						
Standard version						1
<b>Further designs</b>						
Supplement the Article No. with "-Z" and add Order code.						
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2						
					C11	

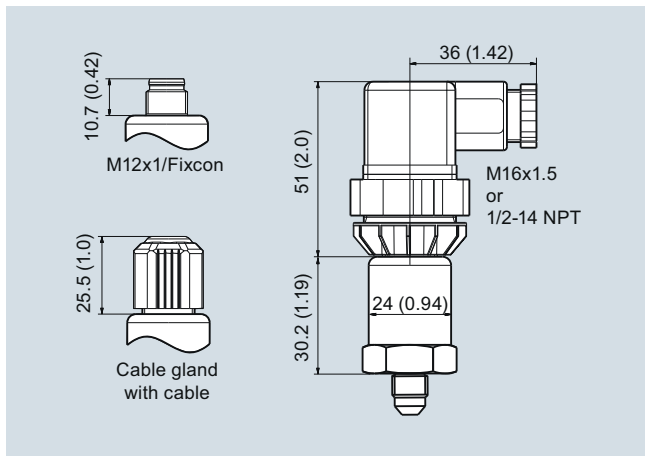
## Pressure Measurement

Single-range transmitters for general applications

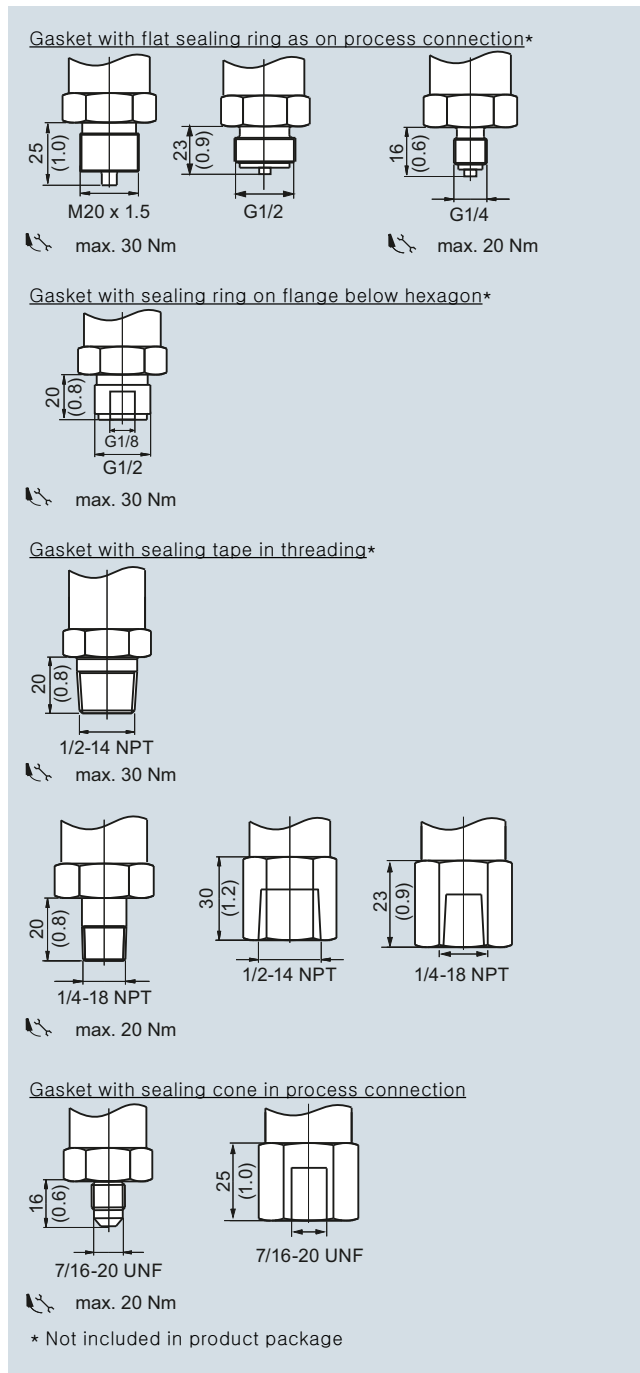
### SITRANS P210 for gauge pressure

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#### Dimensional drawings



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



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

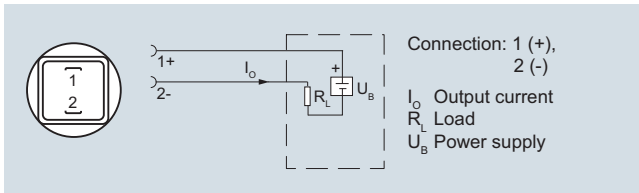
# Pressure Measurement

## Single-range transmitters for general applications

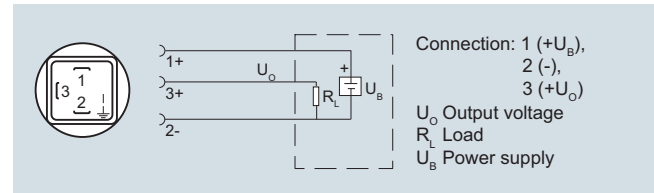
### SITRANS P210 for gauge pressure

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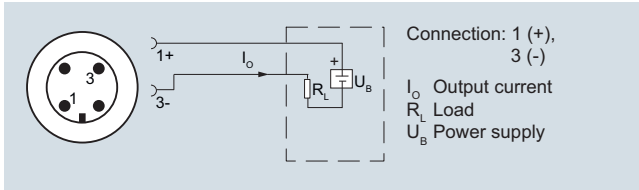
#### Schematics



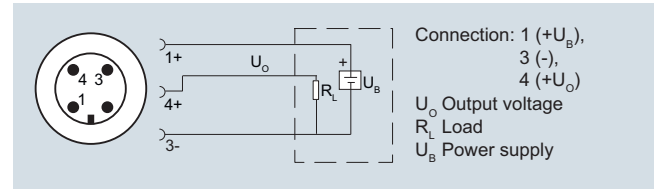
Connection with current output and connector per EN 175301



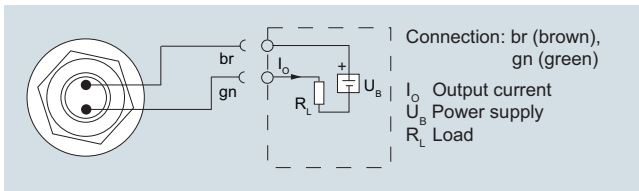
Connection with voltage output, ratiometric output and plug according to EN 175301



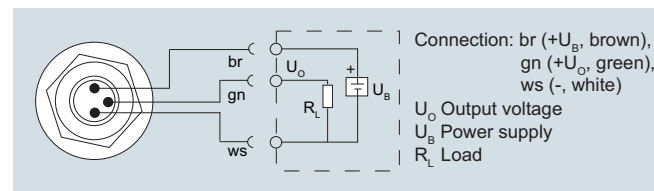
Connection with current output and connector M12x1



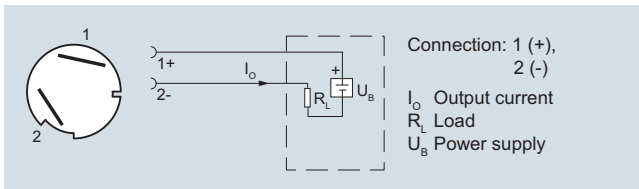
Connection with voltage output, ratiometric output and M12x1 plug



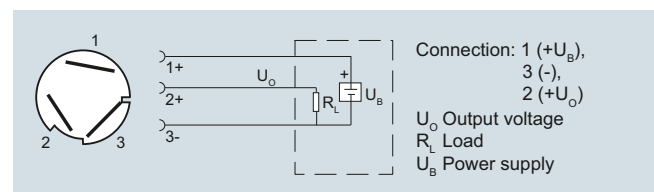
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



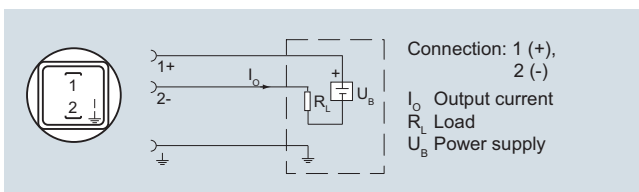
Connection with current output and Quickon cable quick screw connection



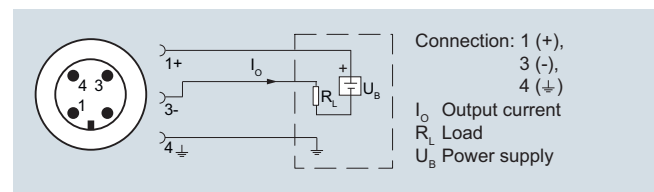
Connection with voltage output, ratiometric output and Quickon fast cable termination

#### 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 connector M12x1 (Ex)