

Pressure Measurement

Transmitters for basic requirements

SITRANS P200 for gauge and absolute pressure

1

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.

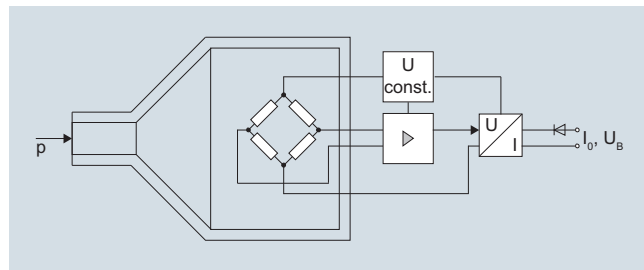
Device structure with explosion protection

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.

Pressure Measurement

Transmitters for basic requirements

SITRANS P200
for gauge and absolute pressure

1

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	
<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 	
Output	
Current signal	4 ... 20 mA
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> Load: $\geq 10 \text{ k}\Omega$ Auxiliary power U_B: 12 ... 33 V DC Power consumption: $< 7 \text{ mA}$ at 10 kΩ 	
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 full-scale value Maximum: 0.5 % of full-scale value
Step response time T_{99}	$< 5 \text{ ms}$
Long-term stability	
<ul style="list-style-type: none"> Lower range value and measuring span: 0.25 % of full-scale value/year 	
Influence of ambient temperature	
<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 	
Conditions of use	
Process temperature with gasket made of:	
<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 	
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 connector 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 $\leq 1 \%$

Design	
Weight	Approx. 0.090 kg (0.198 lb)
Process connections	See dimensional 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 connector 2 or 3-wire (0.5 mm²) cable ($\varnothing \pm 5.4 \text{ mm}$) Quickon cable quick screw connection
Wetted parts materials	
<ul style="list-style-type: none"> Measuring cell: Al₂O₃ - 96 % 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	
<ul style="list-style-type: none"> Enclosure: Stainless steel, mat. No. 1.4404 (SST 316 L) Rack: Plastic Cables: PVC 	
Certificates and approvals	
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)
Lloyd's Register of Shipping (LR)	12/20010
Germanischer Lloyd (GL)	GL19740 11 HH00
American Bureau of Shipping (ABS)	ABS_11_HG 789392_PDA
Bureau Veritas (BV)	BV 271007A0 BV
Det Norske Veritas (DNV)	A 12553
Drinking water approval (ACS)	ACS 11 ACC NY 055
GOST	GOST-R
Underwriters Laboratories (UL)	
<ul style="list-style-type: none"> 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 IIC 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	$L_i = 0 \text{ nH}$; $C_i = 0 \text{ nF}$

Pressure Measurement

Transmitters for basic requirements

SITRANS P200
for gauge and absolute pressure

1

Selection and Ordering data	Article No.	Order code
SITRANS P200 pressure transmitters for pressure and absolute pressure for general applications	7MF 1 5 6 5 -	
Accuracy typ. 0.25 %		
Wetted parts materials: Ceramic and stainless steel + sealing material		
Non-wetted parts materials: stainless steel		
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
Explosion protection (only 4 ... 20 mA)		
None		0
With explosion protection EEx ia IIC T4		1
Electrical connection		
Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)		1
Round connector M12 per IEC 61076-2-101 (not for gauge pressure ranges ≤ 16 bar)		2
Connection via fixed mounted cable, 2m (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
Fix mounted cable, length 5 m		0 7
Special version		9
Process connection		
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 ₂ 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
Special version		Z
Sealing material between sensor and enclosure		
Viton (FPM, standard)		A
Neoprene (CR)		B
Perbunan (NBR)		C
EPDM		D
Special version		Z
Version		
Standard version		1
Further designs		
Supplement the Article No. with "-Z" and add order code.		
Manufacturer's test certificate M per IEC 60770-2 (calibration certificate) supplied	C11	
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)	E10	
Special version		N 1 Y
Special version		P 1 Y
Special version		Q 1 Y

We can offer shorter delivery times for configurations identified as part of the Quick Ship Program. For details see page 9/5 in the appendix.

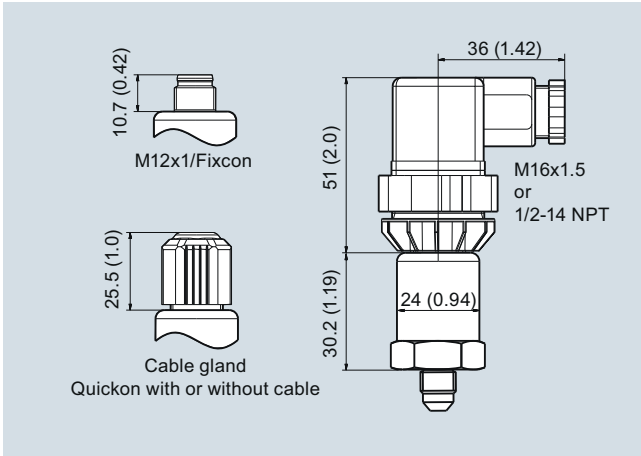
Pressure Measurement

Transmitters for basic requirements

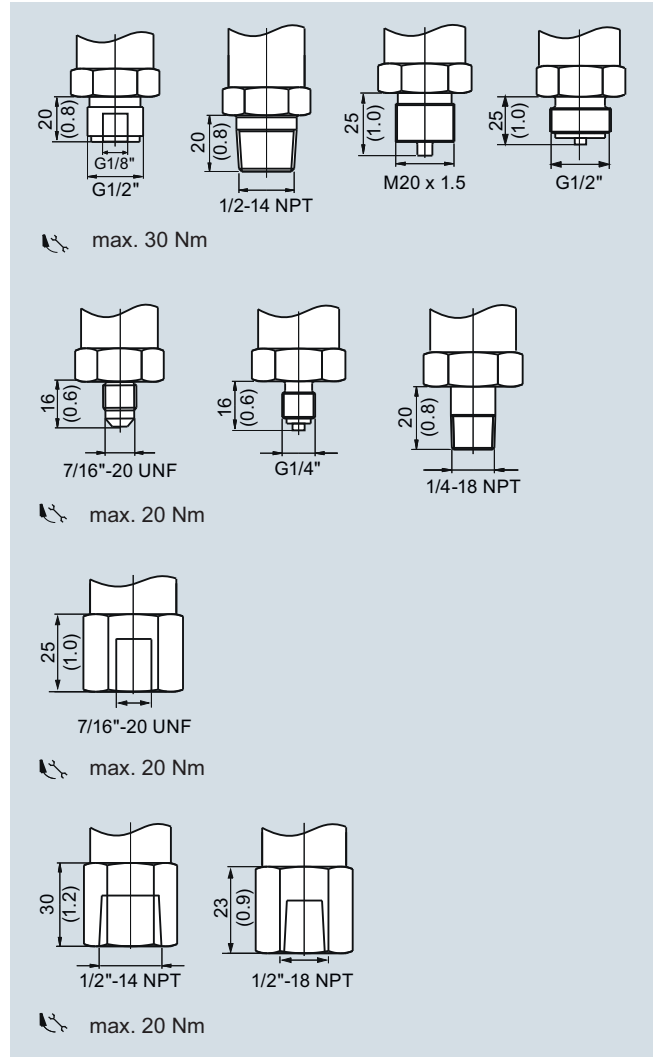
SITRANS P200
for gauge and absolute pressure

1

Dimensional drawings



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

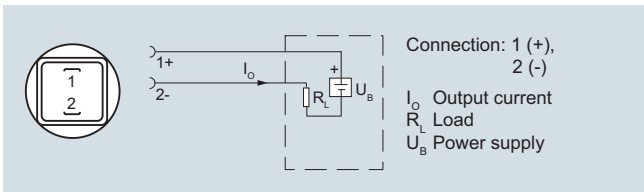


SITRANS P200, process connections, dimensions in mm (inch)

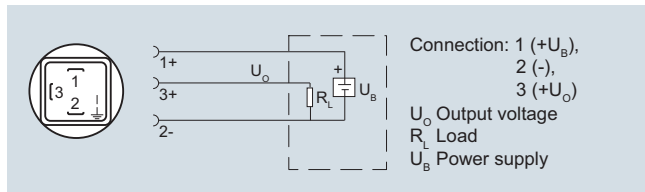
Pressure Measurement Transmitters for basic requirements

SITRANS P200 for gauge and absolute pressure

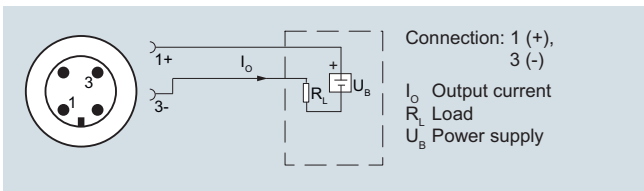
Schematics



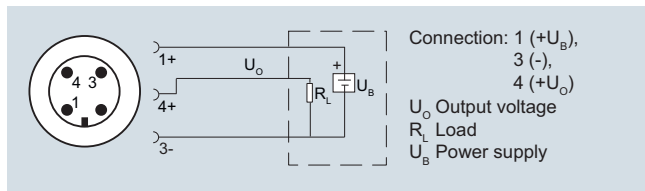
Connection with current output and connector per EN 175301



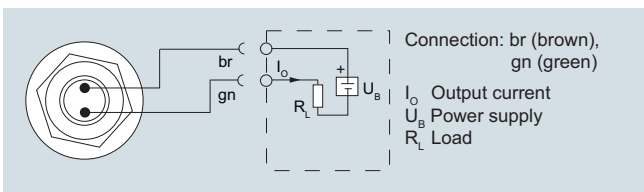
Connection with voltage output and connector per EN 175301



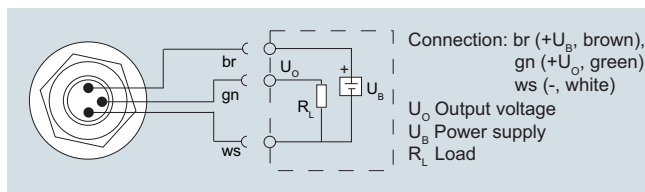
Connection with current output and connector M12x1



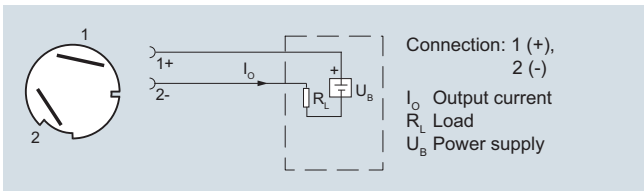
Connection with voltage output and connector M12x1



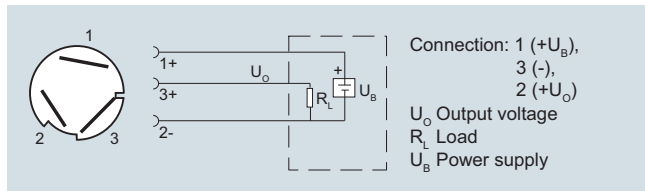
Connection with current output and cable



Connection with voltage output and cable



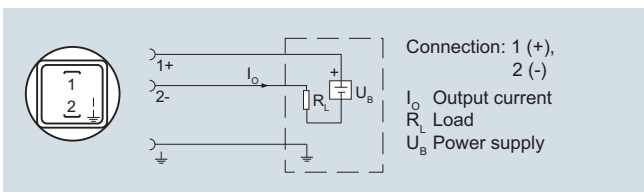
Connection with current output and Quickon cable quick screw connection



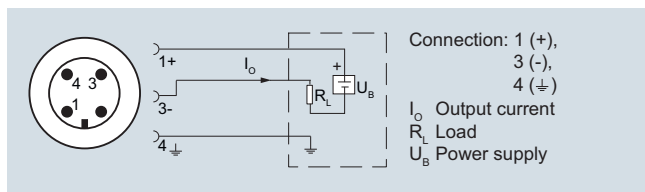
Connection with voltage output and Quickon cable quick screw connection

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)