

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.

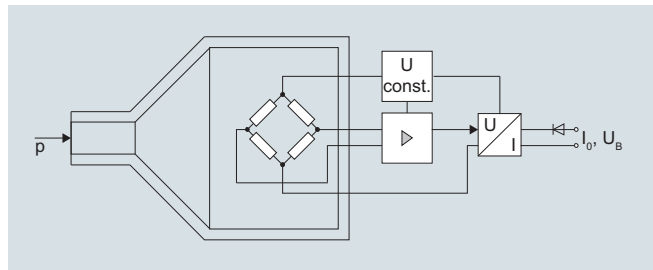
Device structure with explosion protection

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.

SITRANS P200 for gauge and absolute pressure

Technical specifications

Application Gauge and absolute pressure measurement		Liquids, gases and vapors		Electromagnetic compatibility • acc. IEC 61326-1/-2/-3 • acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation $\leq 1\%$	
Mode of operation Measuring principle		Piezo-resistive measuring cell (ceramic diaphragm)		Design Weight	
Measured variable		Gauge and absolute pressure		Process connections	
Inputs Measuring range		Gauge and absolute pressure		Electrical connections	
• Gauge pressure - Metric - US measuring range • Absolute pressure - Metric - US measuring range		1 ... 60 bar (15 ... 870 psi) 15 ... 1000 psi		• 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 ($\varnothing \pm 5.4$ mm) • Quickon cable quick screw connection	
Output Current signal		4 ... 20 mA ($U_B - 10$ V)/0.02 A		Wetted parts materials	
• Load • Auxiliary power U_B		DC 7 ... 33 V (10 ... 30 V for Ex)		• Measuring cell • Process connection	
Voltage signal		0 ... 10 V DC		• Gasket	
• Load • Auxiliary power U_B • Power consumption		≥ 10 k Ω 12 ... 33 V DC < 7 mA at 10 k Ω		Non-wetted parts materials	
Ratiometric output		0 ... 90 %		• Enclosure	
• Load • Auxiliary power U_B • Power consumption		≥ 10 k Ω 5 V DC $\pm 10\%$ < 7 mA at 10 k Ω		• Rack • Cables	
Characteristic curve		Linear rising		Certificates and approvals	
Measuring accuracy Error in measurement at limit setting incl. hysteresis and reproducibility		• Typical: 0.25 % of measuring span • Maximum: 0.5 % of measuring span		Classification according to pressure equipment directive (PED 2014/68/EU)	
Step response time T_{99}		< 5 ms		Lloyd's Register of Shipping (LR) ¹⁾	
Long-term stability		< 5 ms		Germanischer Lloyd (GL) ¹⁾	
• Lower range value and measuring span		0.25% of measuring span/year		American Bureau of Shipping (ABS) ¹⁾	
Influence of ambient temperature		0.25% of measuring span/year		Bureau Veritas (BV) ¹⁾	
• Lower range value and measuring span • Influence of power supply		$0.005\%/V$		Det Norske Veritas (DNV) ¹⁾	
Operating conditions Process temperature with gasket made of:		$-15 \dots +125\text{ }^{\circ}\text{C}$ ($+5 \dots +257\text{ }^{\circ}\text{F}$) $-35 \dots +100\text{ }^{\circ}\text{C}$ ($-31 \dots +212\text{ }^{\circ}\text{F}$) $-20 \dots +100\text{ }^{\circ}\text{C}$ ($-4 \dots +212\text{ }^{\circ}\text{F}$) $-40 \dots +125\text{ }^{\circ}\text{C}$ ($-40 \dots +257\text{ }^{\circ}\text{F}$), usable for drinking water		Drinking water approval (ACS) ¹⁾	
• FPM (Standard) • Neoprene • Perbunan • EPDM		$-25 \dots +85\text{ }^{\circ}\text{C}$ ($-13 \dots +185\text{ }^{\circ}\text{F}$) $-50 \dots +100\text{ }^{\circ}\text{C}$ ($-58 \dots +212\text{ }^{\circ}\text{F}$)		EAC ¹⁾	
Ambient temperature		$-25 \dots +85\text{ }^{\circ}\text{C}$ ($-13 \dots +185\text{ }^{\circ}\text{F}$)		Underwriters Laboratories (UL) ¹⁾	
Storage temperature		$-50 \dots +100\text{ }^{\circ}\text{C}$ ($-58 \dots +212\text{ }^{\circ}\text{F}$)		• for USA and Canada • worldwide	
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		Explosion protection	
				Intrinsic safety "i" (only with current output)	
				EC type-examination certificate	
				Connection to certified intrinsically-safe resistive circuits with maximum values:	
				Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	
				For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
				12/20010	
				GL19740 11 HH00	
				ABS_11_HG 789392_PDA	
				BV 271007A0 BV	
				A 12553	
				ACS 15 ACC NY 360	
				№ TC RU C-DE.Г505.В.00732 OC НАННО «ЛСБЭ»	
				UL 20110217 - E34453	
				IEC UL DK 21845	
				Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db	
				SEV 10 ATEX 0146	
				$U_i \leq 30$ V DC; $I_i \leq 100$ mA; $P_i \leq 0.75$ W	
				$L_i = 0$ nH; $C_i = 0$ nF	

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

SITRANS P200 for gauge and absolute pressure

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

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)

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

Measuring ranges for gauge pressure

0 ... 15 psi	-14.5 psi	35 psi	> 35 psi	4 BB
3 ... 15 psi	-14.5 psi	35 psi	> 35 psi	4 BC
0 ... 20 psi	-14.5 psi	50 psi	> 50 psi	4 BD
0 ... 30 psi	-14.5 psi	80 psi	> 80 psi	4 BE
0 ... 60 psi	-14.5 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

Measuring ranges for absolute pressure

0 ... 10 psi a	0 psi a	35 psi a	> 35 psi a	6 AG
0 ... 15 psi a	0 psi a	35 psi a	> 35 psi a	6 BA
0 ... 20 psi a	0 psi a	50 psi a	> 50 psi a	6 BB
0 ... 30 psi a	0 psi a	80 psi a	> 80 psi a	6 BD
0 ... 60 psi a	0 psi a	140 psi a	> 140 psi a	6 BE
0 ... 100 psi a	0 psi a	200 psi a	> 200 psi a	6 BG
0 ... 150 psi a	0 psi a	350 psi a	> 350 psi a	6 CA
0 ... 200 psi a	0 psi a	550 psi a	> 550 psi a	6 CB
0 ... 300 psi a	0 psi a	800 psi a	> 800 psi a	6 CC

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

H1 Y

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

H2 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

H1 Y

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

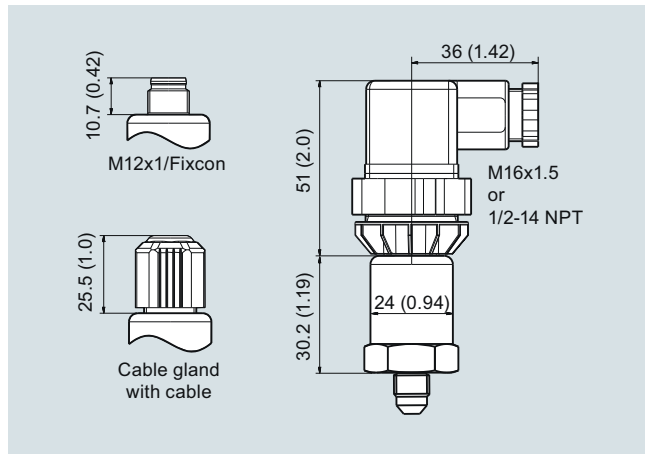
H2 Y

SITRANS P200 for gauge and absolute pressure

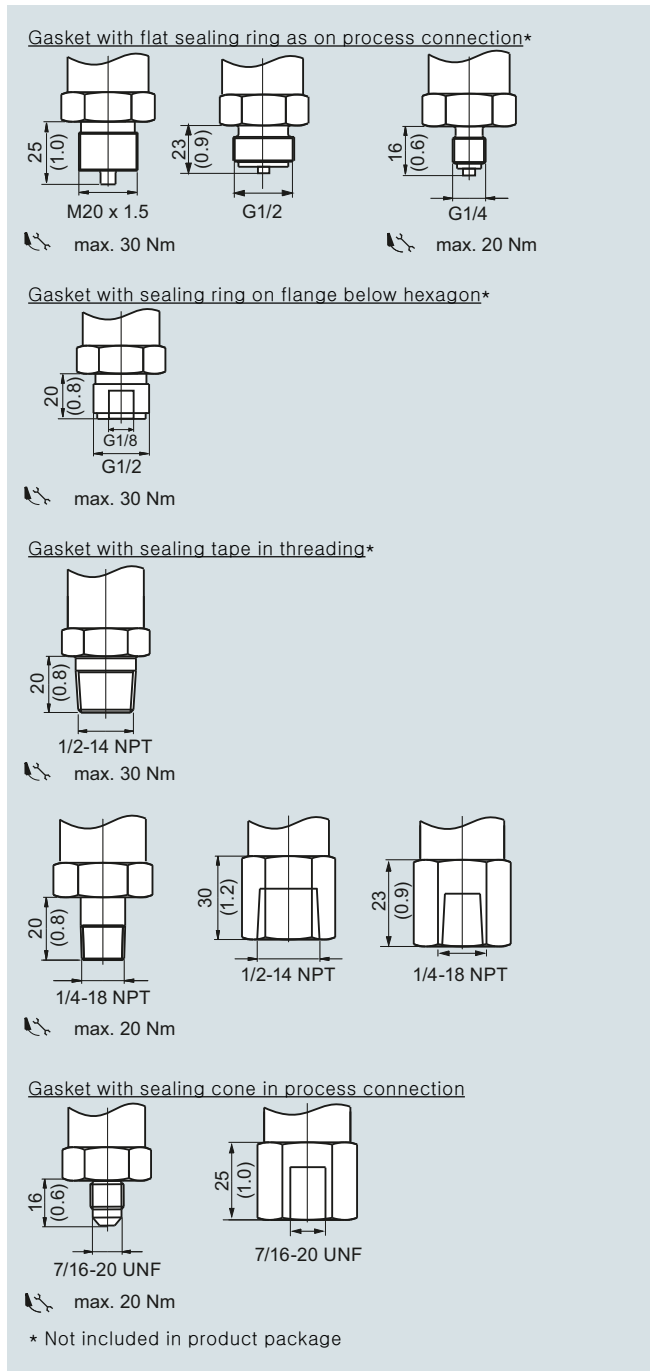
Selection and ordering data	Article No.	Order code
SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications Accuracy typ. 0.25 % Wetted parts materials: Ceramic and stainless steel + sealing material Non-wetted parts materials: stainless steel	7MF1565-	
Output signal 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 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 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	

SITRANS P200 for gauge and absolute pressure

Dimensional drawings

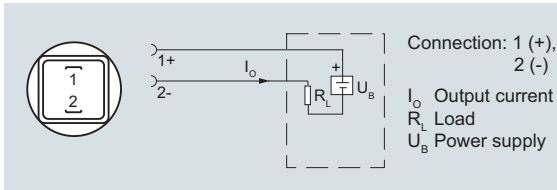


SITRANS P200, electrical connections, dimensions in mm (inch)

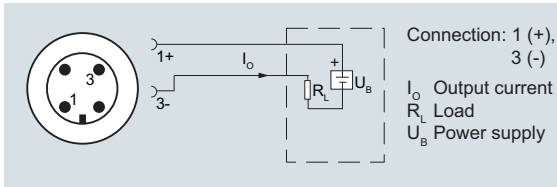


SITRANS P200, process connections, dimensions in mm (inch)

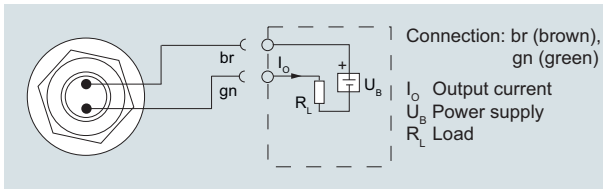
Schematics



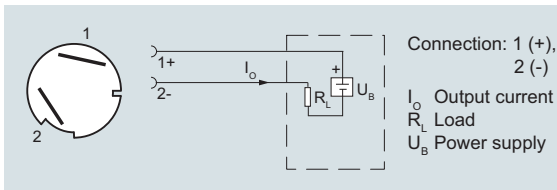
Connection with current output and connector per EN 175301



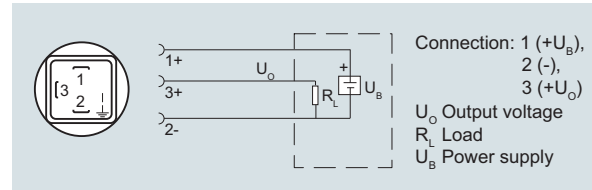
Connection with current output and device plug M12x1



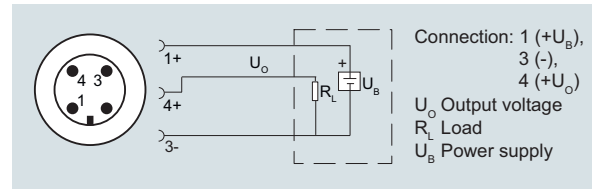
Connection with current output and cable



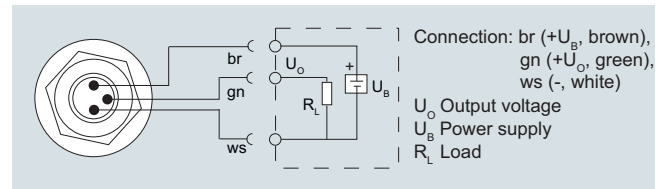
Connection with current output and Quickon cable quick screw connection



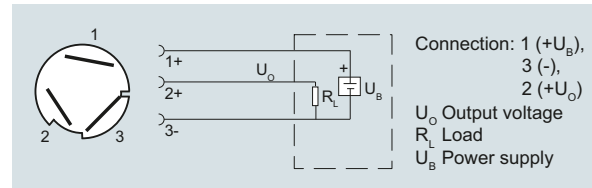
Connection with voltage output, ratiometric output and plug according to EN 175301



Connection with voltage output, ratiometric output and device plug M12x1



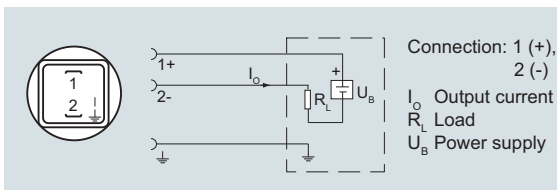
Connection with voltage output, ratiometric output and cable



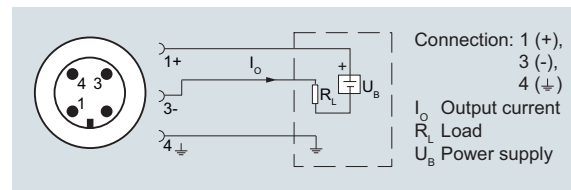
Connection with voltage output, ratiometric output and Quickon fast cable termination

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)