

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

1

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.

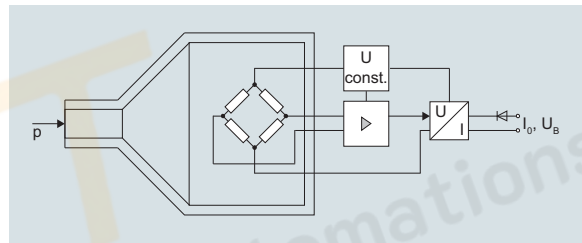
Device structure with explosion protection

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	1 ... 60 bar (15 ... 870 psi)
- Metric	15 ... 1000 psi
- US measuring range	
• Absolute pressure	0.6 ... 16 bar a
- Metric	(10 ... 232 psi abs a)
- US measuring range	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 mm²) 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.В.00732 OC НАИО «ЛЦБЗ»
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

Article No.

Order code

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

7MH565-

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.

Measuring range

Overload limit

Min.

Max.

Burst pressure

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)	3 BA
0 ... 1.6 bar	(0 ... 23.2 psi)	-1 bar (-14.5 psi)	4 bar (58.02 psi)	> 4 bar (> 58.0 psi)	3 BB
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)	3 BD
0 ... 4 bar	(0 ... 58.0 psi)	-1 bar (-14.5 psi)	10 bar (145 psi)	> 10 bar (> 145 psi)	3 BE
0 ... 6 bar	(0 ... 87.0 psi)	-1 bar (-14.5 psi)	15 bar (217 psi)	> 15 bar (> 217 psi)	3 BG
0 ... 10 bar	(0 ... 145 psi)	-1 bar (-14.5 psi)	25 bar (362 psi)	> 25 bar (> 362 psi)	3 CA
0 ... 16 bar	(0 ... 232 psi)	-1 bar (-14.5 psi)	40 bar (580 psi)	> 40 bar (> 580 psi)	3 CB
0 ... 25 bar	(0 ... 363 psi)	-1 bar (-14.5 psi)	62.5 bar (906 psi)	> 62.5 bar (> 906 psi)	3 CD
0 ... 40 bar	(0 ... 580 psi)	-1 bar (-14.5 psi)	100 bar (1450 psi)	> 100 bar (> 1450 psi)	3 CE
0 ... 60 bar	(0 ... 870 psi)	-1 bar (-14.5 psi)	150 bar (2175 psi)	> 150 bar (> 2175 psi)	3 CG

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

9 AA**H 1 Y**

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

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

9 AA**H 2 Y**

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

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

9 AA**H 1 Y**

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

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

9 AA**H 2 Y**

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SITRANS P200 for gauge and absolute pressure**1****Selection and ordering data**

Article No.

Order code

SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications**7MF1565-**

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

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")

03

Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")

04

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

07

Special version

9**N1Y****Process connection**

G½" male per EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar)

A

G½" male thread and G1/8" female thread

B

G¼" male per EN 837-1 (¼" BSP male)

C

7/16"-20 UNF male

D¼"-18 NPT male (standard for pressure ranges inH₂O and psi)**E**

¼"-18 NPT female

F

½"-14 NPT male

G

½"-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**P1Y****Sealing material between sensor and enclosure**

Viton (FPM, standard)

A

Neoprene (CR)

B

Perbunan (NBR)

C

EPDM

D

Special version

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)

C11

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)

E10

Pressure Measurement

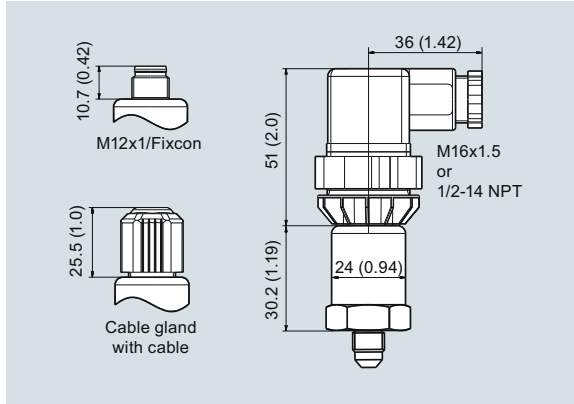
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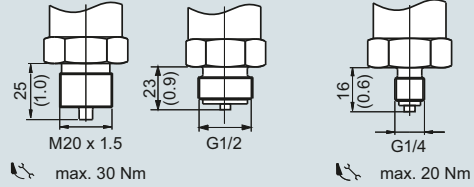
SITRANS P200 for gauge and absolute pressure

Dimensional drawings

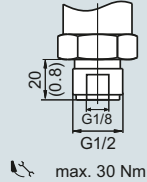


SITRANS P200, electrical connections, dimensions in mm (inch)

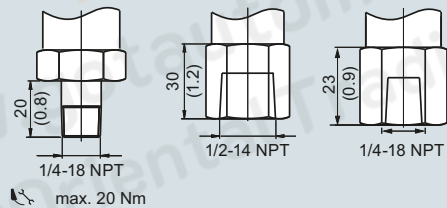
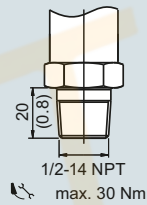
Gasket with flat sealing ring as on process connection*



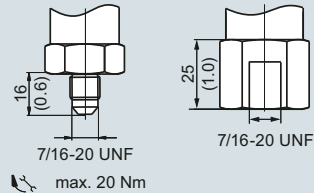
Gasket with sealing ring on flange below hexagon*



Gasket with sealing tape in threading*



Gasket with sealing cone in process connection



* Not included in product package

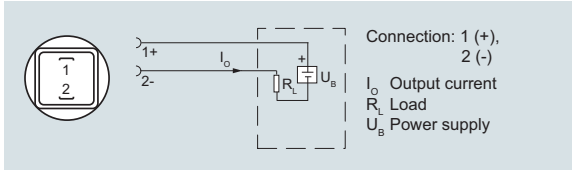
SITRANS P200, process connections, dimensions in mm (inch)

Pressure Measurement

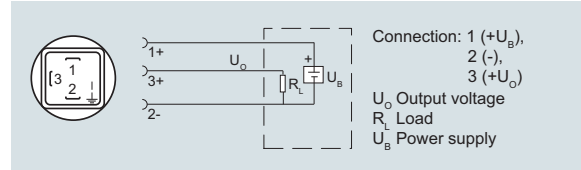
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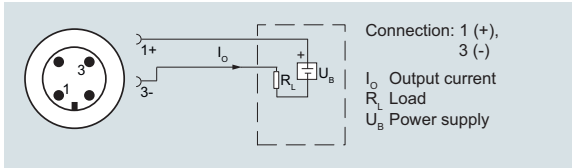
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Schematics

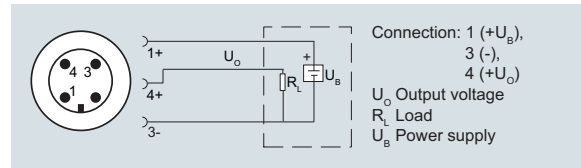
Connection with current output and connector per EN 175301



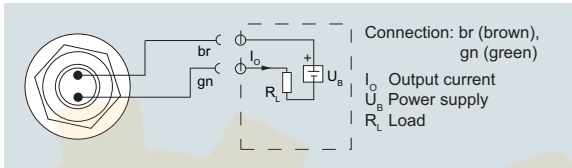
Connection with voltage output, ratiometric output and plug according to EN 175301



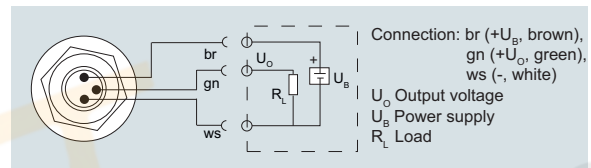
Connection with current output and device plug M12x1



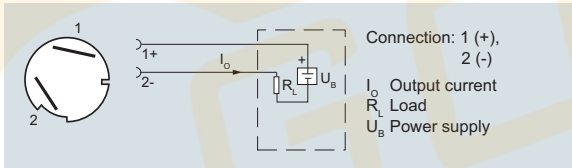
Connection with voltage output, ratiometric output and device plug M12x1



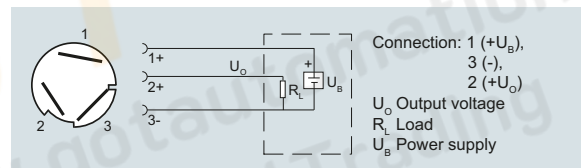
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



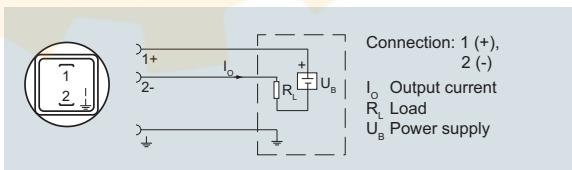
Connection with current output and Quickon cable quick screw connection



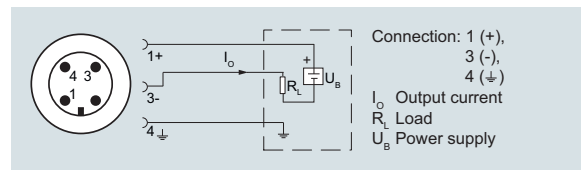
Connection with voltage output, ratiometric output and Quickon fast cable termination

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)

บริษัท เกทโอเรียนเทิลเทรดดิ้ง จำกัด
เลขที่ 1049 ถนนร่วมธรรม
ตำบลคองหงส์ อำเภอหาดใหญ่
จังหวัดสงขลา 90110
074-300212-4



095-078-7525



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@gotrading



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