

Pressure measurement

Pressure transmitters

Single-range transmitters / SITRANS P200

Overview



The SITRANS P200 pressure transmitter measures the gauge and absolute pressure of liquids, gases and vapors.

- With ceramic measuring cell
- Gauge and absolute measuring ranges 1 to 60 bar (15 to 1000 psi)
- For general applications

Benefits

- High measurement accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For corrosive and non-corrosive 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 connected electrically with a device plug to EN 175301-803-A (IP65), an M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67). The output signal is 4 to 20 mA, 0 to 10 V or is available as an IO-Link signal.

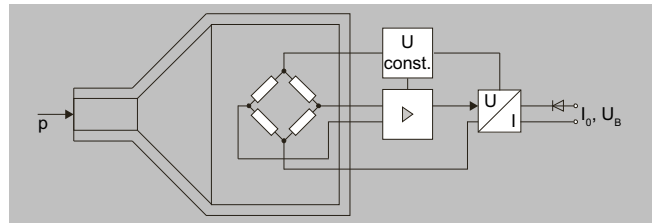
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm, installed in a stainless steel enclosure. It can be connected electrically with a device plug fulfilling EN 175301-803-A (IP65) or an M12 device plug (IP67). The output signal is between 4 and 20 mA.

Function

The pressure transmitter measures the gauge and absolute pressure of liquids, gases and vapors.

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 measuring cell output voltage is fed to the amplifier and converted into a 4 to 20 mA output current, a DC 0 to 10 V output voltage or an IO-Link output signal.

Output current, output voltage or IO-Link signal are linearly proportional to the input pressure.

Selection and ordering data

SITRANS P200 pressure transmitter, for pressure and absolute pressure for general applications								Article No.	Order code
								7MF1565-	
								● ● ● ● ● - ● ● ● ● ● ● ● ●	
Typical characteristic curve deviation 0.25 %, material of wetted parts: Ceramic and stainless steel + gasket material Material of non-wetted parts: Stainless steel									
Click the article number for online configuration in the PIA Life Cycle Portal.									
Measuring range	Minimum overload limit	Maximum overload limit	Burst pressure						
For gauge pressure									
0 ... 1 bar	(0 ... 14.5 psi)	-1 bar	(-14.5 psi)	3 bar	(43.5 psi)	> 3 bar	(> 43.5 psi)	3	B A
0 ... 1.6 bar	(0 ... 23.2 psi)	-1 bar	(-14.5 psi)	4.8 bar	(69.06 psi)	> 4.8 bar	(> 69.6 psi)	3	B B
0 ... 2.5 bar	(0 ... 36.3 psi)	-1 bar	(-14.5 psi)	7.5 bar	(108.75 psi)	> 7.5 bar	(> 108.75 psi)	3	B D
0 ... 4 bar	(0 ... 58.0 psi)	-1 bar	(-14.5 psi)	12 bar	(174 psi)	> 12 bar	(> 174 psi)	3	B E
0 ... 6 bar	(0 ... 87.0 psi)	-1 bar	(-14.5 psi)	15 bar	(217 psi)	> 15 bar	(> 217 psi)	3	B G
0 ... 10 bar	(0 ... 145 psi)	-1 bar	(-14.5 psi)	25 bar	(362 psi)	> 25 bar	(> 362 psi)	3	C A
0 ... 16 bar	(0 ... 232 psi)	-1 bar	(-14.5 psi)	40 bar	(580 psi)	> 40 bar	(> 580 psi)	3	C B
0 ... 25 bar	(0 ... 363 psi)	-1 bar	(-14.5 psi)	62.5 bar	(906 psi)	> 62.5 bar	(> 906 psi)	3	C D
0 ... 40 bar	(0 ... 580 psi)	-1 bar	(-14.5 psi)	100 bar	(1450 psi)	> 100 bar	(> 1450 psi)	3	C E
0 ... 60 bar	(0 ... 870 psi)	-1 bar	(-14.5 psi)	150 bar	(2175 psi)	> 150 bar	(> 2175 psi)	3	C G
Note: For transmitters with IO-Link output signal, no different version of the measuring range is possible. Other version; Add order code and plain text: Measuring range: ... to ... bar (psi)								9	A A 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	A G
0 ... 1 bar a	(0 ... 14.5 psi a)	0 bar a	(0 psi a)	3 bar a	(43.5 psi a)	> 3 bar a	(> 43.5 psi a)	5	B A
0 ... 1.6 bar a	(0 ... 23.2 psi a)	0 bar a	(0 psi a)	4.8 bar a	(69.6 psi a)	> 4.8 bar a	(> 69.6 psi a)	5	B B
0 ... 2.5 bar a	(0 ... 36.3 psi a)	0 bar a	(0 psi a)	7.5 bar a	(108.75 psi a)	> 7.5 bar a	(> 108.75 psi a)	5	B D
0 ... 4 bar a	(0 ... 58.0 psi a)	0 bar a	(0 psi a)	12 bar a	(174 psi a)	> 12 bar a	(> 174 psi a)	5	B E
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	B G
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	C A
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	C B
Note: For transmitters with IO-Link output signal, no different version of the measuring range is possible. Other version; Add order code and plain text: Measuring range: ... to ... mbar a (psi a)								9	A A H 2 Y
Measuring ranges for gauge pressure									
0 ... 15 psi		-14.5 psi		45 psi a		> 45 psi a		4	B B
3 ... 15 psi		-14.5 psi		35 psi a		> 35 psi a		4	B C
0 ... 20 psi		-14.5 psi		60 psi a		> 60 psi a		4	B D
0 ... 30 psi		-14.5 psi		90 psi a		> 90 psi a		4	B E
0 ... 60 psi		-14.5 psi		150 psi a		> 150 psi a		4	B F
0 ... 100 psi		-14.5 psi		250 psi a		> 250 psi a		4	B G
0 ... 150 psi		-14.5 psi		375 psi a		> 375 psi a		4	C A
0 ... 200 psi		-14.5 psi		500 psi		> 500 psi		4	C B
0 ... 300 psi		-14.5 psi		750 psi		> 750 psi		4	C D
0 ... 500 psi		-14.5 psi		1250 psi		> 1250 psi		4	C E
0 ... 750 psi		-14.5 psi		1875 psi		> 1875 psi		4	C F
0 ... 1 000 psi		-14.5 psi		2 000 psi		> 2 000 psi		4	C G
Note: For transmitters with IO-Link output signal, no different version of the measuring range in the unit psi is possible. Other version; Add order code and plain text: Measuring range: ... to ... psi								9	A A H 1 Y
Measuring ranges for absolute pressure									
0 ... 10 psi a	0 psi a			35 psi a		> 35 psi a		6	A G
0 ... 15 psi a	0 psi a			45 psi a		> 45 psi a		6	B A
0 ... 20 psi a	0 psi a			60 psi a		> 60 psi a		6	B B
0 ... 30 psi a	0 psi a			90 psi a		> 90 psi a		6	B D
0 ... 60 psi a	0 psi a			150 psi a		> 150 psi a		6	B E
0 ... 100 psi a	0 psi a			250 psi a		> 250 psi a		6	B G
0 ... 150 psi a	0 psi a			375 psi a		> 375 psi a		6	C A
0 ... 200 psi a	0 psi a			500 psi a		> 500 psi a		6	C B
0 ... 300 psi a	0 psi a			800 psi a		> 800 psi a		6	C C
Note: For transmitters with IO-Link output signal, no different version of the measuring range in the unit psi is possible. Other version; Add order code and plain text: Measuring range: ... to ... psi a								9	A A H 2 Y
Output signal									
4 ... 20 mA; 2-wire system; auxiliary power DC 7 ... 33 V (DC 10 ... 30 V for explosion protection)								0	
0 ... 10 V; 3-wire system; auxiliary power 12 ... 33 V DC								1	0

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Selection and ordering data (continued)

	Article No.	Order code
SITRANS P200 pressure transmitter, for pressure and absolute pressure for general applications	7MF1565-	
	● ● ● ● ● - ● ● ● ● ● ● ● ●	
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC	2 0	
Ratiometric 10 ... 90%; 3-wire system; auxiliary power 5 V DC ± 10%	3 0	
IO-Link interface (only with M12 plug, measuring range bar and without explosion protection)	7 0	
Explosion protection (only 4 ... 20 mA)		
None	0	
With explosion protection Ex ia IIC T4	1	
Electrical connection		
Plug according to EN 175301-803-A, stuffing box thread M16 (with coupling)		1
M12 device plug according to IEC 61076-2-101		2
Connection via permanently installed cable, 2 m (6.6 ft); not for "Intrinsic safety" type of protection	0	3
Quick-screw cable gland Quickon PG9; not for "Intrinsic safety" type of protection	0	4
Plug according to EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)		5
Plug according to EN 175301-803-A, stuffing box thread PG11 (with coupling)		6
Permanently installed cable, length 5 m (16.4 ft)	0	7
Process connection		
G½" male according to EN 837-1 (½" BSP male): Standard for metric pressure ranges mbar, bar		A
G½" male and G1/8" female		B
G¼" male according to EN 837-1 (¼" BSP male)		C
7/16"-20 UNF male		D
¼"-18 NPT male: Standard for pressure ranges inH ₂ O 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
G¼" according to EN ISO 1179-2 (formerly DIN 3852 form E)		Q
G½" according to EN ISO 1179-2 (formerly DIN 3852 form E)		R
Schrader nipple		U
Gasket material between sensor and enclosure		
Viton (FPM, standard)		A
MVQ		B
Perbunan (NBR)		C
EPDM		D
Version		
Standard version		1

Options	Order code
Add "-Z" to article number and specify order code.	
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2	C11
Oxygen version, free of oil and degreased, max. operating pressure 60 bar (870.2 psi), max. medium temperature +85 °C (185 °F)	E10
Notice	
Only with Viton gasket material between sensor and enclosure, and not with explosion protection version!	

Technical specifications

SITRANS P200 for gauge and absolute pressure	
Application Gauge and absolute pressure measurement	Liquids, gases and vapors
Mode of operation Measuring principle	Piezo-resistive measuring cell (ceramic diaphragm)
Measured variable	Gauge and absolute pressure
Input Measuring range	
• Gauge pressure	
- Metric	1 ... 60 bar (15 ... 870 psi)
- US measuring range	15 ... 1000 psi
• Absolute pressure	
- Metric	0.6 ... 16 bar a (10 ... 232 psi a)
- US measuring range	10 ... 300 psi a
Note: For transmitters with IO-Link output signal, no different version of the measuring range in the unit psi is possible	
Output Current signal	4 ... 20 mA
• Load	(U _B - 10 V)/0.02 A
• Auxiliary power U _B	7 ... 33 V DC (10 ... 30 V for Ex)
Voltage signal	0 ... 10 V DC
• Load	≥ 10 kΩ
• Auxiliary power U _B	12 ... 33 V DC
• Current consumption	< 7 mA at 10 kΩ
Radiometric output	10 ... 90%
• Load	≥ 10 kΩ
• Auxiliary power U _B	DC 5 V ± 10%
• Current consumption	< 7 mA at 10 Ω
• Characteristic curve	Linear rising
IO-Link interface	L+: 18 ... 33 V DC L-: GND C/Q: IO-Link / Switching output DI/DQ: Switching output Pressure transmitter is only approved for port class A
• Auxiliary power	UB 18-33 V
• Port class	A
• Characteristic curve	Linear rising
Measuring accuracy Measurement deviation at limit setting including 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 ms
Long-term stability	
• Lower range value and measuring span	0.25% of measuring span/year
Effect of ambient temperature	
• Lower range value and measuring span	0.2%/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)

Technical specifications (continued)

SITRANS P200 for gauge and absolute pressure	
• MVQ	-40 ... +125 °C (-40 ... +257 °F) Explosion protection: -30 ... +120 °C (-22 ... +248 °F)
• Perbunan	-20 ... +100 °C (-4 ... +212 °F)
• EPDM	-40 ... +125 °C (-40 ... +257 °F), usable for drinking water
Ambient temperature	-30 ... +85 °C (-22 ... +185 °F)
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
Degree of protection according to IEC 60529	<ul style="list-style-type: none"> • IP00 with RAST 2.5 plug • IP65 with plug according to EN 175301-803-A • IP67 with M12 device plug • IP67 with cable • IP67 with cable quick screw connection
Electromagnetic compatibility	<ul style="list-style-type: none"> • According to IEC 61326-1/-2/-3 • According to NAMUR NE21 for ATEX devices only, and with a max. measurement error of ≤ 1% • CE-compliant in accordance with EN 61326-2-3
Structural design Weight	Approx. 0.090 kg (0.198 lbs)
Process connections	See dimension drawings
Electrical connections	<ul style="list-style-type: none"> • Plug according to EN 175301-803-A Form A with cable entry M16x1.5 or ½-14 NPT or Pg 11 • Device plug M12 • 2 or 3-wire (0.5 mm²) cable (Ø ± 5.4 mm) • Quickon cable quick screw connection
Material of wetted parts	
• Measuring cell	Al ₂ O ₃ - 96%
• Process connection	Stainless steel, mat. no. 1.4404 (SST 316 L)
• Gasket	<ul style="list-style-type: none"> • FPM (standard) • MVQ • Perbunan • EPDM
Material of non-wetted parts	
• Enclosure	Stainless steel, mat. no. 1.4404 (SST 316 L)
• Connector housing	Plastic
• Cable	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⁾	NSF/ANSI 61/372 according to MH60087
EAC ¹⁾	№ TC RU C-DE.Г605.В.00732 ОЧ НАИНО «ЦЛБЭ»
Underwriters Laboratories (UL) ¹⁾	
• For the USA and Canada	UL 20110217 - E34453
• Worldwide	IEC UL DK 21845

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Technical specifications (continued)

SITRANS P200 for gauge and absolute pressure

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 IIIIC T125 °C Da/Db

EC type-examination certificate

SEV 15 ATEX 0173

Connection to certified intrinsically safe ohmic circuits with maximum values

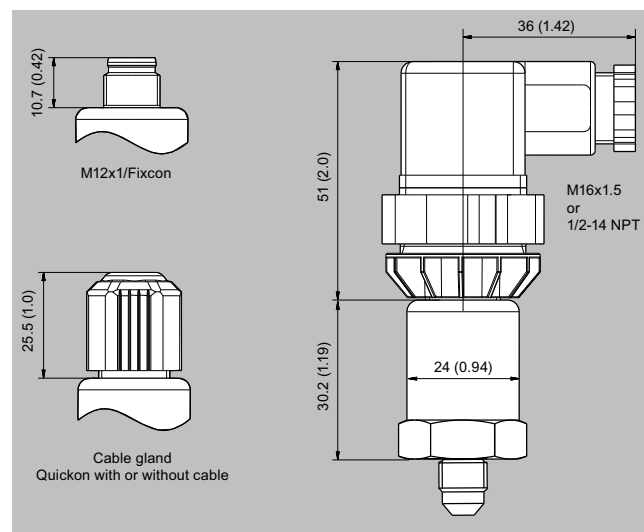
For ratiometric 10 ... 90%: $U_i < 15$ V DC;
 $I_i < 200$ mA; $P_i < 750$ mW

Effective internal inductance and capacity for versions with plugs according to EN 175301-803-A and M12

For ratiometric 10 ... 90%: $L_i = 0$ nH;
 $C_i < 150$ nF

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

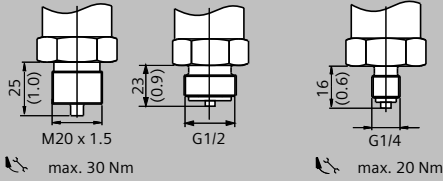
Dimensional drawings



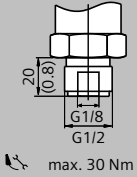
SITRANS P200, electrical connections, dimensions in mm (inch)

Dimensional drawings (continued)

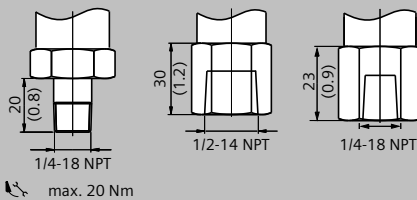
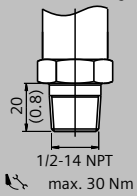
Seal with flat sealing ring as on process connection*



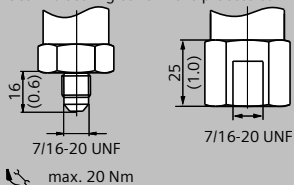
Seal via sealing ring on flange below hexagon*



Seal with sealing tape in the thread*



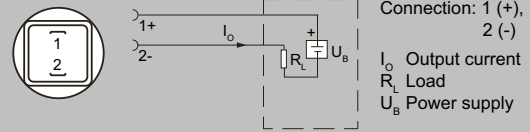
Seal via sealing cone in the process connection



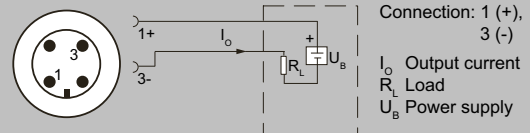
* Not included in product package

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

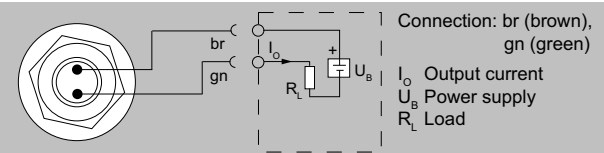
Circuit diagrams



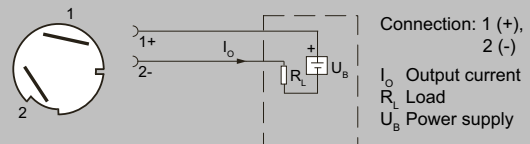
Connection with current output and plug according to EN 175301



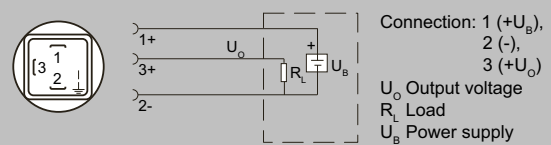
Connection with current output and M12x1 device plug



Connection with current output and cable



Connection with current output and Quickon cable quick screw connection



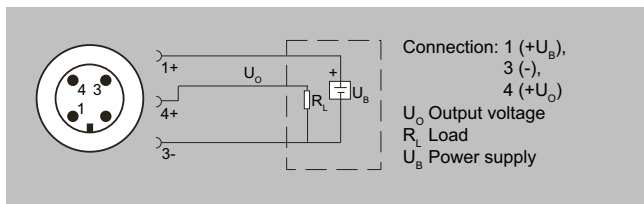
Connection with voltage output, ratiometric output and plug according to EN 175301

Pressure measurement

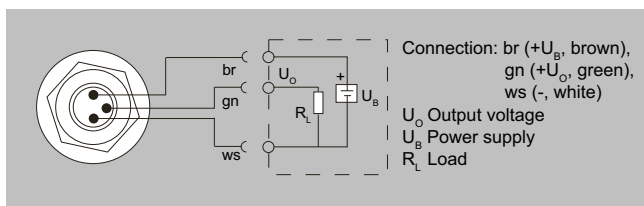
Pressure transmitters

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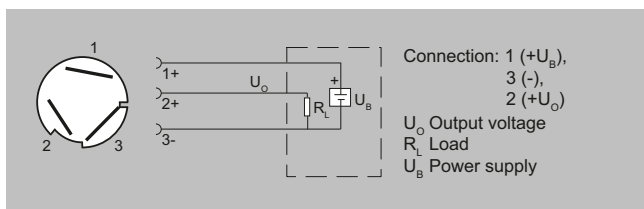
Circuit diagrams (continued)



Connection with voltage output, ratiometric output and M12x1 device plug



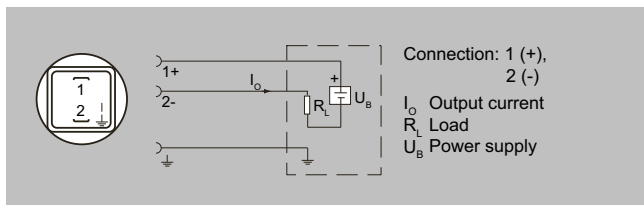
Connection with voltage output, ratiometric output and cable



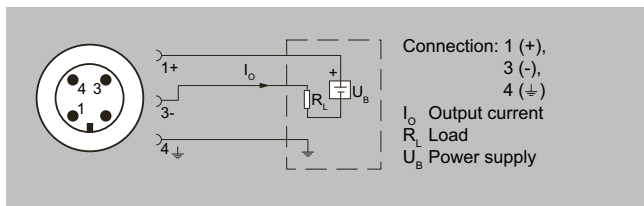
Connection with voltage output, ratiometric output and Quickon fast cable termination

Device design with explosion protection: 4 to 20 mA

The grounding connection is conductively bonded to the transmitter enclosure.

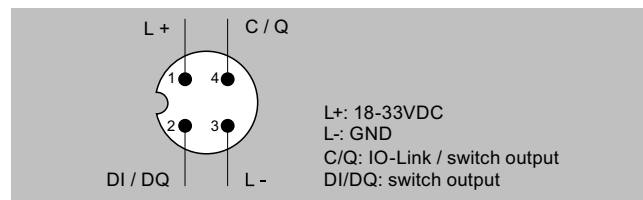


Connection with current output and plug according to EN 175301 (Ex)



Connection with current output and M12x1 (Ex) device plug

Circuit diagrams (continued)



Connection with IO-Link interface, only possible with M12 plug

Overview



The SITRANS P210 pressure transmitter 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 measurement accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For corrosive and non-corrosive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

Application

The SITRANS P210 pressure transmitter for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Energy development
- 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 connected electrically with a device plug to EN 175301-803-A (IP65), an M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67). The output signal is between 4 and 20 mA or 0 and 10 V

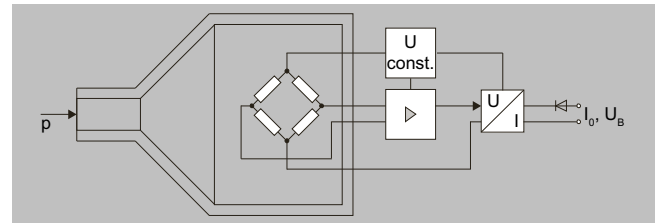
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm, installed in a stainless steel enclosure. It can be connected electrically with a device plug fulfilling EN 175301-803-A (IP65) or an M12 device plug (IP67). 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 transmitter (7MF1566-...), functional diagram

The stainless steel measuring cell with silicone oil filling 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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Selection and ordering data

							Article No.	Order code				
SITRANS P210 pressure transmitter for gauge pressure, for low-pressure applications							7MF1566-					
Measurement deviation typ. 0.25%												
Material of wetted parts: Stainless steel + gasket material												
Material of non-wetted parts: Stainless steel												
Click the article number for online configuration in the PIA Life Cycle Portal.												
Measuring range	Minimum overload limit		Maximum overload limit		Burst pressure							
For gauge pressure												
0...100 mbar (1.45 psi)	-300 mbar	(-4.35 psi)	2 bar	(29 psi)	2 bar	(29 psi)	3	A	A			
0...160 mbar (2.32 psi)	-300 mbar	(-4.35 psi)	2 bar	(29 psi)	2 bar	(29 psi)	3	A	B			
0...250 mbar (3.63 psi)	-300 mbar	(-4.35 psi)	2 bar	(29 psi)	2 bar	(29 psi)	3	A	C			
0...400 mbar (5.8 psi)	-300 mbar	(-4.35 psi)	2 bar	(29 psi)	2 bar	(29 psi)	3	A	D			
0...600 mbar (8.7 psi)	-300 mbar	(-4.35 psi)	2 bar	(29 psi)	2 bar	(29 psi)	3	A	G			
Other version; Add order code and plain text: Measuring range: ... to ... mbar (psi)							9	A	A		H 1 Y	
Output signal												
4 ... 20 mA; 2-wire system; auxiliary power DC 10 ... 33 V (DC 10 ... 30 V for ATEX devices)							0					
0 ... 10 V; 3-wire system; auxiliary power 12 ... 33 V DC							1	0				
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC							2	0				
Ratiometric 10 ... 90%; 3-wire system; auxiliary power 5 V DC ± 10%							3	0				
Explosion protection (only 4 ... 20 mA)												
None							0					
With explosion protection Ex ia IIC T4							1					
Electrical connection												
Plug according to EN 175301-803-A, stuffing box thread M16 (with coupling)											1	
M12 device plug according to IEC 61076-2-101											2	
Connection via permanently installed cable, 2 m (6.6 ft); not for "Intrinsic safety" type of protection							0				3	
Quick-screw cable gland Quickon PG9; not for "Intrinsic safety" type of protection							0				4	
Plug according to EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)											5	
Plug according to EN 175301-803-A, stuffing box thread PG11 (with coupling)											6	
Permanently installed cable, length 5 m (16.4 ft)							0				7	
Process connection												
G½" male according to EN 837-1 (½" BSP male): Standard for metric pressure ranges mbar, bar											A	
G½" male and G1/8" female											B	
G¼" male according to EN 837-1 (¼" BSP male)											C	
7/16"-20 UNF male											D	
¼"-18 NPT male: Standard for pressure ranges inH ₂ O 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	
G¼" according to EN ISO 1179-2 (formerly DIN 3852 form E)											Q	
G½" according to EN ISO 1179-2 (formerly DIN 3852 form E)											R	
Gasket material between sensor and enclosure												
Viton (FPM, standard)											A	
Neoprene (CR)											B	
Perbunan (NBR)											C	
EPDM											D	
Special design											Z	
											Q 1 Y	
Version												
Standard version												1

Options	Order code
Add "-Z" to article number and specify order code.	
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2	C11

Technical specifications

SITRANS P210 for gauge pressure	
Application	
Gauge pressure measurement	Liquids, gases and vapors
Mode of operation	
Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)
Measured variable	Gauge pressure
Input	
Measuring range	
• Gauge pressure	100 ... 600 mbar (1.45 ... 8.7 psi)
Output	
Current signal	4 ... 20 mA
• Load	($U_B - 10 \text{ V}$)/0.02 A
• Auxiliary power U_B	DC 10 ... 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
• Current consumption	< 5 mA at 10 k Ω
Radiometric output	10 ... 90%
• Load	$\geq 10 \text{ k}\Omega$
• Auxiliary power U_B	DC 5 V \pm 10%
• Current consumption	< 5 mA at 10 k Ω
Characteristic curve	Linear rising
Measuring accuracy	
Measurement deviation at limit setting including hysteresis and reproducibility	<ul style="list-style-type: none"> • Typical: 0.35% 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
Effect of ambient temperature	
• Lower range value and measuring span	<ul style="list-style-type: none"> • 0.25%/10 K of measuring span • 0.5%/10 K of measuring span for a measuring range 100 ... 400 mbar (40 ... 240 inH₂O)
• 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	-25 ... +85 °C (-13 ... +185 °F), usable for drinking water
Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Degree of protection according to IEC 60529	<ul style="list-style-type: none"> • IP65 with plug according to EN 175301-803-A • IP67 with M12 device plug • IP67 with cable • IP67 with cable quick screw connection
Electromagnetic compatibility	CE-compliant in accordance with EN 61326-2-3
Mounting position	Vertical, facing up
Structural design	
Weight	Approx. 120 g (0.264 lb)
Process connections	See dimension drawings

Technical specifications (continued)

SITRANS P210 for gauge pressure	
Electrical connections	<ul style="list-style-type: none"> • Plug according to EN 175301-803-A Form A with cable entry 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
Material of wetted parts	
• Measuring cell	Ceramic Al ₂ O ₃ (99.6%)
• Process connection	Stainless steel 1.4404 / AISI 316L
• Gasket	<ul style="list-style-type: none"> • FPM (standard) • Neoprene • Perbunan • EPDM
Material of non-wetted parts	
• Enclosure	Stainless steel, mat. no. 1.4404 (SST 316 L)
• Connector housing	Plastic
• Cable	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 (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.Г605.В.00732 ОС НАНИО «ЦБЭ»
Underwriters Laboratories (UL) ¹⁾	
• For the 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 T120°C Da/Db
EC type-examination certificate	SEV 10 ATEX 0146
Connection to certified intrinsically safe ohmic circuits with maximum values	$U_i \leq \text{DC } 30 \text{ V}$; $I_i \leq 100 \text{ mA}$; $P_i \leq 0.75 \text{ W}$
Effective internal inductance and capacity for versions with plugs according to EN 175301-803-A and M12	$L_i = 0 \text{ nH}$; $C_i = 0 \text{ nF}$

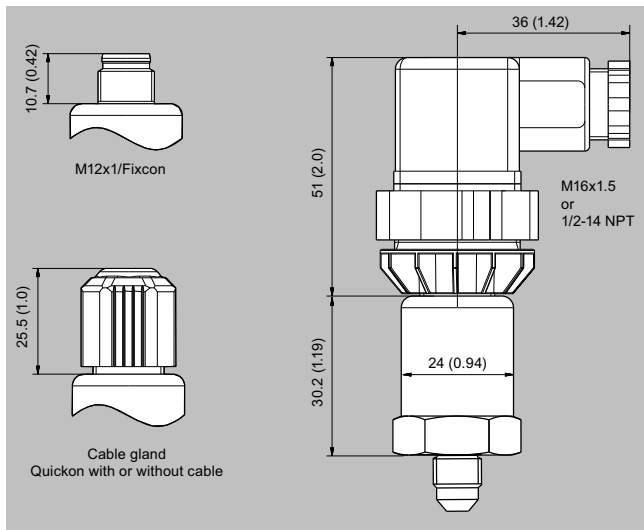
¹⁾ For variants with output signal 0 ... 5 V and radiometric output available soon.

Pressure measurement

Pressure transmitters

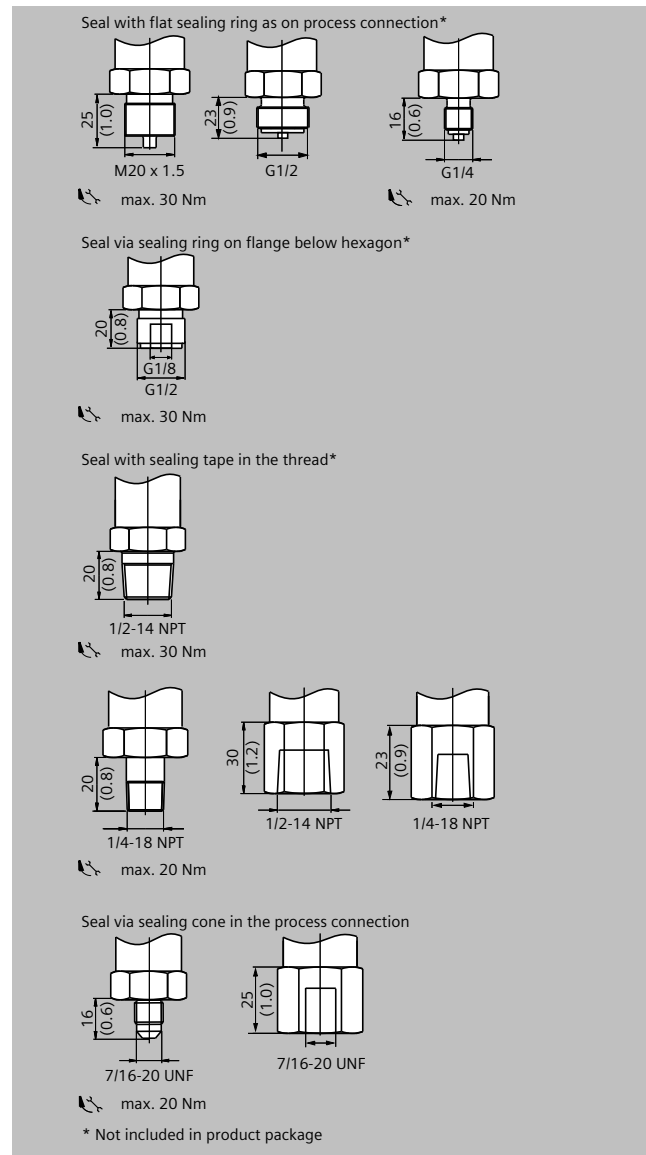
Single-range transmitters / SITRANS P210

Dimensional drawings



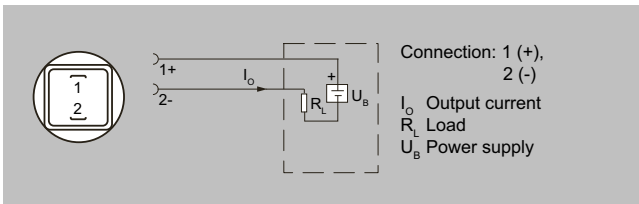
SITRANS P210, electrical connections, dimensions in mm (inch)

Dimensional drawings (continued)

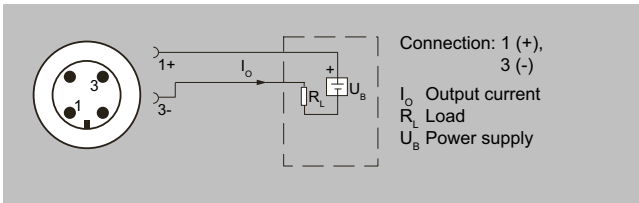


SITRANS P210, process connections, dimensions in mm (inch)

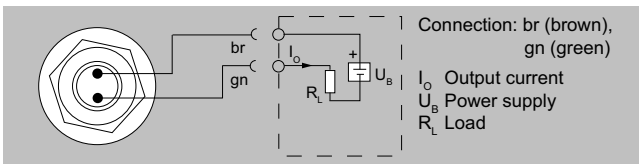
Circuit diagrams



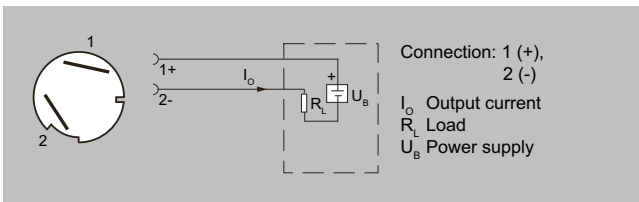
Connection with current output and plug according to EN 175301



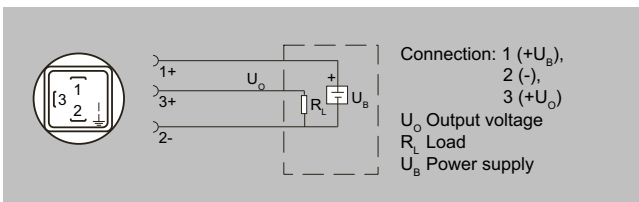
Connection with current output and M12x1 device plug



Connection with current output and cable

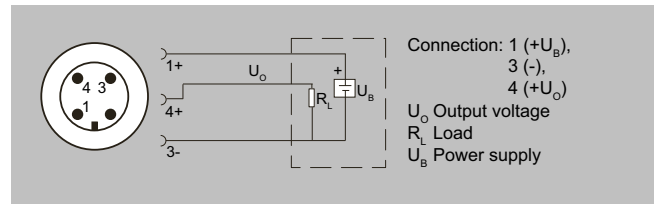


Connection with current output and Quickon cable quick screw connection

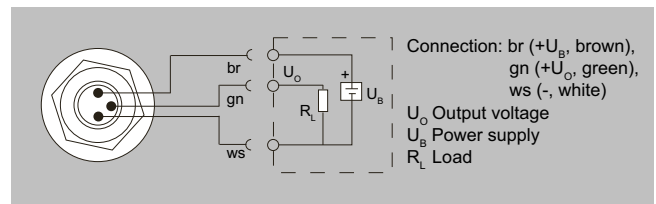


Connection with voltage output, ratiometric output and plug according to EN 175301

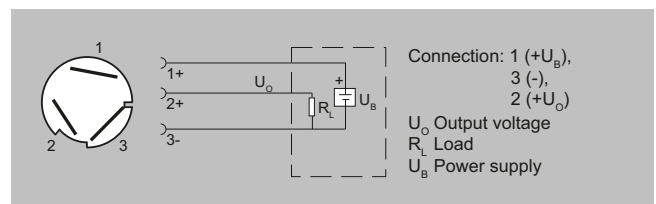
Circuit diagrams (continued)



Connection with voltage output, ratiometric output and M12x1 device plug



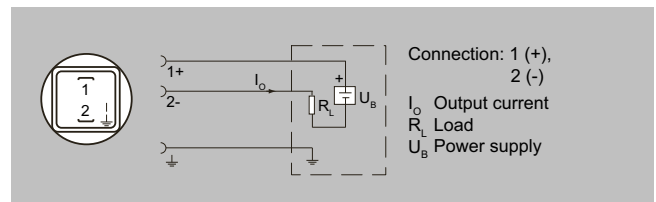
Connection with voltage output, ratiometric output and cable



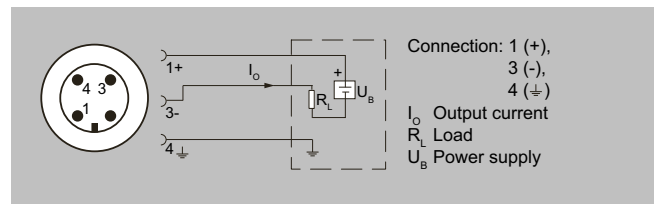
Connection with voltage output, ratiometric output and Quickon fast cable termination

Device design with explosion protection: 4 to 20 mA

The grounding connection is conductively bonded to the transmitter enclosure.



Connection with current output and plug according to EN 175301 (Ex)



Connection with current output and M12x1 (Ex) device plug

Pressure measurement

Pressure transmitters

Single-range transmitters / SITRANS P220

Overview



The SITRANS P220 pressure transmitter measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell, fully welded
- Measuring ranges 2.5 to 1 000 bar (36.3 to 14 500 psi) relative
- For high-pressure applications and refrigeration technology

Benefits

- High measurement accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For corrosive and non-corrosive media
- For measuring the pressure of liquids, gases and vapors
- Compact design
- Gasket-less

Application

The SITRANS P220 pressure transmitter for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Energy development
- 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 connected electrically with a device plug to EN 175301-803-A (IP65), an M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67). The output signal is 4 to 20 mA, 0 to 10 V or is available as an IO-Link signal.

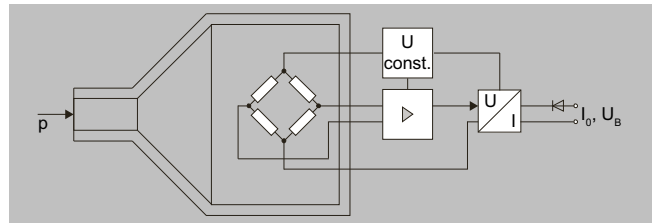
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm, installed in a stainless steel enclosure. It can be connected electrically with a device plug fulfilling EN 175301-803-A (IP65) or an M12 device plug (IP67). 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 P220 pressure transmitters (7MF1567-...), functional diagram

The stainless steel measuring cell has a thick-film resistance bridge to which the operating pressure p is transmitted through a stainless steel diaphragm.

The measuring cell output voltage is fed to the amplifier and converted into a 4 to 20 mA output current, a DC 0 to 10 V output voltage or an IO-Link output signal.

Output current, output voltage or IO-Link signal are linearly proportional to the input pressure.

Selection and ordering data

								Article No.	Order code		
SITRANS P220 pressure transmitter for gauge pressure, for high-pressure and cold applications, fully-welded version								7MF1567-			
								● ● ● ● ● - ● ● A ● ● ● ●			
Measurement deviation typ. 0.25%											
Material of wetted parts: Stainless steel											
Material of non-wetted parts: Stainless steel											
Click the article number for online configuration in the PIA Life Cycle Portal.											
Measuring range	Minimum overload limit		Maximum overload limit		Burst pressure						
For gauge pressure											
0 ... 2.5 bar	(0 ... 36.3 psi)	-1 bar	(-14.5 psi)	12.5 bar	(181.25 psi)	25 bar	(363 psi)	3	B	D	
0 ... 4 bar	(0 ... 58 psi)	-1 bar	(-14.5 psi)	20 bar	(290 psi)	40 bar	(580 psi)	3	B	E	
0 ... 6 bar	(0 ... 87 psi)	-1 bar	(-14.5 psi)	30 bar	(435 psi)	60 bar	(870 psi)	3	B	G	
0 ... 10 bar	(0 ... 145 psi)	-1 bar	(-14.5 psi)	30 bar	(435 psi)	60 bar	(870 psi)	3	C	A	
0 ... 16 bar	(0 ... 232 psi)	-1 bar	(-14.5 psi)	48 bar	(696 psi)	96 bar	(1 392 psi)	3	C	B	
0 ... 25 bar	(0 ... 363 psi)	-1 bar	(-14.5 psi)	75 bar	(1 087.5 psi)	150 bar	(2 176 psi)	3	C	D	
0 ... 40 bar	(0 ... 580 psi)	-1 bar	(-14.5 psi)	120 bar	(1 740 psi)	240 bar	(3 481 psi)	3	C	E	
0 ... 60 bar	(0 ... 870 psi)	-1 bar	(-14.5 psi)	180 bar	(2 610 psi)	360 bar	(5 221 psi)	3	C	G	
0 ... 100 bar	(0 ... 1450 psi)	-1 bar	(-14.5 psi)	300 bar	(4 350 psi)	600 bar	(8 702 psi)	3	D	A	
0 ... 160 bar	(0 ... 2320 psi)	-1 bar	(-14.5 psi)	480 bar	(6 960 psi)	960 bar	(13 924 psi)	3	D	B	
0 ... 250 bar	(0 ... 3625 psi)	-1 bar	(-14.5 psi)	750 bar	(10 875 psi)	1 500 bar	(21 756 psi)	3	D	D	
0 ... 400 bar	(0 ... 5801 psi)	-1 bar	(-14.5 psi)	1 200 bar	(17 400 psi)	2 400 bar	(34 809 psi)	3	D	E	
0 ... 600 bar	(0 ... 8702 psi)	-1 bar	(-14.5 psi)	1 500 bar	(21 755 psi)	2 500 bar	(36 250 psi)	3	D	G	
0 ... 1000 bar	(0 ... 14500 psi)	-1 bar	(-14.5 psi)	1 500 bar	(21 755 psi)	2 500 bar	(36 250 psi)	3	E	A	
Other version; Add order code and plain text: Measuring range: ... to ... bar (psi)								9	A	A	
Note: For transmitters with IO-Link output signal, no different version of the measuring range is possible.										H 1 Y	
Measuring ranges for gauge pressure											
0 ... 30 psi		-14.5 psi		150 psi		300 psi		4	B	E ¹⁾	
0 ... 60 psi		-14.5 psi		300 psi		600 psi		4	B	F ¹⁾	
0 ... 100 psi		-14.5 psi		300 psi		600 psi		4	B	G ¹⁾	
0 ... 150 psi		-14.5 psi		375 psi		870 psi		4	C	A ¹⁾	
0 ... 200 psi		-14.5 psi		600 psi		1 200 psi		4	C	B ¹⁾	
0 ... 300 psi		-14.5 psi		900 psi		1 800 psi		4	C	D ¹⁾	
0 ... 500 psi		-14.5 psi		1 500 psi		3 000 psi		4	C	E ¹⁾	
0 ... 750 psi		-14.5 psi		2 250 psi		4 500 psi		4	C	F ¹⁾	
0 ... 1 000 psi		-14.5 psi		3 000 psi		6 000 psi		4	C	G ¹⁾	
0 ... 1 500 psi		-14.5 psi		4 500 psi		9 000 psi		4	D	A ¹⁾	
0 ... 2 000 psi		-14.5 psi		6 000 psi		12 000 psi		4	D	B ¹⁾	
0 ... 3 000 psi		-14.5 psi		9 000 psi		18 000 psi		4	D	D ¹⁾	
0 ... 5 000 psi		-14.5 psi		15 000 psi		30 000 psi		4	D	E ¹⁾	
0 ... 6 000 psi		-14.5 psi		18 000 psi		36 000 psi		4	D	F ¹⁾	
0 ... 8 700 psi		-14.5 psi		21 750 psi		36 250 psi		4	D	G ¹⁾	
0 ... 14 500 psi		-14.5 psi		21 750 psi		36 250 psi		4	E	A	
Other version; Add order code and plain text: Measuring range: ... to ... psi								9	A	A	
Note: For transmitters with IO-Link output signal, no measuring range in the unit psi is possible.										H 1 Y	
Output signal											
4 ... 20 mA; 2-wire system, auxiliary power 7 ... 33 V DC (10 ... 30 V DC for ATEX devices) ¹⁾								0			
0 ... 10 V; 3-wire system; auxiliary power 12 ... 33 V DC								1	0		
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC								2	0		
Ratiometric 10 ... 90%; 3-wire system; auxiliary power 5 V DC ± 10%								3	0		
IO-Link interface											
For article number: 7MF1565-***70-2***											
IO-Link interface (only with M12 plug, measuring range bar and without explosion protection)								7	0		
Explosion protection (only 4 ... 20 mA)											
None								0			
With explosion protection Ex ia IIC T4 ¹⁾								1			
Electrical connection											
Plug according to EN 175301-803-A, stuffing box thread M16 (with coupling) ¹⁾								1			
M12 device plug according to IEC 61076-2-101								2			
Connection via permanently installed cable, 2 m (6.6 ft); not for "Intrinsic safety" type of protection								0	3		
Quick-screw cable gland Quickon PG9; not for "Intrinsic safety" type of protection								0	4		
Plug according to EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling) ¹⁾								5			

Pressure measurement

Pressure transmitters

Single-range transmitters / SITRANS P220

Selection and ordering data (continued)

	Article No.	Order code
SITRANS P220 pressure transmitter for gauge pressure, for high-pressure and cold applications, fully-welded version	7MF1567-	
	● ● ● ● ● - ● ● A ● ● ● ● ●	
Plug according to EN 175301-803-A, stuffing box thread PG11 (with coupling) ¹⁾		6
Permanently installed cable, length 5 m (16.4 ft)	0	7
Special design		9
		N 1 Y
Process connection		
G½" male according to EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar)		A
G½" male and G1/8" female		B
G¼" male according to EN 837-1 (¼" BSP male)		C
7/16"-20 UNF male		D
¼"-18 NPT male (standard for pressure ranges inH ₂ O and psi) ¹⁾		E
¼"-18 NPT female		F
½"-14 NPT male		G
½"-14 NPT female		H
7/16"-20 UNF female		J
M20×1.5 male		P
G¼" according to EN ISO 1179-2 (formerly DIN 3852 form E)		Q
G½" according to EN ISO 1179-2 (formerly DIN 3852 form E)		R
Process connection G1/2" with double seal and pointed pressure orifice		S
Process connection G1/2 to DIN 3852, form E with pointed pressure orifice		T
Process connection Schrader nipple		U
Version		
Standard version ¹⁾		1

¹⁾ Order code E21 required for complete configurations with CRN and cCSA_{US} Ex approval.

Options	Order code
Add "-Z" to article number and specify order code.	
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2 (not possible for measuring ranges > 0 ... 600 bar/0 ... 8 702 psi)	C11
Oxygen version, free of oil and degreased (not in combination with explosion protection version!)	E10
With CRN and cCSA _{US} Ex approval (only for measuring ranges 0 ... 30 psi to 0 ... 8 700 psi)	E21

Technical specifications

SITRANS P220 for gauge pressure	
Application	
Gauge pressure measurement	Liquids, gases and vapors
Mode of operation	
Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)
Measured variable	Gauge pressure
Input	
Measuring range	
• Gauge pressure	
- Metric	2.5 ... 1 000 bar (36 ... 14 500 psi)
- US measuring range	30 ... 14 500 psi
Note: For transmitters with IO-Link output signal, no measuring range in the unit psi is possible.	
Output	
Current signal	4 ... 20 mA
• Load	($U_B - 7\text{ V}$)/0.02 A ($U_B - 10\text{ V}$ for Ex)
• Auxiliary power U_B	7 ... 33 V DC (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
• Current consumption	$< 7\text{ mA}$ at 10 k Ω
Radiometric output	10 ... 90%
• Load	$\geq 10\text{ k}\Omega$
• Auxiliary power U_B	DC 5 V \pm 10%
• Current consumption	$< 7\text{ mA}$ at 10 k Ω
• Characteristic curve	Linear rising
IO-Link interface	L+: 18 ... 33 V DC L-: GND CI/Q: IO-Link / Switching output DI/DQ: Switching output Pressure transmitter is only approved for port class A
• Auxiliary power	UB 18-33 V
• Port class	A
• Characteristic curve	Linear rising
Measuring accuracy	
Measurement deviation at limit setting including hysteresis and reproducibility	• Typical: 0.25% of measuring span • Maximum: 0.5% of measuring span
Step response time T_{99}	$< 5\text{ ms}$
Long-term stability	
• Lower range value and measuring span	0.25% of measuring span/year
Effect of ambient temperature	
• Lower range value and measuring span	0.2%/10 K of measuring span
• Influence of power supply	0.005%/V
Operating conditions	
Process temperature	-40 ... +135 °C (-40 ... +275 °F) or -30 ... +120 °C (-22 ... +248 °F) for devices with explosion protection intrinsic safety "i"
Ambient temperature	-30 ... +85 °C (-22 ... +185 °F) or -25 ... +85 °C (-13 ... +185 °F) for devices with explosion protection intrinsic safety "i"

Technical specifications (continued)

SITRANS P220 for gauge pressure	
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
Degree of protection according to IEC 60529	• IP65 with plug according to EN 175301-803-A • IP67 with M12 device plug • IP67 with cable • IP67 with cable quick screw connection • IP00, RAST 2.5 plug (3-wire only)
Electromagnetic compatibility	CE-compliant in accordance with EN 61326-2-3
Structural design	
Weight	Approx. 0.090 kg (0.198 lbs)
Process connections	See dimension drawings
Electrical connections	• Plug according to EN 175301-803-A Form A with cable entry M16x1.5 or 1/2-14 NPT or PG 11 • Device plug M12 • 2 or 3-wire (0.5 mm ²) cable ($\varnothing \pm 5.4\text{ mm}$) • Quickon cable quick screw connection
Material of wetted parts	
• Measuring cell	Stainless steel, mat. no. 1.4016
• Process connection	Stainless steel 1.4404 / AISI 316L (internal thread Schrader 1.4305 / AISI 303 only)
Material of non-wetted parts	
• Enclosure	Stainless steel 1.4404 / AISI 316L (internal thread Schrader 1.4305 / AISI 303 only)
• Connector housing	Polyarylamide 50% GF UL 94 V-0
• Cable	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 HAHИO «ЦCB»
CRN ²⁾	0F18659.5C
Underwriters Laboratories (UL) ¹⁾	
• For the 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	For radiometric 10 ... 90%: SEV 15 ATEX 0173
Connection to certified intrinsically safe ohmic circuits with maximum values	For radiometric 10 ... 90%: $U_i < 15\text{ V DC}$; $I_i < 200\text{ mA}$; $P_i < 750\text{ mW}$
Effective internal inductance and capacity for versions with plugs according to EN 175301-803-A and M12	For radiometric 10 ... 90%: $L_i = 0\text{ nH}$; $C_i < 150\text{ nF}$
CSA ²⁾	70006348 Class I, Division I, Groups A, B, C&D; Class II, Division 1, Groups E, F and G, Class III Class I, Division 2, Groups A, B, C and D; Class II, Division 2, Groups F and G, Class III A/Ex ia IIC T4 Ga/Gb A/Ex ia IIIC T125 °C Da/Db

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

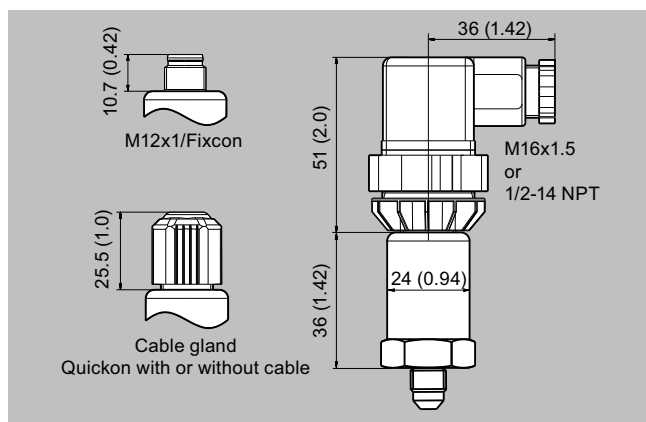
2) See ordering data for available versions.

Pressure measurement

Pressure transmitters

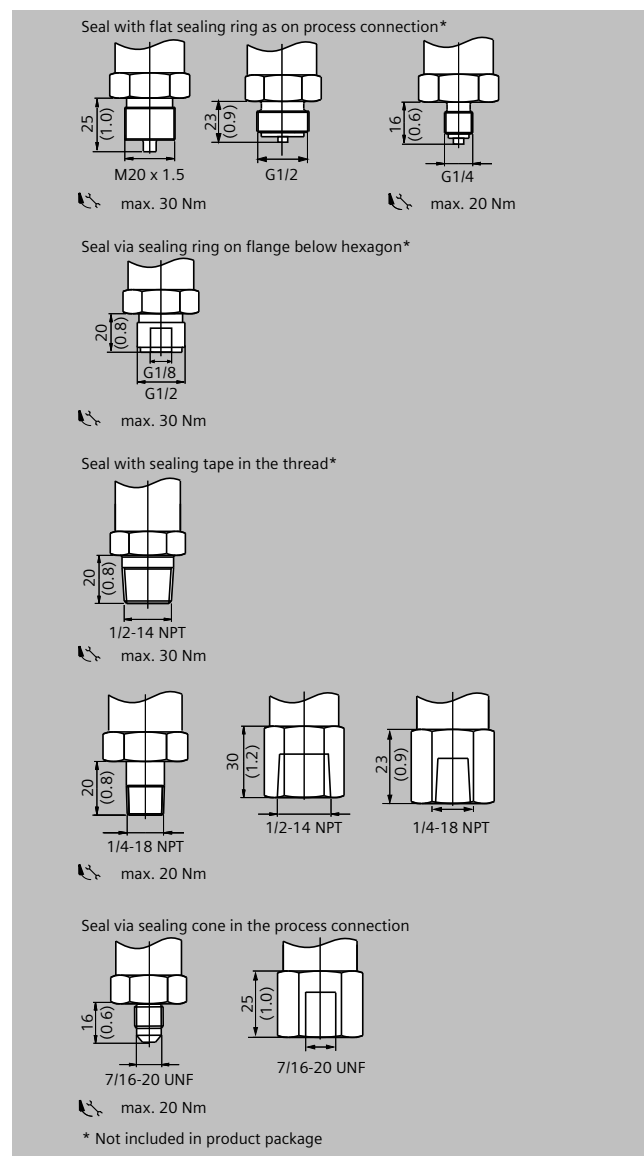
Single-range transmitters / SITRANS P220

Dimensional drawings



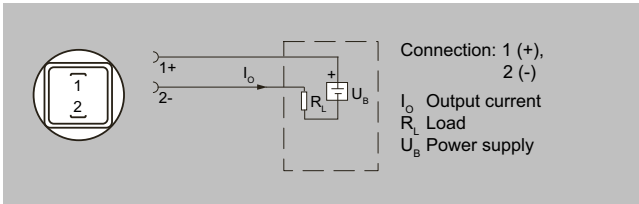
SITRANS P220, electrical connections, dimensions in mm (inch)

Dimensional drawings (continued)

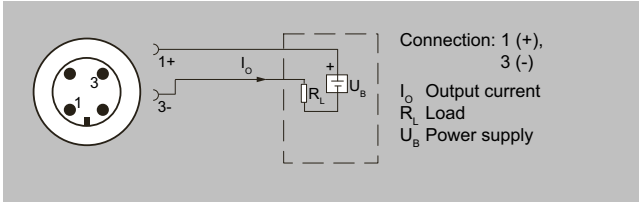


SITRANS P220, process connections, dimensions in mm (inch)

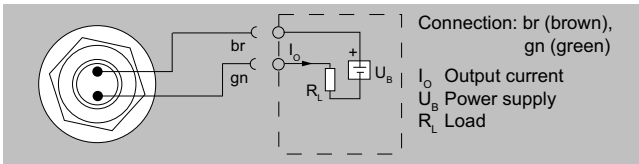
Circuit diagrams



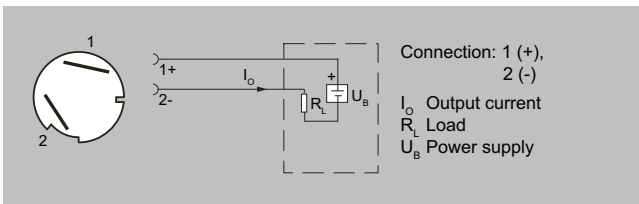
Connection with current output and plug according to EN 175301



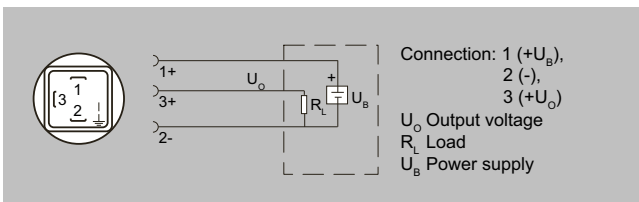
Connection with current output and M12x1 device plug



Connection with current output and cable

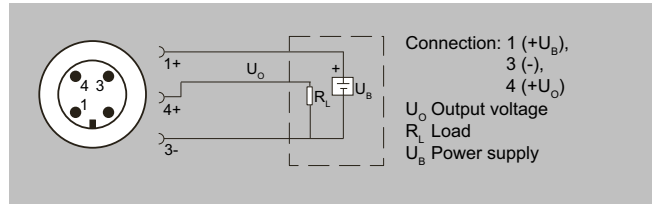


Connection with current output and Quickon cable quick screw connection

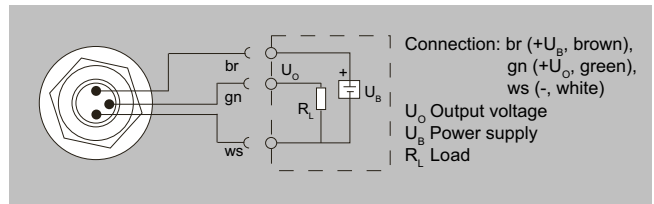


Connection with voltage output, ratiometric output and plug according to EN 175301

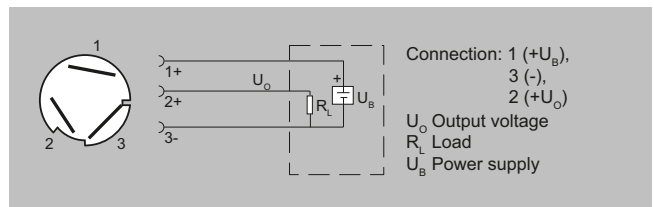
Circuit diagrams (continued)



Connection with voltage output, ratiometric output and M12x1 device plug



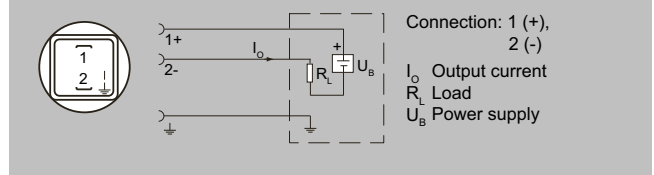
Connection with voltage output, ratiometric output and cable



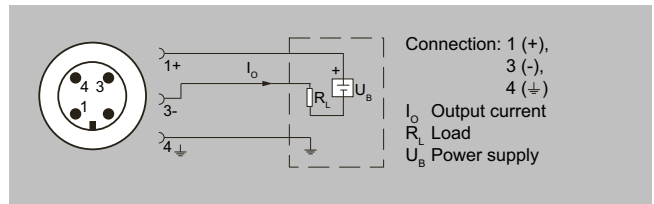
Connection with voltage output, ratiometric output and Quickon fast cable termination

Device design with explosion protection: 4 to 20 mA

The grounding connection is conductively bonded to the transmitter enclosure.



Connection with current output and plug according to EN 175301 (Ex)



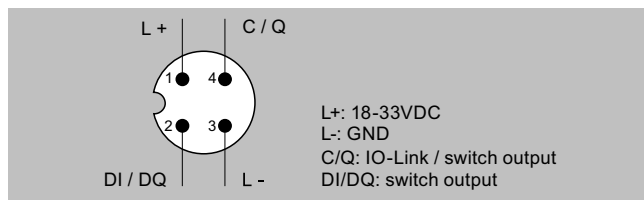
Connection with current output and M12x1 (Ex) device plug

Pressure measurement

Pressure transmitters

Single-range transmitters / SITRANS P220

Circuit diagrams (continued)



Connection with IO-Link interface, only possible with M12 plug