

# SITRANS P measuring instruments for pressure

## Transmitters for gage, absolute and differential pressure

### SITRANS P250 for differential pressure

#### Overview



SITRANS P250 transmitter for differential pressure

The SITRANS P250 transmitter measures the differential pressure of liquids and gases.

#### Benefits

- High measuring accuracy
- Sturdy stainless steel enclosure
- For aggressive and non-aggressive media
- For the measurement of the differential pressure of liquids and gases
- Temperature-compensated measuring cell
- Compact design

#### Application

The SITRANS P250 transmitter for differential pressure is primarily used in the following industries:

- Chemical industry
- Pharmaceutical industry
- Food industry
- Mechanical engineering
- Shipbuilding
- Water supply

#### Design

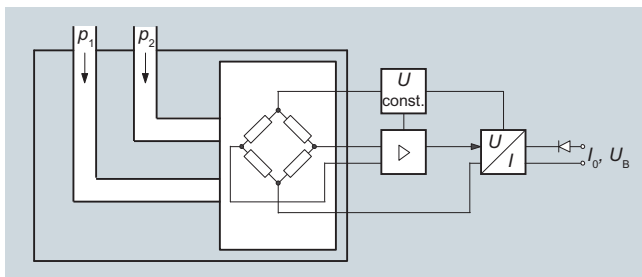
Main components:

- Stainless steel enclosure with piezo-resistive ceramic measuring cell and (temperature-compensated) electronics module.
- Process connection made of stainless steel in diverse designs (see Selection and ordering data)
- Electrical connection through connectors acc. to EN 175301-803-A and round connectors M12, as well as with permanently fixed cable

#### Function

The pressure transmitter measures the differential pressure of liquids and gases.

#### Mode of operation



SITRANS P250 pressure transmitter, function diagram

The piezo-resistive ceramic measuring cell (membrane) has a Wheatstone bridge circuit, on which the operating pressure  $P_1$  and  $P_2$  of the media acts at both ends.

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 5 or 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

#### Technische Daten

##### SITRANS P250 differential pressure transmitter

#### Application

Differential pressure transmitter      Liquids and neutral gases

#### Mode of operation

Measuring principle      Piezo-resistive measuring cell (ceramic diaphragm)

#### Input

Measured variable      Differential pressure

Measuring range      0 ... 0.1 to 0 ... 25 bar  
(0 ... 1.45 to 0 ... 363 psi)

Operating pressure       $\leq 25$  bar (363 psi) at a differential pressure range  $< 6$  bar (87 psi)  
 $\leq 50$  bar (725 psi) at a differential pressure range  $> 10$  bar (145 psi)

Burst pressure      1.5 x operating pressure

#### Output

Output signal

- Current output signal      4 ... 20 mA
- Voltage output signal      0 ... 5 V and 0 ... 10 V DC

#### Load

3-wire       $> 10 \text{ k}\Omega$

2-wire       $\leq (U_H - 11 \text{ V}) / 0.02 \text{ A}$

#### Measuring accuracy

Dynamic behavior (at 25°C (77°F), including conformity error, hysteresis and repeatability)       $\leq 1\%$  of typical full-scale value, see "Measuring range" table

Long-term drift acc. to IEC 60770       $\leq 0.5\%$  of full-scale value/year

Influence of ambient temperature

- Start of scale       $\leq 0.6\%$  /10 K of full-scale value  
( $\leq 1.2\%$  /10 K for measuring cell 0 ... 0.1 bar (1.45 psi))
- Full-scale value       $\leq 0.22\%$  /10 K of full-scale value  
( $\leq 0.37\%$  /10 K for measuring cell 0 ... 0.1 bar (1.45 psi))

Dynamic behavior      Suitable for static and dynamic measurements

Response time  $T_{99}$        $< 5$  ms

Load variation       $< 50$  Hz

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#### Conditions of use

Ambient conditions	
• Temperature of medium	-15 ... +85 °C (5 ... 185 °F)
• Ambient temperature	-15 ... +85 °C (5 ... 185 °F)
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Degree of protection acc. to EN 60529	IP65
Mounting position	Any
Mounting	Mounting bracket, included in delivery

#### Design

Weight	Approx. 430 g (approx. 0.95 lb)
Enclosure material	Stainless steel 1.4305/AISI 303
Electrical connection	<ul style="list-style-type: none"> <li>• Plug EN 175301-803-A</li> <li>• Circular plug EN 60130-9</li> <li>• Cable 1.5 m</li> </ul>
Process connection	<ul style="list-style-type: none"> <li>• Hose sleeve Ø 4 mm/6 mm</li> <li>• Pipe union Ø 6 mm/8 mm</li> <li>• Male thread 7/16-20 UNF, G1/8</li> <li>• Female thread 1/8-27 NPT</li> <li>• (Standard), G1/8</li> </ul>
Wetted parts materials	Stainless steel 1.4305/AISI 303, CuZn nickel-plated
• Process connection	Approx. 430 g (approx. 0.95 lb)
• Diaphragm	Ceramic Al <sub>2</sub> O <sub>3</sub> (96 %)
• Sealing material	FPM (standard), EPDM, NBR, MVQ, CR

#### Power supply $U_H$

Terminal voltage on pressure transmitter

• 2-wire, 4 ... 20 mA	11 ... 33 V DC
• 3-wire, 0 ... 5 V DC	11 ... 33 V DC/ 24 V AC ±15 %
• 3-wire, 0 ... 10 V DC	18 ... 33 V DC/ 24 V AC ±15 %

Current consumption at nominal pressure

• 2-wire	< 20 mA
• 3-wire	< 5 mA

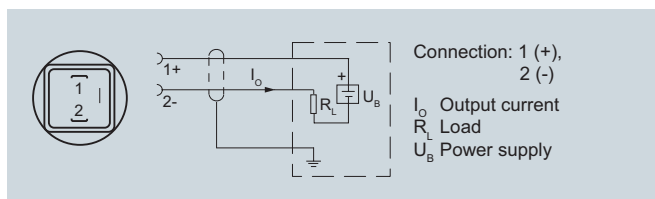
Protection against polarity reversal Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.

#### Certificates and approvals

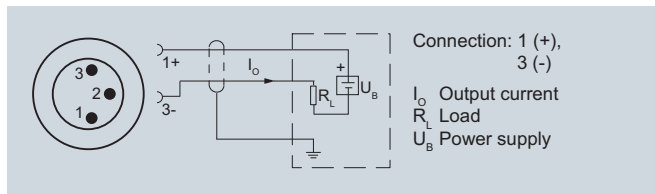
Approval	CE conformity
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Measuring range		Max. permissible operating pressure (on either side)	Burst pressure	Max. permissible operating pressure (on one side)	Accuracy
[bar]	[psi]				
0 ... 0.1	0 ... 1.45	25 bar (363 psi)	37,5 bar (544 psi)	0.6 bar (8.7 psi)	≤ 1,0 %
0 ... 0.2	0 ... 2.9	25 bar (363 psi)	37,5 bar (544 psi)	0.6 bar (8.7 psi)	≤ 1,0 %
0 ... 0.25	0 ... 3.63	25 bar (363 psi)	37,5 bar (544 psi)	0.6 bar (8.7 psi)	≤ 0,5 %
0 ... 0.3	0 ... 4.35	25 bar (363 psi)	37,5 bar (544 psi)	0.6 bar (8.7 psi)	≤ 0,5 %
0 ... 0.4	0 ... 5.8	25 bar (363 psi)	37,5 bar (544 psi)	1.2 bar (17.4 psi)	≤ 0,8 %
0 ... 0.5	0 ... 7.25	25 bar (363 psi)	37,5 bar (544 psi)	1.2 bar (17.4 psi)	≤ 0,5 %
0 ... 0.6	0 ... 8.7	25 bar (363 psi)	37,5 bar (544 psi)	1.2 bar (17.4 psi)	≤ 0,5 %
0 ... 1.0	0 ... 14.5	25 bar (363 psi)	37,5 bar (544 psi)	2 bar (29 psi)	≤ 0,5 %
0 ... 1.6	0 ... 23.2	25 bar (363 psi)	37,5 bar (544 psi)	3.2 bar (46.4 psi)	≤ 0,5 %
0 ... 2.5	0 ... 36.3	25 bar (363 psi)	37,5 bar (544 psi)	5 bar (72.5 psi)	≤ 0,5 %
0 ... 4	0 ... 58	25 bar (363 psi)	37,5 bar (544 psi)	8 bar (116 psi)	≤ 0,5 %
0 ... 6	0 ... 87	25 bar (363 psi)	37,5 bar (544 psi)	12 bar (174 psi)	≤ 0,5 %
0 ... 10	0 ... 145	50 bar (725 psi)	75 bar (1088 psi)	20 bar (290 psi)	≤ 0,5 %
0 ... 16	0 ... 232	50 bar (725 psi)	75 bar (1088 psi)	32 bar (464 psi)	≤ 0,5 %
0 ... 25	0 ... 363	50 bar (725 psi)	75 bar (1088 psi)	50 bar (725 psi)	≤ 0,5 %

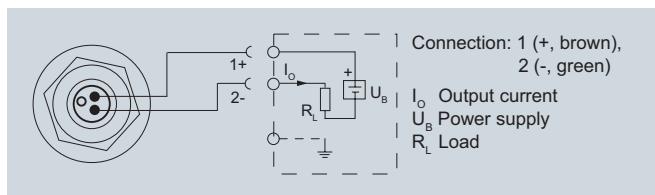
#### Schematics



Connection with current output 4 ... 20 mA and plug to EN 175301-803-A



Connection with current output 4 ... 20 mA and round connector



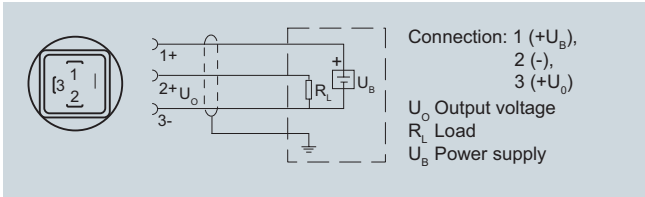
Connection with current output 4 ... 20 mA and permanently fixed cable

# SITRANS P measuring instruments for pressure

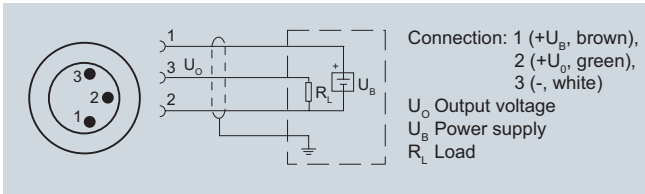
## Transmitters for gage, absolute and differential pressure

### SITRANS P250 for differential pressure

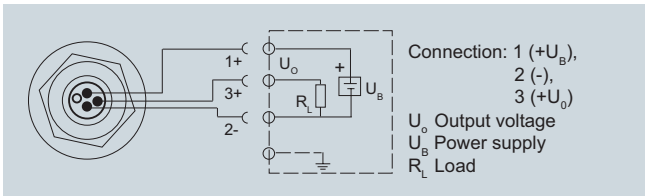
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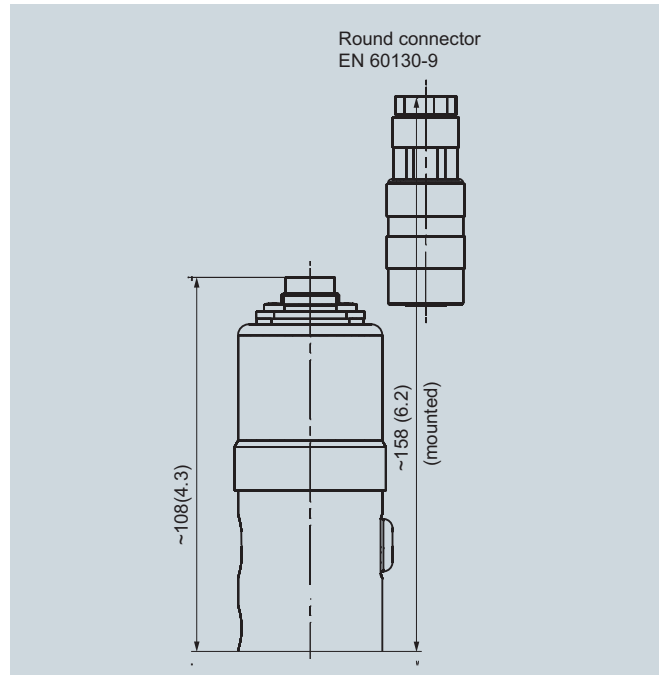
Connection with voltage output 0 ... 5 V DC (0 ... 10 V DC) and plug to EN 175301-803-A



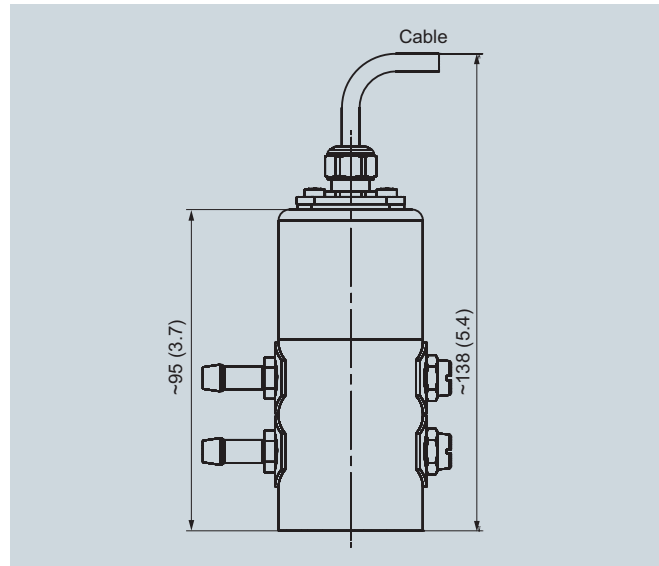
Connection with voltage output 0 ... 5 V DC (0 ... 10 V DC) and round connector



Connection with voltage output 0 ... 5 V DC (0 ... 10 V DC) and permanently fixed cable

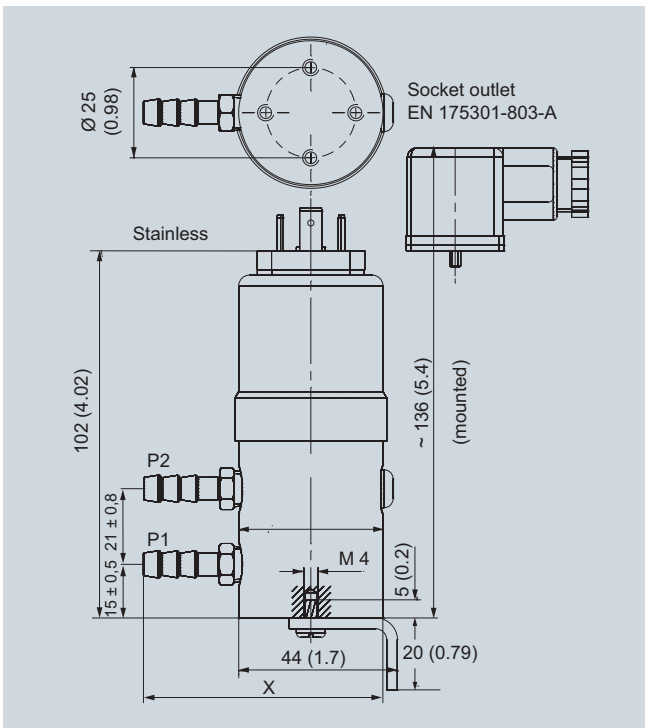


SITRANS P250 differential pressure transmitter with round connector to EN 60130-9, dimensions in mm (inch)



SITRANS P250 differential pressure transmitter with cable, dimensions in mm (inch)

### Dimensional drawings

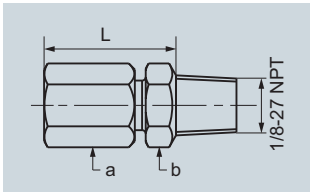
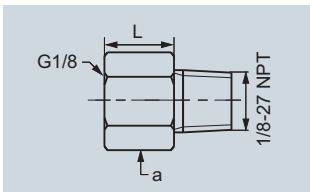
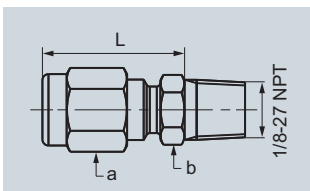
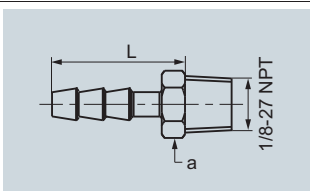
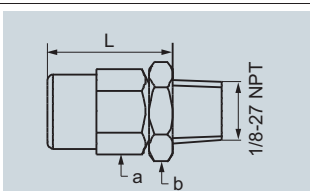
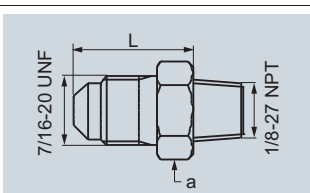


SITRANS P250 differential pressure transmitter with socket outlet to EN 175301-803-A, dimensions in mm (inch)

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Process connections	Ø	Width across flats	L		X	
			[mm]	[inch]	[mm]	[inch]
 <p>Pipe union with screw-in nipple for outer pipe (stainless steel 1.4305/AISI 303)</p>	6	a = 10 b = 12	24		65	
	8	a = 12 b = 14	26		67	
 <p>Female thread G1/8 (stainless steel 1.4305/AISI 303)</p>	-	a = 14	12		53	
 <p>Pipe union with screw-in nipple for outer pipe (CuZn nickel-plated)</p>	6	a = 10 b = 12	24		65	
	8	a = 12 b = 14	25		66	
 <p>Hose connection for hose (CuZn nickel-plated, stainless steel 1.4571/AISI 316TI)</p>	4	a = 10	20		61	
	6	a = 10	25		66	
 <p>Male thread G1/8 (CuZn nickel-plated)</p>	-	a = 10 b = 12	20		61	
 <p>Male thread G1/8 7/16-20 UNF (CuZn nickel-plated)</p>	-	a = 14	18		59	

# SITRANS P measuring instruments for pressure

## Transmitters for gage, absolute and differential pressure

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#### Selection and ordering data

Order No.

Order code

#### SITRANS P 250 pressure transmitter for differential pressure

7MF1641-0-0

Accuracy ≤ 1 %, wetted parts ceramic/stainless steel 1.4301,  
scope of delivery: transmitter, mounting bracket and instruction manual, without explosion protection

#### Measuring range

0 ... 0.1 bar	(0 ... 1.45 psi)	▶	3AA
0 ... 0.2 bar	(0 ... 2.90 psi)	▶	3AC
0 ... 0.25 bar	(0 ... 3.63 psi)	▶	3AD
0 ... 0.3 bar	(0 ... 5.35 ps)	▶	3AE
0 ... 0.4 bar	(0 ... 5.80 psi)	▶	3AF
0 ... 0.5 bar	(0 ... 7.25 psi)	▶	3AG
0 ... 0.6 bar	(0 ... 8.70 psi)	▶	3AH
0 ... 1.0 bar	(0 ... 14.5 psi)	▶	3BA
0 ... 1.6 bar	(0 ... 23.2 psi)	▶	3BB
0 ... 2.5 bar	(0 ... 36.3 psi)	▶	3BD
0 ... 4.0 bar	(0 ... 58.0psi)	▶	3BE
0 ... 6.0 bar	(0 ... 87.0 psi)	▶	3BG
0 ... 10.0 bar	(0 ... 145 psi)	▶	3CA
0 ... 16.0 bar	(0 ... 232 psi)	▶	3CB
0 ... 25.0 bar	(0 ... 363 psi)	▶	3CD

#### Output signal

4 ... 20 mA	▶	0
0 ... 5 V DC		1
0 ... 10 V DC		2

#### Electrical connection

- Plug acc. to EN 175 301-803-A (suitable coupling included in scope of delivery) ▶
- Round connector acc. to EN 60139-9
- Cable 1.5 m with cable gland

#### Process connection

- Without connections, female thread 1/8-27 NPT ▶
- Hose connection
  - CuZn nickel-plated, for hose Ø 4 mm
  - CuZn nickel-plated, for hose Ø 6 mm
  - PVDF, for hose Ø 6 mm
- Pipe union
  - CuZn nickel-plated, for pipe Ø 6 mm
  - Stainless steel 1.4304, for pipe Ø 6 mm
  - CuZn nickel-plated, for pipe Ø 8 mm
  - Stainless steel 1.4304, for pipe Ø 8 mm
- Male thread, 7/16-20 UNF (CuZn nickel-plated)
- Adapter
  - Inner, G1/8 (stainless steel), for pipe Ø 6 mm
  - Outer, with union nut, for pipe Ø 6 mm

#### sealing material

- Fluoro rubber (Viton/FPM) ▶
- Ethylene propylene diene monomer rubber (EPDM)
- Nitrile butadiene rubber (NBR)
- Silicone rubber (MVQ)
- Neoprene (CR)

#### Weitere Ausführungen

Kurzangabe

Please add "-Z" to Order No. and specify Order code(s).

Quality inspection certificate (Factory calibration) to IEC 60770-2 supplied

C11

- ▶ Available ex stock

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