

SITRANS P measuring instruments for pressure

Transmitters for gauge, absolute and differential pressure

ZD series for gauge and absolute pressure

Overview



SITRANS P pressure transmitters, ZD series, are for measuring the gauge pressure, absolute pressure and level of liquids and gases.

They are used to indicate and monitor the pressure measured at the point of installation. ZD pressure transmitters are available in an axial and a radial version.

Benefits

- Robust stainless steel housing with 2 connection versions
- Integrated display with status messages
- Thin-film measuring cell with ceramic diaphragm
- 2-wire system, 4 to 20 mA
- Parameterizable using keys underneath the housing cover
- Range adjustment 1:5
- Measuring accuracy < 0.25% (typical)

Application

The ZD is a configurable pressure transmitter for measuring the gauge and absolute pressure of gases, liquids and vapor.

It is equipped with a display for indicating the pressure value at the point of installation.

SITRANS P pressure transmitters, ZD series, are used in the following industrial areas for example:

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

Design

The pressure transmitter is comprised of a thin-film measuring cell with a ceramic diaphragm, an electronics board and a digital indicator.

All parts are accommodated in a stainless steel field housing (Ø 80 mm) with a glass cover and stainless steel process connection.

At the rear of the housing is the electrical connection for the voltage supply using a current loop 4 to 20 mA. The connection is made with a plug connector.

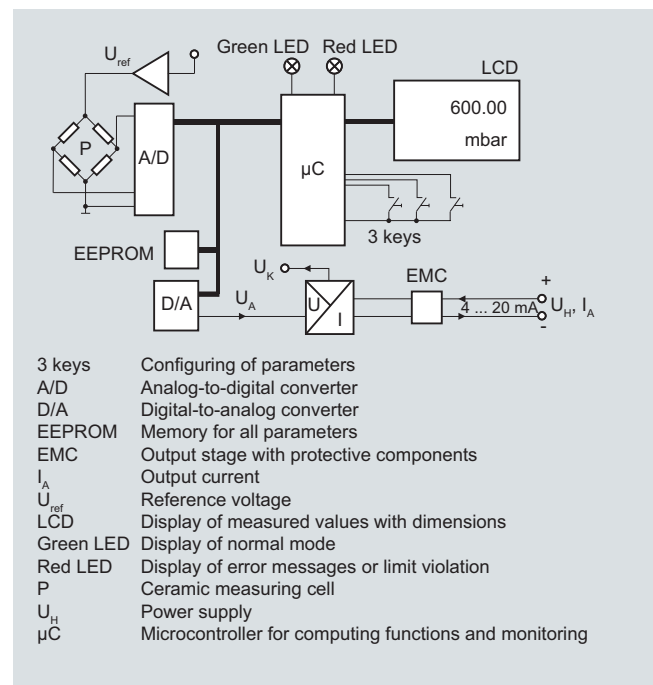
At the front of the housing is the 5-digit display behind a glass cover. Underneath the display are the 3 keys for parameterizing the pressure transmitter. Above the display are a green and a red LED for indicating the operating status.

The ZD pressure transmitter is available in two versions (see "Dimension drawing"):

In the radial version (type A) the display is fitted in parallel with the process connection. The display can be rotated by up to ±120° relative to the process connection.

In the axial version (type B) the display is at right angles to the process connection. The display can be rotated by 360° relative to the process connection.

Function



SITRANS P pressure transmitters, ZD series, mode of operation

Mode of operation

The ZD pressure transmitter has a thin-film strain gauge which is mounted on a ceramic diaphragm.

The measuring cell is temperature-compensated.

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Functions

The ZD pressure transmitter has a 5-digit display behind a glass cover. The following data are shown on the display:

- Measured pressure
- Technical pressure dimension (default setting: bar)
- Limit violation in upward or downward direction, indicated by LED and arrow symbols in the display

The pressure transmitter is set using the 3 input keys behind the glass cover underneath the display.

The key "M" is used to select the operating mode. Following modes of operation are available:

- Measured value
- Password
- Dimension
- Start and end of scale
- Upper and lower limit value
- Zero adjustment
- Upper and lower current saturation limit
- Electrical damping

The other two keys are used to set the values in the individual operating modes.

Two LED indicators are fitted above the display to monitor the set range and the status.

The green LED signals that the measured pressure lies within the set limits. The red LED lights up when the measured pressure lies outside the set limits and when there is an error.

Technical specifications

SITRANS P pressure transmitters, ZD series

Mode of operation	
Measuring principle	Thin-film strain gauge
Input	
Measured variable	gauge and absolute pressure
Measured range gauge pressure	Overload limit
	min. max.
0 ... 2 bar (0 ... 29 psi)	5 bar g (72.5 psig) 0.6 bar g (8.7 psi g)
0 ... 10 bar (0 ... 145 psi)	25 bar g (363 psig) 0 bar g (0 psi g)
0 ... 50 bar (0 ... 725 psi)	120 bar g (1740 psig) 0 bar g (0 psi g)
0 ... 200 bar (0 ... 2900 psi)	500 bar g (7250 psi) 0 bar g (0 psi g)
0 ... 400 bar (0 ... 5802 psi)	600 bar (8700 psi) 0 bar g (0 psi g)
Measured range absolute pressure	Overload limit
	min. max.
0 ... 2 bar (0 ... 29 psi)	5 bar (72.5 psi) 0.6 bar a (8.7 psia)
0 ... 10 bar (0 ... 145 psi)	25 bar a (363 psia) 0 bar a (0 psia)
0 ... 50 bar (0 ... 725 psi)	120 bar (1740 psia) 0 bar a (0 psia)
0 ... 200 bar (0 ... 2900 psi)	500 bar (7250 psia) 0 bar a (0 psia)
0 ... 400 bar (0 ... 5802 psi)	600 bar (8700 psia) 0 bar a (0 psia)
Range adjustment (turndown)	5:1

Output	
Output signal	4 ... 20 mA
Lower current limit	min. 3.6 mA
Upper current limit	max. 23 mA
Output protected against	Reversed polarity, overvoltage and short-circuiting
Max. load	$R_B = (U_H - 12 \text{ V}) / 0.023 \text{ A}$
Voltage measurement	Linear rising
Measuring accuracy	
	To EN 60770-1
Error in measurement (including non-linearity, hysteresis and repeatability, at 25 °C (77 °F))	< 0.25 % of full-scale value (typical), max. 0.5 %
Adjustment time	< 100 ms
Long-term drift	0.25 % of full scale value/year
Influence of ambient temperature	< ±0.25 %/10 K (< ±0.25 %/10 K) of full-scale value
Vibration influence	0.05%/g to 500 Hz in all directions (to IEC 68-2-64)
Power supply effect	< ±0.01 %/V of full-scale value
Rated conditions	
Ambient conditions	
• Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Medium conditions	
• Process temperature	-30 ... +100 °C (-22 ... +212 °F)
Degree of protection	IP65 to EN 60529
Electromagnetic compatibility	
• Emitted interference and interference immunity	To EN 61326/A1 appendix A (1998)
Displays and controls	
Display	LCD, max. 5 digits, digit height 9 mm
Decimal point	Freely parameterizable
Limit values	Freely parameterizable
Limit violation display	Red LED and message on LCD (↑ symbol / ↓ symbol in case of limit violation in upward / downward direction)
Parameterization	With 3 keys
Units	mA or % or physical variable (default setting: bar) Other dimensions: mbar, kPa, MPa, mmH ₂ O, mH ₂ O, psi, inH ₂ O, mmHg, kg/cm ² , torr, atm
Damping	Between 0.1 and 100 s (increment: 0.1 s) freely parameterizable
Design	
Weight	≈ 0.6 kg (≈ 1.32 lb)
Electrical connection	Using 2-pole plug connector with M16x1.5-Cable inlet to EN 175301-803A, plastic
Process connection	<ul style="list-style-type: none"> • Male thread G¹/₂B and female thread G¹/₈B • G¹/₂B to EN 837-1 • Female thread: ½-14 NPT
Version of housing/ process connection	<ul style="list-style-type: none"> • Radial (type A), can be swiveled by max. ±120° (α) • Axial (type B), can be swiveled by max. ±360°

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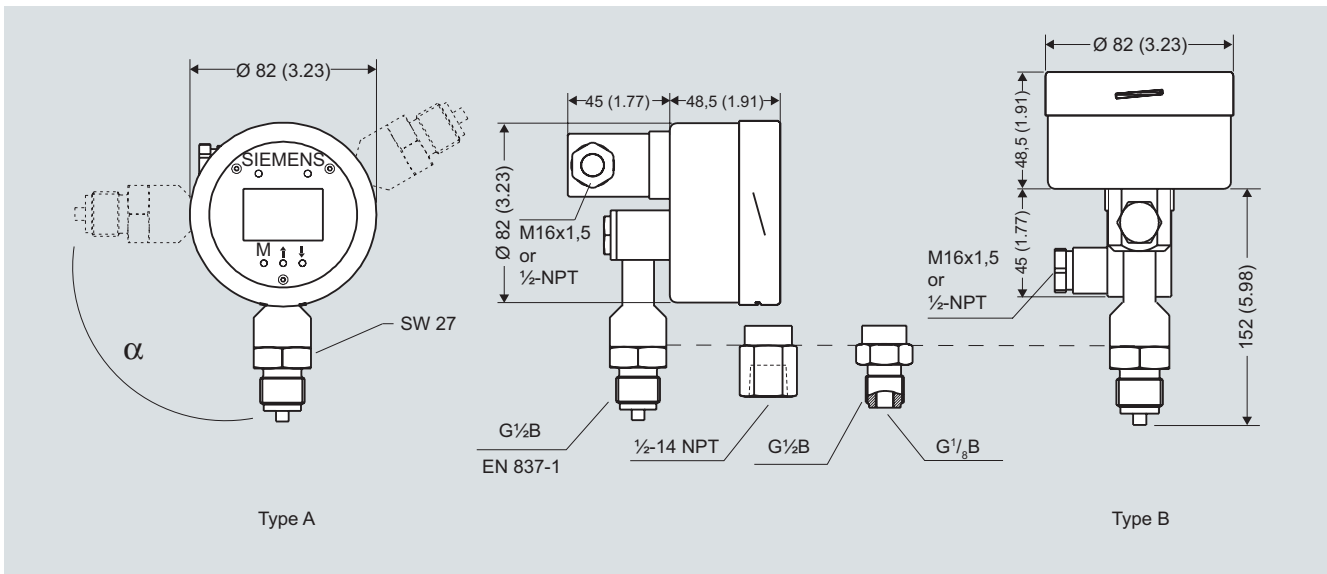
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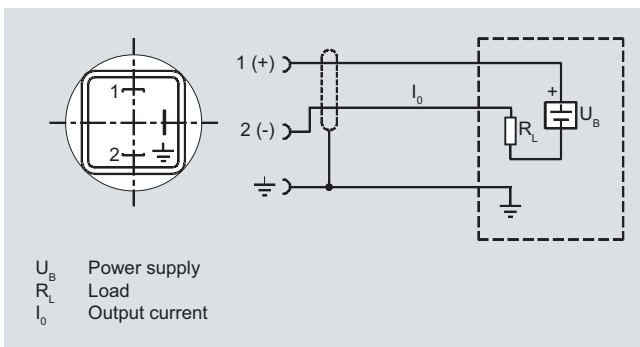
Material	
Non-wetted parts materials	
• Field housing	Ø 80 mm (3.15 inch), stainless steel mat. No. 1.4016
• Cover	Stainless steel, mat. No. 1.4016 with glass
Wetted parts materials	
• Measuring cell	Al ₂ O ₃
• Gasket	Viton
• Process connection	Stainless steel, mat. No. 316L/316Ti
Power supply	
Terminal voltage on pressure transmitter (U_H)	12 ... 30 V DC
Certificate and approvals	
Classification according to pressure equipment directive 97/23/EC	For gases of fluid group 1 and liquids of fluid 1; complies with requirements of article 3, paragraph 3 (sound engineering practice)

Dimensional drawings



SITRANS P pressure transmitters, ZD series, dimensional drawing, dimensions in mm (inch)

Schematics



SITRANS P pressure transmitters, ZD series, connection diagram

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Selection and Ordering data

SITRANS P pressure transmitters, ZD series for gauge and absolute pressure Order No. Ord. Code

Conformity error 0.25 %, range adjustment 1 : 5, housing and process connection made of stainless steel, membrane made of ceramic, 2-wire system, output 4 ... 20 mA

Input variable

Gauge pressure ▶ 1
Absolute pressure (F) ▶ 2

Measured range

Measured range	Span	
0 ... 2 bar (0 ... 29 psi)	0 ... 0.4 / 2 bar (0 ... 5.8 / 29 psi)	▶ D
0 ... 10 bar (0 ... 145 psi)	0 ... 2 / 10 bar (0 ... 5.8 / 145 psi)	▶ E
0 ... 50 bar (0 ... 725 psi)	0 ... 10 / 50 bar (0 ... 145 / 725 psi)	▶ F
0 ... 200 bar (0 ... 2900 psi)	0 ... 40 / 200 bar (0 ... 580 / 2900 psi)	▶ G
0 ... 400 bar (0 ... 5802 psi)	0 ... 80 / 400 bar (0 ... 1160 / 5802 psi)	▶ H

Other version (on request)
add Order Code and plain text:
Process connection: ... Z J 1 Y

Process connection

G $\frac{1}{2}$ B male thread and G $\frac{1}{8}$ B female thread ▶ A
G $\frac{1}{2}$ B to EN 837-1 B
Female thread $\frac{1}{2}$ -14 NPT C
G 1" male thread (F) M

Design

Process connection vertically downwards, thread in connector M16x1.5 ▶ 1
Process connection horizontally to rear, thread in connector M16x1.5 2
Process connection vertically downwards, thread in connector $\frac{1}{2}$ "-14 NPT ▶ 3
Process connection horizontally to rear, thread in connector $\frac{1}{2}$ "-14 NPT 4

Selection and Ordering data

Further designs Order Code

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

Quality inspection certificate (Factory calibration) to IEC 60770-2 supplied C11

Factory certificate to EN 10204-2.2 supplied C14

Oxygen application, oil and grease-free cleaned E10

(only in conjunction with the sealing material Viton between sensor and enclosure and only in conjunction with measuring ranges \geq 1 bar g and 1 bar abs)

Sealing material FEP between sensor and housing, instead of Viton E20

max. operating pressure 15 bar (218 psi),
max. measuring temperature -10 ... +50 °C

Additional data

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

Measuring range to be set, specify in plain text: Y01

Y01: ... up to ... mbar, bar, kPa, MPa, psi

TAG number made of stainless steel Y15

Accessories Order No.

Quality inspection certificate (Factory calibration) to IEC 60770-2 supplied later, specify factory of transmitter. 7MF1564-8CC11

▶ Available ex stock

F) Subject to export regulations AL: 9I999, ECCN: N.