

SITRANS P measuring instruments for pressure

Transmitters for pressure and absolute pressure

ZD series for pressure and absolute pressure

Overview



SITRANS P pressure transmitters, ZD series with digital indicator

SITRANS P pressure transmitters, ZD series, are for measuring the 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 ... 20 mA
- Parameterizable using keys underneath the housing cover
- Range adjustment 1:5 (max. 1:10)
- Measuring accuracy < 0.25% (typical)

Application

The ZD is a configurable pressure transmitter for measuring the pressure 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 (\varnothing 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.

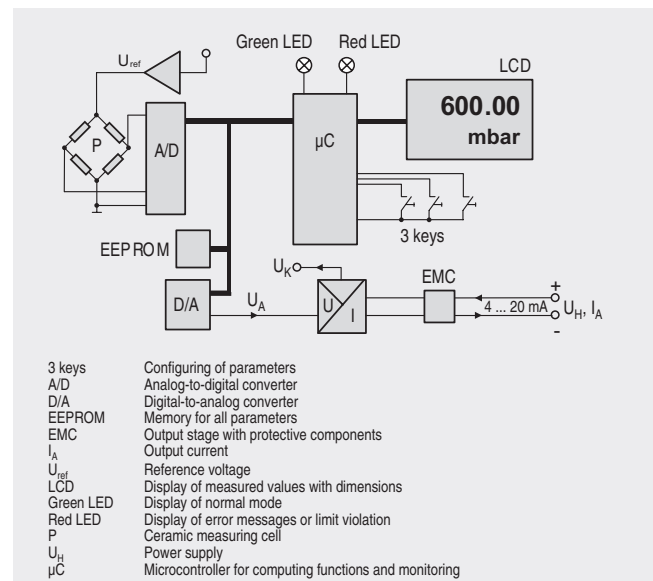
At the front of the housing is the 5-digit display behind a glass cover. Underneath the display are the 3 keys for parameterizing the pressure transmitter. Above the display are a green and a red LED for indicating the operating status.

The ZD pressure transmitter is available in two versions (see "Dimensional drawings"):

In the radial version (type A) the display is fitted in parallel with the process connection. The display can be rotated by up to $\pm 120^\circ$ 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.

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 of scale and end
- Upper and lower limit value
- Zero adjustment
- Upper and lower current saturation limit
- Electrical damping

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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	Pressure and absolute pressure
Measured range	Resolution
0 ... 2 bar (0 ... 29 psi)	0.6 mbar (0.008 psi)
0 ... 10 bar (0 ... 145 psi)	3 mbar (0.044 psi)
0 ... 50 bar (0 ... 725 psi)	15 mbar (0.218 psi)
0 ... 200 bar (0 ... 2900 psi)	60 mbar (0.9 psi)
0 ... 400 bar (0 ... 5800 psi)	120 mbar (1.8 psi)
Measured range	Overload limit
0 ... 2 bar (0 ... 29 psi)	5 bar (72.5 psi)
0 ... 10 bar (0 ... 145 psi)	25 bar (363 psi)
0 ... 50 bar (0 ... 725 psi)	120 bar (1740 psi)
0 ... 200 bar (0 ... 2900 psi)	500 bar (7250 psi)
0 ... 400 bar (0 ... 5800 psi)	600 bar (8700 psi)
Range adjustment (turndown)	5:1 (max. 10:1)

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

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	
• Range adjustment 1:5	< $\pm 0.25\%/10 \text{ K}$ (< $\pm 0.25\%/18 \text{ °F}$) of full-scale value
• Range adjustment 1:10	$\pm 0.5\%/10 \text{ K}$ ($\pm 0.5\%/18 \text{ °F}$) of full-scale value
Vibration influence	0.05%/g to 500 Hz in all directions (to IEC 68-2-64)
Power supply effect	< $\pm 0.01\%/V$ of full-scale value

Rated conditions

Ambient conditions	
• Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
• Temperature for best readability	-10 ... +70 °C (14 ... 158 °F)
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)

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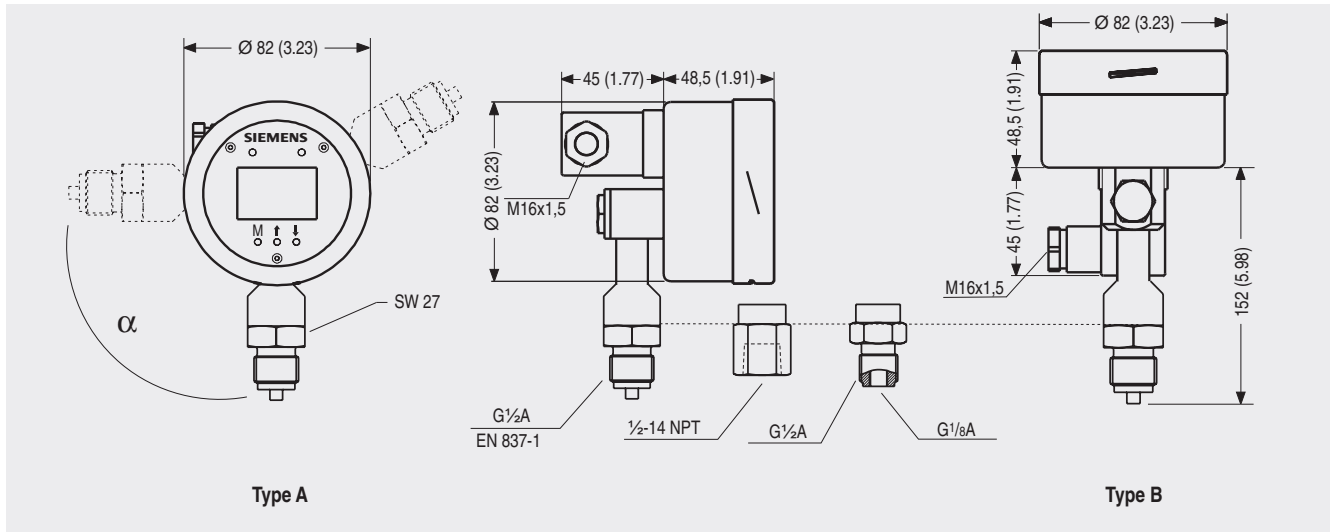
Medium conditions	
• Process temperature	-30 ... +100 °C (-22 ... +212 °F)
Degree of protection	IP65 to EN 60529
Electromagnetic compatibility	
• Emitted interference and noise immunity	To EN 61326/A1 appendix A (1998)
Displays and controls	
Display	LCD, max. 5 digits, digit height 9 mm
Decimal point	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 G^{1/2}A and female thread G^{1/8}A • G^{1/2}A to EN 837-1 • Female thread: 1/2-14 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°
Material	
Non-wetted parts materials	
• Field housing	Ø 80 mm (3.15 inch), stainless steel mat. No. 1.4016
• Cover	Stainless steel, mat. No. 14016 with glass
Wetted parts materials	
• Measuring cell	Al ₂ O ₃
• Gasket	Viton
• Process connection	Stainless steel, mat. No. 1.4571/316Ti
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)

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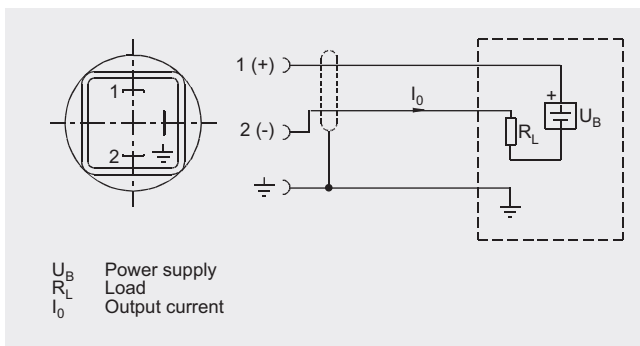
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Dimensional drawings



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

Schematics



SITRANS P pressure transmitters, ZD series, connection diagram

Selection and Ordering data

Order No.

SITRANS P pressure transmitters, ZD series for pressure and absolute pressure

7MF1580-0

Conformity error 0.25%, range adjustment 1:5 (max. 1:10), stainless steel housing and process connection, ceramic diaphragm, 2-wire system, output 4 ... 20 mA

Input variable

Pressure	▶	1
Absolute pressure	▶	2

Measured range

Measured 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 ... 5800 psi)	▶	0 ... 80 / 400 bar (0 ... 1160 / 5800 psi)	H

Process connection

G $\frac{1}{2}$ A outside and G $\frac{1}{8}$ A inside	▶	A
G $\frac{1}{2}$ A to EN 837-1		B
Female thread $\frac{1}{2}$ -14 NPT		C

Design

Process connection pointing vertically downwards	▶	1
Process connection pointing horizontally rearwards		2

▶ Available ex stock