

# SITRANS P measuring instruments for pressure

## Transmitters for gage, absolute and differential pressure

### ZD series for gage and absolute pressure

#### Overview



SITRANS P pressure transmitters, ZD series, are for measuring the gage 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 gage 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 ... 20 mA. The connection is made with a plug connector.

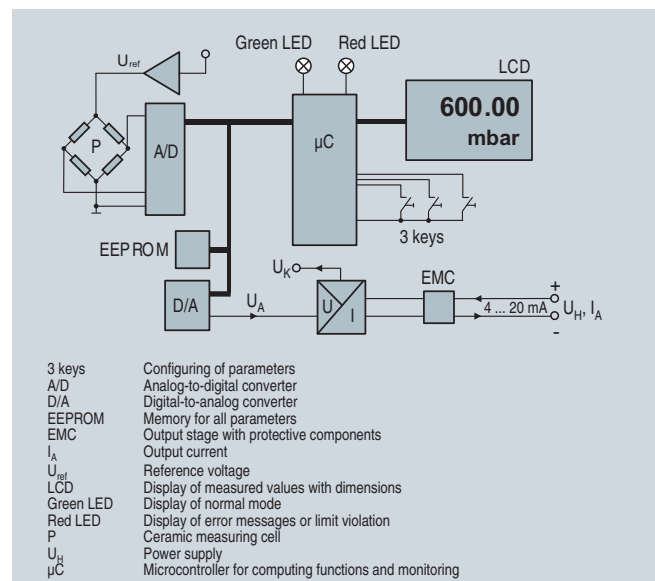
At the front of the housing is the 5-digit display behind a glass cover. Underneath the display are the 3 keys for parameterizing the pressure transmitter. Above the display are a green and a red LED for indicating the operating status.

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  $\pm 120^\circ$  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  $360^\circ$  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 gage 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 and end of scale
- Upper and lower limit value
- Zero adjustment

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- 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 gage

##### Input

Measured variable	Gage 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

##### 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	< $\pm 0.25\%/10 \text{ K}$ (< $\pm 0.25\%/10 \text{ K}$ ) 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)
- 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 <sub>2</sub> O, mH <sub>2</sub> O, psi, inH <sub>2</sub> O, mmHg, kg/cm <sup>2</sup> , 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"> <li>• Male thread G<sup>1</sup>/<sub>2</sub>B and female thread G<sup>1</sup>/<sub>8</sub>B</li> <li>• G<sup>1</sup>/<sub>2</sub>B to EN 837-1</li> <li>• Female thread: ½-14 NPT</li> </ul>
Version of housing/process connection	<ul style="list-style-type: none"> <li>• Radial (type A), can be swiveled by max. <math>\pm 120^\circ</math> (<math>\alpha</math>)</li> <li>• Axial (type B), can be swiveled by max. <math>\pm 360^\circ</math></li> </ul>

##### Material

Non-wetted parts materials

- Field housing  $\varnothing$  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<sub>2</sub>O<sub>3</sub>
- Gasket Viton
- Process connection Stainless steel, mat. No. 1.4571/316Ti

##### Power supply

Terminal voltage on pressure transmitter ( $U_H$ )	12 ... 30 V DC
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##### Certificate and approvals

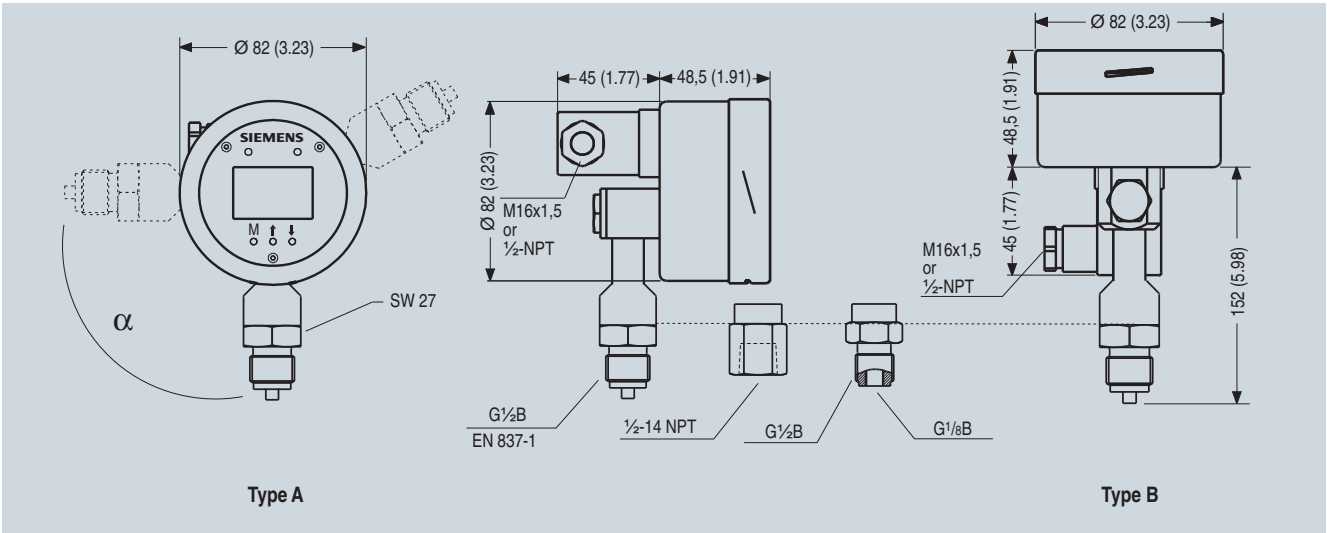
Classification according to pressure equipment directive 97/23/EC For gases of fluid group 1 and liquids of fluid 1; complies with requirements of article 3, paragraph 3 (sound engineering practice)

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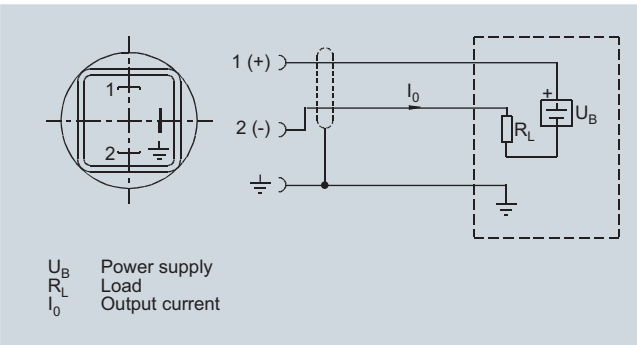
ZD series for gage and absolute pressure

### Dimensional drawings



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

### Schematics



SITRANS P pressure transmitters, ZD series, connection diagram

# SITRANS P measuring instruments for pressure

## Transmitters for gage, absolute and differential pressure

### ZD series for gage and absolute pressure

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#### Selection and Ordering data

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

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

#### Input variable

Gage pressure

Absolute pressure

#### Measured range

0 ... 2 bar

(0 ... 29 psi)

0 ... 10 bar

(0 ... 145 psi)

0 ... 50 bar

(0 ... 725 psi)

0 ... 200 bar

(0 ... 2900 psi)

0 ... 400 bar

(0 ... 5800 psi)

Other version (on request)

add Order Code and plain text:

Process connection: .....

#### Process connection

G $\frac{1}{2}$ B male thread and G $\frac{1}{8}$ B female thread

G $\frac{1}{2}$ B to EN 837-1

Female thread  $\frac{1}{2}$ -14 NPT

G 1" male thread

#### Design

Process connection vertically downwards, thread in connector M16x1.5

Process connection horizontally to rear, thread in connector M16x1.5

Process connection vertically downwards, thread in connector  $\frac{1}{2}$ "-14 NPT

Process connection horizontally to rear, thread in connector  $\frac{1}{2}$ "-14 NPT

Order No. Ord. Code

7MF1580-

0

1

2

F)

D

E

F

G

H

Z

A

B

C

M

1

2

3

4

J1Y

#### Selection and Ordering data

#### Further designs

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

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

**Factory certificate to EN 10204-2.2 supplied**

**Oxygen application, oil and grease-free cleaned**

(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

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

**TAG number made of stainless steel**

#### Accessories

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

► Available ex stock

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

Order Code

C11

C14

E10

E20

Y01

Y15

Order No.

7MF1564-8CC11