

Microelectronic gauge pressure sensors D Series

- Resolution 0,01 %
- Operating pressure range
from 0-0,25 to 0-150 MPa
- Operating temperature range
from -50 to +80 °C
- Electrical insulation
strength – 500 V
- Titanium body

Applications

- ★ Industrial automatics
- ★ Oil and gas industry
- ★ Hydraulics/ Pneumatic
- ★ Pumping stations/ Compressors
- ★ Heat metering

- The sensors are intended for proportional conversion of pressure into electric signal.

New solutions in pressure measurement – “Silicon-on-Sapphire” Technology

- ✓ Sensitive element of pressure sensors is a two-layer sapphire-titanium membrane with monocrystal silicon resistance strain gauges.
- ✓ Monocrystal sapphire membrane is a perfect elastic element that due to connection with titanium acquires the best quality as to the deformation level, and preserves its elastic properties up to +400°C.
- ✓ Monocrystal silicon resistance strain gauges are automatically connected with sapphire (heteroepitaxy method) and provide almost no hysteresis or fatigue effects.
- ✓ Exceptional insulating properties and radiation resistance of sapphire enable to use the sensitive element within temperature range from -200 to +350°C under the effect of high electromagnetic interferences and radiation.
- ✓ Strain gauges elements are manufactured in groups by solid-state micro-electronic methods and provide high quality and good repeatability of the output parameters.



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Datasheet

1 Nominal, overload and burst pressure

Designation	Nominal pressure, MPa	Overload pressure, MPa	Burst pressure, MPa
D 0,25	0...0,25	-0,1...0,5	0,8
D 0,4	0...0,4	-0,1...0,8	1
D 0,6	0...0,6	-0,1...1,2	1,5
D 1	0...1	-0,1...1,6	2
D 1,6	0...1,6	-0,1...2,6	3,2
D 2,5 D D 2,5	0...2,5	-0,1...4	5
D 4	0...4	-0,1...6	8
D 6	0...6	-0,1...10	12
D 10	0...10	-0,1...16	20
D 16	0...16	-0,1...26	32
D 25	0...25	-0,1...40	50
D 40	0...40	-0,1...60	80
D 60	0...60	-0,1...90	120
D 100	0...100	-0,1...125	150
D 150	0...150	-0,1...165	225

2 Temperature ranges

2.1 Operating temperature range from - 50 to + 80°C

2.2 Limiting temperature range from - 60 to + 130°C

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3 Accuracy parameters

3.1 Resolution, % FS	0,01
3.2 Non-linearity, % FS	
3.2.1 For D 0,25 - D 1,6 (D 0,25-T - D 1,6-T)	±0,2
3.2.2 For D 2,5 - D 150 (D 2,5-T - D 150-T); DD 2,5 (DD 2,5-T)	±0,15
3.3 Variation, % FS	
3.3.1 For D 0,25 - D 1,6 (D 0,25-T - D 1,6-T)	±0,1
3.3.2 For D 2,5 - D 150 (D 2,5-T - D 150-T); DD 2,5 (DD 2,5-T)	±0,05
3.4 Output signal repeatability, % FS	±0,05
3.5 Long-term stability of the output signal range within 12 months, %	
3.5.1 For D 0,25 - D 1,6 (D 0,25-T - D 1,6-T)	±0,25
3.5.2 For D 2,5 - D 150 (D 2,5-T - D 150-T); DD 2,5 (DD 2,5-T)	±0,15
3.6 Output signal error caused by the influence of overload pressure, % FS	
for zero output signal	±0,15
for output signal range	±0,1
3.7 Additional ambient temperature error	
3.7.1 Zero output signal, mB/10°C	±1,5
for D 0,25-T - D 150-T; DD 2,5-T	±0,2
3.7.2 Output signal range, % FS/10°C	-0,2±0,5
for D 0,25-T - D 150-T; DD 2,5-T	±0,2
3.8 Additional vibration error of the output signal, % FS	±0,05

4 Electrical characteristics

4.1 Output signal at room temperature, mV	
4.1.1 Zero output signal	±10
4.1.2 Output signal range (FS)	345±75
for D 0,25; D 0,25-T	150±50
for D 0,4; D 0,4-T	200±50
for D 0,6; D 0,6-T	250±50
4.2 Strain gauge bridge resistance at room temperature, kOhm	4,5±0,35
4.3 Temperature resistance coefficient of the strain gauge bridge, K ⁻¹	(1,2±0,2)·10 ⁻³
4.4 Insulation resistance, MOhm	
at room temperature	100
at the upper ambient temperature value	20
4.5 Electrical insulation strength (AC voltage), V	500
4.6 Power supply - stabilized DC, mA	0,2-2
Output signal is rated by the current 1,5 mA.	

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5 Mechanical characteristics

5.1 Vibration resistance (sinusoidal vibration):

Frequency range, Hz from 10 to 5000

Acceleration amplitude, m/s^2 500

5.2 Shock resistance (multiple mechanical shocks):

Shock acceleration peak, m/s^2 1000

Shock pulse width, ms 2

5.3 Torque effect while installation, N·m:

5.3.1 For D 0,25 - D 1,6 (D 0,25-T - D 1,6-T) 15-20

5.3.2 For D 2,5 - D 150 (D 2,5-T - D 150-T); DD 2,5 (DD 2,5-T) 30-50

6 Operating conditions

6.1 IP level IP40

6.2 Sensor body (pressure connection) and membrane are made of titanium alloy with 87 % of titanium.

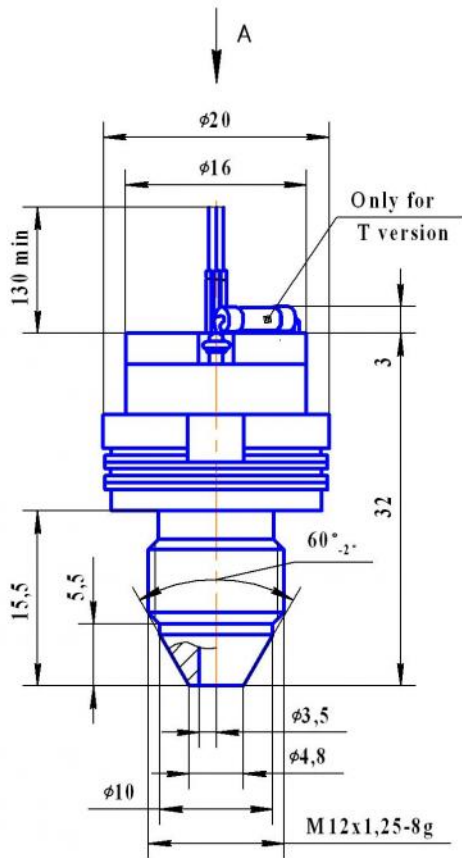
6.3 Pressure media - gases, liquids and their mixtures not aggressive to the titanium alloy (air, sea water, 5 % vitriol acid , chlorine water, chloride solutions, oils, ethyne etc)

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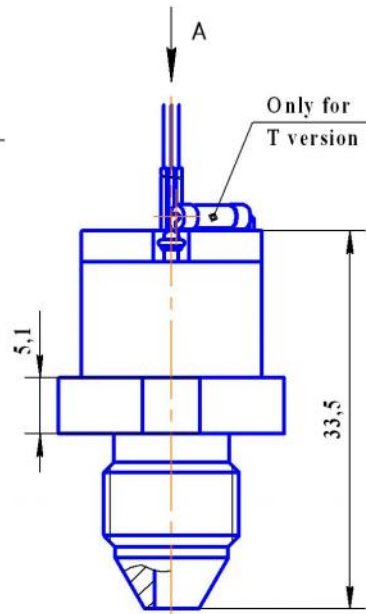
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7 Overall and mounting dimensions

D 0,25 - D 1,6
D 0,25-T - D 1,6-T

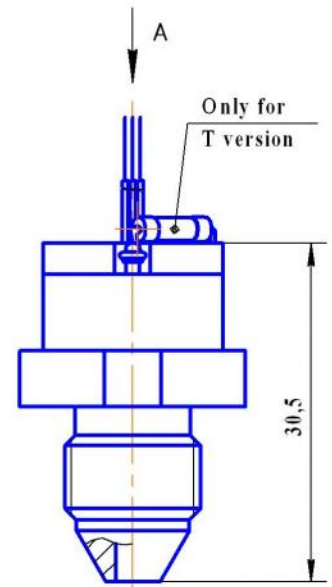


D 2,5 - D 16
D 2,5-T - D 16-T



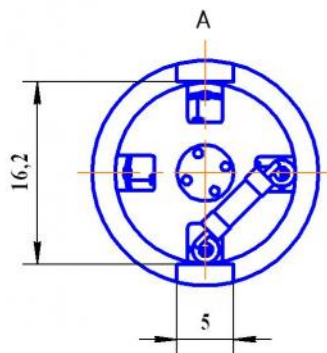
The rest -
ref. drawing 1
Drawing 2

D 25 - D 150
D 25-T - D 150-T

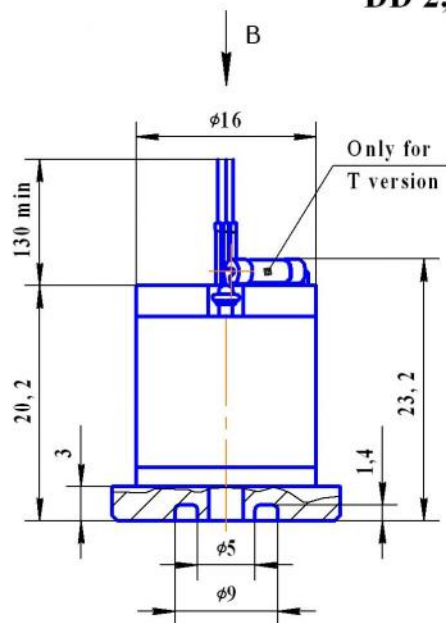


The rest -
ref. drawings 1 and 2
Drawing 3

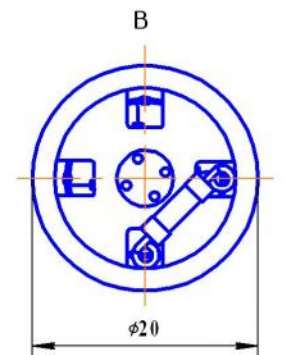
DD 2,5
DD 2,5-T



Drawing 1



Drawing 4

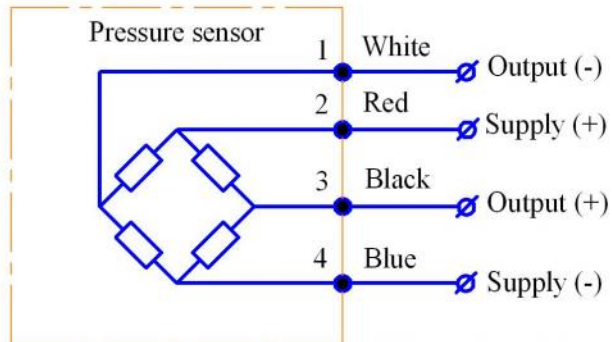


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8 Circuit diagram

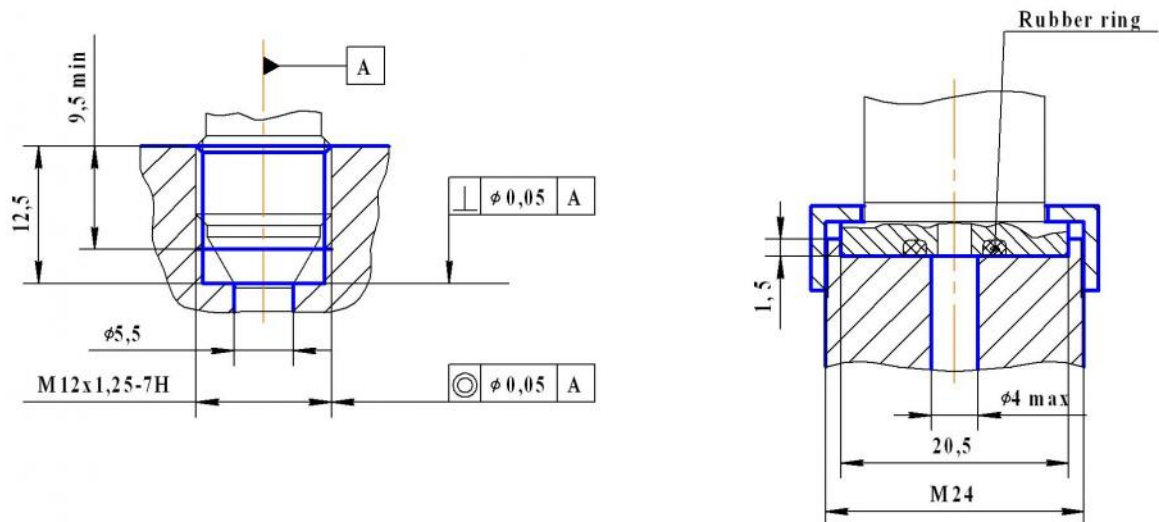
Electrical connection - flexible wire with section 0,09 mm²
in teflon insulation



9 Mounting diagrams

D 0,25 - D 150
D 0,25-T - D 150-T

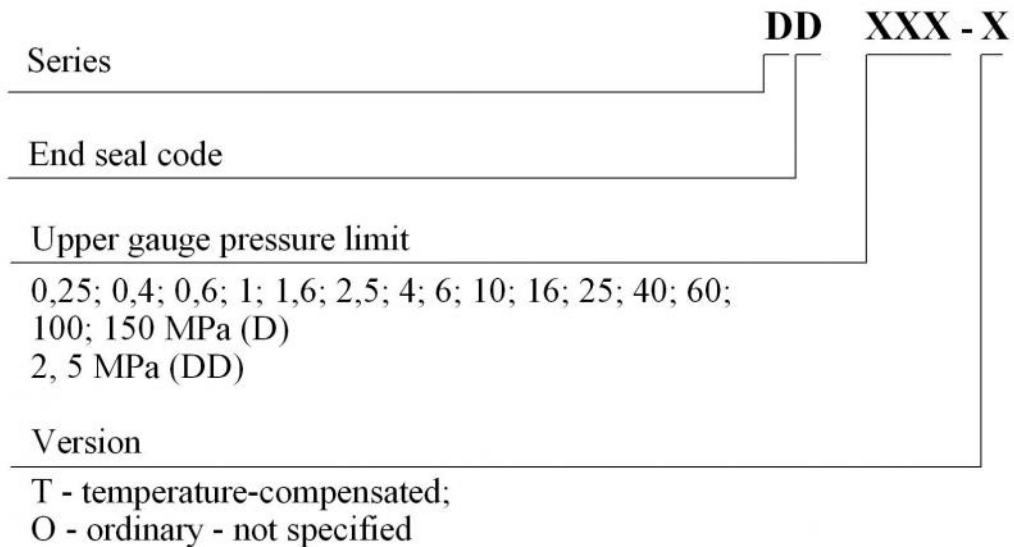
DD 2,5
DD 2,5-T



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10 Type designation



Order example of pressure sensor

Pressure sensor of D series, intended for pressure conversion from 0 to 16 MPa:

Pressure sensor D 16.

Pressure sensor of D series with end seal, intended for pressure conversion from 0 to 2,5 MPa, temperature-compensated:

Pressure sensor DD 2,5-T.

Note: if wished, the wire length (standard 80 mm) can be changed, in this case the required length should be added to the wire code L, for example:

Pressure sensor D 16-L200.

Pressure sensor DD 2,5-T-L200.

11 Marking

Marking on the sensor body must contain following information: designation of the sensor and order number.

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