



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 diaphragm with monocrystal silicon resistance strain gauges.
- √ Monocrystal sapphire diaphragm 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, % FS0,01
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 Hysteresis, % 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 100; D 150	.....±2,0
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	.....±0,2

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
for D 2,5; D 2,5-T; DD 2,5; DD 2,5-T	.....335±85
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, mA0,2-2
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, Hzfrom 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

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) 30-40

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.

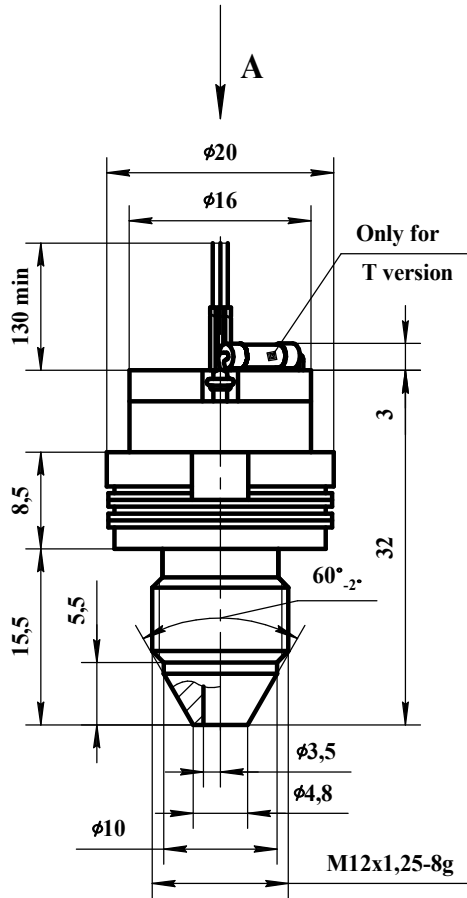
6.3 Pressure media - gases, liquids and their mixtures
not aggressive to the titanium alloy (air, sea water,
5 % vitriol acid , chlorine water, chloride solutions,
oils, ethyne etc)

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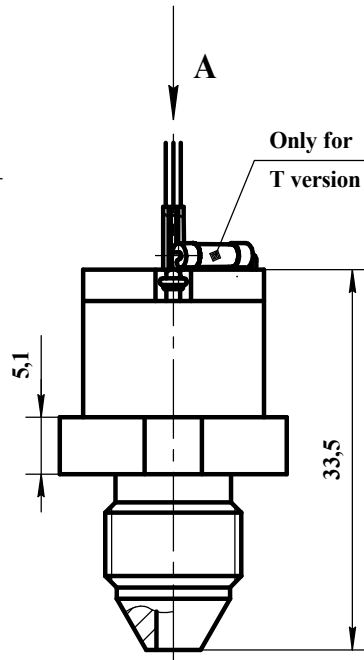
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7 Overall and mounting dimensions

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

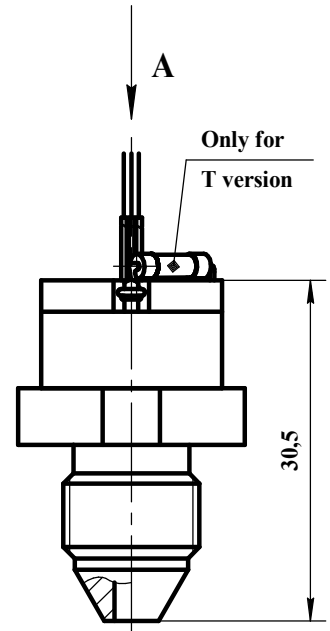


D 2,5 - D 16
D 2,5-T - D 16-T



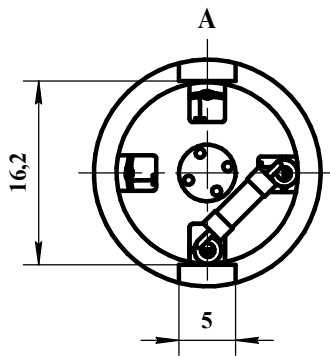
The rest -
ref. drawing 1
Drawing 2

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

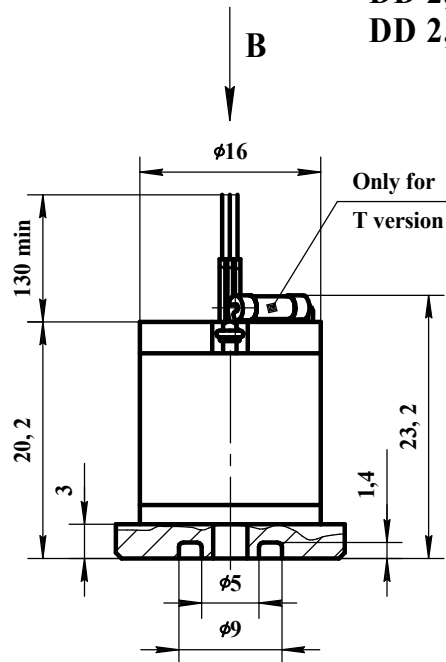


The rest -
ref. drawings 1 and 2
Drawing 3

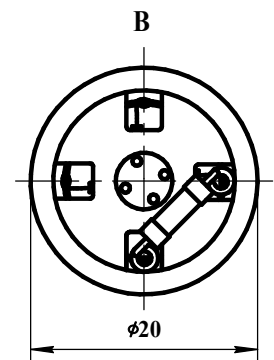
DD 2,5
DD 2,5-T



Drawing 1



Drawing 4

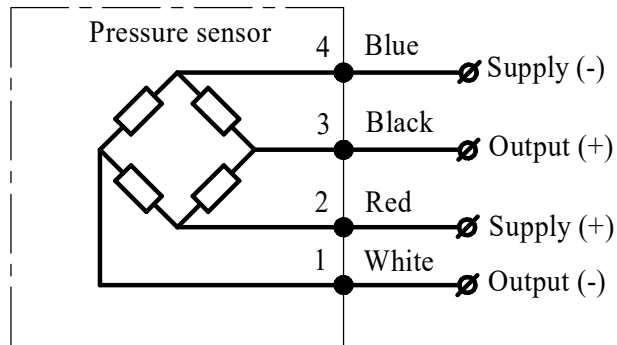


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8 Circuit diagram

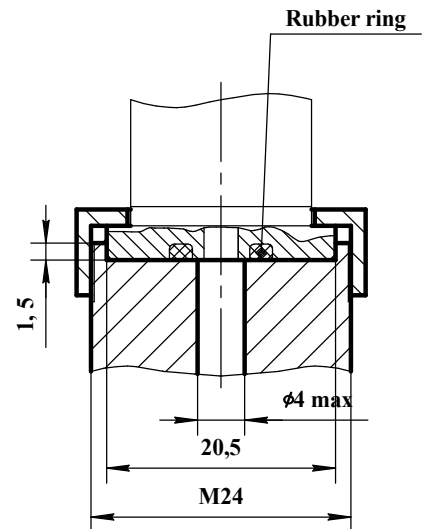
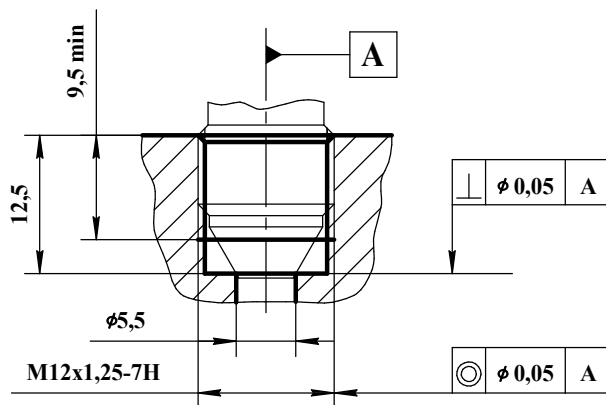
Electrical connection - flexible wire with section 0,08 or 0,12 mm²
in teflon insulation



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

	DD	XXX - X
Series		
End seal code		
Upper gauge pressure limit		
0,25; 0,4; 0,6; 1; 1,6; 2,5; 4; 6; 10; 16; 25; 40; 60; 100; 150 MPa (D) 2, 5 MPa (DD)		
Version	|	
T - temperature-compensated; O - ordinary - not specified		

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 130 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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