

## Microelectronic low temperature gauge pressure sensors HPL-P Series

- **Resolution 0,01 %**
- **Operating pressure range  
from 0-1,6 to 0-25 MPa**
- **Operating temperature range  
from -200 to +25 °C**
- **Electrical insulation  
strength – 500 V**
- **Titanium body**



- **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 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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Low temperature pressure sensors HPL-P Series

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M-247  
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Page 1

Pages 6

## Datasheet

### 1 Nominal, overload and burst pressure

Designation	Nominal pressure, MPa	Overload pressure, MPa	Burst pressure, MPa
HPL 1,6...	0...1,6	-0,1...3,2	4,8
HPL 2,5...	0...2,5	-0,1...5	7,5
HPL 4...	0...4	-0,1...8	12
HPL 6...	0...6	-0,1...12	18
HPL 10...	0...10	-0,1...20	30
HPL 16...	0...16	-0,1...32	48
HPL 25...	0...25	-0,1...50	75

### 2 Temperature ranges

target medium ..... from - 200 to + 25°C  
ambient medium .....from - 60 to + 60°C

### 3 Accuracy parameters

3.1 Resolution, % FS .....0,01  
3.2 Non-linearity,% FS .....±0,2  
3.3 Variation, % FS ..... 0,05  
3.4 Output signal repeatability, % FS .....±0,05  
3.5 Long-term stability of the output signal range within 12 months, % .....±0,2  
3.6 Output signal error caused by the influence of overload pressure, % FS  
for zero output signal .....±0,2  
for output signal range .....±0,05  
3.7 Additional temperature error, % FS/1°C  
3.7.1 For zero output signal .....±0,05  
3.7.2 For output signal range .....±0,05  
3.8 Additional vibration error of the output signal, % FS .....±0,05

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#### 4 Electrical characteristics

4.1 Output signal at room temperature by stabilized DC voltage 10 V	
4.1.1 Zero output signal, mV	±10
4.1.2 Output signal range (FS), mV	150±50
4.2 Strain gauge bridge resistance at room temperature, kOhm	3,40-4,85
4.3 Temperature resistance coefficient of the strain gauge bridge, K <sup>-1</sup>	(1,3±0,2)·10 <sup>-3</sup>
4.4 Insulation resistance, MOhm	
at room temperature	100
4.5 Electrical insulation strength (AC voltage), V	500
4.6 Power supply by stabilized DC voltage, V	1-10

#### 5 Mechanical characteristics

5.1 Vibration resistance (sinusoidal vibration):	
Frequency range, Hz	from 10 to 500
Acceleration amplitude, m/s <sup>2</sup>	50
5.2 Shock resistance (multiple mechanical shocks):	
Shock acceleration peak, m/s <sup>2</sup>	100
Shock pulse width, ms	16
5.3 Torque effect while installation, N·m	30-35

#### 6 Operating conditions

6.1 IP level	IP54
6.2 Sensor body (pressure connection) and membrane are made of titanium alloy with 87 % of titanium.	

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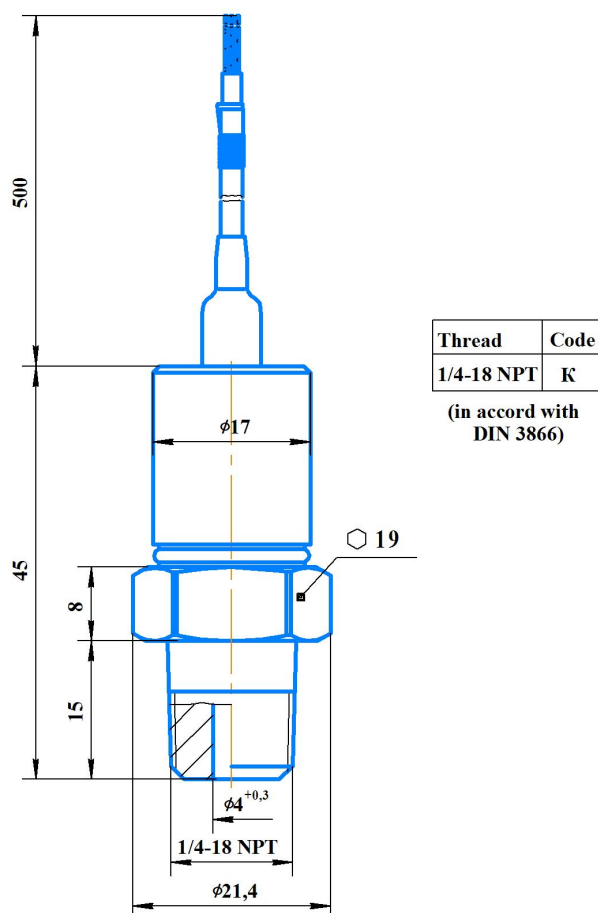
M-247  
2019

Page 3

Pages 6

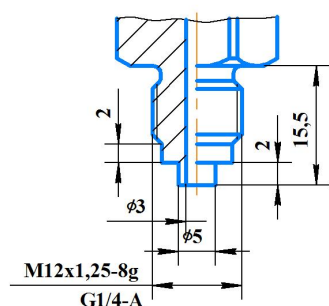
## 7 Overall and mounting dimensions

### HPL-P 1,6(2,5...25)-...-K-P



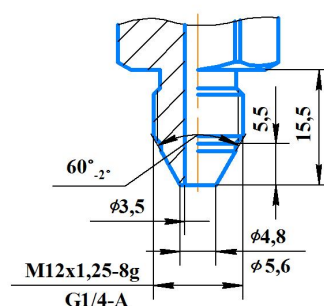
### 7.1 Thread design

#### HPL-P 1,6(2,5...25)-...-MA1(GA1)-...



Thread	Code
M12x1,25-8g	MA1
G1/4-A	GA1

#### HPL-P 1,6(2,5...25)-...-MT1(GT1)-...



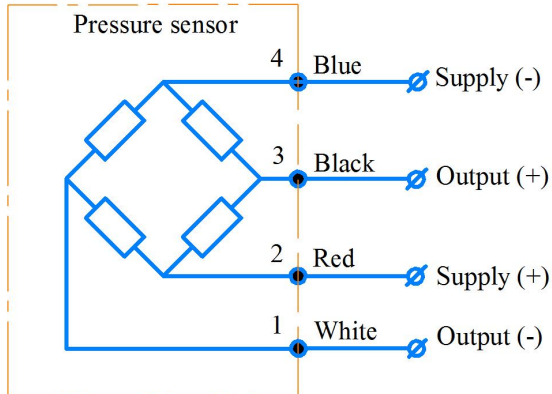
Thread	Code
M12x1,25-8g	MT1
G1/4-A	GT1

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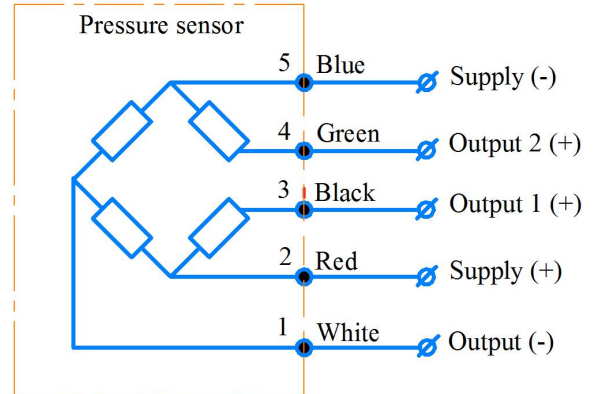
Low temperature pressure sensors HPL-P Series

## 8 Circuit diagram

"Closed bridge" diagram

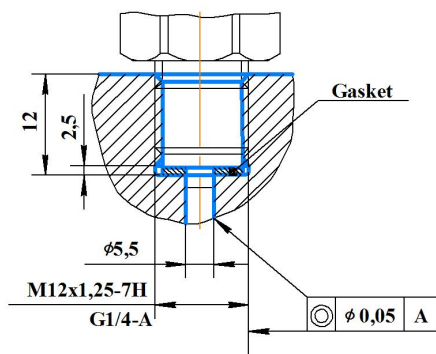


"Open bridge" diagram

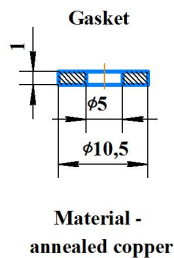
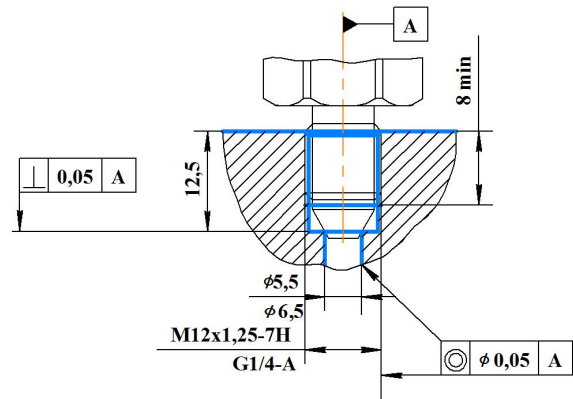


## 9 Mounting diagrams

HPL-P 1,6(2,5...25)-...-MA1(GA1)-...



HPL-P 1,6(2,5...25)-...-MT1(GT1)-...



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## 10 Type designation

**HPL-P XX - XX - XXX - X**

Series

Upper gauge pressure limit

1,6; 2,5; 4; 6; 10; 16; 25 MPa

Operating temperature range

Version 4 - from - 200 to + 25 °C

Circuit

0 - "closed bridge" circuit; 1 - "open bridge" circuit

Thread code

K - 1/4-18 NPT;

MA1 - M12x1,25-8g, end seal;

GA1 - G1/4-A, end seal;

MT1 - M12x1,25-8g, cone seal;

GT1 - G1/4-A, cone seal

Electrical connection

L - flexible cable 500 mm length

### Order example of pressure sensor

Pressure sensor of HPL-P series, intended for pressure conversion from 0 to 1,6 MPa, for operation within temperature range from - 200 to + 25 °C, with "open bridge" circuit, 1/4-18 NPT thread and flexible cable 500 mm length:

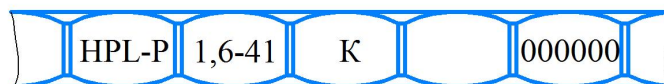
Pressure sensor HPL-P 1,6-41-K-L.

Note: if wished, the cable length (standard 500 mm) can be changed, in this case the required length should be added to the cable code L, for example:

Pressure sensor HPL-P 1,6-41-K-L200.

## 11 Marking

Marking on the sensor body must contain following information: series, upper gauge pressure limit in MPa, version of the operating temperature range, circuit type, thread code and order number



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Page 6

Pages 6