



Microelectronic force sensors C Series

- ▶ **Nominal force range**
5, 10, 40, 50 N
- ▶ **Operating temperature range**
from -50 to +80 °C
- ▶ **Electrical insulation**
strength – 150 V
- ▶ **Titanium body**

Applications

- **Industrial automatics**



- **The sensors are intended for proportional conversion of force 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 and limiting force

Designation	Nominal force range, N	Limit operating force, N	Overforce, N
C 05	5	from -2,5 to +5	±8
C 10	10	from -5 to +10	±16
C 40	40	from -20 to +40	±64
C 50	50	from -25 to +50	±80

Note: “-“ and “+” correspond to the opposite directions of force action.

2 Temperature ranges

2.1 Operating temperature rangefrom - 50 to + 80°C

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

3 Accuracy parameters

3.1 Non-linearity, % FS±0,2

for sensors with alternating force values within

the nominal force range ±0,25

3.2 Variation, % FS0,1

3.3 Overforce influence error, % FS

- one-sided

for zero output signal±0,15

for output signal range±0,1

- alternating

for zero output signal±1,5

3.4 Additional ambient temperature error, % FS/°C

3.4.1 For zero output signal ±0,05

3.4.2 For output signal range-0,02±0,05

3.5 Displacement of the lever end, corresponding to the

change of force from zero to the highest value, mm0,25±0,03

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4 Electrical characteristics

4.1 Output signal at room temperature, mV	
4.1.1 Zero output signal	±15
4.1.2 Output signal range (FS)	320±80
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 highest ambient temperature	5
4.5 Electrical insulation strength (AC voltage), V	150
4.6 Power supply - stabilized DC, mA	1,5±0,3
Output signal is rated by the current, mA	1,5±0,003

5 Mechanical characteristics

5.1 Vibration strength (sinusoidal vibration):	
Frequency range, Hz	from 5 to 120
Acceleration amplitude, m/s ²	20

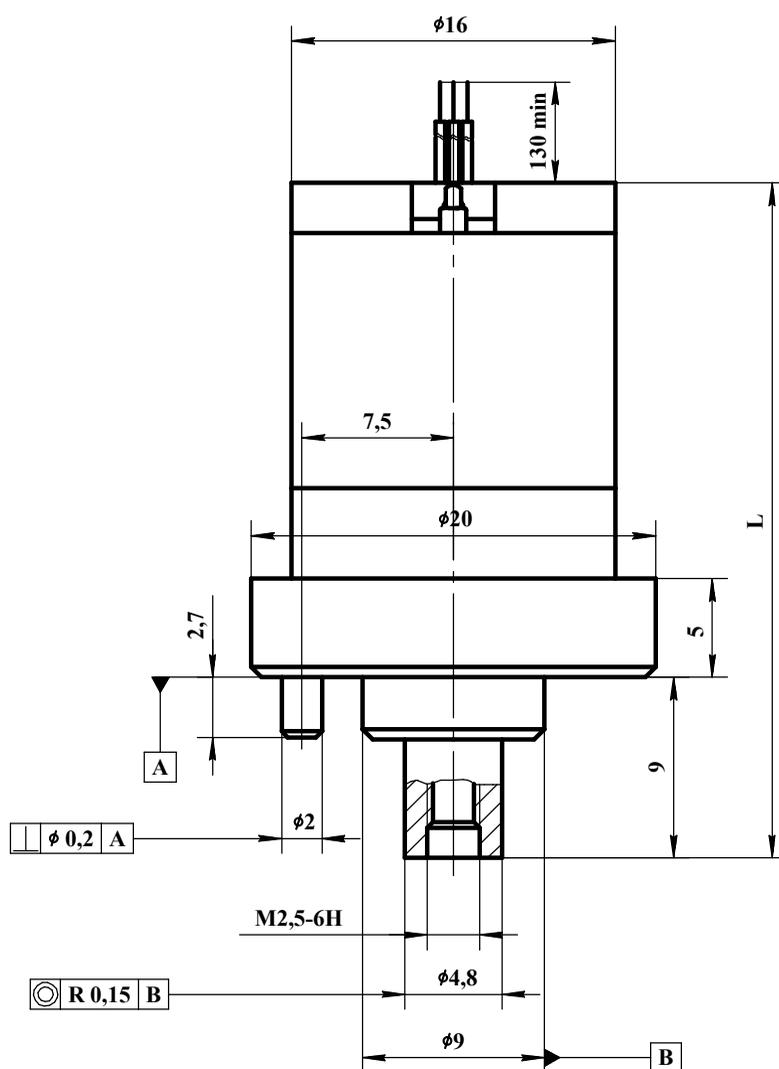
6 Operating conditions

6.1 IP level	IP30
6.2 Sensor body and membrane are made of titanium alloy with 87 % of titanium.	

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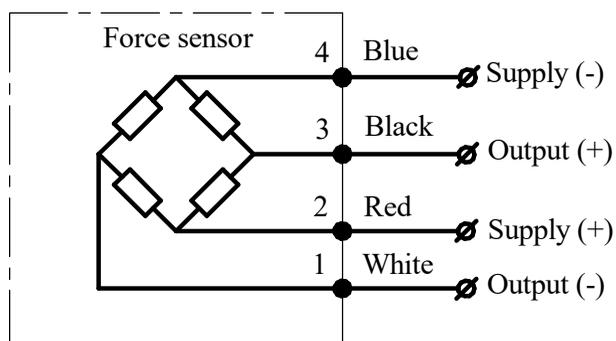
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7 Overall and mounting dimensions



Force, N	L
5	46,5
10, 40, 50	34,5

8 Circuit diagram



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9 Order example of force sensor

Force sensor of C series with nominal force range 50 N:

Force sensor C 50.

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

Force sensor C50-L150.

10 Marking

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

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