

Microelectronic force sensors H Series

- **Operating force ranges**
from 0-100 to 0-300 N
- **Operating temperature range**
from -45 to +80 °C
- **Electrical insulation**
strength – 500 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 force 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 and overload force

Designation	Nominal force, N	Overload force, N
H 100-1	from 0 to 100	from 0 to 200
H 200-1	from 0 to 200	from 0 to 400
H 300-1	from 0 to 300	from 0 to 600
H 100-2	from 0 to 100	from 0 to 200
H 200-2	from 0 to 200	from 0 to 400
H 300-2	from 0 to 300	from 0 to 600

2 Temperature ranges

2.1 Operating temperature rangefrom - 45 to + 80°C

2.2 Limiting temperature rangefrom - 60 to + 130°C

3 Accuracy parameters

3.1 Resolution, % FS0,01

3.2 Non-linearity, % FS±0,2

3.3 Variation, % FS0,1

3.4 Long-term stability of the output signal range within 12 months, %±0,2

3.5 Output signal error caused by the influence of overload pressures, % FS

for zero output signal±0,1

for output signal range±0,01

3.6 Additional ambient temperature error, % FS/1°C

3.6.1 For zero output signal±0,05

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

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3.7 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) 200±50

4.2 Strain gauge bridge resistance at room temperature, kOhm 3,25±0,25

4.3 Insulation resistance, MOhm

at room temperature 100

at the upper ambient temperature value 5

4.4 Electrical insulation strength (AC voltage), V

for version 1 150

for version 2 500

4.5 Power supply - stabilized DC, mA 2±0,3

5 Mechanical characteristics

5.1 Vibration resistance (sinusoidal vibration):

Frequency range, Hz from 10 to 2000

Acceleration amplitude, m/s² 100

5.2 Shock resistance (multiple mechanical shocks):

Shock acceleration peak, m/s² 1000

Shock pulse width, ms 1-3

6 Operating conditions

6.1 IP level IP30

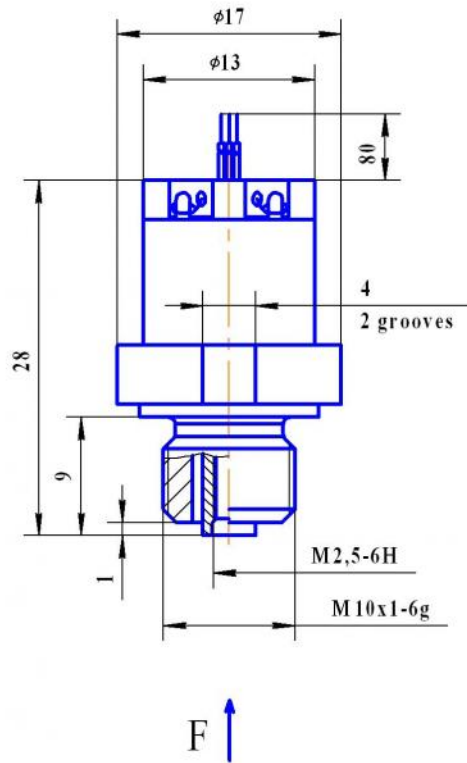
6.2 Sensor body and membrane are made
of titanium alloy with 87 % of titanium.

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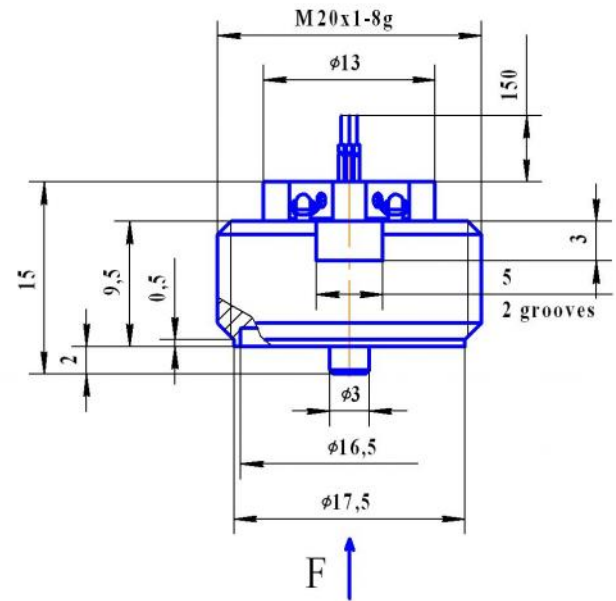
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7 Overall and mounting dimensions

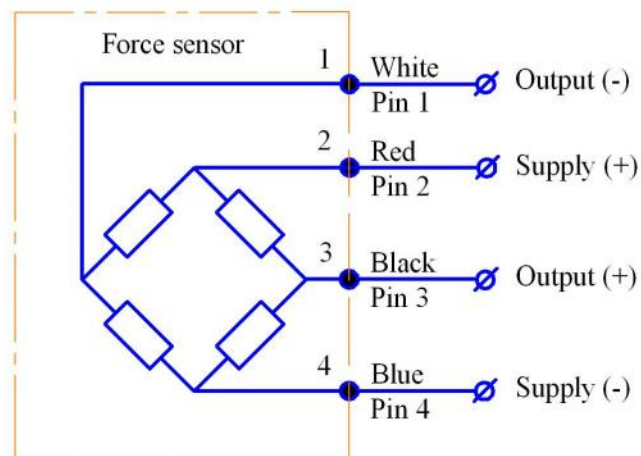
7.1 Force sensors of version 1



7.2 Force sensors of version 2



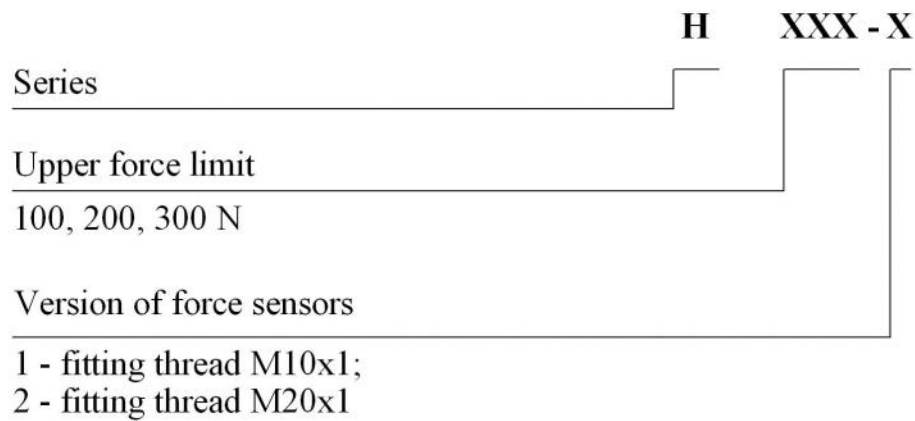
8 Circuit diagram



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9 Type designation



Order example of force sensor

Force sensor of H series, intended for force conversion from 0 to 100 N, with fitting thread M10x1:

Force sensor H 100-1.

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:

Force sensor H 100-1-L130.

10 Marking

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

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