

## Piezoelectric Vibration Velocity Sensor type VT1

### Application

Sensor is especially suitable for monitoring vibrations of machines in heavy duty industrial conditions. It may be used for dynamic machine state evaluation and predicting, balancing and protection of the machine operation based on acceptable vibration levels. It may be used in various rotating machinery such as turbine sets, compressors, fans, pumps, electric motors, etc.

### Description

Designed based on PZT ceramics and piezoelectric effect with shear input function. It is equipped with preliminary voltage amplifier, allowing double conductor connection of a sensor with signal receiver (monitor) being the power source. Preliminary amplifier also performs signal integration, resulting in output signal proportional to measured vibrations velocity. Casing made of stainless steel with double contact connector, according to MIL C-5015. Casing design is air-tight welded (IP68). Leakproofness degree of the sensor depends on applied connector/cable assembly. Usually a plug/cable assembly has a leakproofness of IP50. Other sensor design features:

- sensor's electric system is fully insulated from the casing
- resistance to inverse connection
- resistance to electrostatic discharge
- low-noise preliminary amplifier electronics provides pure signal at low vibrations level

### Performances

#### METROLOGICAL

**Sensitivity:** 20 mV/mm s<sup>-1</sup> ± 10 % at +25°C

**Speed range:** 250 mm/s of peak value

**Amplitude nonlinearity:** ±1 %

**Frequency response:**

(±3 dB) 5 – 7 000 Hz

(±10 %) 8 – 3 500 Hz

**Resonance frequency:** 15 kHz

**Transverse sensitivity:** max. 5 % of axial

**Ambient temperature effect:** ± 5 % at the whole range of ambient temperature changes

#### ELECTRICAL

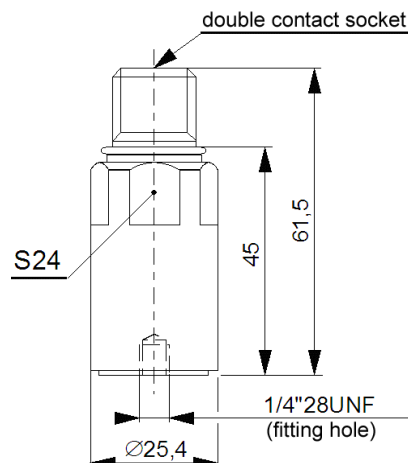
**Power supply requirements:**

Constant current source 2-10 mA at 18-30 V DC

**Broad band electric noise:** 10<sup>-3</sup> mm/s

**Bias output voltage:** 10 V DC

**Grounding:** case isolated, internally shielded



### ENVIRONMENTAL

**Ambient temperature range:** -50°C to +120°C

**Vibration limit:** 250g of peak value

**Shock limit:** 2 500g of peak value

**CE requirements:** Directive 89/336/EEC – Electromagnetic compatibility

### MECHANICAL

**Weight:** 145 grams

**Casing material:** 316L stainless steel

**Installation:** sensor is delivered with M6 mounting stud (optional M8), requiring 6 mm (8mm for M8) hole deep in the machine casing

**Mounting torque:** 3Nm

**Output plug:** 2-pin according to MIL-C-5015

**Mating connector:** MS3106A-10SL-4S

**Recommended Cable:** two conductor shielded with PTFE isolation, section of approx. 0,25 mm<sup>2</sup>

### Sensor ordering information

**A**  
VT1 - □□

**A** □□ Mounting stud thread

M 6 mounting stud with M6 thread

M 8 mounting stud with M8 thread

### Cable for sensor ordering information

**A B C D**  
VSC - □ - □□ - □□ - □□

**A** □ Connector shape

A Axial cable exit (in relation to sensor axis)

R Right-angle cable exit

**B** □□ Connector protection degree

6 4 protection degree IP64

6 6 protection degree IP66

6 8 protection degree IP68 (only A cable output)

**C** □□ Cable length

0 3 cable length 3m

0 5 cable length 5m

1 0 cable length 10m

**D** □□ Stainless steel protective armour

0 0 without armour

0 1 with armour

0 2 with armour having additional kynar outer jacket

