®ICP, triaxial accelerometer Model 138

Main Characteristics

- ®ICP transmission mode
- Annular shear mode (better than obsolete compression design)
- Dual case isolation with internal Faraday shield (suitable for permanent installation, no need for insulation pad, no ground loop)
- medium and high frequency version (10, 50, 100 mV/g)
- Hermetically sealed (laser welded)

Competitive advantage

- World smallest industrial triaxial accelerometer. Industrial means with internal faraday shield isolated from mounting surface.
- Compare to obsolete compression design, annular shear piezoelectric sensors feature better frequency response, improved base strain, lower noise, smaller size, thermal transient imunity and insensitivity to cable motion. Annular shear mode is also less susceptible to transverse vibrations and better immune to electronic saturation at high frequency.
- improved dynamic range (thanks to exceptional bias stability) at elevated temperatures.
- Resistant to shock (magnet mounting) thanks to protected MosFet transistor input.
- ESD and reverse wiring protection.
- The glass seal hermetic connector protects the piezoelectric disc and the electronic from harmful environmental influences, significantly increasing their reliability and lifetime. Associated with low cost IP68 overmolded M12 cable assembly it is a perfect solution for submersible application down to 150 metres. Sensors with epoxy seal will leak after few temperature cycles.
- M12 connector offers compatibility with numerous sensors used in automation. M12 overmolded cable assemblies are available from many cable manufacturers around the world. Mil cordset are expensive because they are only available from vibration sensor manufacturer.

Description

The hermetic sealed triaxial industrial piezoelectric accelerometer model 138 is design to monitor the vibration in harsh industrial environment. It uses the industry standard ®ICP 2-wire voltage transmission technique with a 2 mA minimum constant current supply. Signal ground is isolated from the mounting surface and outer case to prevent ground loops. Faraday shielding will limit sensitivity to ESD to a minimum. Annular shear mode design will prevent from thermal transient and from spurious signal from high transverse vibrations. Low noise electronic and a temperature compensated design will give you accurate result over the complete temperature range. Large choice of frequency range will help to fit almost every customer requirements.

Typical applications

Vibrations measurement in the rugged environments of industrial machinery monitoring. High frequency version will monitor the vibration on roller bearing, pumps cavitation, ... Medium frequency version will monitor overall vibration on pumps, motors, fans, ...

Model 138.01

Ordering information Model 138.01

To order, specify model number, options, accessories and suffix :

138.01- AA - B - MM - YY

AA : Sensitivity

3 : 10 mV/g ±5 % (high frequency)
3D : 10 mV/g ±10 %

5 : 50 mV/g ±5 % (high to medium frequency)
5D : 50 mV/g ±10 %

6 : 100 mV/g ±5 % (medium frequency, general purpose)
6D : 100 mV/g ±10 %
6Q : 100 mV/g ±15 %

Available suffix : N, negative polarity

B : Connector

2 : M12 glass seal

MM : Captive screw

M6 : M6x1
M7 : 1/4" 28 UNF 2A

YY : Agency Approval

omitted : no agency approval
Y1 : Atex approved (please call for availability)

Special Engraving :

Add ZXX at the end of the part number.
XX is a number supplied by VibraSens

*** Most Popular model :**

138.01-6D-2-M6 / 138.01-3D-2-M6

Specifications (24°C)

Dynamic

Frequency response (±3 dB)
A=3X , 5X, 6X (Z axis) ..... 0.5 to 13000 Hz
(X, Y axis) ..... 0.5 to 10000 Hz
Mounted Resonant frequency
A=3X, 5X, 6X ..... 40 kHz Nom
Dynamic range
A=3X ..... 800 g pk
A=5X ..... 160 g pk
A=6X ..... 80 g pkk
Transverse response sensitivity (20Hz, 5g) ..... <5%
Temperature response ..... -10% at -50°C
..... +10% at 120 °C
Polarity ..... see figure 1b
Linearity ..... ±1% Max
Warm up time (Typical)
A=3X, 5X, 6X ..... < 1Sec

Electrical

Electrical Grounding ..... Isolated from machine ground
..... Internal Faraday shielding
Isolation(Case to shield) ..... 100 MΩ Min
Output impedance ..... 50 ΩNom
DC output bias, 4mA supply (AA=3X, 5X, 6X) ..... 12 ± 2 VDC
DC temperature response ..... ±2% at -50 °C
..... ±2% at max operating temperature
Residual noise (24°C) : A=3X
1 Hz to 25 kHz ..... 300 ug rms
1 Hz ..... 30 ug
Residual noise (24°C) : A=6X
1 Hz to 25 kHz ..... 300 ug rms
1 Hz ..... 30 ug
Power requirements Constant current : +2 to +10mA DC
..... Voltage : +22 to +28 VDC
Protection : Overvoltage ..... Yes
: Reverse polarity ..... Yes

Environmental

Temperature, operating continuous : (max. current =4mA)
A= 3X, 5X, 6X ..... -55 to 120 °C (-65 to 250 °F)
Humidity / Enclosure
B= 2 ..... Not affected, hermetically sealed, 1E-8torr.l/s
Acceleration limit : Shock ..... 5 000g peak
: Continuous vibration ..... 500g peak
Temp. transient sens. (3Hz, LLF, 20dB/dec) ..... 5 mg/°C
Mean time between failure (MTBF) ..... 10 Years Nom
ESD Protection ..... > 40 V
Safety ..... EN 61010-1 and IEC 1010-1
EMC emission ..... EN 50081-1, EN 50081-2
EMC immunity (1) ..... EN 50082-1, EN 50082-2

Physical

Dimensions
B=2 ..... Fig. 1b
Design ..... Ceramic, annular shear mode
Weight with connector
A=3X, 5X, 6X ..... 84 gr Nom (3.0 Oz)
Connector
B=2 ..... M12 glass seal, IEC 60947-5-2
Material ..... AISI 316L, DIN 1.4404 (Stainless steel)
Mounting torque (M6, M7 suffix) ..... 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied
..... Sensitivity (5g, 160 Hz)
..... No frequency response

Accessories, not supplied

Cable assembly B=2 (M12 connector)
Polyurethane cable 10.01-E02-A01-31-Length
For more cable option see Model 10.01 (specific cable harness).

Accessories, spares part

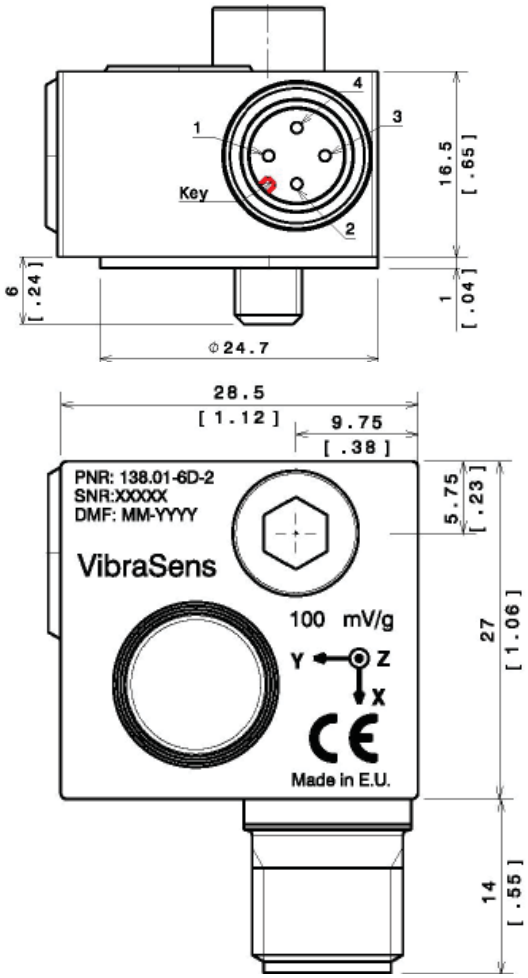
Mounting Stud
M6 machine thread 193.38-06-1
1/4" 28 UNF machine thread 193.38-16-1

Repair

Consult factory for replacement of connector in case of broken or bended pins. Repair of electronic is not possible.

(1) Guaranted if using accessories listed in this product datasheet only

Drawings



	Pin 1	Pin 2	Pin 3	Pin 4
Connector Wiring	X	Y	GND	Z
Standard M12 Cable Wiring 10.01-E02-XX-31-Length	**Brown**	**White**	**Blue**	**Black**

Fig 1b : Outline drawing