®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 immunity 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 Mos-Fet 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 designed 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.

Model 138.02

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, ...

Approvals

Revision History

Ordering information

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

138.02- 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

YY : Agency Approval

Omitted	……..……....	no agency approval
Y1	……..……....	No Atex approval

Special Engraving :

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

Accessories (Ordered separately)

193.38 - 06 - 1	……..…	M6 x 1 Hex captive Screw
193.38 - 16 - 1	……	¼" 28 UNF 2A Hex captive Screw

Most Popular Model :

138.02-6D-2-M6 / 138.02-3D-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 pk.
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 Ω Nom
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 µg rms
1 Hz	30 µg
Residual noise (24°C) : A=6X	
1 Hz to 25 kHz	300 µg rms
1 Hz	30 µg
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-8 torr.l/s
Acceleration limit : Shock		5000g 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

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) Guaranteed 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-XXX-31-Length	**Brown**	**White**	**Blue**	**Black**

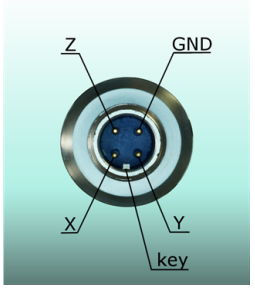

Fig. 1b : Electrical layout