

Description

The hermetic sealed triaxial industrial piezoelectric accelerometer model 138.01 is designed to monitor vibration in harsh industrial environment.

It uses the industrial standard ICP2 2-wire voltage transmission technique with a 2mA minimum constant current supply.

Signal ground is isolated from 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 leads to accurate results over complete temperature range.

Large choice of frequency ranges will help to fit almost every customer requirements.

Typical applications

Vibrations measurement in rugged environments of industrial machinery monitoring. High frequency version monitors vibration of rolling bearings, pump cavitation, Medium frequency version monitors overall vibration of pumps, motors, fans, ...

Competitive advantages

Compared to obsolete compression design, annular shear piezoelectric sensor design features 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.

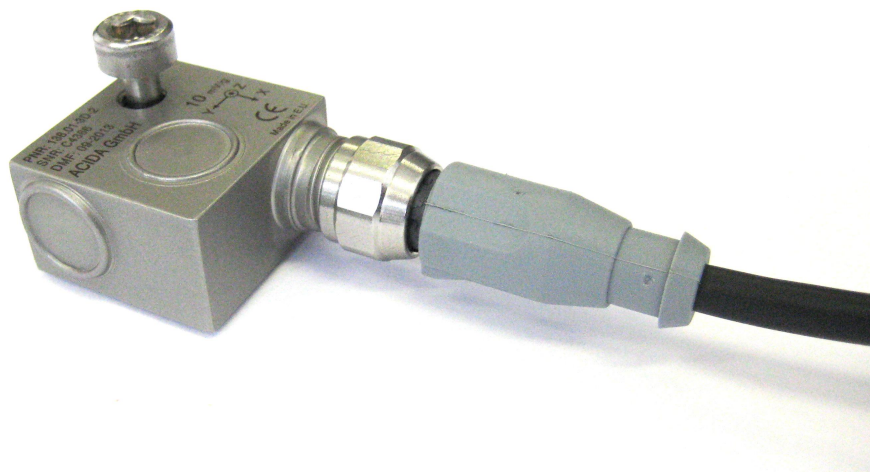
Thanks to exceptional bias stability dynamic range are offered at elevated temperatures.

Resistant to shock (magnet mounting) thanks to protected Mos-Fet transistor input.

Standard are also ESD and reverse wiring protection.

Glas sealed hermetic connector protects piezoelectric sensing element and electronic plate from harmful environmental influences. Associated with low cost IP68 overmolded M12 cable assembly it's a perfect solution for submersible applications down to 150 meters.

4pin M12 connector offers compatibility to numerous sensors used in automation. Corresponding overmolded M12 cable assemblies are available from various cable manufactures around the world. Cable sets with 2pin MIL-plug are expensive cause they are only available from sensor manufacturers.



pic. 1 AC138.01 with overmolded IP68 submersible M12-plug cable assembly

Technical Specifications

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 pic. 2

Linearity ±1% max

Warm up time (Typical)
A=3X, 5X, 6X < 1Sec

Electrical

Electrical Grounding Isolated from machine ground
Internal Faraday shielding
Case to shield Isolation 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 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./s

Acceleration limit: Shock 5 000g peak
Acceleration limit: 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 see pic. 2

Sensor design

Ceramic, annular shear mode

Weight with connector

A=3X, 5X, 6X 84 gr Nom (3.0 Oz)

Connector

4pin-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, 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 bent pins. Repair of electronic is not possible.

Ordering information Model AC138.01

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

AC138.01 – AA – B – M6

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%

B : Connector / Integral cable

2 : 4pin M12 glass seal

Ordering information cable-set Model AC10.01:

Please choose cable set specification according to following scheme:

AC10.01 – AA – BBB – CC – DD

AA – Cable Version

A1: Cable bare, open wire ends
A3: Cable covered with stainless steel braid, open wire ends
A4: Cable covered with protective sleeves, open wire ends

BBB – Plug Version

E01: 4pin M12 plug, straight, pic. 3
E31: 4pin M12 plug, 90°-angled, pic. 3
E61: 4pin M12 plug, straight, field mountable, pic. 4
E81: 4pin M12 plug, 90°-angled, field mountable, pic. 4

CC – Cable-Material

31: polyurethan, PU – isolated cable (max. +90°C)
02: teflon, FEP- isolated cable (max. +200°C)

DD – Cable-Length in Meter

10: length = 10m
15: length = 15m or specify length!

Apply for this datasheet our general business conditions:

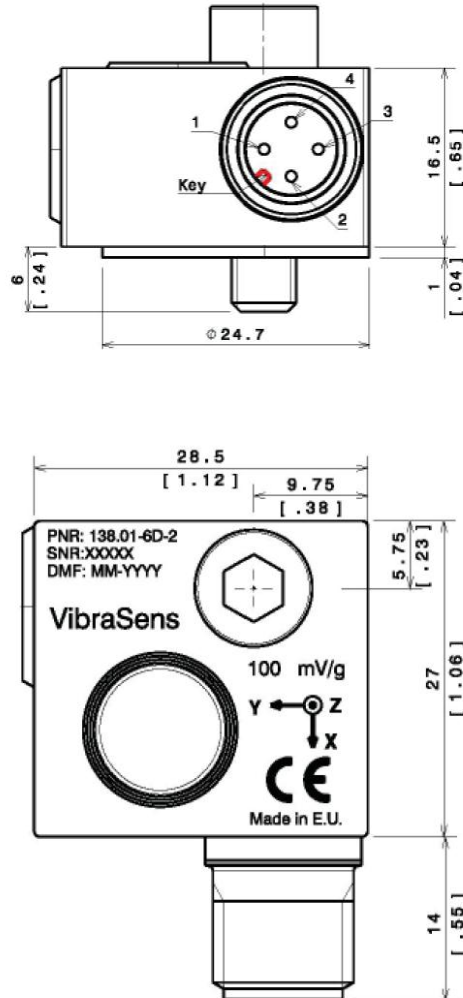
- General conditions for industrial applications
- General conditions for service and delivery
- Hourly- and daily rates

The general conditions and other documents can be downloaded from our website: www.acida.net

More information: info@acida.net

Technical data and images can be modified at any time.

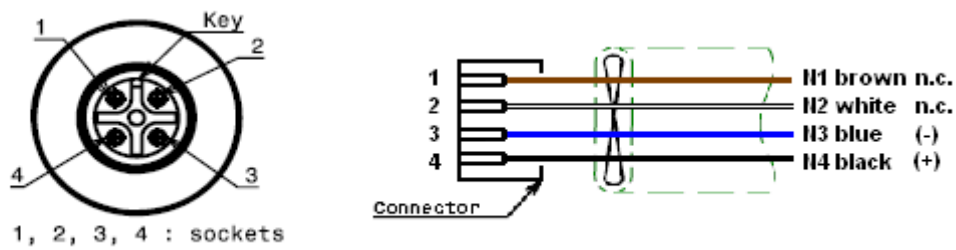
Dimensions



	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

pic. 2 Outline drawing

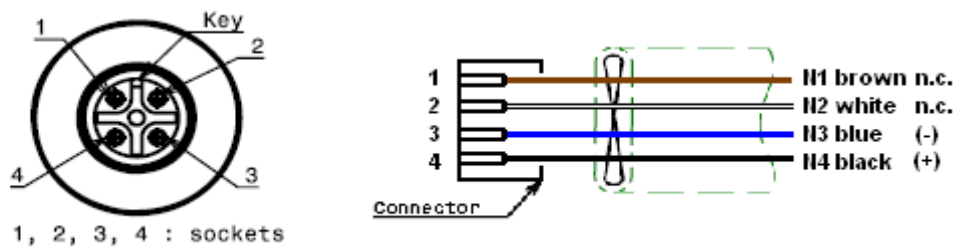
Plug- and Cable-Versions, Model AC10.01



pic. 3 Cable Set-1 and -2 with M12 plug made off PU by IEC 60947-5-2,
max. operating temperature: +90°C

Cable: twisted pair,
low-cost with good oil and fluid resistance;
material: PU, bore: 4.9 mm

M12 plug: material: PA, self-extinguishing box, 4-Pin, gold-plated contacts,
protection: IP 67; PU-seal to the cable
available as straight (E01) and angled (E31) version.



pic. 4 Cable Set-3 and -4 with M12-plug made of PU by IEC 60947-5-2,
max. operating temperature: +90°C

Cable: installed on site (unsealed), twisted pair,
low-cost with good oil and fluid resistance;
material: PU, bore: 4.9mm

M12-plug: material: PA, self-extinguishing box, 4-Pin, contacts mit CuSn-coating,
protection: IP 67; union nut made of stainless steel AISI 316L,
available as straight (E61) and angled (E81) version.