

®ICP Accelerometer Model 101 Premium, Top connector

Main Characteristics

- 10, 100, 500 mV/g version available
- -55°C to 150 °C (-67°F to 302°F)
- ®ICP transmission mode
- Annular shear mode
- Dual case isolation with Faraday shield
- IP67 with associated cable (B=2, 3 only)
- Complies with API 670 requirements (A=6 only)

Competitive advantage

- Annular shear mode is less susceptible to transverse vibrations and better immune to electronic saturation at high frequency
- Exceptional bias voltage stability at elevated temperatures.
- Low cost IP67 overmolded M12 cable assembly
- M12 overmolded cable assembly is available through local electronic distributor
- M12 offers compatibility with sensors used in automation.

Description

The hermetic sealed industrial piezoelectric accelerometer model 101 is design to monitor the vibration in harsh industrial environment. It uses the industry standard ©ICP 2-wire voltage transmission technique with a 4 mA standard constant current supply. Signal ground is isolated from the mounting surface and outer case to prevent ground loops. Faraday shielding will limit sensitivity to EMC 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. Low frequency accelerometers (A=9) incorporate a low-pass filter within the conditioning electronic. This filter attenuates the sensor mechanical resonance and the associated distortion and overload.

Typical applications

Vibrations measurement in the rugged environments of industrial machinery monitoring. High frequency version monitor the vibration on roller bearing, pumps cavitation, Medium frequency version monitor overall vibration on pumps, motors, fans, ... Low frequency model is used in the petrochemical, machine tool, and paper industries for monitoring of slow speed agitators, cooling towers, ... High temperature version is typically used where extra temperature protection is needed, such as the dryer section of a paper machine.

Ordering information model 101.01 (±5% sensitivity)

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

101.01- A - B (CC-DD) - Options - Accessories

A : Sensitivity (±5%)

- 3 : *10 mV/g (high frequency)
 - 6 : *100 mV/g (medium frequency, general purpose)
 - 9 : *500 mV/g (low frequency)
- Available suffix : N, negative polarity

B : Connector / Integral cable

- 1 : MIL-C-5015, glass seal
 - 2 : *M12 glass seal
 - 3 : M12 epoxy sealed
 - 5 : Integral cable
 - 7 : Integral cable with stainless steel overbraid protection
 - 8 : Integral cable with stainless steel protection conduit
- Option 5, 7, 8 needs additional information :(CC-DD)
Options 3, 5, 7, 8 are not stocked. Leadtime is 4 weeks.

CC : Cable Type (only integral cable B=5, 7, 8)



Model 101.01-A-2 with Overmolded M12 cable assembly

- 01 : *Polyurethane twisted pair cable (90°C)
- 02 : *Teflon FEP twisted pair Cable (200°C)
- 03 : Radox twisted pair cable (120°C, halogen free)
- 12 : Teflon FEP twisted triple Cable (200°C). For TO option.
- 13 : Radox twisted triple (120°C, halogen free). For TO option
- 31 : *Polyurethane 4 conductors cable (90°C). For TO option

DD : length in metre (only integral cable B=5, 7, 8)

Options :

Housing thread (Standard thread : M6x1)

- H1 : M16x2 (quick mouting + 120° positioning) (Not stocked)
 - H2 : Quick fit mounting (Not stocked)
 - H7 : 1/4" 28 UNF-2A. (Not stocked)
- option H2 and H1 are recommended for integral cable.
option H7 is available for North American market.

Temperature output

- T0 : 10 mV/°C. (range +2° to +120°C)
- Not available with Mil-C-5015 2 pins connector

Special Agency Approval

- X1 : Atex approved (July 2009)

Accessories :

- M6 : M6x1 mounting stud
- M7 : 1/4" 28 UNF 2A mounting stud
- M8 : M8x1.25 mounting stud
- W6 : Swivel adaptor

Special Engraving :

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

Note : * = preferred and stocked items

Ordering information model 101.11 (150°C Version)

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

101.11- A - B - Options - Accessories

A : Sensitivity (±5%)

- 6 : *100 mV/g (medium frequency, general purpose)
- Available suffix : N, negative polarity

B : Connector / Integral cable

- 1 : *MIL-C-5015, glass seal

Options & Accessories : see model 101.01

Ordering information model 101.21 (±10% sensitivity)

To order, specify model number, options and suffix :

101.21- A - B (CC-DD) - Options - Accessories

A : Sensitivity (±10%)

- 3 : *10 mV/g (high frequency)

6 : *100 mV/g (medium frequency, general purpose)
 Available suffix : N, negative polarity

B : Connector / Integral cable

1 : MIL-C-5015, glass seal
 3 : *M12 epoxy sealed
 5 : Integral cable
 7 : Integral cable with stainless steel overbraid protection
 8 : Integral cable with stainless steel protection conduit
 Options 5, 7, 8 needs additional information : (CC-DD)
 Options 5, 7, 8 are not stocked. Leadtime : 2 to 4 weeks.

CC : Cable Type (only integral cable B=5, 7, 8)

see model 101.01

DD : length in metre (only integral cable B=5, 7, 8)

* Most Popular model :

101.01-6-2 / 101.01-9-2 / 101.01-3-2 / 101.01-6-2-T0

101.11-6-1

101.21-6-3 / 101.21-3-3 / 101.21-6-3-T0

Ordering example :

101.01-6-2M6 Premium accelerometer, M12 glass seal connector

101.01-6-7(02-05)-M6 Premium accelerometer, 5 metres Integral
 teflon cable with Stainless steel overbraid.

Specifications (24°C)

Dynamic

Sensitivity (101.01)

A=3 10 mV/g $\pm$ 5%
 A=6 100 mV/g $\pm$ 5%
 A=9 500 mV/g $\pm$ 5%

Sensitivity (101.11)

A=6 100 mV/g $\pm$ 5%

Sensitivity (101.21)

A=3 10 mV/g $\pm$ 10%
 A=6 100 mV/g $\pm$ 10%

Frequency response 101.01 & 101.21 (fig. 4a, 4b)

A=3 $\pm$ 10 % : 1 to 11000 Hz
 $\pm$ 3 dB : 0.5 to 16000 Hz
 A=6 $\pm$ 10 % : 1 to 9000 Hz
 $\pm$ 3 dB : 0.5 to 14000 Hz
 A=9 $\pm$ 10 % : 0.4 to 1600 Hz
 $\pm$ 3 dB : 0.2 to 3700 Hz

Mounted Resonant frequency

A=3 35 kHz Nom
 A=6 25 kHz Nom
 A=9 16 kHz Nom

Dynamic range

A=3 500 g pk
 A=6 80 g pk
 A=9 10 g pk

Transverse response sensitivity (20Hz, 5g) <5%

Temperature response fig3

Polarity (fig. 1) Suffix dependant

Linearity $\pm$ 1% Max

Warm up time (Typical)

A=3, 6 < 1Sec
 A=9 < 10 Sec

Option T0

Output (between - and Temp) $V_{out}=10mV/^{\circ}C * Temp(^{\circ}C)$
 0VDC at 0°C
 Range +2° to 120°C

Electrical

Electrical Grounding Isolated from machine ground

..... Internal Faraday shielding (fig. 1)

Isolation(Case to shield) 100 M Ω Min

Capacitance to ground 70 pF Nom

Output impedance 50 Ω Nom

DC output bias, 4mA supply 12 VDC Nom (Fig 2)

Residual noise (24°C) : A=3

1 Hz to 25 kHz 300 μ g rms
 1 Hz 30 μ g

Residual noise (24°C) : A=6

1 Hz to 25 kHz 300 μ g rms

1 Hz 30 μ g

Residual noise (24°C) : A=9

1 Hz to 25 kHz 25 μ g rms

1 Hz 2.4 μ g

Power requirements Constant current : +2 to +10mA DC

..... Voltage : +22 to +28 VDC

Protection : Overvoltage Yes

: Reverse polarity Yes

Environmental

Temperature, operating continuous : 101.01 (max. current =4mA)

A= 3, 6 -55 to 120 °C (-65 to 250 °F)

A=9 -55 to 90 °C (-65 to 212 °F)

Temperature, operating continuous : 101.11 (max. current =4mA)

A=6, B=1 -55 to 150°C (-65 to 302 °F)

Humidity / Enclosure

B=1, 2 Not affected, hermetically sealed, 1E-8torr/l/s

B=3 IP67, epoxy sealed

Acceleration limit : Shock 5 000g peak

: Continuous vibration 500g peak

Base strain sensitivity 0.0002 g pk/u strain

Temp. transient sens. (3Hz, LLF, 20dB/dec) 5 mg/°C

Acoustic sensitivity (164 dBSP) 0.5 mg

Electromagnetic sens. (50Hz, 0.03 T) 0.2 g

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=1 Fig. 1a

B=2 Fig. 1b

B=3 Fig. 1c

Design Ceramic, preloaded annular shear mode

Weight

A=3 80 gr Nom (2.8 Oz)

A=6 85 gr Nom (3.0 Oz)

A=9 95 gr Nom (3.4 Oz)

Connector

B=1 MIL-C-5015 glass seal, Type MS3143 10SL-4P

B=2 M12 glass seal, IEC 60947-5-2

B=3 M12 epoxy seal, IEC 60947-5-2

Material AISI 316L, DIN 1.4404 (Stainless steel)

Housing thread Fig 1h

Mounting torque (M6, M7, M8 suffix) 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied

..... Sensitivity (5g, 160 Hz)

..... No frequency response

Accessories, not supplied

Cable assembly

MIL connector (B=1), Polyurethane cable 10.01-B01-A01-01-Length

MIL connector (B=1), FEP Teflon cable 10.01-B01-A01-02-Length

M12 connector B=2, 3 Polyurethane cable 10.01-E01-A01-31-Length

PU or FEP Armored cables are also available. See Model 10.01.

Accessories, spares part

Mounting Stud

M6 machine thread 191.01-06-06-1

1/4" 28 UNF machine thread 191.01-06-16-1

M8 machine thread 191.01-06-08-1

Standard Wiring color

With Mil-C-5015 cable assembly: + = Red // - = White

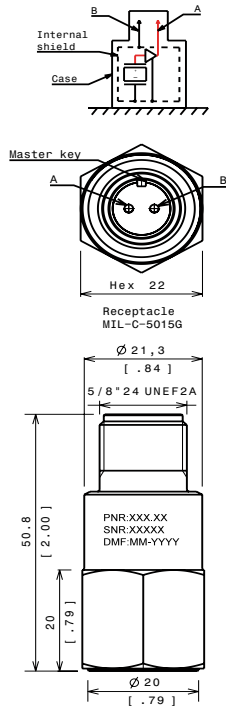
With M12 cable harness: : + = Black // - = Blue // Temperature=White

Repair

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

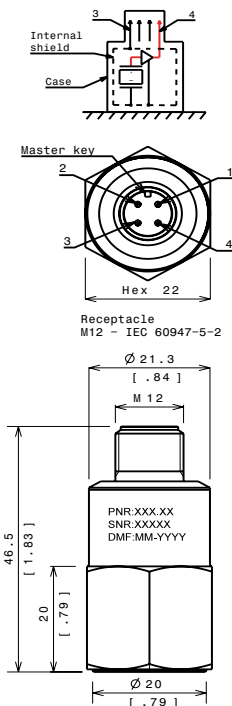
(1) Guaranteed if using accessories listed in this product datasheet only

Drawings



Model Number	Pin A	Pin B
Standard, no option	(+)	(-)
T0 Option (10mV/°C)	N/A	N/A

(N/A) : Not available
Fig 1a : Outline drawing & Electrical layout, B=1 (MIL-C-5015)



Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	NC	NC	(-)	(+)
T0 Option (10mV/°C)	NC	(Temp)	(-)	(+)

(NC) : Not connected
fig 1b : Outline drawing & Electrical layout, B=2 (M12 glass seal)

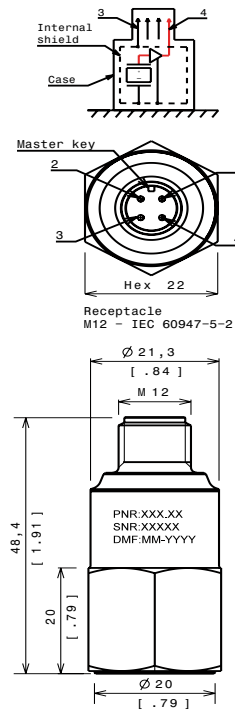
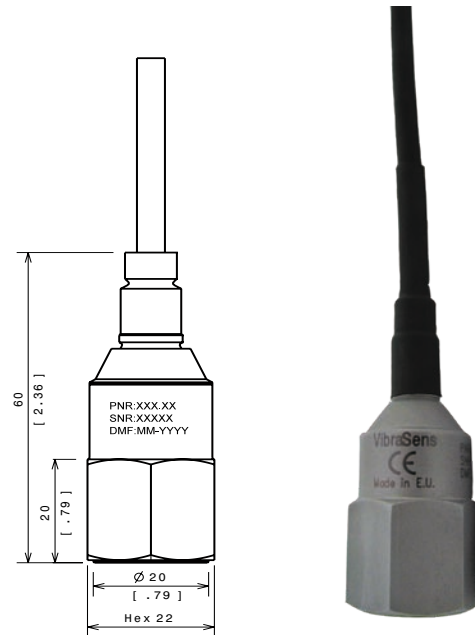


Fig 1c : Outline drawing B=3 (M12 Epoxy)
electrical layout : See above B=2



CC=01, 02 (PU, Teflon)	White (-) / Red (+)
CC=03 (Radox)	White N°1 (-) / White N°2 (+)
CC=12 (Teflon) (1)	White (-) / Red (+) / Black (Temp.)
CC=13 (Radox) (1)	White N°1 (-) / White N°2 (+) / White N°3 (Temp)
CC=31 (PU) (1)	Blue (-) / Black (+) / White (Temp.) / Brown (NC)

(1) T0 option (10mV/°C)
Fig 1d : Outline drawing & Electrical layout, B=5 (cable only)

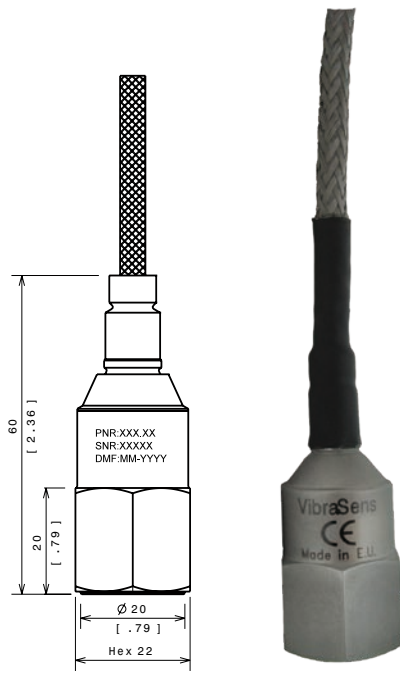


Fig 1e : Outline drawing B=7 (cable with overbraid)
electrical layout : See above B=5

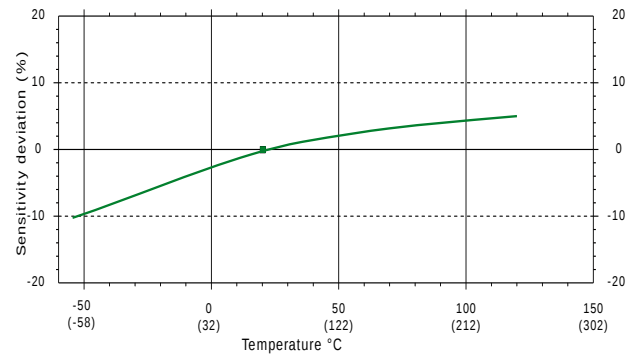


Fig 3 : Sensitivity deviation versus temperature

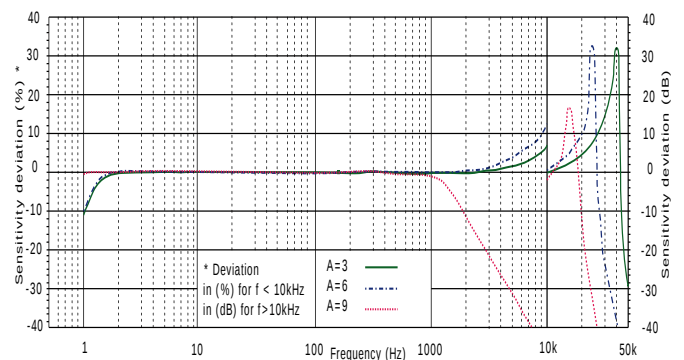


Fig 4a: Frequency response, amplitude

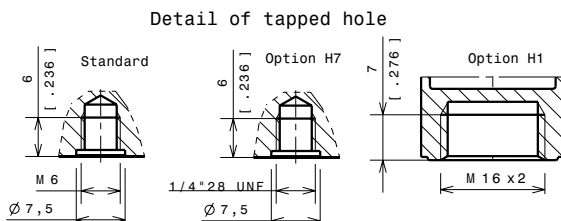


Fig 1h : Housing thread, option H1, H2, H7

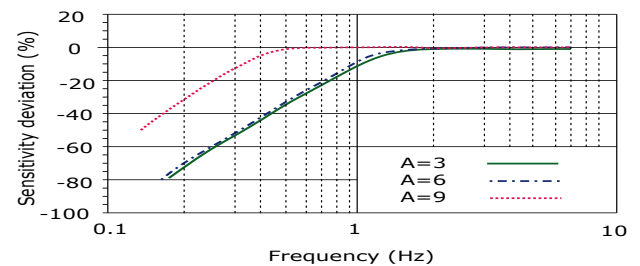


Fig 4b : Low Frequency response, amplitude

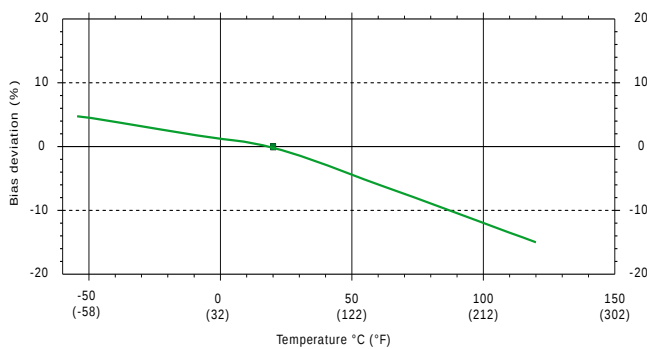


Fig 2 : DC (Bias) deviation versus temperature