

®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 designed 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 ($\pm 5\%$ sensitivity)

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

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

A : Sensitivity ($\pm 5\%$)

- 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 mounting + 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 ($\pm 5\%$)

- 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 ($\pm 10\%$ sensitivity)

To order, specify model number, options and suffix :

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

A : Sensitivity ($\pm 10\%$)

- 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 ±5%	
A=6	100 mV/g ±5%	
A=9	500 mV/g ±5%	
Sensitivity (101.11)		
A=6	100 mV/g ±5%	
Sensitivity (101.21)		
A=3	10 mV/g ±10%	
A=6	100 mV/g ±10%	
Frequency response 101.01 & 101.21 (fig. 4a, 4b)		
A=3	±10 % : 1 to 11000 Hz	
.....	±3 dB : 0.5 to 16000 Hz	
A=6	±10 % : 1 to 9000 Hz	
.....	±3 dB : 0.5 to 14000 Hz	
A=9	±10 % : 0.4 to 1600 Hz	
.....	±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		±1% Max
Warm up time (Typical)		
A=3, 6.....	< 1Sec	
A=9.....	< 10 Sec	
Option T0		
Output (between - and Temp).....	Vout=10mV/°C * Temp.(°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 MΩ Min
Capacitance to ground.....	70 pF Nom
Output impedance	50 ΩNom
DC output bias, 4mA supply.....	12 VDC Nom (Fig 2)
Residual noise (24°C) : A=3	
1 Hz to 25 kHz	300 ug rms
1 Hz	30 ug
Residual noise (24°C) : A=6	
1 Hz to 25 kHz	300 ug rms

1 Hz.....	30 ug	
Residual noise (24°C) : A=9		
1 Hz to 25 kHz	25 ug rms	
1 Hz.....	2.4 ug	
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-8storr./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 mahine thread	191.01-06-08-1

Standard Wiring color

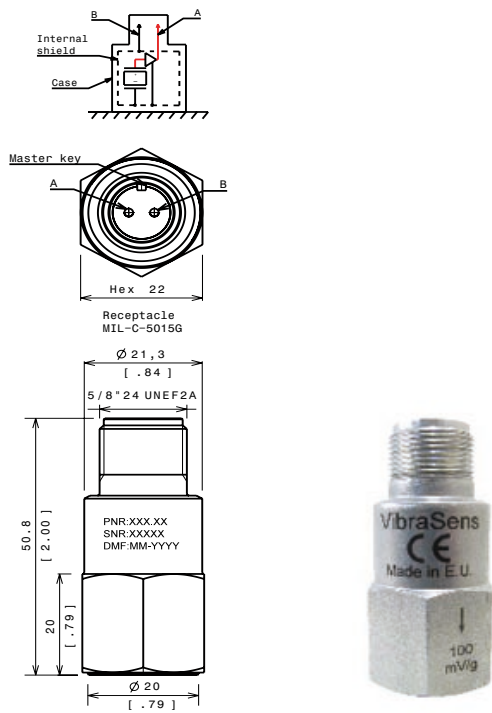
With Mil-C-5015 cable assembly: + = Red // - = White
 With M12 cable harness: : + = Black // - = Blue // Temperature=White

Repair

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

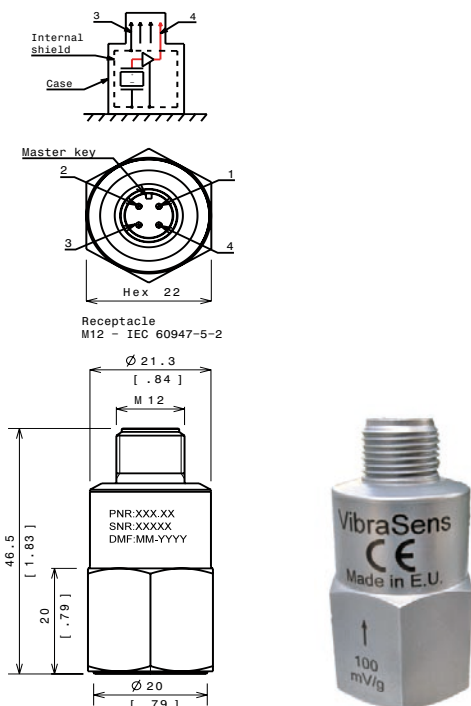
(1) Guaranteed if using accessories listed in this product datasheet only

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)

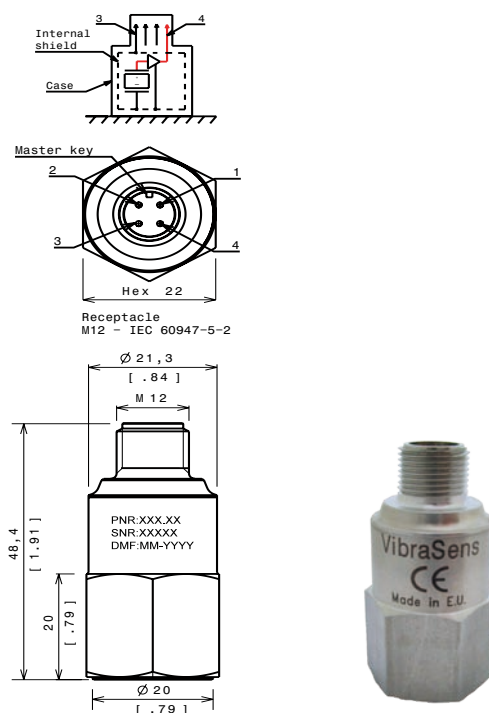
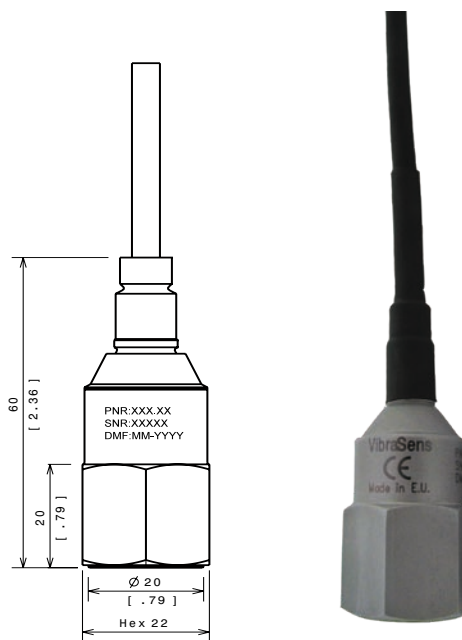


Fig 1c : Outline drawing B=3 (M12 Epoxy)
electrical layout : See above B=2



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)

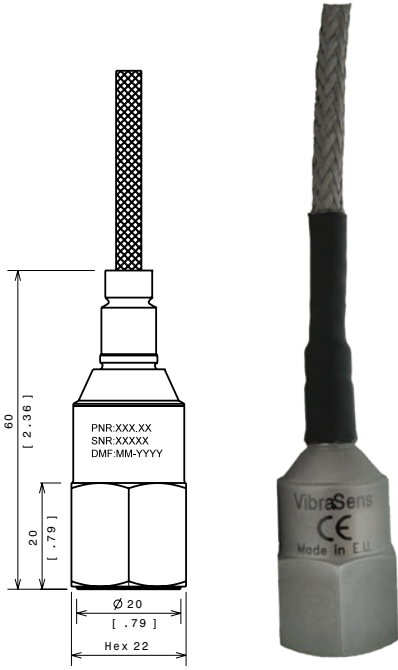


Fig 1e : Outline drawing B=7 (cable with overbraid) electrical layout : See above B=5

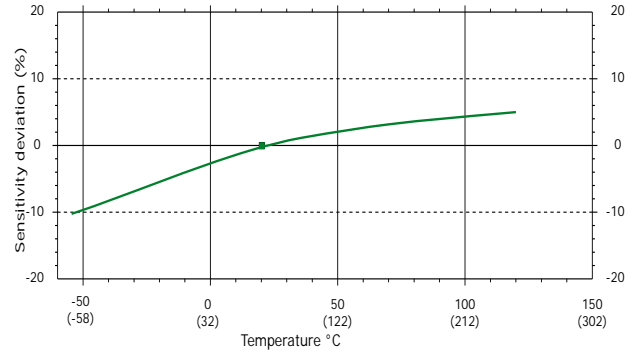


Fig 3 : Sensitivity deviation versus temperature

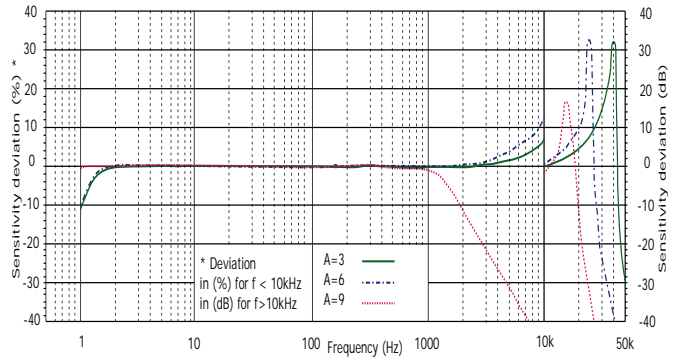


Fig 4a: Frequency response, amplitude

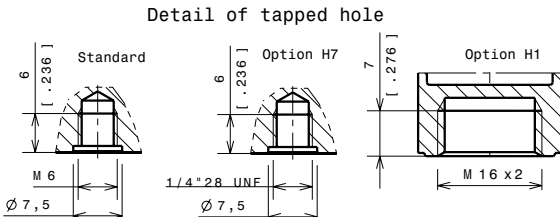


Fig 1h : Housing thread, option H1, H2, H7

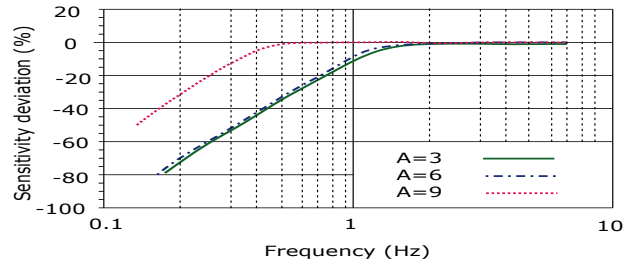


Fig 4b : Low Frequency response, amplitude

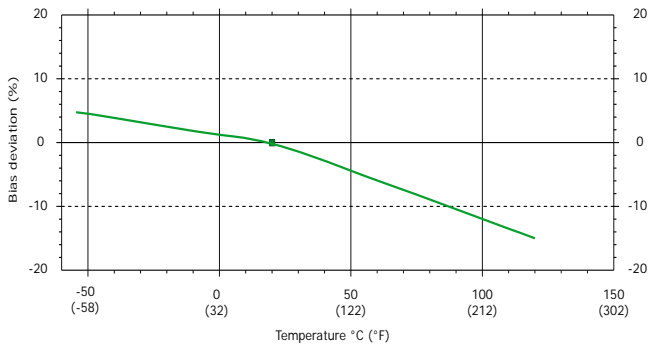


Fig 2 : DC (Bias) deviation versus temperature