

## ®ICP Accelerometer Model 103 Premium, Side connector

### Main Characteristics

- -55°C to 150 °C (-67°F to 302°F)
- ®ICP transmission mode
- Annular shear mode
- Dual case isolation with Faraday shield
- Low, medium and high frequency version
- High temperature version
- IP67 with associated cable (B=2 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 103 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 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. Low frequency accelerometers (A=9) incorporate a low-pass filter within the conditioning electronics. This filter attenuate 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 will monitor the vibration on roller bearing, pumps cavitation, .... Medium frequency version will 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, ....

### Ordering information Model 103.02 (±5% sensitivity)

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

#### 103.02- A - B (CC-DD) - Options - Accessories

To order, specify model number, options and suffix :

#### 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
  - 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 5, 7, 8 are not stocked. Leadtime : 2 to 4 weeks.

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



Model 103.02-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 :

#### Temperature output

T0 : 10 mV/°C. (+2° to +120°C)

Not available with Mil-C-5015 connector

#### Special Agency Approval

X1 : Atex approved (July 2009)

#### Accessories (Machine thread):

M6 : M6x1 Bolt, captive, hex socket

M7 : 1/4" 28 UNF 2A Bolt, captive, hex socket

#### 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 103.12 (150°C Version)

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

#### 103.12- 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 103.02

### Ordering information Model 103.22 (±10% sensitivity)

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

#### 103.22- A - B (CC-DD) - Options - Accessories

To order, specify model number, options and suffix :

#### 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

see model 103.02

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

see model 103.02

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

#### \* Most Popular model :

103.02-6-2 / 103.02-9-2 / 103.02-3-2 / 103.02-6-2-T0  
103.22-6-2

**Ordering example :**

103.02-6-2-M6 Premium Accelerometer, 100mV/g, M12 connector

**Specifications**

**Dynamic**

Sensitivity (103.02)	
A=3	10 mV/g ±5%
A=6	100 mV/g ±5%
A=9	500 mV/g ±5%
Sensitivity (103.12)	
A=6	100 mV/g ±5%
Sensitivity (103.22)	
A=3	10 mV/g ±10%
A=6	100 mV/g ±10%
Frequency response (103.02 & 103.12)..... fig. 14a, 14b	
A=3	±10 % : 1 to 9000 Hz
	±3 dB : 0.5 to 13000 Hz
A=6	±10 % : 1 to 6000 Hz
	±3 dB : 0.5 to 10000 Hz
A=9	±10 % : 0.4 to 1600 Hz
	±3 dB : 0.2 to 3700 Hz
Mounted Resonant frequency	
A=3	32 kHz Nom
A=6	22 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% max	
Temperature response ..... (See fig13)	
Polarity .....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 * T(°C)	
z	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	
Protection : Reverse polarity..... Yes	

<b>Environmental</b>	
Temperature :	
Operating continuous : 103.02 & 103.22 (max. current =4mA)	
A=3, 6	-55 to 120 °C (-65 to 250 °F)
A=9	-55 to 90 °C (-65 to 212 °F)
Operating continuous : 103.12 (max. current =4mA)	
B=1	-55 to 150°C (-65 to 302 °F)
Humidity / Enclosure	
B=1, 2	Not affected, hermetically sealed, 1E-8torr.l/s
Acceleration limit : Shock .....5 000g peak	
Acceleration limit : Continuous vibration.....500g peak	
Base strain sensitivity ..... 0.0002 ug 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	

**Environmental**

Temperature :	
Operating continuous : 103.02 & 103.22 (max. current =4mA)	
A=3, 6	-55 to 120 °C (-65 to 250 °F)
A=9	-55 to 90 °C (-65 to 212 °F)
Operating continuous : 103.12 (max. current =4mA)	
B=1	-55 to 150°C (-65 to 302 °F)
Humidity / Enclosure	
B=1, 2	Not affected, hermetically sealed, 1E-8torr.l/s
Acceleration limit : Shock .....5 000g peak	
Acceleration limit : Continuous vibration.....500g peak	
Base strain sensitivity ..... 0.0002 ug 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	See Fig. 1a

B=2	See Fig. 1b
Design	Ceramic, preloaded annular shear mode
Weight	
A=3	150 gr Nom (5.2 Oz)
A=6	155 gr Nom (5.6 Oz)
A=9	165 gr Nom (6.0 Oz)

Connector	
B=1	MIL-C-5015 glass seal, Type MS3143 10SL-4P
B=2	M12 glass seal, IEC 60947-5-2
Material	AISI 316L, DIN 1.4435 (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	
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 and FEP Armored cables are also available. See Model 10.01.	

**Accessories, spares part**

Mounting Stud	
M6 machine thread	193.01-06-1
1/4" 28 UNF machine thread	193.01-16-1

**Standard Wiring color**

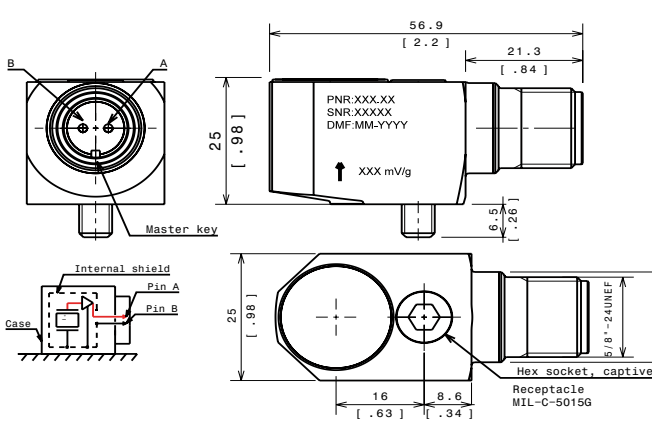
With Mil-C-5015 cable assembly: + = Red // - = White  
 With M12 cable harness: : + = Black // - = Blue // Temperature=White

**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 datasheet only

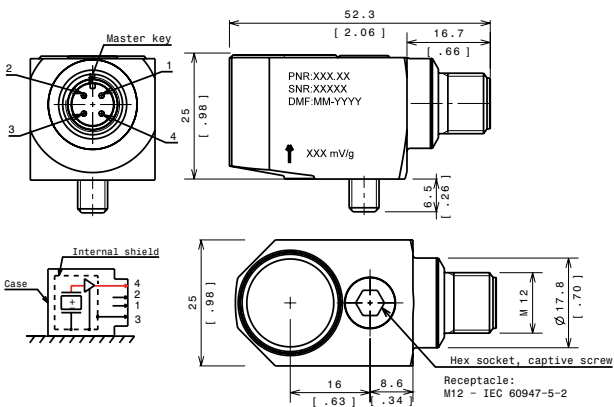
Drawings



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

(N/A) : Not available

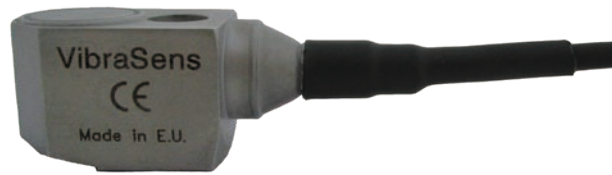
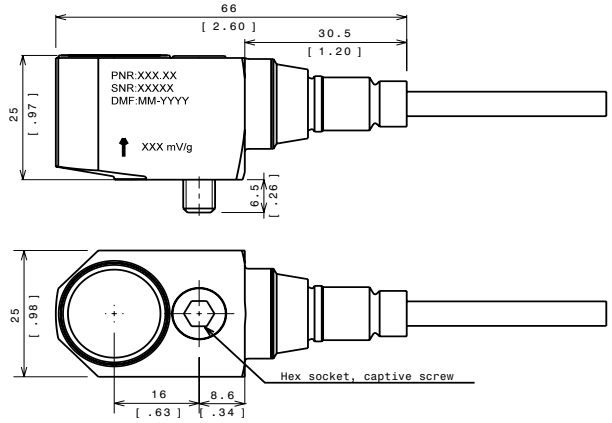
Fig 1a : Outline drawing & Electrical layout for MIL-C-5015 Connector (B=1)



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

(NC) : Not connected / (Temp) : Temperature

Fig 1b : Outline drawing & Electrical layout for M12 Glass seal Connector (B=2)



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

Fig 1d : Outline drawing & Electrical layout, B=5 (cable only)

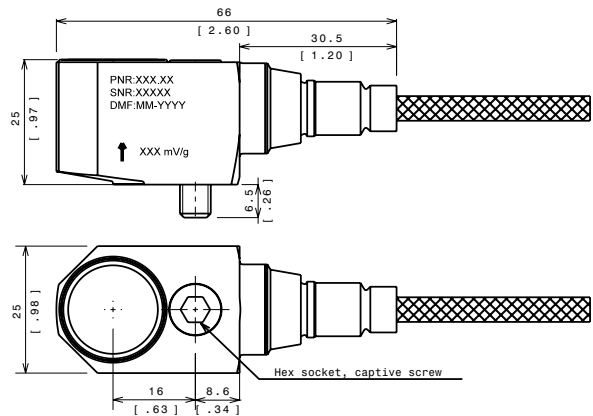


Fig 1e : Outline drawing B=7 (cable with overbraid) electrical layout : See above B=5

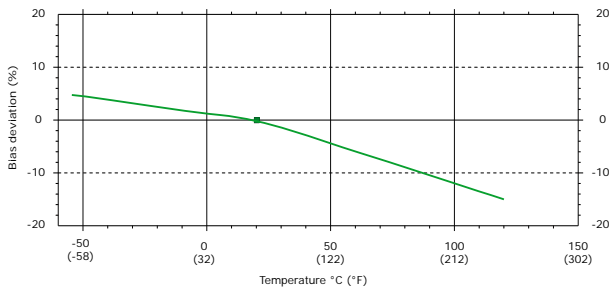


Fig 12 : DC (Bias) deviation versus temperature

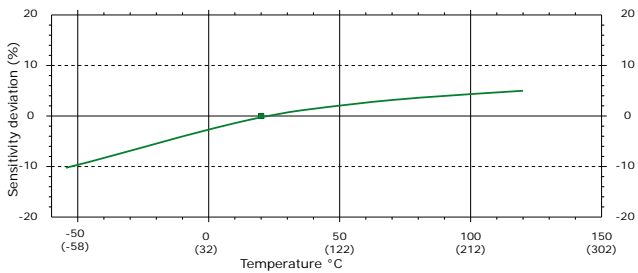
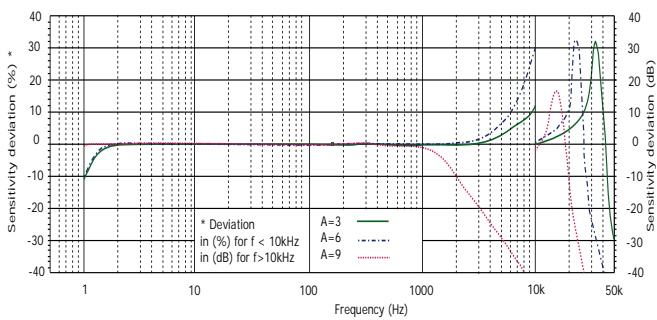


Fig 13 : Sensitivity deviation versus temperature



14a : Frequency response, amplitude

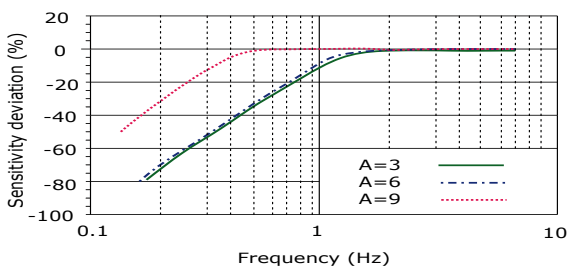


Fig 14b : Low Frequency response, amplitude



76, La Rivière  
45490 SCEAUX DU GATINAIS



info@viaxys.com



www.viaxys.com



02 38 87 45 35



02 38 87 41 33