

®ICP PiezoVelocity sensor Model 113 Side Connector

Main Characteristics

- 100 mV/ips or 4 mV/mm/s
- -55°C to 120 °C (-67°F to 248°F)
- ®ICP transmission mode
- Annular shear mode
- Dual case isolation with Faraday shield
- IP67 with associated cable (B=2, 3 only)

Competitive advantage

- Annular shear mode is less susceptible to base strain.
- Ultra low noise electronic
- Miswiring and surge protections
- 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 piezovelocity transducer model 113 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 base strain. Low noise electronic and a temperature compensated design will give you accurate result over the complete temperature range.

Typical applications

Velocity is the preferred measurement for most rotating machines with rolling element bearings. Unfortunately it is sometimes impossible to get velocity (with digital or analog integration) from standard piezoelectric accelerometer : very high frequency noise can overload the accelerometer and saturate the output. Piezovelocity sensors use an internal integration circuit which inherently decrease high frequency signals allowing better measurement of low frequency signal. Paper machine dryers (when steam leaks), pumps (cavitation high frequency noise) are prone to such phenomenom.

Ordering information model 113.01

To order, specify model number, options and suffix :

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

A : Sensitivity (Suffix)

- 6 : 100 mV/ips (4mV/mm/s)
- Available suffix : N, negative polarity

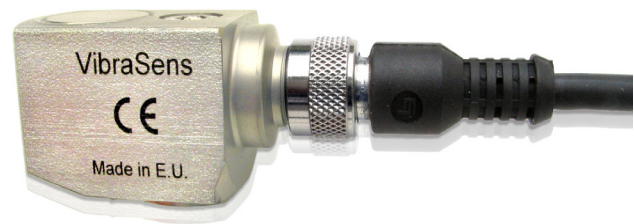
B : Connector / Integral cable

- 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)

- 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 T0 option

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



Model 113.01-A-2 with Overmolded M12 cable assembly

Options :

Temperature output

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

Special Agency Approval

None

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

*Most Popular model (in stock) :

113.02-6-2 / 113.02-6-1

Ordering example :

113.02-6-2-M6 piezovelocity sensor, 100 mV/ips, M12 top connector

Specifications (24°C)

Dynamic

| | |
|--|-----------------------------|
| Sensitivity A=6..... | 100 mV/ips ±10% (4 mV/mm/s) |
| Frequency response (fig. 4a, 4b) | |
| A=6 | ±10 % : 2.5 to 3500 Hz |
| | ±3 dB : 1.9 to 7000 Hz |
| Mounted Resonant frequency A=6 | 16 kHz Nom |
| Dynamic range A=6 | 50 in/sec pk (1250 mm/sec) |
| Transverse response sensitivity (20Hz, 5g) | <5% |
| Temperature response | fig3 |
| Polarity | (fig. 1) Suffix dependant |
| Linearity | ±1% Max |
| Warm up time (Typical) A=6 | < 5Sec |

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 | 200 ΩNom |
| DC output bias, 4mA supply | 10 VDC (Fig 2) |
| Residual noise (24°C) : A=6 | |
| 2.5 Hz to 25 kHz | 100 µin/sec |
| 10 Hz..... | 10 µin/sec |
| 1000 Hz | 0.1 µin/sec |
| 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) | -55 to 120 °C (-65 to 250 °F) |
| Humidity / Enclosure | |
| B=1, 2 | Not affected, hermetically sealed, 1E-8torr.l/s |
| B=3 | IP67, epoxy sealed |
| Acceleration limit : Shock | 2 500g peak |
| : Continuous vibration..... | 250g peak |
| Base strain sensitivity | 0.004 in/sec/µstrain |

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 Fig. 1a
 B=1 Fig. 1b
 B=2 Fig. 1d
 B=6 Fig. 1e
Design Ceramic, preloaded annular shear mode
Weight A=6 165 gr Nom (5.8 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 1.4401 (Stainless steel)
Mounting torque (M6, M7, M8 suffix) 2,4 N.m (21 in-lbs)

Accessories, supplied

Calibration supplied Sensitivity (5 in/sec, 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.
Captive screw
 M6 193.01-06-1
 1/4"28UNF 193.01-16-1

Standard Wiring color

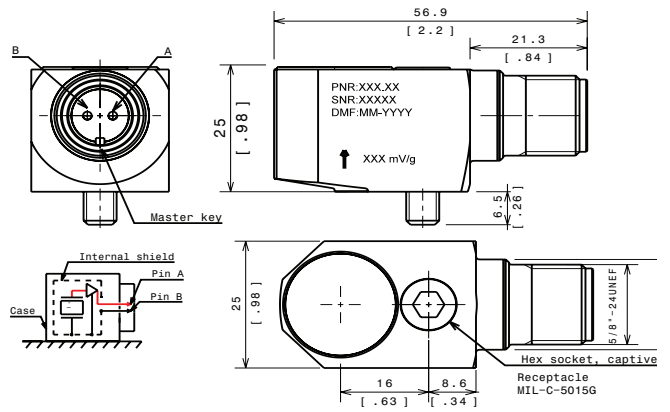
With Mil-C-5015 cable assembly: + = Red // - = White
 With M12 cable harness: : + = Black // - = Blue // Temperature=White

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 product datasheet only

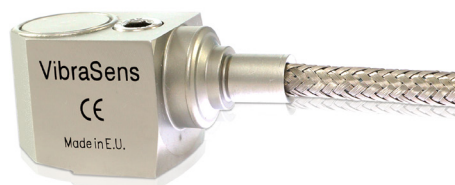
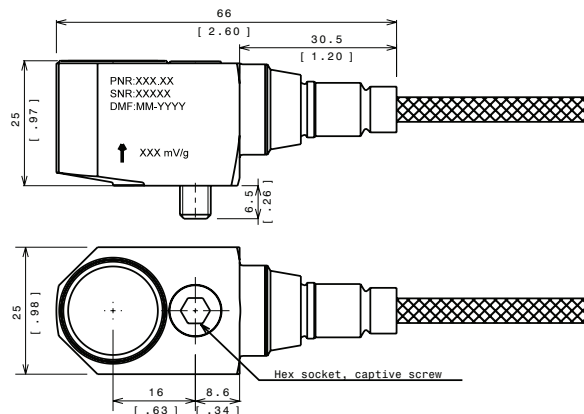
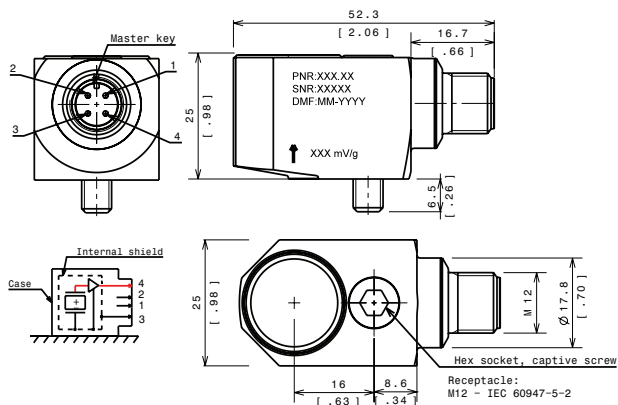
Drawings



| 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 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)

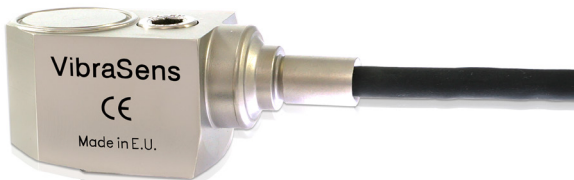
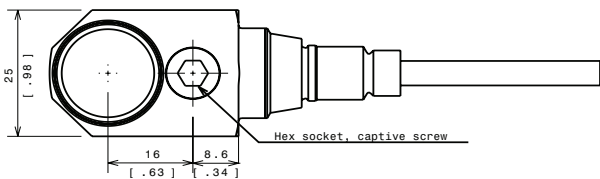
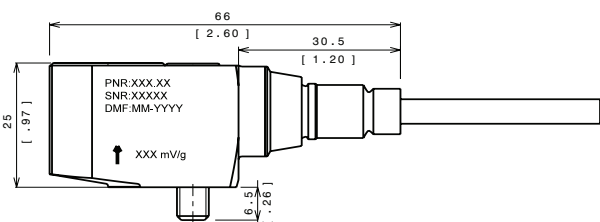


Fig 1e : Outline drawing B=7 (cable with overbraid) electrical layout : See above B=5

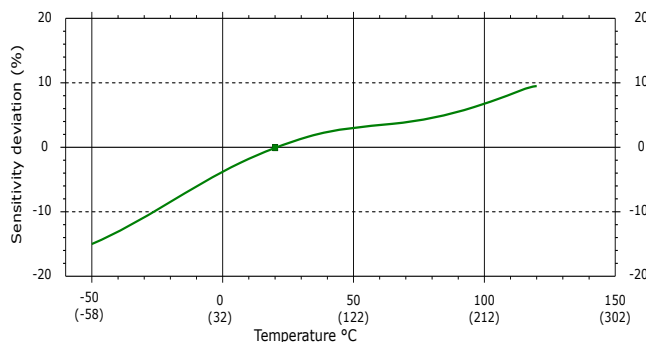


Fig 2 : DC (Bias) deviation versus temperature

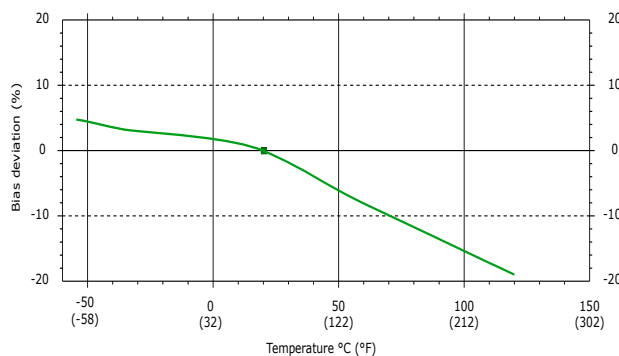


Fig 3 : Sensitivity deviation versus temperature

| | |
|------------------------|---|
| 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)

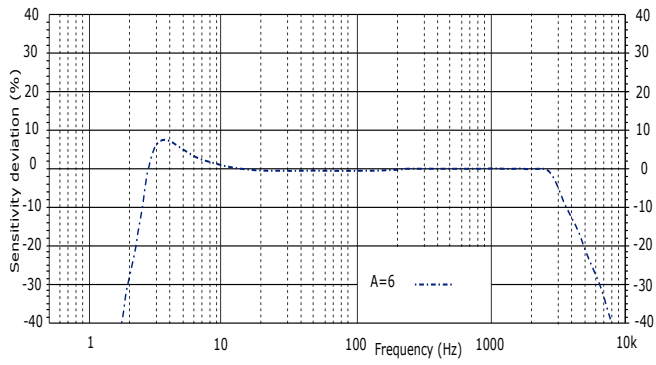


Fig 4a: Frequency response, amplitude