

4-20 mA Vibration Sensor Model 125 Top Connector

Main Characteristics

- Velocity (RMS, Peak) or Acceleration (RMS, Peak)
- Dynamic output available : Velocity or Acceleration
- IP67 with associated cable (B=2, 3 only)

Competitive advantage

- Price
- 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 4-20 mA loop powered industrial accelerometer model 125 is design to monitor the vibration in harsh industrial environment. It uses the industry standard 4-20mA Loop that interfaces directly with PLC, DCS and 4-20mA monitor. Large choice of output (velocity, acceleration, RMS, equivalent Peak) and frequency range will help to fit almost every customer requirements. Their compact size allows for installation in tight places. The dynamic signal output (acceleration or velocity) can allow spectral vibration measurements.

Typical applications

Vibrations measurement in the rugged environments of industrial machinery monitoring. It allows continuous trending of overall machine vibration.

Ordering information model 125.01

To order, specify model number, options and suffix :

125.01- AAAA - B (CC-DD) - Options - Accessories

AAAA : Full Scale (=20mA)

- AR05 : Acceleration RMS 5g (3Hz to 10kHz $\pm 10\%$)
- AR10 : Acceleration RMS 10g (3Hz to 10kHz $\pm 10\%$)*
- AR20 : Acceleration RMS 20g (3Hz to 10kHz $\pm 10\%$)
- AR50 : Acceleration RMS 50g (3Hz to 10kHz $\pm 10\%$)

- AP05 : Acceleration Peak 5g (3Hz to 10kHz $\pm 10\%$)
- AP10 : Acceleration Peak 10g (3Hz to 10kHz $\pm 10\%$)
- AP20 : Acceleration Peak 20g (3Hz to 10kHz $\pm 10\%$)
- AP50 : Acceleration Peak 50g (3Hz to 10kHz $\pm 10\%$)

- VR10: Velocity RMS 10 mm/s (3Hz to 1000 Hz $\pm 10\%$)*
- VR11: Velocity RMS 0.5 ips (3Hz to 1000 Hz $\pm 10\%$)
- VR20: Velocity RMS 20 mm/s (3Hz to 1000 Hz $\pm 10\%$)
- VR21: Velocity RMS 1 ips (3Hz to 1000 Hz $\pm 10\%$)
- VR51: Velocity RMS 2 ips (3Hz to 1000 Hz $\pm 10\%$)

- VP10: Velocity Peak 10 mm/s (3Hz to 1000 Hz $\pm 10\%$)*
- VP11: Velocity Peak 0.5 ips (3Hz to 1000 Hz $\pm 10\%$)
- VP20: Velocity Peak 20 mm/s (3Hz to 1000 Hz $\pm 10\%$)
- VP21: Velocity Peak 1 ips (3Hz to 1000 Hz $\pm 10\%$)
- VP51: Velocity Peak 2 ips (3Hz to 1000 Hz $\pm 10\%$)

Note : Peak is based on the true RMS value of vibration. For a sine wave, the equivalent peak output is 1.414 times the RMS. value.

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



Model 125.01-AAAA-2 with Overmolded M12 cable assembly

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 DA/DV option.
- 13 : Radox twisted triple (halogen free). For DA/DV option
- 31 : *Polyurethane 4 conductors cable (90°C). For DA/DV 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.

Acceleration Dynamic Output: DA

- 100 mV/g +30% for VRXX, VPXX, AR05, AP05
 - 10mV/g +30% for AR10, AR20, AR50, AP10, AP20, AP50.
- DA is not available for MIL-C-5015 2-pin connector (B=1).

Velocity Dynamic Output: DV

- 100 mV/ips +30% for VRXX and VPXX
- DV is not available for MIL-C-5015 2-pin connector (B=1).

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

*Most Popular model (in stock) :

- 125.01-VR10-3-DA // 125.01-VR21-3-DA
- 125.01-AR20-3-DA

Ordering example :

- 125.01-VR10-3-DA-M6 4-20mA sensor, FS=10mm/s RMS, M12 top connector, Dynamic acceleration output

Specifications (24°C)

Dynamic

Sensitivity

No vibration 4 mA
 Full scale (see AAAA ordering information) 20 mA $\pm 2\%$
 Note : Equivalent Peak is based on the true RMS value of vibration. For a sine wave,
 the equivalent peak output is 1.414 times the RMS. value.

Accuracy (Repeatability) 2%
 Frequency response See AAAA ordering information
 Mounted Resonant frequency 25 kHz Nom
 Transverse response sensitivity (20Hz, 5g) <5%
 Linearity $\pm 1\%$ Max
 Turn on time, 4-20 mA loop < 15 Sec

Option : Dynamic acceleration (DA)

Sensitivity See ordering information
 Dynamic 25 g for 100 mV/g output
 250 g for 10 mV/g output
 Power Need 4-20 mA loop, no constant current source is needed, DC bias=2.6V.
 Frequency response $\pm 10\%$: 3 to 9000 Hz
 ± 3 dB : 1 to 14000 Hz

Option : Dynamic velocity (DV)

Sensitivity See ordering information
 Dynamic 1.5 ipstt
 Power Need 4-20 mA loop, no constant current source is needed.
 Frequency response $\pm 10\%$: 3 to TBD Hz
 ± 3 dB : 1 to TBD Hz

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
 Maximum Loop resistance $R_{I \text{ Max}} = (V_{dc \text{ power}} - 10V) / 20mA$
 Minimum RI wattage Watt min=0.0004xRI
 Power requirements for two wire loop Voltage : +10 to +30 VDC
 Protection : Overvoltage Yes
 : Reverse polarity Yes

Environmental

Temperature, operating continuous
 max. loop current =10mA -55 to 120 °C (-65 to 250 °F)
 max. loop current =20mA -55 to 90 °C (-65 to 212 °F)
 Humidity / Enclosure
 B=1, 2 Not affected, hermetically sealed, 1E-8storr./s
 B=3 IP67, epoxy sealed
 Acceleration limit : Shock 2 500g peak
 : Continuous vibration 250g peak
 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
 B=5 Fig. 1e
 B=6 Fig. 1f

Design PZT Ceramic
 Weight 85 gr Nom (3.0 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

.....DA or DV if applicable

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 191.01-06-06-1
 1/4" 28 UNF 191.01-06-16-1
 M8 191.01-06-08-1

Standard Wiring color

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

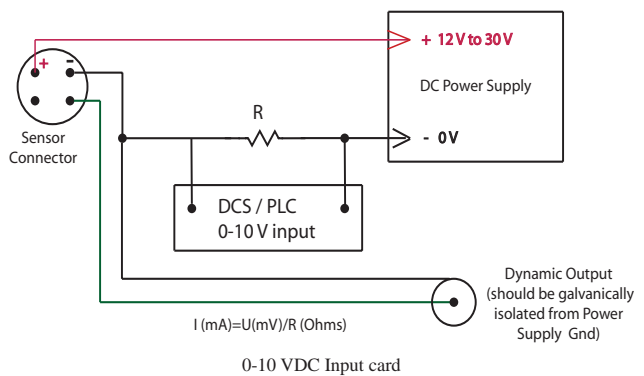
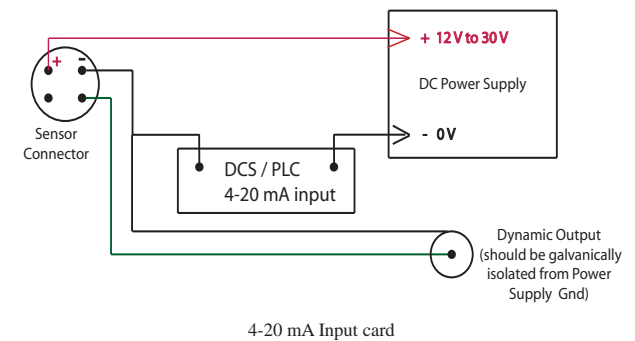
With M12 cable harness: + = Brown // - = White // DA or DV=Black

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

Wiring Schematic



Drawings

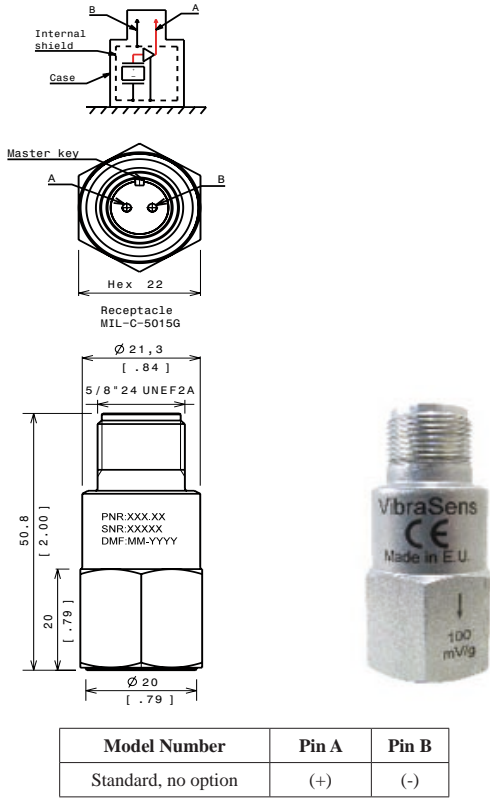
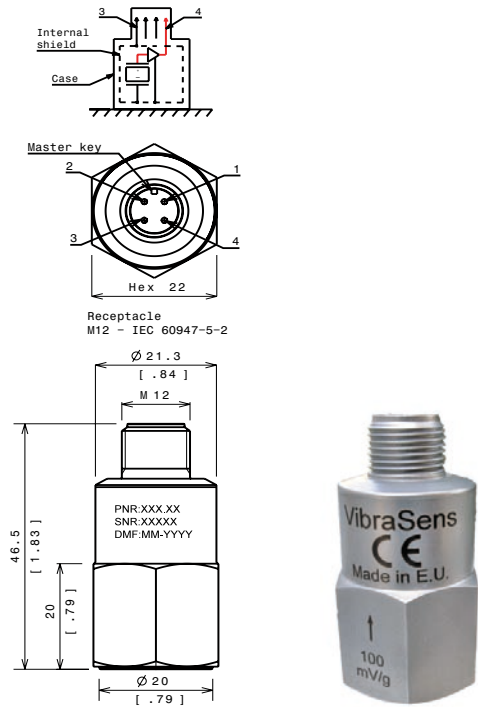


Fig 1a : Outline drawing & Electrical layout, B=1 (MIL-C-5015)



Model Number	Pin 1	Pin 2	Pin 3	Pin 4
Standard, no option	(+)	(-)	NC	NC
DA / DV Option	(+)	(-)	NC	DA or DV

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

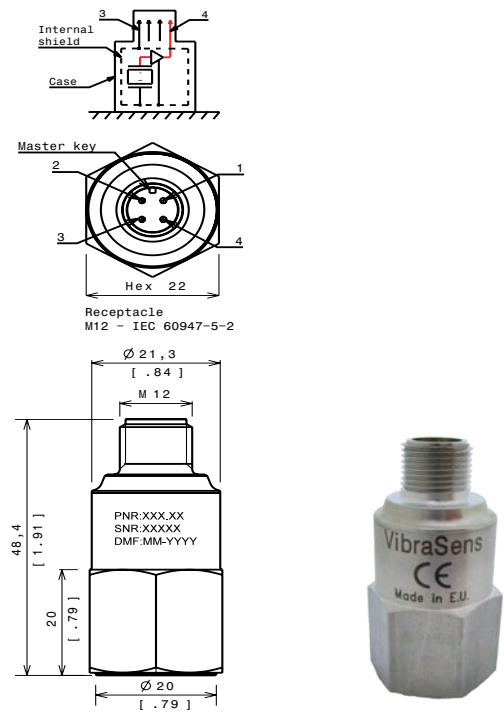


Fig 1c : Outline drawing B=3 (M12 Epoxy)
electrical layout : See above B=2

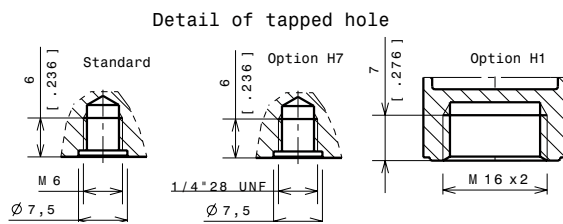
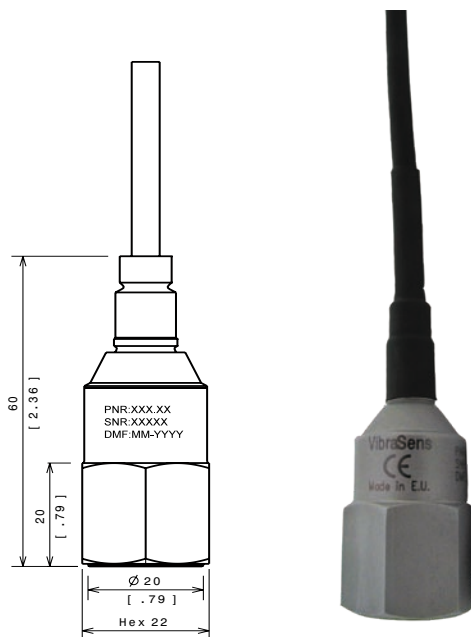


Fig 1h : Housing thread, option H1, H2, H7

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

(NC) : Not connected

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

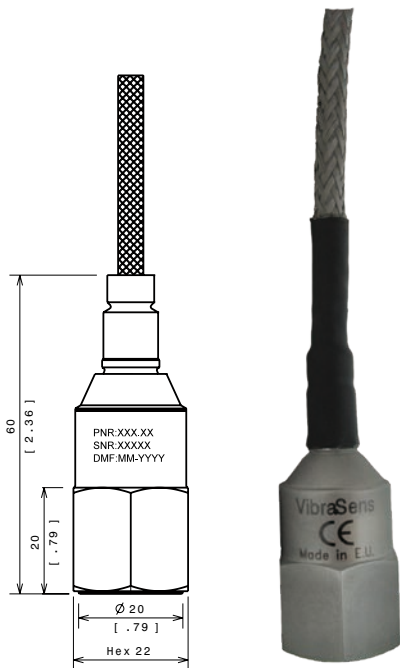


Fig 1e : Outline drawing B=7 (cable with overbraid)
electrical layout : See above B=5