

4-20 mA Vibration Sensor Model 125 Top Connector

Main Characteristics

- Annular shear mode (better than obsolete compression design)
- Velocity (RMS, Peak) or Acceleration (RMS, Peak)
- Dynamic output available : Velocity or Acceleration
- Temperature output available (10 mV/°C)
- Dual case isolation with Faraday shield
- Submersible version (150 metres) with associated IP68 overmolded cable
- life time hermetic sealing warranty (M12/Mil glass seal connector)

Competitive advantage

- Price
- Compare to obsolete compression design, annular shear piezoelectric sensors feature better frequency response, improved base strain, lower noise, smaller size, thermal transient immunity and insensitivity to cable motion (compression design will be affected by cable motion in the velocity range : 3Hz to 1000 Hz). Annular shear mode is also less susceptible to transverse vibrations and better immune to electronic saturation at high frequency.
- Resistant to shock (magnet mounting) thanks to protected Mosfet transistor input.
- ESD and reverse wiring protection.
- The glass seal hermetic connector protects the piezoelectric disc and the electronic from harmful environmental influences, significantly increasing their reliability and lifetime. Associated with low cost IP68 overmolded M12 cable assembly it is a perfect solution for submersible application down to 150 metres. Sensors sealed with epoxy will leak after few temperature cycles.
- M12 connector (4-Pin) offers compatibility with numerous sensors used in automation. M12 overmolded cable assemblies are available from many cable manufacturers around the world. Mil cordset are expensive because they are only available from vibration sensor manufacturer. Moreover the 2-Pin mil connector doesn't allow for optional output like temperature or acceleration.

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.



Model 125.01-AAAA-2 with Overmolded M12 cable assembly

Ordering information model 125.01

To order, specify model number, options and suffix :

125.01- AAAA - B - TT - MM - HH - YY

AAAA : Full Scale (=20mA)

AR05 : Acceleration RMS 5g (3Hz to 10kHz ±10%)
 AR10 : Acceleration RMS 10g (3Hz to 10kHz ±10%)
 AR20 : Acceleration RMS 20g (3Hz to 10kHz ±10%)
 AR50 : Acceleration RMS 50g (3Hz to 10kHz ±10%)

AP05 : Acceleration Peak 5g (3Hz to 10kHz ±10%)
 AP10 : Acceleration Peak 10g (3Hz to 10kHz ±10%)
 AP20 : Acceleration Peak 20g (3Hz to 10kHz ±10%)
 AP50 : Acceleration Peak 50g (3Hz to 10kHz ±10%)

VR10: Velocity RMS 10 mm/s (3Hz to 1000 Hz ±10%)
 VR11: Velocity RMS 0.5 ips (3Hz to 1000 Hz ±10%)
 VR20: Velocity RMS 20 mm/s (3Hz to 1000 Hz ±10%)
 VR21: Velocity RMS 1 ips (3Hz to 1000 Hz ±10%)
 VR51: Velocity RMS 2 ips (3Hz to 1000 Hz ±10%)
 VR100: Velocity RMS 100 mm/s (3Hz to 1000 Hz ±10%)

SR10 : Velocity RMS 10 mm/s (10Hz to 1000 Hz ±10%)
 SR11: Velocity RMS 0.5 ips (10Hz to 1000 Hz ±10%)
 SR20: Velocity RMS 20 mm/s (10Hz to 1000 Hz ±10%)
 SR21: Velocity RMS 1 ips (10Hz to 1000 Hz ±10%)
 SR51: Velocity RMS 2 ips (10Hz to 1000 Hz ±10%)
 SR100: Velocity RMS 100 mm/s (10Hz to 1000 Hz ±10%)

VP10: Velocity Peak 10 mm/s (3Hz to 1000 Hz ±10%)
 VP11: Velocity Peak 0.5 ips (3Hz to 1000 Hz ±10%)
 VP20: Velocity Peak 20 mm/s (3Hz to 1000 Hz ±10%)
 VP21: Velocity Peak 1 ips (3Hz to 1000 Hz ±10%)
 VP51: Velocity Peak 2 ips (3Hz to 1000 Hz ±10%)
 VP100: Velocity Peak 100 mm/s (3Hz to 1000 Hz ±10%)

SP10: Velocity Peak 10 mm/s (10Hz to 1000 Hz ±10%)
 SP11: Velocity Peak 0.5 ips (10Hz to 1000 Hz ±10%)
 SP20: Velocity Peak 20 mm/s (10Hz to 1000 Hz ±10%)
 SP21: Velocity Peak 1 ips (10Hz to 1000 Hz ±10%)
 SP51: Velocity Peak 2 ips (10Hz to 1000 Hz ±10%)
 SP100: Velocity Peak 100 mm/s (10Hz to 1000 Hz ±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

- 1 : MIL-C-5015, glass seal
- 2 : M12 glass seal
- 5 (CC-DD) : Integral cable
- 7 (CC-DD) : Integral cable with sstl overbraid protection
- 8 (CC-DD) : Integral cable with stainless steel protection conduit

CC : Cable Type / DD : length in metre

- 01 : *Polyurethane cable (90°C)
- 02 : *Teflon FEP Cable (200°C)
- 03 : Radox cable (120°C, halogen free)
- 5, 7, 8 : epoxy seal

TT : Optional output (only one optional output is possible)**Omitted : no optional output****T0: Temperature output**

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

DA: Acceleration Dynamic Output

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

DV: Velocity Dynamic Output

- 100 mV/ips +/-30% for VRXX, VPXX, , ARXX, APXX
- (not available with MIL-C-5015 2-pin connector)

MM : Machine thread

- Omitted : no mounting stud will be shipped with the sensor.
- M6 : M6x1
- M7 : 1/4" 28 UNF 2A
- M8 : M8x1.25

HH : Housing thread

- Omitted or H6 : M6x1 (China, Europe, India, South America, ...)
- H1 : M16x2 (quick mounting + 120° positioning) (Not stocked)
- H2 : Quick fit mounting (Not stocked)
- H7 : 1/4" 28 UNF-2A. (U.S.A., UK, ...)

YY : Agency Approval

- omitted : no agency approval
- Y1 : Atex approved (October 2010)

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-VR20-2-DA // 125.01-VR21-2-DA

Ordering example :

125.01-VR20-2-DA-M6 4-20mA sensor, FS=20mm/s RMS, M12 top connector, Dynamic acceleration output

Specifications (24°C)**Dynamic****Sensitivity**

- No vibration 4 mA ±5%
- Full scale (see AAAA ordering information)..... 20 mA ±5%
- 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.

Frequency response See AAAA ordering information

Mounted Resonant frequency 25 kHz Nom

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

Linearity ±1% Max

Turn on time, 4-20 mA loop < 10 Sec

Option : Temperature output (T0)

- Output $V_{out}=10mV/°C * Temp.(°C)$
- 0VDC at 0°C
- Range +2° to 120°C
- Power Need 4-20 mA loop

Option : Dynamic acceleration (DA)

Sensitivity See ordering information : 10 or 100 mV/g

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 ±10 % : 3 to 9000 Hz

..... ±3 dB : 1 to 14000 Hz

Option : Dynamic velocity (DV)

Sensitivity 100 mV/ips (4 mV/mm/s)

Dynamic 1.5 ips

Power Need 4-20 mA loop, no constant current source is needed, DC bias=2.6V.

Frequency response ±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 MΩ Min

Capacitance to ground 70 pF Nom

Maximum Loop resistance $RI_{Max}=(V_{dc} \text{ power} - 10V)/20mA$

Minimum RI wattage $Watt \text{ min}=0.0004xRI$

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 Glass seal, Not affected, hermetically sealed, 1E-8torr/l/s

B=5, 7, 8 Epoxy sealing

Acceleration limit : Shock 2 500g peak

: Continuous vibration 250g peak

Mean time between failure (MTBF) 6 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=5 Fig. 1d

B=7 Fig. 1d

B=8 Fig. 1f

Design ceramic annular shear

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

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

..... 4-20mA Loop // DA or DV if applicable

Accessories, not supplied

Cable assembly

MIL connector (B=1), Polyurethane cable 10.01-B22-A01-01-Length

MIL connector (B=1), FEP Teflon cable 10.01-B22-A01-02-Length

M12 connector (B=2) Polyurethane cable 10.01-E02-A01-31-Length

M12 connector (B=2), FEP Teflon cable 10.01-E02-A01-12-Length

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

Accessories, spares part

Mounting Stud with M6 Housing thread (HH=H6)

M6 191.01-06-06-1

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

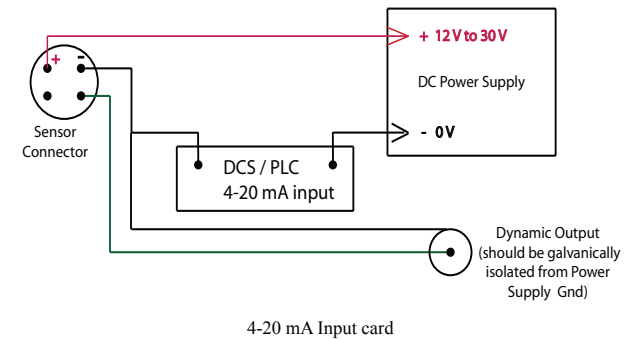
M8 191.01-06-08-1

Repair

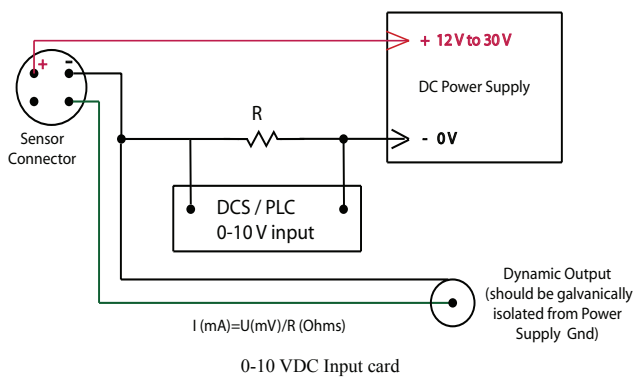
Consult factory for replacement of connector in case of broken or bended pins. Repair of electronic is not possible.

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

Wiring Schematic

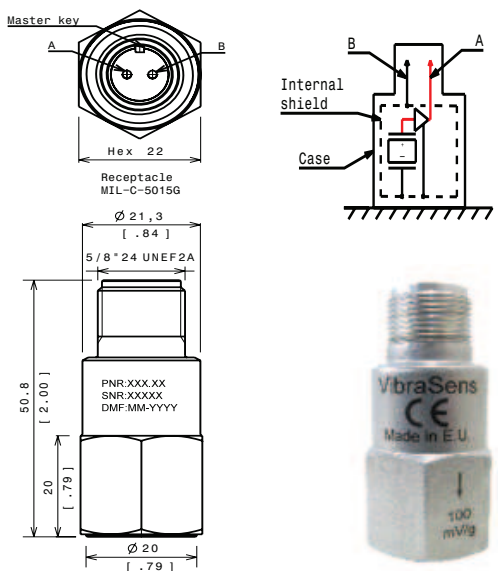


4-20 mA Input card



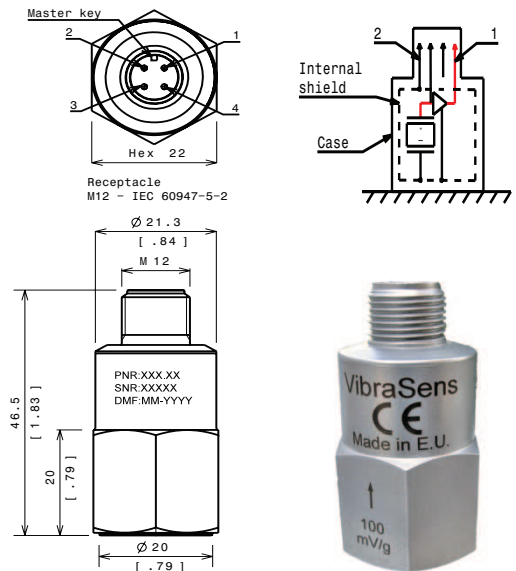
0-10 VDC Input card

Drawings



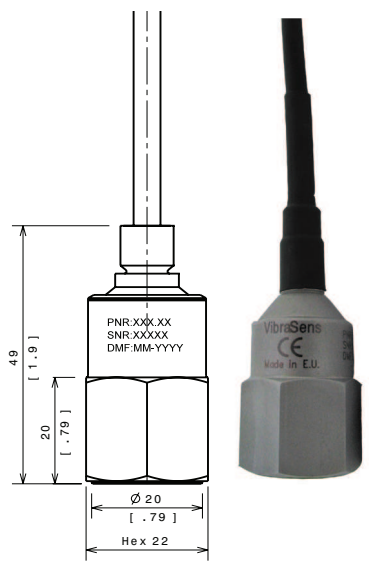
Model Number	Pin A	Pin B
Standard, no option	(+)	(-)

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
Temperature T0 Option	(+)	(-)	T0 (-)	T0 (+)

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



Model Number	(+)	(-)	DA, DV (+)	T0 (+)	T0 (-)
CC=01, 02 (PU, Teflon), no option	Red	White	NA	NA	NA
CC=03 (Radox) with DA/DV option	White N°1	White N°2	White N°3	NA	NA
CC=01 (PU) with DA/DV option	Brown	White	Black	NA	NA
CC=02 (Teflon) with DA/DV option	Red	White	Black	NA	NA
CC=01 (PU) with T0 option	Brown	White	N/A	Black	Blue

(NA) : Not Applicable
Fig 1d : Outline drawing & Electrical layout, B=5 (cable only)

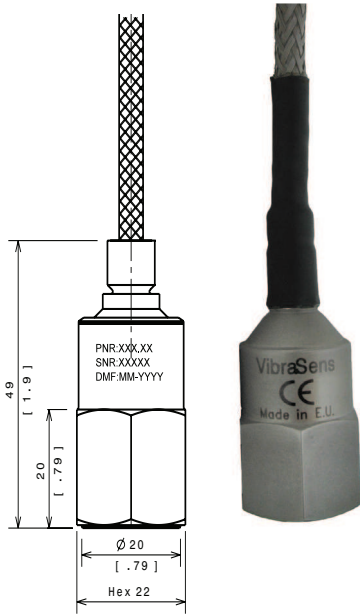


Fig 1e : Outline drawing B=7 (cable with overbraided electrical layout : See above B=5)

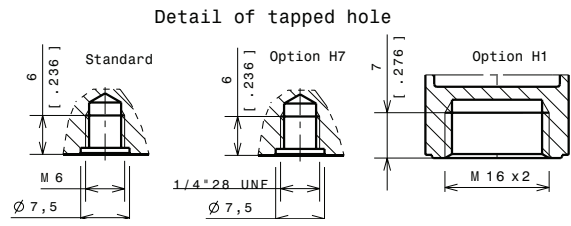


Fig 1h : Housing thread, option H1, H2, H7

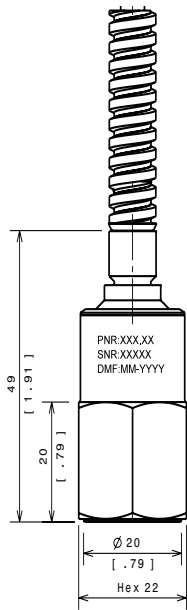


Fig 1f : Outline drawing B=8 (cable with conduit protection electrical layout : See above B=5)