4-20 mA Vibration Transmitter, Top connector

Main Characteristics
- ATEX Approved for zone 0, 1, 2.
- Can monitor machine as low as 180 RPM.
- Annular shear mode
  (better than obsolete compression design)
- Velocity or Acceleration (RMS, Peak) output
- 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 over-molded cable
- Life time hermetic sealing warranty (M12/Mil glass seal connector)
- ISO 10816 (or new ISO 20816) compliant.

Competitive advantage
- Price
  Compare to obsolete compression design, annular shear piezoelectric sensors can monitor machine vibration down to 180 RPM. They are also less sensitive to base strain and are immune to thermal transient and cable motion.
  (compression design can only monitor machine as low as 600 RPM).
- 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 don’t allow for optional out like temperature or acceleration.

Description
The hermetic sealed 4-20 mA loop powered industrial accelerometer model 125 is designed 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

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

Approvals

Revision History
June 2008 : Released
Sept 2016 : DA frequency response is same as 4-20 mA output.
## Model 125.01

### Ordering Information

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

**125.01 - AAAA - B - TT - HH - YY**

**AAAA** : Full Scale (=20mA)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR01</td>
<td>Acceleration RMS 01g (3Hz to 10kHz ±10%)</td>
<td></td>
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<tr>
<td>AR05</td>
<td>Acceleration RMS 05g (3Hz to 10kHz ±10%)</td>
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<tr>
<td>AR10*</td>
<td>Acceleration RMS 10g (3Hz to 10kHz ±10%)</td>
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<tr>
<td>AR20*</td>
<td>Acceleration RMS 20g (3Hz to 10kHz ±10%)</td>
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<tr>
<td>AR50</td>
<td>Acceleration RMS 50g (3Hz to 10kHz ±10%)</td>
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<tr>
<td>AR100</td>
<td>Acceleration RMS 100g (3Hz to 10kHz ±10%)</td>
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<tr>
<td>AP01</td>
<td>Acceleration Peak 01g (3Hz to 10kHz ±10%)</td>
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<td>AP05</td>
<td>Acceleration Peak 05g (3Hz to 10kHz ±10%)</td>
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<td>AP10</td>
<td>Acceleration Peak 10g (3Hz to 10kHz ±10%)</td>
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<td>AP20</td>
<td>Acceleration Peak 20g (3Hz to 10kHz ±10%)</td>
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<tr>
<td>AP100</td>
<td>Acceleration Peak 100g (3Hz to 10kHz ±10%)</td>
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</tr>
<tr>
<td>VR10</td>
<td>Velocity RMS 10 mm/s (3Hz to 1000 Hz ±10%)</td>
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<tr>
<td>VR20*</td>
<td>Velocity RMS 20 mm/s (3Hz to 1000 Hz ±10%)</td>
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<td>VR25</td>
<td>Velocity RMS 25 mm/s (3Hz to 1000 Hz ±10%)</td>
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<td>VR50</td>
<td>Velocity RMS 50 mm/s (3Hz to 1000 Hz ±10%)</td>
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<tr>
<td>VR100</td>
<td>Velocity RMS 100 mm/s (3Hz to 1000 Hz ±10%)</td>
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<tr>
<td>VR11</td>
<td>Velocity RMS 0.5 ips (3Hz to 1000 Hz ±10%)</td>
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<tr>
<td>VR21*</td>
<td>Velocity RMS 1 ips (3Hz to 1000 Hz ±10%)</td>
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<tr>
<td>VR51</td>
<td>Velocity RMS 2 ips (3Hz to 1000 Hz ±10%)</td>
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<tr>
<td>VR101</td>
<td>Velocity RMS 4 ips (3Hz to 1000 Hz ±10%)</td>
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<tr>
<td>SR10</td>
<td>Velocity RMS 10 mm/s (10Hz to 1000 Hz ±10%)</td>
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<tr>
<td>SR20*</td>
<td>Velocity RMS 20 mm/s (10Hz to 1000 Hz ±10%)</td>
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<tr>
<td>SR25*</td>
<td>Velocity RMS 25 mm/s (10Hz to 1000 Hz ±10%)</td>
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<tr>
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<td>Velocity RMS 50 mm/s (10Hz to 1000 Hz ±10%)</td>
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<td>Velocity RMS 100 mm/s (10Hz to 1000 Hz ±10%)</td>
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<tr>
<td>VP10</td>
<td>Velocity Peak 10 mm/s (3Hz to 1000 Hz ±10%)</td>
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<td>SP10</td>
<td>Velocity Peak 10 mm/s (10Hz to 1000 Hz ±10%)</td>
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<tr>
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<td></td>
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</tr>
</tbody>
</table>
**SP101** …………………. Velocity Peak 4 ips (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.*  

* Most common full scale  

**B : Connector (Hermeticity is lifetime Warranty)**  

1. ........................................ MIL-C-5015, glass seal, Type MS3143 10SL-4P  
2. .................................................. M12 glass seal, IEC 60947-5-2  

**B (CC-DD) : Integral Cable**  

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5(01-DD)*</td>
<td>90°C Polyurethane cable</td>
</tr>
<tr>
<td>5(02-DD)*</td>
<td>200°C Teflon FEP cable</td>
</tr>
<tr>
<td>5(03-DD)</td>
<td>120°C Radox Halogen Free cable</td>
</tr>
<tr>
<td>5(12-DD)</td>
<td>200°C Teflon FEP cable with DA or DV output</td>
</tr>
<tr>
<td>5(13-DD)</td>
<td>120°C Radox Halogen Free cable with DA or DV output</td>
</tr>
<tr>
<td>5(31-DD)</td>
<td>90°C Polyurethane cable with DA or DV or T0 output</td>
</tr>
<tr>
<td>5(03-DD)</td>
<td>200°C Teflon FEP cable with sstl overbraid protection</td>
</tr>
<tr>
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<td>120°C Radox Halogen Free cable with DA or DV output</td>
</tr>
</tbody>
</table>

DD length in metres. Standard length are 2m, 5m, 10m, 15m, 20m, 30m.  

* Most common cable  

**TT : Optional output (only one optional output is possible)**  

Omitted : no optional output  

**T0: Temperature output** *(Not available with Mil-C-5015 2-pin connector)*  

10 mV/°C. (range +2° to +120°C)  

**DA: Acceleration Dynamic Output** *(not available with MIL-C-5015 2-pin connector)*  

100 mV/g ±30% for VRXX, VPXX, AR05, AP05  
10mV/g ±30% for AR10, AR20, AR50, AP10, AP20, AP50.  

**DV: Velocity Dynamic Output** *(not available with MIL-C-5015 2-pin connector)*  

100 mV/ips ±30% for VRXX, VPXX.  

**HH : Housing thread**  

Omitted * .............................................................. M6x1  
H7 ................................................................. 1/4" 28 UNF-2A  

* Most common thread  

**YY : Agency Approval**  

Omitted ............................................................ no specific agency approval  

Y1 (Atex & IECEx) ................................................ LCIIE X.XXX  

Group Category Gaz - Protection ........ II 1 G - Ex ia IIC T4 Ga  
Group Category Dusts - Protection ... II 1 D - Ex ia IIIC T135°C Da  
Group Mine - Protection .................... I M1 - Ex ia I Ma  
AA can be ......................................................... All
Model 125.01

B can be ................................................. 1, 2
B(CC,DD) can be ……… 5(03-DD), 7(01-DD), 7(02-DD), 7(03-DD)
& DD ≤ 99
8(01-DD), 8(02-DD), 8(03-DD)

TT can be .............................................. Omitted
HH can be ........................................... Omitted or H7

Y5 (CSA Approval) ........................................ Not Released

IS Class 1, Division 1, Groups A to D
Ex ia IIC / Class I, Zone 0 AEx ia IIC T4

AA Options can be ................................ Same as Y1 (Atex)

OEM or Customer Engraving:
Add ZXX at the end of the part number.
XX is a number supplied by VibraSens
Customer Engraving is not allowed for Explosion proof sensor.
OEM should contact VibraSens if they need custom Engraving for Explosion proof sensor.

In Stock model:
Metric connector
125.01-VR20-2-DA // 125.01-VR21-2-DA // 125.01-SR20-2-DA
American/UK connector
125.01-VR21-1-H7

Ordering example:
125.01-VR20-2-DA 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%

Mounted Resonant frequency 25 kHz Nom
Transverse response sensitivity (20Hz, 5g) <5%
Linearity ±1% Max
Turn on time, 4-20 mA loop < 10 Sec

Temperature output T0 (powered by 4-20 mA current loop)
Vout=10mV/°C * Temp.(°C)
0 VDC at 0°
Range+2° to 120°C

Dynamic acceleration DA (powered by 4-20 mA current loop)
Sensitivity 10 or 100 mV/g
Frequency response same as 4-20mA output
Maximum transmission length 10 m
Dynamic 25 g for 100 mV/g output
250 g for 10 mV/g output

Dynamic velocity DV (powered by 4-20 mA current loop)
Sensitivity 100 mV/ips (4 mV/mm/s)
Frequency response same as 4-20mA output
Dynamic 1.5 ips

Electrical

Electrical Grounding Isolated from machine ground
**Model 125.01**

**Internal Faraday shielding**
- Isolation (Case to shield): $100 \, \Omega \, \text{Min}$
- Capacitance to ground: $70 \, \text{pF} \, \text{Nom}$
- Maximum Loop resistance: $RI_{\text{Max}} = \frac{(V_{\text{dc \, power}} - 10V)}{20mA}$
- Minimum RI wattage: $W_{\text{min}} = 0.0004 \times RI$

**Power requirements for two wire loop Voltage**
- Minimum: $+10 \, \text{to} \, +30 \, \text{VDC}$

**Protection**
- Overvoltage: Yes
- Reverse polarity: Yes
- ESD Protection: $> 40 \, \text{V}$

**Environmental**
- Temperature, operating continuous
  - max. loop current $= 10 \, \text{mA}$: -55 to 120 °C (-65 to 250 °F)
  - max. loop current $= 20 \, \text{mA}$: -55 to 90 °C (-65 to 212 °F)

- Humidity / Enclosure
  - B=1, 2: Glass seal, Not affected, hermetically sealed, 1E-8 torr.l/s
  - B=5, 7, 8: Epoxy sealing

- Acceleration limit
  - Shock: 2500g peak
  - Continuous vibration: 250g peak

**Physical**
- Design: ceramic annular shear
- Weight with connector: 85 gr Nom (3.0 Oz)
- Weight with Integral cable: add sensor weight above + …
  - BB=5(CC-DD): 40 gr/m
  - BB=7(CC-DD): 60 gr/m
  - BB=8(CC-DD): 105 gr/m
- Material: AISI 316L, DIN 1.4404 (Stainless steel)
- Mounting torque (M6, M7, M8 suffix): 2.4 N.m (21 in-lbs)

**European Directive**
- EMC Directive: 2014/30/EU
- RoHS Directive: 2011/65/EU
- Certificate: 101.51-YN_Rohs2

**Atex & IECEx Approval (YY=Y1)**
- Standards: EN 60079-0, Atex General
  - EN 60079-11, Intrinsic safety, Gas, Dusts
  - IEC 61241-0, Atex General
  - IEC 61241-11, Intrinsic safety, Dusts
- Certificate: LCIE ATEX XXX
  - IECEx XXXXXX
- Installation Drawing: 101.51-Y1-IMI
- EU Declaration of Conformity: 101.51-Y1_EUDC

**Accessories, supplied**
- Calibration supplied (tag stick on the box): 4-20mA Loop // DA, DV or T0 if applicable

**Accessories, not supplied**
Cable assembly B=1 (Mil connector)
- Polyurethane cable (90°C) 10.01-A01-B22-06-Length
- FEP Teflon cable (200°C) 10.01-A01-B22-02-Length

Cable assembly B=2 (M12 connector)
- Polyurethane cable (90°C) 10.01-A01-E02-31-Length
- FEP Teflon cable (200°C) 10.01-A01-E61-02-Length

For more cable option see Model 10.01 (specific cable harness).

Mounting Stud for M6 sensor thread
- M6 machine thread 191.01-06-06-1
- 1/4” 28 UNF machine thread 191.01-06-16-1
- M8 machine thread 191.01-06-08-1

Mounting Stud for 1/4”28 UNF sensor thread (H7 Option)
- M6 machine thread 191.01-16-06-1
- 1/4” 28 UNF machine thread 191.01-16-16-1
- M8 machine thread 191.01-16-08-1

Calibration, single point., A4 certificates 501.01

**Repair**

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

### Mil-C-5015 (B=1)
- Pin A : (+)   Pin B : (-)
- Associated cable 10.01-A01-B22-06-Length: Red (+); White (-)
- Associated cable 10.01-A01-B22-02-Length: Red (+); White (-)
- Note: No temperature option available

### M12 glass seal (B=2)
- Pin 1 : (+)   Pin 2 : (-)
- Temperature Output (T0 option) between Pin 3 (-) and Pin 4 (+)
- Raw Output (DA or DV option) between Pin 2 (-) and Pin 4 (+)
- Associated cable 10.01-A01-E02-31-Length
  - Brown (+)    White (-)
  - Raw Output DA or DV between Black (+) and White (-)
  - Temperature (T0 option) between Black (+) and Blue (-)
Integral Cable B=5(CC-DD)

CC=01, 02 (PU, Teflon) : White (-); Red (+)
CC=03 (Radox) : White N°1 (+); White N°2 (-)
CC=12 (Teflon) : White (-); Red (+)
CC=13 (Radox) : White N°1 (+); White N°2 (-)
CC=31 (PU) : Brown (+); White (-)

Raw output (DA or DV) output between Black (+) and White (-)
Temperature output (T0 option) between Black (+) and Blue (-)

NC: Not connected; (1) with T0 option

Integral cable with overbraid B=7(CC-DD)

Same wiring color as B=5

Integral cable with protection conduit B=8(CC-DD)

Same wiring color as B=5
Wiring

4-20 mA Input card

0-10 VDC Input card

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