4-20 mA Vibration Transmitter, Top connector

Main Characteristics
- Atex Approved for zone 0, 1, 2.
- Can monitor machine as low as 180 RPM.
- Piezoelectric 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 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 doesn'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 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.

Approvals

Revision History
- June 2008 : Released
- Sept 2016 : DA frequency response is same as 4-20 mA output.
- Nov 2017 : new housing with M8 option
Model 127.01

Ordering information

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

127.01- AAAA - B - TT - HH - YY

AAAA : Full Scale (=20mA)

AR05 …………………. Acceleration RMS 05g (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 05g (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, Type MS3143 10SL-4P
2 ………………………………. M12 glass seal, IEC 60947-5-2

B (CC-DD) : Integral Cable

5(01-DD) ……………………………. 90°C Polyurethane cable
5(02-DD) ……………………………. 200°C Teflon FEP cable
5(03-DD) ……………………………. 120°C Radox Halogen Free cable
5(31-DD) ………………… 90°C Polyurethane cable with DA or DV or T0 output
5(12-DD) ……………………………. 200°C Teflon FEP cable with DA or DV output
5(13-DD) ………………… 120°C Radox Halogen Free cable with DA or DV output
Model 127.01

7(01-DD) .................. 90°C Polyurethane cable with ssstl overbraid protection
7(02-DD) .................. 200°C Teflon FEP cable with ssstl overbraid protection
7(03-DD) .................. 120°C Radox Halogen Free cable with ssstl overbraid protection
7(12-DD) .................. 200°C Teflon FEP cable with DA or DV output
7(13-DD) .................. 120°C Radox Halogen Free cable with DA or DV output

8(01-DD) .............. 90°C Polyurethane cable with stainless steel protection conduit
8(02-DD) .............. 200°C Teflon FEP cable with stainless steel protection conduit
8(03-DD) .............. 120°C Radox Halogen Free cable with ssstl protection conduit
8(12-DD) .............. 200°C Teflon FEP cable with ssstl conduit & DA or DV output
8(13-DD) .............. 120°C Radox cable with ssstl conduit & DA or DV output

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

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

T0: Temperature output (M12 connector or cable with 4 wires)
10 mV/°C. (range +2° to +120°C)

DA: Acceleration Dynamic Output (M12 connector or cable with 3 wires)
100 mV/g +30% for VRXX, VPXX, AR05, AP05
10mV/g +30% for AR10, AR20, AR50, AP10, AP20, AP50.

DV: Velocity Dynamic Output (M12 connector or cable with 3 wires)
100 mV/ips +30% for VRXX, VPXX.

YY : Agency Approval
Omitted ……………………………………………… no specific agency approval

Y1 (Atex & IECEx) …………………………………………………… LCIE 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 ………………… Not Applicable
AA can be …………………………………………………… All
B can be …………………………………………………… 1, 2
B(CC,DD) can be …… 5(03-DD), 7(01-DD), 7(02-DD), 7(03-DD)
8(01-DD), 8(02-DD), 8(03-DD)
& DD ≤ 99
TT can be …………………………………………………… Omitted
HH can be ………………………………………………… Omitted or H7

Y5 (CSA) ……………………………………………………… Not Released
IS Class I, Division 1, Groups A to D
Ex ia IIC / Class I, Zone 0 AEx ia IIC T4
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

*Most Popular model (in stock) :
127.01-VR20-2-DA // 125.01-VR21-2-DA

Ordering example :
127.01-VR20-2-DA  4-20mA sensor, FS=20mm/s RMS, M12, top connector, Dynamic
acceleration output.

### Specifications (24°C)

#### Dynamic

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>4 mA ±5%</td>
</tr>
<tr>
<td>No vibration</td>
<td>4 mA ±5%</td>
</tr>
<tr>
<td>Full scale (see AAAA ordering information)</td>
<td>20 mA ±5%</td>
</tr>
<tr>
<td>Mounted Resonant frequency</td>
<td>25 kHz Nom</td>
</tr>
<tr>
<td>Transverse response sensitivity (20Hz, 5g)</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Linearity</td>
<td>±1% Max</td>
</tr>
<tr>
<td>Turn on time, 4-20 mA loop</td>
<td>&lt; 10 Sec</td>
</tr>
<tr>
<td>Dynamic acceleration DA (powered by 4-20 mA current loop)</td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td>10 or 100 mV/g</td>
</tr>
<tr>
<td>Frequency response</td>
<td>same as 4-20mA output</td>
</tr>
<tr>
<td>Maximum transmission length</td>
<td>5 m</td>
</tr>
<tr>
<td>Dynamic</td>
<td>25 g for 100 mV/g output</td>
</tr>
<tr>
<td></td>
<td>250 g for 10 mV/g output</td>
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<tr>
<td>Dynamic velocity DV (powered by 4-20 mA current loop)</td>
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</tr>
<tr>
<td>Sensitivity</td>
<td>100 mV/ips (4 mV/mm/s)</td>
</tr>
<tr>
<td>Frequency response</td>
<td>same as 4-20mA output</td>
</tr>
<tr>
<td>Dynamic</td>
<td>1.5 ips</td>
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</tbody>
</table>

#### Electrical

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Grounding</td>
<td>Isolated from machine ground</td>
</tr>
<tr>
<td>Internal Faraday shielding</td>
<td></td>
</tr>
<tr>
<td>Isolation (Case to shield)</td>
<td>100 MΩ Min</td>
</tr>
<tr>
<td>Capacitance to ground</td>
<td>70 pF Nom</td>
</tr>
<tr>
<td>Maximum Loop resistance</td>
<td>Rl Max=(Vdc power - 10V) / 20mA</td>
</tr>
<tr>
<td>Minimum RI wattage</td>
<td>Watt min=0.0004kRl</td>
</tr>
<tr>
<td>Power requirements for two wire loop Voltage</td>
<td>+10 to +30 VDC</td>
</tr>
<tr>
<td>Protection</td>
<td>Overvoltage Yes</td>
</tr>
<tr>
<td></td>
<td>Reverse polarity Yes</td>
</tr>
<tr>
<td></td>
<td>ESD Protection &gt; 40 V</td>
</tr>
</tbody>
</table>

#### Environmental

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature, operating continuous</td>
<td>-55 to 120 °C (-65 to 250 °F)</td>
</tr>
<tr>
<td>max. loop current =10mA</td>
<td></td>
</tr>
<tr>
<td>max. loop current =20mA</td>
<td>-55 to 90 °C (-65 to 212 °F)</td>
</tr>
<tr>
<td>Humidity / Enclosure</td>
<td>Glass seal, Not affected, hermetically sealed, 1E-8 torr.l/s</td>
</tr>
<tr>
<td>B=1, 2</td>
<td></td>
</tr>
<tr>
<td>B=5, 7, 8</td>
<td>Epoxy sealing</td>
</tr>
<tr>
<td>Acceleration limit</td>
<td>Shock 2 500g peak</td>
</tr>
<tr>
<td></td>
<td>Continuous vibration 250g peak</td>
</tr>
</tbody>
</table>
Physical

Design
Weight with connector
160 gr Nom (5.6 Oz)

Weight with Integral cable : add sensor weight above + …
BB=5(CC-DD) 40gr/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 suffix)
2,4 N.m (21 in-lbs)

European Directive

EMC Directive 2014/30/EU
Standards 61326-1
RoHS Directive 2011/65/EU
Certificate 101.51-YN_Rohs2

Atex Approval (YY=Y1 or Y2)

Atex Directive 2014/34/EU
Standards EN 60079-0, Atex General
EN 60079-11, Intrinsic safety, Gas
IEC 61241-0, Atex General
IEC 61241-11, Intrinsic safety, Dust
EN 50303, firedamp and/or coal dust environment
Certificate LCIE ATEX XXX
IECEx XXXXX

Marking
Ex ia II C T4 Ga
Ex ia IIIC IP67 T130°C Da

I M1
Ex ia I Ma
125.01-Y1-IMI

Installation Drawing 125.01-Y1-IMI

CSA Approval (YY=Y5)

Certificate Pending
Marking IS Class 1, Division 1, Groups A to D
Ex ia IIC / Class I, Zone 0 AFex ia IIC T4
Installation Drawing 125.01-Y5-IMI

InMetro (Brazil) Approval (YY=Y7)

Certificate Pending
Installation Drawing Pending

GOST R Ex-proof (Russian Federation) Approval (YY=Y8)

Certificate Pending
Installation Drawing Pending

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
Model 127.01

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 Hex cap screw:
- M6 machine thread 193.01-06-1
- ¼" 28 UNF machine thread 193.01-16-1

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 (-)

M12 glass seal (B=2)
- Pin 1: (+)
- Pin 2: (-)
- Pin 3: T0 (-)
- Pin 4: DA or DV or T0 (+)

Associated cable
10.01-A01-E02-31-Length: Brown (+); White (-); Black (DA or DV); Black (T0 +), Blue (T0 -)

Integral Cable B=5(CC-DD)
- CC=01: Red (+); White (-);
- CC=02: Red (+); White (-)
- CC=03: White 1 (+); White 2 (+)
- CC=12: Red (+); White (-); Black (DA, DV)
Model 127.01

CC=13: White 1 (+); White 2 (-); White 3 (DA, DV)
CC=31: Brown (+); White (-); Black (DA, DV, T0+), Blue (T0 -)

Integral cable with overbraid B=7(CC-DD)
CC=01: Red (+); White (-);
CC=02: Red (+); White (-)
CC=03: White 1 (+); White 2 (-)
CC=12: Red (+); White (-); Black (DA, DV)
CC=13: White 1 (+); White 2 (-); White 3 (DA, DV)

Integral cable with protection conduit B=8(CC-DD)
Same wiring color as B=5

Wiring

4-20 mA Input card

DCS / PLC
4-20 mA Input

Sensor Connector

+ 12 V to 30 V
DC Power Supply

- 0 V

Dynamic Output
(should be galvanically isolated from Power Supply Ground)
0-10 VDC Input card

Legal Information

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