# 4-20 mA Vibration Transmitter, Top connector

## Main Characteristics
- Low Cost velocity version with limited bandwidth 10 Hz to 1000 Hz. Can monitor machine as low as 500 RPM.
- Low Cost MEMs technology with limited 40 g peak dynamic range.
- Dynamic (acceleration or Velocity) output available.
- Temperature output available (10 mV/°C)
- Submersible version down to 150 metres available with integral polyurethane and FEP cable.
- Life time hermetic sealing warranty with M12 & Mil glass seal connector.
- ISO 10816 (or new ISO 20816) compliant.

## Competitive advantage
- Price
- Resistant to shock (magnet mounting)
- ESD and reverse wiring protection.
- The glass seal hermetic connector protects 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 harsh environment.
- M12 connector (4-Pin) offers compatibility with numerous sensors used in automation.
- Large choice of integral cable with stainless steel overbraid or conduit.

## Description
The 4-20 mA loop powered industrial accelerometer model 425.01 is designed to monitor the vibration in harsh industrial environment. It uses the industry standard 2-wire 4-20mA Loop that interfaces directly with PLC, DCS and 4-20mA monitor. Large choice of output (Velocity, 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) can also allow spectral vibration measurements.

Pay attention that low cost capacitive MEMs acceleration / vibration sensor could lead to false trip if acceleration superior to 40 g peak are presents in the 5 kHz region. If such event happen model 425.51 is recommended.

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

## Approvals

## Revision History
April 2018 : Released
## Ordering information

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

425.01- AAAA - B - TT - HH - YY

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Measurement Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR10</td>
<td>Velocity RMS 10 mm/s (10Hz to 1000 Hz ±30%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR20*</td>
<td>Velocity RMS 20 mm/s (10Hz to 1000 Hz ±30%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR25*</td>
<td>Velocity RMS 25 mm/s (10Hz to 1000 Hz ±30%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR50</td>
<td>Velocity RMS 50 mm/s (10Hz to 1000 Hz ±30%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR11</td>
<td>Velocity RMS 0.5 ips (10Hz to 1000 Hz ±30%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR21*</td>
<td>Velocity RMS 1 ips (10Hz to 1000 Hz ±30%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR51</td>
<td>Velocity RMS 2 ips (10Hz to 1000 Hz ±30%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Number</th>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MIL-C-5015, glass seal, Type MS3143 10SL-4P</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M12 glass seal, IEC 60947-5-2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>M12 epoxy seal, IEC 60947-5-2</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omitted</td>
<td>no optional output</td>
</tr>
</tbody>
</table>

* Most common full scale

* Most common cable

DD length in metres. Standard length are 2m, 5m, 10m, 15m, 20m, 30m.
**T0: Temperature output** (Not available with Mil-C-5015 2-pin connector)
10 mV/°C. (range +2° to +120°C)

**DA: Acceleration Dynamic Output** (M12 connector or integral cable with 3 wires)

**DV: Velocity Dynamic Output** (M12 connector or integral cable with 3 wires)

**HH : Housing thread**

- Omitted *
- H7

* Most common thread

**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**
- 425.01-SR20-3 // 425.01-SR21-3 //
- 425.01-SR21-1-H7

**American/UK connector**

**Ordering example :**

425.01-SR20-3  4-20mA sensor, FS=20 mm/s RMS, M12, top connector.
**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) between Pin 2 (-) and Pin 4 (+)
- Associated cable: 10.01-A01-E02-31-Length: Brown (+); White (-)
- Raw Output DA between Black (+) and White (-)
- Temperature (T0 option) between Black (+) and Blue (-)

**LCP connector (B=3)**

- Pin 1: (+)  Pin 2: (-)
- Temperature Output (T0 option) between Pin 3 (-) and Pin 4 (+)
- Raw Output (DA) between Pin 2 (-) and Pin 4 (+)
- Associated cable: 10.01-A01-E02-31-Length: Brown (+); White (-)
- Raw Output DA 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 (+)
Raw output DA output between Black (+) and White (-)

CC=13 (Radox): White N°1 (+); White N°2 (-)
Raw output DA between White N°3 (+) and White N°2 (-)

CC=31 (PU): Brown (+); White (-)
Raw output DA 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
Specifications (24°C)

**Dynamic**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (no vibration)</td>
<td>4 mA ±5%</td>
</tr>
<tr>
<td>Sensitivity (full scale)</td>
<td>20 mA ±5%</td>
</tr>
<tr>
<td>Transverse response sensitivity</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>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Signal</th>
<th>2.4VDC ± 2V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (SRXX, SPXX)</td>
<td>50 mV/g ± 10%</td>
</tr>
<tr>
<td>Frequency response (±10 %)</td>
<td>10 Hz - 1 kHz</td>
</tr>
<tr>
<td>Dynamic</td>
<td>25 g</td>
</tr>
</tbody>
</table>

Maximum transmission length | 10 m |

Dynamic acceleration DV (powered by 4-20 mA current loop)

<table>
<thead>
<tr>
<th>Signal</th>
<th>2.4VDC ± 2V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (SRXX, SPXX)</td>
<td>100 mV/ips ± 10%</td>
</tr>
<tr>
<td>Frequency response (±10 %)</td>
<td>10 Hz - 1 kHz</td>
</tr>
</tbody>
</table>

Maximum transmission length | 10 m |

**Electrical**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Grounding</td>
<td>Isolated from machine ground</td>
</tr>
<tr>
<td>Isolation (Case to shield)</td>
<td>100 MΩ Min</td>
</tr>
<tr>
<td>Maximum Loop resistance</td>
<td>RI Max=(Vdc power - 10V) / 20mA</td>
</tr>
<tr>
<td>Minimum RI wattage</td>
<td>Watt min=0.0004xRI</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, Reverse polarity: Yes, ESD Protection: &gt; 40 V</td>
</tr>
</tbody>
</table>

**Environmental**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</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>-55 to 90 °C (-65 to 212 °F)</td>
</tr>
<tr>
<td>max. loop current =20mA</td>
<td></td>
</tr>
<tr>
<td>Humidity / Enclosure B=1, 2</td>
<td>Glass seal, Not affected, hermetically sealed, 1E-8 torr.l/s</td>
</tr>
<tr>
<td>B=3, 5, 7, 8</td>
<td>Epoxy sealing</td>
</tr>
<tr>
<td>Acceleration limit</td>
<td>Shock: 2 500g peak, Continuous vibration: 500g peak</td>
</tr>
</tbody>
</table>
**Physical**

Weight with connector: 70 gr Nom (2.5 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, M8 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

**Calibration certificate, supplied**

- Calibration certificate supplied

**Calibration certificate, not supplied**

- 501.01 A4 calibration Certificate

**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 or 3 (M12 connector)
  - Polyurethane cable (90°C): 10.01-A01-E02-31-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

**Repair**

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

4-20 mA Input card

0-10 VDC Input card

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