

## 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 (option B=1, 2) protects the electronic from harmful environmental influences, significantly increasing their reliability and lifetime.
- Thanks to all stainless steel IP67 M12 connector (option B=3) an IP68 solution is possible when connected to an overmolded M12 cordset. It is then a perfect cost sensitive solution for a 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 environments. 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.*



**Model 425.01-AAAA-3 shown**

### 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)**

SR10 .....	Velocity RMS 10 mm/s (10Hz to 1000 Hz $\pm 30\%$ )
SR20* .....	Velocity RMS 20 mm/s (10Hz to 1000 Hz $\pm 30\%$ )
SR25* .....	Velocity RMS 25 mm/s (10Hz to 1000 Hz $\pm 30\%$ )
SR50 .....	Velocity RMS 50 mm/s (10Hz to 1000 Hz $\pm 30\%$ )
SR100 .....	Velocity RMS 100 mm/s (10Hz to 1000 Hz $\pm 30\%$ )
SR11 .....	Velocity RMS 0.5 ips (10Hz to 1000 Hz $\pm 30\%$ )
SR21* .....	Velocity RMS 1 ips (10Hz to 1000 Hz $\pm 30\%$ )
SR51 .....	Velocity RMS 2 ips (10Hz to 1000 Hz $\pm 30\%$ )
SR101 .....	Velocity RMS 4 ips (10Hz to 1000 Hz $\pm 30\%$ )
SP10 .....	Velocity Peak 10 mm/s (10Hz to 1000 Hz $\pm 30\%$ )
SP20 .....	Velocity Peak 20 mm/s (10Hz to 1000 Hz $\pm 30\%$ )
SP25 .....	Velocity Peak 25 mm/s (10Hz to 1000 Hz $\pm 30\%$ )
SP50 .....	Velocity Peak 50 mm/s (10Hz to 1000 Hz $\pm 30\%$ )
SP100 .....	Velocity Peak 100 mm/s (10Hz to 1000 Hz $\pm 30\%$ )
SP11 .....	Velocity Peak 0.5 ips (10Hz to 1000 Hz $\pm 30\%$ )
SP21 .....	Velocity Peak 1 ips (10Hz to 1000 Hz $\pm 30\%$ )
SP51 .....	Velocity Peak 2 ips (10Hz to 1000 Hz $\pm 30\%$ )
SP101 .....	Velocity Peak 4 ips (10Hz to 1000 Hz $\pm 30\%$ )

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**

1 .....	MIL-C-5015, glass seal, Type MS3143 10SL-4P
2 .....	M12 glass seal, IEC 60947-5-2
3 .....	M12 epoxy 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
7(01-DD) .....	90°C Polyurethane cable with sstl overbraid protection
7(02-DD)* .....	200°C Teflon FEP cable with sstl overbraid protection
7(03-DD) .....	120°C Radox Halogen Free cable with sstl 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 sstl protection conduit
8(31-DD) .....	90°C PU cable with DA or DV or T0 output
8(12-DD) .....	200°C Teflon FEP cable with sstl conduit & DA or DV output
8(13-DD) .....	120°C Radox cable with sstl conduit & DA or DV output

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** (only available with M12 glass seal connector -2 option or integral cable with 4 wires)  
10 mV/°C. (range +2° to +120°C)

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

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

**HH : Housing thread**

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

\* 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 //

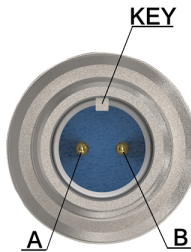
American/UK connector

425.01-SR21-1-H7

**Ordering example :**

425.01-SR20-3 4-20mA sensor, FS=20 mm/s RMS, M12, top connector.

## Configurations



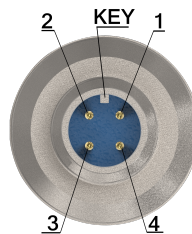
**Mil-C-5015  
(B=1)**

Pin A : (+) Pin B : (-)

Associated cable  
10.01-A01-B22-06-Length: Red (+);  
White (-)

Associated cable  
10.01-A01-B22-02-Length: Red (+);  
White (-)

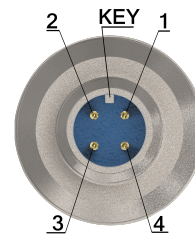
Note: No temperature option available



**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) : Not  
Available  
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

Sensitivity	
No vibration	4 mA ±5%
Full scale ( see AAAA ordering information)	20 mA ±5%
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)	
Signal	2.4VDC ± 2V
Sensitivity (SRXX, SPXX)	50 mV/g ± 10%
Frequency response (±10 %)	10 Hz - 1 kHz
Dynamic	25 g
Maximum transmission length	10 m
Dynamic velocity DV (powered by 4-20 mA current loop)	
Signal	2.4VDC ± 2V
Sensitivity (SRXX, SPXX)	100 mV/ips ± 10%
Frequency response (±10 %)	10 Hz - 1 kHz
Maximum transmission length	10 m

### Electrical

Electrical Grounding	Isolated from machine ground
Isolation(Case to shield)	100 MΩ Min
Maximum Loop resistance	RI Max=(Vdc 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
ESD Protection	> 40 V

### 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-8 torr.l/s, >IP68
B=3	IP67
B=3 with IP68 M12 cordset plugged	IP68
B= 5, 7, 8	> IP68, 50 meters Submersible available
Acceleration limit	
Shock	2 500g peak

Continuous vibration

500g peak

## 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	Measured values printed on Packing Box
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## Calibration certificate, not supplied

501.01	A4 calibration Certificate
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## Accessories, not supplied

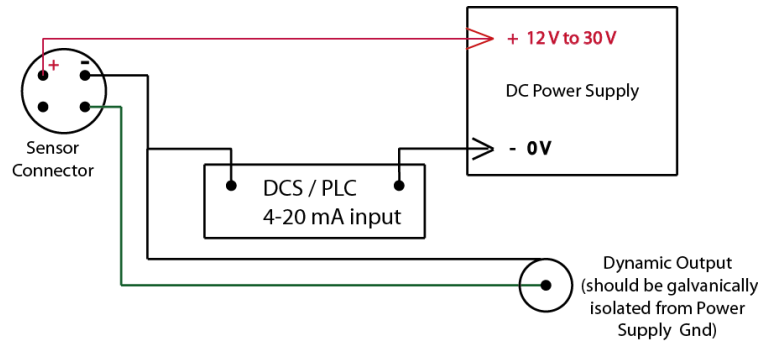
Cable assembly B=1 (Mil connector)	
Polyurethane cable (90°C)	10.01-A01-B22-06-Length
FEP Teflon cable (200°C)	10.01-A01-B22-02-Length
Cable assembly B=2 or 3 (M12 connector)	
Polyurethane cable (90°C)	10.01-A01-E02-31-Length
For more cable options see Model 10.01 (specific cable harness).	
Mounting 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

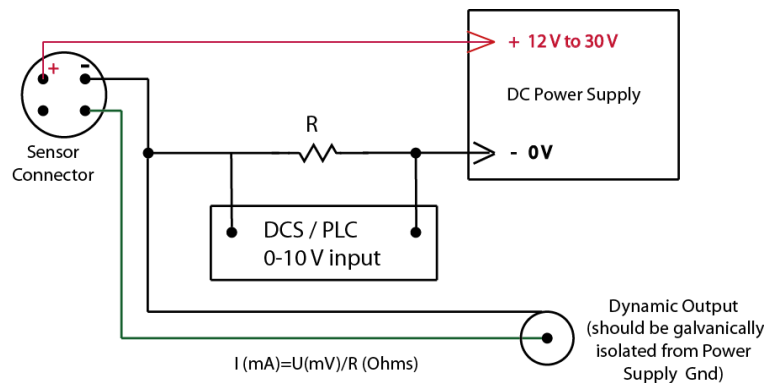
Consult factory for replacement of connector in case of broken or bended pins. Repair of electronics is not possible.

## Wiring

### 4-20 mA Input card



### 0-10 VDC Input card



## Known Installations Issue

### Unstable readings with Variable-frequency drive :

If the motor is not correctly grounded a variable and false reading occurs.

Correction : Ground the motor case and check there is no voltage difference between electronic ground and machine ground.

Correction : If it is not possible to ground the motor then use an isolated mounting pad for the sensor. Call VibraSens for more explanation.

### Legal Information

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