



## Piezoelectric vibration Sensor

PAS-101 / PAS-103 / PVS-111 / PVS-113

### FEATURES

- International Protection Rating IP68
- Polyurethane twisted pair cable up to 50m
- Annular shear mode for reduced transverse vibrations sensitivity
- Dual case isolation with Faraday shield
- Exceptional bias voltage stability at elevated temperatures
- Stainless steel body protected against shock



### Monitoring solution



Shaft & bearing vibration - absolute

### Typical applications



Hydrogenerators



Pumps, fan, cooling towers...



Gas & steam turbines

### DESCRIPTION

The hermetic sealed industrial piezoelectric accelerometer/velocimeter are designed to monitor the vibration in harsh industrial environment. It uses the industry standard @ICP 2-wire voltage transmission technic with a 4 mA minimum constant current supply. Signal ground is isolated from the mounting surface and outer case to prevent ground loops. Faraday shielding will limit sensitivity to ESD to a minimum.

Annular shear mode design prevents from thermal transient and from spurious signal from high transverse vibrations. Low noise electronic and temperature compensated design will ensure accurate results over the complete temperature range.

The sensor provides a voltage output proportional to the vibration acceleration across the two transmission wires. The DC standing voltage is used for OK detection and the dynamic voltage for vibration monitoring. A second output is available in option to output a 4-20mA processed signal proportional to the RMS value of the acceleration / velocity.

## GLOBAL SPECIFICATIONS

### OPERATION

Model version			
Top cable exit	<b>PAS-101 M1</b>	<b>PAS-101 M5</b>	<b>PVS-111</b>
Side cable exit	<b>PAS-103 M1</b>	<b>PAS-103 M5</b>	<b>PVS-113</b>
Measuring principle	Piezoelectric annular shear mode with built-in electronic		
Measuring parameter	Acceleration	Acceleration	Velocity
Electrical grounding	Isolated from machine ground		
Shielding	Internal Faraday shielding		
Isolation case to shield	100M $\Omega$		
Sensitivity	100mV/g	500mV/g	100mV/ips 4mV/mm/s
Sensitivity max error	$\pm 5\%$ <sup>1)</sup>	$\pm 5\%$	$\pm 10\%$ <sup>1)</sup>
Output impedance		50 $\Omega$ nominal	
Output bias voltage	+12V <sub>DC</sub>	+12V <sub>DC</sub>	+10V <sub>DC</sub>
Residual noise (24°C)			
1(2.5)Hz to 25kHz	300 $\mu$ g rms	25 $\mu$ g rms	100 $\mu$ in/s rms
1(10)Hz	30 $\mu$ g	2.4 $\mu$ g	10 $\mu$ in/s rms
PxS-1x1 Frequency response			
$\pm 10\%$	1 to 9'000Hz	0.4 to 1'600Hz	2.5 to 3'500Hz
$\pm 3$ dB	0.5 to 14'000Hz	0.2 to 3'700Hz	1.9 to 7'000 Hz
PxS-1x3 Frequency response			
$\pm 10\%$	1 to 6'000Hz	0.4 to 1'600Hz	2.5 to 3'500Hz
$\pm 3$ dB	0.5 to 10'000Hz	0.2 to 3'700Hz	1.9 to 7'000 Hz
Mounted resonant frequency	25kHz nominal	16kHz nominal	16kHz nominal
Dynamic range	80g pk	10g pk	1250 mm/s pk
Transverse sensitivity	< 5% max of nominal sensitivity at 20Hz, 5g		
Linearity	$\pm 1\%$ max		
Warm up time	< 1s	< 10s	< 5s
Power supply			
Constant current source	+2 to +10mA <sub>DC</sub>		
Voltage	+22 to +28V <sub>DC</sub>		
Protection	Built-in overvoltage and reverse polarity protection		

### OPTIONAL 4-20mA OUTPUT

Vibration parameter	Acceleration TRMS	Not available	Velocity TRMS
Full scale (20mA $\pm 2\%$ )	10g / 20g		10mm/s / 20mm/s
According to order code EE			
Measurement bandwidth	3Hz to 10kHz $\pm 10\%$		3Hz to 10kHz $\pm 10\%$
Accuracy	2%		2%
Linearity	$\pm 1\%$ max		$\pm 1\%$ max
Power supply	4-20mA current loop		
Power requirement	+10V to +30V <sub>DC</sub>		

### Notes:

1) Increased to  $\pm 30\%$  with the optional 4-20mA output (order code EE=10 or 20)

## GLOBAL SPECIFICATIONS (CONTINUED)

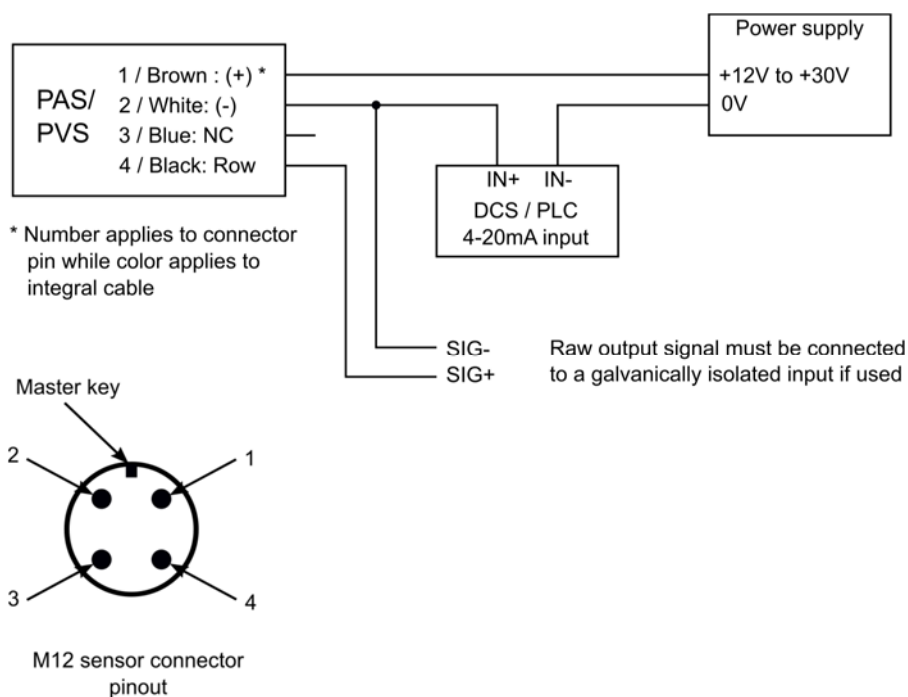
### ENVIRONMENTAL

Model version	PAS-101 M1 PAS-103 M1	PAS-101 M5 PAS-103 M5	PVS-111 PVS-113
Temperature range (continuous operation)	-55°C to +120°C	-55°C to +90°C	-55°C to +120°C
Humidity / Enclosure	Hermetically sealed		
Acceleration limit			
Shock	5'000g pk		
Continuous vibration	500g pk		
Base strain sensitivity	0.0002g pk/μ strain		
ESD protection	> 40V		
EMC emission	EN50081-1, EN50081-2		
EMC immunity	EN50082-1, EN50082-2		

### PHYSICAL

Body material	Stainless steel DIN 1.4401		
Weight (sensor only)			
Top cable exit	85gr	95gr	85gr
Side cable exit	155gr	165gr	165gr
Mounting screw	M6		
Mounting torque	2.4Nm		

## WIRING DIAGRAMM (applies to 4-20mA option only)



## ORDERING INFORMATION

### Piezoelectric Accelerometer Sensor ordering options (PAS)

01.10A.BCC DD - EE- F				
01.10	A	B	CC <sup>1)</sup>	DD
Sensor type	Exit type	Installation screw	Cable length	Sensitivity
PAS	1: Top 3: Side	0: M6 thread	00: none 05: 5m 10: 10m 15: 15m	M1: 100mV/g M5: 500mV/g
...				
EE <sup>2)</sup>	F			
Optional 4-20mA o/p	Glass Seal Connector			
void: no output 10: 10g RMS 20: 20g RMS	0: M12 1: MIL-C-5015			

### Piezoelectric Velocimeter Sensor ordering options (PVS)

01.11A.BCC - EE - F				
01.11	A	B	CC <sup>1)</sup>	EE
Sensor type	Exit type	Installation screw	Cable Length	Optional 4-20mA o/p
PVS	1: Top 3: Side	0: M6 thread 1: M8 thread 2: 1/4" 28 UNF	00: none 05: 5m 10: 10m 15: 15m	void: no output 10: 10mm/s RMS 20: 20mm/s RMS
...				
F				
Glass Seal Connector				
0: M12 1: MIL-C-5015				

Note:

- 1) Available length: 5, 10, 15, 20, 30, 40, 50m (00= Glass Seal Connector see code F)
- 2) The option EE is not available with sensitivity 500mV/g (DD=M5)

**PINOUT**

Signal	without 4-20mA option		Signal	with 4-20mA option	
	Integral cable	Ext. cable M12		Integral cable	Ext. cable M12
-	<i>White</i>	<i>Blue</i>	-	<i>White</i>	<i>White</i>
+	<i>Red</i>	<i>Black</i>	+	<i>Brown</i>	<i>Brown</i>
<b>Shield</b>	<i>Green</i>	<i>Clear</i>	<b>Raw</b>	<i>Black</i>	<i>Black</i>
<b>n/c</b>	<i>n/a</i>	<i>Brown &amp; White</i>	<b>nc</b>	<i>Blue</i>	<i>Blue</i>

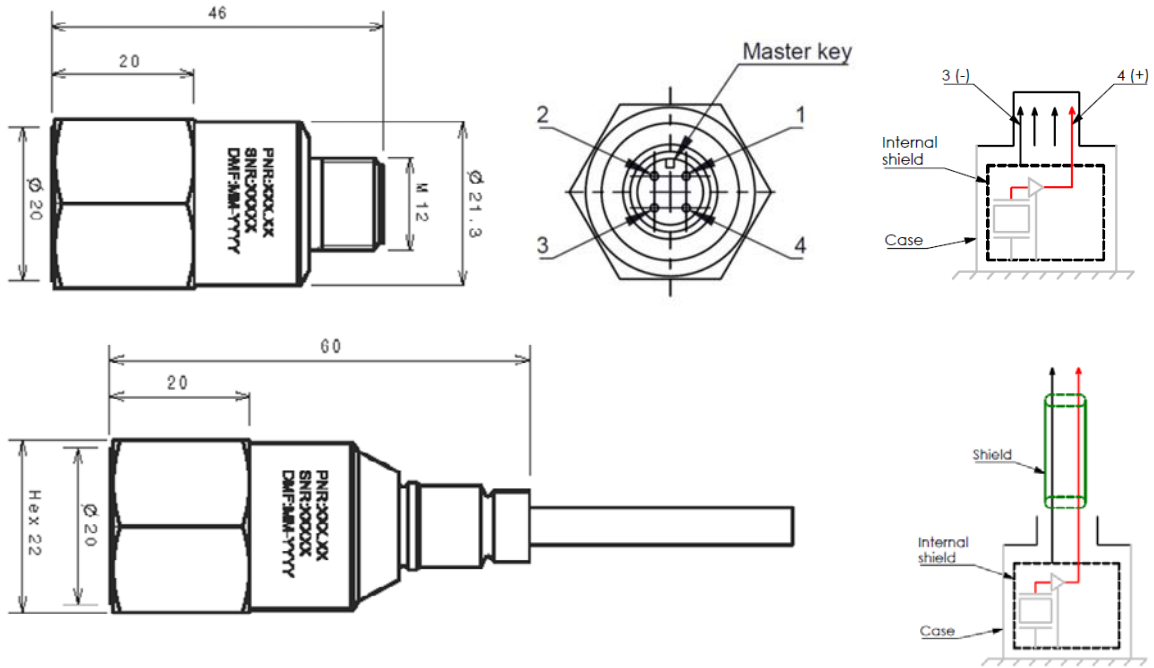
**AVAILABLE ACCESSORIES**

Part type : Extension cable with M12 connector

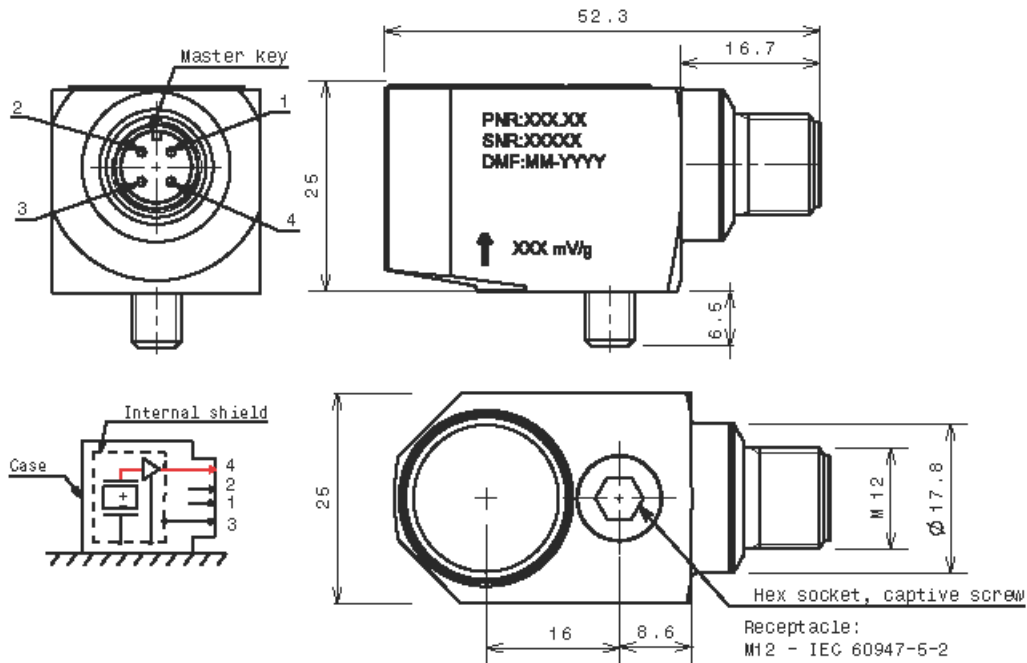
Ordering code	Product name	Length	Cable protection type
01.100.010	10.01-A01-E02-31-10	10m	Without armor, SNC
01.100.020	10.01-A01-E02-31-20	20m	Without armor, SNC
01.200.010	10.01-A04-E04-31-10	10m	With stainless steel armor, SC PNC
01.200.020	10.01-A04-E04-31-20	20m	With stainless steel armor, SC PNC

*SC : Shield Connected to connector shell*
*SNC : Shield Not Connected to connector shell*
*PNC : Protection Not Connected to connector shell*

**MECHANICAL DRAWING - PAS-101 / PVS-111**



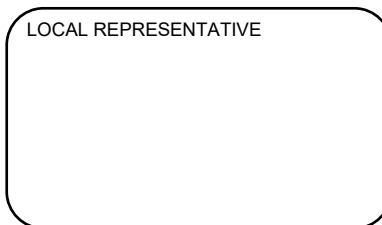
**MECHANICAL DRAWING - PAS-103 / PVS-113**



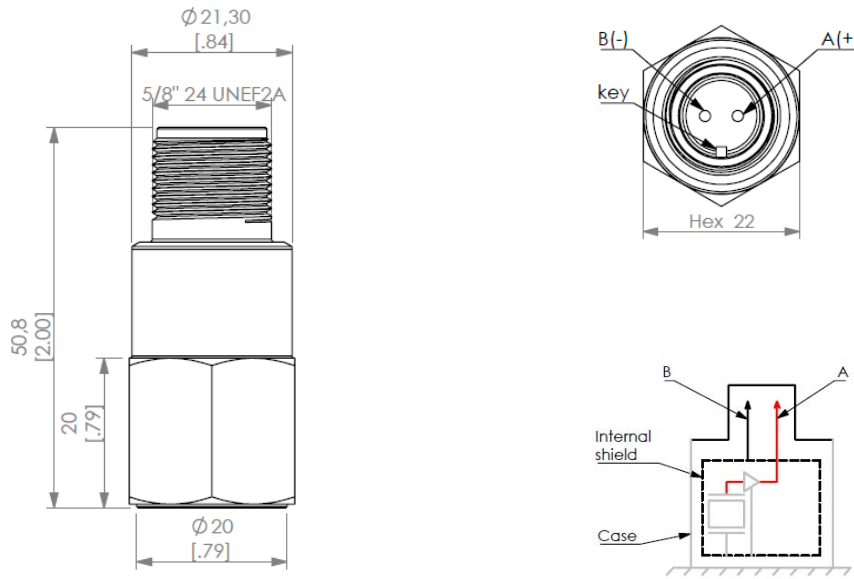
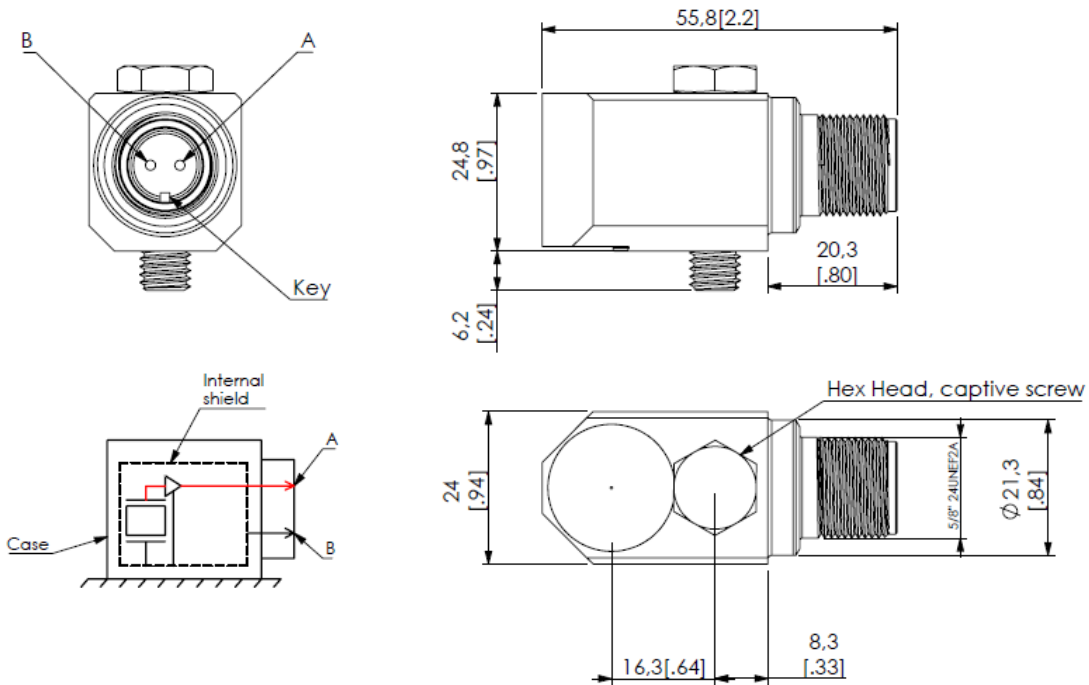
MC-monitoring Quality certifications



LOCAL REPRESENTATIVE



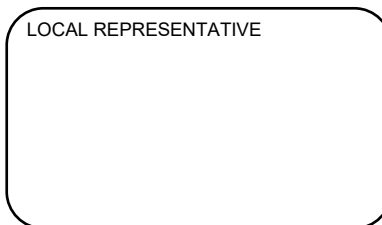
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**MECHANICAL DRAWING - PAS-101 / PVS-111 MIL glass seal connector**

**MECHANICAL DRAWING - PAS-103 MIL glass seal connector**


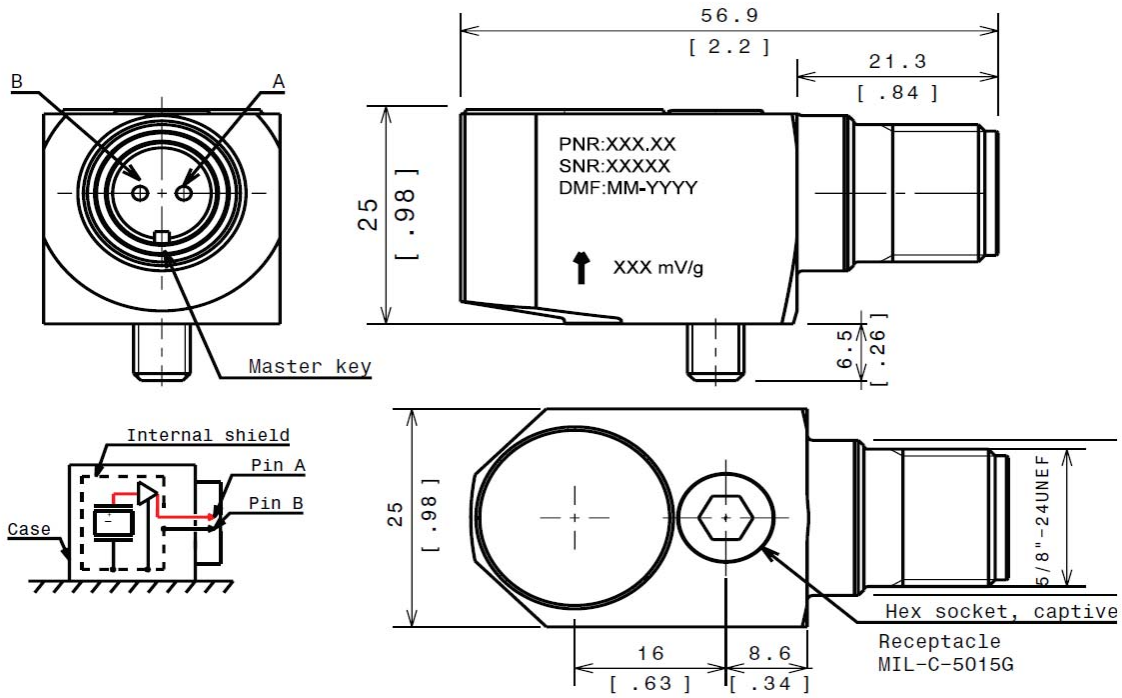
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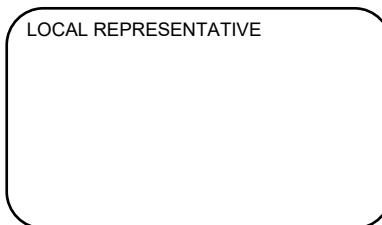
**MECHANICAL DRAWING - PVS-113 MIL glass seal connector**



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