



#### FEATURES

- Dual case isolation with Faraday shield
- Bias voltage stability at elevated temperatures
- M12 offers compatibility with sensors used in automation
- · Stainless steel body protected against water and shock

MC-monitoring CE Made in E.U.

· Low cost IP67 overmolded M12 cable assembly





Shaft & bearing vibration - absolute

### Typical applications

Hydrogenerators

Pumps, fan, cooling towers...

Gas & steam turbines



The hermetic sealed industrial piezoelectric accelerometer PAS-103 is 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 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.



# **GLOBAL SPECIFICATIONS**

Model version PAS-103 M1 PAS-103 M5   Measuring principle Piezoelectric annular shear mode with built-in electronic   Measuring parameter Vibration acceleration   Electrical grounding Isolated from machine ground   Shielding Internal Faraday shielding   Isolation case to shield 100MQ   Sensitivity 100mVig ±5% 500mVig ±5%   Output impedance 2002 nominal   Output bias voltage +10Vnoc   Residual noise (24°C) 114z 300µg rms 25µg rms   1Hz 300µg rms 25µg rms   1Hz 300µg rms 26µg   Frequency response 410% 1 to 6'000Hz 0.4 to 1'600Hz   43dB 0.5 to 10'00Hz 0.2 to 3'700Hz   Mounted resonant frequency 22kHz nominal 16kHz nominal   Dynamic range 80g pk 10g pk   Transverse sensitivity < 5% max of nominal sensitivity at 20Hz, 5g   Linearity ±1% max 2103   Yourm up time < 1s < 10s   Power supply - -55°C to ±120°C   Constant current source +22 to ±20 vpc   Protection Built-in overvoltage and reverse polarity protection   ENVIRONMENTAL -   Temperature	OPERATION		
Measuring parameter   Vibration acceleration     Electrical grounding   Isolated from machine ground     Shielding   Internal Faraday shielding     Isolation case to shield   100MQ     Sensitivity   100mV(g 45%   500mV/g 45%     Output impedance   200Q nominal     Output bias voltage   +10V <sub>RC</sub> Residual noise (24°C)   1Hz     1Hz   30µg   2.4µg     Frequency response   -     ±10%   1 to 6'000Hz   0.4 to 1'600Hz     ±3dB   0.5 to 10'000Hz   0.2 to 3'700Hz     Mounted resonant frequency   22kHz nominal   16kHz nominal     Dynamic range   80g pk   10g pk     Transverse sensitivity   < 5% max of nominal sensitivity at 20Hz, 5g	Model version	PAS-103 M1	PAS-103 M5
Electrical grounding Isolated from machine ground   Shielding Internal Faraday shielding   Isolation case to shield 100MQ   Sensitivity 100mV/g ±5% 500mV/g ±5%   Output impedance 200Ω nominal   Output bias voltage +10V <sub>0</sub> c   Residual noise (24°C) 1   1Hz 300µg rms 25µg rms   1Hz 300µg 2.4µg   Frequency response ±10% 0.4 to 1600Hz   ±3dB 0.5 to 10'000Hz 0.2 to 3700Hz   Mounted resonant frequency 22kHz nominal 16kHz nominal   Dynamic range 80g pk 10g pk   Transverse sensitivity <5% max of nominal sensitivity at 20Hz, 5g	Measuring principle	Piezoelectric annular shear mod	e with built-in electronic
Shielding Internal Faraday shielding   Isolation case to shield 100MΩ   Sensitivity 100m V(g ±5%) 500m V/g ±5%)   Output bias voltage ±10V <sub>0</sub> c   Residual noise (24°C) 100 y g ms 25µg ms   1Hz 020µg ms 25µg ms   1Hz 30µg 2.4µg   Frequency response 410% 0.4 to 1600Hz   ±10% 1 to 6'000Hz 0.4 to 1600Hz   ±3dB 0.5 to 10000Hz 0.4 to 1600Hz   yadB 0.5 to 10000Hz 0.2 to 3700Hz   Mounted resonant frequency 22kHz nominal 16kHz nominal   Dynamic range 80g pk 10g pk   Transverse sensitivity < 5% max of nominal sensitivity at 20Hz, 5g	Measuring parameter	Vibration acceleration	
Shielding Internal Faraday shielding   Isolation case to shield 100MΩ   Sensitivity 100m V(g ±5%) 500m V/g ±5%)   Output bias voltage ±10V <sub>0</sub> c   Residual noise (24°C) 100 y g ms 25µg ms   1Hz 020µg ms 25µg ms   1Hz 30µg 2.4µg   Frequency response 410% 0.4 to 1600Hz   ±10% 1 to 6'000Hz 0.4 to 1600Hz   ±3dB 0.5 to 10000Hz 0.4 to 1600Hz   yadB 0.5 to 10000Hz 0.2 to 3700Hz   Mounted resonant frequency 22kHz nominal 16kHz nominal   Dynamic range 80g pk 10g pk   Transverse sensitivity < 5% max of nominal sensitivity at 20Hz, 5g	Electrical grounding		
$\begin{tabular}{ c c c c } \hline Sensitivity & 100mV/g \pm 5\% & 500mV/g \pm 5\% \\ \hline Output impedance & 200\Omega nominal \\ \hline Output bias voltage & +10V_{0c} \\ \hline Residual noise (24°C) & & & & & & & & & & & & & & & & & & &$	Shielding	-	
Output impedance 200Ω nominal   Output bias voltage +10Vpc   Residual noise (24°C) 300µg rms 25µg rms   1Hz 30µg 2.4µg   Frequency response 1 to 6'000Hz 0.4 to 1'600Hz   ±3dB 0.5 to 10'000Hz 0.2 to 3'700Hz   Mounted resonant frequency 22kHz nominal 16kHz nominal   Dynamic range 80g pk 10g pk   Transverse sensitivity ≤ 5% max of nominal sensitivity at 20Hz, 5g   Linearity ±1% max   Warm up time < 1s	Isolation case to shield	100ΜΩ	
Output bias voltage   +10Vbc     Residual noise (24°C)   300µg mms   25µg mms     1Hz   30µg   2.4µg     Frequency response   1 to 6'000Hz   0.4 to 1'600Hz     ±10%   1 to 6'000Hz   0.4 to 1'600Hz     ±3dB   0.5 to 10'000Hz   0.2 to 3'700Hz     Mounted resonant frequency   22kHz nominal   16kHz nominal     Dynamic range   80g pk   10g pk     Transverse sensitivity   45% max of nominal sensitivity at 20Hz, 5g   11% max     Warm up time   < 1s	Sensitivity	100mV/g ±5%	500mV/g ±5%
Residual noise (24°C)     300µg ms     25µg ms       1Hz     30µg     2.4µg       Frequency response     .41µ     0.4 to 1'800Hz       ±30%     0.5 to 10'000Hz     0.4 to 1'800Hz       ±30%     0.5 to 10'000Hz     0.2 to 3'700Hz       Mounted resonant frequency     22kHz nominal     16kHz nominal       Dynamic range     80g pk     10g pk       Transverse sensitivity     <5% max of nominal sensitivity at 20Hz, 5g	Output impedance	200Ω nominal	
1Hz to 25kHz     300µg rms     25µg rms       1Hz     30µg     2.4µg       Frequency response     2.10%     1 to 6'000Hz     0.4 to 1'600Hz       ±30B     0.5 to 10'000Hz     0.2 to 3'700Hz       Mounted resonant frequency     22kHz nominal     16kHz nominal       Dynamic range     80g pk     10g pk       Transverse sensitivity     <5% max of nominal sensitivity at 20Hz, 5g	Output bias voltage	+10V <sub>DC</sub>	
1Hz 30µg 2.4µg   Frequency response ±10% 1 to 6'000Hz 0.4 to 1'600Hz   ±3dB 0.5 to 10'000Hz 0.2 to 3'700Hz   Mounted resonant frequency 22kHz nominal 16kHz nominal   Dynamic range 80g pk 10g pk   Transverse sensitivity < 5% max of nominal sensitivity at 20Hz, 5g	Residual noise (24°C)		
Frequency response   1 to 6'000Hz   0.4 to 1'600Hz     ±10%   1 to 6'000Hz   0.2 to 3'700Hz     Mounted resonant frequency   22kHz nominal   16kHz nominal     Dynamic range   80g pk   10g pk     Transverse sensitivity   <5% max of nominal sensitivity at 20Hz, 5g	1Hz to 25kHz	300µg rms	25µg rms
±10%1 to 6'000Hz0.4 to 1'600Hz±3dB0.5 to 10'000Hz0.2 to 3'700HzMounted resonant frequency22kHz nominal16kHz nominalDynamic range80g pk10g pkTransverse sensitivity<5% max of nominal sensitivity at 20Hz, 5g	1Hz	30µg	2.4µg
±3dB0.5 to 10'000Hz0.2 to 3'700HzMounted resonant frequency22kHz nominal16kHz nominalDynamic range80g pk10g pkTransverse sensitivity<5% max of nominal sensitivity at 20Hz, 5g	Frequency response		
Mounted resonant frequency   22kHz nominal   16kHz nominal     Dynamic range   80g pk   10g pk     Transverse sensitivity   < 5% max of nominal sensitivity at 20Hz, 5g	±10%	1 to 6'000Hz	0.4 to 1'600Hz
Dynamic range80g pk10g pkTransverse sensitivity<5% max of nominal sensitivity at 20Hz, 5g	±3dB	0.5 to 10'000Hz	0.2 to 3'700Hz
Transverse sensitivity< 5% max of nominal sensitivity at 20Hz, 5g	Mounted resonant frequency	22kHz nominal	16kHz nominal
Linearity ±1% max Warm up time < 1s < 10s 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 ENVIRONMENTAL Temperature range continuous operation) 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) 155g 165g Connector M12 glass seal, IEC 60947-5-2 Mounting screw M6	Dynamic range	80g pk	10g pk
Warn up time< 1s< 10sPower supplyConstant current source+2 to +10mApcVoltage+22 to +28VpcProtectionBuilt-in overvoltage and reverse polarity protectionENVIRONMENTAL-Temperature range (continuous operation)-55°C to +120°CHumidity / EnclosureHermetically sealedAcceleration limit-Shock5'000g pkContinuous vibration500g pkBase strain sensitivity0.0002g pk/µ strainESD protection> 40VEMC emissionEN50081-1, EN50081-2EMC immunityEN50082-1, EN50082-2PHYSICALBody materialBody materialStainless steel DIN 1.4401Weight (sensor only)155g165gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	Transverse sensitivity		
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     ENVIRONMENTAL   Temperature range (continuous operation)   -55°C to +120°C   -55°C to +90°C     Humidity / Enclosure   Hermetically sealed   -55°C to +90°C   -55°C to +90°C     Acceleration limit   5'000g pk   -5000g pk   -5000g pk     Shock   5'000g pk   -5000g pk   -5000g pk     Base strain sensitivity   0.0002g pk/µ strain   -5500000000000000000000000000000000000	Linearity	±1% max	
Constant current source   +2 to +10mA <sub>DC</sub> Voltage   +22 to +28V <sub>DC</sub> Protection   Built-in overvoltage and reverse polarity protection     ENVIRONMENTAL	Warm up time	< 1s	< 10s
Voltage +22 to +28V <sub>DC</sub> Protection Built-in overvoltage and reverse polarity protection   ENVIRONMENTAL -55°C to +120°C   Temperature range (continuous operation) -55°C to +120°C   Humidity / Enclosure Hermetically sealed   Acceleration limit -5000g pk   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   Body material Stainless steel DIN 1.4401   Weight (sensor only) 155g 165g   Connector M12 glass seal, IEC 60947-5-2   Mounting screw M6	Power supply		
ProtectionBuilt-in overvoltage and reverse polarity protectionENVIRONMENTALTemperature range (continuous operation)-55°C to +120°C-55°C to +90°CHumidity / EnclosureHermetically sealedAcceleration limit5'000g pkShock5'000g pkContinuous vibration500g pkBase strain sensitivity0.0002g pk/µ strainESD protection> 40VEMC emissionEN50081-1, EN50081-2EMC immunityEN50082-1, EN50082-2PHYSICALStainless steel DIN 1.4401Weight (sensor only)155g165gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	Constant current source	+2 to +10mA <sub>DC</sub>	
ENVIRONMENTAL   -55°C to +120°C   -55°C to +90°C     Temperature range (continuous operation)   -55°C to +120°C   -55°C to +90°C     Humidity / Enclosure   Hermetically sealed     Acceleration limit   5'000g pk     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   Stainless steel DIN 1.4401     Weight (sensor only)   155g   165g     Connector   M12 glass seal, IEC 60947-5-2     Mounting screw   M6   1000000000000000000000000000000000000	Voltage	+22 to +28V <sub>DC</sub>	
Temperature range (continuous operation)-55°C to +120°C-55°C to +90°CHumidity / EnclosureHermetically sealedAcceleration limit5'000g pkShock5'000g pkContinuous vibration500g pkBase strain sensitivity0.0002g pk/µ strainESD protection> 40VEMC emissionEN50081-1, EN50081-2EMC immunityEN50082-1, EN50082-2PHYSICALBody materialStainless steel DIN 1.4401Weight (sensor only)155g165gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	Protection	Built-in overvoltage and reverse	polarity protection
(continuous operation)Hermetically sealedHumidity / EnclosureHermetically sealedAcceleration limit5'000g pkShock5'000g pkContinuous vibration500g pkBase strain sensitivity0.0002g pk/µ strainESD protection> 40VEMC emissionEN50081-1, EN50081-2EMC immunityEN50082-1, EN50082-2PHYSICALFMS Stainless steel DIN 1.4401Weight (sensor only)155gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	ENVIRONMENTAL		
Acceleration limit5'000g pkShock5'000g pkContinuous vibration500g pkBase strain sensitivity0.0002g pk/µ strainESD protection> 40VEMC emissionEN50081-1, EN50081-2EMC immunityEN50082-1, EN50082-2PHYSICALBody materialStainless steel DIN 1.4401Weight (sensor only)155g165gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6		-55°C to +120°C	-55°C to +90°C
Shock5'000g pkContinuous vibration500g pkBase strain sensitivity0.0002g pk/µ strainESD protection> 40VEMC emissionEN50081-1, EN50081-2EMC immunityEN50082-1, EN50082-2PHTYICALBody materialStainless steel DIN 1.4401Weight (sensor only)155g165gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	Humidity / Enclosure	Hermetically sealed	
Continuous vibration500g pkBase strain sensitivity0.0002g pk/µ strainESD protection> 40VEMC emissionEN50081-1, EN50081-2EMC immunityEN50082-1, EN50082-2PHYSICALBody materialStainless steel DIN 1.4401Weight (sensor only)155g165gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	Acceleration limit		
Base strain sensitivity0.0002g pk/µ strainESD protection> 40VEMC emissionEN50081-1, EN50081-2EMC immunityEN50082-1, EN50082-2PHYSICALBody materialStainless steel DIN 1.4401Weight (sensor only)155g165gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	Shock	5'000g pk	
ESD protection> 40VEMC emissionEN50081-1, EN50081-2EMC immunityEN50082-1, EN50082-2PHYSICALBody materialStainless steel DIN 1.4401Weight (sensor only)155g165gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	Continuous vibration	500g pk	
EMC emissionEN50081-1, EN50081-2EMC immunityEN50082-1, EN50082-2PHYSICALStainless steel DIN 1.4401Body materialStainless steel DIN 1.4401Weight (sensor only)155gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	Base strain sensitivity	0.0002g pk/µ strain	
EMC immunity   EN50082-1, EN50082-2     PHYSICAL   Stainless steel DIN 1.4401     Body material   Stainless steel DIN 1.4401     Weight (sensor only)   155g   165g     Connector   M12 glass seal, IEC 60947-5-2     Mounting screw   M6	ESD protection	> 40V	
PHYSICAL   Body material   Stainless steel DIN 1.4401     Weight (sensor only)   155g   165g     Connector   M12 glass seal, IEC 60947-5-2     Mounting screw   M6	EMC emission	EN50081-1, EN50081-2	
Body materialStainless steel DIN 1.4401Weight (sensor only)155g165gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	EMC immunity	EN50082-1, EN50082-2	
Weight (sensor only)155g165gConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	PHYSICAL		
ConnectorM12 glass seal, IEC 60947-5-2Mounting screwM6	Body material	Stainless steel DIN 1.4401	
Mounting screw M6	Weight (sensor only)	155g	165g
-	Connector	M12 glass seal, IEC 60947-5-2	
Mounting torque 2.4Nm	Mounting screw	M6	
	Mounting torque	2.4Nm	



# **ORDERING INFORMATION**

Part type	Piezoelectric acceleration s	Piezoelectric acceleration sensor with M12 connector side exit	
Ordering cod	e 01.103.000 M1	01.103.000 M5	
Description	PAS-103 M1 Sensitivity = 100mV/g	PAS-103 M5 Sensitivity = 500mV/g	

### AVAILABLE ACCESSORIES

Part type	Extension cable with M12 connector
Ordering code	01.100.010
Cable length	10m (other length upon request)

# **MECHANICAL DRAWING**



Due to the continual development of our products we reserve the right to modify the specifications without notification

MC-monitoring Quality certifications



LOCAL REPRESENTATIVE

MC-monitoring SA Route André Piller 19 | PO BOX 97 CH-1762 Givisiez | Switzerland Phone : +41 58 411 54 00 Fax : +41 58 411 54 10 Mail : info@mc-monitoring.com sales@mc-monitoring.com