MEGGiTT
smart engineering for
extreme environments

PV 102

Piezoelectric velocity sensor

FEATURES

- From the Vibro-Meter® product line
- Designed for medium temperature industrial applications:
  −50 to +120 °C (−58 to +248 °F)
- Frequency response:
  6.0 to 2500 Hz: ±10%
  4.5 to 5000 Hz: ±3 dB
- Ultra low-noise electronics for clear signals at very low vibration levels
- Tuned bandpass flatness for repeatability
- Eliminates distortion caused by high frequency signals
- Hermetically sealed and corrosion resistant for harsh environments
- Case insulated and internally shielded, with reverse wiring protection
- Certified for use in potentially explosive atmospheres

IECEx

DESCRIPTION

The PV 102 is an all-purpose piezoelectric velocity sensor from Meggitt Sensing Systems' Vibro-Meter product line that combines piezoelectric accelerometer technology and an integrator (as part of the internal electronics) to produce an output that is proportional to velocity. The output signal has a sensitivity of 100 mV/in/sec.

The sensor has extremely low noise levels which allows very low-level vibration signals to be resolved and it is tuned for bandpass flatness to ensure repeatability. It also exhibits exceptional bias voltage stability at elevated temperatures.

DESCRIPTION *(continued)*

The PV 102 uses the industry standard 2-wire voltage transmission technique with a constant current supply. Thanks to the sensor's isolated ground and internal shield, no ground loops or frame voltages are present to disturb the measurement.

The sensor is a rugged device with a simpler design (fewer components) than typical velocity sensors, making it inherently reliable. Further, the PV 102 is housed in a hermetically sealed and corrosion resistant case, making the sensor suitable for use with machinery in harsh industrial environments.

SPECIFICATIONS

Note: Unless otherwise stated, all values listed are typical values, referenced at +23°C (at +73°F), 24 V_{DC} supply, 4 mA constant current and 100 Hz.

OPERATING

Sensitivity, at +25°C (+77°F)	: 100 mV/in/sec (3.94 mV/mm/sec) ±5%
Velocity range	: 50 in/sec peak (1270 mm/sec peak)
Transverse sensitivity (maximum)	: 5% of axial
Amplitude nonlinearity	: 2%
Frequency response (nominal)	
• *6.0 to 2500 Hz*	: ±10%
• *4.5 to 5000 Hz*	: ±3 dB
Resonant frequency, mounted (nominal)	: 15 kHz
Typical deviation	: ±5% over operating temperature range

ELECTRICAL

Input supply current	: 2 to 10 mA
Supply voltage for current source	: 22 to 28 V_{DC}
Bias output voltage (nominal)	: 12 V_{DC}
Output impedance (maximum)	: 80 Ω
Electrical noise, equivalent in/sec (nominal)	
• *Broadband: 2.5 Hz to 25 kHz*	: 150 µin/sec
• *Spectral: 10 Hz*	: 25 µin/sec/√Hz
100 Hz	: 1.5 µin/sec/√Hz
1000 Hz	: 1.0 µin/sec/√Hz
Grounding	: Case isolated, internally shielded
Reversed polarity	: Protected

ENVIRONMENTAL

Temperature range	: −50 to +120°C (−58 to +248°F)
Vibration limit	: 250 g peak
Shock limit	: 5000 g peak
Base strain sensitivity (maximum)	: 0.005 in/sec/με (µstrain)
ESD Protection	: Yes
Electromagnetic sensitivity, equivalent in/sec	: 50 µin/sec/gauss
Sealing	: Hermetically sealed

SPECIFICATIONS *(continued)*

Explosive atmospheres

Available in Ex approved versions for use in hazardous locations

Type of protection Ex i: intrinsic safety		
Europe	EC type examination certificate	SIRA 11 ATEX 2039 II 1G (Zones 0, 1, 2) Ex ia IIC T4 Ga Ta = −50 °C to 110 °C
North America	cCSAus certificate of compliance	cCSAus 2378611 Class I, Division 1, Groups A, B, C, D Class II, Division 1, Groups E, F, G Class III, Division 1 Class I, Zone 0 Ex ia IIC T4
International	IECEx certificate of conformity	IECEx SIR 11.0018 Ex ia IIC T4 Ga Ta = −50 °C to 110 °C

Type of protection Ex nA: non-sparking apparatus		
North America	cCSAus certificate of compliance	cCSAus 2378611 Class I, Division 2, Groups A, B, C, D Class I, Zone 2 Ex nA II T4

Type of protection Ex nC: enclosed break		
Europe	Type examination certificate	SIRA 11 ATEX 4049 II 3G (Zone 2) Ex nC IIC T4 Gc Ta = −50 °C to 110 °C
International	IECEx certificate of conformity	IECEx SIR 11.0018 Ex nC IIC T4 Gc Ta = −50 °C to 110 °C

⚠ **For specific parameters of the mode of protection concerned and special conditions for safe use, please refer to the certificates that are available from Meggitt SA on demand.**

PHYSICAL

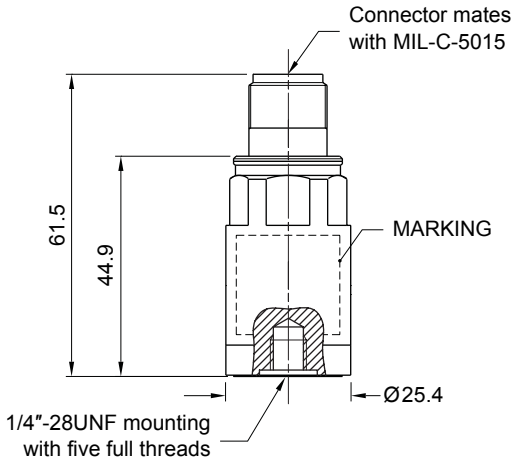
Weight	: 145 g
Case material	: 316L stainless steel
Mounting	: 1/4-28 UNF tapped hole
Mounting torque	: 2.7 N•m (24 inch-pounds) for standard flanged mounting stud (SF6)
Output connector	: MIL-C-5015 style, 2 pin
• *Pin A*	: Signal, power
• *Pin B*	: Common
Mating connector	: MIL-C-5015 style
Recommended cable	: Shielded twisted pair. See Accessories.

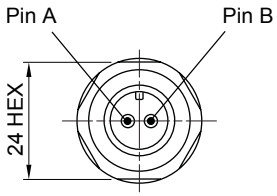
CALIBRATION

Dynamic calibration at factory. No subsequent calibration necessary.

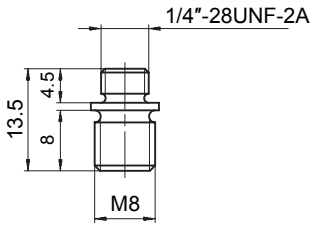
MECHANICAL DRAWING

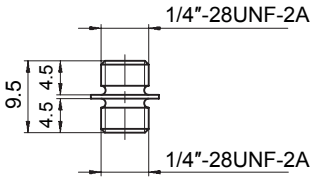
Piezoelectric velocity sensor





Adaptor studs





Note: all dimensions in mm unless otherwise stated.

ORDERING INFORMATION

To order please specify:

Type	Designation	Ordering number
PV 102	Piezoelectric velocity sensor – standard version	440-102-000-011
PV 102	Piezoelectric velocity sensor – Ex approved version	440-102-000-111

ACCESSORIES

Supplied

Item	Type
• *Adaptor studs*	1/4-28 UNF 1/4-28 UNF to M8
• *Calibration data*	Calibration data showing low frequency performance, including graph

ACCESSORIES

Optional

Item	Type	Part number
• *Cable*	EC 318	Refer to drawing 922-318-000Dxxx
	EC 319	Refer to drawing 922-319-000Dxxx
• *Mounting adaptor*	MA 122_012 1/4-28 UNF to M6 (with conic base)	809-122-000-012
• *Insulating stud*	MA 122_021 1/4-28 UNF to M6 (with conic base)	809-122-000-021

Headquartered in the UK, Meggitt PLC is a global engineering group specializing in extreme environment components and smart sub-systems for aerospace, defence and energy markets.
Meggitt Sensing Systems is the operating division of Meggitt specializing in sensing and monitoring systems, which has operated through its antecedents since 1927 under the names of ECET, Endevco, Ferroperm Piezoceramics, Lodge Ignition, Sensorex, Vibro-Meter and Wilcoxon Research. Today, these operations are integrated under one strategic business unit called Meggitt Sensing Systems, headquartered in Switzerland and providing complete systems, using these renowned brands, from a single supply base.
The Meggitt Sensing Systems facility in Fribourg, Switzerland was formerly known as Vibro-Meter SA, but is now Meggitt SA. This site produces a wide range of vibration and dynamic pressure sensors capable of operation in extreme environments, leading-edge microwave sensors, electronics monitoring systems and innovative software for aerospace and land-based turbo-machinery.

In this publication, a dot (.) is used as the decimal separator and thousands are separated by spaces. Example: 12345.67890.

Sales offices

Meggitt Sensing Systems has offices in more than 30 countries. For a complete list, please visit our website.

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ISO 14001 BUREAU VERITAS Certification

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