PRECISION ICP®
ACCELEROMETERS

IMI SENSORS
A PCB DIVISION

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PRECISION ICP® ACCELEROMETERS

IMI Sensors offers a wide range of ICP® accelerometers with an AC voltage output. These accelerometers are ideal for route-based and permanently-mounted predictive maintenance applications. The AC voltage output can interface with third-party data collectors or other online monitoring systems for analysis.

ICP® accelerometers operate on a simple, two-wire system consists of an 18-30 VDC power source, current-regulating diode, voltmeter and decoupling capacitor.

- 18-30 VDC Power Source: Supply voltage can be provided by line or battery power. Most line-powered signal conditioners supply 24 VDC power as they are connected to an external 24VDC power source. The power provided by a battery-powered signal conditioner can vary depending on the number and voltage of the batteries.
- Current-Regulating Diode: ICP® accelerometers require a fixed constant current between 2 and 20 mA so the power must pass through a current-regulating diode. There is an approximate 1V drop across the diode.
- Voltmeter: The power is transmitted to the ICP® accelerometer via two-conductor cable with one conductor acting as the ground and the other conductor transmitting both the power to the sensor and the output signal from the sensor. The portion of the voltage used to power the accelerometer's amplifier is called the bias voltage and is usually in the range of 8-12 VDC. The voltmeter monitors this bias voltage and is useful for checking sensor operation. The output signal is an AC dynamic signal that rides on top of the bias voltage.
- Decoupling Capacitor: When the output signal is received at the signal conditioner, the DC bias voltage must be decoupled from the AC signal voltage in order to record accurate data. The 10-30 µF capacitor shifts the signal level to essentially eliminate the sensor bias voltage, providing a drift-free AC mode operation.

LOW-COST VS. PRECISION

IMI Sensors' ICP® accelerometer product offering can be divided into two categories- low cost and precision. The table below highlights the difference between the two product categories.

Characteristics	Low Cost	Precision
Construction	Embeddable pellet	Shear-mode element
Calibration	Single point	Frequency sweep
Sensitivity Tolerance	Less tight	Tighter
Price	Lower	Higher

OPTIONAL SENSITIVITIES AND FEATURES

Most models listed in this brochure are available with alternate sensitivities and optional features. Alternate sensitivities are 10 mV/g, 50 mV/g and 500 mV/g. Optional features are indicated by a prefixed model number; to select any of the below-listed features, add the appropriate prefix to the core model number. Any of the prefixes can be combined together. When selecting a prefixed model, refer to model-specific outline drawings as some prefixed models' dimensions differ slightly from their unprefixed model equivalents.

Optional Feature	Prefix	Description
Hazardous Area Approval	EX	Accelerometer is certified for use in potentially explosive environments via ATEX, CSA and IECEx. Available on 621, 622, 623, 625, and 628 Series.
High Temperature Range	HT	Accelerometer's operating temperature range is increased from +250 °F (+121°C) to +325 °F (+163 °C). Available on 622, 623, 624, 625, and 628 Series.
Metric Mount	M	Accelerometer includes an M6x1 mounting stud or bolt instead of a ¼-28 mounting stud or bolt. Available on all series.
Temperature Output	TO	Accelerometer includes a built-in temperature sensor and provides a DC voltage temperature output in addition to the AC voltage vibration output. To transmit the second signal, accelerometer has one additional pin (connector version) or one/two cable conductors (integral cable version). Available on 622, 623, 624, 625, and 628 Series.
Velocity Output	VO	Accelerometer provides a measurement range in velocity rather than in velocity and outputs 100 mV/ips rather than 100 mV/g. Available on 622, 625, and 626 Series.

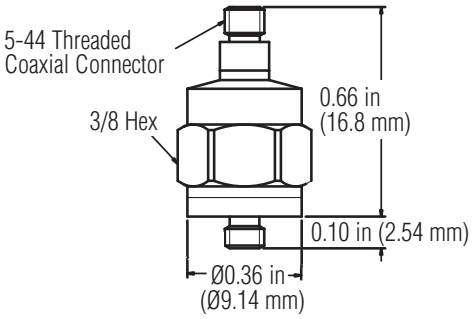
VERY HIGH FREQUENCY ICP® ACCELEROMETER

621 Series

ACCELEROMETER WITH 5-44 CONNECTOR

MODEL 621C40

- ± 3 dB frequency response up to 30 kHz and measurement range up to 500 g
- High frequency response ideal for gearbox and bearing fault detection



SPECIFICATIONS	
Performance	
Sensitivity (±10 %)	10 mV/g 1.02 mV/(m/s²)
Measurement Range	±500 g ±4905 m/s²
Frequency Range (±10 %)	3.4 to 18000 Hz
Frequency Range (±3 dB)	1.6 to 30000 Hz
Resonant Frequency	85 kHz
Broadband Resolution (1 to 10000 Hz)	120 µg 1176 µm/s²
Non-Linearity	±1 %
Transverse Sensitivity	≤5 %
Environmental	
Overload Limit (Shock)	10000 g pk 98100 m/s² pk
Temperature Range	-65 to +250 °F -54 to +121 °C
Enclosure Rating	IP68
Electrical	
Settling Time (within 1% of bias)	≤3.0 sec
Discharge Time Constant	≥0.1 sec
Excitation Voltage	18 to 28 VDC
Constant Current Excitation	2 to 20 mA
Output Impedance	<100 Ohm
Output Bias Voltage	8 to 12 VDC
Spectral Noise (10 Hz)	100 µg/√Hz
Spectral Noise (100 Hz)	30 µg/√Hz
Spectral Noise (1 kHz)	10 µg/√Hz
Electrical Isolation	$>10^8$ Ohm
Physical	
Sensing Element	Ceramic
Sensing Geometry	Shear
Housing Material	Stainless Steel
Sealing	Welded Hermetic
Mounting Thread	5-44 Male
Mounting Torque	1.6 to 1.66 ft-lb 2.0 to 2.2 Nm
Electrical Connector	5-44 Female
Electrical Connection Position	Top
Weight	0.167 oz 4.75 g

Monitoring vibration on induction motors is at the core of any predictive maintenance program. Typical applications demand vibration measurements in the horizontal, vertical and axial direction on both the inboard and outboard motor bearings. Aside from typical mechanical issues, such as misaligned couplings and unbalance, the vibration analyst can also detect electrical issues that cause mechanical vibrations. Some common electrical faults include air gap variation, broken rotor bars and bearing fluting.

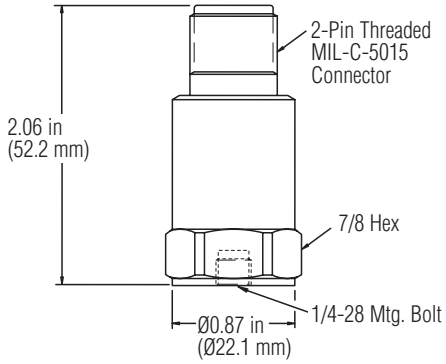
TOP EXIT ICP® ACCELEROMETER

622 Series

ACCELEROMETER WITH MIL CONNECTOR

MODEL 622B01

- Most popular top exit precision accelerometer
- Low noise



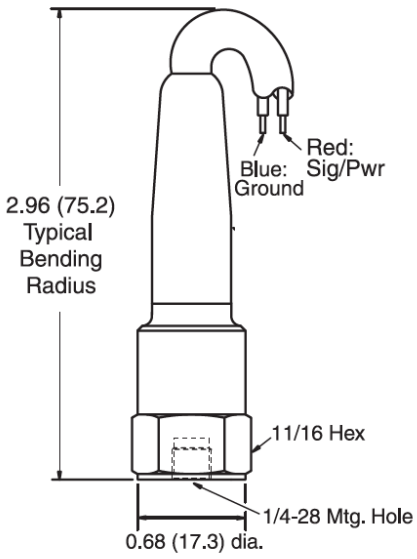
SPECIFICATIONS	
Performance	
Sensitivity (±5 %)	100 mV/g 10.2 mV/(m/s²)
Measurement Range	±50 g ±490 m/s²
Frequency Range (±5 %)	0.58 to 6000 Hz
Frequency Range (±10 %)	0.42 to 10000 Hz
Frequency Range (±3 dB)	0.2 to 15000 Hz
Resonant Frequency	30 kHz
Broadband Resolution (1 to 10000 Hz)	50 µg 490 µm/s²
Non-Linearity	±1 %
Transverse Sensitivity	≤5 %
Environmental	
Overload Limit (Shock)	5000 g pk 49050 m/s² pk
Temperature Range	-65 to +250 °F -54 to +121 °C
Enclosure Rating	IP68
Electrical	
Settling Time (within 1% of bias)	≤5.0 sec
Discharge Time Constant	≥0.8 sec
Excitation Voltage	18 to 28 VDC
Constant Current Excitation	2 to 20 mA
Output Impedance	<100 Ohm
Output Bias Voltage	8 to 12 VDC
Spectral Noise (10 Hz)	4.0 µg/√Hz
Spectral Noise (100 Hz)	0.8 µg/√Hz
Spectral Noise (1 kHz)	0.4 µg/√Hz
Electrical Isolation (Case)	>10⁸ Ohm
Physical	
Sensing Element	Ceramic
Sensing Geometry	Shear
Housing Material	Stainless Steel
Sealing	Welded Hermetic
Mounting Thread	1/4-28 Female
Mounting Torque	2 to 5 ft-lb 2.7 to 6.8 Nm
Electrical Connector	2-Pin MIL-C-5015
Electrical Connection Position	Top
Weight	3.3 oz 94 g
Accessories	
Model 081A40: Mounting stud, 1/4-28 x 0.438"	

ADDITIONAL BASE MODEL CONFIGURATIONS

ACCELEROMETER WITH INTEGRAL POLYURETHANE CABLE

MODEL 622B11

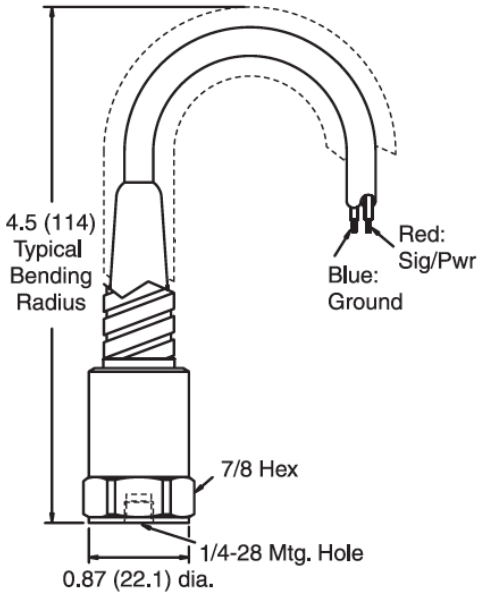
- Configurable cable length and terminating connector



ACCELEROMETER WITH INTEGRAL ARMORED POLYURETHANE CABLE

MODEL 622B61

- Configurable cable length, armor length and terminating connector



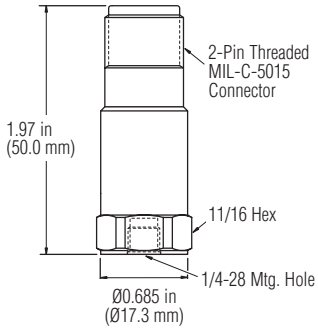
HIGH FREQUENCY ICP® ACCELEROMETER

623 Series

ACCELEROMETER WITH MIL CONNECTOR

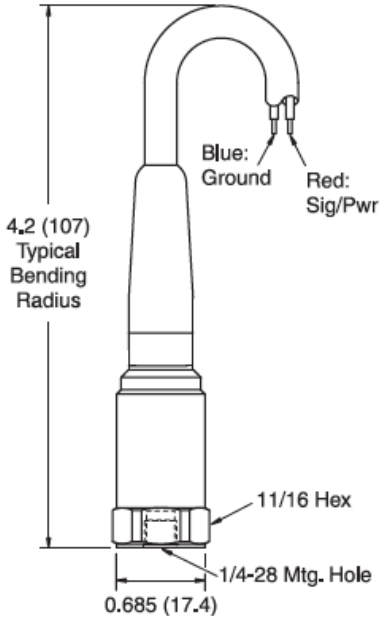
MODEL 623C01

- High frequency response ideal for gearbox and bearing fault detection
- Small footprint for installation in tight spaces



SPECIFICATIONS	
Performance	
Sensitivity (±5 %)	100 mV/g 10.2 mV/(m/s²)
Measurement Range	±50 g ±490 m/s²
Frequency Range (±5 %)	2.4 to 8000 Hz
Frequency Range (±10 %)	1.7 to 10000 Hz
Frequency Range (±3 dB)	0.8 to 15000 Hz
Resonant Frequency	40 kHz
Broadband Resolution (1 to 10000 Hz)	100 µg 981 µm/s²
Non-Linearity	±1 %
Transverse Sensitivity	≤5 %
Environmental	
Overload Limit (Shock)	5000 g pk 49050 m/s² pk
Temperature Range	-65 to +250 °F -54 to +121 °C
Enclosure Rating	IP68
Electrical	
Settling Time (within 1% of bias)	≤2.0 sec
Discharge Time Constant	≥0.2 sec
Excitation Voltage	18 to 28 VDC
Constant Current Excitation	2 to 20 mA
Output Impedance	<100 Ohm
Output Bias Voltage	8 to 12 VDC
Spectral Noise (10 Hz)	7.0 µg/√Hz
Spectral Noise (100 Hz)	2.8 µg/√Hz
Spectral Noise (1 kHz)	0.9 µg/√Hz
Electrical Isolation (Case)	>10⁸ Ohm
Physical	
Sensing Element	Ceramic
Sensing Geometry	Shear
Housing Material	Stainless Steel
Sealing	Welded Hermetic
Mounting Thread	1/4-28 Female
Mounting Torque	2 to 5 ft-lb 2.7 to 6.8 Nm
Electrical Connector	2-Pin MIL-C-5015
Electrical Connection Position	Top
Weight	1.8 oz 51 g
Accessories	
Model 081A40: Mounting stud, 1/4-28 x 0.438"	

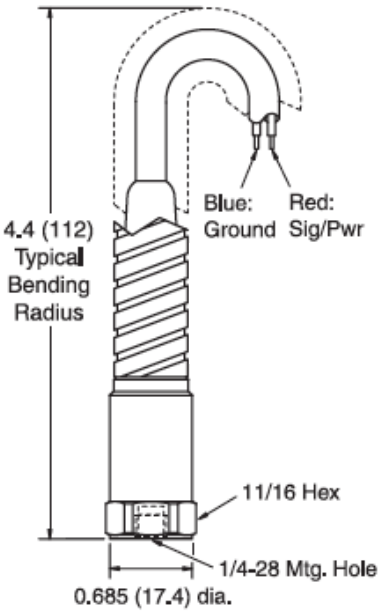
ADDITIONAL BASE MODEL CONFIGURATIONS



ACCELEROMETER WITH INTEGRAL POLYURETHANE CABLE

MODEL 623C11

- Configurable cable length and terminating connector



ACCELEROMETER WITH INTEGRAL ARMORED POLYURETHANE CABLE

MODEL 623C61

- Configurable cable length, armor length and terminating connector

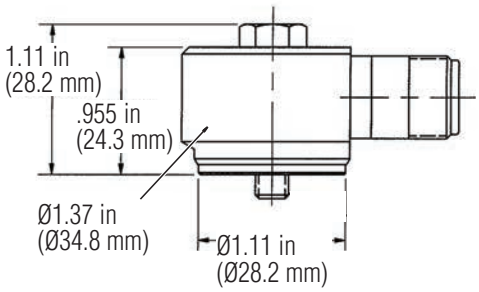
QUARTZ ELEMENT ICP® ACCELEROMETER

624 Series

ACCELEROMETER WITH MIL CONNECTOR

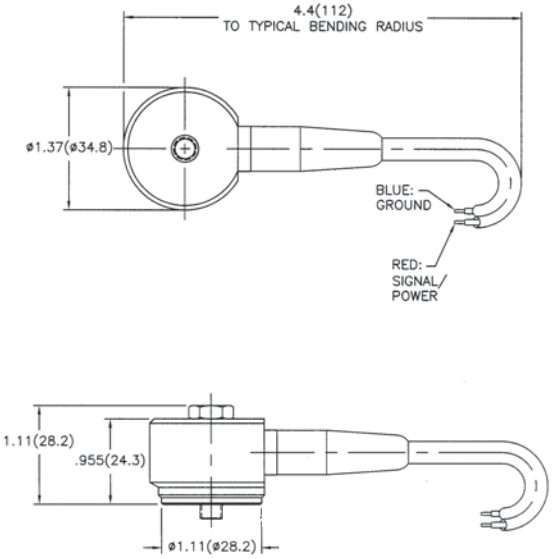
MODEL 624B01

- Naturally piezoelectric quartz element for excellent long-term stability and repeatability as well as linear sensitivity in thermally-active environments.
- Ring-style design with through-bolt allows for easy cable positioning.



SPECIFICATIONS	
Performance	
Sensitivity (±5 %)	100 mV/g 10.2 mV/(m/s²)
Measurement Range	±50 g ±490 m/s²
Frequency Range (±5 %)	2.4 to 5000 Hz
Frequency Range (±10 %)	1.7 to 7000 Hz
Frequency Range (±3 dB)	0.8 to 10000 Hz
Resonant Frequency	18 kHz
Broadband Resolution (1 to 10000 Hz)	1000 µg 9810 µm/s²
Non-Linearity	±1 %
Transverse Sensitivity	≤5 %
Environmental	
Overload Limit (Shock)	5000 g pk 49050 m/s² pk
Temperature Range	-65 to +250 °F -54 to +121 °C
Enclosure Rating	IP68
Electrical	
Settling Time (within 1% of bias)	≤10.0 sec
Discharge Time Constant	≥0.2 sec
Excitation Voltage	18 to 28 VDC
Constant Current Excitation	2 to 20 mA
Output Impedance	<100 Ohm
Output Bias Voltage	8 to 12 VDC
Spectral Noise (10 Hz)	50 µg/√Hz
Spectral Noise (100 Hz)	20 µg/√Hz
Spectral Noise (1 kHz)	6 µg/√Hz
Electrical Isolation (Case)	>10⁸ Ohm
Physical	
Sensing Element	Quartz
Sensing Geometry	Shear
Housing Material	Stainless Steel
Sealing	Welded Hermetic
Mounting Thread	1/4-28 Male
Mounting Torque	2 to 5 ft-lb 2.7 to 6.8 Nm
Electrical Connector	2-Pin MIL-C-5015
Electrical Connection Position	Side
Weight	4.2 oz 120 g
Accessories	
Model 081A67: Mounting bolt, 1/4-28 x 1.12"	

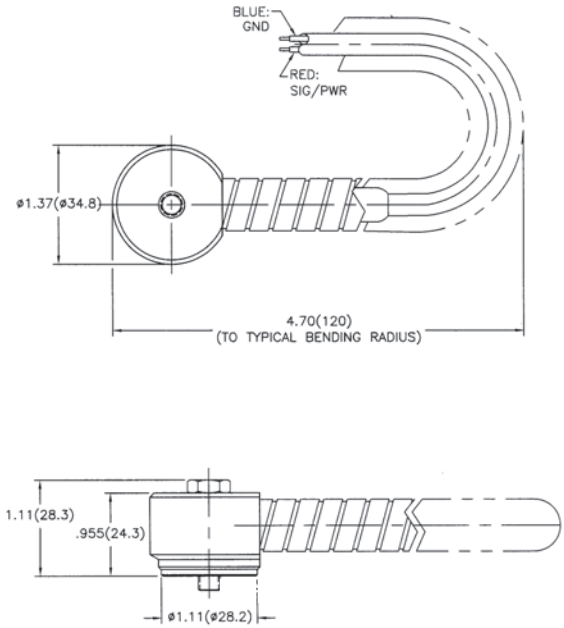
ADDITIONAL BASE MODEL CONFIGURATIONS



ACCELEROMETER WITH INTEGRAL POLYURETHANE CABLE

MODEL 624B11

- Configurable cable length and terminating connector



ACCELEROMETER WITH INTEGRAL ARMORED POLYURETHANE CABLE

MODEL 624B61

- Configurable cable length, armor length and terminating connector

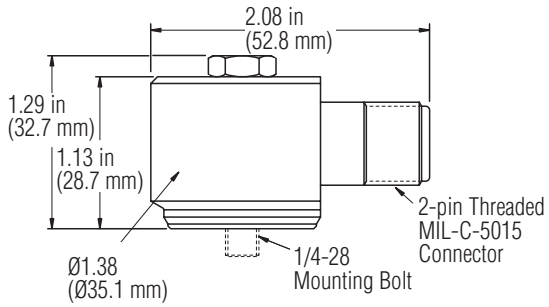
SIDE EXIT ICP® ACCELEROMETER

625 Series

ACCELEROMETER WITH MIL CONNECTOR

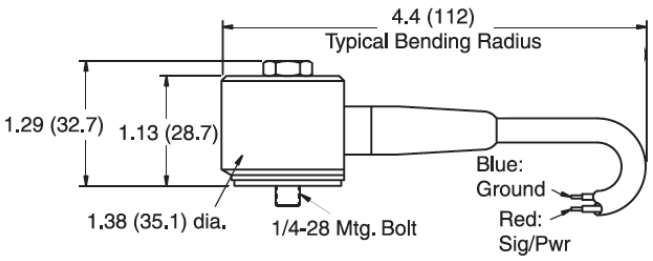
MODEL 625B01

- Most popular side-exit precision accelerometer.
- Ring-style design with through-bolt allows for easy cable positioning.



SPECIFICATIONS	
Performance	
Sensitivity (±5 %)	100 mV/g 10.2 mV/(m/s²)
Measurement Range	±50 g ±490 m/s²
Frequency Range (±5 %)	0.5 to 6500 Hz
Frequency Range (±10 %)	0.37 to 7500 Hz
Frequency Range (±3 dB)	0.2 to 10500 Hz
Resonant Frequency	25 kHz
Broadband Resolution (1 to 10000 Hz)	50 µg 490 µm/s²
Non-Linearity	±1 %
Transverse Sensitivity	≤5 %
Environmental	
Overload Limit (Shock)	5000 g pk 49050 m/s² pk
Temperature Range	-65 to +250 °F -54 to +121 °C
Enclosure Rating	IP68
Electrical	
Settling Time (within 1% of bias)	≤8.0 sec
Discharge Time Constant	≥1.0 sec
Excitation Voltage	18 to 28 VDC
Constant Current Excitation	2 to 20 mA
Output Impedance	<100 Ohm
Output Bias Voltage	8 to 12 VDC
Spectral Noise (10 Hz)	2.5 µg/√Hz
Spectral Noise (100 Hz)	0.8 µg/√Hz
Spectral Noise (1 kHz)	0.5 µg/√Hz
Electrical Isolation (Case)	>10^8 Ohm
Physical	
Sensing Element	Ceramic
Sensing Geometry	Shear
Housing Material	Stainless Steel
Sealing	Welded Hermetic
Mounting Thread	1/4-28 Male
Mounting Torque	2 to 5 ft-lb 2.7 to 6.8 Nm
Electrical Connector	2-Pin MIL-C-5015
Electrical Connection Position	Side
Weight	5.1 oz 145 g
Accessories	
Model 081A73: Mounting bolt 1/4-28 x 1.34" Model 080B45: Thermal boot	

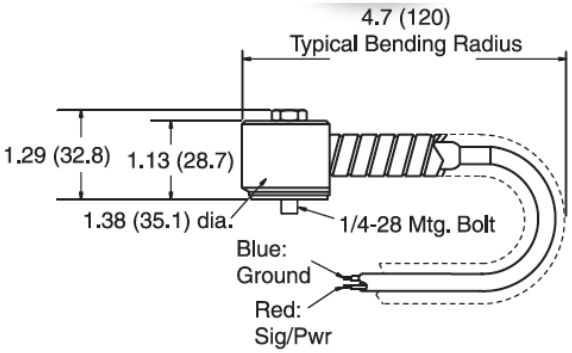
ADDITIONAL BASE MODEL CONFIGURATIONS



ACCELEROMETER WITH INTEGRAL POLYURETHANE CABLE

MODEL 625B11

- Configurable cable length and terminating connector



ACCELEROMETER WITH INTEGRAL ARMORED POLYURETHANE CABLE

MODEL 625B61

- Configurable cable length, armor length and terminating connector

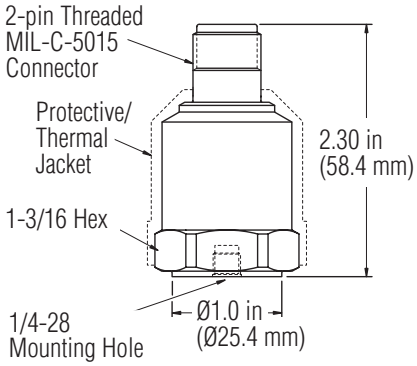
LOW FREQUENCY ICP® ACCELEROMETER

626 Series

ACCELEROMETER WITH MIL CONNECTOR

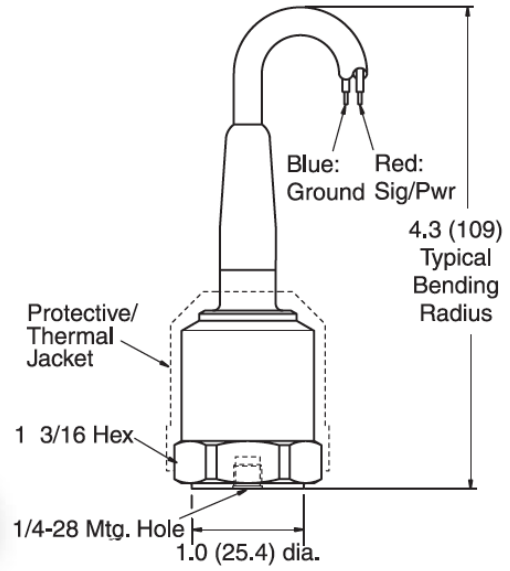
MODEL 626B01

- Low frequency response ideal for measuring vibration of slow rotating machinery, buildings, bridges and large structures.
- Larger size accommodates larger seismic, internal masses necessary to generate a stronger output signal.



SPECIFICATIONS	
Performance	
Sensitivity (±5 %)	100 mV/g 10.2 mV/(m/s²)
Measurement Range	±50 g ±490 m/s²
Frequency Range (±5 %)	0.5 to 5000 Hz
Frequency Range (±10 %)	0.37 to 7000 Hz
Frequency Range (±3 dB)	0.2 to 10000 Hz
Resonant Frequency	23 kHz
Broadband Resolution (1 to 10000 Hz)	100 µg 981 µm/s²
Non-Linearity	±1 %
Transverse Sensitivity	≤5 %
Environmental	
Overload Limit (Shock)	5000 g pk 49050 m/s² pk
Temperature Range	-65 to +250 °F -54 to +121 °C
Enclosure Rating	IP68
Electrical	
Settling Time (within 1% of bias)	≤5.0 sec
Discharge Time Constant	≥1.0 sec
Excitation Voltage	18 to 28 VDC
Constant Current Excitation	2 to 20 mA
Output Impedance	<100 Ohm
Output Bias Voltage	8 to 12 VDC
Spectral Noise (1 Hz)	15.0 µg/√Hz
Spectral Noise (10 Hz)	4.0 µg/√Hz
Spectral Noise (100 Hz)	1.5 µg/√Hz
Spectral Noise (1 kHz)	0.7 µg/√Hz
Electrical Isolation (Case)	>10^8 Ohm
Physical	
Sensing Element	Ceramic
Sensing Geometry	Shear
Housing Material	Stainless Steel
Sealing	Welded Hermetic
Mounting Thread	1/4-28 Female
Mounting Torque	2 to 5 ft-lb 2.7 to 6.8 Nm
Electrical Connector	2-Pin MIL-C-5015
Electrical Connection Position	Top
Weight	5.3 oz 150 g
Accessories	
Model 081A40: Mounting stud, 1/4-28 x 0.438" Model 085A31: Thermal jacket	

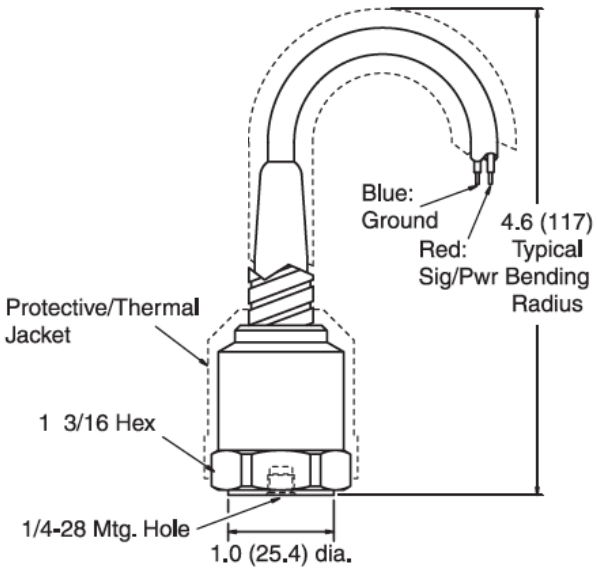
ADDITIONAL BASE MODEL CONFIGURATIONS



ACCELEROMETER WITH INTEGRAL POLYURETHANE CABLE

MODEL 626B11

- Configurable cable length and terminating connector



ACCELEROMETER WITH INTEGRAL ARMORED POLYURETHANE CABLE

MODEL 626B61

- Configurable cable length, armor length and terminating connector

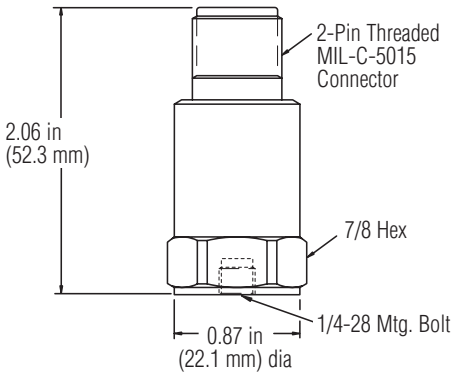
QUARTZ ELEMENT ICP® ACCELEROMETER

627 Series

ACCELEROMETER WITH MIL CONNECTOR

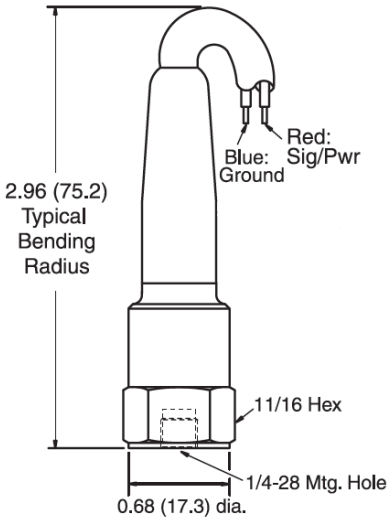
MODEL 627A01

- Naturally piezoelectric quartz element for excellent long-term stability and repeatability as well as linear sensitivity in thermally-active environments.
- Single-point calibration with nominal value etched on sensor.



SPECIFICATIONS	
Performance	
Sensitivity (±15 %)	100 mV/g 10.2 mV/(m/s²)
Measurement Range	±50 g ±490 m/s²
Frequency Range (±3 dB)	0.33 to 10000 Hz
Resonant Frequency	18 kHz
Broadband Resolution (1 to 10000 Hz)	1000 µg 9810 µm/s²
Non-Linearity	±1 %
Transverse Sensitivity	≤5 %
Environmental	
Overload Limit (Shock)	5000 g pk 49050 m/s² pk
Temperature Range	-65 to +250 °F -54 to +121 °C
Enclosure Rating	IP68
Electrical	
Settling Time (within 1% of bias)	≤10.0 sec
Discharge Time Constant	≥0.5 sec
Excitation Voltage	18 to 28 VDC
Constant Current Excitation	2 to 20 mA
Output Impedance	<100 Ohm
Output Bias Voltage	8 to 12 VDC
Spectral Noise (10 Hz)	50.0 µg/√Hz
Spectral Noise (100 Hz)	20.0 µg/√Hz
Spectral Noise (1 kHz)	6.0 µg/√Hz
Electrical Isolation (Case)	>10⁸ Ohm
Physical	
Sensing Element	Quartz
Sensing Geometry	Shear
Housing Material	Stainless Steel
Sealing	Welded Hermetic
Mounting Thread	1/4-28 Female
Mounting Torque	2 to 5 ft-lb 2.7 to 6.8 Nm
Electrical Connector	2-Pin MIL-C-5015
Electrical Connection Position	Top
Weight	3.3 oz 94 g
Accessories	
Model 081A40: Mounting stud, 1/4-28 x 0.438"	

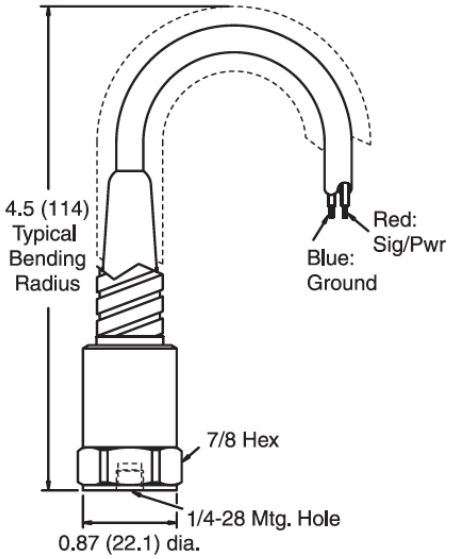
ADDITIONAL BASE MODEL CONFIGURATIONS



ACCELEROMETER WITH INTEGRAL POLYURETHANE CABLE

MODEL 627A11

- Configurable cable length and terminating connector



ACCELEROMETER WITH INTEGRAL ARMORED POLYURETHANE CABLE

MODEL 627A61

- Configurable cable length, armor length and terminating connector

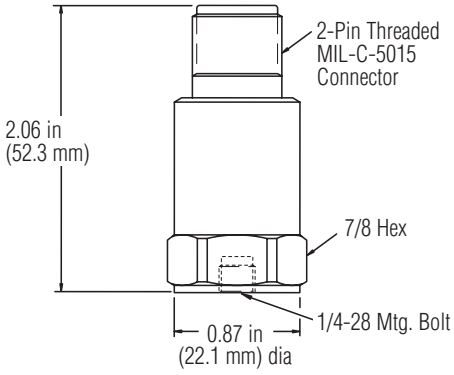
QUARTZ ELEMENT ICP® ACCELEROMETER

628 Series

ACCELEROMETER WITH MIL CONNECTOR

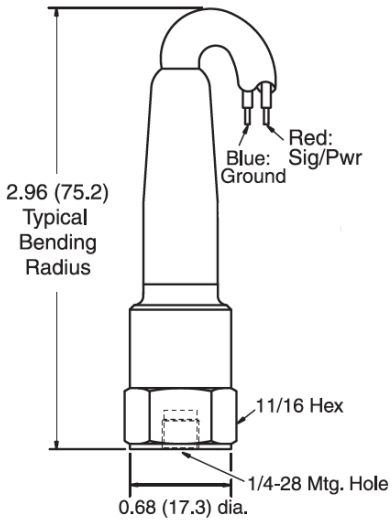
MODEL 628F01

- Naturally piezoelectric quartz element for excellent long-term stability and repeatability as well as linear sensitivity in thermally-active environments.
- Ideal for conveyors, outdoor installation, paper mills and power plants.



SPECIFICATIONS	
Performance	
Sensitivity (±5 %)	100 mV/g 10.2 mV/(m/s²)
Measurement Range	±50 g ±490 m/s²
Frequency Range (±5 %)	1.0 to 4000 Hz
Frequency Range (±10 %)	0.67 to 6500 Hz
Frequency Range (±3 dB)	0.33 to 12000 Hz
Resonant Frequency	18 kHz
Broadband Resolution (1 to 10000 Hz)	1000 µg 9810 µm/s²
Non-Linearity	±1 %
Transverse Sensitivity	≤5 %
Environmental	
Overload Limit (Shock)	5000 g pk 49050 m/s² pk
Temperature Range	-65 to +250 °F -54 to +121 °C
Enclosure Rating	IP68
Electrical	
Settling Time (within 1% of bias)	≤10.0 sec
Discharge Time Constant	≥0.5 sec
Excitation Voltage	18 to 28 VDC
Constant Current Excitation	2 to 20 mA
Output Impedance	<100 Ohm
Output Bias Voltage	8 to 12 VDC
Spectral Noise (10 Hz)	50.0 µg/√Hz
Spectral Noise (100 Hz)	20.0 µg/√Hz
Spectral Noise (1 kHz)	6.0 µg/√Hz
Electrical Isolation (Case)	>10^8 Ohm
Physical	
Sensing Element	Quartz
Sensing Geometry	Shear
Housing Material	Stainless Steel
Sealing	Welded Hermetic
Mounting Thread	1/4-28 Female
Mounting Torque	2 to 5 ft-lb 2.7 to 6.8 Nm
Electrical Connector	2-Pin MIL-C-5015
Electrical Connection Position	Top
Weight	3.3 oz 94 g
Accessories	
Model 081A40: Mounting stud, 1/4-28 x 0.438"	

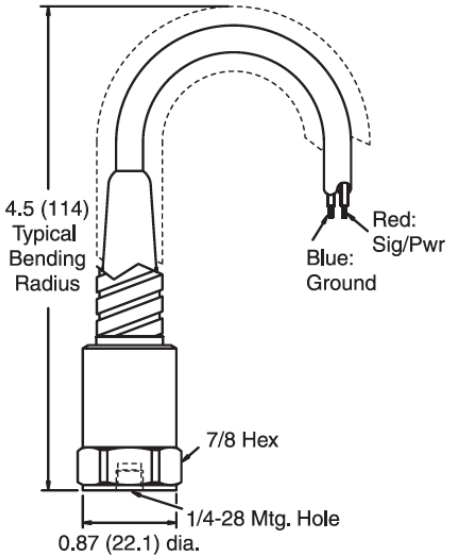
ADDITIONAL BASE MODEL CONFIGURATIONS



ACCELEROMETER WITH INTEGRAL POLYURETHANE CABLE

MODEL 628F11

- Configurable cable length and terminating connector



ACCELEROMETER WITH INTEGRAL ARMORED POLYURETHANE CABLE

MODEL 628F61

- Configurable cable length, armor length and terminating connector

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