

### 4-170 Piezoelectric Accelerometer



#### Description:

The CEC Model 4-170 accelerometer is a self-generating, piezoelectric accelerometer designed for medium temperature vibration measurement applications. This instrument provides a high sensitivity and stable output for continuous operation at temperatures as high as +500°F (+260°C). While the unit does not require power for operation, the accelerometer output must be operated into a charge converter that is designed to accept a 100,000 ohm source resistance.

The 4-170 accelerometer's piezo ceramic sensing element is housed within a rugged case. The case and connector are both made from 440C S.S. The mounting base incorporates a standard three-point mounting pattern on a 1.188" diameter B.C., common to many applications. The 4-170 series provides a balanced differential output that is isolated from the case ground. Sensitivities available include 10 pC/g, 50 pC/g and 100 pC/g.

#### Features:

- Self-Generating (no external power)
- Balanced Differential Output
- Operates to +500°F (+260°C)
- Ideal for Test Cell Turbine Vibration Monitoring
- Available in 10, 50 or 100 pC/g Sensitivity

Model Number	Description			
4-170-0001	10 pC/g RMS ±5% referenced @ 100 Hz	5 to 2000 Hz	-65 to +500°F (-54 to +260°C)	
4-170-0002	50 pC/g RMS ±5% referenced @ 100 Hz	5 to 2000 Hz	-65 to +500°F (-54 to +260°C)	
4-170-0003	100 pC/g RMS ±5% referenced @ 100 Hz	5 to 2000 Hz	-65 to +500°F (-54 to +260°C)	

### 4-160 (Top or Side Exit) Series Accelerometer



#### Description:

The 4-160 series accelerometers are intended to satisfy the general requirements for a low cost vibration sensor for use in multi-point experimental or light industrial vibration monitoring applications.

These accelerometers feature a two-wire current loop operating principle which permits very long interconnecting cables to be used where necessary and at minimum expense since standard screened pair (or multi-pair) cables may be used.

#### Features:

- Two-Wire, Current Driven
- Internal Amplifier
- Hermetically Sealed
- Internally Shielded
- Electrical Isolation
- Thermal Isolation
- Stainless Steel Body
- Single Point Mounting
- Temperature Range: -58 to +250°F (-50 to +121°C)

Model Number	Output	Frequency Range	Mounting	Connection
4-160-1001	100mV/g	2 Hz - 4 kHz (±5%)	Stud Mount .250 - 28 UNF	
4-160-1005	500mV/G	2 - 4k ±5%, 0.5 to 15k ± 3dB	Stud Mount .250 - 28 UNF	
4-160-1201	100mV/g	2 Hz - 3 kHz (±5%)	Captive Bolt .250 - 28 UNF	
4-160-2001-01	100mV/g	2 - 4k ±5%, 0.5 to 15k ± 3dB	Stud Mount .250 - 28 UNF	Integral 10ft./shielded cable polyurethane jacket
4-160-2001-02	100mV/g	2 - 4k ±5%, 0.5 to 15k ± 3dB	Stud Mount .250 - 28 UNF	Integral 30ft./shielded cable polyurethane jacket
4-160-2001-03	100mV/g	2 - 4k ±5%, 0.5 to 15k ± 3dB	Stud Mount .250 - 28 UNF	Integral 50ft./shielded cable polyurethane jacket
4-160-2001-04	100mV/g	2 - 4k ±5%, 0.5 to 15k ± 3dB	Stud Mount .250 - 28 UNF	Integral 100ft./shielded cable polyurethane jacket
4-160-2201-01	100mV/g	2 - 3k ±5%, 0.5 to 10k ± 3dB	Captive Bolt .250 - 28 UNF	Integral 10ft./shielded cable polyurethane jacket
4-160-2201-02	100mV/g	2 - 3k ±5%, 0.5 to 10k ± 3dB	Captive Bolt .250 - 28 UNF	Integral 30ft./shielded cable polyurethane jacket
4-160-2201-03	100mV/g	2 - 3k ±5%, 0.5 to 10k ± 3dB	Captive Bolt .250 - 28 UNF	Integral 50ft./shielded cable polyurethane jacket
4-160-2201-04	100mV/g	2 - 3k ±5%, 0.5 to 10k ± 3dB	Captive Bolt .250 - 28 UNF	Integral 100ft./shielded cable polyurethane jacket
4-160-5001	100mV/g	2 - 4k ±5%, 0.5 to 15k ± 3dB	Stud Mount .250 - 28 UNF	
4-160-5201	100mV/g	2 - 3k ±5%, 0.5 to 10k ± 3dB	Captive Bolt .250 - 28 UNF	



<b>Model Number</b>	<b>Output</b>	<b>Frequency Range</b>	<b>Mounting</b>	<b>Connection</b>
4-160-6001-01	100mV/g	2 - 4k ±5%, 0.5 to 15k ± 3dB	Stud Mount .250 - 28 UNF	Integral 10ft./shielded cable polyurethane jacket
4-160-6001-02	100mV/g	2 - 4k ±5%, 0.5 to 15k ± 3dB	Stud Mount .250 - 28 UNF	Integral 30ft./shielded cable polyurethane jacket
4-160-6001-03	100mV/g	2 - 4k ±5%, 0.5 to 15k ± 3dB	Stud Mount .250 - 28 UNF	Integral 50ft./shielded cable polyurethane jacket
4-160-6001-04	100mV/g	2 - 4k ±5%, 0.5 to 15k ± 3dB	Stud Mount .250 - 28 UNF	Integral 100ft./shielded cable polyurethane jacket
4-160-6201-01	100mV/g	2 - 3k ±5%, 0.5 to 10k ± 3dB	Captive Bolt .250 - 28 UNF	Integral 10ft./shielded cable polyurethane jacket
4-160-6201-02	100mV/g	2 - 3k ±5%, 0.5 to 10k ± 3dB	Captive Bolt .250 - 28 UNF	Integral 30ft./shielded cable polyurethane jacket
4-160-6201-03	100mV/g	2 - 3k ±5%, 0.5 to 10k ± 3dB	Captive Bolt .250 - 28 UNF	Integral 50ft./shielded cable polyurethane jacket
4-160-6201-04	100mV/g	2 - 3k ±5%, 0.5 to 10k ± 3dB	Captive Bolt .250 - 28 UNF	Integral 100ft./shielded cable polyurethane jacket

### 4-161 Series Velocity Output Accelerometer



#### Description:

The 4-161 series velocity output accelerometer intended to satisfy the general specification requirements for a low cost vibration sensor. Designed for use in multi-point experimental or light industrial vibration monitoring applications, where velocity measurements are required.

The velocity output accelerometer two-wire current loop operating principle permits very long interconnecting cables to be used where necessary and at minimum expense since standard screened pair (or multi-pair) cables may be used.

#### Features:

- Two-Wire, Current Driven
- Internal Amplifier
- Hermetically Sealed
- Internally Shielded
- Electrical Isolation
- Thermal Isolation
- Intrinsically Safe
- Stainless Steel Body
- Single Point Mounting
- Temperature Range: -58 to +250°F (-50 to +121°C)

Model Number	Output	Frequency Response	Mounting	Connection
4-161-1001	100mV / inches per second $\pm 5\%$	2 Hz to 12 kHz $\pm 3\text{dB}$	Stud Mount .250 - 28 UNF	
4-161-2001-01	100mV / inches per second $\pm 5\%$	2 Hz to 12 kHz $\pm 3\text{dB}$	Stud Mount .250 - 28 UNF	Integral 10ft./shielded cable polyurethane jacket
4-161-2001-02	100mV / inches per second $\pm 5\%$	2 Hz to 12 kHz $\pm 3\text{dB}$	Stud Mount .250 - 28 UNF	Integral 30ft./shielded cable polyurethane jacket
4-161-2001-03	100mV / inches per second $\pm 5\%$	2 Hz to 12 kHz $\pm 3\text{dB}$	Stud Mount .250 - 28 UNF	Integral 50ft./shielded cable polyurethane jacket
4-161-2001-04	100mV / inches per second $\pm 5\%$	2 Hz to 12 kHz $\pm 3\text{dB}$	Stud Mount .250 - 28 UNF	Integral 100ft./shielded cable polyurethane jacket

### 4-162 Vibration Sensor/Transmitter (4-20 mA Output)



#### Description:

The 4-162 vibration sensor is a compact, well-protected industrial accelerometer, giving a process output of 4-20mA proportional to various vibration ranges in terms of velocity RMS.

The 4-162 is intended for use as a direct input of vibration levels into many different kinds of control and data acquisition systems, however it can be used with a trip amplifier or suitable display as a stand alone unit.

#### Features:

- Two-Wire, Current Driven
- Internal Amplifier
- Hermetically Sealed
- Internally Shielded
- Electrical Isolation
- Thermal Isolation
- Stainless Steel Body
- Single Point Mounting
- Temperature Range: -58 to +250°F (-50 to +121°C)

Model Number	Output	Frequency Response	Mounting	Connection
4-162-1001	4-20mA = 0-0.5 ips RMS	2.5 to 2500 ±5%	Stud .250 - 28 UNF	
4-162-1002	4-20mA = 0-1 ips RMS	2.5 to 2500 ±5%	Stud .250 - 28 UNF	
4-162-1003	4-20mA = 0-2 ips RMS	2.5 to 2500 ±5%	Stud .250 - 28 UNF	
4-162-2001-01	4-20mA = 0-0.05 ips RMS	2.5 to 2500 ±5%	Stud .250 - 28 UNF	Integral 10ft./shielded cable polyurethane jacket
4-162-2002-01	4-20mA = 0-1 ips RMS	2.5 to 2500 ±5%	Stud .250 - 28 UNF	Integral 10ft./shielded cable polyurethane jacket
4-162-2003-01	4-20mA = 0-2 ips RMS	2.5 to 2500 ±5%	Stud .250 - 28 UNF	Integral 10ft./shielded cable polyurethane jacket

## 4-202 Strain Gage Accelerometer

### Description:

Performance characteristics of the CEC 4-202 Strain Gage Accelerometer are distinctly superior to any comparable instrument available today. It is one of the smallest temperature compensated strain gage accelerometers on the market. External dimensions are approximately 1 inch cubed, and weight is 3 ounces.



Designed for measuring static or dynamic accelerations perpendicular to the mounting surface, the 4-202 is available in ranges from  $\pm 5g$  to  $\pm 500g$ . Operable temperature range is  $-70^{\circ}F$  to  $+300^{\circ}F$  ( $-57^{\circ}C$  to  $+149^{\circ}C$ ). Combined linearity and hysteresis is conservatively rated at less than  $\pm 0.75\%$  of full range output.

The 4-202 is a linear unbonded strain gage bi-directional accelerometer with four active arm, spring type sensing elements. Allowable over acceleration up to 20 times rated range - is achieved by incorporating mechanical stops on the instrument.

### Features:

- Operates from  $\pm 5g$  to  $\pm 500g$
- Wide temperature range:  $-65^{\circ}F$  to  $+250^{\circ}F$  ( $-54^{\circ}C$  to  $+121^{\circ}C$ )
- Low cross axis sensitivity: 0.01 g/g

Model Number	Output Sensitivity	Frequency Range (Hz)	Temperature Range	Excitation Source	Mounting Base	Mating Connector	Integral Cable	Product Weight
4-202-0001	+/- 5g	0 to 100	-65 to +250°F -54 to +121°C	+5 VDC	4 holes equally spaced 0.770 typ.	Prepared Leads	2 ft.	3 oz
4-202-0015	+/- 10g	0 to 133	-65 to +250°F -54 to +121°C	+5 VDC	4 holes equally spaced 0.770 typ.	Prepared Leads	2 ft.	3 oz
4-202-0016	+/- 15g	0 to 176	-65 to +250°F -54 to +121°C	+5 VDC	4 holes equally spaced 0.770 typ.	Prepared Leads	2 ft.	3 oz
4-202-0017	+/- 25g	0 to 217	-65 to +250°F -54 to +121°C	+5 VDC	4 holes equally spaced 0.770 typ.	Prepared Leads	2 ft.	3 oz
4-202-0018	+/- 50g	0 to 293	-65 to +250°F -54 to +121°C	+5 VDC	4 holes equally spaced 0.770 typ.	Prepared Leads	2 ft.	3 oz
4-202-0019	+/- 100g	0 to 417	-65 to +250°F -54 to +121°C	+5 VDC	4 holes equally spaced 0.770 typ.	Prepared Leads	2 ft.	3 oz
4-202-0020	+/- 250g	0 to 667	-65 to +250°F -54 to +121°C	+5 VDC	4 holes equally spaced 0.770 typ.	Prepared Leads	2 ft.	3 oz
4-202-0021	+/- 500g	0 to 967	-65 to +250°F -54 to +121°C	+5 VDC	4 holes equally spaced 0.770 typ.	Prepared Leads	2 ft.	3 oz