ENDEVCO
AN AMPHENOL COMPANY

INSTRUCTION MANUAL

For Model 7262A
Amplified Output Piezoresistive Accelerometer

IM7262A, Revision NR (10/24/25)

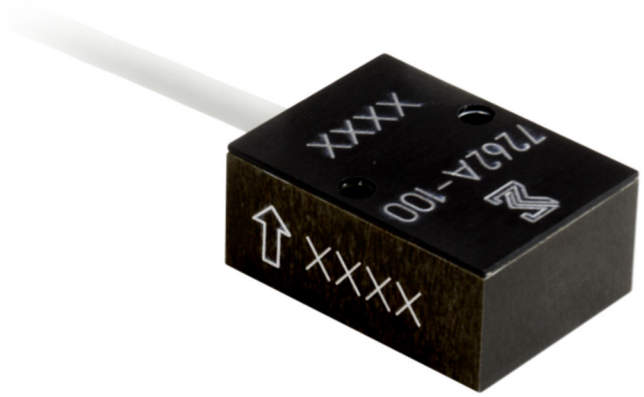

Figure 1: The Endevco® 7262A Accelerometer
(photo not to scale)

The Endevco® Model 7262A is a rugged, gas-damped piezoresistive transducer. It features an active circuit with temperature compensation electronics for stable performance over a wide range of temperatures. The sensing element itself is a silicon MEMS element used in a full-bridge configuration. This model is designed for shock applications with gas damping to reduce resonance excitation, and overtravel stops are employed to reduce breakage in overrange conditions. These two features combine to offer more survivability and reliability in environments that may not be well defined.

Due to the severe environment in which these accelerometers are installed, the user should carefully read this instruction manual in its entirety.

A Calibration Certificate is included in the shipment of your Endevco® shock accelerometer. Additionally, a product specification datasheet can be found at Endevco.com.

The 7262A shares many usage precautions and considerations with other Endevco® piezoresistive accelerometers. Please refer to the Endevco® instruction manual IM PR for more information on general handling precautions, mounting considerations, electrical information, and other topics.

HANDLING PRECAUTIONS

Endevco® shock accelerometers are survivable to thousands of Gs of acceleration, but only when they are installed to a proper mounting surface. An unmounted unit can be damaged from seemingly harmless situations. Things like a drop onto the floor or a bump into a metal rack are more dangerous than one would think. These events send high frequency shock waves into the sensor and cause it to ring at its resonant frequency. Resonance can lead to sensor damage such as large ZMO or resistance changes, even if the sensor housing and cable look perfectly fine from the outside. High frequencies are normally attenuated by the mounting surface on which the sensor sits, so resonance is much more of a risk when the unit is unmounted. Take extra caution when transporting sensors or when handling them at a benchtop.

Endevco® shock accelerometers are shipped in electrostatic discharge (ESD) safe packaging. When handling any accelerometer it is always best practice to handle with ESD in mind. The accelerometer should only be handled by properly grounded technicians (via wrist straps or heel straps) at ESD safe work stations. If ESD damage does occur it will typically result in a large shift in the zero measurand output (ZMO). If ESD damage is sufficiently high, complete accelerometer failure is likely, showing up as an extremely large ZMO or an open gage of the Wheatstone bridge.

INITIAL CHECKOUT

Upon receipt, check the accelerometer to ensure that it was not damaged in transit. A simple ZMO check with the unit powered on is a quick way of verifying that the MEMS element is intact and the sensor is functional.

> ZMO Test – Open the accelerometer container, and install a mating cable or connector if required. Unwind a few inches of cable for easier access to the individual cable wires. Use a power supply to apply excitation voltage across the red (+EXC) and black (-EXC) wires. Then use a voltmeter or DMM with clip leads to measure the DC voltage across the green (+OUT) and white (-OUT) wires. The resulting voltage measurement is the ZMO, and it should be within the specified tolerance as listed on the product specification sheet.

The ZMO specification for 7262A is ± 50 mV maximum.

If the above voltage measurement is not within the noted specification there may be a problem with the accelerometer. Contact Endevco/PCB for further troubleshooting.

MOUNTING SURFACE PREPARATION AND INSTALLATION

The 7262A is supplied 2pc of ½" length 2-56 screws and 2pc of #2 size washers. The mounting surface should be prepared with two 2-56 threaded holes, separated by a distance of 0.480", and each with a depth 0.180" or greater. Before installing the 7262A, a thin layer of acoustic couplant (or vacuum grease) is recommended between the accelerometer and mounting surface. This will fill in any extremely small and subtle gaps between sensor and mating surface due to imperfect roughness, and will enhance transmissibility of the shock input. Two recommended acoustic couplants are Echotrace 9000 and Dow Corning DC-111. Place the 7262A on the mounting surface, then place one #2 washer under the head of each 2-56 screw, then insert the 2-56 screws through the mounting holes of the 7262A housing. Use a torque of 6 ± 1 lbf-in (0.7 ± 0.1 N-m) on each mounting screw to secure the 7262A to the mounting surface.

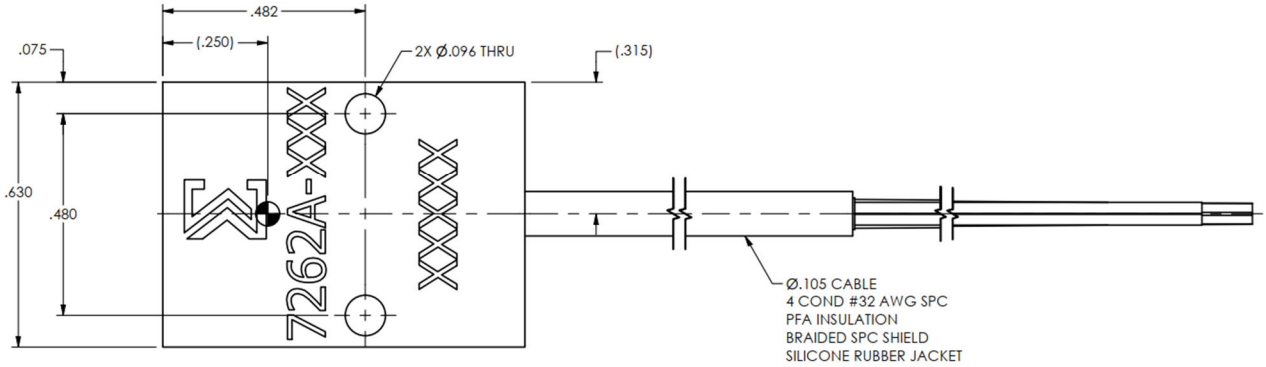

Figure 2: Outline drawing of 7262A, showing the mounting hole pattern for the 2-56 screws.

The 7262A may be mounted with adhesives rather than the supplied screws and washers. For permanent installations, Thermoset EP-937 is recommended. For temporary installations, Aremco Crystalbond 509 is recommended. Crystalbond 509 is a wax that is applied using a moderate amount of heat and can be cleaned up with acetone. Cyanoacrylate (super glue) is not recommended as a temporary adhesive unless an appropriate solvent (such as acetone) is used to weaken the glue joint before attempting to remove the accelerometer. The 7262A may be adhesively mounted on any surface of the housing, including the side walls or the top cover, but be aware that sensor performance is only calibrated and guaranteed for mounting via the bottom mounting surface.

Refer to IM PR (Piezoresistive Instruction Manual) for a summary of general mounting surface preparation and install processes.

CABLE HANDLING

The 7262A shock accelerometer includes an integral, non-removable, 4-conductor cable. As the cable is terminated with a pigtail, the user can select an appropriate end connector.

If possible, the mounting preparation should allow for the cable to be routed perpendicular to the primary shock direction to reduce the amount of tensile stress on the cable. To strain relieve the cable close to the accelerometer, form a small bend (~¼" radius) in the cable within two to three inches of the housing-cable interface, and then tack the cable to the mounting surface with tape. In routing the remaining portion of the cable to the signal conditioner, it is important that there be sufficient slack in the cable, i.e. the cable should not be pulled tight between the test specimen and the signal conditioner.

ELECTRICAL CONSIDERATIONS

1. Excitation Voltage – The 7262A is calibrated using an excitation voltage of 10.000 ± 0.005 Vdc. However, the voltage to the active circuit inside is controlled with a voltage regulator, allowing the sensor to operate with identical performance at any excitation voltage between 6 Vdc and 18 Vdc. Voltages below 6 Vdc will not provide sufficient power to the circuit for full operation. Voltages above 18 Vdc risk causing permanent damage to the device. Note that even with an on-board voltage regulator, the accelerometer requires a clean, well-regulated, constant voltage power supply.

2. Power and Signal Leads – The cable leads are assigned as follows:

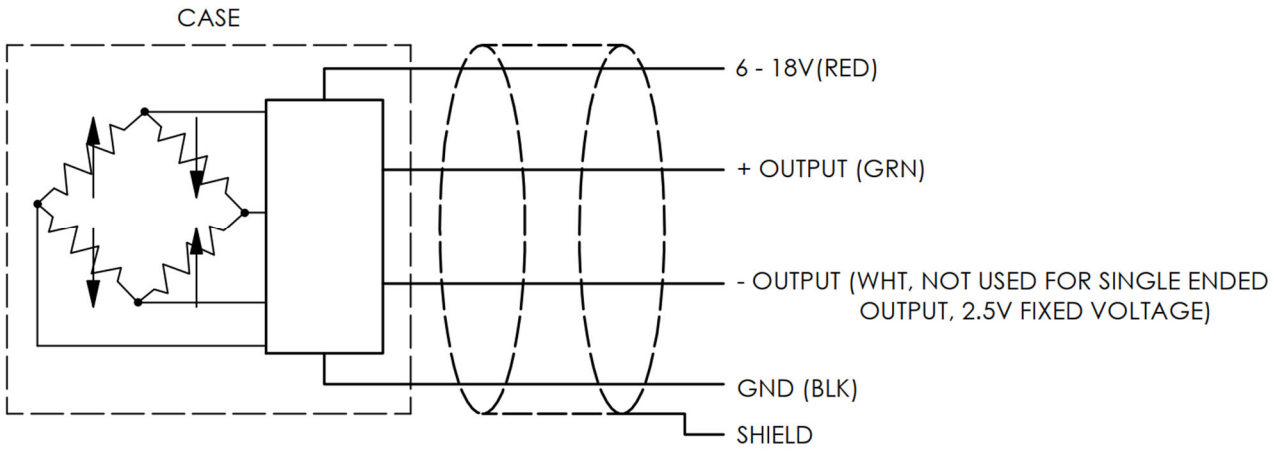

Figure 3: Simplified 7262A schematic.

3. Differential Mode and Single-Ended Mode – The 7262A can function in "differential mode" which uses all four integral cable wires, or in "single-ended" mode which only requires three of the integral cable wires. In both modes, excitation voltage must be applied across the red (+EXC) and black (-EXC) wires.
    a. Differential Mode – The sensor's output is measured via the voltage reading across the green (+OUT) and white (-OUT) wires. In this mode, the full-scale output range is ±0.5V (-100 only) or ±1.0V (-500 and -1000 only). If subjected to accelerations above its full-scale range, the sensor will continue to provide output up to the electrical limits of ±2.5V.
    b. Single-Ended Mode – The sensor's output is measured via the voltage reading across the green (+OUT) and black (-EXC) wires. In this configuration, the white (-OUT) wire is left unused. In this mode, the full-scale output range is 2.0V to 3.0V (-100 only) or 1.5V to 3.5V (-500 and -1000), with 2.5V of bias voltage. If subjected to accelerations above its full-scale range, the sensor will continue to provide output up to the electrical limits of 0V minimum and +5V maximum.

CLEANING

If desired, dirty accelerometers may be wiped clean using a damp cloth and a solvent such as acetone. **Do not soak or immerse** the unit in any solvent or water. Do not use any sharp tool such as a screwdriver to remove dirt or contaminants. Any temporary adhesives, such as wax or cyanoacrylate, used to mount the accelerometer should be cleaned with an appropriate solvent (such as acetone).

RECALIBRATION

Sensitivity and ZMO calibration should be performed at 6 to 12 month intervals depending on usage. Ordinarily, recalibration need only be performed at 12 month intervals if it is known that the accelerometer has not been used beyond its rated specifications. If the unit is used under severe environments, it may be desirable to use shorter calibration intervals.

The general health of the accelerometer can be assessed by measuring the ZMO per the "Initial Checkout" section above, and comparing the value to the most recent calibration certificate. Note that due to the 7262A's high sensitivity, the ZMO can change by several mV due to the sensor housing's orientation alone (right-side up vs. sideways vs. upside down).

After the above test, if you are still uncertain about the performance of your accelerometer, please contact Endevco/PCB.

QUESTIONS

If you have any questions regarding the use of these accelerometers (or any other Endevco® product) please contact Endevco/PCB at 1-716-684-0002 in North America, or your local sales representative.