ENDEVCO
AN AMPHENOL COMPANY

INSTRUCTION MANUAL

For Model 2262B
Piezoresistive High Shock Accelerometer

IM2262B, Revision NR (07/26/22)

Figure 1: The Endevco® 2262B Damped Accelerometer
(photo not to scale)

The Endevco® Model 2262B is a rugged, gas-damped piezoresistive transducer. It has an integral hermetic receptacle that is designed to mate with a detachable shielded cable assembly (Endevco® Model 3915). The sensing element itself is a silicon MEMS element used in a full-bridge configuration. This model is designed for high-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® high shock accelerometer. Additionally, a product specification datasheet can be found at Endevco.com.

The 2262B 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® high 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 resistance test is a quick way of verifying that all legs in the Wheatstone bridge sensing element are intact.

> Resistance Test – Open the accelerometer container, and install a mating cable if required. Unwind a few inches of cable for easier access to the individual cable wires. Measure the input resistance (red to black) and output resistance (green to white) with an ohmmeter and a pair of clip leads. The measured resistance should be within the specified tolerance as listed on the product specification data sheet.

Typical specification for 2262B input/output resistance is 6,500 ± 2,000 Ω.

If the above resistance measurements are 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 2262B is supplied with the Endevco® 2981-12 mounting stud accessory. The stud has a long threaded 10-32 end and a short threaded 10-32 end. The long end is intended for the mounting surface, and the short end is intended for the 2262B. The mounting surface should be prepared with a single 10-32 threaded hole, depth 0.280" or greater. Install the stud accessory to the mounting surface first, with torque 18 ± 2 lbf-in (2.0 ± 0.2 N-m). Before installing the 2262B, 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. Use a torque of 18 ± 2 lbf-in (2.0 ± 0.2 N-m) to secure the 2262B to the mounting stud.

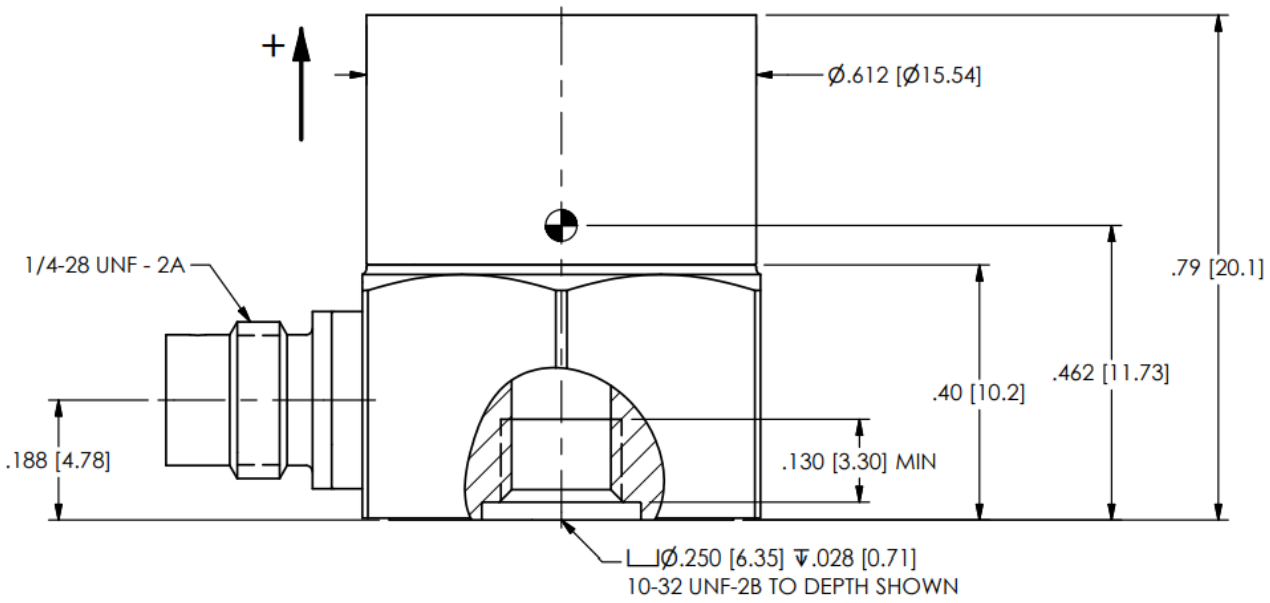

Figure 2: Outline drawing of 2262B, showing the 10-32 thread for mounting.

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

CABLE HANDLING

The 2262B high shock accelerometer is designed to be used with the Endevco® 3915 mating cable assembly, which has one connectorized end to mate with the 2262B and one pigtail end. The user can select an appropriate end connector.

In high-shock applications, the threaded interface between the 2262B sensor and 3915 mating cable may slip and loosen. The mating cable should be re-torqued to finger tightness, if possible, after each high-level shock test. An alternative approach is to use liquid thread-locking compound (such as Loctite®).

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 connector 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 2262B is calibrated using an excitation voltage of 10.000 ± 0.005 Vdc, unless otherwise specified at the time of order (the maximum excitation voltage without damage is 12 Vdc). If a voltage other than the voltage used at the time of calibration is applied to the unit, the ZMO and sensitivity will differ from the specified value on the Calibration Certificate, thus excitation voltages other than 10 Vdc should be specified at the time of order. The accelerometer requires a clean, well-regulated, constant voltage power supply.

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

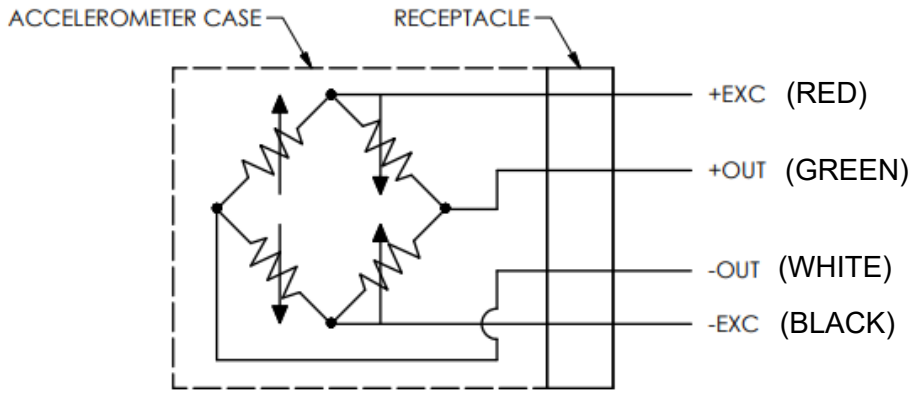

Figure 3: Simplified 2262B schematic.

The cable shield is electrically connected to the accelerometer case. To avoid ground loops, leave the cable shield floating on the DAQ side.

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 and comparing the value to the most recent calibration certificate. Another good health check is the resistance test "Initial Checkout" section above.

After the above tests, 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.