OPERATION MANUAL
MODEL 4807A ACCELEROMETER

WARRANTY

Measurement Specialties, Inc. accelerometers are warranted during a period of one year from date of shipment to original purchaser to be free from defects in material and workmanship. The liability of Seller under this warranty is limited to replacing or repairing any instrument or component thereof which is returned by Buyer, at his expense, during such period and which has not been subjected to misuse, neglect, improper installation, repair, alteration, or accident. Seller shall have the right to final determination as to the existence and cause of a defect. In no event shall Seller be liable for collateral or consequential damages. This warrant is in lieu of any other warranty, expressed, implied, or statutory; and no agreement extending or modifying it will be binding upon Seller unless in writing and signed by a duly authorized officer.

RECEIVING INSPECTION

Every Measurement Specialties, Inc. accelerometer is carefully inspected and is in perfect working condition at the time of shipment. Each accelerometer should be checked as soon as it is received. If the unit is damaged in any way, or fails to operate, a claim should immediately be filed with the transportation company.

SERVICE CONCERNS

If a Measurement Specialties, Inc. instrument requires service, first contact the nearest Measurement Specialties, Inc. representative. They may be able to solve the problem without returning the unit to the factory. If it is determined that factory service is required, call Customer Service at the regional headquarters for an RMA number before return.

RETURNS

All units being returned to the factory require an RMA (Return Material Authorization) number before they will be accepted. This number may be obtained by calling Customer Service at the regional headquarters with the following information; model number(s), quantity, serial number(s), and symptoms of the problem, if being returned for service. You must include the original purchase order number if under warranty.

RECALIBRATION SERVICES

The Vibration Sensors Design Center and its two manufacturing facilities in China and France offer factory re-calibration services for Piezoresistive, Piezoelectric and Integrated Electronics Piezoelectric (IEPE, ISOTRON, ICP, etc.) accelerometers. NIST (US), DKD (Germany), COFRAC (France) traceable calibration services on sensitivity at 100 Hz (102 or 120 Hz in Europe) and full frequency sweeps are offered. Contact the regional headquarters for pricing information.

DESCRIPTION

The Model 4807A is an ultra low noise DC response accelerometer packaged in a welded stainless steel housing with integral temperature compensation. The accelerometer incorporates a miniature side-mounted connector with a detachable mating cable assembly. The Model 4807A is offered in ranges from ±2 to ±200g and incorporates gas damped silicon MEMS sensing elements with a wide bandwidth from DC up to 1500Hz. A patent pending Auto-Zero function is also included which allows the user to minimize zero offset at the output.

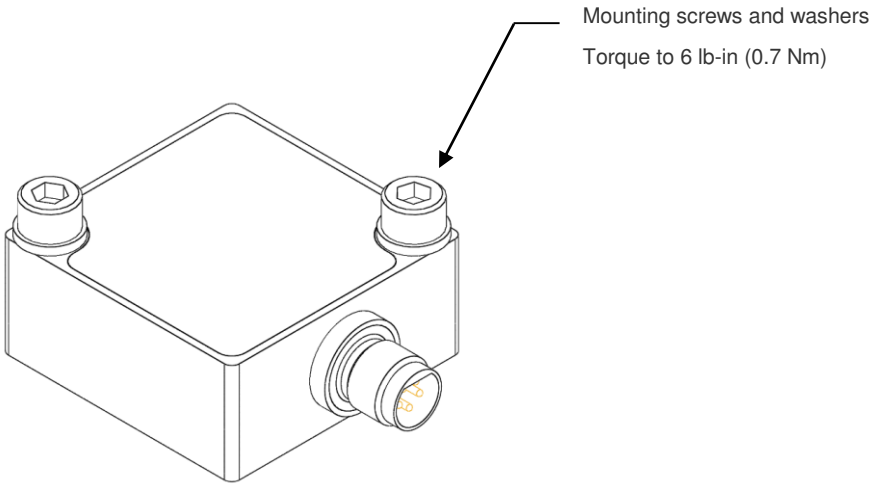
INSTALLATION

The model 4807A accelerometer is designed to be screw mounted but can also be adhesively mounted if the installation does not allow for screw mounting.

Screw Mounting

For screw mounting of accelerometers the following guidelines should be followed:

- The mounting surface should be clean and free of any residue or foreign material.
- The mounting surface should be smooth, flat, and with a maximum surface roughness of 32 micro-inches rms.
- Optional: Apply a light coating of coupling fluid (machine oil or silicone grease) on the mating surface to maximize the usable frequency range.
- Torque screws to recommended limits using steel washers under the heads of the mounting screws. Use manual torque wrench (do not use electric tools).



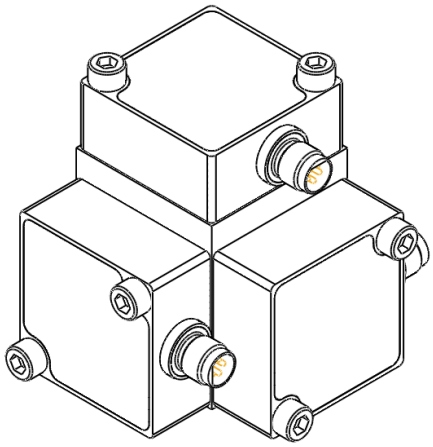
Adhesive Mounting

To avoid damaging the accelerometer during subsequent removal, it is recommended to use an adhesive mounting adaptor for this method of attachment. For adhesively mounting of accelerometers the following guidelines should be followed:

- The mounting surface should be clean and free of any residue or foreign material.
- The mounting surface should be smooth, flat, and with a maximum surface roughness of 64 micro-inches rms.
- For best high frequency performance a cyanoacrylate adhesive is recommend. A thin layer offers best frequency response.
- Soften adhesive cured adhesive with a chemical debonder (eg. acetone) prior to removal. Gently shear accelerometer loose from the mounting surface after waiting a few minutes for the debonding agent to penetrate the epoxy. Make sure not to use excessive force as this may damage the accelerometer.

Triaxial Mounting

For triaxial measurements it is recommended that the AC-D02652 triaxial mounting block is used. The triaxial block is supplied with both #8-36 UNF and M4x0.7 mounting screws. Alternatively, the triaxial block can also be mounted with a 10-32 UNF mounting stud.



CABLE ROUTING

The model 4807A accelerometer incorporates a miniature side-mounted connector with a detachable mating cable assembly (model 340A or 341A). For reliable operation it is recommend that a small amount of thread locking compound is used to secure the connector plug during testing. For long term use in a wet or oily environment it is recommended that the connector interface is protected with a silicone sealant and a flexible heat shrink tubing.

The cable assembly should also be properly secured at regular intervals during testing. It is recommended to use clamps, wax, or tape to secure the cable to minimize cable motion that can add noise to the output signal. The initial attachment should be within two to three inches of the accelerometer with some slack in the cable to prevent tension at the connector joint

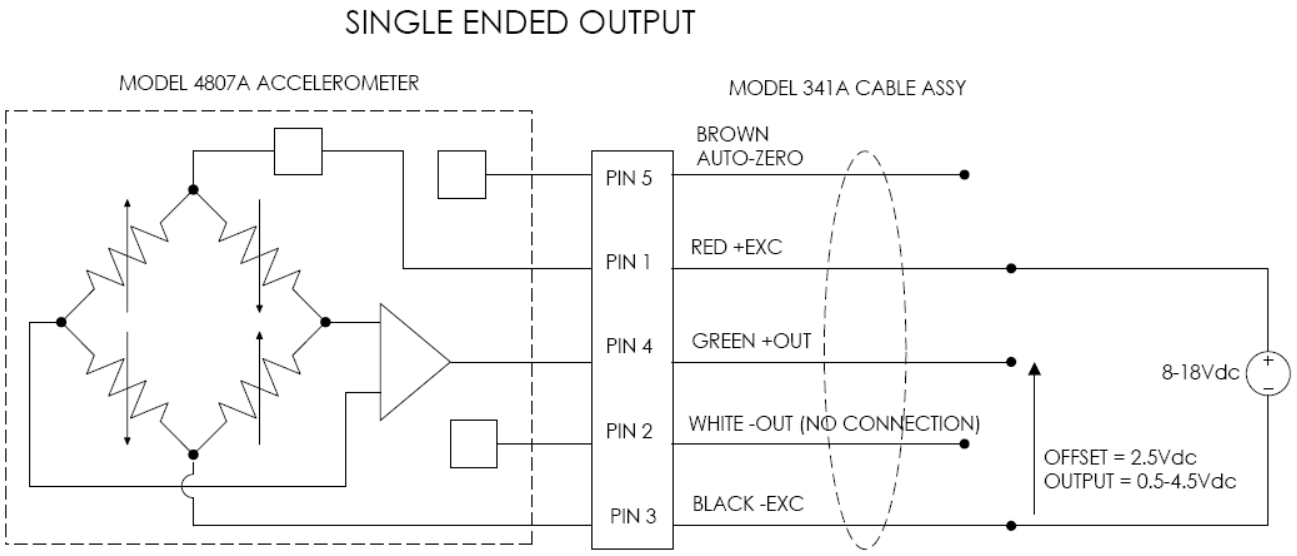
Avoid routing cables near high-voltage wires and also ground the shield at the signal conditioner to minimize ground loops. The housing of the 4807A has a conductive surface connected to the shell of its integral connector. Therefore, single-point grounding is required in order to prevent ground loops. If mounting the accelerometer to a structure that is not electrically isolated, the shield of the cable should be left floating at the signal conditioner.

WIRING

The accelerometer is designed to be operated from 8-18Vdc excitation and provide a ±2V full scale output with a 2.5V reference voltage. The output is DC-coupled and can be used in either single-ended or differential mode. Differential mode offers the best performance since common mode errors are minimized. The electrical hookup for both modes of operation is detailed below.

Single-Ended Operation

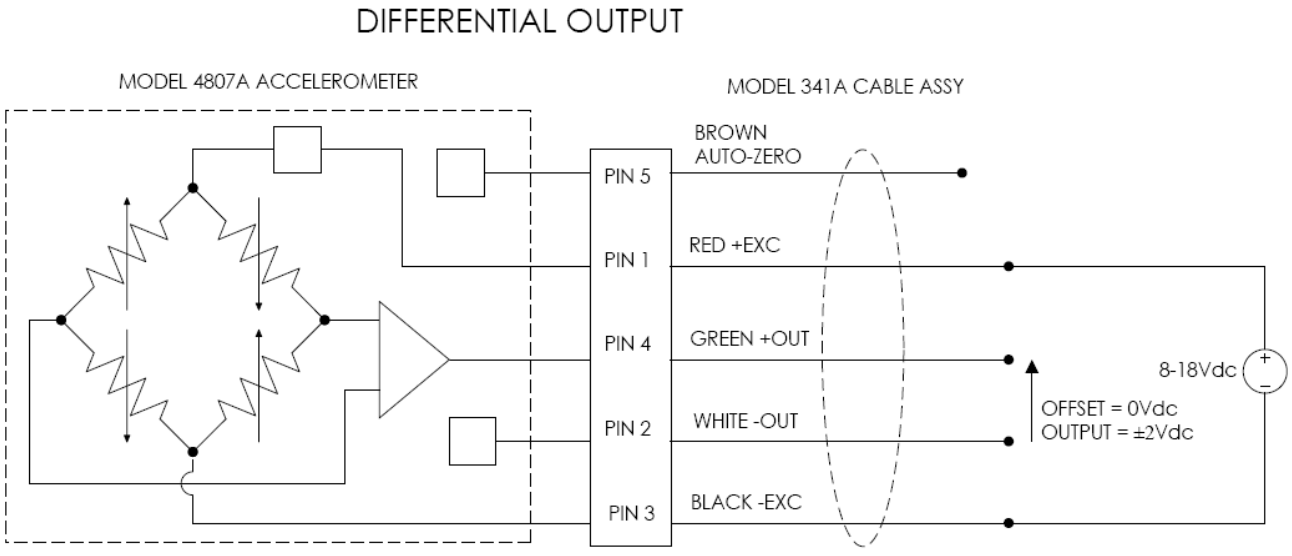
For single-ended operation a 2.5Vdc bias will be present on the output leads and the output of the accelerometer will be 0.5-4.5V full scale. For single-ended operation the accelerometer should be connected to the signal conditioner as detailed below**. To avoid permanently damaging the accelerometer, the white wire should not be connected to ground.**



Model 340A cable can also be used if auto-zero function is not required.

Differential Operation

For differential operation the output of the accelerometer will be ±2V full scale without a bias voltage present. For differential operation the accelerometer should be connected to the signal conditioner as detailed below. Common mode voltage is 2.5V.



Model 340A cable can also be used if auto-zero function is not required.

AUTO-ZERO FUNCTION

The model 4807A accelerometer incorporates a unique auto-zero feature. The model 341A cable is required to utilize this function.

Auto-zero is accomplished by momentarily grounding the connection to pin 5 of the 4807A integral connector for a period of two seconds minimum. Multiple actuations may be required for the output to pull within the limit of ±1.5 mV. The auto-zero function can be accomplished remotely from the 4807A by connecting a push button to the designated wire in the mating cable bundle. To avoid inadvertent zeroing, the connection to pin 5 needs to be isolated from grounding or extraneous voltage signals.

The accelerometer can auto-zero outputs within a range of ±500 mV so the accelerometer does not have to be oriented at zero-g during auto-zero actuation. For the 4807A-002, the output can be auto-zeroed with the accelerometer oriented in a plus one-g field but output span is reduced to a range that extends from -1g to +2g. This analysis also applies to auto-zeroing in a minus one-g field except for the reversal of signs.

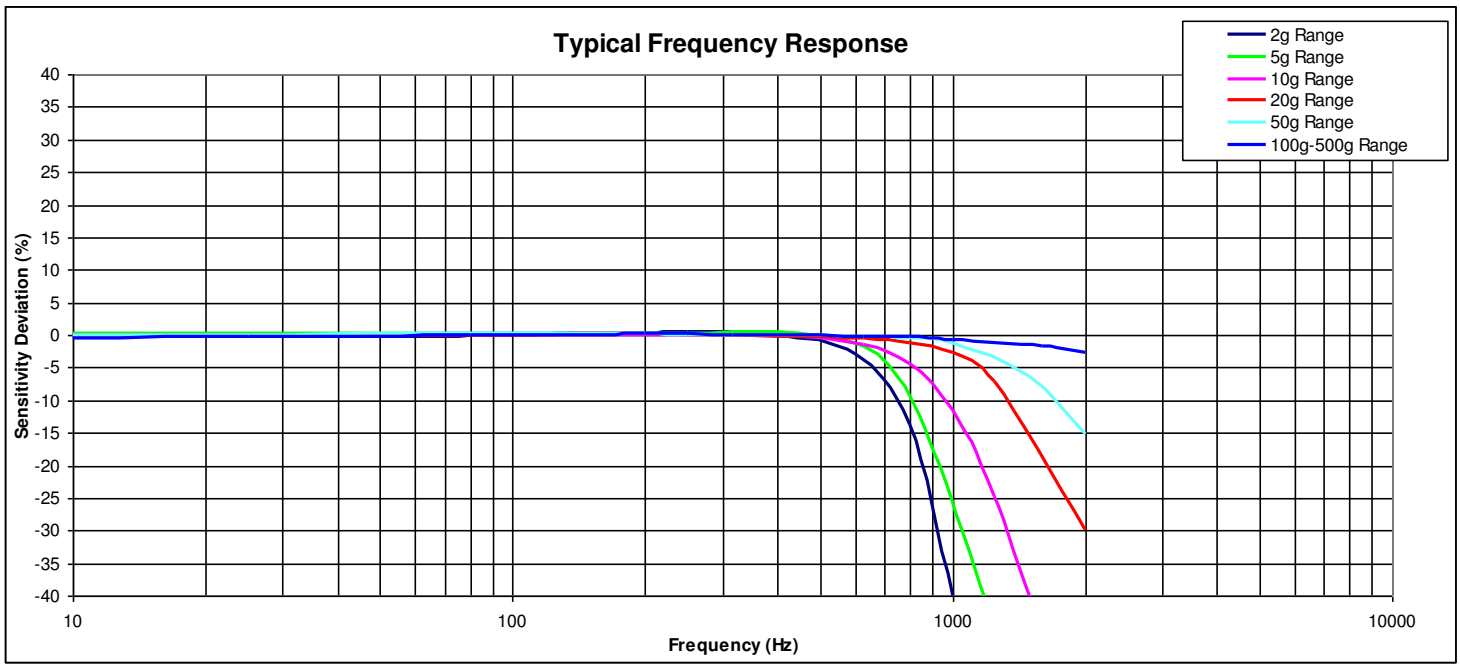
NOISE FLOOR SPECIFICATIONS

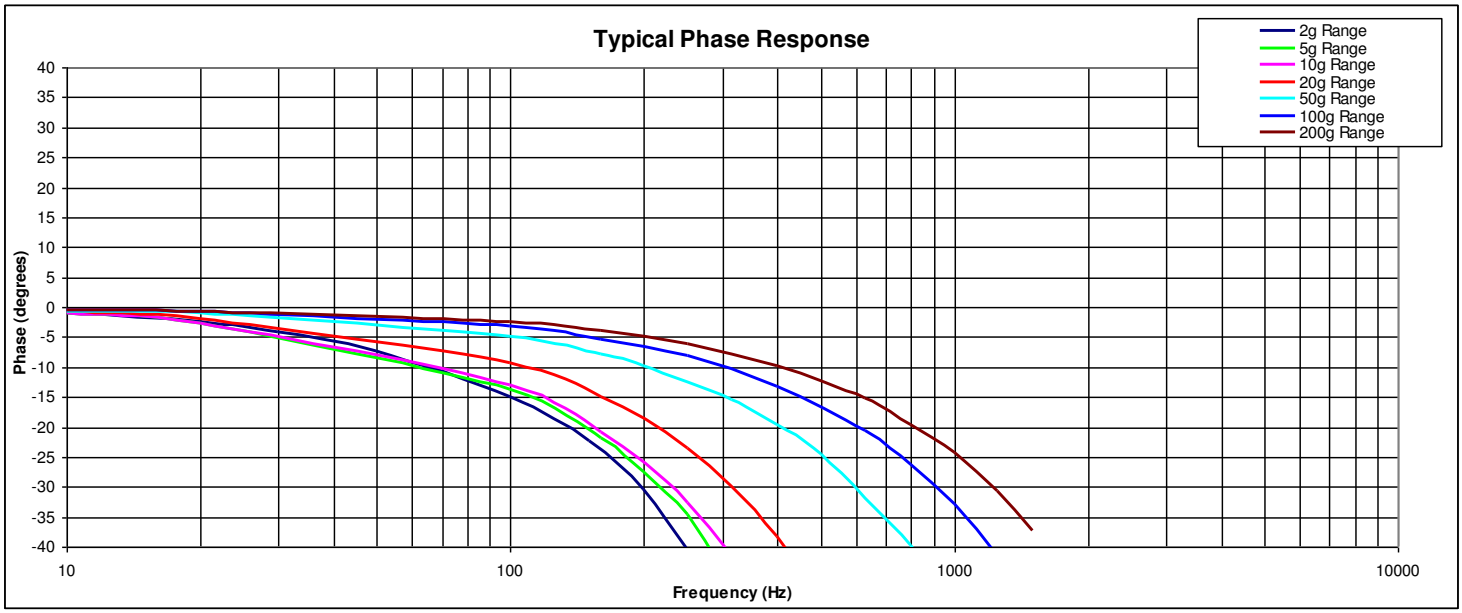
The model 4807A accelerometer incorporates an ultra low-noise circuit which offers micro-g resolution. The noise specifications for this accelerometer are detailed in table below.

FULL SCALE RATING (g-pk)	SENSITIVITY (mV/g)	±5% AMPL PASSBAND (Hz)	PASSBAND NOISE (µVrms)	SPECTRAL NOISE (µg-rms/√Hz)	DYNAMIC RANGE (dB)
2	1000	200	25	2	95
5	400	300	20	3	97
10	200	400	23	6	96
20	100	700	31	12	93
30	67	700	36	21	92
50	40	1000	26	21	95
100	20	1500	32	41	93
200	10	1500	32	82	93
500	4	1500	32	210	93

Frequency Response & Phase Deviation Curves

The typical frequency response and phase deviation curves for the model 4807A accelerometer are illustrated below.





NORTH AMERICA

Measurement Specialties, Inc.,
a TE Connectivity Company
1000 Lucas Way
Hampton, VA 23666
United States
Tel: +1 757 766 1500
Email: customercare.hmpt@te.com

Measurement Specialties, Inc.,
a TE Connectivity Company
Vibration Sensors Design Center
32 Journey, Suite 150
Aliso Viejo, CA 92656, USA
Tel: +1 949 716 7324

EUROPE

MEAS Deutschland GmbH
a TE Connectivity Company
Impasse Jeanne BENOZZI
CS 83 163, 31027 Toulouse Cedex 3, France
Tel: +33 (0) 582 08 22 00
Email: customercare.tlse@te.com

ASIA

Measurement Specialties China Ltd.,
a TE Connectivity Company
No. 26, Langshan Road
Shenzhen High-tech Park (North)
Nanshan District, Shenzhen 518057
China
Phone: +86-755-3330-5088
Email: customercare.shzn@te.com

te.com/sensorsolutions