Model 3703D1FD20G

Triaxial capacitive accel., 100 mV/g, +/- 20 g, 5-30 VDC excitation voltage, 9-pin conn.

Installation and Operating Manual

For assistance with the operation of this product,
contact the PCB Piezotronics, Inc.

Toll-free: 716-684-0001
24-hour SensorLine: 716-684-0001
Fax: 716-684-0987
E-mail: info@pcb.com
Web: www.pcb.com

Repair and Maintenance

PCB guarantees Total Customer Satisfaction through its "Lifetime Warranty Plus" on all Platinum Stock Products sold by PCB and through its limited warranties on all other PCB Stock, Standard and Special products. Due to the sophisticated nature of our sensors and associated instrumentation, **field servicing and repair is not recommended and, if attempted, will void the factory warranty**.

Beyond routine calibration and battery replacements where applicable, our products require no user maintenance. Clean electrical connectors, housings, and mounting surfaces with solutions and techniques that will not harm the material of construction. Observe caution when using liquids near devices that are not hermetically sealed. Such devices should only be wiped with a dampened cloth—never saturated or submerged.

In the event that equipment becomes damaged or ceases to operate, our Application Engineers are here to support your troubleshooting efforts 24 hours a day, 7 days a week. Call or email with model and serial number as well as a brief description of the problem.

Calibration

Routine calibration of sensors and associated instrumentation is necessary to maintain measurement accuracy. We recommend calibrating on an annual basis, after exposure to any extreme environmental influence, or prior to any critical test.

PCB Piezotronics is an ISO-9001 certified company whose calibration services are accredited by A2LA to ISO/IEC 17025, with full traceability to SI through N.I.S.T. In addition to our standard calibration services, we also offer specialized tests, including: sensitivity at elevated or cryogenic temperatures, phase response, extended high or low frequency response, extended range, leak testing, hydrostatic pressure testing, and others. For more information, contact your local PCB Piezotronics distributor, sales representative, or factory customer service representative.

Returning Equipment

If factory repair is required, our representatives will provide you with a Return Material Authorization (RMA) number, which we use to reference any information you have already provided and expedite the repair process. This number should be clearly marked on the outside of all returned package(s) and on any packing list(s) accompanying the shipment.

Contact Information

PCB Piezotronics, Inc.
3425 Walden Ave.
Depew, NY14043 USA
Toll-free: (800) 828-8840
24-hour SensorLine: (716) 684-0001
General inquiries: info@pcb.com
Repair inquiries: rma@pcb.com

For a complete list of distributors, global offices and sales representatives, visit our website, www.pcb.com.

Safety Considerations

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the precautions required to avoid injury. While our equipment is designed with user safety in mind, the protection provided by the equipment may be impaired if equipment is used in a manner not specified by this manual.

Discontinue use and contact our 24-Hour Sensorline if:

- Assistance is needed to safely operate equipment
- Damage is visible or suspected
- Equipment fails or malfunctions

For complete equipment ratings, refer to the enclosed specification sheet for your product.

Definition of Terms and Symbols

The following symbols may be used in this manual:

DANGER
Indicates an immediate hazardous situation, which, if not avoided, may result in death or serious injury.

CAUTION
Refers to hazards that could damage the instrument.

NOTE
Indicates tips, recommendations and important information. The notes simplify processes and contain additional information on particular operating steps.

The following symbols may be found on the equipment described in this manual:

This symbol on the unit indicates that high voltage may be present. Use standard safety precautions to avoid personal contact with this voltage.

This symbol on the unit indicates that the user should refer to the operating instructions located in the manual.

This symbol indicates safety, earth ground.

PCB工业监视和测量设备 - 中国RoHS2公布表

PCB Industrial Monitoring and Measuring Equipment - China RoHS 2 Disclosure Table

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
住房	O	O	O	O	O	O
PCB板	X	O	O	O	O	O
电气连接器	O	O	O	O	O	O
压电晶体	X	O	O	O	O	O
环氧	O	O	O	O	O	O
铁氟龙	O	O	O	O	O	O
电子	O	O	O	O	O	O
厚膜基板	O	O	X	O	O	O
电线	O	O	O	O	O	O
电缆	X	O	O	O	O	O
塑料	O	O	O	O	O	O
焊接	X	O	O	O	O	O
铜合金/黄铜	X	O	O	O	O	O

本表格依据 SJ/T 11364 的规定编制。

O： 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

X： 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

铅是欧洲RoHS指令2011/65/ EU附件三和附件四目前由于允许的豁免。

CHINA RoHS COMPLIANCE

Component Name	Hazardous Substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Chromium VI Compounds (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
PCB Board	X	O	O	O	O	O
Electrical Connectors	O	O	O	O	O	O
Piezoelectric Crystals	X	O	O	O	O	O
Epoxy	O	O	O	O	O	O
Teflon	O	O	O	O	O	O
Electronics	O	O	O	O	O	O
Thick Film Substrate	O	O	X	O	O	O
Wires	O	O	O	O	O	O
Cables	X	O	O	O	O	O
Plastic	O	O	O	O	O	O
Solder	X	O	O	O	O	O
Copper Alloy/Brass	X	O	O	O	O	O

This table is prepared in accordance with the provisions of SJ/T 11364.

O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: Indicates that said hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement of GB/T 26572.
Lead is present due to allowed exemption in Annex III or Annex IV of the European RoHS Directive 2011/65/EU.

1.0 Introduction

This operating guide contains information that will familiarize the user with the basic operation and installation of Series 3700 Variable Capacitance Accelerometers. However, it is not intended to cover all of the specific measurement challenges that one may encounter while using the device. Therefore, if you have detailed questions or are unsure of how to properly operate the sensor after reading this "Operating Guide", please contact a PCB Application Engineer using our 24-Hour SensorLine™ at 716-684-0001.

2.0 Common Applications and Features

Series 3700 Variable Capacitance Accelerometers achieve true DC response for measuring uniform (or constant) acceleration and low-frequency vibration. For this reason, they are often used to:

- Perform ride quality assessments of elevators, automobiles, trains, and amusement park rides.
- Analyze the low frequency characteristics of buildings, bridges, and large aerospace objects.
- Acquire tilt and orientation data for feedback control and stabilization purposes.

Because of the critical nature of these and similar test applications, all Series 3700 Variable Capacitance Accelerometers have been designed and manufactured with following common characteristics:

- Rugged, all-welded titanium housing insures reliability and durability in demanding applications and environments.
- Built-in microelectronics provide conveniently standardized sensitivities and low-noise output signals unmatched by similar sensing technologies.
- Internal voltage regulator allows sensor to be powered from virtually any unregulated DC voltage source, such as a bench-top power supply or portable battery source.

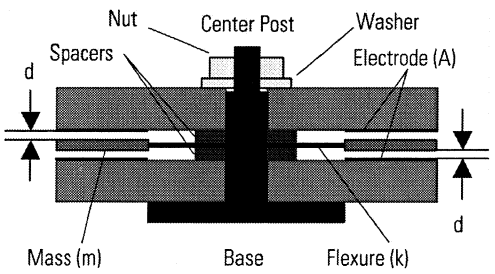


Figure 1a: Sensing Element in "0 g" Condition

- Natural air damping extends the upper frequency range, attenuates unwanted high-frequency vibration, and provides stable performance over the entire operating temperature range.
- Integral ground isolation plate electrically isolates sensor ground from test structure ground thereby minimizing the chances of ground loop noise.
- Hermetic, multi-pin connector or optional sealed, integral cable provides a reliable connection even under the harshest environmental conditions.

3.0 Principle of Operation

In the simplest sense, variable capacitance accelerometers operate on a technique where the capacitance of the internal sensing element changes in proportion to the applied acceleration.

In Series 3700 Variable Capacitance Accelerometers, the sensing mechanism consists of a "washer-shaped," seismic mass (m) suspended by a proprietary flexure with stiffness (k). This assembly is sandwiched between two circular plates with an electrode area (A), whose distance (d) is closely controlled with precision chemically etched spacers. The resulting air-gap between each electrode and the sensing flexure forms a "mechanical capacitor". A cross-sectional drawing of this sensing element under a "0 g" condition is depicted in Figure 1a. Figure 1b depicts a "+1 g" condition as may be experienced by the sensor as it rests in the Earth's Gravitational Field.

As shown in Figure 1b, when the element is accelerated (a), an inertial force (F) is created on the mass (m) according to Newton's Second Law of Motion.

$$F = ma \qquad \text{(Eq. 1)}$$

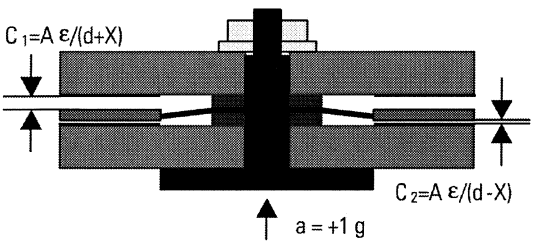


Figure 1b: Sensing Element in "+1g" Condition

MANUAL NUMBER: 18542
MANUAL REVISION: NR

This force causes the mass to move a certain distance (X) closer to the lower electrode and the same distance (X) further from the upper electrode. This distance depends on the flexure stiffness (k) and is based on the simple Spring Equation (Hooke's Law).

$X = F/k$ (Eq. 2)

The change in distance correspondingly changes the capacitance (C).

$C_1 = (A\varepsilon)/(d+X)$ (Eq. 3)
$C_2 = (A\varepsilon)/(d-X)$ (Eq. 4)

where, A= Electrode Area
ε = Permittivity of Air
d = Distance between Mass and Electrode
X = Displacement of Mass

The built-in microelectronics contains a capacitive bridge circuit that converts this change in capacitance to a useful voltage signal. A simplified schematic of the circuit is shown in Figure 2a. The theoretical response from the +1g acceleration shown in Figure 1b is depicted by the time traces shown in Figure 2b. The numbers 1 through 8 on Figure 2b correspond to the signals at locations 1 through 8 on Figure 2a. For example, if the signal from location 2 were viewed on an oscilloscope, it would look like the signal shown in graph 2 of Figure 2b.

Power to the circuit is in the form of a simple DC voltage. This voltage can be derived from laboratory power supplies, automotive or marine batteries, or other portable power sources. Initially, the power is passed through a voltage regulator. This regulator ensures clean power to microelectronics and fixes the amplitude of the subsequent oscillator chip. (The output voltage from the regulator (V_r) is dependent on which power supply voltage range has been ordered.) By fixing the amplitude of the oscillator output as seen at Location 1 the sensitivity of the accelerometer becomes independent of the supply voltage. This is often advantageous as precise calibration of the power supply is generally not required.

Next, the oscillator output is directed into the capacitance-bridge, where the signal "splits" and travels into each arm of the bridge. Each arm acts as a capacitor divider. The resulting amplitude of the amplitude-modulated signal at Locations 2 and 3 is directly proportional to the changes in capacitance experienced by the sensing element.

$V_2 = V_r * (1/C_3) / [(1/C_3) + (1/C_1)]$ (Eq. 5)
$V_3 = V_r * (1/C_4) / [(1/C_4) + (1/C_2)]$ (Eq. 6)

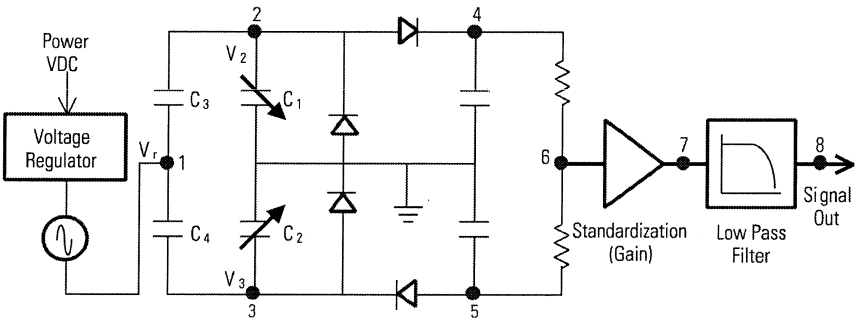


Figure 2a Circuit Schematic

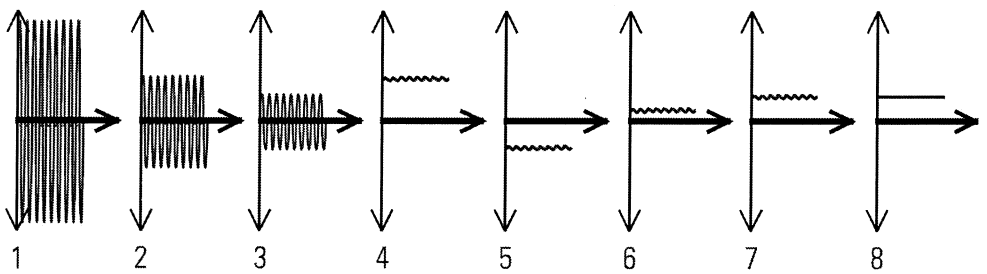


Figure 2b: Response from Circuit from +1g Static Acceleration (x-axis = time and y-axis = voltage)

To demodulate these signals, the signals are passed through a series of diodes and capacitors at Locations 4 and 5. The signals are then summed together at Location 6. At this point, the electrical signal is proportional to the input acceleration.

It would be sufficient to complete the circuit at this point, however, a couple additional features are included to enhance the performance of the sensor. First is the addition of a "standardization" amplifier. This is used to "trim" the range of the sensor to a convenient number such 3g, 20g, 50g or 200g. For example, the amplifier in Figure 2a is used to gain the signal by a factor of 2. In other words, the voltage at Location 7 is twice as large as it is at Location 6. Second, a low-pass electrical filter is used to reduce unwanted signals from high frequency vibration and eliminate any residual affects of the oscillator frequency.

4.0 Typical Measurement System

Typical measurement systems, like the ones shown in Figure 3a and 3b, consist of a sensor, cable, power supply, and readout device. (The readout device, which may be an oscilloscope, analyzer or tape recorder, is not supplied or offered by PCB.)

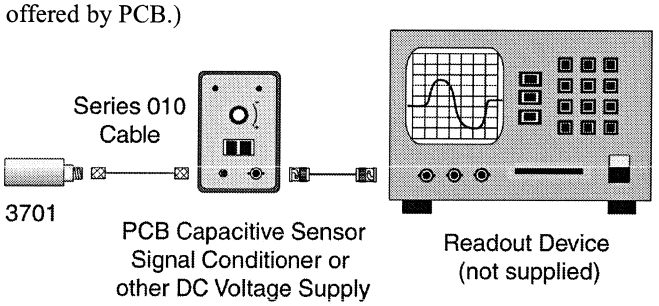


Figure 3a: Series 3701 Single Axis Typical System

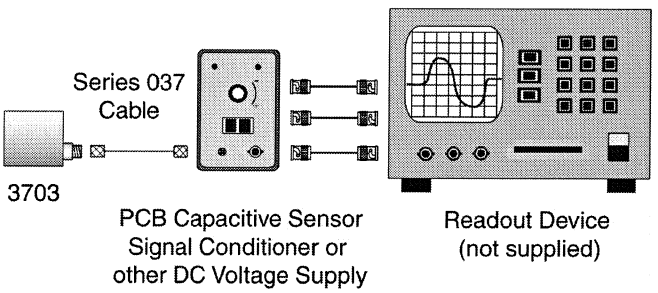


Figure 3b: Series 3703 Triaxial Typical System

5.0 Sensor Installation

When choosing an installation technique, be certain to carefully examine the different application characteristics that may affect sensor performance. Characteristics such as mounting location may limit the use of large mounting blocks or the amplitude range may necessitate the use of a stud mount rather than using adhesive. A summary of the recommended mounting methods is provided below.

Stud Mount: Recommended for permanent mount applications or in test situations that require a rugged or secure installation. The necessary information, including surface finish, mounting hole dimensions, and recommended mounting torque for installing the sensor is listed on the enclosed Sensor Installation Drawing. It is recommended that an experienced technician or machinist with good machining capabilities adequately prepare the surface.

Adhesive Mount: Recommended for temporary mounting of the sensor or when the test object surface cannot be properly prepared for stud mounting. Wax works well for temporary mount applications under conditions where the operating temperature will not melt the wax or the acceleration levels will not dislodge the sensor from the test object. Cyanoacrylate-based, "quick-bonding" adhesives provide a quick mounting method, while two-part epoxies can be used for a more secure mount. To remove an adhesively mounted sensor, it is best to place an open-ended wrench over the sensor and twist it to shear the adhesive bond. Striking the sensor with a hammer or other object may permanently damage the sensor.

Easy Mount Clip: Recommended when frequent installation and removal of Series 3701 Variable Capacitance Accelerometers is desired. The Easy-Mount Clip can either be stud mounted or adhesively mounted to the test structure. (If adhesively mounting the clip, detach the sensor from the clip while adhering it to the test structure as excessive adhesive may creep through the mounting holes and adhere to the sensor. This will make separation and removal from the clip difficult.) Once the Easy-Mount Clip has been attached to the test structure, the sensor can be easily snapped into and out of the clip. Over time, the Easy-Mount Clip must be replaced as it will "wear-out" and eventually lose its ability to securely hold the sensor.

6.0 Powering

Series 3700 Variable Capacitance Accelerometers contain built-in microelectronics that will operate from any PCB Series 445 or Series 478 Capacitive Sensor Signal Conditioner. These signal conditioners provide the necessary voltage and current required for all of the powering options available on the Series 3700 Variable Capacitance Accelerometers.

Series 3700 Variable Capacitance Accelerometers may also be powered by other voltage sources such as DC voltage laboratory supplies, automotive or marine batteries, or low-voltage supplies designed for powering PC Board components. If you decide to not use a Series 445 or Series 478 Signal Conditioner, insure that the source provides power within the excitation voltage range listed on the specification sheet for

that model. It is important to note that since the accelerometers contain a built-in voltage regulator, precise calibration of the power source is generally not required.

7.0 Operation

After the sensor has been installed and the cable connected for proper operation, there are a few measurement points to take note of:

a) After providing power to the sensor, it may be used immediately for taking measurements above 0.1 Hz. However, the sensor requires approximately 15 minutes to fully stabilize for tilt measurements requiring absolute DC response.

b) To take advantage of the DC response of the accelerometer, the readout device must be in a DC coupled state. Consult the appropriate manufacturer or product manual for your readout device for details.

c) Because Series 3700 Variable Capacitance Accelerometer can measure static (constant) accelerations, the DC offset voltage will be affected by the positional alignment relative to the Earth's gravity. In other words, when the sensor is mounted perpendicular with the Earth's surface, the offset will equal that as specified on the calibration certificate for "zero-g offset voltage." If the sensor is mounted parallel with the Earth's surface, the sensor will be experiencing 1 g of acceleration and the offset voltage will increase by the sensitivity of the accelerometer.

8.0 Sensor Verification

If the sensor has been handled in a rough manner or before a critical measurement application, it is a good idea to verify that the sensor's sensitivity is still within specification. An accurate static calibration of Series 3700 Variable Capacitance Accelerometers can be performed using the Earth's Gravitational Field as a reference. The sensor can simply be "flipped" (rotated 90°) in the Earth's Gravity to obtain the scaling factor (sensitivity). First, place the accelerometer on its side with its sensing axis perpendicular to the Earth's Gravity (i.e., on a level table). The output from the sensor in this position is known the "zero-g offset" voltage. Then, rotate sensor 90° so that the base rests on the table parallel with the Earth's gravity. The sensor is now experiencing +1g acceleration. Subtract the "zero-g offset" voltage from this output voltage. This value is the sensitivity of the sensor.

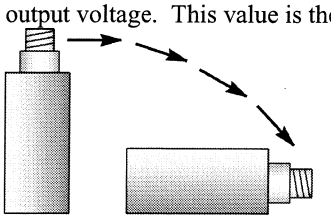


Figure 4: Sensor Verification using flip test

9.0 Sensor Calibration

Due to ISO 9001, ISO Guide 25, or other contractual requirements, it may become necessary to send the accelerometer back to PCB for recalibration. In this case, a complete back-to-back frequency response test will be performed and the "zero-g" offset voltage will be checked with NIST traceable equipment.

10.0 Maintenance and Repair

Because of the sophisticated nature of PCB instrumentation, field repair of the equipment is not recommended. Most PCB sensors are of modular construction and are factory repairable. A repair or replacement quotation is available at no charge. Before returning equipment for repair, it is recommended that the user confer with a factory application engineer (or international representative) to first troubleshoot the problem.

11.0 Return Procedure

To expedite the repair process, contact a factory application engineer to obtain a Return Material Authorization (RMA) number prior to sending equipment to the factory. Please have information, such as model number, serial number and description of the problem, available.

Customers outside the U.S. should consult their local PCB distributor for information on returning equipment. For exceptions to this guideline, please contact the International Sales department to request shipping instructions and an RMA.

For further assistance, please call (716) 684-0001 or fax us at (716) 684-0987. You may also receive assistance via e-mail at **sales@pcb.com** or visit our web site at **www.pcb.com**.

12.0 Customer Service / Warranty

The employees of PCB strive to provide superior, unmatched customer service. Should you at any time find yourself dissatisfied with any PCB product for any reason, consult a factory Application Engineer or local representative/distributor to discuss repair, refund, or exchange procedures.

When unexpected measurement problems arise, call our 24-hour Sensor Line to discuss your immediate instrumentation needs with a Factory Representative. Dial (716) 684-0001.

Manual Number: 18542
Manual Revision: A

Model Number	TRIAXIAL CAPACITIVE ACCELEROMETER	Revision: H
3703D1FD20G		ECN #: 24452

Performance	ENGLISH	SI	
Sensitivity (± 5 %)	100 mV/g	10.2 mV/(m/s²)	[4]
Measurement Range	± 20 g pk	± 196 m/s² pk	
Frequency Range (± 5 %)	0 to 300 Hz	0 to 300 Hz	
Frequency Range (± 10 %)	0 to 500 Hz	0 to 500 Hz	
Resonant Frequency	>900 Hz	>900 Hz	
Phase Response (100 Hz)	<10 °	<10 °	
Damping Ratio	0.70	0.70	[2]
Broadband Resolution (0.5 to 100 Hz)	160 µg rms	1600 µm/s² rms	[2]
Non-Linearity	≤ 1 %	≤ 1 %	[5]
Transverse Sensitivity	≤ 3 %	≤ 3 %	[6]
Environmental			
Overload Limit (Shock)	± 2000 g pk	± 19,600 m/s² pk	
Temperature Range (Operating)	-40 to +185 °F	-40 to +85 °C	
Temperature Range (Storage)	-85 to +250 °F	-65 to +121 °C	
Temperature Coefficient of Sensitivity	≤ 0.07 %/°F	≤ 0.12 %/°C	[3]
Zero g Offset Temperature Coefficient	≤ 0.013 g/°F	≤ 0.225 m/s²/°C	[3]
Base Strain Sensitivity	0.0001 g/µε	0.001 (m/s²)/µε	[2]
Magnetic Sensitivity	65 equiv. µg/gauss	6.38 (m/s²)/Tesla	[2]
Electrical			
Excitation Voltage	5 to 30 VDC	5 to 30 VDC	
Current Consumption	≤ 30 mA	≤ 30 mA	
Output Impedance	≤ 75 ohm	≤ 75 ohm	
Offset Voltage (0 g)	± 40 mVDC	± 40 mVDC	[1]
Spectral Noise (1 Hz)	50 µg/√Hz	490 (µm/s²)/√Hz	[2]
Spectral Noise (10 Hz)	20 µg/√Hz	196 (µm/s²)/√Hz	[2]
Spectral Noise (100 Hz)	10 µg/√Hz	98 (µm/s²)/√Hz	[2]
Electrical Isolation (Base)	$>10^8$ ohm	$>10^8$ ohm	
Physical			
Housing Material	Titanium	Titanium	
Sealing	Hermetic	Hermetic	
Size (Length x Width x Height)	1.1 in x 1.1 in x 1.1 in	28 mm x 28 mm x 28 mm	
Weight	2.7 oz	78.1 gm	
Electrical Connector	9-Pin	9-Pin	
Electrical Connection Position	Side	Side	
Mounting Thread	10-32 Female	10-32 Female	

CE [7]

All specifications are at room temperature unless otherwise specified.
In the interest of constant product improvement, we reserve the right to change specifications without notice.

ICP® is a registered trademark of PCB Group, Inc.

OPTIONAL VERSIONS

Optional versions have identical specifications and accessories as listed for the standard model except where noted below. More than one option may be used.

HT - High temperature, extends normal operation temperatures

Temperature Range (Operating)	-40 to +250 °F	-40 to +121 °C

NOTES:

[1] Offset tolerance is based on 10 Ft of 037 test cable.
[2] Typical.
[3] Valid from 70°F to 185°F [21°C to 85°C]
[4] Measured at 100 Hz, 1 grms.
[5] Zero-based, least-squares, straight line method.
[6] Transverse sensitivity is typically ≤ 1.5 %
[7] See PCB Declaration of Conformance PS027 for details.

SUPPLIED ACCESSORIES:

Model 080A190 Adhesive Mounting Base (1)
Model 081A05 Mounting stud, 10-32 to 10-32 x 0.27" long, BeCu (H900), no shoulder (1)
Model ACS-11T NIST traceable amplitude response calibration from 0.5 Hz to upper point. (1)
Model M081A05 Mounting Stud 10-32 to M6 x 0.75 x 0.27" long BeCu (H900), no shoulder (1)

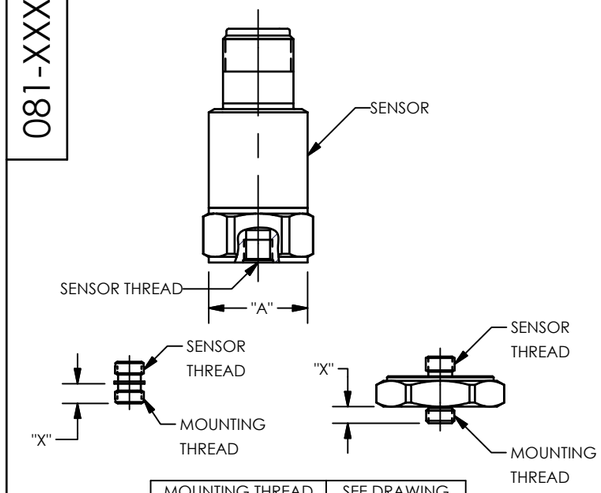
Entered: BLS	Engineer: JMS	Sales: WOV	Approved: [illegible]	Spec Number:
Date: 7-10-06	Date: 7/10/06	Date: 7/11/6	Date: 7/13/06	13328

PCB PIEZOTRONICS™
VIBRATION DIVISION
3425 Walden Avenue, Depew, NY 14043

Phone: 716-684-0001
Fax: 716-685-3886
E-Mail: vibration@pcb.com

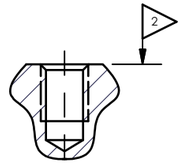
081-XXXX-90

STANDARD STUD MOUNT



MOUNTING THREAD	SEE DRAWING
5-40	A
M3 X 0.50	B
10-32	C
M5 X 0.80	D
1/4-28	E
M6 X 1.00	F

"A" 5-40 MOUNTING INSTRUCTIONS
(METRIC DIMENSIONS IN BRACKETS)

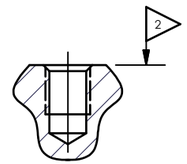


MOUNTING HOLE PREPARATION:

1 Ø.101[Ø2.57]
X .20[5.1]↧ MIN.
5-40 UNC-2B
X .15[3.8]↧ MIN.

4.) RECOMMENDED MOUNTING TORQUE,
4-5 INCH POUNDS
[45-55 NEWTON CENTIMETERS].

"B" M3 X 0.50 MOUNTING INSTRUCTIONS
(ENGLISH DIMENSIONS IN BRACKETS)

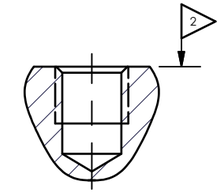


MOUNTING HOLE PREPARATION:

1 Ø2.5[Ø.099]
X 4.6 [.18]↧ MIN.
M3 X 0.50-6H
X 3.3[.13]↧ MIN.

4.) RECOMMENDED MOUNTING TORQUE,
45-55 NEWTON CENTIMETERS
[4-5 INCH POUNDS].

"C" 10-32 MOUNTING INSTRUCTIONS
(METRIC DIMENSIONS IN BRACKETS)

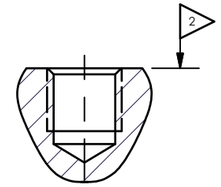


MOUNTING HOLE PREPARATION:

1 Ø.159[Ø4.04]
X .23[5.8]↧ MIN.
10-32 UNF-2B
X .15[3.8]↧ MIN.

4.) RECOMMENDED MOUNTING TORQUE,
10-20 INCH POUNDS
[113-225 NEWTON CENTIMETERS].

"D" M5 X 0.80 MOUNTING INSTRUCTIONS
(ENGLISH DIMENSIONS IN BRACKETS)

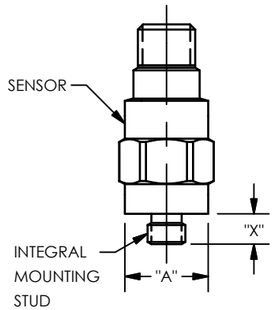


MOUNTING HOLE PREPARATION:

1 Ø4.22[Ø.166]
X 7.62 [.300]↧ MIN.
M5 X 0.8-6H
X 5.08[.200]↧ MIN.

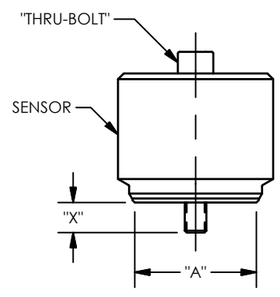
4.) RECOMMENDED MOUNTING TORQUE,
113-225 NEWTON CENTIMETERS
[10-20 INCH POUNDS].

INTEGRAL STUD MOUNT



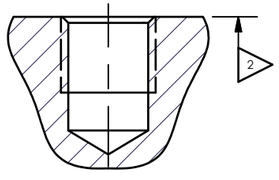
MOUNTING THREAD	SEE DRAWING
5-40	A
M3 X 0.50	B
10-32	C
M5 X 0.80	D
1/4-28	E
M6 X 1.00	F

"THRU-BOLT" STUD MOUNT



BOLT THREAD	SEE DRAWING
10-32	C
M5 X 0.80	D
1/4-28	E
M6 X 1.00	F
M8 X 1.25	F

"E" 1/4-28 MOUNTING INSTRUCTIONS
(METRIC DIMENSIONS IN BRACKETS)

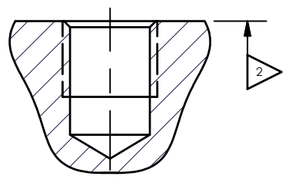


MOUNTING HOLE PREPARATION:

1 Ø.218[Ø5.54]
X .300[7.62]↧ MIN.
1/4-28 UNF-2B
X .200[5.08]↧ MIN.

4.) RECOMMENDED MOUNTING TORQUE,
2-5 FOOT POUNDS
[3-7 NEWTON METERS].

"F" M6 X 0.75, M6 X 1.00, M8 X 1.25 MOUNTING INSTRUCTIONS
(ENGLISH DIMENSIONS IN BRACKETS)



M6 X 0.75 MOUNTING HOLE PREPARATION:

1 Ø5.31[Ø.209]
X 7.62 [.300]↧ MIN.
M6 X 0.75-6H
X 5.08[.200]↧ MIN.

M6 X 1.0 MOUNTING HOLE PREPARATION:

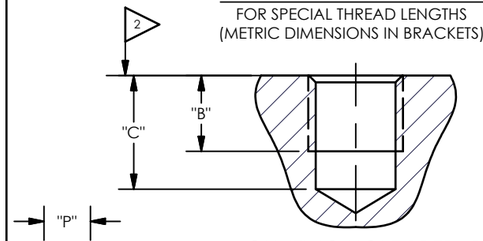
1 Ø5.05[Ø.199]
X 8.10 [.320]↧ MIN.
M6X 1.0-6H
X 6.35[.250]↧ MIN.

M8 X 1.25 MOUNTING HOLE PREPARATION:

1 Ø6.75[Ø.266]
X 8.64 [.340]↧ MIN.
M8 X 1.25-6H
X 5.00[.197]↧ MIN.

4.) RECOMMENDED MOUNTING TORQUE,
3-7 NEWTON METERS [2-5 FT POUNDS].

"G" MOUNTING INSTRUCTIONS
FOR SPECIAL THREAD LENGTHS
(METRIC DIMENSIONS IN BRACKETS)



1 THREAD PITCH SHOWN

MOUNTING HOLE PREPARATION:

1 Ø DRILL DIA.
X "C"↧ MIN.
TAP
X "B"↧ MIN.

THREAD DEPTH : B= X + 1 THREAD PITCH
DRILL DEPTH : C= B + 3 THREAD PITCH
SEE A-F FOR APPROPRIATE DRILL AND TAP
THREAD PITCH= 1/TPI [P]

3.) FOR BEST RESULTS, PLACE A THIN LAYER OF SILICONE GREASE (OR EQUIVALENT) ON INTERFACE PRIOR TO MOUNTING.

2 MOUNTING SURFACE SHOULD BE FLAT TO WITHIN .001(0.03) TIR OVER DIM 'A' WITH A 63[1.61] OR BETTER FINISH FOR BEST RESULTS.

1 DRILL PERPENDICULAR TO MOUNTING SURFACE TO WITHIN ± 1°.

REVISIONS		
REV	DESCRIPTION	DIN
R	CHANGED "B" HOLE TOLERANCE	53828

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:	
DIMENSIONS IN INCHES DECIMALS XX ±.01 XXX ±.005 ANGLES ± 2 DEGREES	DIMENSIONS IN MILLIMETERS [IN BRACKETS] DECIMALS X ± 0.3 XX ± 0.13 ANGLES ± 2 DEGREES
CABLE TOLERANCES IN ENGLISH 1"≤ LENGTH < 1' = +1"/ - 0 1'≤ LENGTH < 5' = +2"/ - 0 5'≤ LENGTH < 100' = +6"/ - 0 100'≤ LENGTH = +1'/ - 0	CABLE TOLERANCES IN METRIC 2.54cm ≤ LENGTH < 30.5cm = +2.54cm/ - 0 30.5cm ≤ LENGTH < 1.5m = +5.1cm/ - 0 1.5m ≤ LENGTH < 30.5m = +15.2cm/ - 0 30.5m ≤ LENGTH = +30.5cm/ - 0
FILLETS AND RADII .003 - .005	FILLETS AND RADII 0.07 - 0.13

DRAWN		CHECKED		ENGINEER	
NJF	05/03/23	JDM	05/03/23	MJN	05/03/23

TITLE

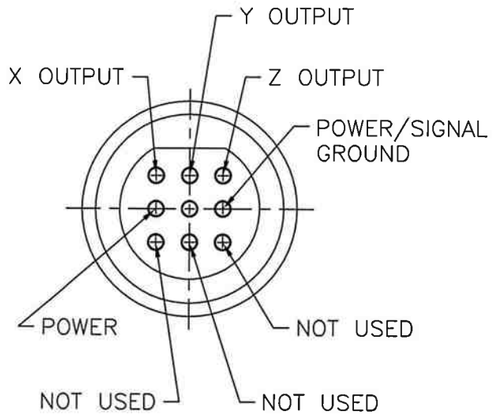
INSTALLATION DRAWING
FOR STANDARD
081 SERIES MOUNTING

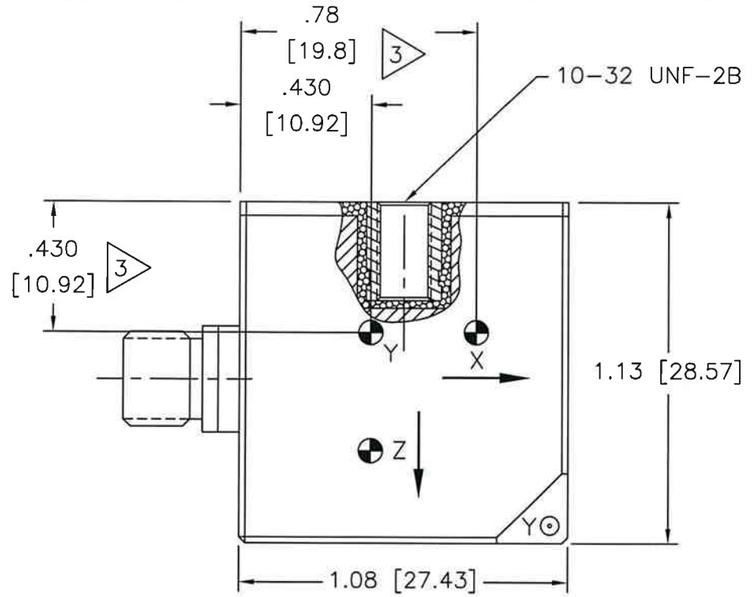
PCB PIEZOTRONICS
AN AMPHENOL COMPANY
3425 WALDEN AVE. DEPEW, NY 14043
(716) 684-0001 E-MAIL: sales@pcb.com

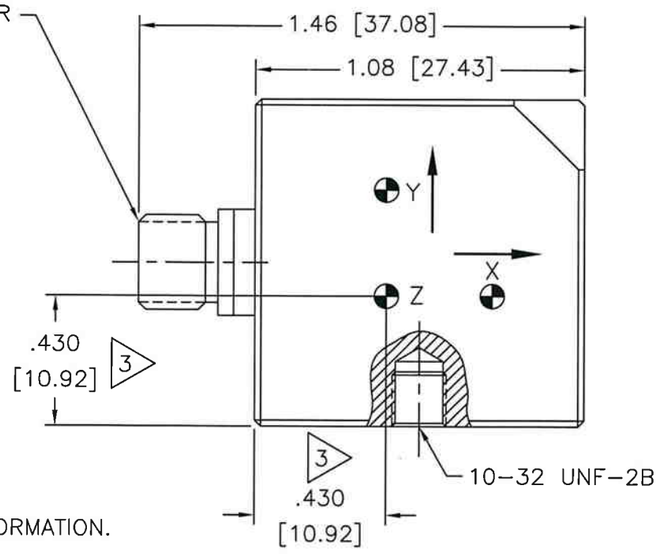
CODE IDENT. NO.	DWG. NO.
52681	081-XXXX-90
SCALE: NONE	SHEET 1 OF 1

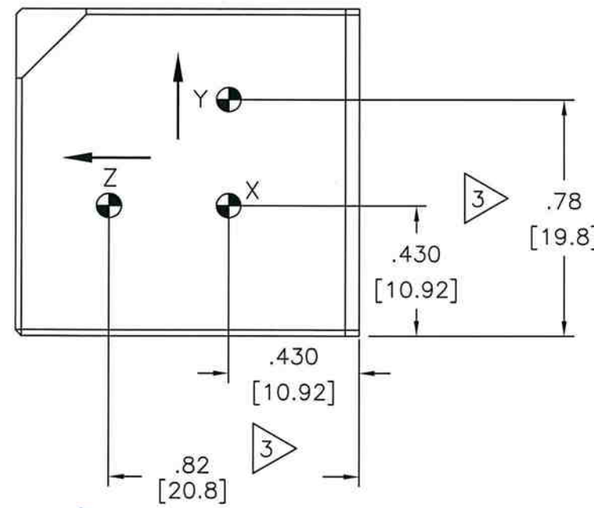
13159

REVISIONS					
ZONE	REV	DESCRIPTION	ECN	DATE	APP'D
	B	REVISED PER ECN	21445	2/3/05	DM
	C	CORRECTED DRAWING	26484	5/29/07	









OUTPUT SIGNAL:
REFERENCE TO GROUND.

POWER:
CONECT TO DC VOLTAGE POWER SUPPLY. SEE SPECIFICATION SHEET FOR PROPER EXCITATION VOLTAGE.

4.) SEE SHEET 2 OF 2 FOR CABLE STRAIN RELIEF INFORMATION.

△3 CG-CENTER OF SIESMIC MEASUREMENT.

2.) MOUNTING SURFACE SHOULD BE FLAT TO WITHIN .001[0.03] TIR OVER R0.60 [R15.2] WITH A MINIMUM 63√[1.6√] FINISH FOR BEST RESULTS.

1.) DRILL PERPENDICULAR TO MOUNTING SURFACE TO WITHIN ±1°

UNLESS SPECIFIED TOLERANCES	
DIMENSIONS IN INCHES DECIMALS XX ±.03 XXX ±.010 ANGLES ±2 DEGREES	DIMENSIONS IN MILLIMETERS [IN BRACKETS] DECIMALS X ±0.8 XX ±0.25 ANGLES ±2 DEGREES
FILLETS AND RADII .003 - .005	FILLETS AND RADII [0.07 - 0.13]
DD012 REV. C 01/21/03	

DRAWN		5/22/07	MFG	MY	6/8/07
CHK'D		6/7/07	ENGR	CCR	6/11/07
APP'D	SD	6/11/07	SALES	RJR	6/8/07

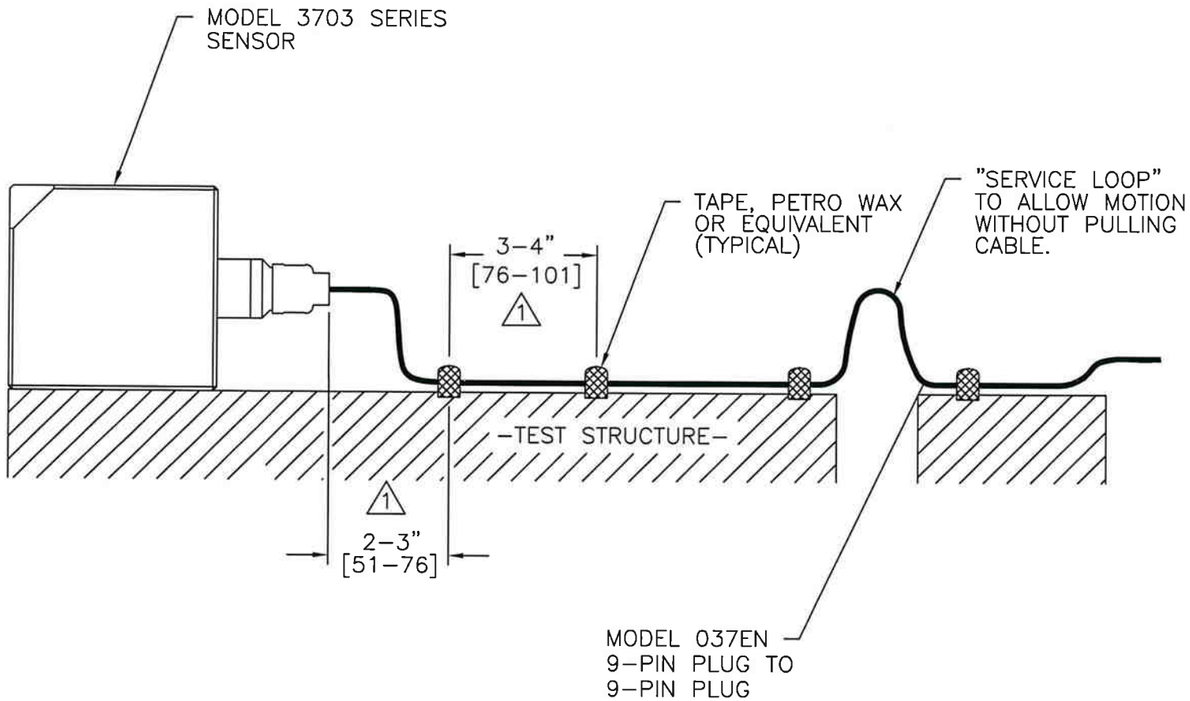
TITLE: OUTLINE DRAWING
MODEL 3703 SERIES
TRIAXIAL ACCELEROMETER

PCB PIEZOTRONICS INC
3425 WALDEN AVE. DEPEW, NY 14043
(716) 684-0001 EMAIL: SALES@PCB.COM

CODE IDENT. NO. 52681 | DWG. NO. 13159 | SCALE: 2X | SHEET 1 OF 2

13159

REVISIONS					
ZONE	REV	DESCRIPTION	ECN	DATE	APP'D
		-SEE SHEET ONE-			



1 FASTEN CABLE TO TEST STRUCTURE TYPICALLY WITHIN 2-3"(51-76) OF SENSOR. THEN FASTEN AGAIN WITHIN 3-4"(76-101) OF PREVIOUS ATTACHMENT. BETWEEN THE TEST STRUCTURE AND A FIXED STRUCTURE, ALLOW A SERVICE LOOP LARGE ENOUGH TO PREVENT PULLING OF THE CABLE WHEN SHAKING. MORE ATTACHMENT POINTS WILL PROVIDE LESS NOISE IN THE RESULTING DATA. LOOSE CABLES OR PARTS ELSEWHERE ON THE TEST STRUCTURE CAN ALSO GENERATE "NOISE" ON THE SIGNAL RECEIVED FROM THE MODEL 3703 SERIES.

UNLESS SPECIFIED TOLERANCES	
DIMENSIONS IN INCHES DECIMALS XX ±.03 XXX ±.010 ANGLES ±2 DEGREES	DIMENSIONS IN MILLIMETERS [IN BRACKETS] DECIMALS X ±0.8 XX ±0.25 ANGLES ±2 DEGREES
FILLETS AND RADII .003 - .005	FILLETS AND RADII [0.07 - 0.13]
DD012 REV. C 01/21/03	

DRAWN	[illegible]	6/7/07	MFG	[illegible]	6/8/07
CHK'D	[illegible]	6/8/07	ENGR	CCD	6/11/07
APP'D	[illegible]	6/11/07	SALES	RJL	6/8/07

TITLE: OUTLINE DRAWING
MODEL 3703 SERIES
TRIAXIAL ACCELEROMETER

PCB PIEZOTRONICS
3425 WALDEN AVE. DEPEW, NY 14043
(716) 684-0001 EMAIL: SALES@PCB.COM

CODE IDENT. NO. 52681 | DWG. NO. 13159 | SCALE: 1.25X | SHEET 2 OF 2