

#### Model 66212ANZ1

## **ICP® TO-5 Accelerometer**

# **Installation and Operating Manual**

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

Toll-free: 800-959-4464 24-hour SensorLine: 716-684-0001

Fax: 716-684-3823 E-mail: imi@pcb.com Web: www.imi-sensors.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, <a href="https://www.pcb.com">www.pcb.com</a>.

# **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

|               | <b>有害物</b> 质 |           |           |              |                    |              |  |  |
|---------------|--------------|-----------|-----------|--------------|--------------------|--------------|--|--|
| 部件名称          | 铅 (Pb)       | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬 (Cr(VI)) | <b>多溴</b> 联苯 (PBB) | 多溴二苯醚 (PBDE) |  |  |
| 住房            | 0            | 0         | 0         | 0            | 0                  | 0            |  |  |
| PCB板          | Х            | 0         | 0         | 0            | 0                  | 0            |  |  |
| 电气连接 <b>器</b> | 0            | 0         | 0         | 0            | 0                  | 0            |  |  |
| 压电晶 <b>体</b>  | Х            | 0         | 0         | 0            | 0                  | 0            |  |  |
| 环氧            | 0            | 0         | 0         | 0            | 0                  | 0            |  |  |
| 铁氟龙           | 0            | 0         | 0         | 0            | 0                  | 0            |  |  |
| 电子            | 0            | 0         | 0         | 0            | 0                  | 0            |  |  |
| 厚膜基板          | 0            | 0         | Х         | 0            | 0                  | 0            |  |  |
| 电线            | 0            | 0         | 0         | 0            | 0                  | 0            |  |  |
| 电缆            | Х            | 0         | 0         | 0            | 0                  | 0            |  |  |
| 塑料            | 0            | 0         | 0         | 0            | 0                  | 0            |  |  |
| 焊接            | Х            | 0         | 0         | 0            | 0                  | 0            |  |  |
| 铜合金/黄铜        | Х            | 0         | 0         | 0            | 0                  | 0            |  |  |

#### 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<br>Compounds<br>(Cr(VI)) | Polybrominated<br>Biphenyls (PBB) | Polybrominated<br>Diphenyl Ethers<br>(PBDE) |  |
| Housing                | 0                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| PCB Board              | Х                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| Electrical Connectors  | 0                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| Piezoelectric Crystals | Х                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| Ероху                  | 0                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| Teflon                 | 0                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| Electronics            | 0                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| Thick Film Substrate   | 0                    | 0            | X            | 0                                    | 0                                 | 0   |  |
| Wires                  | 0                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| Cables                 | Х                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| Plastic                | 0                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| Solder                 | Х                    | 0            | 0            | 0                                    | 0                                 | 0   |  |
| Copper Alloy/Brass     | Х                    | 0            | 0            | 0                                    | 0                                 | 0   |  |

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

Lead is present due to allowed exemption in Annex III or Annex IV of the European RoHS Directive 2011/65/EU.

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.

Model Number 66212ANZ1

# ICP® TO-5 ACCELEROMETER

Revision: A ECN #: 35587

| ENGLISH                            | SI  | -  |
|------------------------------------|---|--|
|                                    |   |  |
| 100 mV/g                           | 1.02 mV/(m/s²)  | [2]  |
| ± 50 g                             | ± 490 m/s <sup>2</sup>  | [3]  |
| 30 to 60,000 cpm                   | 0.5 to 10,000 Hz  | [4][5]   |
|                                    | 25 kHz  | [1][5]   |
|                                    | 3434 um/sec <sup>2</sup> rms  | [1]  |
| ≤ 1 %                              | ≤ 1 %   | [6]  |
| ≤ 7 %                              | ≤ 7 %   |  |
|                                    |   |  |
| 5000 g pk                          | 49,000 m/s <sup>2</sup> pk  |  |
| -65 to +185 °F                     | -54 to +85 °C   |  |
| See Graph                          | See Graph   | [1]  |
|                                    | 0000000000000000000000000000000000000   | -  |
| ≤ 2 sec                            | ≤ 2 sec   |  |
| 0.3 sec                            | 0.3 sec   |  |
| 18 to 28 VDC                       | 18 to 28 VDC  |  |
| 2 to 20 mA                         | 2 to 20 mA  |  |
| <150 ohm                           | <150 ohm  |  |
| 8 to 12 VDC                        | 8 to 12 VDC   |  |
| 8 μg/√Hz                           | 78.5 (µm/sec <sup>2</sup> )/√Hz   | [1]  |
| 5 μg/√Hz                           |   | [1]  |
| 4 μg/√Hz                           |   | [1]  |
| 5. FO CO. M. 1900                  | 1012 (pii//000 )/ 1112  |  |
| 0.36 in x 0.38 in                  | 9.1 mm x 9.7 mm   |  |
| 0.1 oz                             |   |  |
| Adhesive/Solder                    |   |  |
| Ceramic                            | Ceramic   |  |
| Shear                              | Shear   |  |
| Stainless Steel                    | Stainless Steel   |  |
| Welded Hermetic                    | Welded Hermetic   |  |
| Header Pins                        | Header Pins   |  |
| Bottom                             | Bottom  |  |
| Signal / Power                     | Signal / Power  |  |
| Ground                             | Ground  |  |
| Not Used                           | Not Used  |  |
| Typical Sensitivity  6 3 0 0 -3 -6 | Deviation vs Temperature  |  |
|                                    | ± 50 g  30 to 60,000 cpm 1500 kcpm 350 µg rms ≤ 1 % ≤ 7 %  5000 g pk -65 to +185 °F See Graph  ≤ 2 sec 0.3 sec 18 to 28 VDC 2 to 20 mA <150 ohm 8 to 12 VDC 8 µg/√Hz 5 µg/√Hz 4 µg/√Hz 0.36 in x 0.38 in 0.1 oz Adhesive/Solder Ceramic Shear Stainless Steel Welded Hermetic Header Pins Bottom Signal / Power Ground Not Used | ± 50 g  30 to 60,000 cpm 1500 kcpm 25 kHz 350 µg rms 3434 µm/sec² rms ≤ 1 % ≤ 7 %  5000 g pk -65 to +185 °F See Graph  ≤ 2 sec 0.3 sec 18 to 28 VDC 2 to 20 mA <150 ohm 8 to 12 VDC 8 µg/\Hz 5 µg/\Hz 4 µg/\Hz 5 µg/\Hz 4 µg/\Hz 4 µg/\Hz 5 µg/\Hz 4 µg/\Hz 5 µg/\Hz 4 µg/\Hz 5 µg/\Hz 5 µg/\Hz 4 µg/\Hz 5 µg/\Hz 5 µg/\Hz 5 µg/\Hz 6 in x 0.38 in 0.1 oz Adhesive/Solder Ceramic Shear Stainless Steel Welded Hermetic Header Pins Bottom Signal / Power Ground Not Used  150 to 10,000 Hz 25 kHz 3434 µm/sec² 7ms  ≤ 2 kHz 4 9,000 m/s² pk -54 to +85 °C See Graph  49,000 m/s² pk -54 to +85 °C See Graph  49,000 m/s² pk -54 to +85 °C See Graph  49,000 m/s² pk -54 to +85 °C See Graph  5 to 20 mA <150 ohm 8 to 12 VDC 8 µg/\Hz 4 p1 (µm/sec²)/\Hz 4 9.1 (µm/sec²)/\Hz 4 9.1 (µm/sec²)/\Hz 5 µg/\Hz 5 µg/\Hz 6 Signal / Power Signal / Power Ground Not Used  5 to 12 VDC 8 µg/\Hz 6 Namical Signal / Power Ground Not Used |

#### **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)

-65 to 250 °F -54 to +121 °C

RH - RoHS Compliant

#### NOTES:

[1] Typical.
[2] Conversion Factor 1g = 9.81 m/s².
[3] Negative output in upward direction when pin mounted.
[4] The high frequency tolerance is accurate within ±10% of the specified frequency.
[5] Performance depends on mounting

- [6] Zero-based, least-squares, straight line method.
  [7] See PCB Declaration of Conformance PS023 or PS060 for details.

[7] -75-50-25 0 25 50 75 100125150175200225

Temperature (°F)

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.

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SUPPLIED ACCESSORIES:

Model ICS-2 NIST-traceable single-axis single-point amplitude response calibration at 6000 cpm (100 Hz) (1)

Entered: mu Sales: Approved: por Engineer: 😙 Spec Number: Date: 1 Date: 🛕 Date:11 Date: 46761



Phone: 800-959-4464 Fax: 716-684-3823 E-Mail: imi@pcb.com

