



Model 102B10

Cryogenic ICP® pressure sensor, 100 psi, 50 mV/psi, 3/8-24 mtg thd, ground isolated with safety wire holes

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.

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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.

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Safety Considerations

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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:



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

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住房	0	0	0	0	0	0
PCB板	X	0	0	0	0	0
电气连接器	0	0	0	0	0	0
压电晶体	X	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	X	0	0	0
电线	0	0	0	0	0	0
电缆	X	0	0	0	0	0
塑料	0	0	0	0	0	0
焊接	X	0	0	0	0	0
铜合金/黄铜	X	0	0	0	0	0
本表格依据 SJ/T 11364 的规定编制。						
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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

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**OPERATING GUIDE
DYNAMIC (CRYOGENIC)
ICP® PRESSURE SENSORS
MODELS 102B10, B11, B13, B14**

1.0 DESCRIPTION

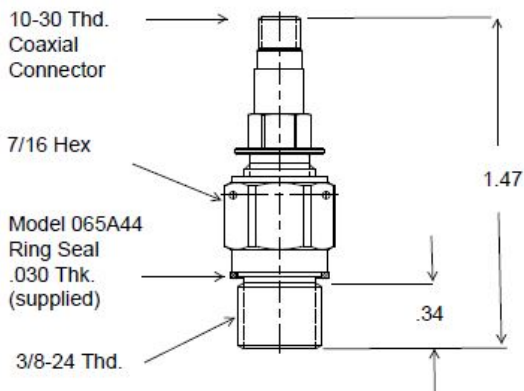
This sensor series consists of a Model 112A quartz pressure element coupled to a special MOSFET amplifier circuit to permit operation at cryogenic temperatures.

Cryogenic sensors use special electronics that have some characteristics differing from standard designs.

Polarity of the output signal is positive-going for increasing pressure.

2.0 INSTALLATION

Refer to installation drawing for mounting hole preparation. The outer housing of the thread adaptor is ground isolated from the sensing element.



Series 102B10: Cryogenic Pressure Sensor

Prepare mounting ports in accordance with the installation drawing for the specific model, paying particular attention to sealing surfaces. These surfaces must be smooth and free from chatter marks, nicks and other irregularities which could prevent a pressure-tight seal.

Seals are provided with each sensor and should always be used. Extra seals for all standard models are in stock at the factory. It is recommended to replace the seals every time the sensor is re-installed.

Although these low-impedance sensors are not affected by moisture, in extreme environments such as cryogenic, it is advisable to protect cable connections with shrink tubing. Low-noise cable

(003A) is not necessary. Model 070A09 solder connector adaptor permits the use of ordinary two-wire cable.

3.0 OPERATION

These sensors are operated like standard ICP® sensors.

For general laboratory-type use, either Model 480C02 battery-powered signal conditioner or Model 482A06 line-powered signal conditioner is recommended for use with Cryogenic Sensors. Both Models provide 2 mA constant current to power the sensor electronics.

Other standard signal conditioners Series 481A, 482A, and 483A may also be used, provided the current is adjusted to 2 mA. All above Models include a bias de-coupling capacitor in series with the output connector.

For telemetry applications, Model 495A signal conditioner provides band pass filtering, adjustable gain, bias and limiting.

4.0 CALIBRATION

Because of the relatively short time constants of these sensors (see specification sheet at the front of this manual), only dynamic calibration methods can be used.

5.0 MAINTENANCE

Because of the miniature size and built-in electronics of these units, field maintenance is not recommended.

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6.0 CAUTION

The FET amplifier used in these sensors is a special low-noise device with gate breakdown voltage of 125 volts.

This voltage rating can be exceeded by either imposing a high-pressure step or a fast-rising pressure ramp to the diaphragm in excess of the rating for the sensor.

Slowly applied or released static pressure levels, within the mechanical capability of the sensor, are not dangerous since the charge generated by the quartz element has time to leak off through the FET bias resistor.

It is important to note that the following two pressure ratings are involved:

1. Maximum total pressure (mechanical consideration).
2. Maximum step pressure (electrical consideration).

NOTE: To avoid damage to the sensor, limit pressure application to maximum values on specification sheet at the front of this manual.

The maximum step pressure may be exceeded up to the maximum total pressure level provided the total pressure (rise or fall) takes place.



Model 061A01

Mounting adaptor, 3/8-24 external thd to 5/16-24 internal thd, 17-4 SS (for Series 111, 112 & 113)

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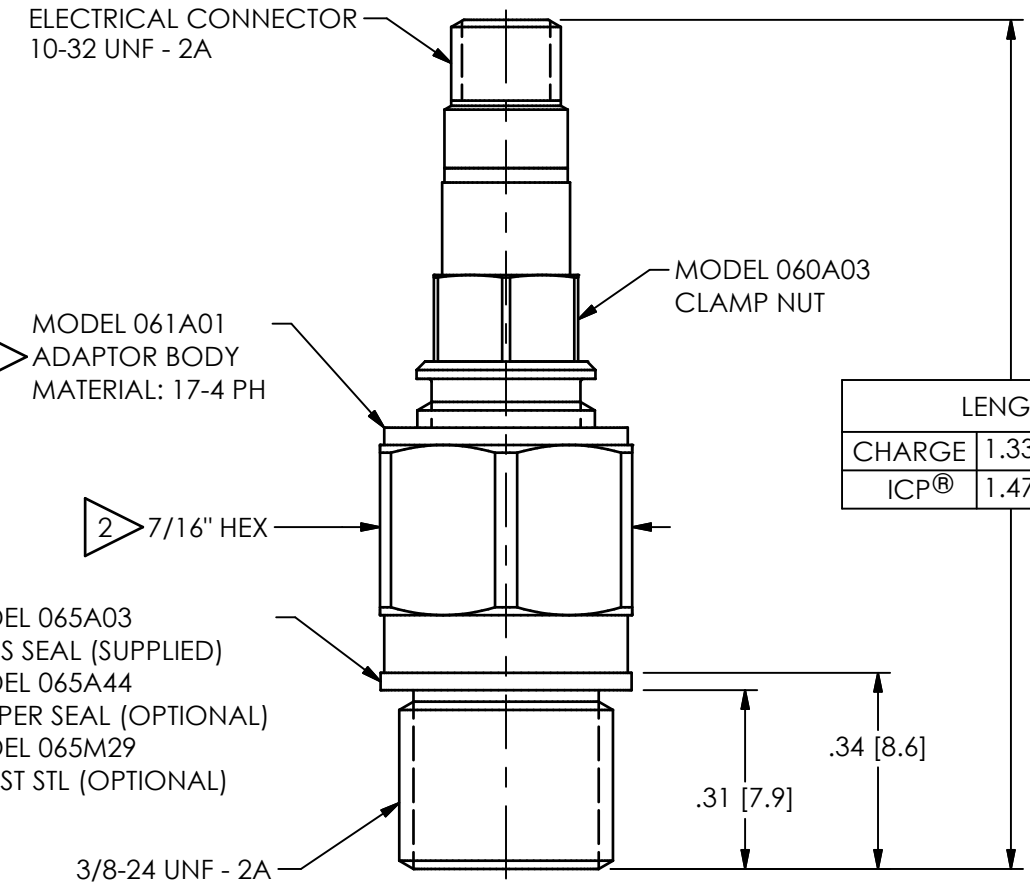
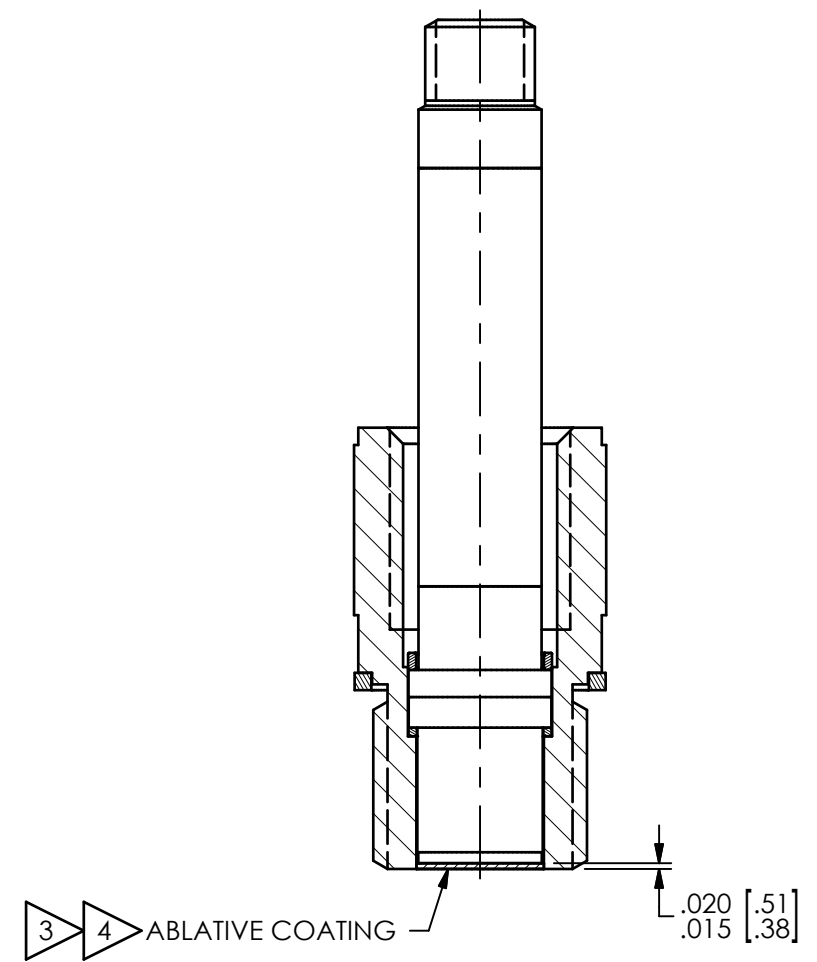
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REVISIONS		
REV	DESCRIPTION	DIN
G	UPDATED NOTES	54569

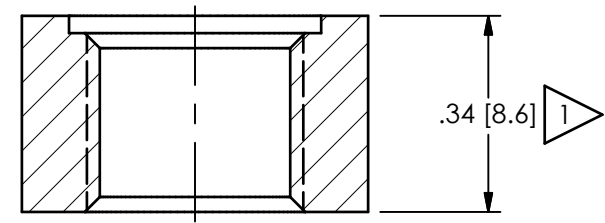
ABLATIVE INSTALLATION



LENGTH	
CHARGE	1.33± .05 [33.8]
ICP®	1.47± .05 [37.3]

MOUNTING HOLE PREPARATION:

3/8-24 UNF - 2B THRU
 $\perp \text{ } \phi .437 \pm .001 [11.10 \pm .03] \nabla .030 [.76]$



- 5 ADAPTOR MAY BE PURCHASED SEPARATELY: 061A01 (17-4PH) OR 061A09 (316L)
- 4 BLACK VINYL ELECTRICIANS TAPE HAS BEEN FOUND TO BE AN EFFECTIVE ABLATIVE MATERIAL, AS IS DC-4 SILICON GREASE
- 3 "CA" OPTION ONLY
- 2 MOUNTING TORQUE ON 7/16" HEX: 5-8 FT-LBS [6.78-10.85 Nm]
- 1 ABOVE INSTALLATION SHOWN FOR WALL THICKNESS OF .34 [8.6]. \perp THICKER WALLS $\phi .75 [19.1]$ TO CLEAR 7/16" HEX AND ALLOW FOR SOCKET WRENCH

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:				DRAWN		CHECKED		ENGINEER	
DIMENSIONS IN INCHES		DIMENSIONS IN MILLIMETERS [IN BRACKETS]		NJF	02/02/24	JDM	02/02/24	MJB	02/02/24
DECIMALS XX ±.01	DECIMALS X ±.03	DECIMALS XXX ±.005	DECIMALS XX ±.013	TITLE					
CABLE TOLERANCES IN ENGLISH		CABLE TOLERANCES IN METRIC		INSTALLATION DRAWING MODELS 101A, 102A, 102B, 102M, 061A01, & 061A09 PRESSURE SENSOR					
1" ≤ LENGTH < 1' = +1"/ - 0	2.54cm ≤ LENGTH < 30.5cm = +2.54cm/ - 0	1' ≤ LENGTH < 5' = +2"/ - 0	30.5cm ≤ LENGTH < 1.5m = +5.1cm/ - 0						
5' ≤ LENGTH < 100' = +6"/ - 0	1.5m ≤ LENGTH < 30.5m = +15.2cm/ - 0	100' ≤ LENGTH = +1"/ - 0	30.5m ≤ LENGTH = +30.5cm/ - 0	CODE IDENT. NO. 52681		SHEET B		DWG. NO. 6450	
FILLETS AND RADII .003 - .005		FILLETS AND RADII 0.07 - 0.13		SCALE: 3X		SHEET 1 OF 1			

PCB PIEZOTRONICS
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电子	0	0	0	0	0	0
厚膜基板	0	0	X	0	0	0
电线	0	0	0	0	0	0
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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
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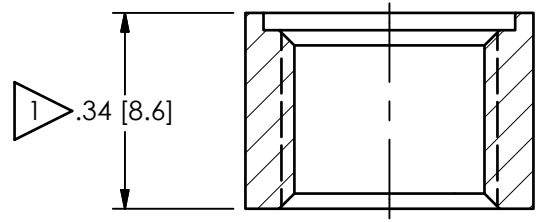
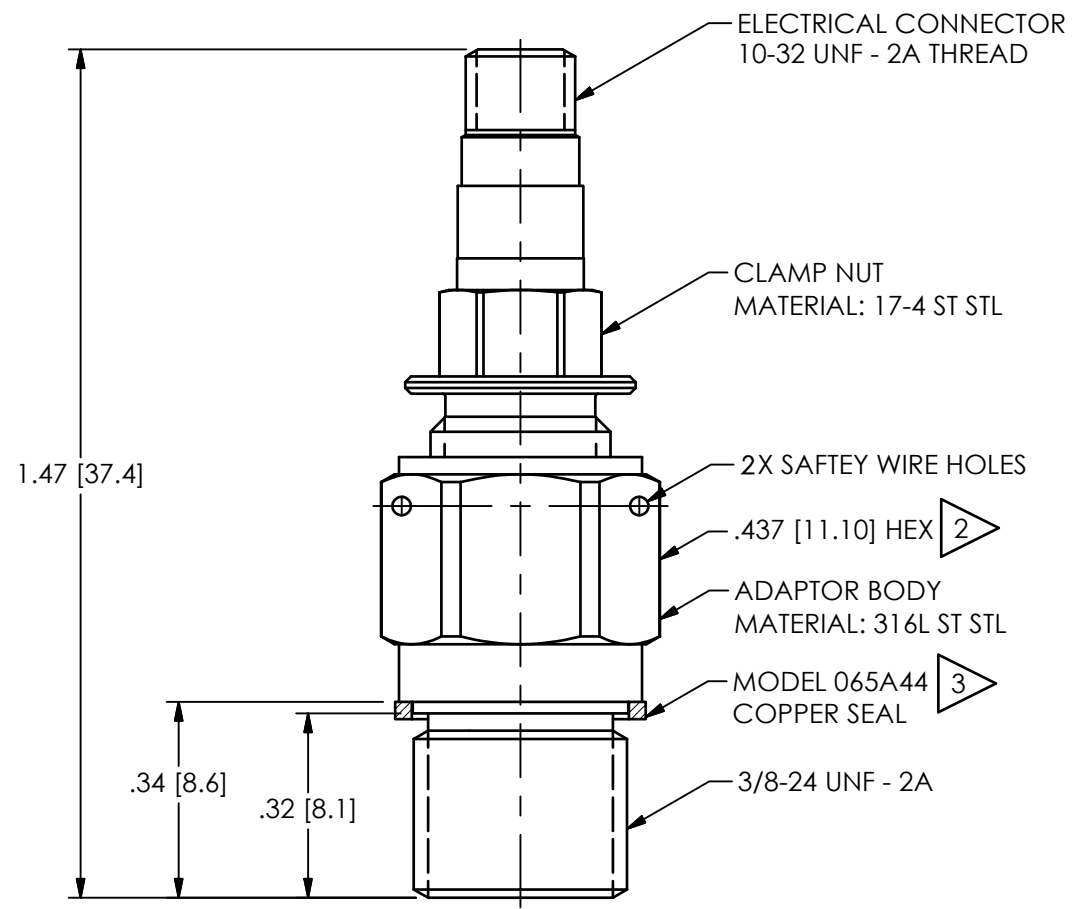
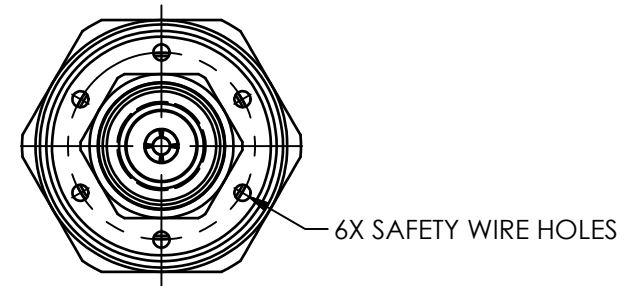
X: Indicates that said hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement of GB/T 26572.

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

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70414

REVISIONS		
REV	DESCRIPTION	DIN
A	UPDATED TORQUE NOTE	52229



MOUNTING HOLE PREPARATION:
 \varnothing .332 [8.43] THRU
 \llcorner \varnothing .437 [11.10] ∇ .030 [.76]
 3/8-24 UNF-2B THRU

- 3 MODEL 065M29 ST STL SEAL AVAILABLE
- 2 MOUNTING TORQUE ON 7/16 HEX: 5 - 8 FT LBS [6.78 - 10.85 Nm] WITHOUT THREAD LUBRICANT
- 1 ABOVE INSTALLATION SHOWN FOR WALL THICKNESS OF .34 [8.6] THICK, \llcorner THICKER WALLS \varnothing .75 [19.0] TO CLEAR .437 [11.10] HEX AND ALLOW FOR SOCKET WRENCH

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		DRAWN		CHECKED		ENGINEER			
DIMENSIONS IN INCHES	DIMENSIONS IN MILLIMETERS [IN BRACKETS]	JJF	10/27/21	JJF	10/27/21	MJP	10/27/21		
DECIMALS XX ±.01 XXX ±.005	DECIMALS X ±0.3 XX ±0.13	TITLE INSTALLATION DRAWING CRYOGENIC GROUND ISOLATED ICP® PRESSURE SENSOR							
ANGLES ± 2 DEGREES	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								
		CODE IDENT. NO. 52681		DWG. NO. 70414		SCALE: 3X		SHEET 1 OF 1	