



**Model 102C14**

**Cryogenic ICP® pressure sensor, 5000 psi, 1 mV/psi, 3/8-24 mtg thd, safety wire holes**

**Installation and Operating Manual**

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

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**OPERATING GUIDE  
DYNAMIC (CRYOGENIC)  
ICP® PRESSURE SENSORS  
MODELS 102C10, C11, C13, C14**

## 1.0 DESCRIPTION

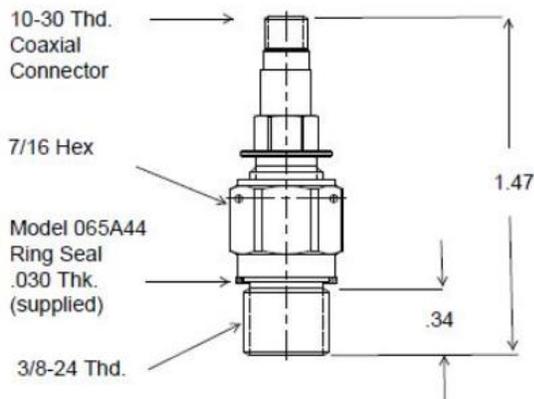
This sensor series consists of a Model 112A quartz pressure element coupled to a special MOSFET amplifier circuit to permit operation at cryogenic temperatures.

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.



### 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.

DIN: 56216  
81170  
Rev: NR

## 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.

## 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.

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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.

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	ENGLISH	SI
<b>Performance</b>		
Measurement Range(for ±5V output)	5 kpsi	34,475 kPa
Useful Overrange(for ± 10V output)	10 kpsi	68,950 kPa [1]
Sensitivity(± 15 %)	1.0 mV/psi	0.145 mV/kPa
Maximum Pressure(Total)	15 kpsi	103,425 kPa
Resolution	100 mpsi	0.690 kPa [2]
Resonant Frequency	≥ 250 kHz	≥ 250 kHz
Rise Time	≤ 2.0 μ sec	≤ 2.0 μ sec
Low Frequency Response(- 5 %)	0.25 Hz	0.25 Hz
Non-Linearity	≤ 1.0 % FS	≤ 1.0 % FS [3]
<b>Environmental</b>		
Acceleration Sensitivity	0.002 psi/g	0.0014 kPa/(m/s <sup>2</sup> ) [2]
Temperature Range(Operating)	-400 to +212 °F	-240 to +100 °C
Temperature Coefficient of Sensitivity	≤ 0.06 %/°F	≤ 0.108 %/°C
Maximum Vibration	2,000 g pk	19,600 m/s <sup>2</sup> pk
Maximum Shock	20,000 g pk	196,000 m/s <sup>2</sup> pk
<b>Electrical</b>		
Output Polarity(Positive Pressure)	Positive	Positive
Discharge Time Constant	≥ 2.0 sec	≥ 2.0 sec
Excitation Voltage	20 to 30 VDC	20 to 30 VDC
Constant Current Excitation	2 to 20 mA	2 to 20 mA
Output Impedance	< 100 Ohm	< 100 Ohm
Output Bias Voltage	8 to 14 VDC	8 to 14 VDC
<b>Physical</b>		
Sensing Element	Quartz	Quartz
Housing Material	304L/316L Stainless Steel	304L/316L Stainless Steel
Thread Adaptor Material	316L Stainless Steel	316L Stainless Steel
Diaphragm	316L Stainless Steel	316L Stainless Steel
Sealing	Welded Hermetic	Welded Hermetic
Electrical Connector	10-32 Coaxial Jack	10-32 Coaxial Jack
Weight	0.388 oz	11.00 gm

**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.

**M** - Metric Mount  
 Supplied Accessory: Model 065A34 Seal ring 0.435" OD x 0.397" ID x 0.030" Cu (3) replaces Model 065A44

**NOTES:**

[1]Excitation voltage >=28 volts required.  
 [2]Typical.  
 [3]Zero-based, least-squares, straight line method.  
 [4]See PCB Declaration of Conformance PS023 for details.

**SUPPLIED ACCESSORIES:**

Model 065A44 Seal ring 0.435" OD x 0.377" ID x 0.030" thk Cu (3)  
 Model PCS-10AA Single point sensitivity coefficient at sensor minimum operating temperature (-320°F / -196°C limit)  
 Model PCS-1AZ Sensitivity calibration at 100% and 10% of sensor range

Entered: ND	Engineer: MP	Sales: AH	Approved: RPF	Spec Number:
Date: 11/12/2025	Date: 11/12/2025	Date: 11/12/2025	Date: 11/12/2025	81160

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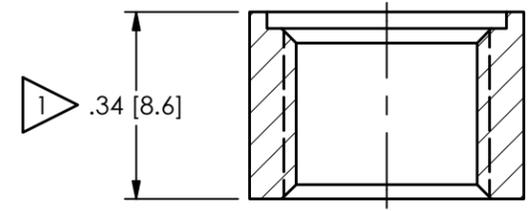
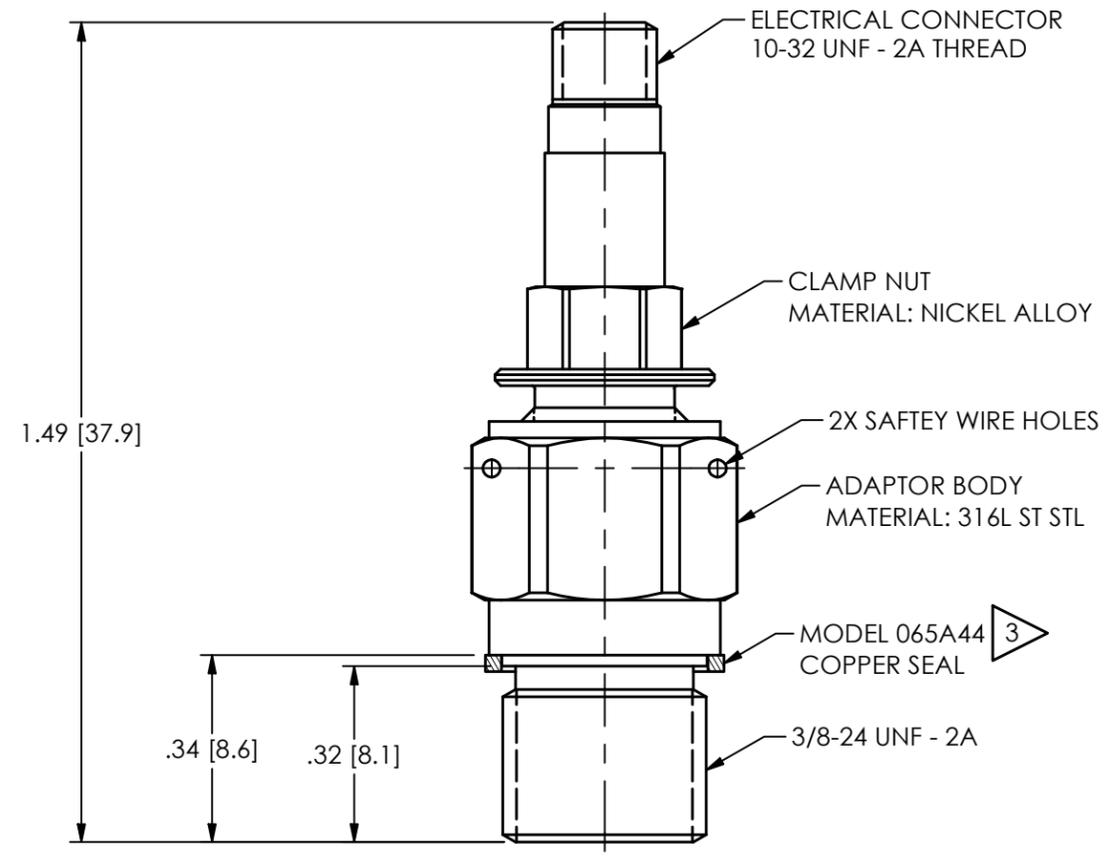
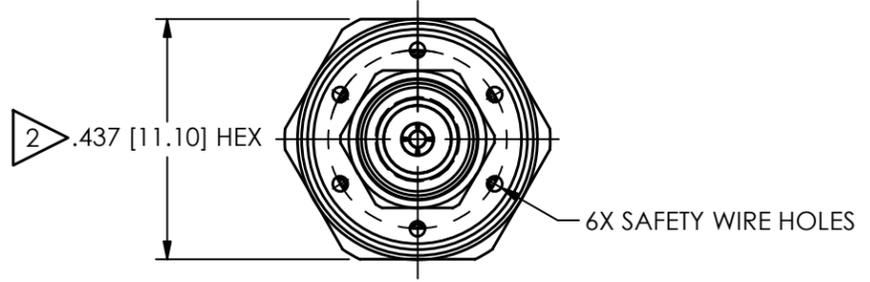


All specifications are at room temperature unless otherwise specified.  
 In the interest of constant product improvement, we reserve the right to change specifications without notice.  
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81174

REVISIONS		
REV	DESCRIPTION	DIN
NR	RELEASED TO DRAFTING	56216



**MOUNTING HOLE PREPARATION:**  
 $\varnothing .332 [8.43]$  THRU  
 $\sqcup \varnothing .437 \pm .001 [11.10 \pm .03] \nabla .030 [.76]$   
 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,  $\sqcup$  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		AME	10/23/25	JDM	10/23/25	MJP	10/23/25
DECIMALS XX ±.01	DIMENSIONS IN MILLIMETERS [IN BRACKETS]	TITLE					
XXX ±.005	DECIMALS X ±0.3	INSTALLATION DRAWING CRYOGENIC ICP® PRESSURE SENSOR					
ANGLES ± 2 DEGREES	DECIMALS XX ±0.13						
CABLE TOLERANCES IN ENGLISH	CABLE TOLERANCES IN METRIC						
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	SCALE: 3X		SHEET 1 OF 1			
5' ≤ LENGTH < 100' = +6" / - 0	1.5m ≤ LENGTH < 30.5m = +15.2cm / - 0	CODE IDENT. NO. 52681		SIZE B		DWG. NO. 81174	
100' ≤ LENGTH = +1' / - 0	30.5m ≤ LENGTH = +30.5cm / - 0	FILLETS AND RADII .003 - .005		FILLETS AND RADII 0.07 - 0.13		PCB PIEZOTRONICS AN AMPHENOL COMPANY 3425 WALDEN AVE. DEPEW, NY 14043 (716) 684-0001 E-MAIL: sales@pcb.com	