PCB PIEZOTRONICS
AN AMPHENOL COMPANY

Model 102C11

Cryogenic ICP pressure sensor, 1000 psi, 5 mV/psi, 3/8-24 mtg thd, lockwire hole on clamp nut and outer adaptor

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

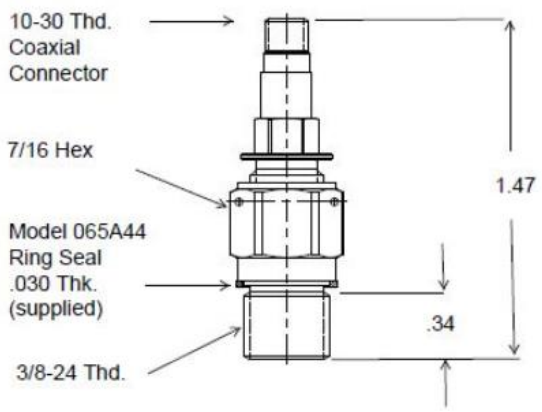
This sensor series consists of a Model 112A quartz pressure element coupled to a special MOSFET amplifier circuit to permit operation at cryogenic temperatures.

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 102Bl0: 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.

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 Number 102C11	ICP® PRESSURE SENSOR	Revision: NR ECN #: 56216

Performance	ENGLISH	SI	
Measurement Range(for ±5V output)	1 kpsi	6,895 kPa	
Useful Overrange(for ± 10V output)	2,000 psi	13,790 kPa	[1]
Sensitivity(+/- 15 %)	5.0 mV/psi	0.725 mV/kPa	
Maximum Pressure(step)	10,000 psi	69,000 kPa	
Maximum Pressure(Total)	15 kpsi	103,425 kPa	[2]
Resolution	20 mpsi	0.138 kPa	[3]
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	[4]
Environmental			
Acceleration Sensitivity	0.002 psi/g	0.0014 kPa/(m/s²)	[3]
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/s² pk	
Maximum Shock	20,000 g pk	196,000 m/s² pk	
Electrical			
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	
Physical			
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	.388 oz	11.00 gm	

CE

UK CA [5]

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 Piezotronics, 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.

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]Due to high sensitivity, the static pressure should be applied and removed very slowly. Rate should prevent more than 10 Volt change in output until Output Bias Voltage returns to normal (approximately 15 times discharge time constant).
[3]Typical.
[4]Zero-based, least-squares, straight line method.
[5]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: 10/23/2025	Date: 10/23/2025	Date: 10/23/2025	Date: 10/23/2025	81158

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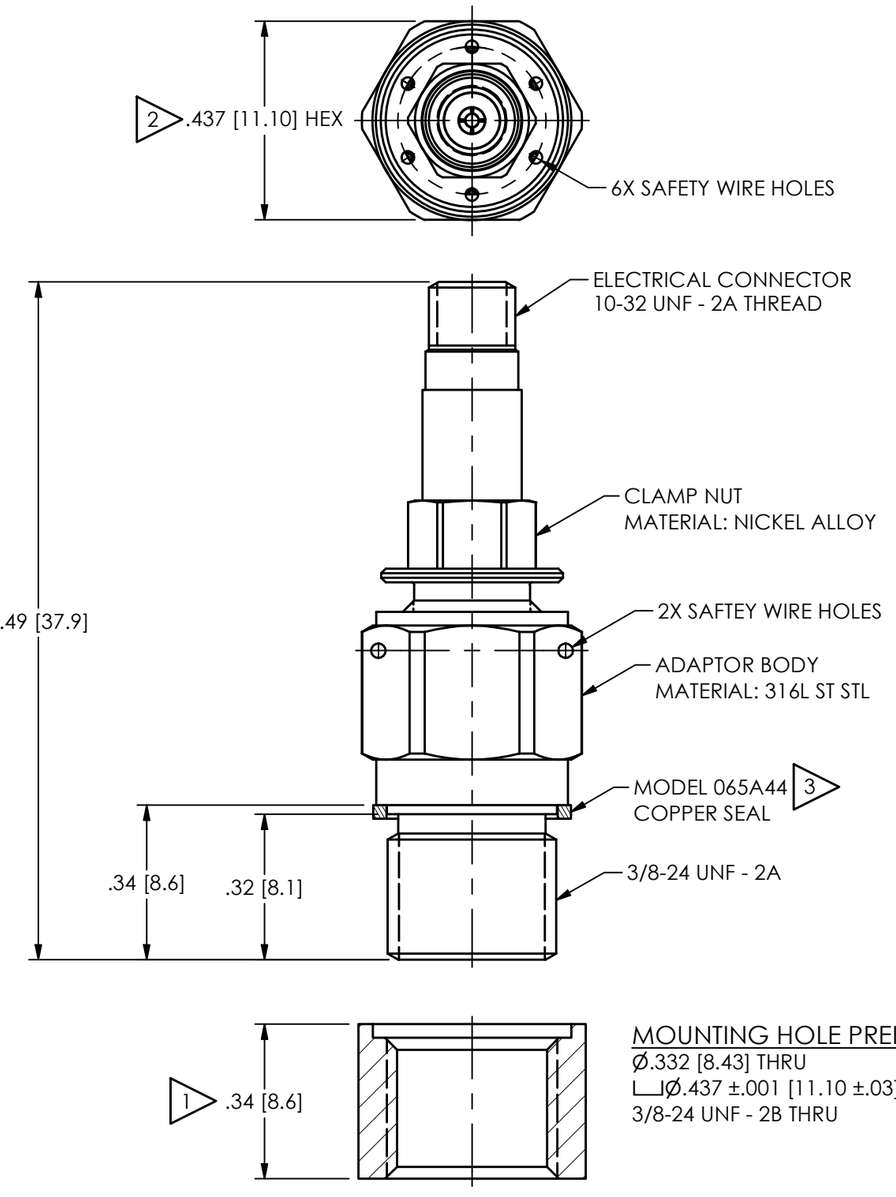
81174

REVISIONS		
REV	DESCRIPTION	DIN
NR	RELEASED TO DRAFTING	56216



MOUNTING HOLE PREPARATION:
Ø.332 [8.43] THRU
⌴Ø.437 ±.001 [11.10 ±.03] ↧.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, ⌴ THICKER WALLS Ø.75 [19.0] TO CLEAR .437 [11.10] HEX AND ALLOW FOR SOCKET WRENCH

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	
AME	10/23/25	JDM	10/23/25	MJP	10/23/25

TITLE
INSTALLATION DRAWING
CRYOGENIC ICP®
PRESSURE SENSOR

PCB PIEZOTRONICS
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CODE IDENT. NO.	SIZE	DWG. NO.
52681	B	81174
SCALE: 3X		SHEET 1 OF 1