



[Click to Learn More! >](#)

Model 121A4X / 102A4X

# Hazardous Area Approved Industrial Dynamic ICP<sup>®</sup> Pressure Sensors

Solid-state, quartz piezoelectric sensing elements with integral microelectronic ICP<sup>®</sup> amplifier

## Highlights

- Detect and Monitor pulsations, instability, surges, turbulence and acoustics
- Hazardous location troubleshooting, predictive maintenance, and process improvement
- All-welded, hermetically sealed, stainless steel construction
- For gas compressors, chemical plants, power generation, hazardous processes



### Model 121A4x / 102A4X

ICP<sup>®</sup> Pressure Sensors with Hazardous Area Approvals

**CSA (Canada & US):**  
AEx nA IIC T4, DIV2 CL1 GR A-D  
Ex nL IIC T4, DIV2 CL1 GR A-D  
AEx ia IIC T4, DIV1 CL1 GR A-D  
Ex ia IIC T4, DIV1 CL1 GR A-D

**ATEX:**  
Ex ia IIC T4  
Ex nL IIC T4  
Ex nA IIC T4

Piezoelectric pressure sensors offer the unique ability to respond to very rapid pressure spikes, pulsations and surges. They can also sense minute pressure fluctuations, while subjected to very high static pressures. Series 121A4X case isolated and 102A4X ground isolated Hazardous Area Approved, dynamic ICP<sup>®</sup> pressure sensors satisfy such measurement requirements in monitoring, diagnostic, troubleshooting, and control applications typical of hazardous factory environments.

Applications include monitoring dynamic pressure events, such as surges; pulsations; spikes; leak detection; combustion instability; and acoustics found in operation of compressors, pumps, pipelines and gas turbines. Sensors may be used with ICP<sup>®</sup> signal conditioning and permit use of a variety of inexpensive 2-wire cable systems. The low-impedance signal may be transmitted over long cable distances, and sensors may be used in dirty environments without signal degradation. PCB<sup>®</sup> Series 121A4X case isolation eliminates all electrical noise from both environment and structure. Series 102A4X ground isolation eliminates electrical noise from the structure under test; however, there is still a chance to pick up unwanted electrical noise from the environment.

As with all PCB<sup>®</sup> instrumentation, this equipment is complemented with toll-free applications assistance, 24-hour customer service, and is backed by a no-risk policy that guarantees satisfaction or your money refunded.





**Specifications**

The models featured below represent some of the most popular Hazardous Area Approved, dynamic, ICP® pressure sensors available from PCB®. Please contact the factory to discuss your specific requirements.

Model	121A41		121A44		121A45		102A43		102A44		102A45	
Dynamic Performance	English	SI	English	SI	English	SI	English	SI	English	SI	English	SI
Measurement Range (for ±5 V output)	100 psi	689.5 kPa	50 psi	344.7 kPa	500 psi	3447 kPa	4000 psi	27,580 kPa	50 psi	344.7 kPa	500 psi	3447 kPa
Sensitivity (± 20 %)	50 mV/psi	7.25 mV/kPa	100 mV/psi	14.5 mV/kPa	10 mV/psi	1.45 mV/kPa	1 mV/psi	0.145 mV/kPa	100 mV/psi	14.5 mV/kPa	10 mV/psi	1.45 mV/kPa
Maximum Pressure (step) [8]	1000 psi	6895 kPa	500 psi	3447 kPa	5000 psi	34,470 kPa	4000 psi	27,580 kPa	500 psi	3447 kPa	4000 psi	27,580 kPa
Maximum Pressure (Total)	8000 psi	55,160 kPa	8000 psi	55,160 kPa	8000 psi	55,160 kPa	4000 psi	27,580 kPa	4000 psi	27,580 kPa	4000 psi	27,580 kPa
Resolution	0.004 psi	0.028 kPa	0.0005 psi	0.003 kPa	0.003 psi	0.02 kPa	0.1 psi	0.69 kPa	0.001 psi	0.0069 kPa	0.010 psi	0.069 kPa
Resonant Frequency	≥ 60 kHz						≥ 250 kHz					
Rise Time (Reflected)	≤ 4 μ sec						≤ 2 μ sec					
Low Frequency Response (-5 %)	0.5 Hz											
Non-Linearity [9]	≤ 2 % FS						≤ 1 % FS					
<b>Environmental</b>												
Acceleration Sensitivity	≤ 0.05 psi/g	≤ 0.035k Pa/(m/s²)	≤ 0.05 psi/g	≤ 0.035k Pa/(m/s²)	≤ 0.05 psi/g	≤ 0.035k Pa/(m/s²)	≤ 0.002 psi	≤ 0.0014 kPa/g	≤ 0.002 psi	≤ 0.0014 kPa/g	≤ 0.002 psi	≤ 0.0014 kPa/g
Temperature Range (Operating)	-65 to +250 °F	-54 to +121 °C	-65 to +250 °F	-54 to +121 °C	-65 to +250 °F	-54 to +121 °C	-65 to +250 °F	-54 to +121 °C	-65 to +250 °F	-54 to +121 °C	-65 to +250 °F	-54 to +121 °C
Temperature Coefficient of Sensitivity	≤ 0.1 %/°F	≤ 0.18%/°C	≤ 0.1 %/°F	≤ 0.18%/°C	≤ 0.1 %/°F	≤ 0.18%/°C	≤ 0.1 %/°F	≤ 0.18%/°C	≤ 0.1 %/°F	≤ 0.18%/°C	≤ 0.1 %/°F	≤ 0.18%/°C
Maximum Flash Temperature	+ 3,000 °F	+ 1,650 °C	+ 3,000 °F	+ 1,650 °C	+ 3,000 °F	+ 1,650 °C	+ 3,000 °F	+ 1,650 °C	+ 3,000 °F	+ 1,650 °C	+ 3,000 °F	+ 1,650 °C
Hazardous Area Approval [1], [2], [3], [4]	* CSA (C-US) NRTL - Canadian Standards Association											
Hazardous Area Approval [5], [6], [7]	* ATEX											
<b>Electrical</b>												
Output Polarity (Positive Pressure)	Positive											
Discharge Time Constant (at room temp)	≥ 1.0 sec											
Excitation Voltage	22 to 28 VDC						20 to 30 VDC					
Constant Current Excitation	2-20 mA											
Output Impedance	< 100 ohm											
Output Bias Voltage	10 to 15 VDC						8 to 14 VDC					
Electrical Isolation	Case Isolated ≥ 10⁸ ohm						Ground Isolated ≥ 10⁸ ohm					
<b>Physical</b>												
Sensing Geometry	Compression											
Sensing Element	Quartz											
Housing Material	316 L Stainless Steel						17-4 PH Stainless Steel					
Diaphragm	316 L Stainless Steel											
Sealing	Welded Hermetic											
Mounting Thread	1/4-27 NPT						1/8-27 NPT					
Electrical Connector	2-pin MIL-C-5015						10-32 Coaxial Jack					
Weight	2.7 oz	75.6 gm	2.7 oz	75.6 gm	2.7 oz	75.6 gm	0.6 oz	17 gm	0.6 oz	17 gm	0.6 oz	17 gm

**Notes:**  
 [1] AEx nA IIC T4, DIV2 CL1 GR A-D [2] Ex nL IIC T4, DIV2 CL1 GR A-D [3] AEx ia IIC T4, DIV1 CL1 GR A-D  
 [4] Ex ia IIC T4, DIV1 CL1 GR A-D [5] Ex ia IIC T4 [6] Ex nL IIC T4 [7] Ex nA IIC T4  
 [8] 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 constants). [9] Zero-based, least-squares, straight line method [10] Diaphragm with ablative coating on Models 102A43, 102A44, 102A45

\*Use of intrinsic safety barrier may be required (order separately) to maintain hazardous area approvals. Contact PCB® for details.

**CE** These products conform to applicable European Directives for CE marking.

**Model 691B60**  
**Intrinsic Safety Barrier**  
 (order separately)



3425 Walden Avenue, Depew, NY 14043-2495 USA

Toll-Free in USA 800-828-8840

24-hour SensorLine™ 716-684-0001

Fax 716-684-0987 E-mail info@pcb.com

Web site www.pcb.com

AS9100 CERTIFIED ■ ISO 9001 CERTIFIED ■ A2LA ACCREDITED to ISO 17025

© 2009 PCB Group, Inc. In the interest of constant product improvement, specifications are subject to change without notice. PCB, ICP, Modally Tuned, Spindler, Swiveler and TORKDISC are registered trademarks of PCB Group. SoundTrack LXT, Spark and Blaze are registered trademarks of PCB Piezotronics. SensorLine is a service mark of PCB Group. All other trademarks are property of their respective owners.

PG-121A4/102A4-1209

Printed in U.S.A.

**PCB® Piezotronics Test & Measurement** Pressure product offering includes piezoelectric, strain gage and thin-film pressure sensors for research & development, test, measurement, monitoring, and control requirements. Piezoelectric sensors measure rapid transients, pulsations, turbulence, noise, spikes, combustion, explosions, cavitation, blast shock waves, and other such pressures. Strain gage and thin-film pressure sensors measure static or slowly changing test and process pressures. Additional Test & Measurement products include sensors for acoustics, force, load, strain, torque, acceleration, shock, vibration, and supporting electronics. PCB® products are backed by our **Total Customer Satisfaction** policy, which guarantees your satisfaction or your money refunded.

Visit [www.pcb.com](http://www.pcb.com) to locate your nearest sales office