Hazardous Area Approved Industrial Dynamic ICP® Pressure Sensors

Solid-state, quartz piezoelectric sensing elements with integral microelectronic ICP® amplifier

Highlights

- Detect & Monitor Pulsations, Instability, Surges, Turbulence & Acoustics
- Hazardous location trouble-shooting, predictive maintenance, & process improvement
- All-welded, hermetically sealed, stainless steel construction
- For gas compressors, chemical plants, power generation, hazardous processes

Model 102A4X / 121A4X

ICP® Pressure Sensors with Hazardous Area Approvals

ATEX:

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

CSA (Canada & US):
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 102A4X ground isolated & 121A4X case isolated Hazardous Area Approved, dynamic ICP® 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® 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. 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. PCB® Series 121A4X case isolation eliminates all electrical noise from both environment and structure.

As with all PCB® 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.

Model 102A4X / 121A4X HAZARDOUS AREA APPROVED DYNAMIC ICP® PRESSURE SENSORS

The models featured below represent some of the most popular Hazardous Area Approved, dynamic, ICP® pressure sensors available from PCB®. Additional versions are available with pressure ranges up to 100,000 psi (689,476 kPa), sensitivities to 5000 mV/psi (725 mV/kPa), a variety of NPT and straight mounting threads (english and metric), as well as tailored frequency response characteristics. Please contact the factory to discuss your specific requirements.

Specifications

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	5000 psi	34,470 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)	1000 psi	6895 kPa	500 psi	3447 kPa	5000 psi	34,470 kPa	8000 psi	55,160 kPa	500 psi	3447 kPa	5000 psi	34,470 kPa
Maximum Pressure (Total)	8000 psi	55,160 kPa	8000 psi	55,160 kPa	8000 psi	55,160 kPa	8000 psi	55,160 kPa	8000 psi	55,160 kPa	8000 psi	55,160 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	≤ 2 % FS						≤ 1 % FS					
Environmental												
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	* CSA (C-US) NRTL - Canadian Standards Association											
Hazardous Area Approval	* ATEX											
Electrical												
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 ≥ 10^8 ohm						Ground Isolated ≥ 10^8 ohm					
Physical												
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 total pressure should be applied and removed slowly [9] Zero-based, least-squares, straight line method [10] Diaphragm with ablative coating on Models 102A43, 102A44, 102A45

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

These products conform to applicable European Directives for CE marking.

Model 691A60
Intrinsic Safety Barrier
(order separately)

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AS9100:2004 CERTIFIED ISO 9001:2000 CERTIFIED A2LA ACCREDITED to ISO 17025

PCB® Piezotronics specializes in the development, application and support of sensors and related instrumentation, including accelerometers, microphones, impact hammers, pressure sensors; force, torque, load and strain sensors; and related signal conditioning, for measurement of shock and vibration; acoustics; pressure; force, torque, load and strain, utilizing ICP®, piezoelectric, capacitive, strain gage, variable capacitive, piezoresistive, TEDS and MEMS sensing technologies. All products are backed by our **Total Customer Satisfaction** policy, which guarantees your satisfaction or your money refunded.

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