PCB PIEZOTRONICS
AN AMPHENOL COMPANY

Model 422E65/A

In-line charge converter, 1 mV/pC, +/-5V output, -5% frequency 5 Hz, 10-32 jack conn., Rad Hard

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

Model Number	IN-LINE CHARGE CONVERTER	Revision: D
422E65/A		ECN #: 39690

Performance	**ENGLISH**	**SI**	
Sensitivity(± 2 %)(Charge Conversion)	1 mV/pC	1 mV/pC	
Input Range	± 5000 pC	± 5000 pC	
Low Frequency Response(-5 %)	5 Hz	5 Hz	[2]
High Frequency Response(4 mA)	35 kHz	35 kHz	[1][3]
Non-Linearity	≤ 1.0 % FS	≤ 1.0 % FS	
Environmental			
Temperature Range(Operating)	-65 to +250 °F	-54 to +121 °C	
Maximum Shock	1000 g pk	9810 m/s² pk	
Humidity Range	100 %	100 %	
Radiation Exposure Limit(Integrated Gamma Flux)	≤ 1 Mrad	≤ 1 Mrad	
Radiation Exposure Limit(Integrated Neutron Flux)	≤ 10^{10} N/cm²	≤ 10^{10} N/cm²	
Electrical			
Excitation Voltage	+18 to 28 VDC	+18 to 28 VDC	
Constant Current Excitation	2.2 to 20 mA	2.2 to 20 mA	
Output Voltage	± 5 V	± 5 V	
Output Impedance	<20 Ohm	<20 Ohm	
Output Bias Voltage	9 to 14.5 VDC	9 to 14.5 VDC	
Broadband Electrical Noise(1 to 10,000 Hz)	7.0 µV	-103 dB	[1]
Spectral Noise(1 Hz)	5.0 µV/√Hz	-106 dB	[1]
Spectral Noise(10 Hz)	1.0 µV/√Hz	-120 dB	[1]
Spectral Noise(100 Hz)	0.1 µV/√Hz	-140 dB	[1]
Spectral Noise(1 kHz)	0.1 µV/√Hz	-140 dB	[1]
Spectral Noise(10 kHz)	0.05 µV/√Hz	-146 dB	[1]
Capacitance(Maximum allowable at input)	20,000 pF	20,000 pF	
Discharge Time Constant	≥ 0.1 sec	≥ 0.1 sec	
Resistance(Minimum required at input)	10,000 Ohm	10,000 Ohm	
Source Capacitance Loading	<0.0005 %/pF	<0.0005 %/pF	
Physical			
Housing Material	Stainless Steel	Stainless Steel	
Sealing	Welded	Welded	
Electrical Connector(Input)	10-32 Coaxial Jack	10-32 Coaxial Jack	
Electrical Connector(Output)	10-32 Coaxial Jack	10-32 Coaxial Jack	
Size (Diameter x Length)	0.50 in x 3.0 in	13 mm x 76 mm	
Weight	0.8 oz	23 gm	

CE[4]

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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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.

NOTES:

[1] Tested using voltage source and input capacitor equal to the feedback capacitor, to simulate a charge output sensor.
[2] The low frequency response is accurate within ±25% of the specified frequency
[3] Slew rate limiting may result at higher frequencies.
[4] See PCB Declaration of Conformance PS024 for details. A low impendance connection from case to earth ground is required to maintain CE compliance.

Entered: AP	Engineer: AJP	Sales: JJM	Approved: JWH	Spec Number:
Date: 1/31/2013	Date: 1/31/2013	Date: 1/31/2013	Date: 1/31/2013	**31909**

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422-5010-95

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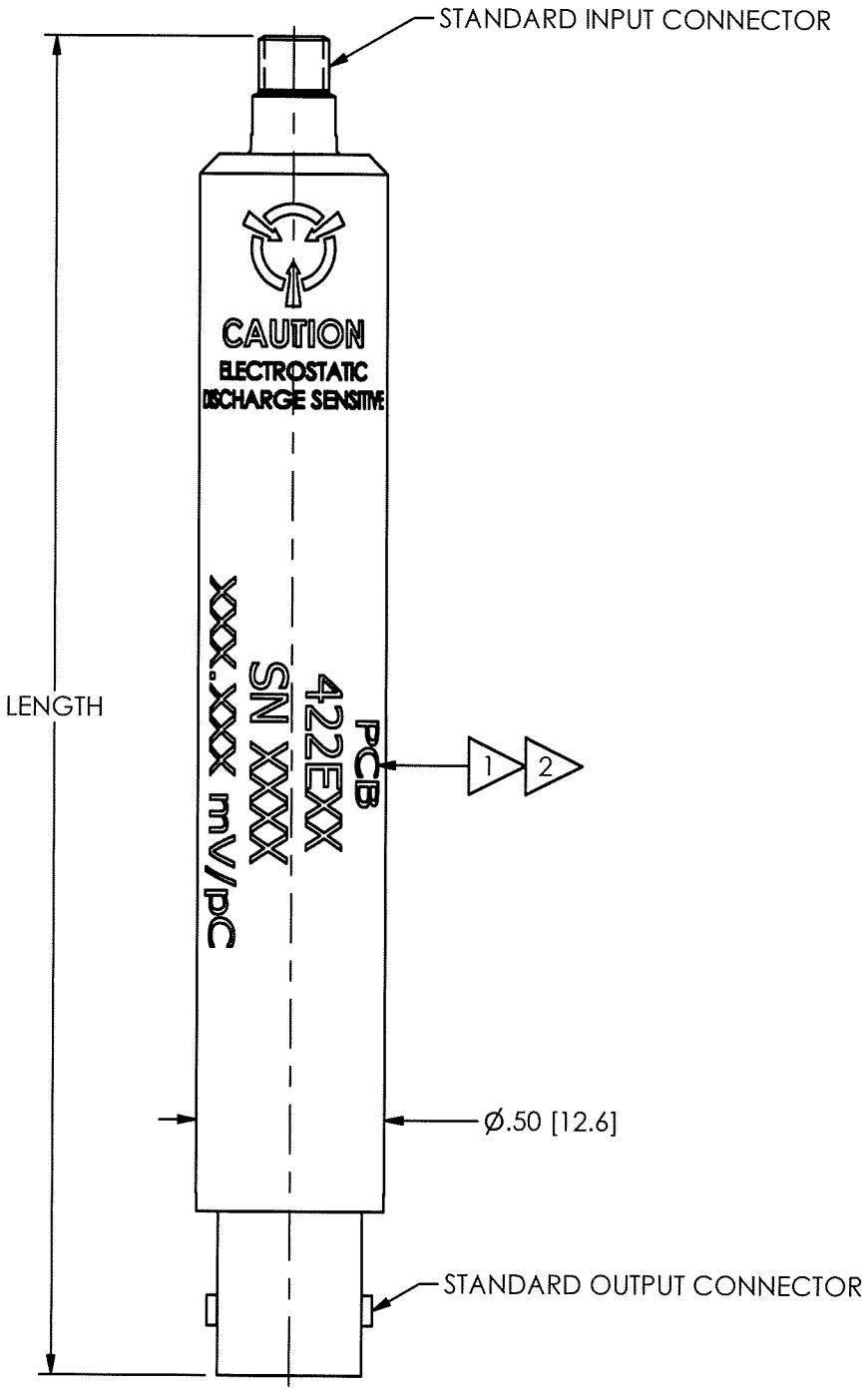
REVISIONS		
REV	DESCRIPTION	DIN
L	REMOVED ITAR STAMP	37190



AVAILABLE CONNECTOR OPTIONS:

STANDARD MODEL NUMBER
INPUT: 10-32 MICRO DOT JACK
OUTPUT: BNC JACK
LENGTH: 3.4 [85]

MODEL NO./A
INPUT: 10-32 MICRO-DOT JACK
OUTPUT: 10-32 MICRO-DOT JACK
LENGTH: 3.0 [76]

MODEL NO./C
INPUT: 10-32 MICRO-DOT JACK
OUTPUT: BNC PLUG
LENGTH: 3.2 [81]

MODEL NO./D
INPUT: BNC JACK
OUTPUT: BNC JACK
LENGTH: 4.2 [107]

2 ETCH WITH "IN ← → OUT" TO INDICATE PROPER ORIENTATION.

1 ETCH WITH NORMAL SENSITIVITY, AS IT APPEARS ON SPEC SHEET.

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		DRAWN		CHECKED		ENGINEER	
DIMENSIONS IN INCHES	DIMENSIONS IN MILLIMETERS [IN BRACKETS]	SMB	10/7/11	EcB	10/7/11	BAM	10/7/11
DECIMALS XX ±.03 XXX ±.010	DECIMALS X ±0.8 XX ±0.25	TITLE					
ANGLES ± 2 DEGREES	ANGLES ± 2 DEGREES	OUTLINE DRAWING MODEL 422E SERIES IN-LINE CHARGE AMPLIFIER					
FILLETS AND RADII .003 - .005	FILLETS AND RADII 0.07 - 0.13						

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CODE IDENT. NO. 52681	DWG. NO. 422-5010-95
SCALE: 2X	SHEET 1 OF 1

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.

In the event that equipment becomes damaged or ceases to operate, our Application Engineers are here to support your troubleshooting efforts 24 hours a day, 7 days a week. Call or email with model and serial number as well as a brief description of the problem.

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.

PCB Piezotronics is an ISO-9001 certified company whose calibration services are accredited by A2LA to ISO/IEC 17025, with full traceability to SI through N.I.S.T. In addition to our standard calibration services, we also offer specialized tests, including: sensitivity at elevated or cryogenic temperatures, phase response, extended high or low frequency response, extended range, leak testing, hydrostatic pressure testing, and others. For more information, contact your local PCB Piezotronics distributor, sales representative, or factory customer service representative.

Returning Equipment

If factory repair is required, our representatives will provide you with a Return Material Authorization (RMA) number, which we use to reference any information you have already provided and expedite the repair process. This number should be clearly marked on the outside of all returned package(s) and on any packing list(s) accompanying the shipment.

Contact Information

PCB Piezotronics, Inc.
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Toll-free: (800) 828-8840
24-hour SensorLine: (716) 684-0001
General inquiries: info@pcb.com
Repair inquiries: rma@pcb.com

For a complete list of distributors, global offices and sales representatives, visit our website, www.pcb.com.

Safety Considerations

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the precautions required to avoid injury. While our equipment is designed with user safety in mind, the protection provided by the equipment may be impaired if equipment is used in a manner not specified by this manual.

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:

This symbol on the unit indicates that high voltage may be present. Use standard safety precautions to avoid personal contact with this voltage.

This symbol on the unit indicates that the user should refer to the operating instructions located in the manual.

This symbol indicates safety, earth ground.

PCB- PCB工业监测和测量设备 - 中国RoHS 公布表

PCB Industrial Monitoring and Measuring Equipment - China RoHS Disclosure Table

部件名称 Part Name	有毒和危险品 Toxic and Hazardous Substances or Elements									
Part	铅 (Pb)	水银 (Hg)	镉 (Cd)	六价 铬 (Cr(VI)	多溴化 苯 (PBB)	多溴化二苯 醚 (PBDE)	邻苯二甲酸 二(2-乙基) 己酯 (DEHP)	邻苯二甲丁 基苄酯 (BBP)	邻苯二甲酸 二酸正丁酯 (DBP)	邻苯二甲酸 二异丁酯 (DIBP)
电气外壳 (Electrical Enclosures)	X	O	O	O	O	O	O	O	O	O
紧固件和弹簧 (Fasteners)	X	O	O	O	O	O	O	O	O	O
电缆组件 (Cable Assembly)	X	O	O	O	O	O	O	O	O	O
印刷电路板组装 (PCBAs)	X	O	O	O	O	O	O	O	O	O
机械零件(Mechanical Parts)	O	O	O	O	O	O	O	O	O	O
塑料和橡胶零件 (Plastic & Rubber Parts)	O	O	O	O	O	O	O	O	O	O
金属零件 (Metal Parts)	X	O	O	O	O	O	O	O	O	O

本表格依据 SJ/T 11364 的规定编制

O =表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下 (indicates that the content of the toxic and hazardous substance in all the Homogeneous Materials of the part is below the concentration limit requirement as described in GB/T 26572).

X =表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求 (indicates that the content of the toxic and hazardous substance in at least one Homogeneous Material of the part exceeds the concentration limit requirement as described in GB/T 26572).