Model 1502A02FJ1KPSIS

Pressure Transducer

Installation and Operating Manual

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

Toll-free: 800-828-8840
24-hour SensorLine: 716-684-0001
Fax: 716-684-0987
E-mail: info@pcb.com
Web: www.pcb.com

PCB PIEZOTRONICS INC.
A PCB GROUP COMPANY

Warranty, Service, Repair, and Return Policies and Instructions

The information contained in this document supersedes all similar information that may be found elsewhere in this manual.

Total Customer Satisfaction – PCB Piezotronics guarantees Total Customer Satisfaction. If, at any time, for any reason, you are not completely satisfied with any PCB product, PCB will repair, replace, or exchange it at no charge. You may also choose to have your purchase price refunded in lieu of the repair, replacement, or exchange of the product.

Service – Due to the sophisticated nature of the sensors and associated instrumentation provided by PCB Piezotronics, user servicing or repair is not recommended and, if attempted, may void the factory warranty. Routine maintenance, such as the cleaning of electrical connectors, housings, and mounting surfaces with solutions and techniques that will not harm the physical material of construction, is acceptable. Caution should be observed to insure that liquids are not permitted to migrate into devices that are not hermetically sealed. Such devices should only be wiped with a dampened cloth and never submerged or have liquids poured upon them.

Repair – In the event that equipment becomes damaged or ceases to operate, arrangements should be made to return the equipment to PCB Piezotronics for repair. User servicing or repair is not recommended and, if attempted, may void the factory warranty.

Calibration – Routine calibration of sensors and associated instrumentation is recommended as this helps build confidence in measurement accuracy and acquired data. Equipment calibration cycles are typically established by the users own quality regimen. When in doubt about a calibration cycle, a good "rule of thumb" is to recalibrate on an annual basis. It is also good practice to recalibrate after exposure to any severe temperature extreme, shock, load, or other environmental influence, or prior to any critical test.

PCB Piezotronics maintains an ISO-9001 certified metrology laboratory and offers calibration services, which are accredited by A2LA to ISO/IEC 17025, with full traceablility to N.I.S.T. In addition to the normally supplied calibration, special testing is also available, such as: sensitivity at elevated or cryogenic temperatures, phase response, extended high or low frequency response, extended range, leak testing, hydrostatic pressure testing, and others. For information on standard recalibration services or special testing, contact your local PCB Piezotronics distributor, sales representative, or factory customer service representative.

Returning Equipment – *Following these procedures will insure that your returned materials are handled in the most expedient manner.* Before returning any equipment to PCB Piezotronics, contact your local distributor, sales representative, or factory customer service representative to obtain a Return

Materials Authorization (RMA) Number. This RMA number should be clearly marked on the outside of all package(s) and on the packing list(s) accompanying the shipment. A detailed account of the nature of the problem(s) being experienced with the equipment should also be included inside the package(s) containing any returned materials.

A Purchase Order, included with the returned materials, will expedite the turn-around of serviced equipment. It is recommended to include authorization on the Purchase Order for PCB to proceed with any repairs, as long as they do not exceed 50% of the replacement cost of the returned item(s). PCB will provide a price quotation or replacement recommendation for any item whose repair costs would exceed 50% of replacement cost, or any item that is not economically feasible to repair. For routine calibration services, the Purchase Order should include authorization to proceed and return at current pricing, which can be obtained from a factory customer service representative.

Warranty – All equipment and repair services provided by PCB Piezotronics, Inc. are covered by a limited warranty against defective material and workmanship for a period of one year from date of original purchase. Contact PCB for a complete statement of our warranty. Expendable items, such as batteries and mounting hardware, are not covered by warranty. Mechanical damage to equipment due to improper use is not covered by warranty. Electronic circuitry failure caused by the introduction of unregulated or improper excitation power or electrostatic discharge is not covered by warranty.

Contact Information – International customers should direct all inquiries to their local distributor or sales office. A complete list of distributors and offices can be found at www.pcb.com. Customers within the United States may contact their local sales representative or a factory customer service representative. A complete list of sales representatives can be found at www.pcb.com. Toll-free telephone numbers for a factory customer service representative, in the division responsible for this product, can be found on the title page at the front of this manual. Our ship to address and general contact numbers are:

PCB Piezotronics, Inc.
3425 Walden Ave.
Depew, NY 14043 USA
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E-mail: info@pcb.com

DOCUMENT NUMBER: 21354
DOCUMENT REVISION: B
ECN: 17900

Installation and Operating Manual

Series 1500

Pressure Transducers and Transmitters

Please review all instructions, specification sheet(s), and product literature prior to installing this product. Incorrect installation and/or operation may cause damage to the unit and void warranty.

For assistance with the operation of this product, contact:

PCB PIEZOTRONICS INC. – PRESSURE DIVISION
3425 Walden Avenue, Depew, New York 14043-2495 USA
Toll Free: 888-684-0011 Fax: 716-686-9129
24-Hour SensorLine[SM]: 716-684-0001
E-mail: pressure@pcb.com
Website: www.pcb.com
ISO 9001 CERTIFIED

PCB PIEZOTRONICS INC.
PRESSURE DIVISION

OPERATION MANUAL FOR MODELS 1501, 1502 AND 1503 PRESSURE TRANSDUCERS AND TRANSMITTERS

1.0 INTRODUCTION

The 1500 series Pressure Transducers/Transmitters are designed to provide a highly stable and accurate measurement of fluid (liquid and/or gas) pressure.

2.0 DESCRIPTION

All models utilize a sensing element that changes resistance in proportion to changes in applied strain, which is sensed by the force collecting passive diaphragm. This change in resistance is conditioned and amplified as needed to provide the required output and performance characteristics. Various electrical and mechanical interfaces are available.

3.0 INSTALLATION

Mechanical (please refer to the specification sheet supplied with each unit for pressure port configuration):

- Wrench only on the wrench flats for mounting or removing the unit. Do not use the housing or electrical termination for wrenching.

- The pressure cavity, unless otherwise specified, is manufactured with 17-4 and 316 stainless steels and is suitable for use with all media compatible with those materials. Foreign objects (such as screwdrivers, etc) should not be introduced into the pressure cavity.

- To prevent performance degradation units must be protected from exposure to pressure transients and spikes that exceed the rated proof pressure range.

Electrical (please refer to the specification sheet supplied with each unit or the 1500 Series data sheet for specific wiring and excitation requirements):

- Units must have proper excitation to perform within specification. Insufficient power may prevent the unit from providing the full rated output at the full rated pressure.

- Electronics can be damaged by power surges. Surge arresters are recommended for applications where power surges are possible. (Mechanical isolation may also be required.)

- Electrical termination must be made in a NEMA 4 (or better) enclosure. Care must be taken to prevent migration of fluids into the cable jacket.

- Unless otherwise specified, the unit's electronics should not be exposed to temperatures above 260° F.

4.0 OPERATION

When the unit is properly wired, powered and mounted it is ready for operation. (PCB offers various power supply solutions, consult factory or local representative for specifics.)

5.0 POLARITY

All units are designed to provide an increasing output with increasing pressure.

6.0 CALIBRATION

Each unit is provided with a calibration certificate. Calibration is verified via a 2-point calibration for an 0.5% accuracy and an 11- point calibration for 0.25% and 0.1% accuracies. If required, the internal or external shunt value will be recorded at 95% Full Scale Output (±1% Full Scale Output). Consult factory for other calibration or recalibration services.

7.0 MAINTENANCE

All PCB Pressure Transducers and Transmitters are engineered to be maintenance free to provide years of trouble free service.

The pressure cavity may be cleaned with cotton swabs and mild solvents. (No metallic objects or high-pressure sprays.)

Model Number	PRESSURE TRANSDUCER	Revision: A
1502A02FJ1KPSIS		ECN #: 21990

	ENGLISH	SI	
Performance			
Measurement Range	0 to 1000 psi s	0 to 1000 psi s	
Output	0-10 VDC	0-10 VDC	
Accuracy	≤ 0.5 % FS	≤ 0.5 % FS	[2]
Drift	≤ 0.2 % FS / Year	≤ 0.2 % FS / Year	
Sensitivity (± 2 %)	10 mV/psi	10 mV/psi	
Full Scale Output Tolerance	± 1.0 % FS	± 1.0 % FS	
Zero Output Tolerance	± 1.0 % FS	± 1.0 % FS	
Resolution	≤ 0.01 % FS	≤ 0.01 % FS	
Response Time	≤ 1 mS	≤ 1 mS	
Environmental			
Proof Pressure	4 x FS	4 x FS	
Burst Pressure	>20 x FS	>20 x FS	
Temperature Range (Operating)	-40 to +260 °F	-40 to +125 °C	
Temperature Range (Compensated)	-5 to +180 °F	-20 to +80 °C	
Thermal Error (Operating Temp. Range)	≤ 2.0 % FS	≤ 2.0 % FS	
Thermal Error (Compensated Temp. Range)	≤ 1.5 % FS	≤ 1.5 % FS	
Acceleration Sensitivity (Maximum) (any direction)	± 0.03 %FS/g	± 0.3 % FS / (m/s^2)	
Mechanical Shock Survivability Rating	IEC 60068-2-32-1	IEC 60068-2-32-1	
Vibration Survivability (5 to 2000 Hz)	35 g pk	35 g pk	
Enclosure Rating	Welded Hermetic	Welded Hermetic	
Fatigue Life	>10^8 FS cycles	>10^8 FS cycles	
Electrical			
Supply Voltage	6.5 to 30 VDC	6.5 to 30 VDC	[1]
Supply Voltage Sensitivity	≤ 0.01 % FS / VDC	≤ 0.01 % FS / VDC	
Load Resistance (Minimum)	2.5 kohm	2.5 kohm	
Current Consumption	6 mA	6 mA	
Output Impedance	<1000 ohm	<1000 ohm	
Physical			
Pressure Port	1/4-18 NPT	1/4-18 NPT	
Thread	External	External	
Dead Volume	0.09 in^3	1480 mm^3	
Wetted Parts Material	17-4 PH Stainless Steel	17-4 PH Stainless Steel	
Housing Material	316/316L Stainless Steel	316/316L Stainless Steel	
Electrical Connector	3-Pin MIL-C-5015	3-Pin MIL-C-5015	
Electrical Connections (Pin A)	Pos (+) Power	Pos (+) Power	
Electrical Connections (Pin B)	Common	Common	
Electrical Connections (Pin C)	Pos (+) Output	Pos (+) Output	
Electrical Connections (Case)	Earth Ground	Earth Ground	
Weight	5.0 oz	143 gm	

CE [3]

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] When operating the sensor in ambient conditions > 212 °F (> 100 °C), the Supply Voltage must not exceed 24 VDC.
[2] Combined least squares linearity, hysteresis and repeatability.
[3] See PCB Declaration of Conformance PS042 for details.

Entered: BLS	Engineer: KLG	Sales: DPC	Approved: RF	Spec Number:
Date: 5-9-05	Date: 5-11-05	Date: 5/23/05	Date: 5/27/05	15825

PCB PIEZOTRONICS
PRESSURE DIVISION
3425 Walden Avenue, Depew, NY 14043

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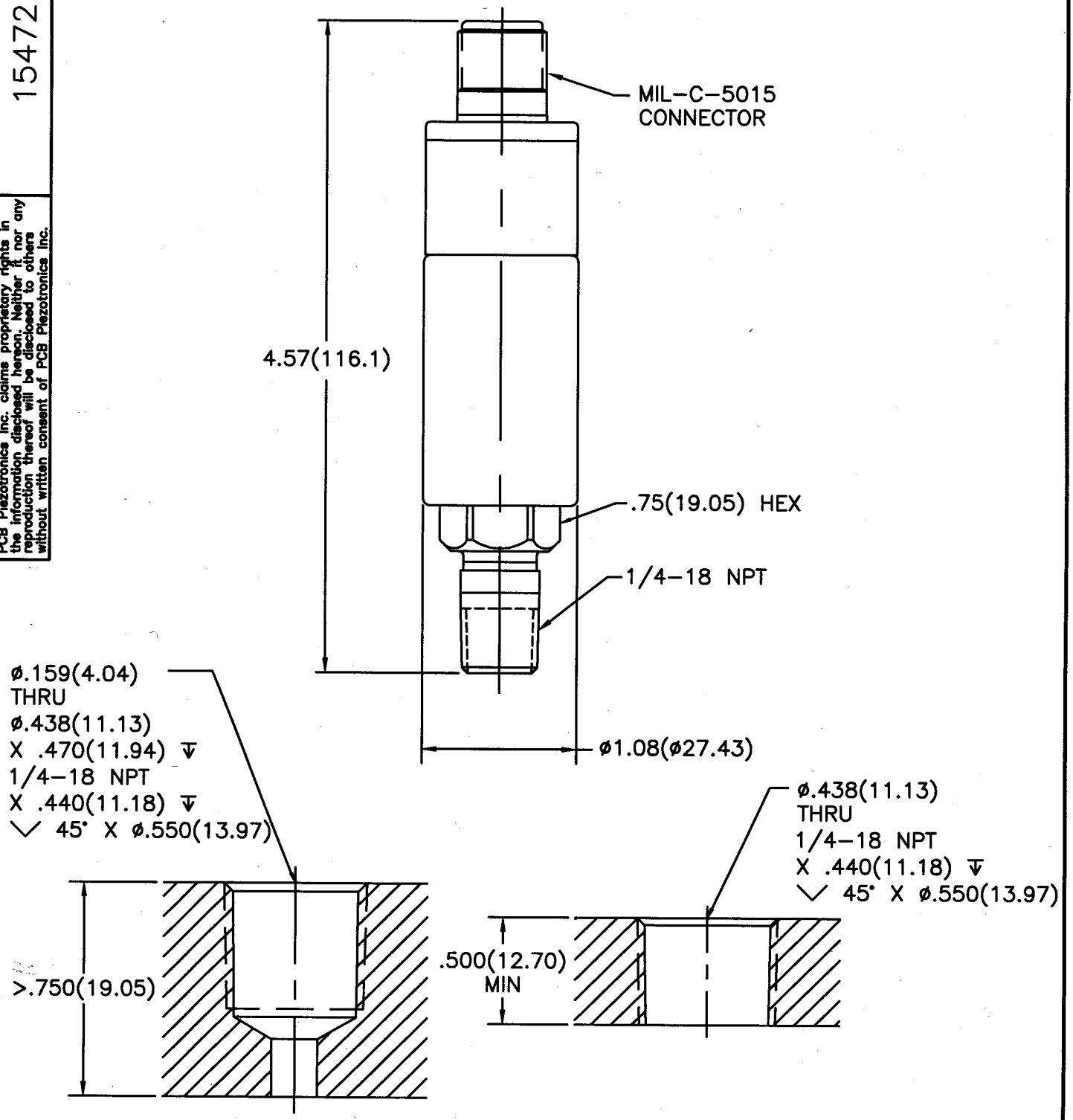
15472

APPLICATION		
NEXT ASS'Y	USED ON	VAR

REVISIONS				
REV	DESCRIPTION	ECN	DATE	APP'D
B	REMOVE 2-PIN NOTE	19645	4/8/04	DM 4/8/04



UNLESS SPECIFIED TOLERANCES	
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
FILLETS AND RADII .003 - .005	FILLETS AND RADII [0.07 - 0.13]
DD011 REV. C 01/21/03	

DRAWN	ECB	4/8/04	MFG	SP	4/13/04
CHK'D	DM	4/13/04	ENGR	KLG	4/8/04
APP'D	MEM	4/14/04	SALES	JMM	4/13/04

TITLE: INSTALLATION DRAWING
MODEL 150XX02MIL-C-5015
DC PRESSURE SENSOR

PCB PIEZOTRONICS
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CODE IDENT. NO.	DWG. NO.
52681	15472

SCALE: FULL | SHEET 1 OF 1