Model 483A

Multi-Channel Rack Power Unit

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
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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:

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DOCUMENT NUMBER: 21354
DOCUMENT REVISION: B
ECN: 17900

PCB PIEZOTRONICS

MODEL 483A AND 483A02 12 and 6 CHANNEL RACK MOUNT ICP POWER UNITS OPERATING GUIDE

REVISIONS

1.0 INTRODUCTION

The Models 483A and 483A02 are AC or DC driven power units and are 12 and 6 channels, respectively, for multiple operations.

In addition to providing constant current excitation to ICP transducers with built-in amplifiers or in-line amplifiers, these units decouple the signal from the DC bias voltage and provide for fault monitoring of each channel. The constant current to the transducer(s) can be varied from 2 to 20 mA.

2.0 DESCRIPTION

A well-regulated 24 VDC power supply provides constant current for up to 12 individual channels.

The rear panel of both units contains BNC jacks for both "input" and "output" connections. The "output" connection for each channel is also brought out at the front panel for convenience in signal monitoring. The rear panel also contains a dual banana jack for external DC power input. This jack can be used for battery operation if the line power supply fails, or for remote field testing.

The signal from the transducer is decoupled from the 9 to 14 VDC bias voltage by a 10uF coupling capacitor provided for each channel.

The bias monitor consists of a color coded front panel voltmeter and a 12 or 6 (Model 483A or 483A02) position selector switch to monitor the bias voltage for each individual channel.

3.0 INSTALLATION

Models 483A and 483A02 are identical in physical size and mount in a standard 19 inch equipment rack. See installation drawing in this manual for specific dimensions.

Heat dissipation vents are not necessary for these units. The power transistor is mounted in a heat sink on the inside rear of the package. The rear panel contains connectors and fuse receptacle.

Four #10 screws hold the unit to the equipment rack.

4.0 OPERATION STANDARD AC LINE

Plug 3-wire line cord into a source of 120V 60Hz power and switch power to "ON-AC". A pilot light above the switch will indicate system is energized.

With no load on the unit (transducer unconnected) the front panel bias monitor meter (Figure 1) will indicate full scale (yellow) or open circuit supply voltage.

RED-SHORT IN CABLE CONNECTOR OR AMP.

YELLOW-OPEN CIRCUIT IN CABLE CONNECTOR OR ICP AMP.

GREEN-NORMAL

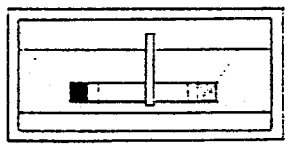

FIGURE 1 BIAS MONITOR METER

With an ICP transducer connected to the input jack of any channel, the voltage will drop to approximately 11 volts and the bias monitor meter will read in the mid-scale (green) or normal operation.

If the transducer or cable is open, the circuit will be open and the meter will indicate in the full scale (yellow) area.

4.0 OPERATION STANDARD AC LINE (con't)

If the cable or transducer is shorted, the meter will indicate zero volts (red).

Immediately after connecting readout equipment (oscilloscope, meter, recorder, etc.) to the output jack, the 10uF coupling capacitor will begin to charge through the input resistance of the readout instrument. This charging will cause an apparent drift in the output voltage until the capacitor is fully charged. A momentary short across the output may be used to charge the coupling capacitor immediately thereby preventing the output from drifting.

The small leakage through the 10uF coupling capacitor will normally result in a +30mV maximum offset with a 1 megohm readout load.

4.1 COUPLING TIME CONSTANT, AC COUPLED

The coupling time constant is the product of the coupling capacitor (10uF) and the input resistance of the readout instrument. (Figure 2).

TC (sec) = Cc (FARADS) x Rin (OHMS) (EQ 1)

Normally, it is desirable to keep the coupling time constant long with respect to the transducer discharge time constant to minimize the effect of the coupling TC on low frequency response.

Typical coupling time constants for various values of input resistance are:

Rin	TC
10 megohm	100 sec.
1 megohm	10 sec.
100k ohms	1.0 sec.
10k ohms	0.1 sec.
1k ohms	.01 sec.

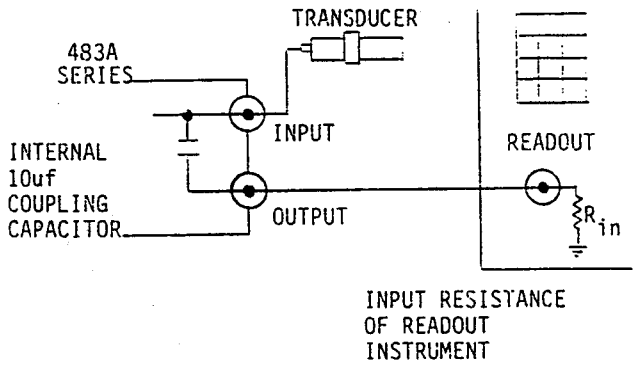

FIGURE 2 TYPICAL AC COUPLED CONNECTION

4.2 SETTING THE CONSTANT CURRENT

The 483A series power units are normally supplied with the constant current output to the transducer set at 4mA.

This current is adequate for most laboratory and field applications. Special situations such as driving extra long cables (more than 1000 ft.) with high frequency or fast rise time pulses, may require increasing the transducer drive current to 12mA or higher.

When driving[1] fast rise time pulses over long lines, system performance can be optimized by "tuning" the drive current to the line, i.e. by finding the best current setting for the particular set of physical parameters established by the transducer, line length, line termination, pulse rise time, etc.

To determine the optimal current setting, experiment with your particular test set-up. A good rule of thumb is to use the lowest current consistent with satisfactory results in order to minimize transducer heat and noise.

[1]When driving long lines (over 50 ft.), the systems' fidelity can be notably increased by employing the Model 073A impedance matching resistor module.

4.2 SETTING THE CONSTANT CURRENT (con't)

To set the constant current, remove the top cover of the unit and locate the current adjust pot as illustrated in Figure 3.

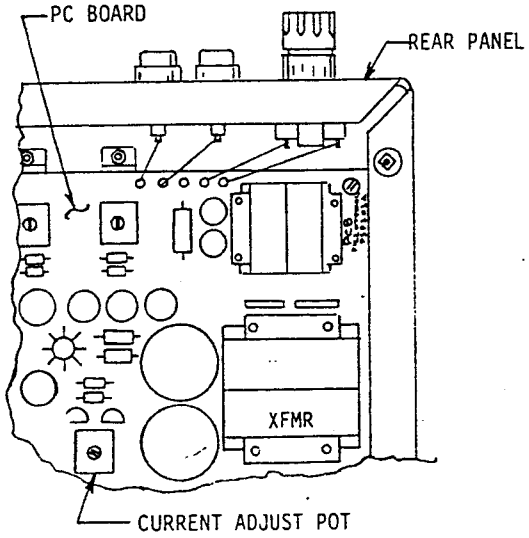

FIGURE 3 TOPVIEW, COVER REMOVED

Connect a 0-30mA meter as shown in Figure 4 (to any input jack) and read constant current directly. All channels on the 483A or 483A02 are set to the same current reading by this one adjust pot.

CAUTION: Take care not to exceed 20mA when adjusting the current to avoid damaging the transducer's microamplifier.

Also, use caution to avoid shorting components with metal screwdriver blades.

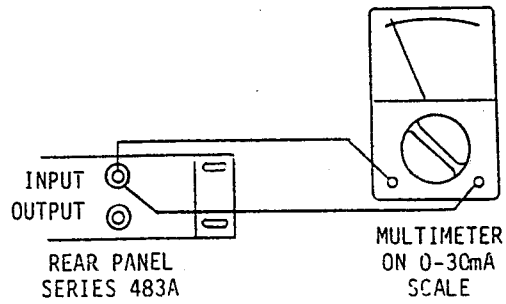

FIGURE 4 CONNECTIONS TO MULTIMETER

4.3 ALTERNATE CONNECTION FOR BEST LOW FREQUENCY RESPONSE

With the 483A connected to a readout instrument as shown in Figure 2, the low frequency response of the coupling circuit is determined by the relationship.

$$-3db\ FREQ.\ fo = \frac{.16}{(Rin)\ (10uF)}\ Hz \qquad (EQ\ 2)$$

This is the frequency at which the coupling circuit will be -3db down.

As stated previously in EQ 1:
TC = (Rin) (10uF) seconds

Frequently the coupling time constant may be too short for any practical low frequency response particularly during calibration.

To take advantage of the transducer discharge time constant, an alternate connection can be used provided the readout device can accept the +11 VDC offset.

With the system wired as shown in Figure 5, using a Model 070A01 "T" connector, the readout instrument is direct coupled to the transducer but the +11 volt bias level must be zeroed out by the readout device. The system time constant is now equal to the transducer time constant.

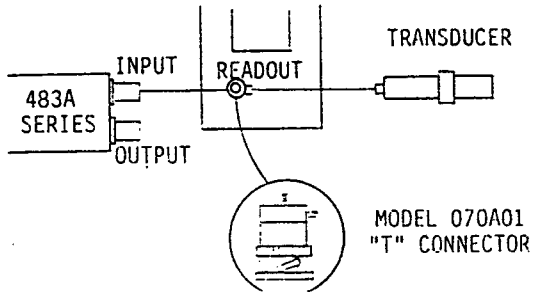

FIGURE 5 DIRECT COUPLED CONNECTION

4.4 BATTERY OPERATION

To operate the 483A Series Power Units from batteries, place power switch in "EXT-DC" position and connect an 18 to 24V battery at the rear panel banana jack labeled "EXT-DC". A diode is built-in to protect against reverse polarity damage.

4.5 220 VAC OPERATION

To convert from 110V to 220VAC operation, remove top cover of unit. Insert jumper wires in receptacles as shown in installation drawing. Insert line plug in 220VAC outlet.

5.0 MAINTENANCE AND REPAIR

It is not recommended that the customer attempt repair of the Models 483A or 483A02 in the field.

Should trouble occur, the factory should be contacted for assistance.

If the unit must be returned to the factory for servicing, attach a tag or include a brief note describing the nature of the problem.

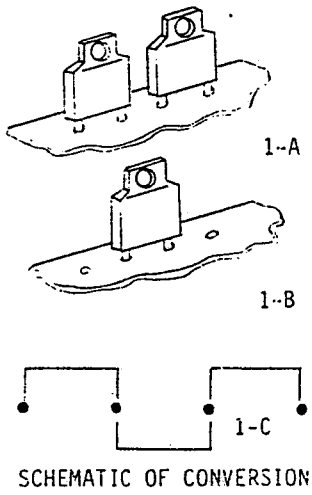

FIGURE 6 CONVERTING TO 230V OPERATION

MANUAL NUMBER: 19979
MANUAL REVISION: NR

Model Number	MULTI-CHANNEL RACK POWER UNIT	Revision: E
483A		ECN #: 40512

Performance	**ENGLISH**	**SI**	
Channels	12	12	
Sensor Input Type(s)	ICP®	ICP®	
Voltage Gain(± 1 %)	1:1	1:1	
Low Frequency Response(-5 %)	≤ 0.05 Hz	≤ 0.05 Hz	[4]
High Frequency Response(-5 %)	>1000 kHz	>1000 kHz	
Environmental			
Temperature Range(Operating)	+30 to +130 °F	-1.1 to +54.4 °C	
Electrical			
Power Required	105 to 125 VAC/50 to 400Hz/0.25A	105 to 125 VAC/50 to 400Hz/0.25A	
Power Required(Alternate)	+24VDC/260Ma	+24VDC/260Ma	
Excitation Voltage(To Sensor)	24 VDC	24 VDC	[1]
DC Offset(with 1 M load at output)	<30 mV	<30 mV	
Constant Current Excitation(To Sensor)(To Sensor)	2 to 20 mA	2 to 20 mA	[2]
Broadband Electrical Noise(1 to 10,000 Hz)	4.5 µV/rms	4.5 µV/rms	[3]
Spectral Noise(1 Hz)	0.22 µV/√Hz	0.22 µV/√Hz	[3]
Spectral Noise(10 Hz)	0.07 µV/√Hz	0.07 µV/√Hz	[3]
Spectral Noise(100 Hz)	0.04 µV/√Hz	0.04 µV/√Hz	[3]
Spectral Noise(1 kHz)	0.04 µV/√Hz	0.04 µV/√Hz	[3]
Spectral Noise(10 kHz)	0.03 µV/√Hz	0.03 µV/√Hz	[3]
Physical			
Electrical Connector(ICP□® Sensor Input - rear)	BNC Isolated jack	BNC Isolated jack	
Electrical Connector(Output rear)	BNC Isolated jack	BNC Isolated jack	
Electrical Connector(Output front)	BNC Isolated jack	BNC Isolated jack	
Electrical Connector(VDC Power In)	Banana Jack	Banana Jack	
Size (Height x Width x Depth)	1.75 in x 19.0 in x 7.0 in	44.5 mm x 482.6 mm x 178.0 mm	
Weight	4.5 lb	2.0 Kg	

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 Group, 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.

F - 230 VAC operation [5]

NOTES:

[1] To adjustable current source for the ICP transducer or in-line amplifier.
[2] Units supplied with current set at 4 mA unless otherwise specified.
[3] Typical.
[4] Assuming >250KOhm input impedance of readout device. Output coupled through 47MF series capacitor. Low frequency response is determined by input impedance of readout device and output coupling capacitor.
[5] Unit set to 230 VAC when ordered as model F483A.

SUPPLIED ACCESSORIES:

Model 017AXX Power Cord (1)

Entered: AP	Engineer: AK	Sales: JJM	Approved: JWH	Spec Number:
Date: 2/5/2013	Date: 2/5/2013	Date: 2/5/2013	Date: 2/5/2013	**483-1010-80**

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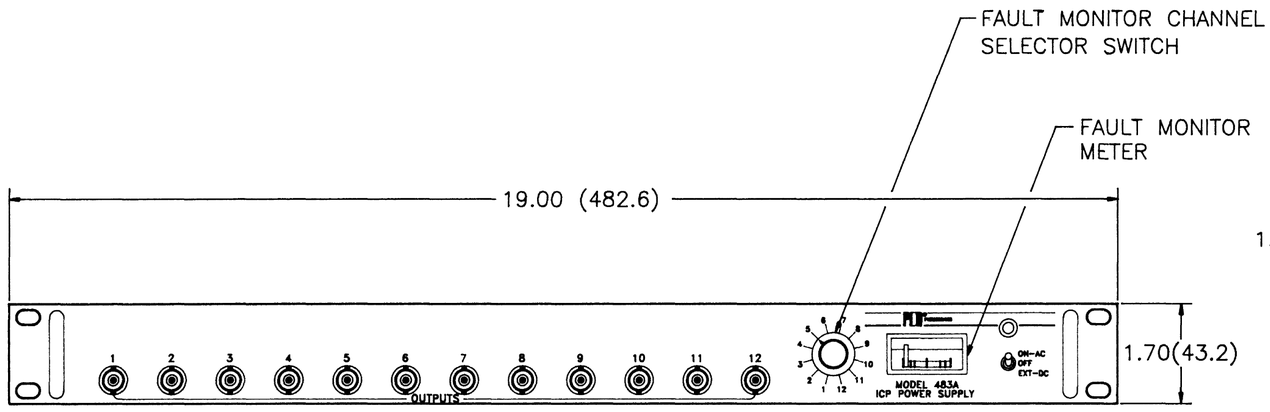
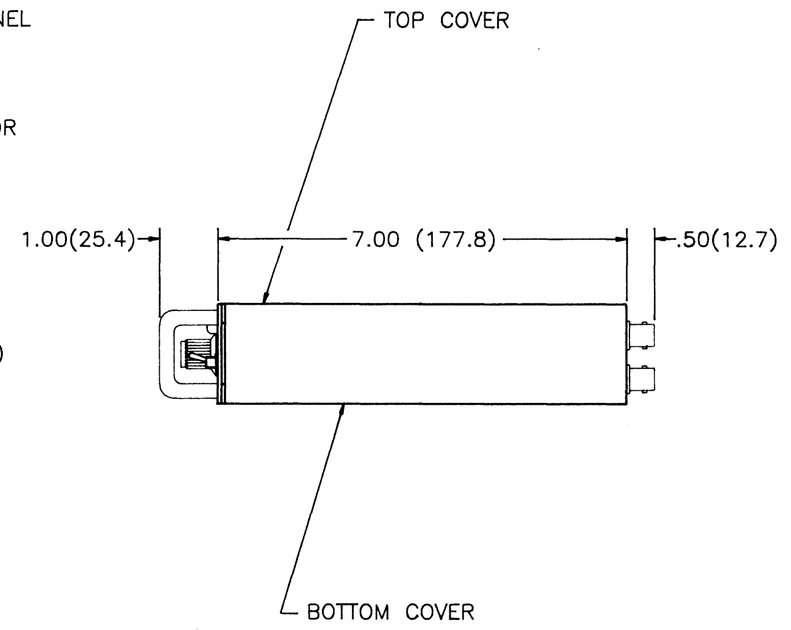
E-Mail: info@pcb.com

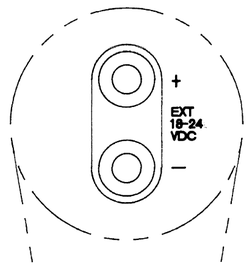
APPLICATION		
NEXT ASS'Y	USED ON	VAR

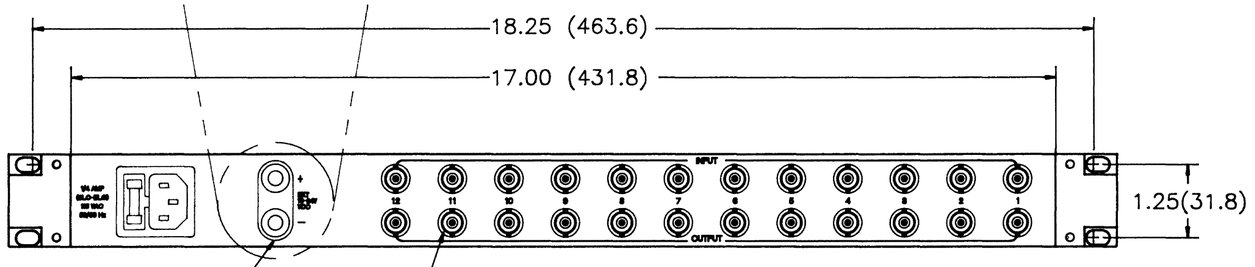
REVISIONS					
ZONE	REV	DESCRIPTION	ECN	DATE	APP'D
	E	REVISED AND REDRAWN ON CAD	5410	4/17/95	KEN L.
	F	REVISED PER ECN	5721	5/8/95	5/9/95

483-1010-90





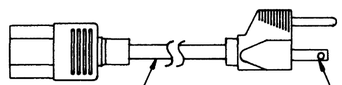




REAR VIEW

EXTERNAL D.C.
POWER INPUT
DUAL BANANA JACK

BNC JACK (TYP)



8 FT LINE CORD
(DETACHABLE)
MOD 017XXX

3 WIRE AC PLUG

UNLESS SPECIFIED TOLERANCES	
DIMENSIONS IN INCHES DECIMALS XX ±.01 XXX ±.005 ANGLES ±2 DEGREES	DIMENSIONS IN MILLIMETERS (IN PARENTHESIS) DECIMALS XX ±0.3 XXX ±0.13 ANGLES ±2 DEGREES
FILLETS AND RADII .003 – .005	FILLETS AND RADII (0.07 – 0.13)
DD013 REV. NR 10/25/94	

DRAWN	JL	5/8/95	MFG		
CHK'D	JM	5/8/95	ENGR		
APP'D		5/9/95			

TITLE: INSTALLATION DRAWING
MODEL 483A01
12 CHANNEL RACK POWER UNIT

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3425 WALDEN AVE. DEPEW, NEW YORK 14043
PHONE: (716) 684-0001

CODE IDENT. NO. 52681

DWG. NO. 483-1010-90

SCALE: 1=2

SHEET 1 OF 1