

PROFORCE

Installation Manual

**PIEZO I/O MODULE
FOR METAL STAMPING PRESSES
& other Dynamically Loaded Machinery**

MADE IN USA



IMCO.US
www.imco.us

TABLE OF CONTENTS

TABLE OF CONTENTS

INTRODUCTION

OVERVIEW

SECTION I

TRANSDUCER BRACKET DRAWING

Page 1—Transducer Bracket Template with Mounting Dimensions

Page 2—Piezo Transducer Drawing with Dimensions

Page 3—Piezo Transducer with Cable Clamp on Press Frame

SECTION II

PEZOELECTRIC TRANSDUCER INSTALLATION

Page 1—Piezo Transducer Mounting Instructions

Page 2—Drawing for OBI, GAP, C-Frame & Press Brake

Page 3—Drawing Straight Side Press, Column Mounting 112G

Page 4—Drawing Straight Side Press, Pitman Mounting 112

Page 5—Drawing of Pitman Mounting Locations

SECTION III

TERMINAL BLOCK WIRING DISCRIPTIONS

Page 1—Terminal Block Points 1 - 4

POINT 1 - *+24 Volt D.C.*

POINT 2 - *Grd. Input*

POINT 3 - *Grd. Output*

POINT 4 - *Analog Signature Output*

Page 2—Terminal Block Points 5 - 9 TRANSDUCER INPUTS

Page 3—Piezoelectric Transducer Descriptions

Page 4—Terminal Block Points 10 - 12 CALIBRATING CAPACITORS

Page 5—Terminal Block Points 13 - 16

POINT 13 - *Grd. (output to IMCO "Read Me" device)*

POINT 14 - *Peak Output*

POINT 15 - *+24 Volts (output to IMCO "Read Me" device)*

POINT 16 - *Cal (Calibrate)*

Page 6—Terminal Block Points 17 - 19

POINT 17 - *Trim Ref (Trim Reference)*

POINT 18 - *Peak Reset*

POINT 19 - *Display Reset*

SECTION IV

CONNECTING PROFORCE I/O MODULE TO PLC

Page 1—Determining Cable Length, Minimizing Electrical Noise Interference, Preparing The Cable

Page 2—Preparing The Cable, continued

Page 3—Wiring the Cable and Connecting to Proforce I/O Module, Minimizing Ground Loops

SECTION V

BLANKING/FORMING SWITCH

Mode of Operation - Set Position of Switch To Blanking or Forming

PROFORCE PIEZO I/O MODULE

Our new, low cost small size (100mm x 80mm x 25mm) Proforce Piezo I/O Module with Peak Indicating is D-Rail mounted and work in conjunction with any manufactures PLC or Industrial PC. Proforce Piezo I/O Module is used for one (1) channel of Load Monitoring. They can work with any press tonnages or press speeds.

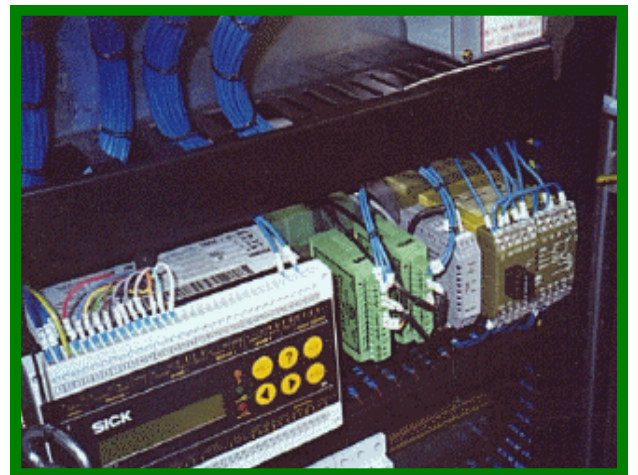
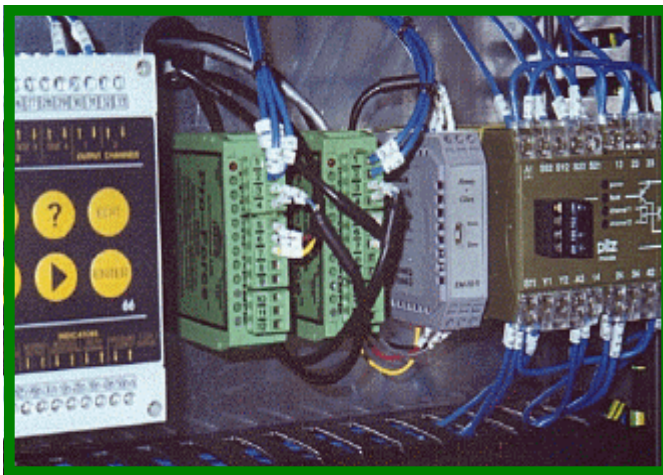
The Proforce Piezo I/O Module offers the ability to customize Load Monitoring requirements by adapting customized software programs. They can program load trip point for both Press and Dies. Hidden menus are easily created to monitor press overload and die overloads for warranty purposes or other information that may be required.

The Analog of the Proforce Piezo I/O Module feeds directly into the PLC or Industrial PC A to D Converter Board. The output signal is 0 - 10 Volts. - 24 Volt input.

All types of IMCO's Piezoelectric Transducers are used with the Proforce Piezo I/O Module. Column mounted, Pitman mounted and "Satellite" In-Die Transducers offer suitable mounting choices for the Proforce Piezo I/O Module.

FEATURES

- COMPATIBLE WITH ANY MANUFACTURES PLC OR PC
- SIMULTANEOUSLY READS BOTH THE ANALOG TRACKING AND PEAK HIGH
- EACH MODULE OPERATES INDEPENDENTLY OF OTHER CHANNELS 0 - 10 VOLTS
- IMCO'S "ROCK SOLID " TECHNOLOGY FOR TEMPERATURE AND NOISE STABILITY
- D- RAIL MOUNTED
- CUSTOMIZE PRODUCTION REQUIREMENTS BY CREATING ANY LOAD MONITORING FEATURES
- SMALL - SLEEK - COMPACT DESIGN
- LOW COST - THROW AWAY CONCEPT
- FUNCTIONAL WITH ALL TYPES OF IMCO PIEZOELECTRIC TRANSDUCERS
- CAM SELECT MODULE FOR DOUBLE ACTION PRESS - TURNS PIEZOELECTRIC TRANSDUCERS ON AND OFF - optional



IMCO.US

Sales Office
Manufacturing

1190 Harrison Rd., #4, Santa Fe, NM 87507
245 East Laraway Rd., Frankfort, IL 60423

Ph: 505-438-4344

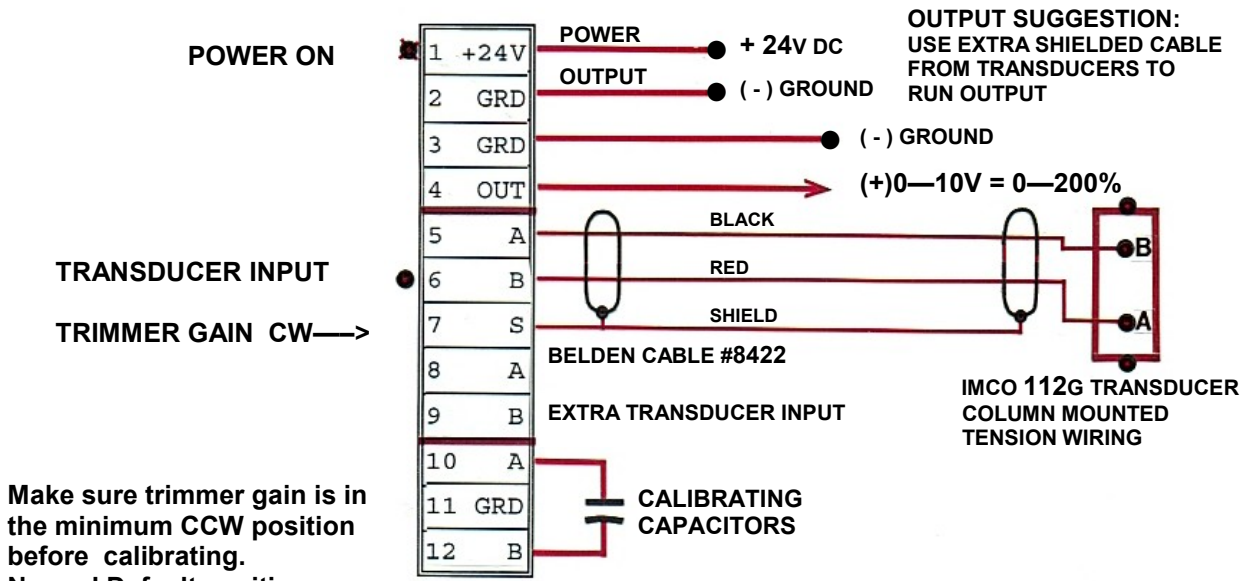
Fax: 505-438-4364

E-Mail: imco@imco.us

PROFORCE PIEZO ANALOG-DIGITAL I/O MODULE OVERVIEW

Terminal Block Description
Points 13—19
(see separate sheets)

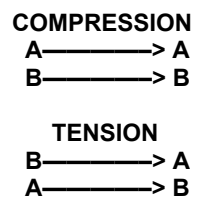
| | | | | | | | | | | | | | | | | | |
|-----|----|------|----|--------|----|-----|----|------|----|------|----|------|----|-------|---------|-------|----|
| GRD | 13 | PEAK | 14 | OUTPUT | 15 | CAL | 16 | TRIM | 17 | REF. | 18 | PEAK | 18 | RESET | DISPLAY | RESET | 19 |
|-----|----|------|----|--------|----|-----|----|------|----|------|----|------|----|-------|---------|-------|----|



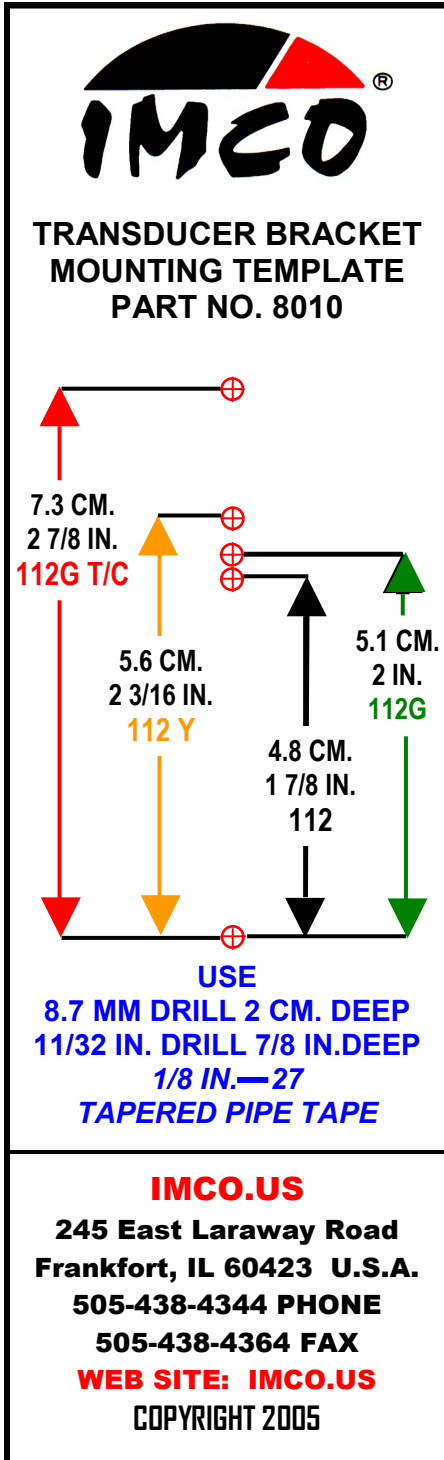
Make sure trimmer gain is in the minimum CCW position before calibrating. Normal Default position use calibrating capacitors to set calibration reading just below desired reading, then use trimmer gain to increase (INC.) signal for fine tuning.

CW CLOCKWISE
CCW COUNTERCLOCKWISE

**PIEZOELECTRIC TRANSDUCERS
TERMINAL BLOCK WIRING**



TRANSDUCER BRACKET MOUNTING



Stick-on templates are supplied with all Proforce Piezo I/O Modules. Determine the mounting bracket locations based on the type of piezoelectric transducers to be used and the optimum output mounting location for piezoelectric transducers to be used. Attach template to the chosen location. Drill and tap the two appropriate holes using the self-adhesive bracket mounting template (see [Template No. 8010](#)) to determine correct hole spacing. Make sure that in drilling the holes, the piezoelectric transducers will remain parallel to the mounting surface (Example: column or pitman's). Use regular capacity 3/8 inch or 1/2 inch power drill; we suggest, if possible, a carbide tipped drill bit, because the outer skin surface of the machine has a tendency to be tempered hardened. Use a 1/8 IN.—27 Inch tapered (conical) pipe tape.

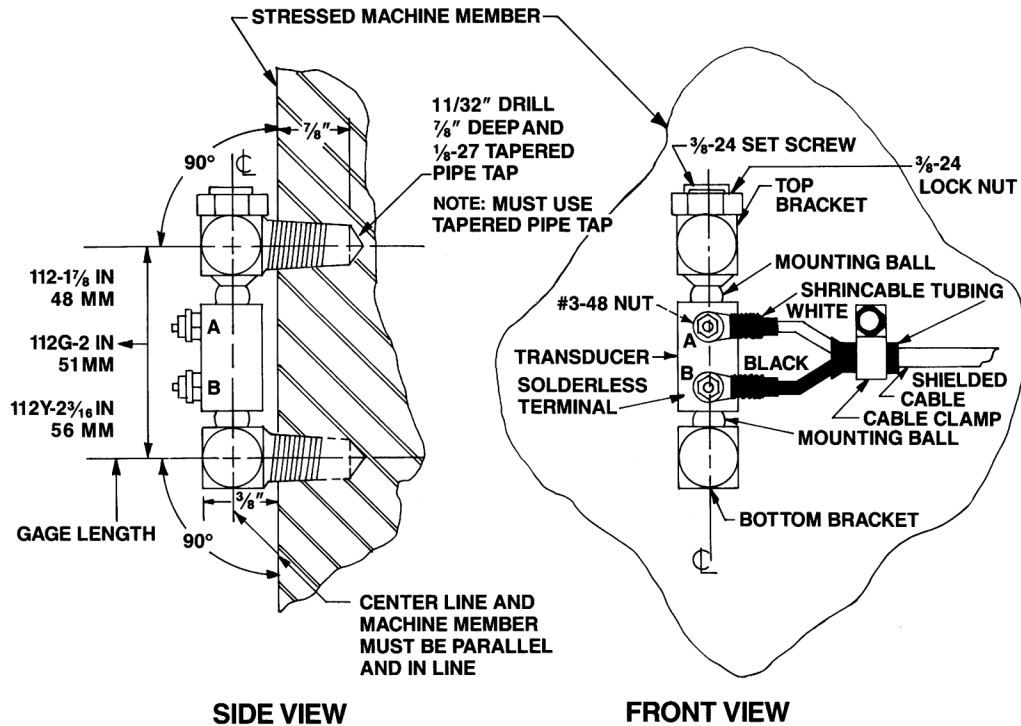
IMPORTANT:
DO NOT SUBSTITIUTE A NON TAPERED TAPE

After drilling and tapping the holes, apply a light oil or grease for lubrication and insert both top and bottom brackets; top brackets have the lock nuts and should be mounted on top. Jam brackets into frame with open end wrench so as to get square part of bracket body as close as possible to column or frame of Press. **Do not remove the top bracket set screw when jamming into press frame.** Make sure brackets are tight. Lock nuts should be “kissing” the frame or column.

NOTE:
Piezoelectric transducers are measuring micro strain in frame of Press. Brackets should be tightened into Press frame as close as possible to assure maximum piezoelectric transducer signal.

TORQUE TRANSDUCERS
IN BRACKETS TO 15 INCH LBS.

TRANSDUCER BRACKET MOUNTING

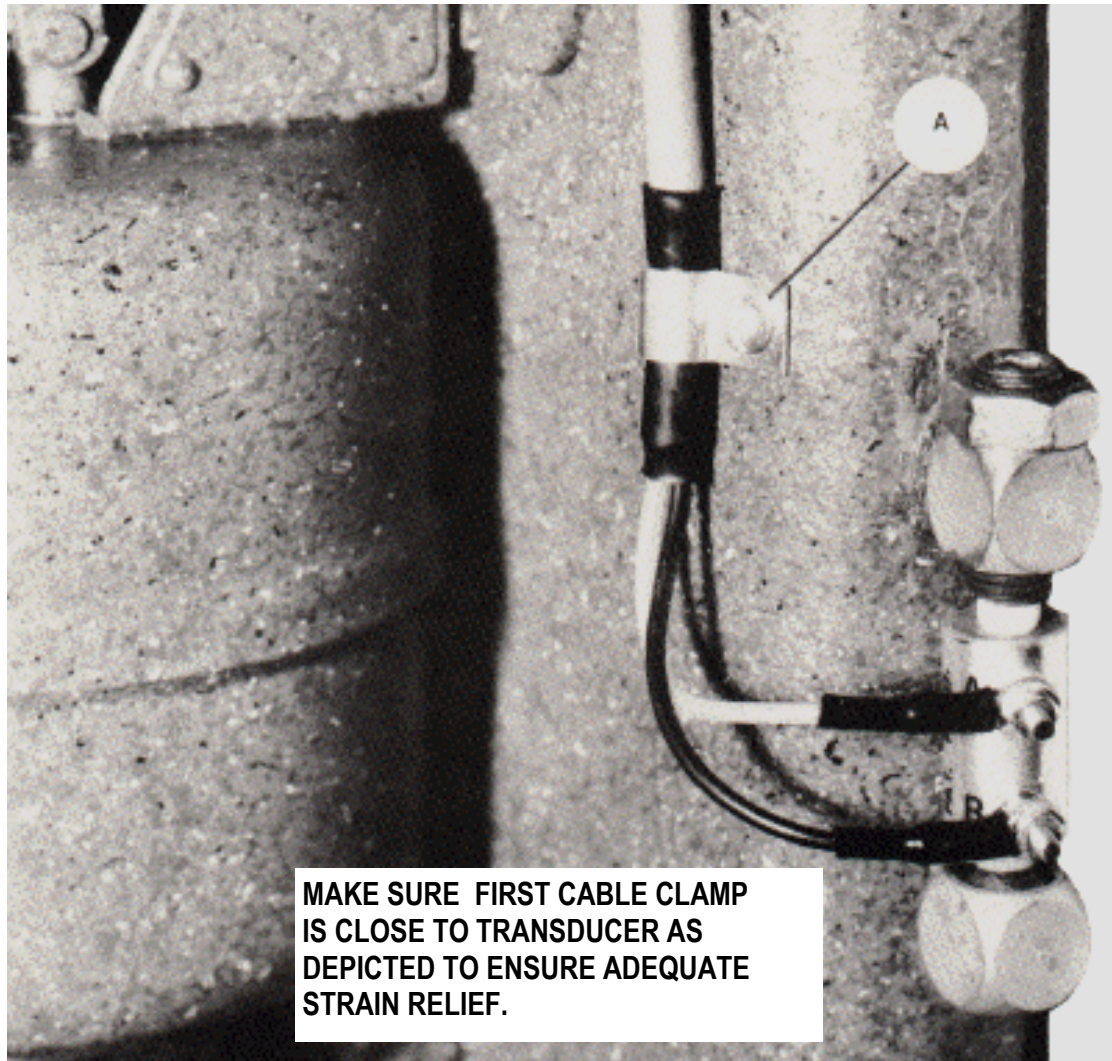


The IMCO Load Monitor and piezoelectric transducers are ruggedly built to withstand normal industrial environment conditions and require minimal maintenance. However, each system can benefit from careful use and maintenance. It is recommended that the following procedure be carried out at a minimum frequency of every three months.

TRANSDUCERS

Each piezoelectric transducer is factory pre-wired and terminal connections sealed. A visual inspection of seal and connections is all that is required. Torque piezoelectric transducers to 15 inch/lbs. at time of installation or before calibration. They should not come loose even when located on a moving connection and subjected to heavy shock. You can torque again to 15 inch/lbs., if any piezoelectric transducers screw becomes loose and the original calibration is maintained. Check to see that top locknut remains securely fastened. If loose, tighten with regular wrench. A small drop of LockTite or similar fluid should avoid future loosening of locknut.

TRANSDUCER CABLE MOUNTING



TRANSDUCER CABLES

Check to see if cables are in good condition and covering remains pliable. Cracked or damaged cable can cause erratic or lack of signal from piezoelectric transducers. Activation of each piezoelectric transducer is easily checked on press by sharply squeezing top and bottom piezoelectric transducer bracket. Hold sections between thumb and forefinger simulating a quick pressure on the piezoelectric transducer as when the press member is dynamically loaded. Appropriate meter needle (digital display) should indicate a response.

SECTION II
Page 2

OBI - GAP - C-FRAME
PRESS BRAKE

Column Mounting
112G Piezoelectric Transducer

IMCO piezoelectric transducers are normally placed, one at the back of each frame (see [Figure No. 1](#)) for simplicity of mounting. Each IMCO piezoelectric transducer is located between mounting brackets positioned approximately on a center line between the top and bottom of the gap, excluding any bolster plates. This location permits individual readout of peak load on each frame.

If for any reason the IMCO piezoelectric transducers cannot be located at the back of each frame, they can be placed on the pitman. Two IMCO piezoelectric transducers per pitman mounting connected in parallel will provide only a single channel of readout.

Note: Do not substitute or splice in an alternate type cable.
Use only Belden #1503A and #8451 for Column Mounting.

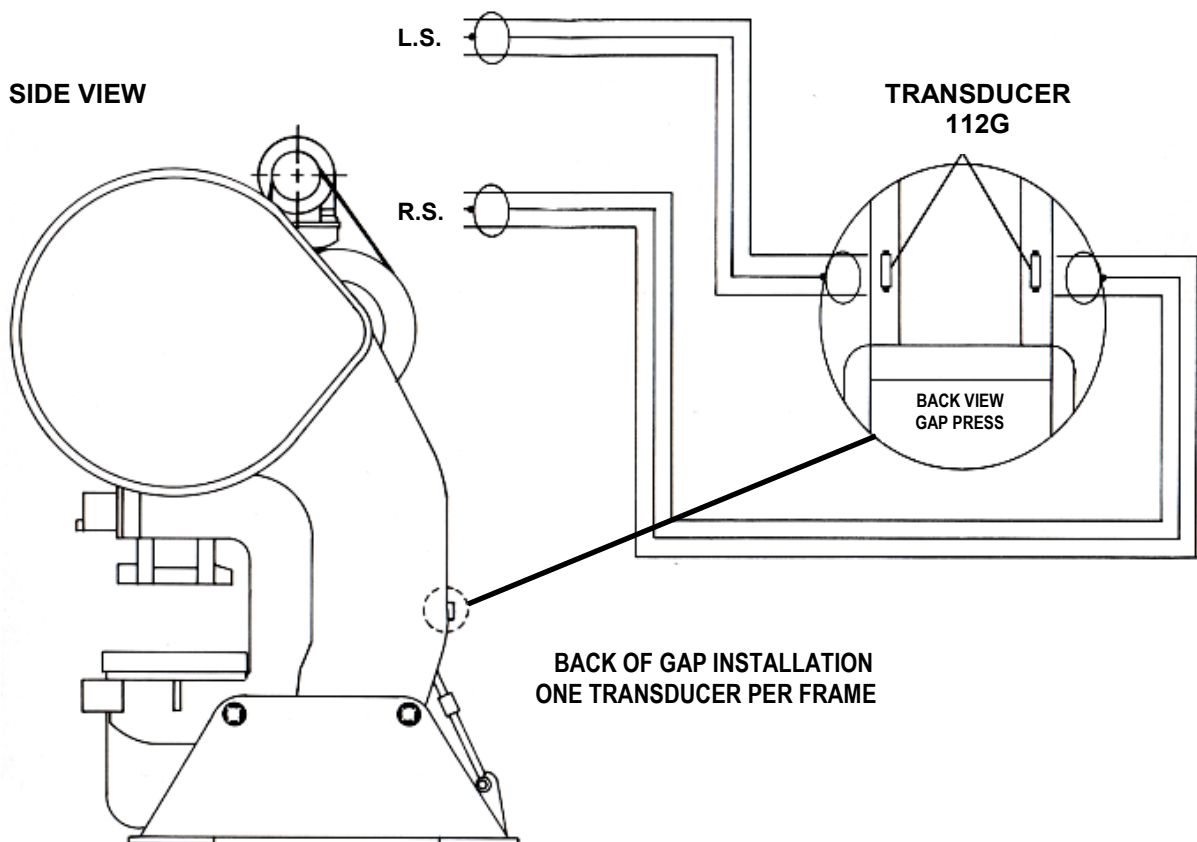


Figure No. 1

SECTION II

STRAIGHT SIDE PRESS Column Mounting 112G Piezoelectric Transducers

Location of IMCO piezoelectric transducers on straight side presses should be on the columns front and back, (not the sides) away from keyways. One IMCO piezoelectric transducer for each column should be mounted approximately on a center line between the top of the ram and the bottom of the bed, excluding any bolster plates, to assure continued optimum output and positive response. (see **Figure No. 2** and **Figure No. 3**).

**Note: Do not substitute or splice in an alternate type cable.
Use only Belden #1503A and #8451 for Column Mounting.**

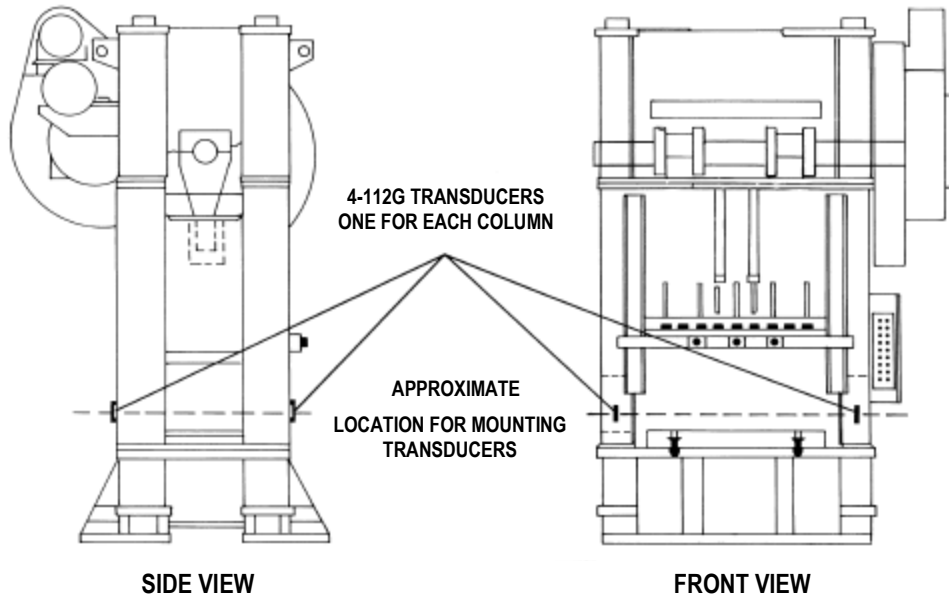


Figure No. 2

TOP VIEW - STRAIGHT SIDE PRESS

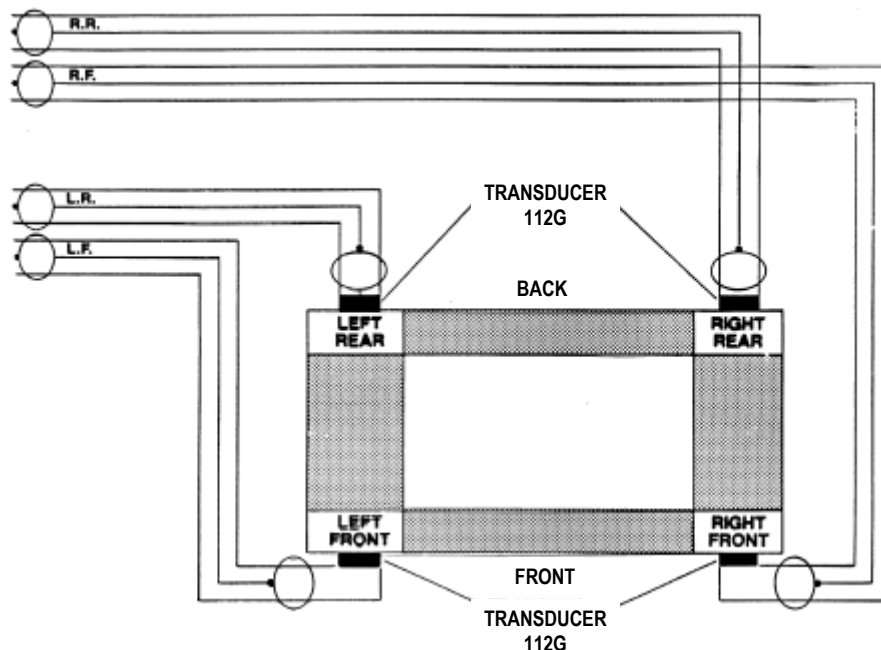


Figure No. 3

SECTION II

STRAIGHT SIDE PRESS

Page 4

Pitman Mounting

112 Piezoelectric Transducers

Attach two IMCO piezoelectric transducers on each pitman located 180 degrees from each other and as close to the directional axis of rotation as possible. Wiring will be in parallel. We do not advise pitman mounting if your pitman is split or it has an adjustment mechanism in the pitman. (see Figure No. 4, Figure No. 5, Figure No. 6 and Figure No. 7)

Note: Do not substitute or splice in an alternate type cable. Use only Belden #83319 for Pitman Mounting.

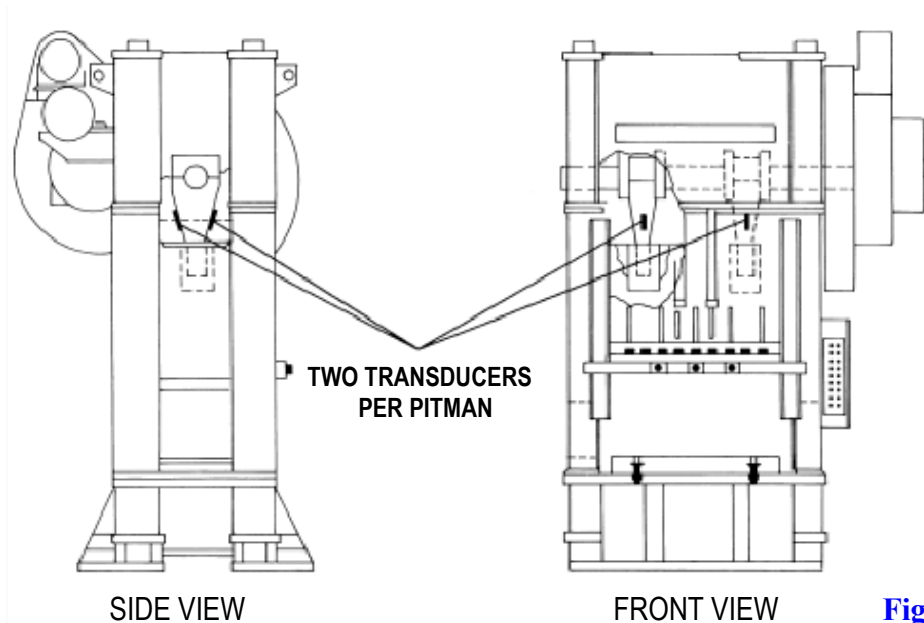
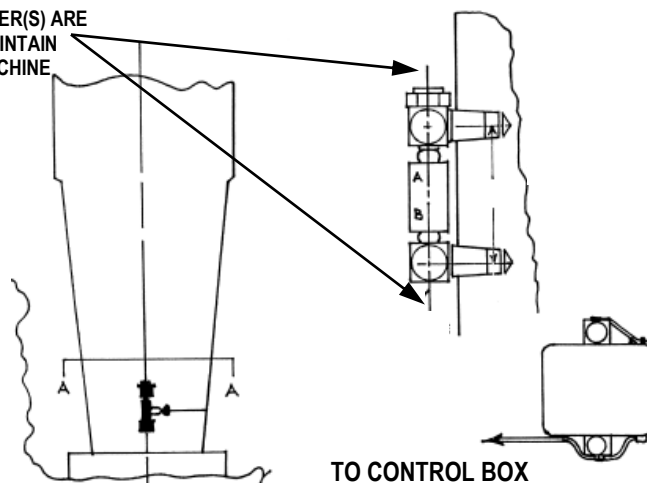


Figure No. 4

PITMAN VIEW

MAKE SURE TRANSDUCER(S) ARE MOUNTED SO AS TO MAINTAIN PARALLELISM WITH MACHINE MEMBER



FOR TRANSDUCER BRACKET SPACING REFER TO TEMPLATE PART NO. 8010

PRE-WIRED TRANSDUCERS ATTACH AS SHOWN

TO CONTROL BOX

NOTE: TWO (2) TRANSDUCERS ONLY PER PITMAN MAY BE ATTACHED IN LOCATIONS 1-1, 2-2, 3-3, OR 4-4 DEPENDENT ON MOUNTING CONVENIENCE.

SECTION Z - Z

Figure No. 5

STRAIGHT SIDE PRESS
Pitman Mounting
112 Piezoelectric Transducers

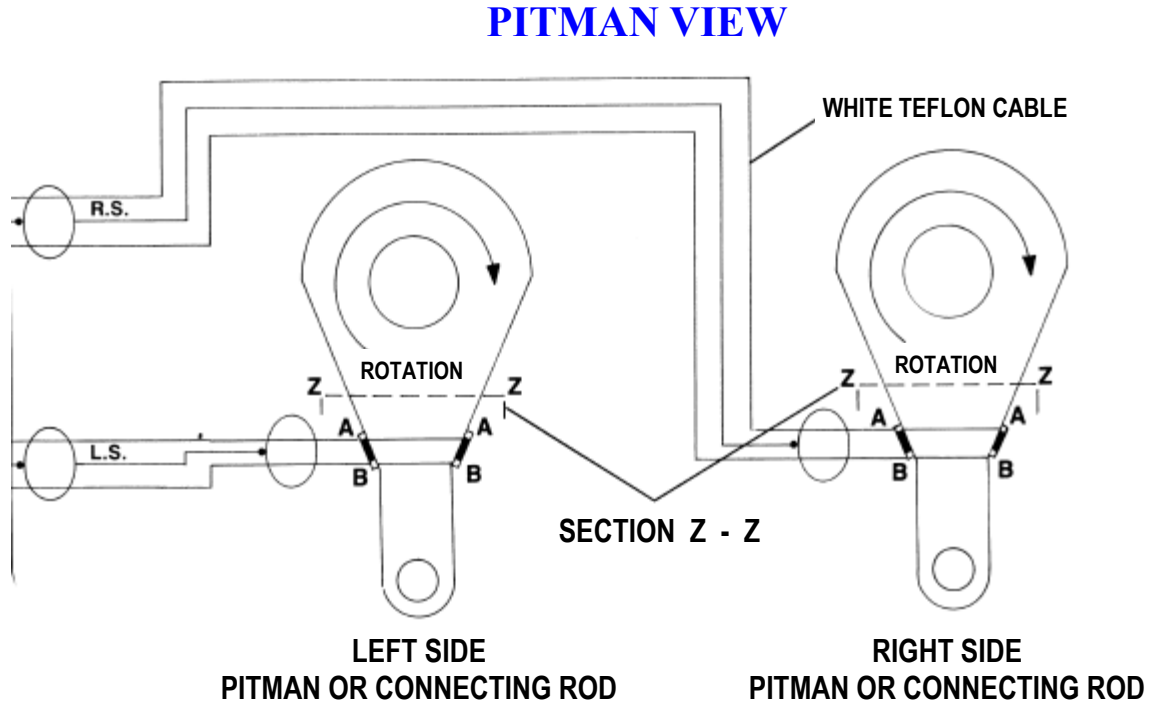


Figure No. 6

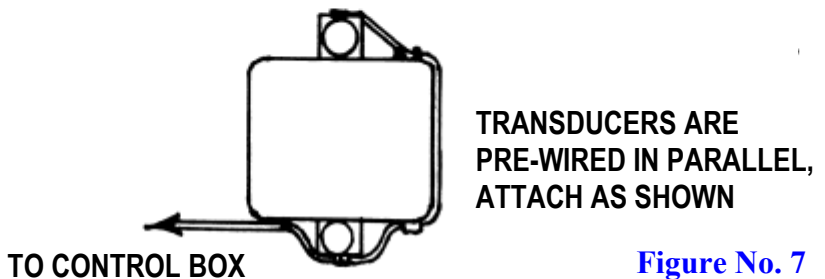
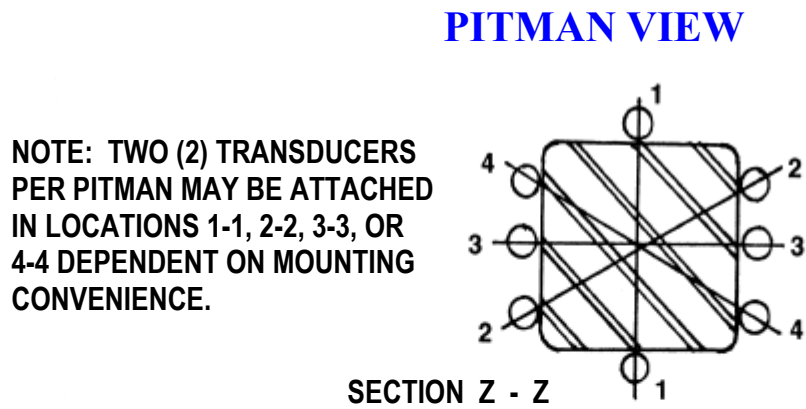


Figure No. 7

PROFORCE

PIEZO I/O MODULE

Terminal Block Points 1– 4



POINTS

Description

1 +24 V D.C.

Input from **+24 Volt D.C.** Power Supply

2 GRD. INPUT

Ground Input from (-) terminal of 24 Volt D.C. Power Supply.

3 GRD. OUTPUT

Ground Output used with Point 4 Analog Signature output.

4 ANALOG SIGNATURE OUTPUT

0 TO + - 10 VOLTS sometimes called Track Output 0 to 100% or 0 to 200% Operation (see Calibrate Point (PT.) 16 for explanation and example)

SECTION III

Page 2

PROFORCE Piezo I/O Module

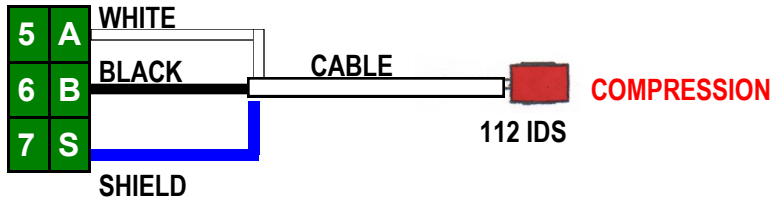
Terminal Block Points 5 - 9

| | | | | |
|---|---|---|---|---|
| 6 | 8 | 7 | 9 | 5 |
| B | A | S | B | A |

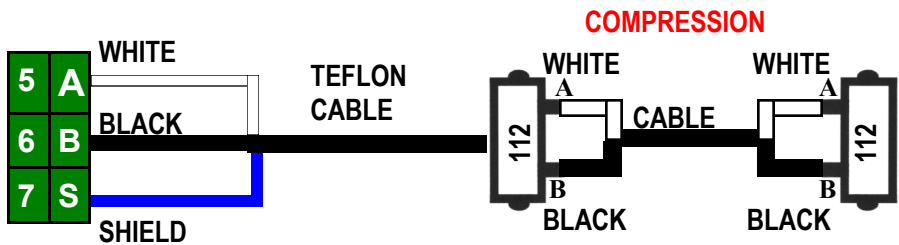
TRANSDUCER INPUT

TORQUE TRANSDUCERS IN BRACKETS TO 15 INCH LBS.

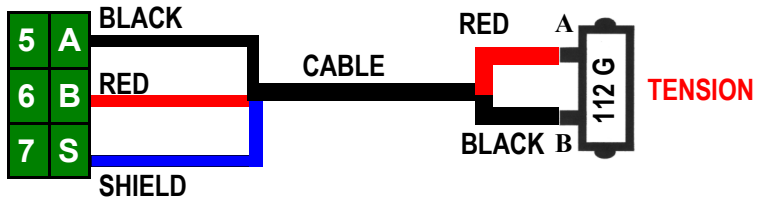
112 IDS In-Die Transducer



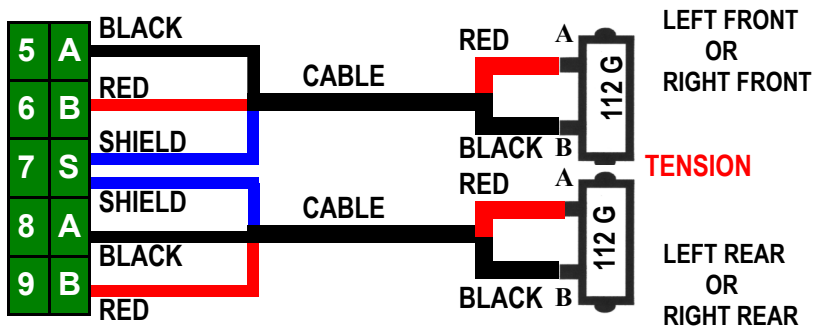
112 Pitman Transducer



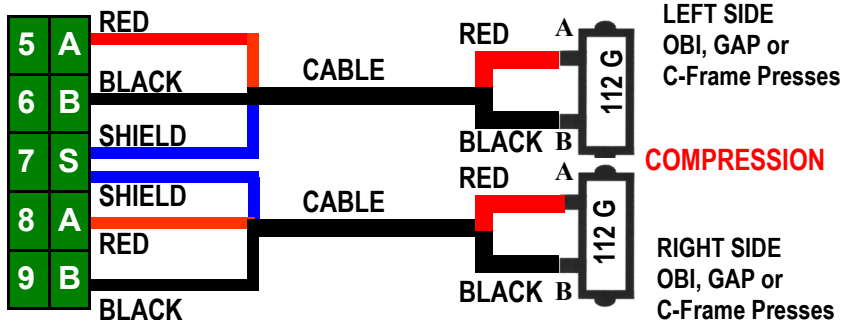
112 G Column Transducer



112 G Column Transducer
Two 112G wired in Parallel
(2nd. Parallel sensor)



Two 112G wired in Parallel
For OBI, GAP or C-Frame
Presses
(2nd. Parallel sensor)



PROFORCE
PIEZO I/O MODULE

TRANSDUCER DESCRIPTIONS

The Proforce Piezo I/O Module is capable of using any IMCO 112 Series Piezoelectric transducer and can be wired for tension or compression by switching the A + B points on the transducer input terminal block Points 5 through 9.

Transducer Input
Terminal Block Points 5 - 9

| | | | | |
|---|---|---|---|---|
| 9 | 8 | 7 | 6 | 5 |
| B | A | S | B | A |

112 IDS In-Die Satellite Piezoelectric Transducer

112IDS are mounted in the hardened die plate under a section of die that has a critical load to be monitored. Multiply 112IDS transducers may be connected in parallel to increase signal strength and average the load from a wider area in the die. 112IDS transducers are wired for compression with Teflon cable, which is impervious to oil and maintains its flexibility. (wiring diagram "Terminal Block Points 5 through 9", separate sheet)

112 Pitman Mounted Piezoelectric Transducer

112 are used on the connecting rods or pitman's of the press, because the stresses on the pitman's are greater than on the columns. The lower output 112 transducer is suitable for pitman mounting. Two (2) 112 transducers are pre-wired in parallel and mounted on each pitman or connecting rod. One (1) 112 transducer is mounted on the front of the pitman and the other is mounted on the back of the pitman, 180 degrees apart in the direction of the rotation compensating for bending of the pitman. Even though the 112 transducer is ideally suited for pitman mounting with its lower output, it does not limit its mounting use in other areas. 112 transducers are wired for compression with Teflon cable, which is impervious to oil and maintains its flexibility. (wiring diagram "Terminal Block Points 5 through 9", separate sheet.)

112G Column Mounted Piezoelectric Transducer

112G transducers are used for column mounting in Single Point Straight Side Press (one pitman), Two Point Straight Side Press (two pitman's) , Four Point Straight Side Press (four pitman's) and the back of GAP, C-Frame, OBI, Press brakes. 112G transducers have three (3) times the output of the 112 transducer. When mounted on the columns of Presses the 112G transducers are wired for tension, When mounted on the back of GAP, C-Frame, OBI and Press Brakes the 112G transducer is wired for compression. The optimum way to monitor a Straight Side Presses is to use one (1) 112G transducer on each Press column and use one (1) Proforce Piezo I/O Module for each column being measured. IMCO recommends mounting 112G transducers on the front and back of the Press column halfway between the bed of the press and the top of the ram. We do not recommend mounting on the sides of the Press columns in order to reduce the chance of measuring bending which can occur on the side of some Presses. (wiring diagram "Terminal Block Points 5 through 9", separate sheet)

112G Column Mounted Transducer wired in parallel (2nd Parallel Sensor)

Two 112G transducers wired in parallel can be used on Two Point Straight Side Presses (two Pitman's) using one (1) Proforce Piezo I/O Module and two (2)112G transducers wired in parallel to be mounted on the left front Press column and the left rear column. Then the same on the right front and right rear Press column ending up with a Proforce Piezo I/O Module for the (LS) left side and one for the (RS) right side of the Press, instead of one 112G transducer and one (1) Proforce Piezo I/O Module for each column of the Press. (wiring diagram "Terminal Block Points 5 through 9", separate sheet)

CALIBRATING CAPACITORS

Terminal Block Points 10 - 12

POINTS

Description

10 A

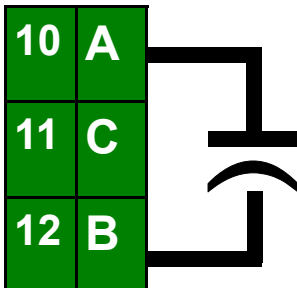
“A” TERMINAL FOR CALIBRATING CAPACITORS

11 C

NO CONNECTION

12 B

“B” TERMINAL FOR CALIBRATING CAPACITORS



The **Calibrating Capacitors** are used to reduce the output from the piezoelectric transducers. During Calibration the more capacitance placed across Points 10 and 12 , the less output the transducers will have. Once the approximate reading is reached, use the Trimmer Gain Pot to fine tune the capacitor settings. The best way to use the Trimmer Gain is to have it set to the minimum full counter clock wise position before Calibrating (normal position when shipped).

Set the calibrating capacitors readings for 10% or 15% lower than the desired calibrate reading. Once the calibrating capacitors are set between Point A & B, the Trimmer Gain can then be double for that reading. It is always best to get as close to the reading with the calibrating capacitors, before adding the Trimmer Gain, because the Gain goes up and not down.

After completing the Calibration, log the calibration values and use Trim Ref. Point 17 to establish how much Trimmer Gain was used for fine adjustment. This is helpful for changing a Proforce I/O Module without recalibrating.

PROFORCE PIEZO I/O MODULE

Terminal Block Points 13—16



POINTS

Description

| | |
|--|--|
| <div style="background-color: #008000; color: white; padding: 5px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">13</div> GRD. | <p>Ground (output to IMCO “Read Me” device)</p> |
| <div style="background-color: #008000; color: white; padding: 5px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">14</div> PEAK OUTPUT | <p>0—10 Volts = 200% Highest output signal held until reset by Peak Reset. The signal remains available to read for PC or PLC with a slower Analog to Digital Converter Board or Modular. The PC or PLC then resets the Peak Output Signal by momentarily connecting Peak Reset Point 18 to GRD (ground). This resets the Peak Reading to 0 Volts preparing it for the next stroke.</p> |
| <p>NOTE: <i>The Peak Output Signal can also be read directly on voltmeters. The reading is then reset by connecting the Display Reset Point 19 to the Ground Point 13 through a normally open push button switch.</i></p> | |
| <div style="background-color: #008000; color: white; padding: 5px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">15</div> +24V | <p>+24 Volts (output to IMCO “Read Me” device)</p> |
| <div style="background-color: #008000; color: white; padding: 5px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">16</div> CAL | <p>Calibrate The Calibrate Point when connected to GRD (ground) through a normally open switch feeds a 1 Volt signal into the piezoelectric transducer input, providing a test signal to the Proforce Piezo I/O Module to assure its operation and provides a standard input to output calibration reference. While the Calibrate Switch is held closed, the output signal should read approximately 5 Volts on the Peak Output Point 14 and 5 Volts on Point 4 of the Analog Output, sometimes referred as the Track Output. The 5 Volts represent 50% of the 0 - 10 Volt signal, if you are using 10 Volts to represent 100%. Doing this means that a 1 Volt output from the piezoelectric transducer will provide 5 Volts or a 50% reading from the Proforce Piezo I/O Module and the 2 Volt output from the piezoelectric transducer will provide a 10 Volt output from the Proforce Piezo I/O Module representing 100%. Another method of using the 1 Volt Calibrate reference is to let the 1 Volt represents 100% or 5 Volts on the output. Choosing to let 5 Volts represent 100% on the Proforce Piezo I/O Module output allows the additional 5 Volts to 10 Volts range to read overloads from 100% to 200%. This provides the over range capability when displaying loads on Stamping Presses.</p> |

Example: *A Press operating a 95% load and the overload limit is set to 199% and can be set no higher, If a 20% overload occurred, you would not be able to capture and display the 115% load if 10 Volts equaled 100%. You could not display any readings above 100% or 10 Volts. You would have no idea how much the load was exceeded above 100% without an over range capacity.*

PROFORCE PIEZO I/O MODULE

Terminal Block Points 17—19



POINTS

Description

17 TRIM REF

Trim Reference The Trim Ref. when connected to GRD (ground) through a normally open switch provides a method of determining how much trimmer gain is used when calibrating. It provides a reference number in either volts or percent which allows for a replacement Proforce Piezo I/O Module to be installed without recalibrating. If using a Volt Meter to read Terminal Block Point 4 Analog Track Output, the reading should be from 5 Volts for no Trimmer Gain to 7.50 Volts for full Trimmer gain. If reading using an **IMCO** hand held “**READ ME**”

18 PEAK RESET

Peak Reset The Peak Reset is needed to reset the Peak Detector circuit after a PC, PLC or Volt Meter display has captured the PEAK Reading. A momentary connection of the Peak Reset Point 18 to GRD (ground) will reset the Peak and prepare the Proforce Piezo I/O Module to capture a new reading for the next cycle of the press.

19 DISPLAY RESET

Display Reset The Display Reset when connected momentarily to GRD (ground) Point 13 through a normally open switch is used to reset the calibrate signal.

The Calibrate Reference Signal is a simulated signal and requires the resetting of both the Peak Detector and the Test Signal. The Test Signal cleared by resetting the Piezoelectric Transducer Input.

The Display Reset can be used to reset the Peak Detector, keeping in mind, that it also clears the Piezoelectric Transducer Input. Any Output Signal to the Analog Track Output Point 4 will be disrupted, such as taking a Signature Reading.

Also in some situations, where the Piezoelectric Transducer could detect extra unwanted mechanical stresses, clearing the Piezoelectric Transducer Input and the Peak Detector at the same time can be beneficial, as long as disruption to the Analog Track Output Point 4 in not a problem.

The Display Reset is also used to reset the display on the IMCO hand held “**READ ME**” Device.

The Display Reset can be controlled by a PC or PLC by momentarily connecting Point 19 to GRD (ground).

CONNECTING I/O MODULE TO PLC

DETERMINING CABLE LENGTH

When you determine the length of cable required to connect Proforce I/O Module, remember to include additional length to route the drain wire and foil shield to earth ground. Route cable long enough to avoid signal attenuation..

MINIMIZING ELECTRICAL NOISE INTERFERENCE

High speed analog signals are particularly vulnerable to electrical noise. Take precautions when routing signal cables. To help reduce the effects of electrical noise on analog signals, we recommend that you:

- Install the PLC AND Proforce I/O Module in a NEMA rated enclosure.**
- Make sure that the PLC and Proforce I/O Module is properly grounded.**
- Use Belden cable # 1503A, # 8451 or #8761 (or equivalent) for signal wiring.**
- Ground the cable properly.**
- Route signal cables away from other wiring or in grounded conduit.**
- Group Proforce I/O Modules away from AC or high-voltage DC modules.**

We recommend re-checking Proforce I/O modules operation after installing new machinery or other sources of electrical noise near the I/O Modules.



ATTENTION: Before wiring a Proforce I/O Module, disconnect Power from the I/O Module and from any other Power source to the module.

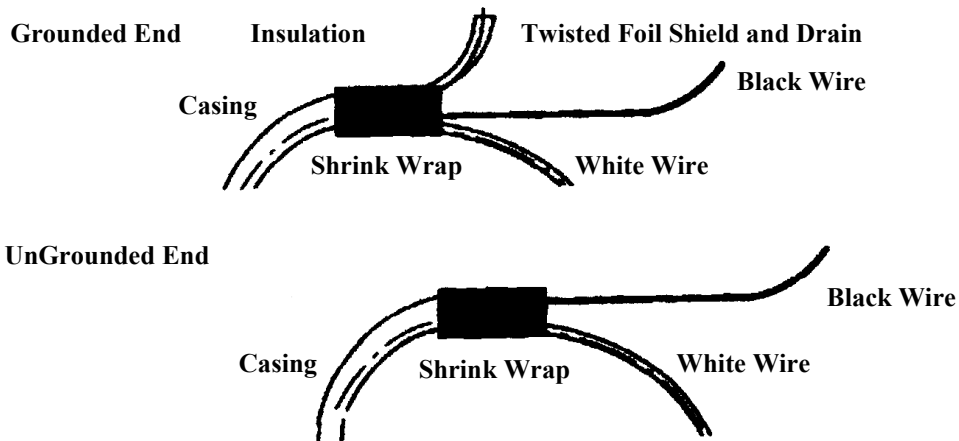
PREPARING THE CABLE

1. At each end of the cable, strip about 3 inches (76.19 mm) of casing to expose the wires.
2. At the ground end of the cable (Figure 1), twist the drain wire and the foil shield together and bend them away from the cable. Using a hot air blower, apply shrink wrap where wires leave the casing.
3. At the other end of the cable, cut off the drain wire and foil shield. Apply shrink wrap to the junction where wires leave casing.
4. Trim the signal wires to 2 inch (50.8 mm) lengths. Strip about 3/16 inch (4.76 mm) of insulation away to expose the copper strands for connections.
5. Decide where you will connect the cable to earth ground, and ground it. Refer to **GROUNDING THE CABLE**.
6. Connect signal wire (black and white) to terminal block and to input or out put device. (see separate sheets for Wiring Terminal Block Points 1 through 19).

CONNECTING I/O MODULE TO PLC

Continued: Preparing The Cable

Figure 1

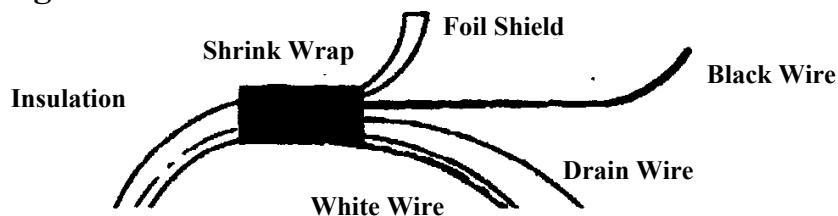


Repeat steps 1— 6 for each channel.
For each unused input channel, follow your A to D Board Instruction Manual.

GROUNDING THE CABLE

Signal cable such as Belden #1503A, #8451 and #8761 (or equivalent) has two signal wires (black and white), one drain wire and a Foil shield (Figure 2). The drain wire and foil shield must be grounded *at only one end of the cable*, not at both ends.

Figure 2



IMPORTANT: Ground the cable shield at one end having a good earth ground connection, such as at an I/O chassis mounting bolt or nearest ground bus in the I/O enclosure. Make this connection as short as possible. *Do not* ground the cable at the input to the A to D Board.

CONNECTING I/O MODULE TO PLC

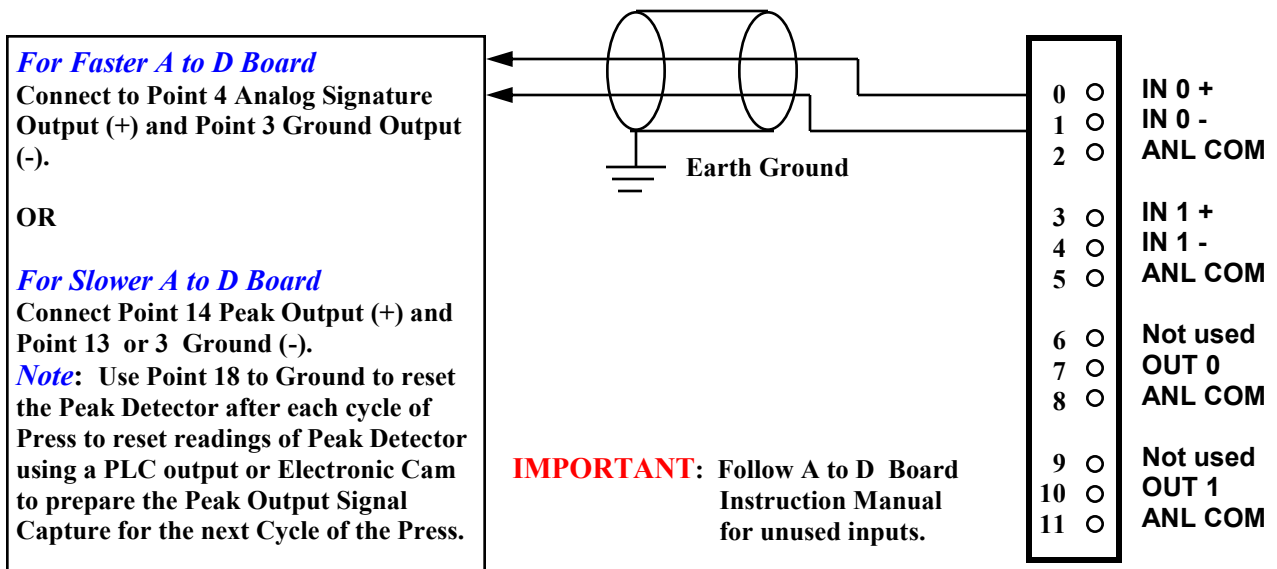
WIRING THE CABLE



ATTENTION: Before wiring the Proforce I/O Module, disconnect PLC System power, I/O Rack power, and module power.

CONNECT TO PROFORCE I/O MODULE

Use appropriate terminal block points, depending on the *speed* of A to D Board



MINIMIZING GROUND LOOPS

To keep the ground-loop current of input circuits to a minimum, we recommend that you:

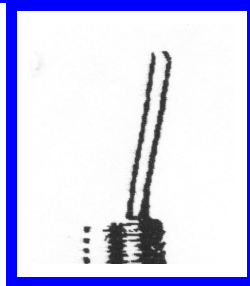
- Use the same power supply to power both input channels of a Proforce I/O Module
- Or Tie together the grounds of separate power supplies

SECTION V

PROFORCE Piezo I/O Module

BLANKING/FORMING SWITCH


BLANKING




Normal Mode


FORMING


FOR

 Presses normally running above 600 SPM.

 The blanking of very heavy metal.

FOR

 Presses normally running from 5 SPM to 600 SPM.

 The forming of very deep drawn parts.

Normal Mode

The normal mode of operation is the Forming Mode and the Switch should only be used in the less sensitive Blanking Mode for high speed press running 600 SPM to 2500 SPM or extremely heavy blanking operations.