



INSTRUCTION SHEET D2-3175-1 Pressure-to-Electrical Transducer Kit

**Model 1PE4020 (1–20 HP), IPE3040 (22 kw–30 kw 380/416)
Model 1PE4050 (25–50 HP 460, 575), IPE2025 (15–25 HP 230/208)
GP2000/VTAC V A-C V★S® Drives**

DANGER

ONLY QUALIFIED ELECTRICAL PERSONNEL FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THIS EQUIPMENT AND THE HAZARDS INVOLVED SHOULD INSTALL, ADJUST, OPERATE, AND/OR SERVICE THIS EQUIPMENT. READ AND UNDERSTAND THIS MANUAL IN ITS ENTIRETY BEFORE PROCEEDING. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

DESCRIPTION

The products described in this instruction sheet are manufactured and/or distributed by Reliance® Electric Industrial Company.

The Pressure-to-Electrical Transducer Kit provides control of the speed reference of the A-C V★S Drive Controller by a pressure signal of 3 to 15 PSIG. This kit can be used with a stand-alone controller, a controller mounted in an Expanded Cabinet or a VTAC V.

The basic component is a pressure transducer assembly. The transducer assembly is used as a voltage source for the controller automatic mode speed reference. Between 0 and 3 PSIG, it has a 0 volt D-C output. The output increases to the voltage setting of the controller Max Hz setting as the pressure is increased to 15 PSIG.

Upon receiving, check the contents of the kit with the contents as listed in Tables 1, 2, or 3. Store this equipment in a clean and dry area until ready to use. The ambient temperature of the storage area must not exceed 65°C (149°F) or go below –40°C (–40°F) within a relative humidity range of 5 to 95% without condensation.

Table 1. Complete Parts List.
M/N IPE4020 (1 – 10 HP All) IPE4050 (480/575V, 25 – 50 HP)

Description	Quantity	Part Number
Transducer Assembly	1	608813-112Y
M5 x 45 HHCS	2	419062-4HHR
Spacer	2	419065-1P
Insulator Cur/Volt Ref	1	608887-15A
Cur/Volt Ref Isolator	1	0-55325-2B
M3.5 x 13 CCWS	4	419062-1PFJ
Transformer (50VA)	1	417155-SC
M5 x 10 TTS	5	419062-100PHG
Fuse (1.0 A)	2	64676-64D
Fuse (0.5 A)	2	64676-64B
Fuse Block (2 Pos)	1	49454-19B
Nameplate (6FU)	1	417197-50A
Nameplate (7FU)	1	417197-50A
M4 x 10 TTS	2	419062-100PGG
Nameplate (Fuse Replacement 1.0 A)	1	417114-77R
Nameplate (Fuse Replacement 0.5 A)	1	417114-77B
M5 Nut/Washer	2	419063-100SH
Mounting Bracket	1	708205-47A
M4 Nut/Washer	3	419063-201SG
Wire Harness (188 189)	1	608813-112V
Wire Harness (181 182)	1	708205-50S
Wire Harness (281A 282A)	1	708205-50R
Wire Harness (188 189)	1	608813-112W
Wire Jumper (GND)	1	708205-53D
Wire Harness (RED, WHT)	1	608813-112X
Ty-Rap	6	69306-3D

**Table 2. Complete Parts List.
M/N IPE2025 230/208 (15–25 HP)**

Description	Quantity	Part Number
Transducer Assembly	1	608813-112Y
M5 x 45 HHCS	2	419062-4HHR
Spacer	2	419065-1P
Insulator Cur/Volt Ref	1	608887-15A
Cur/Volt Ref Isolator	1	0-55325-2B
M3.5 x 13 CCWS	4	419062-1PFJ
Transformer (150VA)	1	417155-8C
M5 x 10 TTS	5	419062-100PHG
Fuse (2.0 A)	2	64676-64G
Fuse Block (2 Pos)	1	49454-19B
Nameplate (6FU)	1	417197-50A
Nameplate (7FU)	1	417197-50A
M4 x 10 TTS	2	419062-100PGG
Nameplate (Fuse Replacement 2.0 A)	1	417114-77V
M5 Nut/Washer	2	419063-100SH
Mounting Bracket	1	708205-47A
M4 Nut/Washer	3	419063-201SG
Wire Harness (188 189)	1	608813-112V
Wire Harness (181 182)	1	708205-50S
Wire Harness (281A 282A)	1	708205-50R
Wire Harness (188 189)	1	608813-112W
Wire Jumper (GND)	1	708205-53D
Wire Harness (RED, WHT)	1	608813-112X
Ty-Rap	6	69306-3D

Table 3. Complete Parts List.
M/N IPE3040 380/416 (22 kw/30 HP – 30 kw/40 HP)

Description	Quantity	Part Number
Transducer Assembly	1	608813-112Y
M5 x 45 HHCS	2	419062-4HHR
Spacer	2	419065-1P
Insulator Cur/Volt Ref	1	608887-15A
Cur/Volt Ref Isolator	1	0-55325-2B
M3.5 x 13 CCWS	4	419062-1PFJ
Transformer (150VA)	1	417155-12A
M5 x 10 TTS	5	419062-100PHG
Fuse (1.25 A)	2	64676-64W
Fuse Block (2 Pos)	1	49454-19B
Nameplate (6FU)	1	417197-50A
Nameplate (7FU)	1	417197-50A
M4 x 10 TTS	2	419062-100PGG
Nameplate (Fuse Replacement 1.25 A)	1	417114-77N
M5 Nut/Washer	2	419063-100SH
Mounting Bracket	1	708205-47A
M4 Nut/Washer	3	419063-201SG
Wire Harness (188 189)	1	608813-112V
Wire Harness (181 182)	1	708205-50S
Wire Harness (281A 282A)	1	708205-50R
Wire Harness (188 189)	1	608813-112W
Wire Jumper (GND)	1	708205-53D
Wire Harness (RED, WHT)	1	608813-112X
Ty-Rap	6	69306-3D

**INSTALLATION: (1–10 HP 230/208 V,
1–20 HP 460/380 V, and 1–20 HP 575
V Without Expanded Cabinet)**

Note: All components of the Pressure-to-Electrical Transducer Kit must be mounted in a clean and dry environment. Maximum ambient temperature must not exceed 40°C outside the cabinet (55°C inside the cabinet), and the relative humidity must fall within a range of 5 to 95% without condensation.

DANGER

DO NOT INSTALL MODIFICATION KITS WITH POWER APPLIED TO THE UNIT. DISCONNECT AND LOCK OUT INCOMING POWER BEFORE ATTEMPTING SUCH INSTALLATION. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

DANGER

THE USER IS RESPONSIBLE FOR CONFORMING TO THE NATIONAL ELECTRICAL CODE AND ALL OTHER APPLICABLE LOCAL CODES. WIRING PRACTICES, ENCLOSURES, GROUNDING, DISCONNECTS, AND OVERCURRENT PROTECTION ARE OF PARTICULAR IMPORTANCE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

1. Disconnect all power to the controller before installing this kit.
2. Mount the Pressure-to-Electrical Transducer components. Refer to Figure 1 for mounting hole detail.

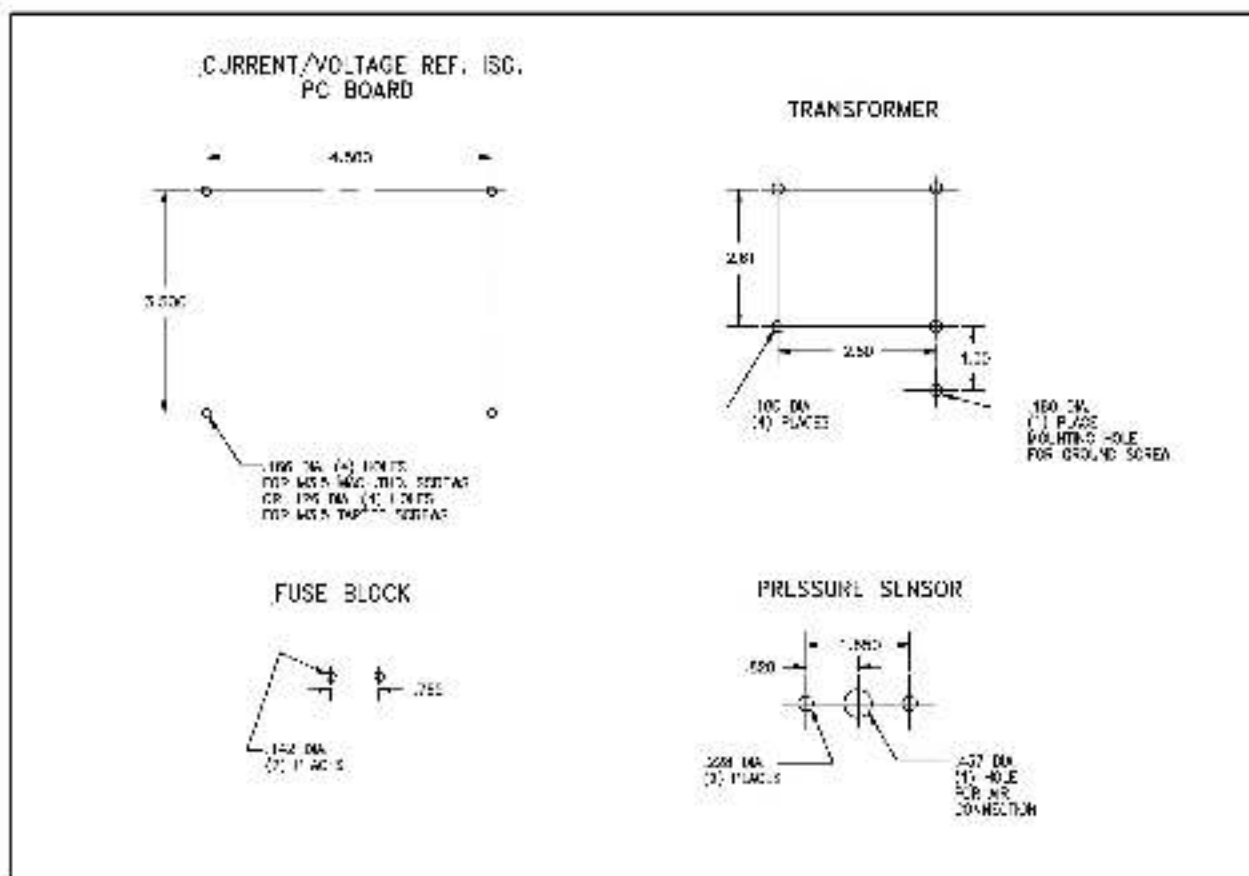


Figure 1. Pressure-to-Electrical Transducer Component Mounting Hole Dimensions.

3. Remove the controller cover and set aside for reassembly.
4. Follow the wiring diagrams and instructions in the Controller Instruction Manual D2-3171 (Expanded Cabinet Kit), and/or any other appropriate kit instruction manuals (if other kits are

installed} for all wires except those wires detailed in this instruction sheet.

Note: The wire harnesses provided in this kit are designed for use with an Expanded Cabinet Kit and may not be usable with some stand-alone controllers.

5. Using wire harness 608813-112X or wire selected in accordance with all applicable codes, connect from terminals 3 and 4 on the Current/Voltage Reference Isolator PC Board to TB11 terminals 2 and 3 on the regulator board. Refer to Figure 2 for wiring detail. Note: If a Control Signal Buffer Kit is installed, connect from terminals 3 and 4 on the Current/Voltage Reference Isolator PC Board to TB11 terminals 2 and 3 on the Control Signal Buffer PC Board.
6. Using wire harness 608813-112V connect from terminals 5 and 6 on the Current/Voltage Reference Isolator PC Board. Connect harness 608813-112W to terminals 188 (X1) and 189 (X3) on the transformer. Plug the two harnesses together. This connection provides a convenient means of disconnecting power to the Current/Voltage Reference Isolator PC Board while troubleshooting. Refer to Figure 2 for wiring detail.
7. Using wire harness 708205-50R connect from terminals H1 and H2, H3, or H4 (per nameplate specifications) to one end of the fuse block. Refer to Figure 2 for wiring detail.
8. Using wire harness 708205-50S connect from terminals R1 and S1 located on the controller, to the other end of the fuse block. Refer to Figure 2 for wiring detail.
9. Using the wire harness supplied with the pressure sensor unit (transducer assembly), connect from the Current/Voltage Reference Isolator PC Board to the pressure sensor unit. Refer to Figure 2 for wiring detail.
10. Connect ground jumper 708205-53D from transformer terminal 189 (X3) to an appropriate grounding location. Refer to Figure 2 for wiring detail.
11. Proceed to the section "Complete the Pneumatic Installation."

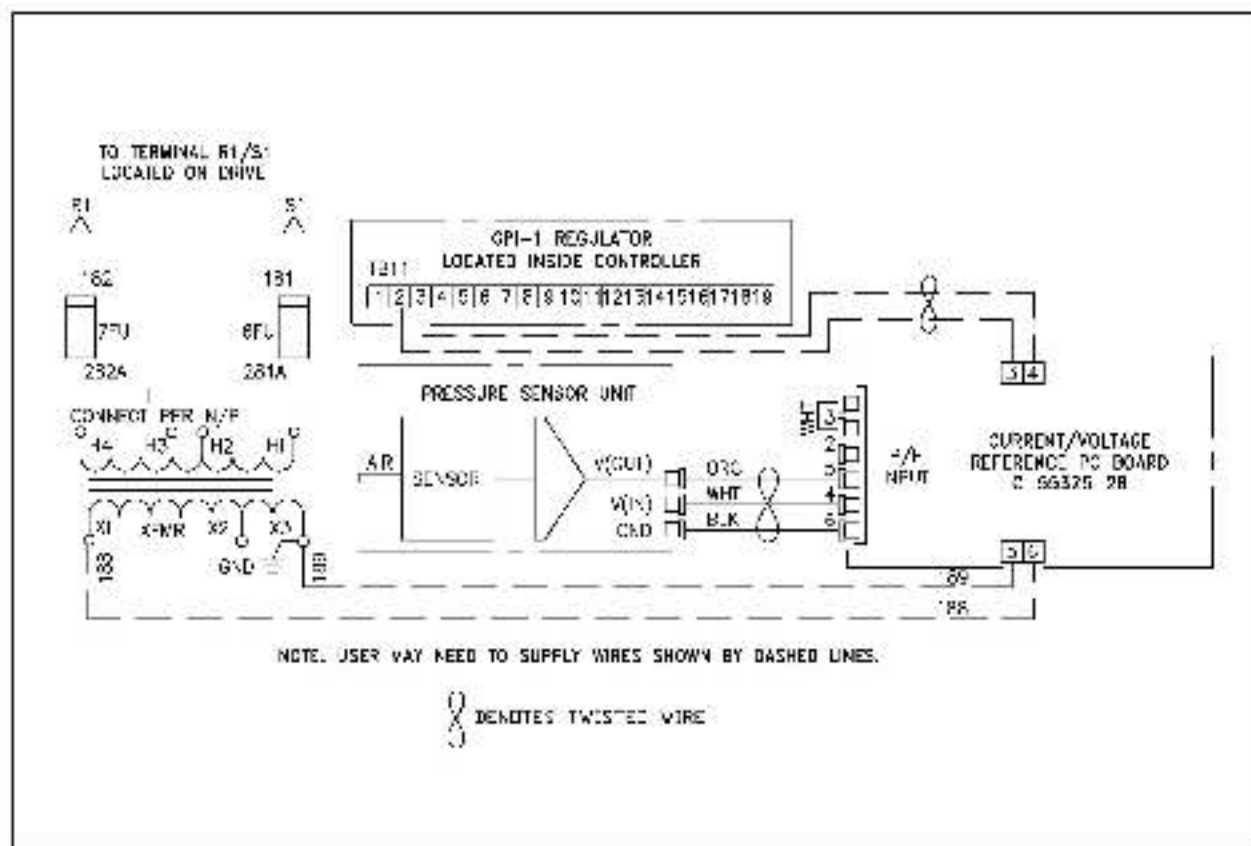


Figure 2. Pressure-to-Electrical Transducer Connection Diagram (1–10 HP 230/208 V, 1–20 HP 460/380 V, and 1–20 HP 575 V without Expanded Cabinet).

INSTALLATION: EXPANDED CABINET-MOUNTED CONTROLLER OR VTAC V

Note: All components of the Pressure-to-Electrical Transducer Kit must be mounted in a clean and dry environment. Maximum ambient temperature must not exceed 40°C outside the cabinet (55°C inside the cabinet), and the relative humidity must fall within a range of 5 to 95% without condensation.

DANGER

DO NOT INSTALL MODIFICATION KITS WITH POWER APPLIED TO THE UNIT. DISCONNECT AND LOCK OUT INCOMING POWER BEFORE ATTEMPTING SUCH INSTALLATION. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

1. Disconnect all power to the controller before installing this kit.

Note: When used with the Inverter Bypass option, the Pressure-to-Electrical Transducer Kit receives power from the Bypass control transformer. Opening the Bypass troubleshooting disconnect switch in the Bypass compartment removes power from the inverter side of the cabinet except for the Pressure-to-Electrical Transducer circuit. It remains energized from the 120 VAC secondary of the Bypass control transformer. A plug connection between the harnesses that connect the transformer to the Current/Voltage Reference Isolator PC Board permits removing 120 VAC power from the Pressure-to-Electrical Transducer circuit. See Step 6 below for details about the plug connection.

2. Open the cabinet cover.

DANGER

THE USER IS RESPONSIBLE FOR CONFORMING TO THE NATIONAL ELECTRICAL CODE AND ALL OTHER APPLICABLE LOCAL CODES. WIRING PRACTICES, ENCLOSURES, GROUNDING, DISCONNECTS, AND OVERCURRENT PROTECTION ARE OF PARTICULAR IMPORTANCE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

3. Mount the Pressure-to-Electrical transducer components in the Expanded Cabinet or VTAC V. For (1–10 HP 230/208 V, 1–20 HP 460/380 V, 1–20 HP 575 V) controllers, refer to Figure 3 for mounting locations. For (25–50 HP 460

V, 30–50 HP 575 V, 15–25 HP 230/208 V, 22–30 kw 380/416 V) controllers, refer to Figure 4 for mounting locations.

4. Follow the wiring diagrams and instructions in the Controller Instruction Manual (Expanded Cabinet Kit), and/or any other appropriate kit instruction manuals (if other kits are installed) for all wires except those wires detailed in this instruction sheet.
5. Using wire harness 808813-112X connect from terminals 3 and 4 on the Current/Voltage Reference Isolator PC Board to TB11 terminals 2 and 3 on the Control Signal Buffer PC Board. Refer to Figure 5 for wiring detail.

Note: If the optional Bypass is mounted in the Expanded Cabinet, connect the wires in Step 6 to the transformer supplied with the Bypass. **Do not perform Steps 7 through 10 if the Bypass is installed. Refer to Figure 5A for wiring detail.**

6. Using wire harness 808813-112V connect from terminals 5 and 6 on the Current/Voltage Reference Isolator PC Board. Connect harness 808813-112W to terminals 188 (X1) and 189 (X3) on the transformer. Plug the two harnesses together. Refer to Figure 5 for wiring detail.

Note: This plug connection is provided to give service personnel a convenient means of disconnecting the Current/Voltage Reference Isolator PC Board from 120 VAC power in case the Pressure-to-Electrical Transducer Kit is used with the Bypass option.

7. Using wire harness 708205-50R connect from terminals H1 and H2, H3, or H4 (per nameplate specifications) to one end of the fuse block. Refer to Figure 5 for wiring detail.
8. Using wire harness 708205-50S connect from terminals R1 and S1 located on the terminal board, to the other end of the fuse block. Refer to Figure 5 for wiring detail.
9. Using the wire harness supplied with the pressure sensor unit (transducer assembly), connect from the Current/Voltage Reference Isolator PC Board to the Pressure Sensor Unit. Refer to Figure 5 for wiring detail.
10. Connect ground jumper 708205-53D from transformer terminal 189 (X3) to an appropriate grounding location. Refer to Figure 5 for wiring detail.
11. Proceed to the section "Complete the Pneumatic Installation."

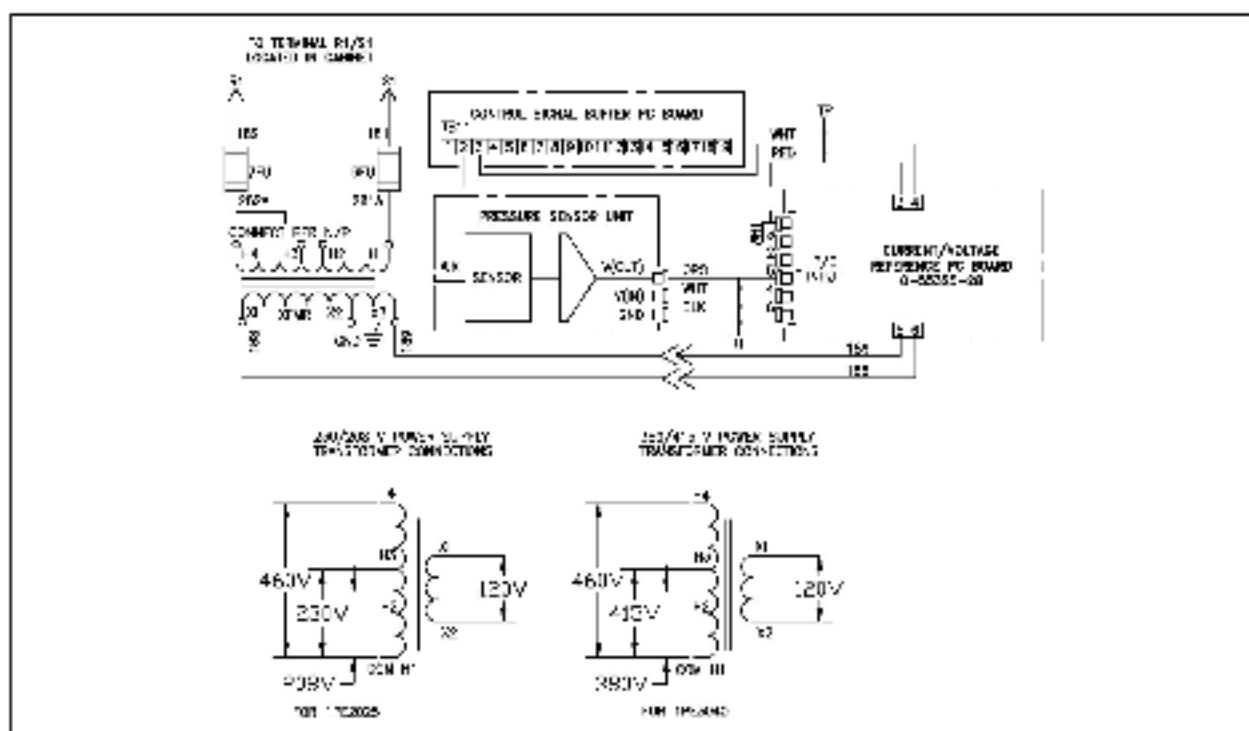


Figure 5. Pressure-to-Electrical Transducer Connection Diagram (Cabinet Mounting, without Bypass).

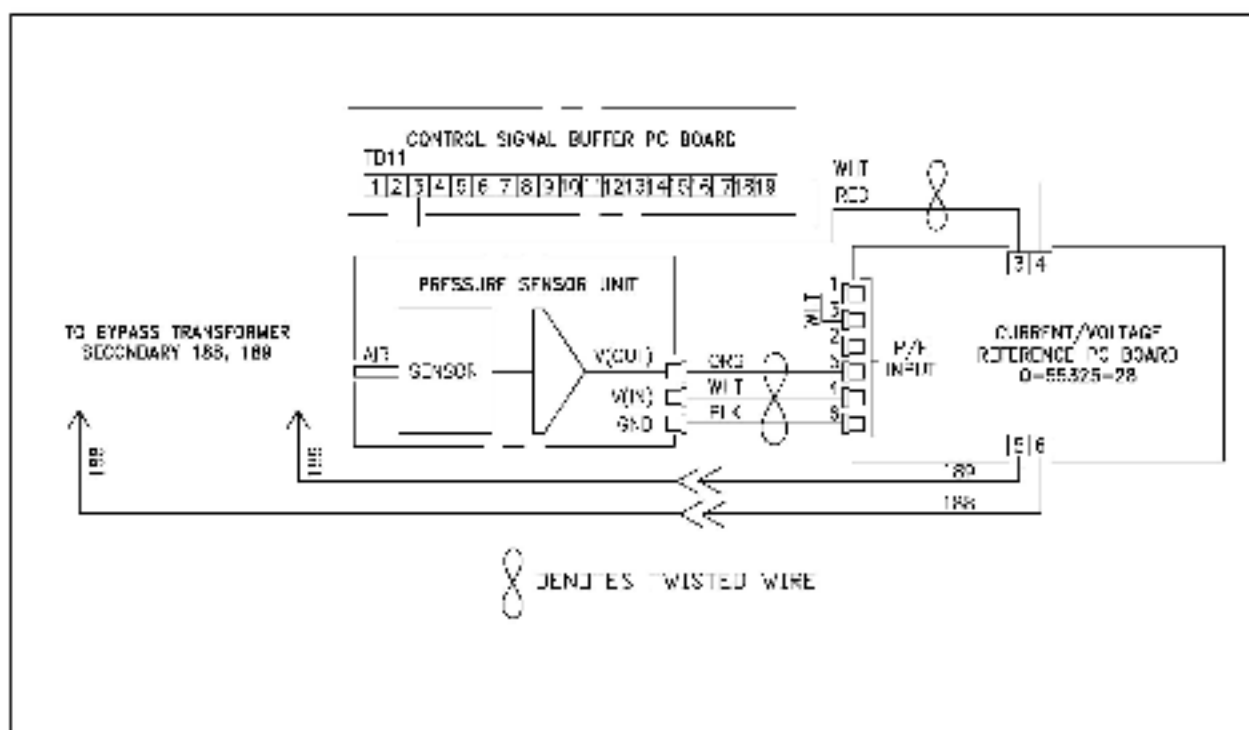


Figure 5A. Pressure-to-Electrical Transducer Connection Diagram (Cabinet Mounting, with Bypass).

COMPLETE THE PNEUMATIC INSTALLATION

1. Make sure the transmitting instrument provides clean, dry, oil-free instrument air. Refer to Instrument Society of America's "Quality Standard for Instrument Air" (ISA-S7-3).
2. Install 1/4" OD tubing (not supplied) from the transmitting instrument to the pressure transducer.
3. Fit the tube over the fitting.
4. Leak test all fittings and tube connections in the input line to the pressure transducer. Repair any leaks.

CAUTION: The maximum pressure applied to this transducer must not exceed 30 PSIG. Failure to observe this precaution could result in damage to, or destruction of, this equipment.

ADJUST THE PRESSURE-TO-ELECTRICAL TRANSDUCER

DANGER

ADJUSTMENTS ARE MADE WITH THE POWER ON. EXERCISE EXTREME CARE AS HAZARDOUS VOLTAGE EXISTS. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

Note: To properly adjust the controller performance for automatic operation from 3 to 15 PSIG, a pressure regulator with good resolution from 0 to 15 PSIG is required.

CAUTION: Do not use an ohmmeter to check the transducer. Failure to observe this precaution could result in damage to, or destruction of, the transducer.

Note: For automatic only operation, proceed to Step 7.

1. With power OFF, connect a voltmeter on a 12 VDC or greater scale to terminals 3 (+) and 4 (COM) on the Current/Voltage Reference Isolator PC Board. Refer to Figure 5 for wiring detail.
2. The controller does not need to be running. If an automatic start/stop contact is being used, make sure that it remains open.

DANGER

THIS EQUIPMENT IS AT LINE VOLTAGE WHEN A-C POWER IS CONNECTED TO THE CONTROLLER. DISCONNECT ALL UN-GROUNDED CONDUCTORS OF THE A-C POWER LINE FROM THE CONTROLLER. AFTER POWER IS REMOVED, VERIFY WITH A VOLTMETER AT TERMINALS 147(+) AND 45(-) THAT THE D-C BUS CAPACITOR(S) IS DISCHARGED BEFORE TOUCHING ANY INTERNAL PARTS OF THE CONTROLLER. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

3. Turn main power to the controller ON.
4. In the automatic mode, establish 15 PSIG on the transducer input. Measure and record the voltage. Adjust the voltage to equal 10.0 volts with the gain pot on the Current/Voltage Reference Isolator PC Board.
5. Reduce pressure to 3 PSIG. Voltage should equal zero volts. If it does not, adjust to zero volts with the bias pot on the Current/Voltage Reference Isolator PC Board.
6. Re-establish 15 PSIG on the transducer input. Finely adjust the voltage to equal 10.0 volts on with the gain pot on the Current/Voltage Reference Isolator PC Board.
7. Turn main power to the controller OFF, then disconnect the voltmeter.
8. Proceed to, "Adjust the Controller Functions," in the main Controller Manual supplied with the controller. Make all of the adjustments in the automatic mode. Disregard all jumpers on the controller when using this kit. Establish 3 PSIG (or system minimum) on the transducer. Measure the output of the Current/Voltage Reference Isolator PC Board between terminals 3 and 4. The output voltage should be 0 volts. If not, adjust the bias Pot to obtain 0 volts.
9. Establish 15 PSIG (or system maximum) Note: System maximum cannot exceed 20 PSIG. Measure the output of the Current/Voltage Reference Isolator PC Board between terminals 3 and 4. Output voltage should be 10 volts. If not, adjust the gain Pot to obtain 10 volts.
10. Repeat step 8 to obtain 0 volts between terminals 3 and 4 on the Current/Voltage Reference

Isolation PC Board at minimum pressure reference.

11. If bias adjustments are made repeat step 9 to obtain 10 volts between terminals 3 and 4 on the Current/Voltage Reference Isolation PC Board at maximum pressure reference.

12. Replace the controller cover.

13. Apply power to the controller. In the automatic mode verify that 3 PSIG (or system minimum) causes the controller to run at minimum speed and 15 PSIG (or system maximum) causes the controller to run at maximum speed.

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