

## STD5000 & STD6000 Series I/P Transducers

Inches (mm)

1/4" NPTF Supply Pressure Connection

### INSTALLATION / INSTRUCTION / TECHNICAL MANUAL



# INTRODUCTION

The Brandt STD5000 (General Purpose, NEMA 4X) and STD6000 (Explosion Proof, Dust Ignition Proof, NEMA 4X) Series of I/P Transducers represent a “New Generation” in pneumatic signal conversion. Brandt’s unique “State Of The Art”, solid state current-to-pressure converter (“E-Pi”) uses minimal electrical energy and air consumption to produce accurate, precise output pressure signals. Because there are no moving parts, the unit will operate reliably for many years when installed properly. The STD5000/6000 I/P’s were designed for ease of installation and operation. This manual is intended as a guide for those customers who desire more in-depth explanations and service instructions.

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## DANGER, WARNING, CAUTION and NOTE Statements:

- DANGER** • Refers to conditions or hazards which could result in serious personal injury or death.
- WARNING** • Refers to conditions or hazards which could result in personal injury.
- CAUTION** • Refers to conditions or hazards which could result in equipment or property damage.
- NOTE** • Alerts you to facts or special instructions.

**ALL DANGER, WARNING, AND CAUTION NOTICES MUST BE COMPLIED WITH IN FULL**

## SPECIFICATIONS

- Input** . . . . . 4-20mA or 10-50mA
- Output** . . . . . 6-30, 3-27, 3-15 or 1-17 psig and 0.2-1.0 Bar.
- Accuracy** . . . . . ±0.15% of Span (3-15, 1-17 PSI & 0.2-1.0 Bar Output), ±0.25% of Span (3-27 & 6-30 PSI Output)
- Repeatability** . . . . . ±0.05% of Span
- Deadband** . . . . . 0.02% of Span
- Stability/Reproducibility** 0.5% of Span / 6 Months
- Position Effect** . . . . . Not Measurable
- Vibration Effect** . . . . . <0.25% from 1-200Hz/1g
- Frequency Response** . . . -3db at 5 Hz (per ISA-S26.4.3.1 Configuration A)
- Loop Load** . . . . . 3.8Vdc +5 ohms (195 ohm load at 20mA)
- Operating Current** . . . 3.7mA min. 200mA max. continuous at 120°F Half cycle 70 amp 1/120 sec. at 68°F
- Supply Pressure** . . . **Standard Configuration:** Minimum of 3 psig and maximum of 10 psig above the maximum calibrated output (except for a 1-17 psig output which will be 35 psig).  
**High Pressure Configuration:** For Outputs of 3-15 psi (0.2-1.0 Bar) the standard supply range is 35-100 psi (2.4 to 6.9 Bar). Some units may be calibrated to operate using a unique range (such as 20-80 psi). Always use the supply pressure range noted on the label. Supply pressures outside the limits of the supply range may affect the output of the unit. Other output ranges & supply ranges may be possible. Consult Factory.
- Supply Pressure Effect** Not measurable within the recommended supply pressure range
- Output Capacity** . . . **Standard Configuration:** 4.0 SCFM (Supply and Exhaust characteristics are balanced to within ±10%).  
**High Pressure Configuration:** 4-8 SCFM possible (dependent on air supply and tubing sizes).
- Air Consumption** . . . 0.04 SCFM Steady State Average (0.06 SCFM Maximum)
- Operating Temperature** -40° to 150° F (-40° to 66° C)
- Temperature Effect** . . ±0.02% / °F of Span (Range of 0°F to 150°F), or ±0.04% / °F of Span (Range of -40°F to 150°F)
- RFI-EMI Effect** . . . . . Less than ±1% effect on Zero & Span (26-1000mHz @ 30V/m) when installed per Installation guidelines this manual, Section 1.1.4. Refer to CE Conformity, page 4, for Test Standards.
- Operational Modes** . . Direct, Reverse, and/or Split-Range (field-selectable, no additional parts needed).
- Failure Mode** . . . . . **TRANSDUCER ALWAYS FAILS IN THE DIRECT MODE REGARDLESS OF MODE SELECTION**
- Enclosure** . . . . . Internally purged NEMA 4X. Cast Aluminum with powder coat epoxy
- Electrical Safety** . . . Factory Mutual , CSA, SIRACENELEC Approved Intrinsically Safe & Explosion Proof Operation. See Sections 1.5.0, 1.6.0, 1.7.0 for Approval Details.
- Weight** . . . . . 2.5 lbs



# MODEL NUMBER

**STD X X X X - X I/P**

**Series Number**

- 5: STD5000 I/P - NEMA 4X
- 6: STD6000 I/P - NEMA 4X, Explosion Proof\*

**Input**

- 1: 4-20 mA, Intrinsically Safe\*
- 2: 10-50mA
- 3: Other (Consult Factory)

**Options**

- 1: Pipe Mount Kit
- 3: Direct Only
- 4: Mounted Filter Regulator
- 5: Valve Mount Kit
- 6: Mounted Output Gauge

**Case Style**

- 1: Standard
- H: High Pressure Supply: 3-15 psig & 0.2-1.0 Bar output ranges only. Standard supply range is 35-100 psig.

**Output**

- 1: 6-30 PSIG<sup>1</sup>
- 2: 3-27 PSIG<sup>1</sup>
- 3: 3-15 PSIG (Standard or High Pressure Supply)
- 4: 1-17 PSIG
- 5: Other (Consult Factory).
- 6: 0.2 to 1.0 BAR (Standard or High Pressure Supply)

All models are supplied with the appropriate combination of Factory Mutual, Canadian Standards and CENELEC approvals.

1. Split Range Not Available on These Models

Example: STD6131-1 I/P =

STD6000 Explosion Proof, NEMA 4X I/P with 4-20mA input, 3-15 Output, Pipe Mount Option

## 1. INSTALLATION and APPROVALS

### 1.1. PRE-INSTALLATION REQUIREMENTS



**1.1.1 Environment:** Suitable for installations in the following locations:

1. STD 5000 I/P:
  - Intrinsically Safe Operation in Hazardous Locations Outdoors (NEMA 4X, CSA.ENC.4 & IP65). 4-20mA Models Only.
2. STD 6000 I/P:
  - Intrinsically Safe Operation in Hazardous Locations Outdoors (NEMA 4X, CSA.ENC.4 & IP65). 4-20mA Models Only.
  - Explosion Proof Installation in Hazardous Locations Outdoors (NEMA 4X, CSA.ENC.4 & IP65) - FM & CSA Units Only.
3. See Sections 1.5.0, 1.6.0, 1.7.0 for Factory Mutual, Canadian Standards and SIRA/CENELEC approvals.

**DANGER**

- All wiring must be made in accordance with all local and national codes appropriate to the area in which the instrument is installed.

**1.1.2 Temperature:** Ambient temperature must match specifications

**1.1.3 Mounting/Attitude:** No Restrictions

**1.1.4 Electrical Input:** 4-20mAdc or 10-50mAdc current source (specify when ordering). It is recommended that shielded cable be used and that shield be grounded to unit and earth ground. If cable contains shield and drainwire, ground shield not drain wire, unless metal conduit is used. Metal conduit should be grounded to earth ground. See Figure 1 on page 3 for location of ground screw.

**1.1.5 Air Supply:** Clean, dry and oil free instrument air within acceptable pressure range for calibrated output.

1. Standard supply pressure should be 20 (±2) psi for 3-15 psig output and 35 (±2) psig for a 3-27, 6-30 or 1-17 psig.
2. For standard high pressure configurations, supply pressure will be 35-100 psig (2.4 to 6.9 Bar). Refer to supply range noted on the unit label.

**NOTE**

- The air line should be purged of all debris, oil and water. A 43 micron external filter is strongly recommended.
- Failures attributable to instrument air supply contamination are not covered by the warranty.
- If supply pressure is not within acceptable range, a regulator should be installed (consult factory).

**CAUTION**

- This instrument vents to atmosphere. The use of supply gas other than air can create a hazardous environment.

## 1.2. MOUNTING

- 1.2.1 The STD5000/6000 Series housing has been designed for mounting to a standard valve yoke (2.25" bolt spacing) or a 2 1/2" (6.4cm) pipe.
- 1.2.2 A Valve Mount Kit consisting of bolts and washers for mounting to the valve yoke (P.N.# FP45-OPTN-VM) is available from the factory.
- 1.2.3 A Pipe Mount Adapter Accessory (P.N.# FP45-OPTN-PM) is available from the factory.
- 1.2.4 See Dimensional Drawings on Front and Back Cover.

## 1.3. PNEUMATIC CONNECTIONS

- 1.3.1 One (1) 1/4" FNPT port is provided for supply air connections. Each unit has a filter screen installed in this port.
- 1.3.2 Two (2) 1/4" FNPT ports are provided for pneumatic output connections. Either port may be used and one may be used for the mounting of an output gauge. If no gauge is installed, the unused port must be plugged with the pipe plug included with the unit.
- 1.3.3 See Dimensional Drawings on Front and Back Cover.

**NOTE**

- Before connecting pneumatics, blow out lines thoroughly.
- Soap test all joints and fittings for leaks.

**CAUTION**

- It is recommended pipe thread tapes not be used on pneumatic piping.

## 1.4. ELECTRICAL CONNECTIONS

- 1.4.1 The STD5000/6000 Series I/P's are supplied with two (2) 1/2" FNPT electrical conduit connections. The unused connection requires the insertion of a 1/2" FNPT pipe plug.
- 1.4.2 A two (2) position "Barrier Type" terminal block with wire-ready #6-32 screws is supplied for 22-12 AWG wire. Terminal block will accept spade lugs or stripped wire. Wire should be stripped approximately 1/4" before insertion. The Terminals are labeled "+" and "-" on E-Pi Label.
- 1.4.3 It is recommended that shielded cable be used and the shield grounded at the unit and to earth ground. See Figure 1.
- 1.4.4 See Dimensional Drawings on Cover and Figure 1

**NOTE**

- Observe polarity: Reverse polarity will not damage the unit, but unit will not operate.

**CAUTION**

- Conduit should be connected to prevent condensation from collecting in the instrument.

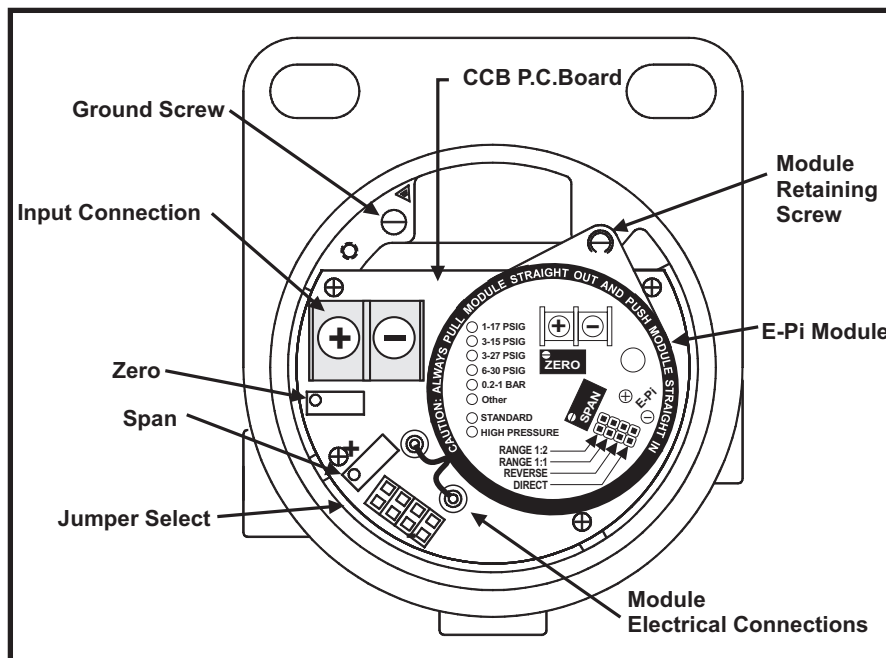


Figure 1 - PCB Connections

# 1.5. FACTORY MUTUAL RESEARCH CORPORATION



• **INTRINSICALLY SAFE INSTALLATION - STD5000 & STD6000 MODELS (4-20 MA ONLY)**

Intrinsically Safe Operation for Class I, II and III, Division 1, Applicable Groups A, B, C, D, E, F, and G;  
 Nonincendive for Class I, Division 2, Groups A, B, C, and D;  
 Suitable for Class II, Division 2 Groups F and G:  
 Suitable for Class III, Division 2  
 Hazardous Locations Outdoors (NEMA 4X) per entity requirements when installed per Brandt drawing in Figure 2.

• **EXPLOSION PROOF / DUST IGNITION PROOF INSTALLATION - STD6000 MODELS ONLY**

Explosion Proof for Class I, Division 1 and 2, Applicable Groups B, C, and D Hazardous Locations Outdoors (NEMA 4X).  
 Dust Ignition Proof for Class II, Division 1 and 2, Applicable Groups E, F, and G Hazardous Locations Outdoors (NEMA 4X).

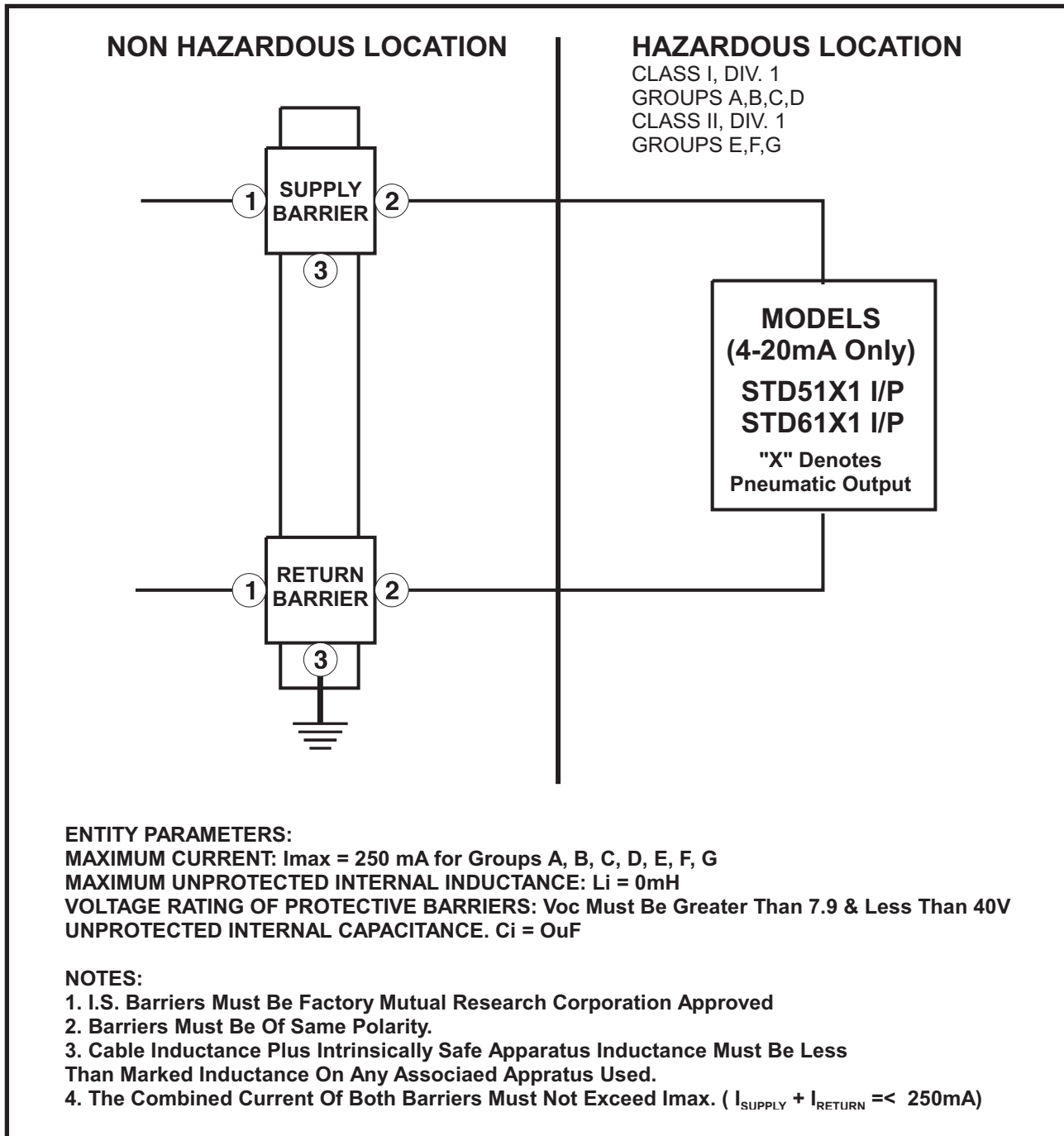


Figure 2 - Factory Mutual IS Installation Drawing

## 1.6 CANADIAN STANDARDS ASSOCIATION



### • STD5000 SERIES I/P TRANSDUCER

Intrinsically Safe / Securite Inrinseque: Class I, Groups A, B, & Class II, Groups E, F, G, & Class III, Input of 4-20mA, outputs of 3-15, 3-27, 6-30 and 1-17 psig, Temp Code T3C, Intrinsically Safe when connected to CSA Certified Safety Barriers rated 31.5V max., 463 ohms min. CSA.ENC.4 Outdoors

Intrinsically Safe / Securite Inrinseque: Class I, Groups C, D & Class II, Groups E, F, G & Class III, Input of 4-20mA, outputs of 3-15, 3-27, 6-30 and 1-17 psig, Temp Code T3C, Intrinsically Safe when connected to CSA Certified Safety Barriers rated 28V max., 120 ohms min. CSA.ENC.4 outdoors.

Class I, Division 2, Groups A, B, C, & D: Inputs 4-20mA or 10-50mA, outputs 3-15, 3-27,6-30 & 1-17 psig without Safety Barriers. CSA.ENC.4 Outdoors.

**Warning: Substitution Of Components May Impair Intrinsic Safety / Division 2**

**Advertissement: La Substitution De Composants Peut Compromettre La Securite Inrinseque / Division 2**

**Caution / Attention: Open Circuit Before Removing Cover. Ouvrir Le Circuit Avant D'Enlever Le Couvercle**

### • STD6000 SERIES I/P TRANSDUCER

**Intrinsically Safe / Securite Inrinseque:** Class I, Groups A, B, & Class II, Groups E, F, G, & Class III, Input of 4-20mA, outputs of 3-15, 3-27, 6-30 and 1-17 psig, Temp Code T3C, Intrinsically Safe when connected to CSA Certified Safety Barriers rated 31.5V max., 463 ohms min. CSA.ENC.4 Outdoors

**Intrinsically Safe / Securite Inrinseque:** Class I, Groups C, D & Class II, Groups E, F, G & Class III, Input of 4-20mA, outputs of 3-15, 3-27, 6-30 and 1-17 psig, Temp Code T3C, Intrinsically Safe when connected to CSA Certified Safety Barriers rated 28V max., 120 ohms min. CSA.ENC.4 outdoors.

**Explosion Proof:** Class I, Groups B, C, D & Class II, Groups E,F,G & Class III & Class I, Division 2, Groups A,B,C,D Hazardous Locations Outdoors, CSA.ENC.4 Outdoors

## 1.7 SIRA / CENELEC



### • STD5000 and STD6000 SERIES I/P TRANSDUCER

**SIRA / CENELEC Approved For Intrinsically Safe Operation**

Category: . . . . . EEx ia IIC T4 Tamb = 60°C

Certificate No: . . . . . Ex 93C2032X

Complies With The Harmonized European Standards: EN50 014 (1977) & EN50 020 (1977)

Intrinsic safety is assured by the limitation of voltage and energy by means of shunt zener diodes and also by infallible segregation.

Umax = 30Vdc, Imax = 100mA, Ceq = 0.94nF, Leq = 7.0 mH, Pmax = 0.75W

### • STD6000 SERIES I/P TRANSDUCER

**CENELEC Approved for Flame Proof Installations**

Complies with harmonized European Standards BS EN50 014: 1992 and BS EN50 018: 1994

Category: EEx d IIC T6

Certificate No. Ex98E1121X

Pi 0.7W

## 1.8 EC Declaration Of Conformity



We, Brandt Instruments, Inc.  
3333 Airpark Road  
Fuquay, NC 27526 USA

Declare that the following products:

- Plant Standard STD5000 Series Current To Pressure Transducer
- Plant Standard STD6000 Series Current To Pressure Transducer

To which this declaration applies, complies with these norms:

- BS EN50081-1: 1993 Generic Emissions, Residential Commercial & Light Industrial
- BS EN50082-1: 1995 Generic Emissions, Residential Commercial & Light Industrial

Following the provisions of the EMC directive 89/336/EEC

Date: January 23, 1996

Name Of Responsible Person: Willie Pennington, Quality Assurance Supervisor

Signature \_\_\_\_\_

## 2. OPERATION

A block diagram outlining the operation of the STD5000/6000 is shown in Figure 3. The electric to pneumatic conversion takes place in the “E-Pi” valve. A conditioned 4-20mA input signal provides an electric current to the coil of the “E-Pi”.

This creates a magnetic field which magnetizes the valve. The magnetization is proportional to the input current signal and positions the membrane/button relative to the valve seat. The pneumatic output (back pressure) is thereby modulated relative to the input current. Further conditioning of the pneumatic output is achieved with a volume booster.

Final conditioning of the boosted pneumatic output signal is achieved by actually measuring the output with a pressure sensor. This signal is then compared with the current to the “E-Pi” to achieve the exact pneumatic output relative to the 4-20mA (10-50mA) current input.

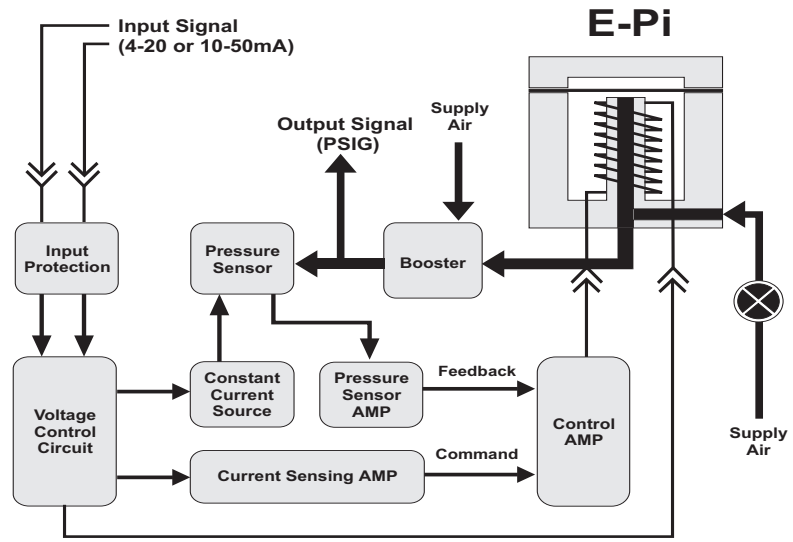


Figure 3 - Operational Flow Chart

### 2.1. PROGRAMMING DIRECT, REVERSE OR SPLIT RANGE

2.1.1 Programming is selectable via internal jumpers located on the circuit board. To access, remove the Cover. A label located on the E-Pi Module shows the location and position of these jumpers. See Figure 4.

2.1.2 To Select desired operating mode, plug in jumpers according to Table 1 on Page 6.

**NOTE**

- It is recommended that mode selection be accomplished prior to final inspection
- When switched from direct to reverse or into split range, the span will remain within +/- 1%

**CAUTION**

- TRANSDUCER FAILS IN DIRECT MODE REGARDLESS OF OPERATING MODE SELECTED

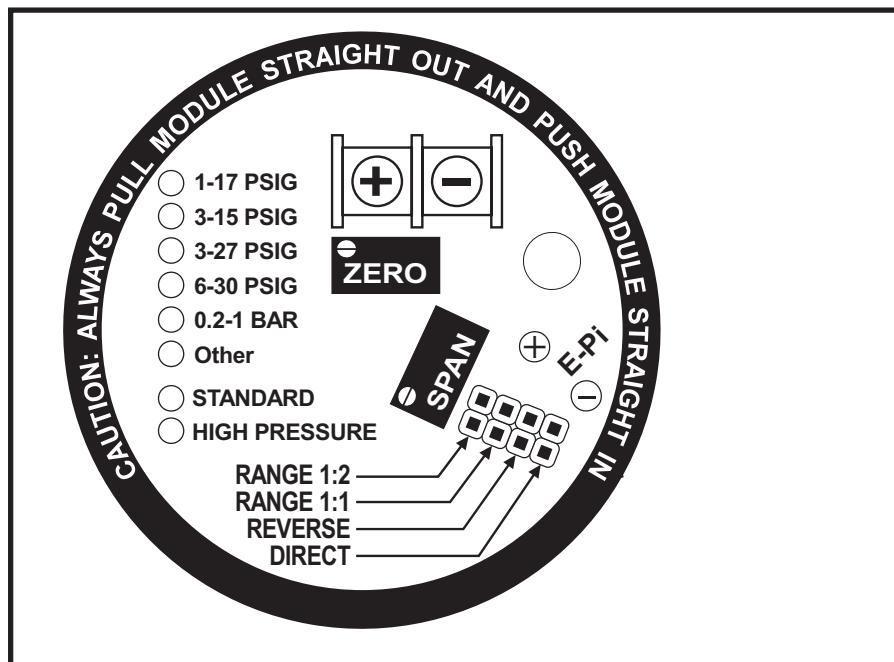


Figure 4 - Jumper Selection

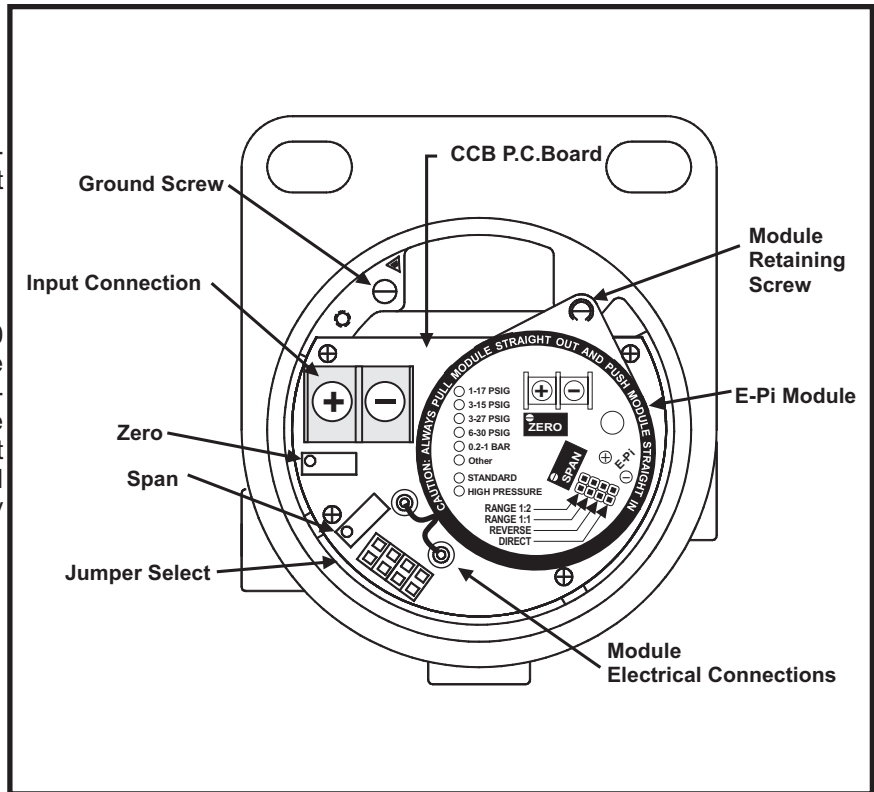


# Direct, Reverse and Split Range

Table 1 describes the jumper selections that are necessary for different inputs and outputs.

## Output

The Output of a STD5000 or 6000 can be changed by replacing the E-Pi Module and adjusting the supply pressure. Shown below is the part number of the E-Pi module that you will need to achieve the desired outputs and the necessary supply pressure.



OUTPUT	USES THIS	INPUT (mA)	SUPPLY PRESSURE		JUMPER SELECT SWITCH POSITION				ADJUST
	E-Pi MODULE		STND	HIGH PRESSURE	Direct	Reverse	Range 1:1	Range 1:2	
3-15 PSIG	SA45-1502-15	4-20 or 10-50	20 PSIG	35-100 PSIG	*		*		ZERO
3-15 PSIG	SA45-1502-15	4-12 or 10-30	20 PSIG	35-100 PSIG	*			*	ZERO
3-15 PSIG	SA45-1502-15	12-20 or 30-50	20 PSIG	35-100 PSIG	*			*	ZERO
15-3 PSIG	SA45-1502-15	4-20 or 10-50	20 PSIG	35-100 PSIG		*	*		ZERO
15-3 PSIG	SA45-1502-15	4-12 or 10-30	20 PSIG	35-100 PSIG		*		*	ZERO
15-3 PSIG	SA45-1502-15	12-20 or 30-50	20 PSIG	35-100 PSIG		*		*	ZERO
3-27 PSIG	SA45-1502-27	4-20 or 10-50	35 PSIG	NA	*			*	ZERO
27-3 PSIG	SA45-1502-27	4-20 or 10-50	35 PSIG	NA		*		*	ZERO
6-30 PSIG	SA45-1502-30	4-20 or 10-50	35 PSIG	NA	*			*	ZERO
30-6 PSIG	SA45-1502-30	4-20 or 10-50	35 PSIG	NA		*		*	ZERO
1-17 PSIG	SA45-1502-17	4-20 or 10-50	35 PSIG	NA	4		4		ZERO
1-17 PSIG	SA45-1502-17	4-12 or 10-30	35 PSIG	NA	*			*	ZERO
1-17 PSIG	SA45-1502-17	12-20 or 30-50	35 PSIG	NA	*			*	ZERO
17-1 PSIG	SA45-1502-17	4-20 or 10-50	35 PSIG	NA		*	*		ZERO
17-1 PSIG	SA45-1502-17	4-12 or 10-30	35 PSIG	NA		*		*	ZERO
17-1 PSIG	SA45-1502-17	12-20 or 30-50	35 PSIG	NA		4		4	ZERO

Table 1 - As Ordered and Denoted by Model Number



**IMPORTANT: When Ordering E-Pi Modules, Include Operating Pressure**

### UNITS WITH OUTPUT RANGES OF 3-27 OR 6-30 PSIG

- Units with output ranges of 3-27 psig or 6-30 psig must be programmed for 1:2 mode to achieve output range.
- Split ranging is not possible on these units, but Reverse mode can be utilized.
- Units factory calibrated for 3-27 psig can be converted to a 3-15 psig output range by changing mode selection from 1:2 to 1:1 and recalibrating (reducing the supply pressure to 20 psig may cause the pneumatic ZERO to drop, so try the unit at 35 psig supply first).
- Units factory calibrated for 6-30 psig may have a pneumatic zero "TOO" high to recalibrate to 3-15 psig. You can attempt to recalibrate by changing mode selection from 1:2 to 1:1. If this does not work, the unit must be sent back to the factory for recalibration, or replace the 6-30psig E-Pi module with a 3-15 psig E-Pi module.



### 2.1.3 PREVENTION OF VALVE OPERATION OVERLAP

There is adequate adjustment of span and zero to put a dead spot in the output to prevent valve operation overlap in split range. Table 2 shows the values. (If valve overlap is desired, there is also adequate adjustment of span and zero to provide a margin of overlap).

Mode	Input(mA)	Output(psig)	Adjustment
Direct, 1:2	4-11	3-15	Zero & Span
	13-20	3-15	Zero & Span
Reverse, 1:2	4-11	15-3	Zero & Span
	13-20	15-3	Zero & Span

Table 2 - Valve Operation Overlap

### 2.1.4 UNITS WITH OUTPUT RANGES OF 3-27 OR 6-30 PSIG

Must be programmed for 1:2 mode to achieve output range. See Page 7.

## 3. E-PI PLUG-IN-MODULE

With the STD5000 and STD6000 I/P's, Brandt has introduced the innovative "E-Pi Plug-In-Module". This feature not only allows the user to solve the majority of field service issues without having to disconnect tubing, wiring or recalibrating, but to do so with a minimum of down time.

### Important Notes:

- When removing or installing the E-Pi Plug-In-Module, Always **Push Straight In** or **Pull Straight Out**. Damage or breakage may occur if module is pulled out at an angle
- Once removed, the **E-Pi Plug-In-Module** can be discarded or refurbished and used as a spare part. See Section 3.2.
- In the **Standard Pressure & High Pressure Units** it is not necessary to shut off the air supply to the I/P, but you should be aware that the output signal will be lost during the replacement process.
- **High Pressure E-Pi Modules** come supplied with a stiffening bracket mounted under the mounting screw.
- Removing the **E-Pi Plug-In-Module** with the air supply still operating creates a situation where particles that may have accumulated from a contaminated air supply can be blown out. Service technicians should be cautioned.
- Always make sure that the **E-Pi Plug-In-Module** you are putting in the unit matches the range (3-15, 1-17, 3-27, or 6-30 psig) of the unit. No damage will occur, but unit will not operate properly. Each E-Pi Module is marked as to the range.
- If a replacement **E-Pi Plug-In-Module** has been in storage for a long period of time or handled poorly, it may be necessary to apply a lubricant to the O-Rings (Dow 111 or equivalent).

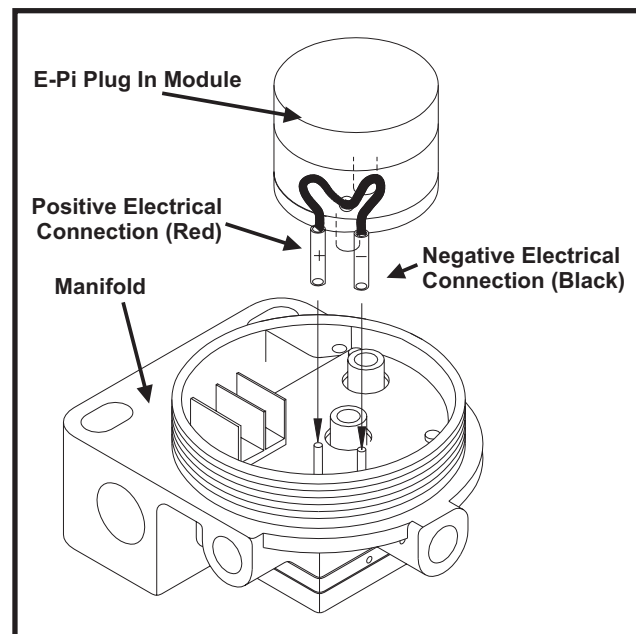
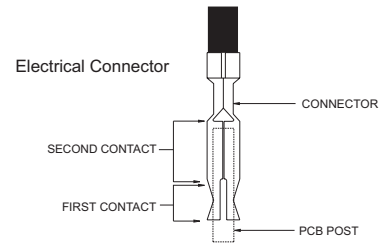


Figure 5 - E-Pi Plug-In-Module

### 3.1. E-Pi Plug-In-Module Removal and Replacement

- 3.1.1 Remove the Cover.
- 3.1.2 Locate and loosen the Module retaining captive screw from the manifold. The module is designed such that the screw should not have to be removed from the plastic piece.
- 3.1.3 Grab the E-Pi firmly and pull it from the manifold. **Pull STRAIGHT Out of the manifold.**

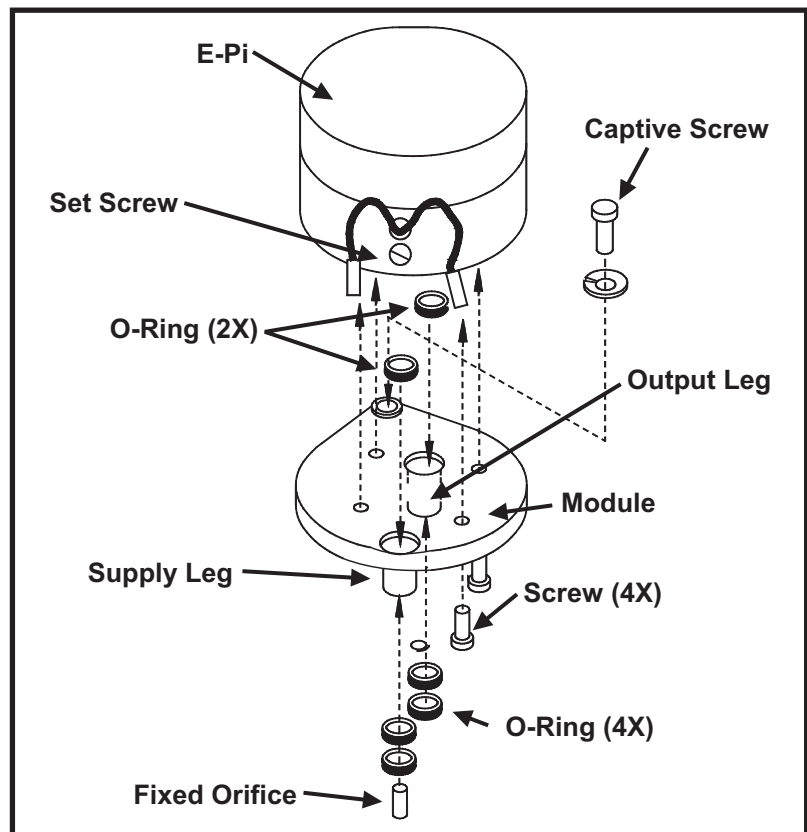
- 3.1.4 Align the replacement E-Pi Module with the pneumatic and electrical connections and press firmly back into the manifold. **Always Push STRAIGHT Down.** Tighten down the retaining screw.
- 3.1.5 Electrical connections are a “TWO” point contact system. The “First” contact occurs when the connector is pushed on to the PCB male pin. The “Second” occurs as the barrel of the connector is pushed further onto the pin. It may be necessary to use needle nose pliers to make the second connection. If so grip the connector firmly above the barrel section and push “Straight Down”.
- 3.1.6 Unit should operate without the need to recalibrate.



### 3.2. Fixed Orifice Replacement

- 3.2.1 Use Fixed Orifice Replacement Kit #SA45-8002-00
- 3.2.2 Remove the E-Pi Module from the manifold. See Section 3.1
- 3.2.3 See Figure 6. Try pulling the Fixed Orifice out of the Supply leg with needle nose pliers. If this is possible skip Step 3.2.4 and go to Step 3.2.5.
- 3.2.4 Turn the E-Pi over and remove the four (4) screws holding the E-Pi to the plastic module. It is not necessary to disconnect the wires from the module. Do not discard O-Rings. Push the Fixed Orifice out of the leg with a small diameter wire.
- 3.2.5 Choose a corresponding color Fixed Orifice from the Orifice Replacement Kit. Press this orifice, “**TAPERED END FIRST**” into supply leg as far as it will go (approximately 1/32” will stick out of the leg) .
- 3.2.6 Reassemble the E-Pi and plastic module (if necessary). The E-Pi Module is now ready for use .

Figure 6 - E-Pi Plug-In-Module Assembly



### 3.3. E-Pi Module Cleaning and Repair

- 3.3.1 The E-Pi Module can be cleaned and serviced to remove contaminants. Review Figure 7.
- 3.3.2 Remove the E-Pi Module from the manifold. See section 3.1.
- 3.3.3 Locate and loosen the three (3) set screws from the E-Pi top. It is not necessary to remove them. Do not discard.
- 3.3.4 Carefully remove the E-Pi top.
- 3.3.5 Carefully remove the Membrane Assembly. Hold by metal ring. Note: Membrane ring should be located under ring toward the E-Pi base.
- 3.3.6 With an "Alcohol Based" (or equivalent) contact cleaner, insert the "STRAW" into the small holes in the bottom of the E-Pi module and the E-Pi seat and spray. Allow cleaner to air dry. Note: It is also acceptable to use clean, instrument quality air (30 psi) if oil is not the problem, to blow out the E-Pi.
- 3.3.7 With an "Alcohol Based" (or equivalent) contact cleaner, spray off both sides of the Membrane Assembly. Allow cleaner to air dry. It should not be necessary to touch the membrane. Place the Membrane Assembly on the E-Pi base (membrane side down toward seat).
- 3.3.8 With an "Alcohol Based" (or equivalent) contact cleaner, spray off the top. Allow cleaner to air dry. (Top can also be wiped dry with a lint free cloth).
- 3.3.9 Reassemble the E-Pi by applying downward pressure to the E-Pi top while tightening the three set screws.
- 3.3.10 Store unit in a plastic bag until needed.

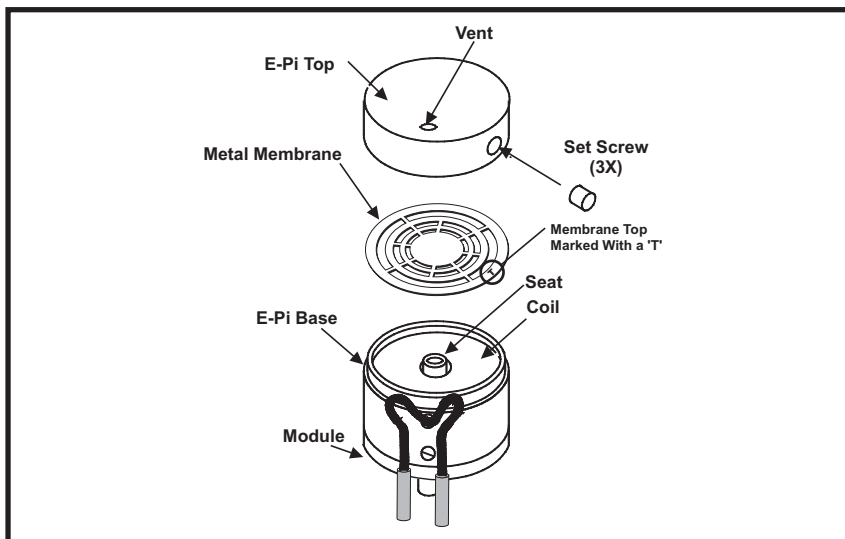


Figure 7 - E-Pi Assembly

## 4. MAINTENANCE AND REPAIRS

The STD5000 / 6000 I/P's have been designed using Brandt's solid state "E-Pi" valve technology. As such, there are no moving parts on which routine maintenance can be performed. However, routine maintenance should be performed on both the supply air filtration and the pneumatic and electrical connections.

### 4.1. EXTERNAL FILTRATION

- 4.1.1 Failures due to instrument supply air contamination are not covered by original equipment warranty.
- 4.1.2 Applying heavily oil and/or water laden instrument air can cause the loss of unit output.
- 4.1.3 Poor quality instrument air can result in unit failure. It is recommended that a coalescent, oil efficient, 43 micron filter be placed upstream of each unit where oil and/or water laden instrument air is suspected.
- 4.1.4 It is good practice on any instrument air system to provide proper filtration off the compressor for the removal of oil and water. Proper filtration will insure long term proper operation with minimal maintenance.
- 4.1.5 An External Filter System is available from the factory. P.N.# FR20-0001-00.

## 4.2. SUPPLY PRESSURE REGULATION

- 4.2.1 Maintain supply air at pressures required by output range. See Table 1, page 7.
- 4.2.2 **Standard Configuration:** Although the STD5000/6000 Series I/P's should not be damaged by excessive supply pressure, elevated zero levels may result. The maximum supply pressure is 10 psig above the maximum calibrated range.
- 4.2.3 **High Pressure Configuration:** The STD5000/6000 Series I/P's with the High Pressure Configuration are calibrated to operate within the published range. Supply pressures below the minimum range may cause the unit to function abnormally. Pressures above the maximum range can cause elevated zeros. A regulator is not required.
- 4.2.4 A filter regulator is available from Brandt. P.N.# FP82-2022-00

## 4.3. CONTROL CIRCUIT BOARD (CCB) REPLACEMENT

- 4.3.1 Refer to Figure 8.

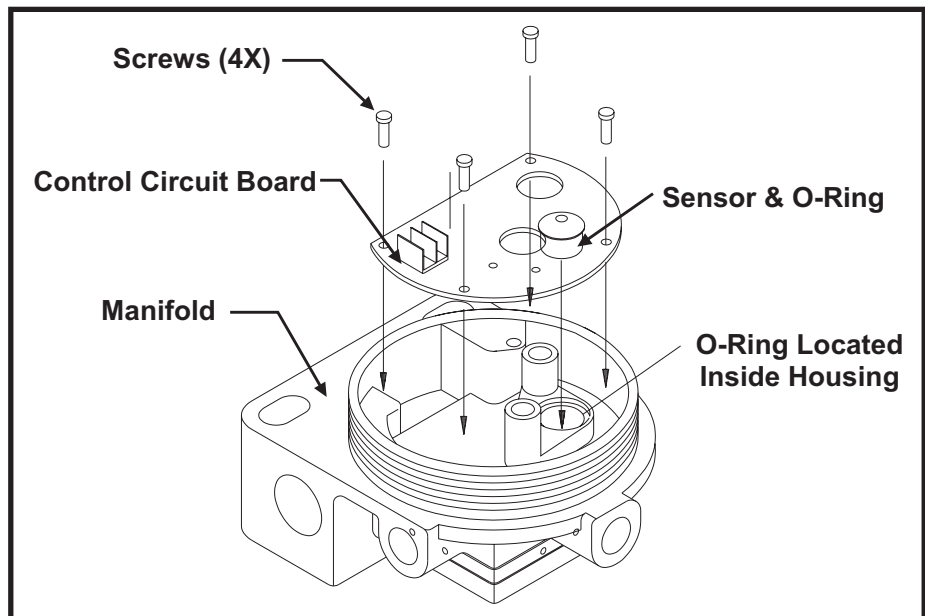
**NOTE** • This procedure can be done in the field but caution should be taken to insure no contaminants enter the unit.

- 4.3.2 Cut off air supply.
- 4.3.3 Remove the Cover.
- 4.3.4 Remove the E-Pi Plug-In-Module. See Section 3.1.
- 4.3.5 Disconnect Input Leads.
- 4.3.6 Remove four (4) screws holding the CCB in the manifold. Do Not Discard.
- 4.3.7 Remove the CCB.

**NOTE** • Your replacement CCB should have an O-Ring around the pressure sensor mounted to the CCB. Another O-Ring is in the recessed hole where the pressure sensor plugs in. Do not discard or lose this.

- 4.3.8 Mount the new CCB by reversing the above steps.

Figure 8 - CCB Assembly



## 4.4. FACTORY REPAIRS

- 4.4.1 In the unlikely event the STD5000 or STD6000 I/P should fail, the unit can be returned to the factory for warranty repair if the warranty period has not expired.
- 4.4.2 Repairs for the STD5000 and STD6000 in or out of warranty are done on a repair/exchange basis.
- 4.4.3 All units returned for repair must be authorized before receipt at the factory. Call the Receiving Department at (919) 552-9011 or arrange returns through your local Brandt Sales Representative.

## 5. ACCESSORIES and SPARE PARTS

Part Number	Accessories/Spare Parts	Notes
FR20-0001-00	External Filter System (5 micron prefilter & 0.3 Micron Coalescent Filter)	1/4" Compression Fittings
FP45-OPTN-VM	Valve Mount Kit (Bolts and Washers)	See Section 1.2
FP45-OPTN-PM	2 1/2" Pipe Mount Adapter	See Section 1.2
FP45-OPTN-TSW	Stainless Steel Tag , Mounted With Wire	Engraved
FP45-OPTN-TSD	Stainless Steel Tag (Small) Engraved, Mounted With Drive Screws	Engraved
FP82-2022-00	FAS2022 Filter Regulator With Supply Gauge	
GA21-1200-30	Output Gauge, 0-30 PSI 1/4" CBM	2 Inch
GA21-1200-60	Output Gauge, 0-60 PSI 1/4" CBM	2 Inch
MA45-5600-00	STD5000/6000 Technical Manual	1 Included With Each Shipment @ NC
SA45-1502-XX	E-Pi Module Replacement - Standard Pressure	XX = Specify Model Number & Output. Consult Factory
SA45-1502-XXHP	E-Pi Module Replacement - High Pressure Configuration	XX = Specify Model Number & Output . Consult Factory
SA45-2501-00	Circuit Board/O-Ring, 4-20mA	Specify Model Number
SA45-2501-01	Circuit Board/O-Ring, 10-50mA	Specify Model Number
SA45-8502-XX	Fix Orifice Replacement Kit (XX Denotes output. Consult Factory)	Recommended Spare Part

## 6. TROUBLESHOOTING GUIDE

PROBLEM	LOOK FOR	SOLUTION	SEE SECTION
<b>Output Pressure Is 0 PSIG</b>	- Instrument Supply Not Applied . . . . .	Check Air Supply . . . . .	1.1.5, 4.3.1
	- E-Pi Failure . . . . .	Replace E-Pi Module . . . . .	3.0
<b>Output Remains Between 1-2 PSI With Increase Of Input</b>	- Input Leads Are Reversed . . . . .	Reverse Input Leads . . . . .	1.4
	- Faulty Internal Connections . . . . .	Check Internal Connections . . . . .	1.4
	- Circuit Board Failure . . . . .	Replace Circuit Board . . . . .	4.4
<b>Unit Will Not Zero Down To 3 PSI</b>	- Oil Contamination In E-Pi . . . . .	Replace Or Clean E-Pi . . . . .	3.0
	- E-Pi Failure . . . . .	Replace Or Clean E-Pi . . . . .	3.0
<b>Output Signal Fails Below Calibrated</b>	- Input Current Loop Is Open . . . . .	Check Input Loop	
	- Loss Of Loop Power . . . . .	Check Input Loop	
<b>TEST: Disconnect E-Pi Leads from Circuit board and measure the resistance across the coil. A reading of 0 ohms indicates an open coil.</b>			
<b>Zero Level, 1-2.5 PSI</b>	- Open Input Loop Due To . . . . .	Check Input For Overcurrent & Instr. Protection Circuit Breakdown	
	- No Power . . . . .	Replace Circuit Board	
	- E-Pi Coil Is Open . . . . .	Disconnect/Reseat Connectors. . . . .	1.4
		Replace E-Pi Module . . . . .	3.0
<b>TEST: Disconnect power and E-Pi Leads from Circuit board. Connect current calibrator to power leads and connect ammeter to E-Pi leads. Input 4mA and ammeter should read 3.5mA. 0mA = Failure.</b>			
	- Circuit Board Failure . . . . .	Replace Circuit Board. . . . .	3.4
<b>Output Signal Fails To 0 PSIG</b>	- Instrument Air Has Failed . . . . .	Check Supply Air . . . . .	1.1.5, 4.31
<b>TEST: : Disconnect positive (+) E-Pi lead from module. Connect ammeter in series with lead and pin. Input 20 mA. If full-scale output is not achieved approximately 3.5mA should be measured. 3mA indicates circuit board failure.</b>			
<b>Unit Will Not Go To Full Scale With Full Scale Input</b>	- E-Pi Is Contaminated . . . . .	Replace/clean E-Pi Module . . . . .	3.0
	- Circuit Board Failure . . . . .	Replace Circuit Board. . . . .	4.4
	- Leak In Tubing . . . . .	Check Tubing . . . . .	1.3
<b>Will Not Split Range</b>	- Circuit Board Failure . . . . .	Replace Circuit Board. . . . .	4.4
	- Bad Connection . . . . .	Check Connections & Jumpers . . . . .	1.4
<b>Operates in 1:1 Only</b>	- Circuit Board Failure . . . . .	Replace Circuit Board. . . . .	4.4
	- Bad Connection . . . . .	Check Connections & Jumpers . . . . .	4.4, 2.1
<b>Output Goes To Full Scale With No Input</b>	- E-Pi Is Contaminated. . . . .	Replace/Clean E-Pi Module . . . . .	3.0

# 7. EXPLODED VIEW

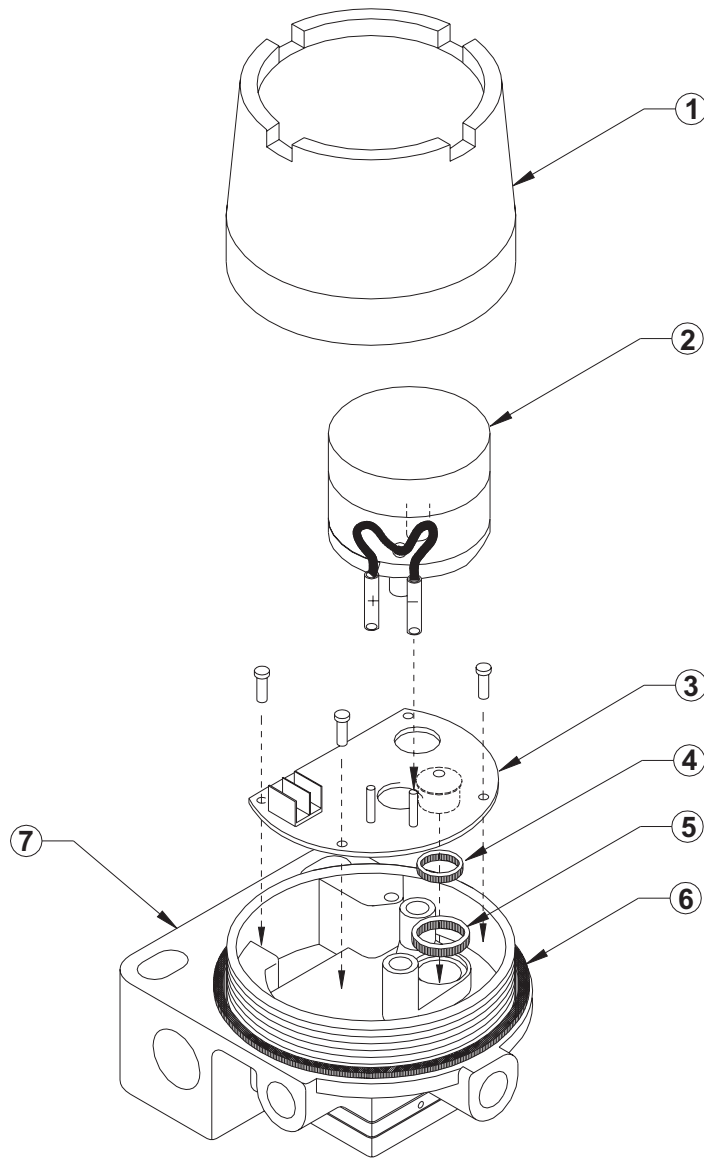
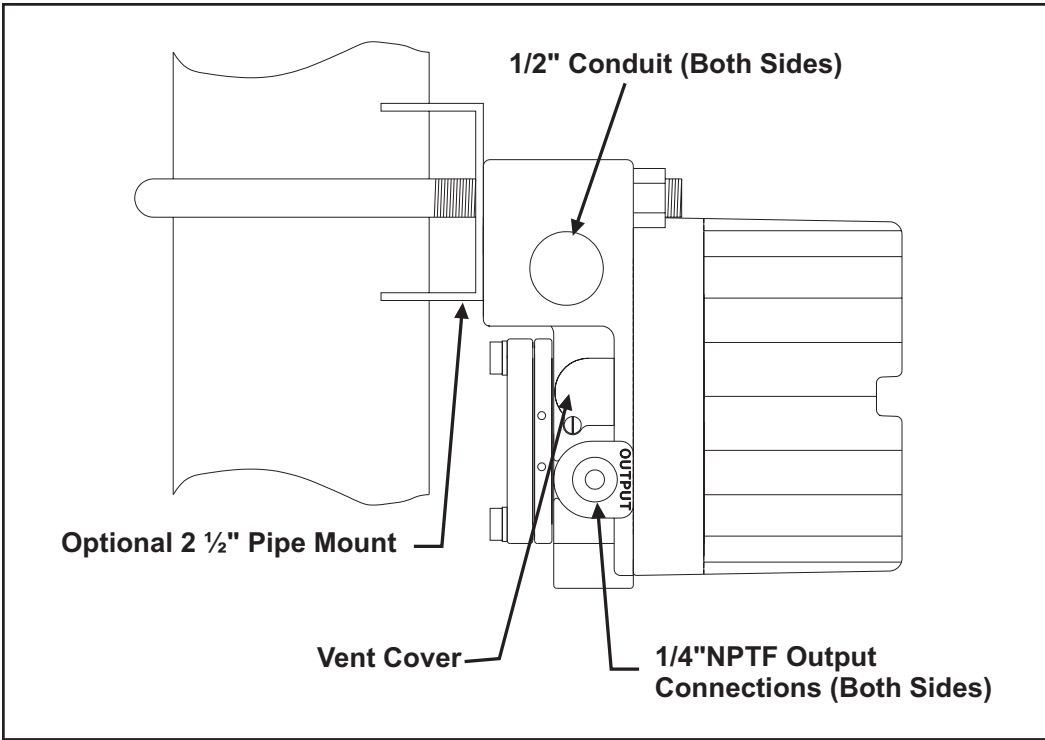
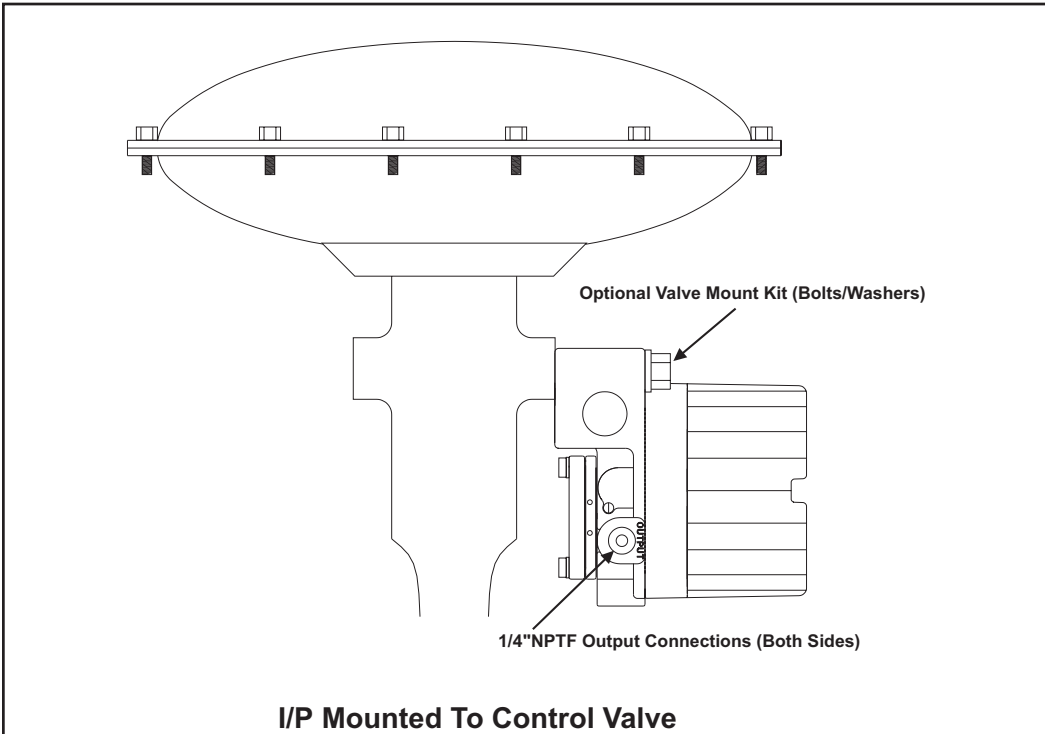


Figure 9 - Exploded View Of STD Series I/P

ITEM	DESCRIPTION
1	Die Cast Cover
2	E-Pi Module
3	Control Circuit Board
4	Sensor O-Ring
5	Sensor / Manifold O-Ring
6	Cover / Manifold O-Ring
7	Booster Assembly



**STD Series I/P with  
Pipe Mount, P.N.  
FP45-OPTN-PM**



**STD Series I/P Valve  
Mounted, P.N.  
FP45-OPTN-VM**



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