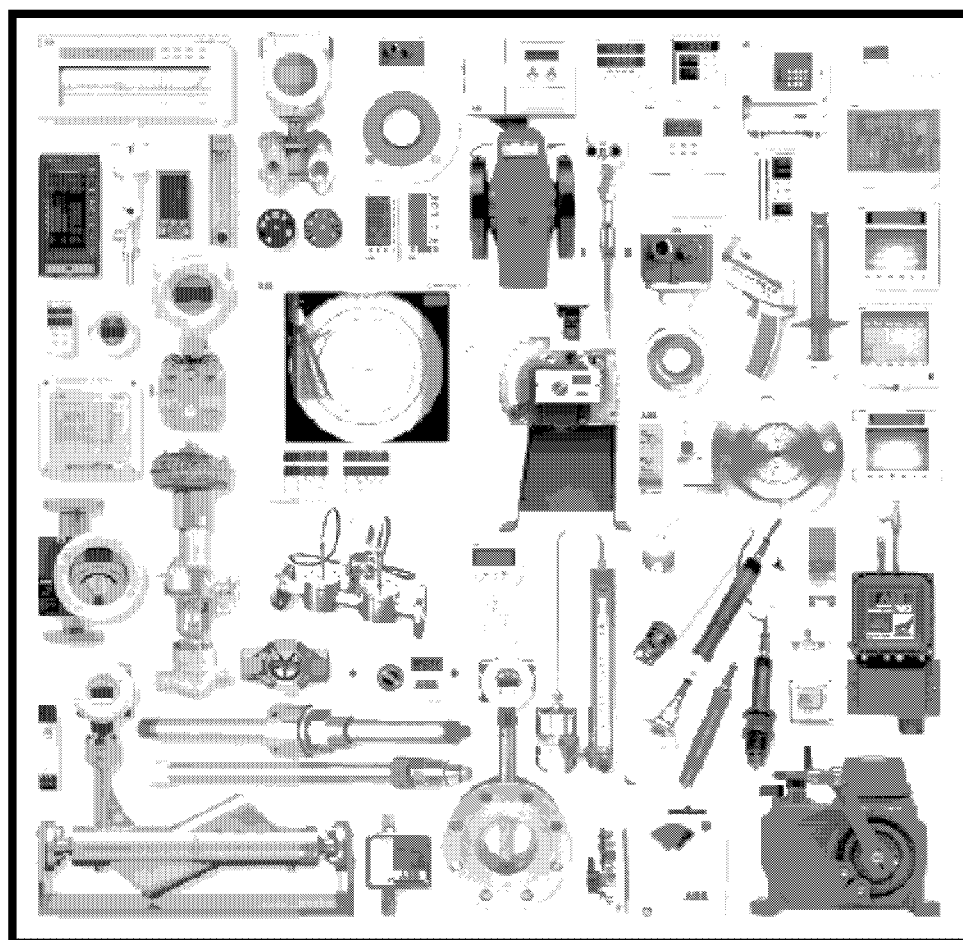


# ***INSTRUCTION BULLETIN***

## ***POSITION TRANSMITTER***

### ***AVPT2020***

## ***TYPE AVPT POSITION TRANSMITTER***



PN24951

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### WARNING

**POSSIBLE PROCESS UPSETS.** Maintenance must be performed only by qualified personnel and only after securing equipment controlled by this product. Adjusting or removing this product while it is in the system may upset the process being controlled. Some process upsets may cause injury or damage.

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## Safety Summary

---

**GENERAL  
WARNINGS**

**RADIO FREQUENCY INTERFERENCE.** Most electronic equipment is influenced by radio frequency interference (RFI). Caution should be exercised with regard to the use of portable communications equipment in the area around such equipment. Prudent practice dictates that signs should be posted in the vicinity of the equipment cautioning against the use of portable communications equipment.

**POSSIBLE PROCESS UPSETS.** Maintenance must be performed only by qualified personnel and only after securing equipment controlled by this product. Adjusting or removing this product while it is in the system may upset the process being controlled. Some process upsets may cause injury or damage.

**RETURN OF EQUIPMENT.** All equipment being returned to Fischer & Porter for repair must be free of any hazardous materials (acids, alkalis, solvents, etc.). A Material Safety Data Sheet (MSDS) for all process liquids must accompany returned equipment. Contact Fischer & Porter for authorization prior to returning equipment.

**INSTRUCTION MANUALS.** Do not install, maintain or operate this equipment without reading, understanding and following the proper Fischer & Porter instructions and manuals, otherwise injury or damage may result.

**SPECIFIC  
WARNINGS**

**Before mounting or installing the Position Transmitter, check nameplate data to make certain the Position Transmitter is suitable for the application desired. DO NOT AT ANY TIME EXCEED THE RATINGS LISTED ON THE NAMEPLATE.**

## Safety Summary (continued)

### **GÉNÉRAUX AVERTISSEMENTS**

**PERTURBATIONS DE LA FREQUENCE RADIOPHONIQUE.** La plupart des équipements électroniques sont sensibles aux perturbations de la fréquence radio. Des précautions devront être prises lors de l'utilisation de matériel de communication portatif. La prudence exige que les précautions à prendre dans ce cas soient signalées aux endroits voulus dans votre usine.

**PROBLÈMES POTENTIELS.** La maintenance doit être réalisée par du personnel qualifié et seulement après avoir sécurisé les équipements contrôlés par ce produit. L'ajustement ou le démontage de ce produit lorsqu'il est lié au système peut entraîner des dysfonctionnements dans le procédé qu'il contrôle. Ces dysfonctionnements peuvent entraîner des blessures ou des dommages.

**RETOUR D'ÉQUIPEMENT.** Tout débitmètre et(ou) convertisseur retourné à Fischer & Porter pour réparation doit être exempt de toute trace de produit dangereux (acide, base, solvant, A). Un certificat de sécurité matériel doit être joint pour tous les liquides utilisés dans le procédé. Contacter Fischer & Porter pour autorisation avant renvoi du matériel.

**MANUEL DE MISE EN ROUTE.** Ne pas installer, maintenir ou utiliser cet équipement sans avoir lu, compris et suivi les instructions et manuels de Fischer & Porter, dans le cas contraire il y a risque d'entraîner blessures ou dommages.

### **SPÉCIFIQUES AVERTISSEMENTS**

Avant le support ou le positionneur d'installation, les données de plaque signalétique de contrôle pour assurer le positionneur conviennent à l'application désirée. **N'EXCÉDEZ PAS À TOUT MOMENT LES ESTIMATIONS ÉNUMÉRÉES SUR LA PLAQUE SIGNALÉTIQUE.**

## Read First

---

*The information in this publication provides technical personnel with installation, operation, calibration, repair and replacement, and maintenance information about Type AVPT Position Transmitters.*

*Throughout this instruction, the term actuator is used to describe the device to which the Position Transmitter interfaces (i.e., valve or diaphragm).*

*It is important for safety reasons that this instruction be read and understood before attempting anything related to installation, calibration, operation, maintenance or repair.*

### **WARNING**

#### **INSTRUCTION MANUALS**

**Do not install, maintain or operate this equipment without reading, understanding and following the proper ABB - Fischer & Porter instructions and manuals, otherwise injury or damage may result.**

#### **RETURN OF EQUIPMENT**

**All equipment being returned to ABB - Fischer & Porter for repair must be free of any hazardous materials (acids, alkalis, solvents, etc.). A Material Safety Data Sheet (MSDS) for all process liquids must accompany returned equipment. Contact ABB - Fischer & Porter for authorization prior to returning equipment.**

***Read these instructions before starting installation;  
save these instructions for future reference.***

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## SECTION 1 - INTRODUCTION

---

### **DESCRIPTION**

Type AVPT Electronic Position Transmitters provide fast and accurate position indication of single or double acting actuators (i.e. cylinders, valves, etc.). Refer to Specifications Section for Position Transmitter performance specifications. The AVPT Position Transmitters use the same housing and mounting dimensions as Type AV Position Transmitters.

The mechanical input to the AVPT is supplied by an adjustable linkage from the actuator. As the actuator changes position, the linkage rotates the transmitter's drive arm and set of gears which provide input to the 4-20 mA Position Transmitter Assembly. This assembly, in turn, produces a 4-20 mA DC signal output proportional to position.

---

### **NEMA 4X Option**

The Type AVPT2020N Position Transmitter is furnished with a NEMA 4X housing. To maintain the NEMA 4X classification, the Position Transmitter shall be installed per drawing C258567 and the conduit connection shall be suitable for a NEMA 4X rating.

---

### **FEATURES**

- **Compact Rugged Design.** Die cast aluminum housing provides long life and maximum environmental protection. The compact housing increases mounting flexibility.
- **Highly Visible Position Status Indicator.** A fluorescent orange position indicator is visible through a polycarbonate window, providing fast indication of actuator position.
- **Adaptable Usage.** The Position Transmitter can indicate the position of both single and double acting, linear and rotary type actuators.

---

### **HOW TO USE THIS INSTRUCTION**

For safety reasons, read and completely understand this instruction before completing any tasks or procedures associated with installation, calibration, operation, maintenance or repair.

The section arrangement of this instruction is sequential. After initial start-up and calibration, store this instruction in a safe place for future reference.

---

**MODELS**

AVPT20200:	Standard
AVPT2020N:	NEMA4X Enclosure Rating

---

**SPECIFICATIONS**

<b>Enclosure Classification</b>	<b>AVPT20200</b> : Standard (NEMA 3R) <b>AVPT2020N</b> : NEMA 4X when installed per drawing C258567.
<b>Input</b>	Mechanical Position
<b>Stroke</b>	25.4 to 101.6 mm (1 to 4 in.) linear; 45° to 100° rotary.
<b>Power Supply Voltage</b>	16 to 34 VDC
<b>Output Signal</b>	4 to 20 mA
<b>Output Loading</b>	500 Ω at 24 VDC, 1000 Ω at 34 VDC
<b>Accuracy</b>	<0.6% of span (maximum)
<b>Hysteresis</b>	<0.5% of span (maximum)
<b>Ambient temperature effect</b>	<0.063% per °C (<0.035% per °F)
<b>EMI/RFI effect</b>	<1.5% maximum at 10 V/m field strength, 20 to 450 MHz
<b>Temperature limits</b>	<b>Operating:</b> -40°C to 82°C (-40°F to 180°F) <b>Storage:</b> -40°C to 93°C (-40°F to 200°F)
<b>Materials:</b>	
<b>Enclosure</b>	Aluminum and <0.5% magnesium
<b>Window</b>	Lexan® (polycarbonate)
<b>Enclosure Screws</b>	Stainless Steel
<b>Fasteners</b>	Steel / Stainless Steel
<b>Gasket/O-Ring</b>	Buna-N
<b>Indicator</b>	Valox
<b>Gears</b>	Delrin
<b>Gear Hub</b>	Brass

<b>Cam Shaft</b>	Stainless Steel
<b>Bearings</b>	Bronze
<b>Drive Arm</b>	Aluminum

**Table 1-1. Agency Approvals<sup>1</sup>**

Approval/Certification <sup>2</sup>	
Factory Mutual Research (FM):	Canadian Standards Association (CSA):
Approved as nonincendive for:	Certified as:
Class I, Division 2, Groups A, B, C and D	Class I, Division 2, Groups A, B, C and D
Class II, Division 2, Groups F and G	Class II, Division 2, Groups E, F and G
Class III, Division 2	Class III, Division 2
Approved as intrinsically safe for:	Certified as intrinsically safe for:
Class I, Division 1, Groups A, B, C and D	Class I, Division 1, Groups A, B, C and D
Class II, Division 1, Groups E, F and G	Class II, Division 1, Groups E, F and G
Class III, Division 1	Class III, Division 1
This product complies with all applicable European Community product requirements, and specifically with those required to display the CE marking on the product nameplate.	

**NOTES:**

1. Hazardous locations approvals for use in flammable atmospheres are for ambient conditions of -25°C to 40°C (-13°F to 104°F), 86 to 106 kPa (12.5 to 15.7 psig) with a maximum oxygen concentration of 21%.
2. For installing the Position Transmitter in a hazardous location, refer to *Product Application Guide, Installing a Type AV Position Transmitter in a Hazardous Location*.

**Table 1-2. Accessories<sup>1</sup>**

Accessory	Description
Mounting kits	Dependent on valve stem size (Figure 5-2, kit number 5327321??).

**NOTE:**

1. For recommended spare parts and additional spare parts, refer to Section 5.

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## SECTION 2 - DESCRIPTION AND OPERATION

---

### **GENERAL**

Two versions of the AVPT Position Transmitter are available:

- AVPT20200 - Standard (NEMA 3R)
- AVPT2020N - NEMA 4X Enclosure

### **DESCRIPTION**

Position transmitters sense the position of the input shaft. This information is supplied by an adjustable linkage from an actuator. As the actuator changes position, the linkage rotates the transmitter's drive arm which is geared to the potentiometer shaft. The resistive change of the potentiometer is sensed by a bridge circuit, producing a voltage proportional to shaft position. EMI/RFI protected circuitry converts the bridge voltage to a 4 to 20 mA DC output signal which is directly proportional to the position of the actuator.

Terminals TB1-1(+) and TB1-2(-) provide customer access to the 4 to 20 mA output signal. A jumper position provides control over direct or reverse-acting operation. Test jacks are available for in-line current monitoring.

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## SECTION 3 - INSTALLATION

---

### ***UNPACKING AND INSPECTION***

1. Check for obvious damage to the shipping carton.
2. Open the carton and remove all loose packing.
3. Carefully remove the Position Transmitter from the carton and inspect for any physical damage that may have occurred during shipping.
4. Remove the two cover screws and the Position Transmitter cover and examine the interior for any loose components such as nuts, screws, etc. Check the data on the nameplate to be certain the Position Transmitter type ordered for the application was received.
5. If the Position Transmitter is suitable for the application and appears undamaged, install the cover and proceed with the installation instructions.
6. If storing the Position Transmitter prior to installation, leave it in the original carton, if possible. Store in an area free from corrosive vapors and extremes in temperature and humidity.
7. Do not store the Position Transmitter in an area that would violate the specifications listed in SECTION 1 - ***SPECIFICATIONS***.

---

### ***ENCLOSURE CLASSIFICATION***

The standard enclosure for the Type AVPT20200 Position Transmitters conform to NEMA 3R which meets the extended corrosion resistance requirements of NEMA 250.

A NEMA 4X version is available as an option (Type AVPT2020N Position Transmitters). To maintain the NEMA 4X classification, the Position Transmitter shall be installed per drawing C258567 and the conduit connections shall be suitable for a NEMA 4X rating.

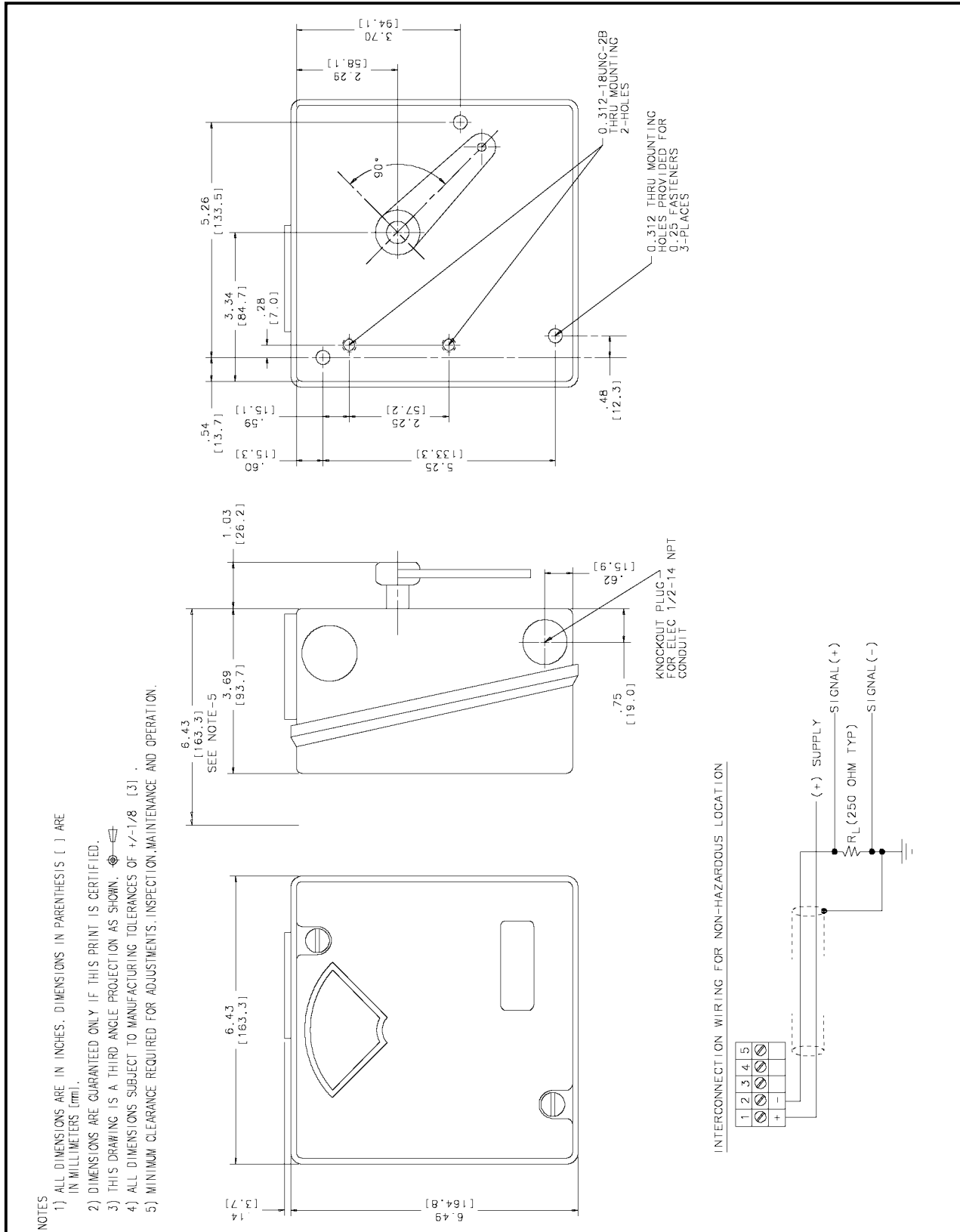


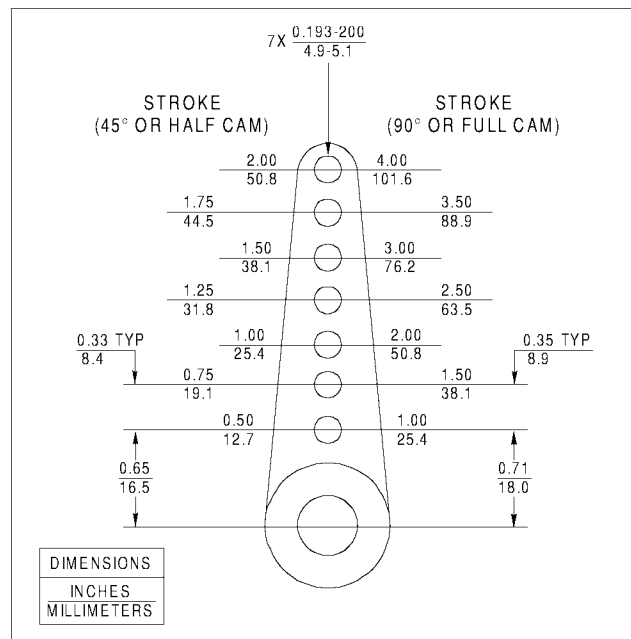
Figure 3-1. External and Mounting Dimensions For AVPT Position Transmitter



**MOUNTING CONSIDERATIONS**

Choose a location for the Position Transmitter based on the following factors:

- Access to the internal Position Transmitter adjustments — the mounting location should provide enough room to remove the cover in order to perform calibration and repair and replacement procedures inside the Position Transmitter. Refer to Figure 3-1 for Position Transmitter dimensions. Figure shows the electrical connections and Figure 3-2 shows the dimensions of the drive arm connections.
- Allow room for linkage to the actuator — the mounting position should be such that a practical linkage arrangement can be made between the Position Transmitter and the actuator for full range travel.



*Figure 3-2. Drive Arm Connections*

**MOUNTING TYPE AVPT POSITION TRANSMITTERS**

- The Type AVPT Position Transmitter can be used with double acting or single acting actuators. External dimensions are shown in Figure 3-1. Figure 3-3 shows a typical mounting arrangement using a Fischer & Porter mounting kit. Refer to Figure 5-2 for an exploded view and complete parts list of the kit.

**NOTE:** If the actuator is equipped with a Type AVPT Position Transmitter as ordered, verify that all the connections are secure and make any adjustments as required

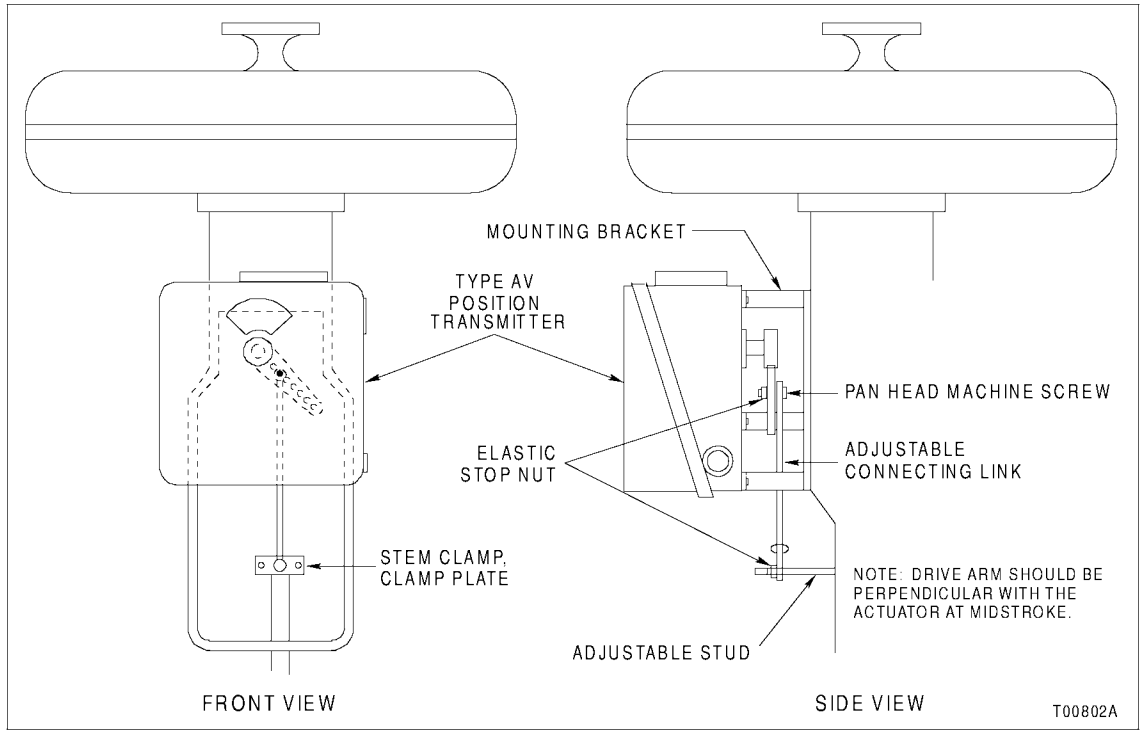


Figure 3-3. Mounting Using Linkage (Typical)

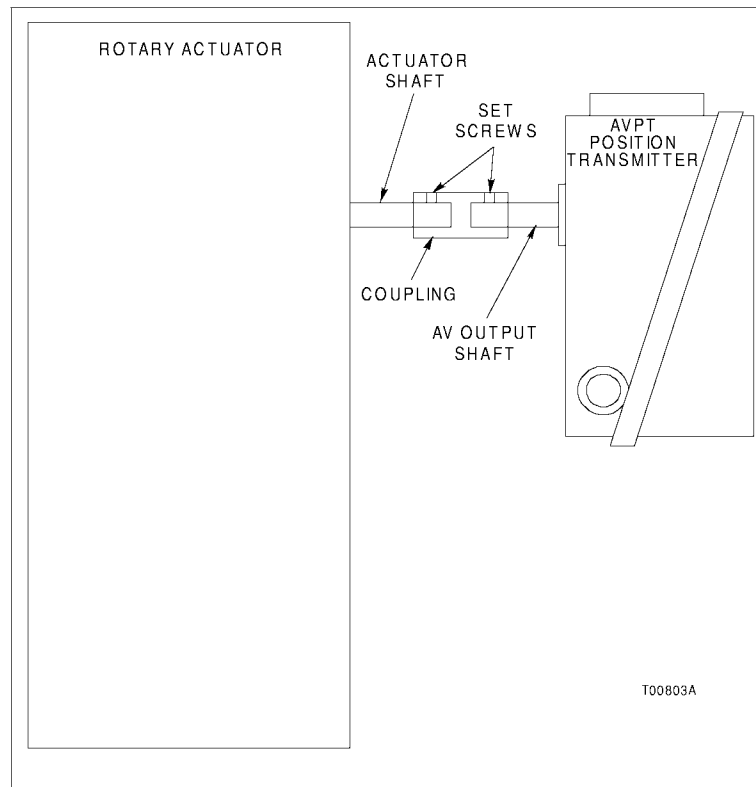


Figure 3-4. Mounting Using Direct Coupling (Typical)

Due to the wide range of applications that the Type AVPT Position Transmitter is suited for, we can only provide general information about mounting. Use the following procedure to mount the Position Transmitter.

**WARNING**

**Before mounting or installing the Position Transmitter, check nameplate data to make certain the Position Transmitter is suitable for the application desired. DO NOT AT ANY TIME EXCEED THE RATINGS LISTED ON THE NAMEPLATE.**

1. Set the actuator at the zero position. Connect the adjustable linkage to the drive arm. The drive arm holes correspond to stroke length of the actuator. Refer to Figure for the stroke length for each drive arm hole.
2. Adjust the connecting linkage so that the output current is equal to 4 mA.
3. Lock all linkage components in place

***WIRING TYPE AVPT Position Transmitter***

Use the following procedure to wire the Type AVPT Position Transmitter:

1. Connect a 24-VDC power supply in series with the required output load (refer to SECTION 1-**SPECIFICATIONS**) to terminals TB1-1(+) and TB1-2 (-) (Refer to Table 3-1 and Figure 3-1).

**NOTE:** If using a twisted shielded pair for signal wiring, ground one end of the shielded pair at the source. Trim the other end of the pair, located inside the enclosure, so that bare wires are not exposed.

**NOTE:** Route the wiring inside the Position Transmitter so it does not become entangled with moving parts. A cable clamp (Figure 3-1) is provided inside the Position Transmitter so entanglement can be avoided

2. Grounding the Position Transmitters should be done in accordance with local electrical codes (in U.S, National Electrical Code, ANSI/NFPA 70. In Canada, Canadian Electrical Code, CSA c22.1). A grounding screw is provided inside the enclosure for grounding, denoted by ⊕.

**NOTES:**

1. The grounding screw located inside the enclosure is a safety ground and should not be used to ground the shielded pair.
2. The Position Transmitter must be grounded to avoid ground loop conditions.

Table 3-1. Power Connections

MODEL	TB1 CONNECTIONS	
	1	2
AVPT2020_	+	-

---

## **RADIO FREQUENCY INTERFERENCE**

Most electronic equipment is influenced by radio frequency interference (RFI). Caution should be exercised with regard to the use of portable communications equipment in the area.

Fischer & Porter recommends posting appropriate signs in the plant. Refer to the site-planning instructions for additional information on RFI.

Under ideal conditions, the use of conduit and shielded wire may not be required. However, to avoid noise problems, it is recommended that wiring be enclosed in conduit. Just prior to entering the housing, rigid conduit should be terminated and a short length of flexible conduit should be installed to reduce any stress.

## SECTION 4 - CALIBRATION

### CALIBRATING THE POSITION TRANSMITTER

Labels located inside the Position Transmitter cover show the location of jumpers, test points, calibration potentiometers and field connection terminals for the position transmitter (Figure 4-1).

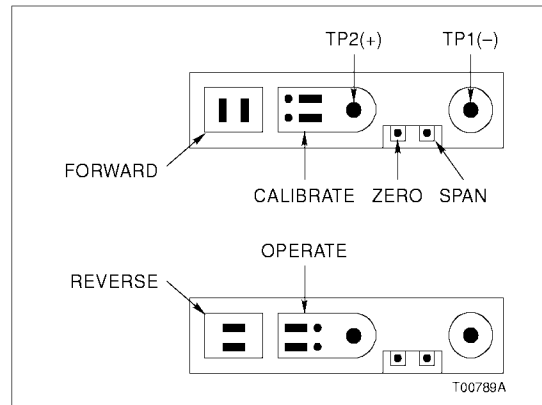


Figure 4-1. Calibration Features for 4 to 20-mA Position Transmitter

1. Remove the FOR/REV jumpers, and place the CAL/OPER jumpers in the calibrate (CAL) position (Fig. 4-1).
  2. Move the actuator to the 50% output position.
  3. Insert ohmmeter leads into test jacks TP1 (-) and TP2 (+). If the resistance value is between 940 and 1060  $\Omega$ , remove the ohmmeter leads and proceed to Step 4. Otherwise continue with Step 3.
    - a. Loosen the set screw on the hub of the small gear using a  $\frac{1}{16}$ -in. Allen wrench (Figure 5-1).
    - b. Use a screwdriver to adjust the shaft on the potentiometer until the ohmmeter reads 1000,  $\pm 10 \Omega$ . While adjusting the resistance, hold the gears and cam shaft stationary so rotation does not occur. Only the potentiometer shaft should move while adjusting the resistance.
- NOTE:** If the mesh between the large and small gears is not tight, adjust the position of the potentiometer mounting bracket (Figure 5-1) so that backlash is eliminated.
- c. Tighten the set screw on the small gear hub.
  - d. Remove the ohmmeter from TB1-1 and TB1-2. Install the screw, flag, nut and washer (Figure 5-1).

4. Place the CAL/OPER jumpers into the operate (OPER) position (Figure 4-1). For direct-acting, place the FOR/REV jumpers in the FOR position. For reverse-acting, place the jumpers in the REV position (Figure 4-1).
5. Connect a 24-VDC external power supply across TB1-1 and TB1-2.
6. Insert ammeter leads into TP2(+) and TP1(-).
7. Move the actuator to the 0% position. Adjust the zero potentiometer to 4.00 mA. Refer to Figure 4-1 for the location of the zero potentiometer.
8. Move the actuator to the 100% position. Adjust the span potentiometer to 20.00 mA. Refer to Figure 4-1 for the location of the span potentiometer.
9. Repeat Steps 7 and 8 until the indicated current readings are obtained.
10. Refer to Section 5 - for list of parts.

## SECTION 5 - PARTS

---

### *GENERAL*

This section provides parts information for the following purposes:

- stocking for spare parts inventory
- replacement purposes.

Should a problem occur with the AVPT Position Transmitter, use Figures 5-1 and 5-2 to locate the parts required for repair or replacement.

Figure 5-1 shows a breakdown of parts for the overall AVPT Position Transmitter.

Figure 5-2 shows the parts supplied with the Mounting Kits for the AVPT Position Transmitter.

PARTS

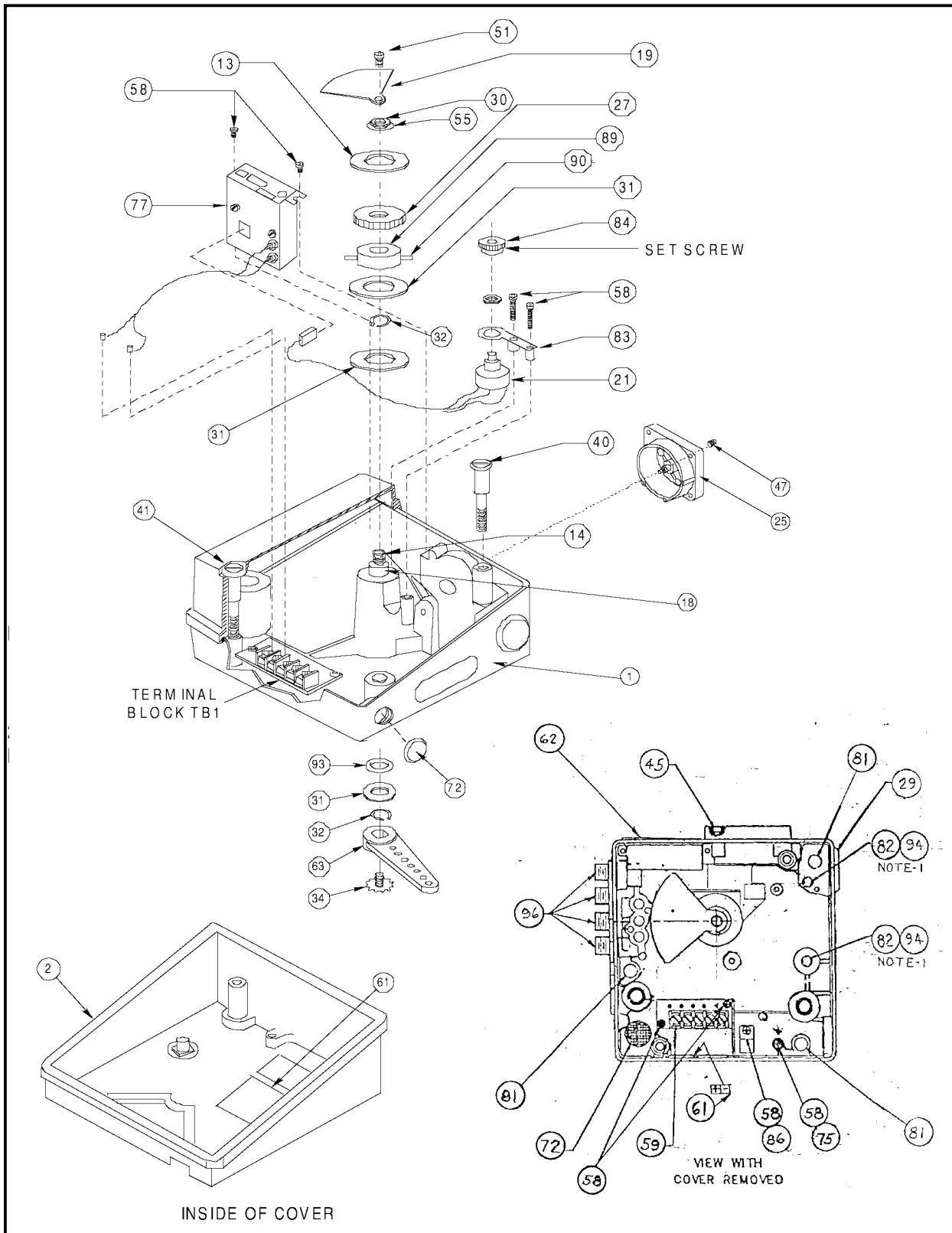


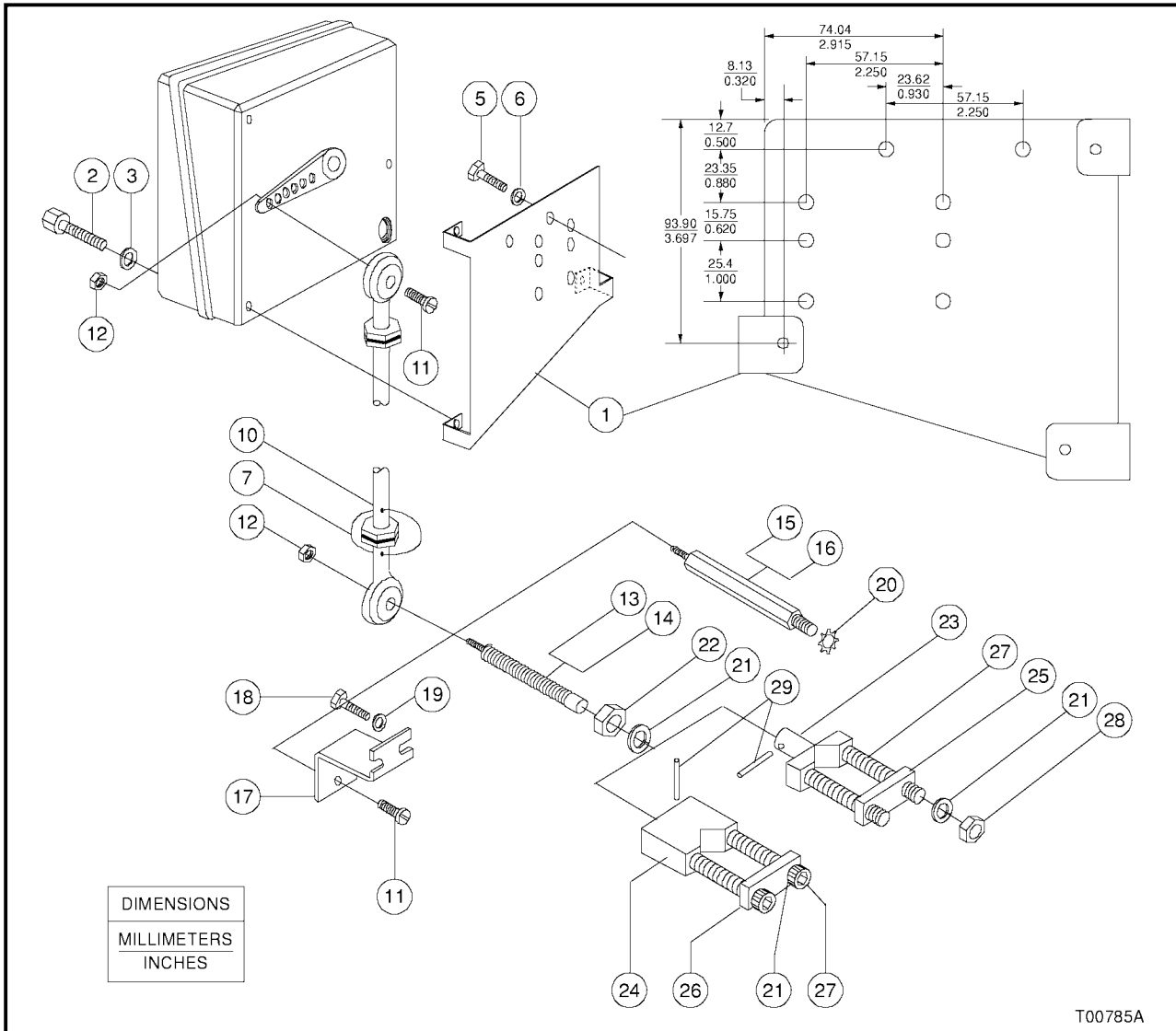
Figure 5-1. Type AVPT Position Transmitter



Table 5-1. Type AVPT Position Transmitter Parts List for Figure 5-1

Item	Part No.	Description	Item	Part No.	Description
1	5400253?3	Housing	57	Form MP432-889	Label, Indicator
2	5400258?1	Cover assembly	58	197893A1	Thread forming screw (12 req)
13	085A816S31	1/2 in. Plain SAE Washer	59	6639559A1	Termination Assembly
14	5400287A1	Cam shaft	61	MP409-393	Label, Terminal Block
18	193214A1	Bearing	62	1963318A10	Nameplate, Universal
19	5400286A1	Indicator	63	5327445A1	Drive arm
21	6639540A1	Potentiometer assembly	72	114B094U01	Button, Plug
25	5400295A1	Diaphragm cover	75	NTMHA13000	Lock Washer, Internal Tooth
27	193243B1	Large position transmitter gear	77	6639479A1	Ass'y, Position Transmitter
29	114B095U01 1943573A1	Plug button, Standard Plug button, NEMA4X	81	1951755A1	Bumper Grommet
30	197120A28	Cam nut	82	1951755A2	Bumper Grommet
31	19734A45	Washers	83	5400268B2	Potentiometer Mtg. Bracket
32	197777A50	Retaining ring, cam (2 req)	84	193242A1	Gear, Non-Metallic
34	197227A1	Special hex head sems screw	86	1943187A1	Cable clip, Nylon
40	NBZHA21014	Cover screw	89	5400317A1	Gear Adaptor
41	NBZHA21040	Cover screw	90	NKJHA13004	Socket Set Screw, Cup
45	NBAHA13006	Diaphragm cover screw (4 req)	93	1951631A206	Seal. O-Ring
47	197865A1	Stroke adjustment screw	94	NKJHA23006	Socket Set Screw, Cup
51	NIDHA13005	Indicator screw	95	258567A1	Kit, NEMA-4X Mtg. (not shown)
55	NTGHA10000	Cam washer	96	1951041A1	Pipe plug
<b>NOTES (Refer to Figure 5-1):</b>					
1. For NEMA 4X version, Item 94 is used; For STANDARD version, Item 82 is used.					
2. Item 95 is not shown. It is placed inside Position Transmitter package for the NEMA 4X version.					

**MOUNTING KITS**



**Figure 5-2. Mounting Kits**

**Table 5-2. Position Transmitter Mounting Kit Number 5327321?12<sup>1</sup>**  
 Valve Stem Diameter 0.375 to 0.750 in. (Figure 5-2)

Item	Part Number	Description	Item	Part Number	Description
1	5400266?1	Position Transmitter mounting bracket	12	197120?5	Nut, elastic stop (2 req)
2	0.250-20 x 0.750	Screw, socket head (3 req)	13	5311690?1	Adjustable stud, 2.69 in.
3	0.250	Lock washer, reg spring (3 req)	14	5311690?2	Adjustable stud, 3.43 in.
5	0.312-18 x 0.625	Cap screw, hex socket head (2 req)	21	0.375	Lock washer, med spring (3 req)
6	0.312	Lock washer, reg spring (2 req)	22	0.375-24	Nut, hex jam
7	R6440-005	Type 347 stainless steel wire, 0.300 diameter, 6-in. length	23	5311687?2	Stem clamp, 0.375 - 0.750-in. dia
8 <sup>2</sup>	19934?248	Spacer	25	5311691?1	Clamp plate, 0.375 - 0.750-in. dia

**Table 5-2. Position Transmitter Mounting Kit Number 5327321?12<sup>1</sup>** (continued)  
Valve Stem Diameter 0.375 to 0.750 in. (Figure 5-2)

Item	Part Number	Description	Item	Part Number	Description
9 <sup>2</sup>	0.190-32 x 1.125	Screw, pan head machine	27	0.375-16 x 1.50	Screw, hex skt head cap (2 req)
10	5312449?4	Connecting link, 12-in. length (cut to fit)	28	0.375-16	Nut, hex jam (2 req)
11 <sup>2</sup>	0.190-32 x 0.875	Screw, pan head machine (2 req)	29	0.125 dia x 0.750	Groove pin, type 1

**NOTES:**

1. Position Transmitter mounting kits for direct or reverse acting diaphragm actuators and single or double acting piston actuators with linear (reciprocating) motion.
2. When fastening Item 10 to the drive arm at the first hole (nearest the drive shaft), use Items 8 and 9 and omit one of Item 11.

**Table 5-3. Position Transmitter Mounting Kit Number 5327321?13<sup>1</sup>**  
Valve Stem Diameter 0.750 to 1.000 in. (Figure 5-2)

Item	Part Number	Description	Item	Part Number	Description
1	5400266?1	Position Transmitter mounting bracket	11 <sup>2</sup>	0.190-32 x 0.875	Screw, pan head machine (2 req)
2	0.250-20 x 0.750	Screw, socket head (3 req)	12	197120?5	Nut, elastic stop (2 req)
3	0.250	Lock washer, reg spring (3 req)	14	5311690?2	Adjustable stud, 3.43 in.
5	0.312-18 x 0.625	Cap screw, hex socket head (2 req)	21	0.375	Lock washer, med spring (3 req)
6	0.312	Lock washer, reg spring (2 req)	22	0.375-24	Nut, hex jam
7	R6440-005	Type 347 stainless steel wire, 0.300 diameter, 6-in. length	24	5312483?1	Stem clamp, 0.750 - 1.00-in. dia
8 <sup>2</sup>	19934?248	Spacer	26	5312471?1	Clamp plate, 0.750 - 1.00-in. dia
9 <sup>2</sup>	0.190-32 x 1.125	Screw, pan head machine	27	0.375-16 x 1.50	Screw, hex skt head cap (2 req)
10	5312449?4	Connecting link, 12-in. length (cut to fit)	29	0.125 dia x 0.750	Groove pin, type 1

**NOTES:**

1. Position Transmitter mounting kits for direct or reverse acting diaphragm actuators and single or double acting piston actuators with linear (reciprocating) motion.
2. When fastening Item 10 to the drive arm at the first hole (nearest the drive shaft), use Items 8 and 9 and omit one of Item 11.

**Table 5-4. Position Transmitter Mounting Kit Number 5327321?14<sup>1</sup>** (for use on Fisher Actuators)  
Valve Stem Diameter 0.375 to 0.750 in. (Figure 5-2)

Item	Part Number	Description	Item	Part Number	Description
1	5400266?1	Position Transmitter mounting bracket	11 <sup>2</sup>	0.190-32 x 0.875	Screw, pan head machine (2 req)
2	0.250-20 x 0.750	Screw, socket head (3 req)	12	197120?5	Nut, elastic stop (2 req)
3	0.250	Lock washer, reg spring (3 req)	15	5319500?11	Drive stud, 4.59 in.
5	0.312-18 x 0.625	Cap screw, hex socket head (2 req)	16	5319500?1	Drive stud, 3.43 in.
6	0.312	Lock washer, reg spring (2 req)	17	5328155?1	Stud bracket
7	R6440-005	Type 347 stainless steel wire, 0.300 diameter, 6-in. length	18	0.312-18 x 0.500	Screw, hex head cap (2 req)
8 <sup>2</sup>	19934?248	Spacer	19	1218-00	Lock washer, shakeproof (2 req)
9 <sup>2</sup>	0.190-32 x 1.125	Screw, pan head machine	20	5319524?1	Lock washer, star
10	5312449?4	Connecting link, 12-in. length (cut to fit)			

**NOTES:**

1. Position Transmitter mounting kits for direct or reverse acting diaphragm actuators and single or double acting piston actuators with linear (reciprocating) motion.
2. When fastening Item 10 to the drive arm at the first hole (nearest the drive shaft), use Items 8 and 9 and omit one of Item 11.

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PN24951



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