

# Type 3610J and 3620J Series Positioners

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**3620JP POSITIONER WITH TYPE 1061 ACTUATOR AND DESIGN V500 VALVE**



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**TYPE 3610J POSITIONER AND BYPASS VALVE WITH TYPE 1052 ACTUATOR, AND edisc VALVE**

*Figure 1. Typical Positioners*



# 3610J and 3620J Positioners

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## Introduction

### Scope of Manual

This instruction manual includes installation, operation, calibration, maintenance, and parts ordering information for the 3610J and 3620J Series positioners. (i.e. Type 3610J, 3610JP, 3611JP, 3620J, 3620JP, and 3621JP). This manual also provides field installation information for the Type 3622 electro-pneumatic converter. Refer to separate instruction manuals for information on the actuator and control valve.

No person may install, operate or maintain a 3610J or 3620J Series positioner without first ● being fully trained and qualified in valve, actuator and accessory installation, operation and maintenance, and ● carefully reading and understanding the



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Figure 2. Type 3621JP Positioner with Type 585C Actuator

contents of this manual. If you have any questions about these instructions, contact your Fisher sales office.

### Note

**Emerson Process Management does not assume responsibility for the selection, use, or maintenance of any product. Responsibility for the selection, use, and maintenance of any Fisher product remains with the purchaser and end-user.**

### Description

The Type 3610J or 3610JP pneumatic positioners and the Type 3620J or 3620JP electro-pneumatic positioners are used with diaphragm rotary actuators and with piston rotary actuators as shown in figure 1. The Type 3611JP and 3621JP positioners are used with the Type 585, 585R, 585C, or 585CR sliding stem actuators as shown in figure 2.

The positioner mounts integrally to the actuator housing and provides a valve ball, disk, or plug position for a specific input signal. The positioner accepts either a pneumatic or milliamper input signal. Refer to the Type Number Description for a detailed explanation of type numbers.

Table 1. Specifications

<p><b>Unless otherwise specified, the specifications listed are for all positioner type numbers</b></p> <p><b>Available Configurations</b> Refer to the type number description</p> <p><b>Input Signal<sup>(1)</sup></b> <b>Type 3610J, 3610JP, and 3611JP:</b> Standard: ■ 0.2 to 1.0 bar (3 to 15 psig), ■ 0.4 to 2.0 bar (6 to 30 psig), or ■ split range, see table 8 <i>Adjustable:</i> Zero is adjustable from 0.07 to 1.5 bar (1 to 22 psig) for standard valve rotations or valve travels. Span is adjustable from 0.2 to 2.0 bar (3.2 to 28.8 psi) for standard valve rotations or valve travels. Adjustment locations are shown in figure 13. <b>Type 3620J, 3620JP, and 3621JP:</b> 4 to 20 mA dc constant current with 30 V dc maximum compliance voltage. Minimum terminal voltage is 2.4 V dc at 20 mA. Split range is also available, see table 8.</p> <p><b>Equivalent Circuit</b> <b>Type 3620J, 3620JP, and 3621JP:</b> 120 ohms shunted by three 5.6 V zener diodes</p> <p><b>Output Signal<sup>(1)</sup></b> Pneumatic pressure as required by the actuator up to full supply pressure <b>Action<sup>(2)</sup>:</b> Field-reversible between ■ direct and ■ reverse within the pneumatic positioner</p> <p><b>Typical Performance for Type 3610J, 3610JP, 3620J, and 3620JP Positioners with Type 1051, 1052, and 1061 Actuators</b> <b>Independent Linearity<sup>(1)</sup></b> <i>Direct-Acting Type 3610J and 3620J:</i> ±1.5% of output span <i>Reverse-Acting Type 3610J and 3620J:</i> ±0.75% of output span <i>Direct-Acting Type 3610JP and 3620JP:</i> ±1.25% of output span <i>Reverse-Acting Type 3610JP and 3620JP:</i> ±0.5% of output span <b>Hysteresis<sup>(1)</sup></b> <i>Type 3610J:</i> 1.0% of output span</p>	<p><i>Type 3620J:</i> 0.75% of output span <i>Type 3610JP:</i> 0.5% of output span <i>Type 3620JP:</i> 0.6% of output span <b>Deadband<sup>(1)</sup>:</b> 0.1% of input span</p> <p><b>Refer to table 3 for typical performance for Type 3611JP and 3621JP Positioners</b></p> <p><b>Electromagnetic Interference (EMI)<sup>(1)</sup></b> <i>Type 3620J, 3620JP, 3621JP and 3622:</i> Tested per IEC 61326-1 (Edition 1.1). Meets emission limits for Class A equipment (industrial locations) and Class B equipment (domestic locations). Meets immunity requirements for industrial locations (Table A.1). Immunity performance is shown in table 2.</p> <p><b>Maximum Supply Air Demand<sup>(3)</sup></b> <b>Type 3610J and 3620J:</b> <i>1.4 bar (20 Psig) Supply:</i> 13 normal m<sup>3</sup>/hour (490 scfh) <i>2.4 bar (35 Psig) Supply:</i> 17 normal m<sup>3</sup>/hour (640 scfh) <b>Type 3610JP, 3620JP, 3611JP, and 3621JP:</b> <i>5.2 Bar (75 Psig) Supply:</i> 37 normal m<sup>3</sup>/hour (1380 scfh) <i>6.9 Bar (100 Psig) Supply:</i> 46 normal m<sup>3</sup>/hour (1700 scfh)</p> <p><b>Operating Influences<sup>(1)</sup> for Type 3610J, 3610JP, 3620J, and 3620JP</b> <b>Supply Pressure Sensitivity:</b> A 10% change in supply pressure changes the valve shaft position less than the following percentages of valve rotation: <i>Type 3610J and 3620J:</i> 1.0% at 1.4 bar (20 psig) supply pressure <i>Type 3610JP and 3620JP:</i> 1.5% at 4.1 bar (60 psig) supply pressure</p> <p><b>Supply Pressure<sup>(1,4)</sup></b> <b>Minimum Recommended:</b> 0.3 bar (5 psig) above actuator requirement [1.4 bar (20 psig) for a 0.2 to 1.0 bar (3 to 15 psig) nominal actuator signal; 2.4 bar (35 psig) for a 0.4 to 2.0 bar (6 to 30 psig) nominal actuator signal] <b>Maximum:</b> 10.3 bar (150 psig) or maximum pressure rating of the actuator, whichever is lower.</p>
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# 3610J and 3620J Positioners

Table 1. Specifications (Continued)

<p><b>Steady-State Air Consumption<sup>(3)</sup></b>  <b>Type 3610J:</b> 0.40 normal m<sup>3</sup>/hour (15 scfh) at 1.4 bar (20 psig) supply pressure  <b>Type 3610JP:</b> 0.64 normal m<sup>3</sup>/hour (24 scfh) at 6.9 bar (100 psig) supply pressure  <b>Type 3620J:</b> 0.49 normal m<sup>3</sup>/hour (18.2 scfh) at 1.4 bar (20 psig) supply pressure  <b>Type 3620JP:</b> 0.93 normal m<sup>3</sup>/hour (35.0 scfh) at 6.9 bar (100 psig) supply pressure</p> <p><b>Operative Temperature Limits<sup>(1,4)</sup></b>          -40 to 82°C (-40 to 180°F)</p> <p><b>Electrical Classification for Type 3620J, 3620JP, and 3621JP</b></p> <p><b>Hazardous Area:</b></p> <p> Explosion proof, Dust-Ignition proof, DIV 2, Intrinsically Safe</p> <p> Explosion proof, Non-incendive, Dust-Ignition proof, Intrinsically Safe</p> <p><b>ATEX</b> Intrinsically Safe, Type n and Flameproof (Gas Atmospheres Only)</p> <p><b>SAA</b> Intrinsically Safe, Type n and Flameproof</p> <p>Refer to the Hazardous Area Classification bulletin and the positioner nameplate (see figure 31) for specific approvals.</p>	<p><b>Housing Classification for Type 3620J, 3620JP, and 3621JP</b>          NEMA 3, IEC 529 IP54; Instrument should be mounted with vent on side or bottom to meet weatherproofing classification</p> <p><b>Pressure Connections</b>          1/4-inch NPT female</p> <p><b>Conduit Connection for Type 3620J, 3620JP, and 3621JP</b>          1/2-inch NPT female (standard), M20 or PG13 adapter (optional)</p> <p><b>Rotary Valve Rotation</b>          60, 75, or 90 degrees</p> <p><b>Sliding Stem Valve Travel</b></p> <table border="1"> <thead> <tr> <th>mm</th> <th>Inches</th> </tr> </thead> <tbody> <tr> <td>11</td> <td>0.4375</td> </tr> <tr> <td>19 to 51</td> <td>0.75 to 2</td> </tr> <tr> <td>29 to 51</td> <td>1.125 to 2</td> </tr> <tr> <td>51 to 102</td> <td>2 to 4</td> </tr> </tbody> </table> <p><b>Approximate Weight</b>  <b>3610J Series:</b> 2.5 kg (5.6 pounds)  <b>3620J Series:</b> 3.6 kg (8.0 pounds)</p>	mm	Inches	11	0.4375	19 to 51	0.75 to 2	29 to 51	1.125 to 2	51 to 102	2 to 4
mm	Inches										
11	0.4375										
19 to 51	0.75 to 2										
29 to 51	1.125 to 2										
51 to 102	2 to 4										

1. This term is defined in ISA Standard S51.1  
 2. For direct action, an increasing input signal extends actuator rod. For reverse action, an increasing input signal retracts actuator rod.  
 3. Normal m<sup>3</sup>/hr—Normal cubic meters per hour (0°C and 1.01325 bar, absolute). Scfh—Standard cubic feet per hour (60°F and 14.7 psia).  
 4. The pressure and temperature limits in this manual, and any applicable code or standard should not be exceeded.

Table 2. EMC Immunity Performance Criteria

Port	Phenomenon	Basic Standard	Performance Criteria <sup>(1)</sup>
Enclosure	Electrostatic Discharge (ESD)	IEC 61000-4-2	A
	Radiated EM field	IEC 61000-4-3	A
	Rated power frequency magnetic field	IEC 61000-4-8	A
I/O signal/control	Burst	IEC 61000-4-4	A
	Surge	IEC 61000-4-5	B
	Conducted RF	IEC 61000-4-6	A

Specification limit = ±1% of span  
 1. A= No degradation during testing. B= Temporary degradation during testing, but is self-recovering.

*Table 3. Typical Performance Specifications<sup>(1)</sup> for Type 3611JP and Type 3621JP Positioners with Type 585, 585R, 585C, and 585CR Actuators*

Characteristic	Type 585C and 585CR Size 25 Actuator <sup>(9)</sup>	Type 585C and 585CR Size 50 Actuator <sup>(9)</sup>	Type 585 and 585R Size 100 Actuator Standard	Type 585 and 585R Size 100 Actuator with Boosters <sup>(2)</sup>
Deadband <sup>(1,3)</sup>	0.1% of input span	0.1% of input span	0.1% of input span	0.1% of input span
Step Response <sup>(1,4,6)</sup>	0.3 seconds	0.3 seconds	2 seconds	0.3 seconds
Steady-State Air Consumption <sup>(3,5,8)</sup>	0.01 normal m <sup>3</sup> /min (0.4 scfm)	0.01 normal m <sup>3</sup> /min (0.4 scfm)	0.01 normal m <sup>3</sup> /min (0.4 scfm)	0.01 normal m <sup>3</sup> /min (0.4 scfm)
Hysteresis <sup>(3)</sup>	0.5% of output span	0.5% of output span	0.5% of output span	0.5% of output span
Terminal-Based Linearity <sup>(3,7)</sup>	1% of output span	1% of output span	1% of output span	1% of output span
Frequency Response <sup>(1,3)</sup> (-6 dB)	2 Hz	2 Hz	0.2 Hz	2 Hz
Supply Pressure Sensitivity	10% change in supply pressure changes the actuator stem position less than 0.1%			

1. Performance tests are based on 6.9 bar (100 psig) supply pressure and lightest actuator springs. Performance will vary with other pressures and springs.  
 2. Equipped with two Type 2625 boosters with 1/2 inch supply and exhaust ports.  
 3. These terms are defined in ISA Standard S51.1.  
 4. Step response is the time for the actuator to reach 63 percent of expected travel after a 10 percent step change in input signal.  
 5. At 6.9 bar (100 psig) supply pressure. Normal m<sup>3</sup>/min-cubic meters per minute (0°C and 1.01325 bar). Scfm--standard cubic feet per minute (60°F and 14.7 psia).  
 6. Type 3621JP positioner step response equals 0.4 seconds.  
 7. Type 3621JP positioner terminal-based linearity equals ±2.25%.  
 8. Type 3621JP positioner steady-state air consumption equals 0.02 normal m<sup>3</sup>/min (0.58 scfm).  
 9. Size 25 and 50 actuators tested with appropriate parallel flexure (key 179).

**Type Number Description**

The following descriptions provide specific information on the different positioner constructions. If the type number is not known, refer to the nameplate on the positioner. For the nameplate location, refer to key 157, figure 25.

**Type 3610J:** A single-acting pneumatic rotary valve positioner for use with Type 1051 and 1052 actuators.

**Type 3610JP:** A double-acting pneumatic rotary valve positioner for use with Type 1061 and 1069 actuators.

**Type 3611JP:** A double-acting pneumatic sliding stem valve positioner for use with Type 585, 585R, 585C, and 585CR actuators.

**Type 3620J:** A single-acting electro-pneumatic rotary valve positioner for use with Type 1051 and 1052 actuators.

**Type 3620JP:** A double-acting electro-pneumatic rotary valve positioner for use with Type 1061 and 1069 actuators.

**Type 3621JP:** A double-acting electro-pneumatic sliding stem valve positioner for use with Type 585, 585R, 585C, and 585CR actuators.

**Type 3622:** An electro-pneumatic converter used for conversion of a 4 to 20 milliampere dc input signal to a 0.2 to 1.0 bar (3 to 15 psig) input signal for the pneumatic positioner. Use this unit in combination with a Type 3610J, 3610JP, or 3611JP positioner to make a Type 3620J, 3620JP or a 3621JP positioner.

**Specifications**

Specifications for the valve positioners are shown in table 1. Performance specifications for the Type 3611JP and 3621JP positioners are shown in table 3.



**WARNING**

**This product is intended for a specific range of pressure, temperatures and other application specifications. Applying different pressure, temperature and other service conditions could result in malfunction of the product, which could cause property damage or personal injury.**

**Installation**

Normally, a positioner is shipped with the actuator. If so, the factory mounts and calibrates the positioner and connects the positioner to actuator tubing. If the positioner is ordered separately from the actuator, perform the appropriate mounting procedure, and follow the Calibration procedures in this instruction manual. Refer to the appropriate instruction manuals for actuator and valve mounting procedures.



**WARNING**

**Avoid personal injury from sudden release of process pressure. Before mounting the positioner:**

# 3610J and 3620J Positioners

- **Always wear protective clothing and eyewear when performing any installation operations to avoid personal injury.**

- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**

- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure on both sides of the valve.**

- **Vent the power actuator loading pressure and relieve any actuator spring precompression.**

- **When installing 3620J Series positioners in a hazardous area, turn off control signals until installation is complete. Be sure all safety barriers, connections, and the converter housing cap and O-ring are properly installed before applying a control signal to the unit.**

- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**

- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

## Mounting Type 3610J, 3610JP, 3620J, and 3620JP Positioners

During the following mounting procedures, refer to figure 3 for part locations. Refer to figure 28 for key number locations unless otherwise indicated.

1. Mark the positions of the travel indicator and actuator cover. Then, remove the actuator travel indicator machine screws, travel indicator, and actuator cover cap screws.

2. Remove the positioner plate from the actuator housing.

3. For actuator styles A and D, proceed to the note before step 7. For actuator styles B and C, continue with step 4.

4. Disconnect the actuator turnbuckle from the lever arm.

### Note

**Do not change the position of the rod end bearing on the end of the turnbuckle.**

5. Loosen the lever clamping bolt in the lever.

6. Mark the lever/valve shaft orientation, and remove the lever.

### Note

**Cams A, B, and C have the letter D (direct acting) on one side and the letter R (reverse acting) on the other side. Always install the cam with the letter D on the same side as the cam mounting screw heads (key 83, figure 3).**

7. Install the desired cam (key 82) on the actuator lever with the cam mounting screws (key 83). Cams B and C use the cam adjustment indicator (key 84) between the screw heads and the cam. Align the cam adjustment indicator with the desired total valve rotation indication on the cam. Cam A does not use the cam adjustment indicator and does not require adjustment.

8. For actuator styles A and D, proceed to step 11. For actuator styles B and C, continue with step 9.

9. Slide the lever/cam assembly (cam side first) onto the valve shaft. Orient the lever with the shaft as noted in step 6, and tighten the lever clamping bolt.

### Note

**Refer to the appropriate actuator instruction manual to determine the distance required between the housing face and the lever face and to determine the proper tightening torque for the lever clamping bolt.**

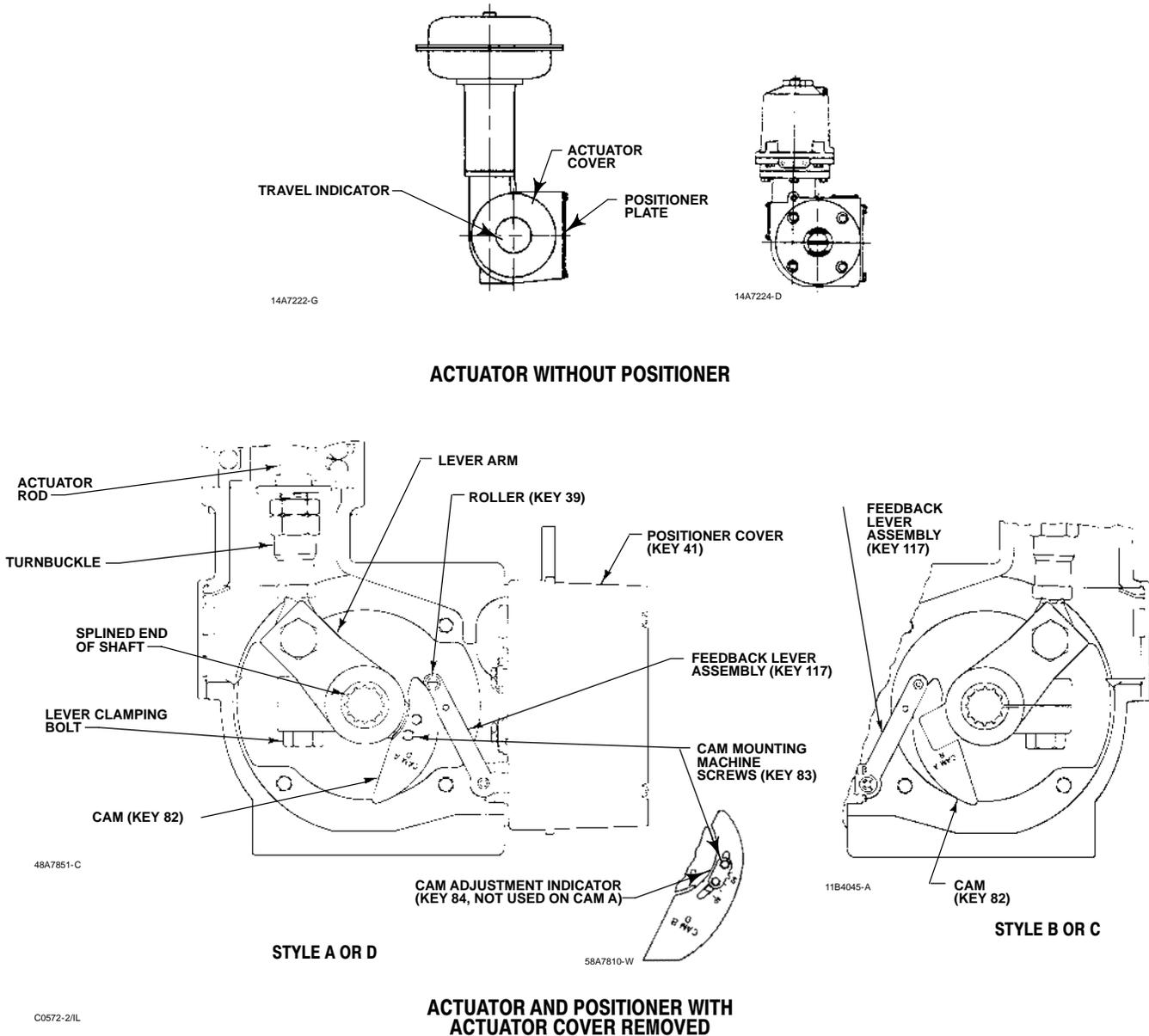


Figure 3. Typical Mounting Details for 3610J and 3620J Series Positioners on Rotary Actuators

10. Connect the turnbuckle and the lever arm.
11. Remove the positioner cover (key 41) from the positioner. Slide the positioner into the actuator housing so the cam roller (key 39) rests on the cam. Insert and tighten the socket head screws (key 54) to secure the positioner to the actuator housing.
12. Replace the actuator cover and the travel indicator in the positions that were marked in step 1.

**Note**

To aid cover alignment on the Type 1051 and 1052 actuators, use a regulated air source to move the actuator slightly away from its upper travel stop. If hole alignment is still not possible, temporarily loosen the cap screws that secure the housing to the mounting yoke, and shift the housing slightly.

# 3610J and 3620J Positioners

## CAUTION

To avoid parts damage, do not completely stroke the actuator while the cover is removed.



## WARNING

To avoid personal injury from moving parts, keep fingers and tools clear while stroking the actuator with the cover removed.

### Changing Cams—Actuator Styles A, B, C, and D

During the following procedures, refer to figure 3 for part locations and refer to figure 28 for key number locations unless otherwise indicated.

1. Mark the positions of the travel indicator and actuator cover. Then, remove the actuator travel indicator machine screws, travel indicator, and actuator cover cap screws.
2. Remove the positioner plate from the actuator housing.
3. For actuator styles A and D, proceed to the note before step 7. For actuator styles B and C, continue with step 4.
4. Disconnect the actuator turnbuckle from the lever arm.

#### Note

Do not change the position of the rod end bearing on the end of the turnbuckle.

5. Loosen the lever clamping bolt in the lever.
6. Mark the lever/valve shaft orientation, and remove the lever.

#### Note

Cams A, B, and C have the letter D (direct acting) on one side and the letter R (reverse acting) on the other side. Always install the cam with the letter D on the same side as the cam mounting screw heads (key 83, figure 3).

7. Install the desired cam (key 82) on the actuator lever with the cam mounting screws (key 83). Cams B and C use the cam adjustment indicator (key 84) between the screw heads and the cam. Align the cam adjustment indicator with the desired total valve rotation indication on the cam. Cam A does not use the cam adjustment indicator and does not require adjustment.

8. For actuator styles A and D, proceed to step 11. For actuator styles B and C, continue with step 9.

9. Slide the lever/cam assembly (cam side first) onto the valve shaft. Orient the lever with the shaft as noted in step 6, and tighten the lever clamping bolt.

#### Note

Refer to the appropriate actuator instruction manual to determine the distance required between the housing face and the lever face and to determine the proper tightening torque for the lever clamping bolt.

10. Connect the turnbuckle and the lever arm.

11. Replace the actuator cover and the travel indicator in the positions that were marked in step 1.

#### Note

To aid cover alignment on the Type 1051 and 1052 actuators, use a regulated air source to move the actuator slightly away from its upper travel stop. If hole alignment is still not possible, temporarily loosen the cap screws that secure the housing to the mounting yoke, and shift the housing slightly.

## CAUTION

To avoid parts damage, do not completely stroke the actuator while the cover is removed.



## WARNING

To avoid personal injury from moving parts, keep fingers and tools clear while stroking the actuator with the cover removed.

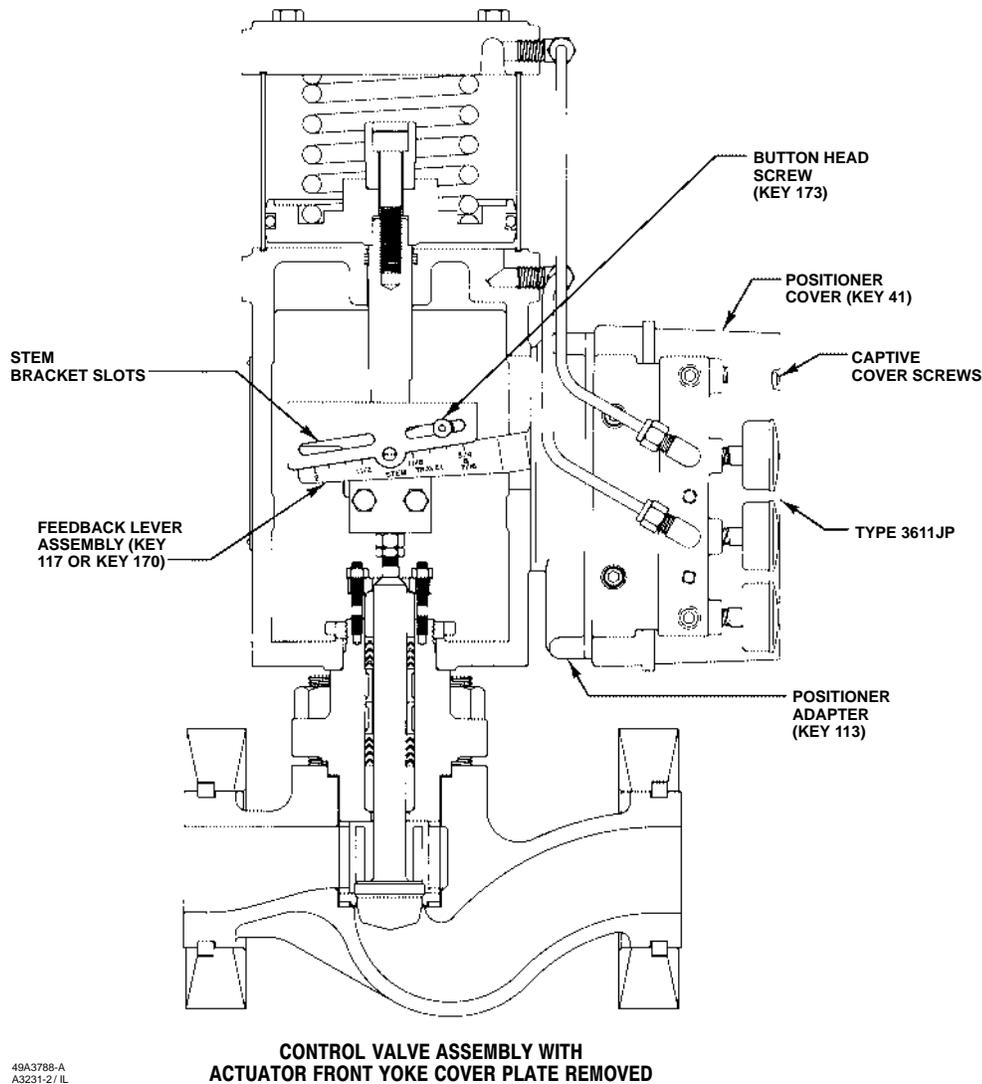


Figure 4. Typical Mounting Details for Type 3611JP and 3621JP Positioners on 585 Series Actuators

### Mounting Type 3611JP and 3621JP Positioners on 585 and 585R Size 100 Actuators

Refer to figure 4 for part locations. Refer to figure 29 for key number locations unless otherwise indicated.

1. Refer to the appropriate actuator instruction manual. Loosen the four screws, and remove the front yoke cover plate from the actuator.

2. Stroke the actuator from the top stop to the bottom stop, and record the travel distance.

3. Loosen the four captive cover screws and remove the positioner cover (key 41, figure 28).

4. Refer to the appropriate actuator instruction manual. Loosen the four screws, and remove the actuator blanking plate.

5. Attach the positioner adapter (key 113) to the actuator with four socket head screws (key 54).

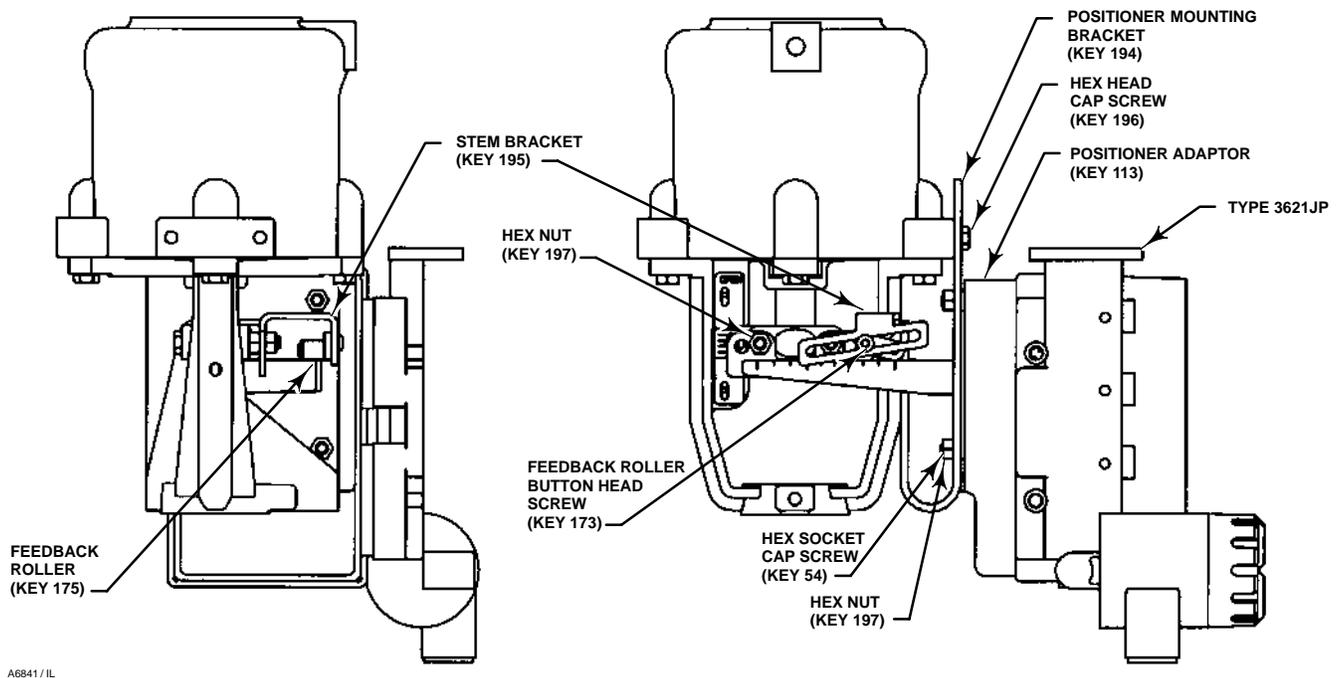


Figure 5. Typical Mounting Details for Type 3611JP and 3621JP Positioners on Type 585C Actuator

6. Disconnect the positioner range spring (key 150, figure 25) from the range spring hanger (key 130, figure 25).

7. Attach the roller (key 175) and washers (key 184) to the adjuster assembly (key 174) and secure with the retaining ring (key 172).

8. Apply pressure to the actuator piston and move the actuator to approximately the mid-travel position.

9. Install the positioner on the actuator so the feedback lever assembly (key 170) is under the stem bracket and secure the positioner to the adapter (key 113) with the four socket head screws (key 54).

10. With the actuator still at mid-travel and the top edge of the feedback lever assembly perpendicular to the actuator stem, install the adjuster assembly/roller in the appropriate stem bracket slot with the button head screw (key 173) so the roller is centered over the correct actuator travel marked on the feedback lever assembly (key 170) as shown in figure 4.

11. Tighten the button head screw (key 173) and replace the range spring (key 150, figure 25).

12. For size 100 actuators with greater than a 51 mm (2-inch) travel, install the feedback lever spring (key 185).

13. Replace the positioner cover.

14. Replace the front actuator cover plate.

15. Discard the actuator blanking plate and the four screws.

## Mounting Type 3611JP and 3621JP Positioners on 585C and 585CR Size 25 and 50 Actuators

The Type 3611JP pneumatic positioner and the Type 3621JP electro-pneumatic positioner can be mounted on either a Type 585C or 585CR piston actuator. A positioner adaptor (key 113) attaches to the back of the positioner and serves as the interface to the mounting bracket (key 194). Refer to the Type 585C and 585CR Actuators instruction manual, Form 5353 for additional information on the actuator.

Refer to figure 5 for parts identification.

1. Stroke the actuator from the top stop to the bottom stop, and record the travel distance.

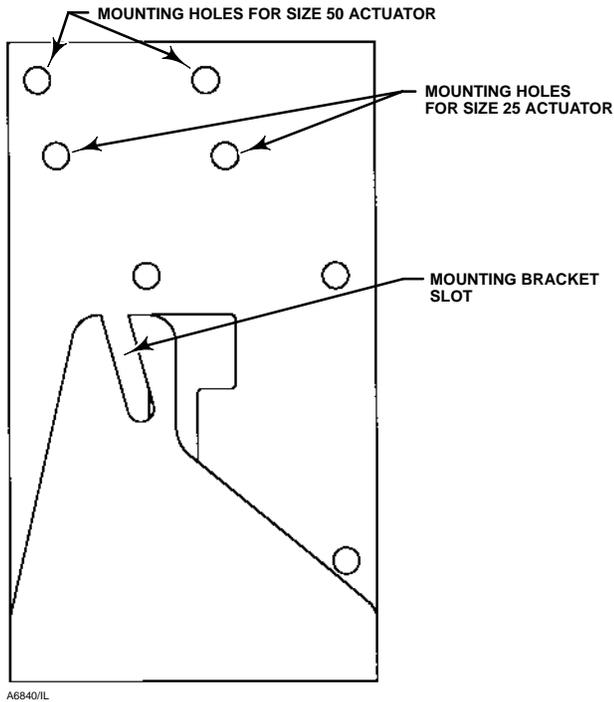


Figure 6. Positioner Mounting Bracket

2. Loosen the four captive cover screws and remove the positioner cover (key 41, figure 28).
3. Mount the stem bracket (key 195) to the actuator with two hex nuts (key 197).
4. Disconnect the positioner range spring (key 150, figure 25) from the range spring hanger (key 130, figure 25).
5. Attach the feedback roller (key 175) to the stem bracket (key 195) with the button head screw (key 173).
6. Attach the positioner adaptor (key 113) to the mounting bracket (key 194) with four hex nuts (key 197) and four hex socket cap screws (key 54).
7. Remove the positioner cover. Attach the Type 3611JP or 3621JP positioner to the positioner adaptor/mounting bracket assembly with four hex socket cap screws (key 54).
8. Apply pressure to the actuator piston and move the actuator to approximately the mid-travel position.

9. Thread one of the three hex head cap screws (key 196) into the yoke leg threaded hole approximately two (2) turns.

10. Install the assembly from step 7 to the Type 585C or 585CR actuator by sliding the mounting bracket slot (see figure 6) onto the yoke leg cap screw. As you attach this assembly to the

actuator, center the spring-loaded feedback arm under the feedback roller (key 175) on the stem bracket (key 195). Align the mounting bracket top holes (see figure 6) with the cylinder holes and install the remaining two hex head cap screws (key 196). Tighten all screws.

11. With the actuator still at mid travel and the top edge of the feedback lever assembly perpendicular to the actuator stem, install the adjuster assembly/roller in the appropriate stem bracket slot with the button head screw (key 173) so the roller (key 175) is centered over the correct actuator travel marked on the feedback lever assembly.

12. Tighten the feedback roller button head screw (key 173) and replace the range spring (key 150, figure 25).

13. Replace the positioner cover.

### Installing the Type 3622 Electro-Pneumatic Converter

If installing the converter on an existing pneumatic positioner, refer to the Gauge Block Disassembly procedures in the Maintenance section. The converter module replaces the original pneumatic gauge block. Refer to the the Type 3622 Electro-pneumatic Converter Assembly procedure to install the converter. When calibrating the electro-pneumatic positioner for a 4 to 20 milliamper dc input range, use the range spring hole that corresponds to a 0.2 to 1.0 bar (3 to 15 psig) input range (0.8 bar (12 psig) span). See tables 6 and 7 and figure 15 for the range spring and range spring hole selection.

### Changing Positioner Types

All 3610J and 3620J Series positioners have the same basic construction. For the Type 3611JP or Type 3621JP, a parallel flexure (key 179, figure 13) is added (not required on Type 585 size 100 actuator). When changing positioner types, other parts may require changing, such as the nozzle

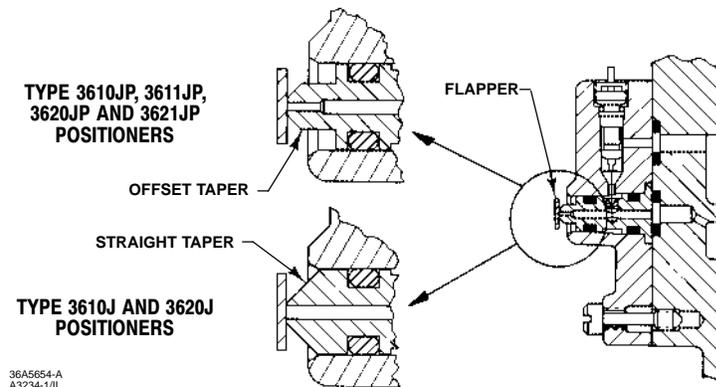


Figure 7. Nozzle Block Assembly

assembly (key 116, figure 25), the feedback lever assembly (key 117 or 170, figure 29), and the range spring (key 150, figure 25). Refer to the Parts List for part number identification. Changing parts may require partial disassembly and reassembly as described in the Maintenance section. Figure 7 illustrates the slight difference in nozzle assemblies between the single-acting (Type 3610J and 3620J) and double-acting (Type 3610JP, 3620JP, 3611JP and 3621JP) positioners. See the Changing Positioner Types procedure in the Maintenance section for additional information.

**bursting from system overpressure, make sure the supply pressure never exceeds the maximum safe working pressure of any connected equipment.**

## Supply Connection

### WARNING

## Pressure Connections

To complete the installation of a 3610J or 3620J Series positioner requires connecting tubing and fittings between the positioner and the actuator. The fittings, tubing, and mounting parts required depend on the type number and optional equipment: such as filter, regulator, and bypass valve. Positioner pressure connection locations are shown in figure 8. All pressure connections to the 3610J and 3620J Series positioners are 1/4-inch NPT female. Use 3/8-inch tubing or 1/4-inch pipe for all tubing connections. Refer to the Vent Connection section for remote vent connections.

**Severe personal injury or property damage may occur from process instability if the instrument air supply is not clean, dry and oil-free. While use and regular maintenance of a filter that removes particles larger than 40 microns in diameter will suffice in most applications, check with a Fisher Field office and Industry Instrument air quality standards for use with corrosive gas or if you are unsure about the proper amount or method of air filtration or filter maintenance.**

### WARNING

**The positioner is capable of providing full supply pressure to connected equipment. To avoid personal injury or equipment damage caused by parts**

Supply pressure must be clean, dry air or noncorrosive gas. Use of a Fisher Type 67CFR Filter Regulator, or equivalent, to filter and regulate supply air should suffice in most applications. The Type 67CFR filter regulator can be integrally mounted with the positioner. Use 3/8-inch tubing or 1/4-inch pipe for the supply line.

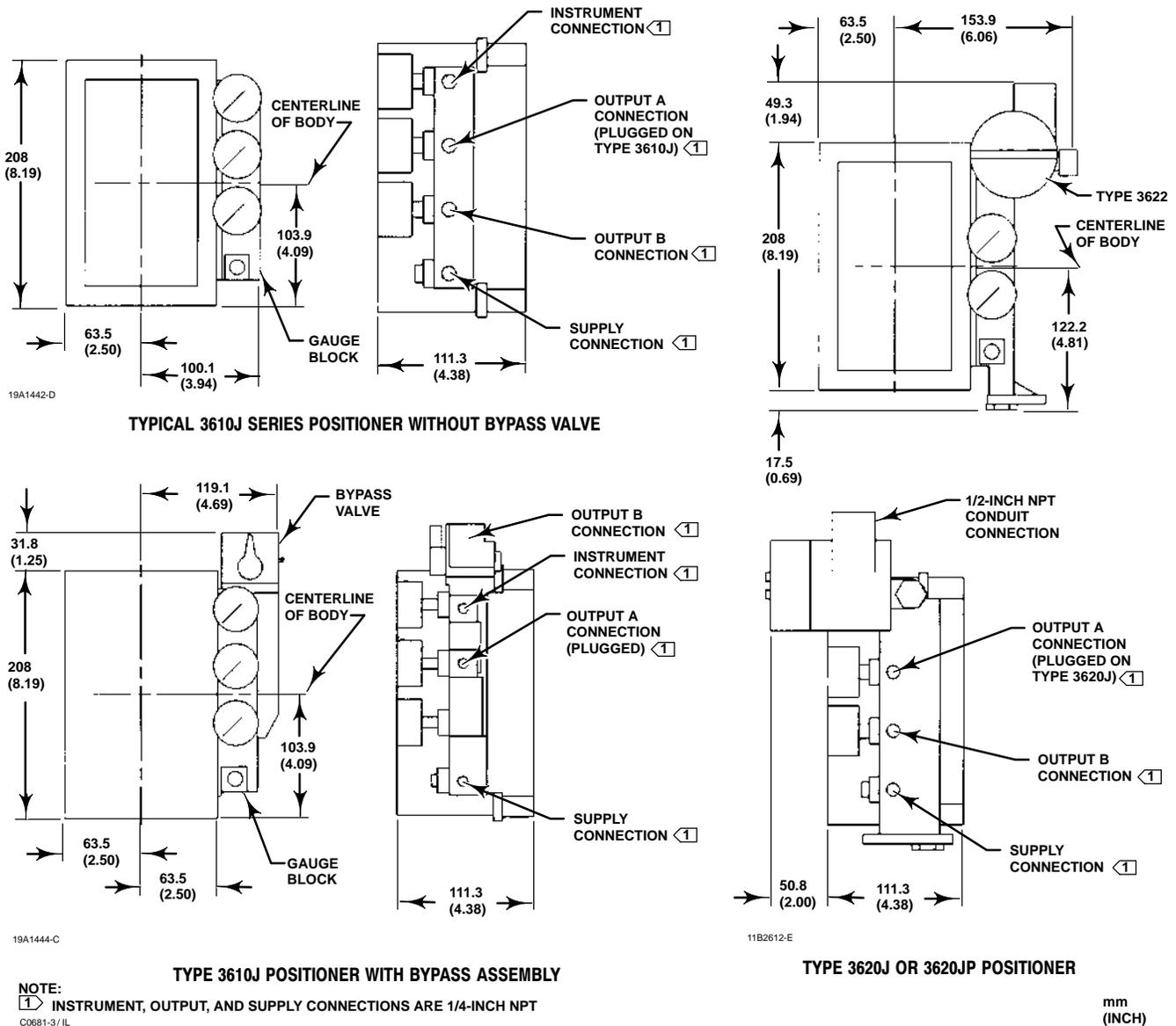


Figure 8. Typical Mounting Dimensions and Connections

The supply pressure should be high enough to permit setting the regulator 0.3 bar (5 psi) above the upper limit of the appropriate pressure range, for example: 1.4 bar (20 psig) for a 0.2 to 1.0 bar (3 to 15 psig) range. However, do not exceed the maximum allowable supply pressure of 10.3 bar (150 psig) nor the pressure rating of any connected equipment.

**CAUTION**

To avoid equipment damage caused by excessive pressure, do not exceed the maximum pressure rating of the actuator or positioner. Refer to the appropriate instruction manual to determine the maximum pressure rating of the actuator, and to table 1 for the maximum pressure rating of the positioner.

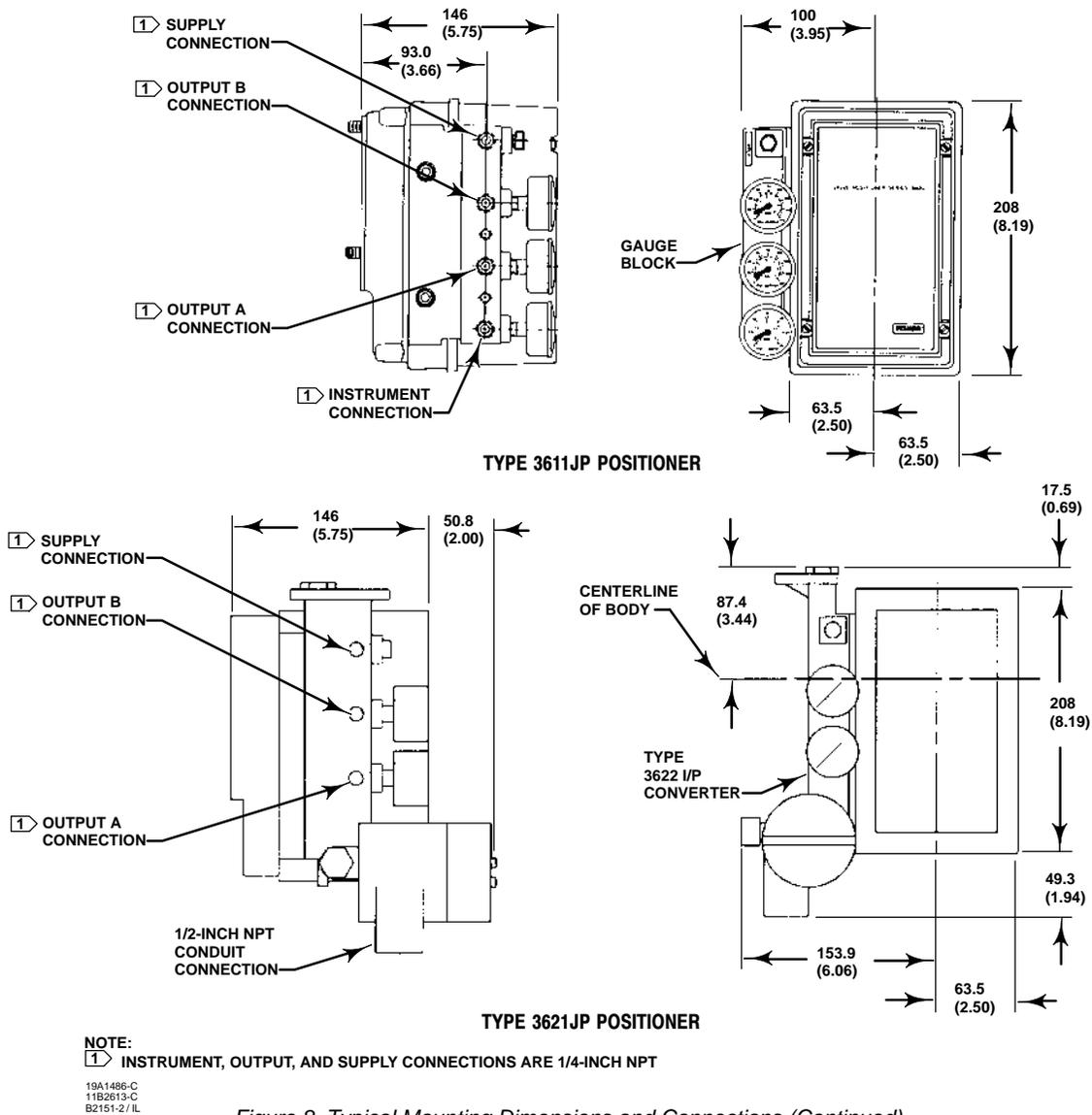


Figure 8. Typical Mounting Dimensions and Connections (Continued)

## Output Connections

For the Type 3610J or 3620J positioner, the OUTPUT A connection must be plugged. Connect the OUTPUT B connection to the actuator diaphragm casing connection. Figure 8 shows a positioner with a bypass valve. When the bypass valve is used, connect the OUTPUT connection on the bypass valve to the diaphragm casing connection on the actuator. A manifold in the bypass body adapter internally connects OUTPUT B to the bypass valve. Use 3/8-inch tubing between the actuator and the positioner.

For the Type 3610JP or 3620JP positioner, connect the OUTPUT A connection to the lower actuator cylinder connection and the OUTPUT B connection to the upper actuator cylinder connection. Figure 1 shows the positioner connected to a piston actuator. Use 3/8-inch tubing between the actuator and positioner.

For the Type 3611JP or 3621JP positioner, connect the OUTPUT A connection to the lower actuator cylinder connection and the OUTPUT B connection to the upper actuator cylinder connection. Figure 2 shows the positioner connected to a Type 585C actuator. Use 3/8-inch tubing between the actuator and the positioner.

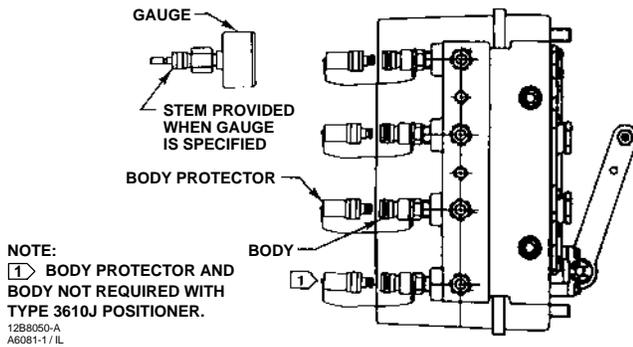


Figure 9. FlowScanner™ Diagnostic System Connections for Type 3610J and 3610JP Positioners

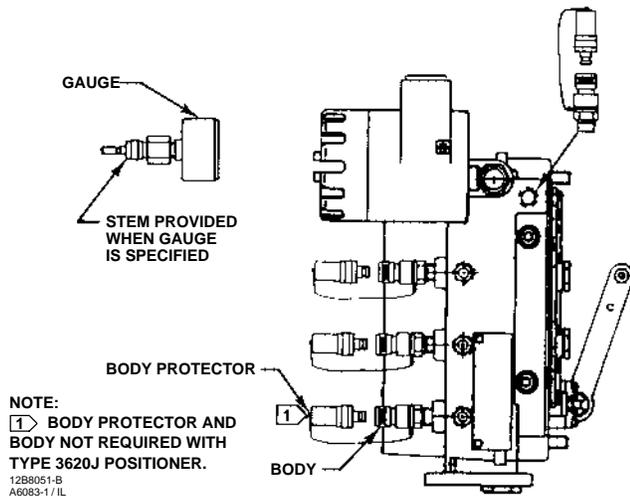


Figure 10. FlowScanner™ Diagnostic System Connections for Type 3621J and 3620JP Positioners

### Instrument Connection

Use 3/8-inch tubing to connect the output from the control device to the INSTRUMENT connection on a pneumatic positioner. For the electro-pneumatic positioner, refer to the Electrical Connections section.

### Diagnostic Connections

To support diagnostic testing of valve/actuator/positioner/accessory packages, special connectors and hardware are available. The hardware used includes 1/8-inch NPT connector bodies and body protectors. If the diagnostic

connectors are ordered for a positioner with gauges, 1/8-inch stems are also included.

Install the connectors on the 3610J Series positioner gauge block or bypass block assembly as shown in figure 9. For the Type 3620J Series positioners, install the connectors on the Type 3622 housing as shown in figure 10. Before installing the connectors on the positioner, apply sealant to the threads. Sealant is provided with the diagnostic connections and hardware.

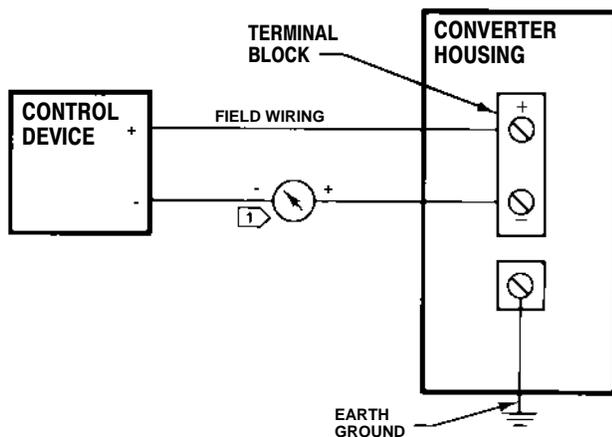
### Vent Connection

The 3610J and 3620J Series positioner relays exhaust actuator pressure through the positioner case and into the Type 1051, 1052, 1061, and 1069 actuator housings. These actuator housings provide a 1/4-inch NPT connection and a screen is normally installed in this connection to prevent blockage from debris or insects. Restricting this vent area can produce a pressure buildup in the case and degrade positioner performance. There also is a 1/4-inch NPT connection on the Type 3622 converter housing where the vent (key 28) is installed. Type 585, 585R, 585C, and 585CR actuators do not have a 1/4-inch vent connection.

### WARNING

Personal injury or property damage could result from fire or explosion of accumulated gas if a flammable gas is used as the supply pressure medium and the positioner/actuator is in an enclosed area. The positioner/actuator assembly does not form a gas-tight seal, and a remote vent line is recommended. However, a remote vent line cannot be relied upon to remove all hazardous gas, and leaks may still occur. Provide adequate ventilation and necessary safety measures. Vent line piping should comply with local and regional codes and should be as short as possible with adequate inside diameter and few bends to reduce case pressure buildup.

If a remote vent is required, the vent line must be as short as possible with a minimum number of bends and elbows. Vent line piping should have a minimum inside diameter of 19 mm (3/4 inches) for runs up to 6.1 m (20 feet) and a minimum inside diameter of 25 mm (1 inch) for runs from 6.1 to 30.5 meters (20 to 100 feet).



NOTE:  
1 FOR TROUBLESHOOTING OR MONITORING OPERATION, AN INDICATING DEVICE CAN BE A VOLTMETER ACROSS A 250 OHM RESISTOR OR A CURRENT METER.

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Figure 11. Typical Field Wiring Diagram

## Electrical Connection for 3620J Series Positioners

### WARNING

Personal injury or property damage may result from fire or explosion if power is not disconnected before removing the Type 3622 convert cap.

For Class I, Division 1 explosion-proof applications, install rigid metal conduit and a conduit seal no more than 457 mm (18 inches) from the Type 3622 converter. Personal injury or property damage may result from explosion if the seal is not installed.

For intrinsically-safe installations, refer to Fisher loop schematics or to instructions provided by the barrier manufacturer for proper wiring and installation.

Use the 1/2-inch NPT (or M20 thread) conduit connection for field wiring installation. Refer to figures 11 and 12 when connecting field wiring from the control device to the converter. Connect the positive wire from the control device to the converter + terminal and the negative wire from the control device to the converter - terminal. Do not overtighten the terminal screws. Maximum torque is 0.45 N•m (4 lbf•in).

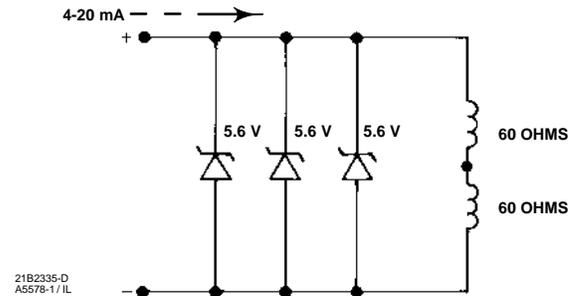


Figure 12. Type 3622 Converter Equivalent Circuit

## Calibration

The following calibration procedures are for pneumatic positioner adjustment. For Type 3620J, 3620JP, or 3621JP positioners, there are no adjustments within the converter portion of the positioner. All adjustments are accomplished within the pneumatic portion of the positioner.

### WARNING

Avoid personal injury or equipment damage from sudden release of process fluid. Before calibration:

- Always wear protective clothing and eyewear when performing any calibration operations.
- Disconnect any operating lines providing air pressure, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.
- Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure on both sides of the valve.
- Vent the actuator loading pressure and disconnect positioner supply pressure.
- Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
- Check with your process or safety engineer for any additional measures that must be taken to protect against process fluid.

Refer to figure 25 for key number locations. Adjustments are shown in figure 13.

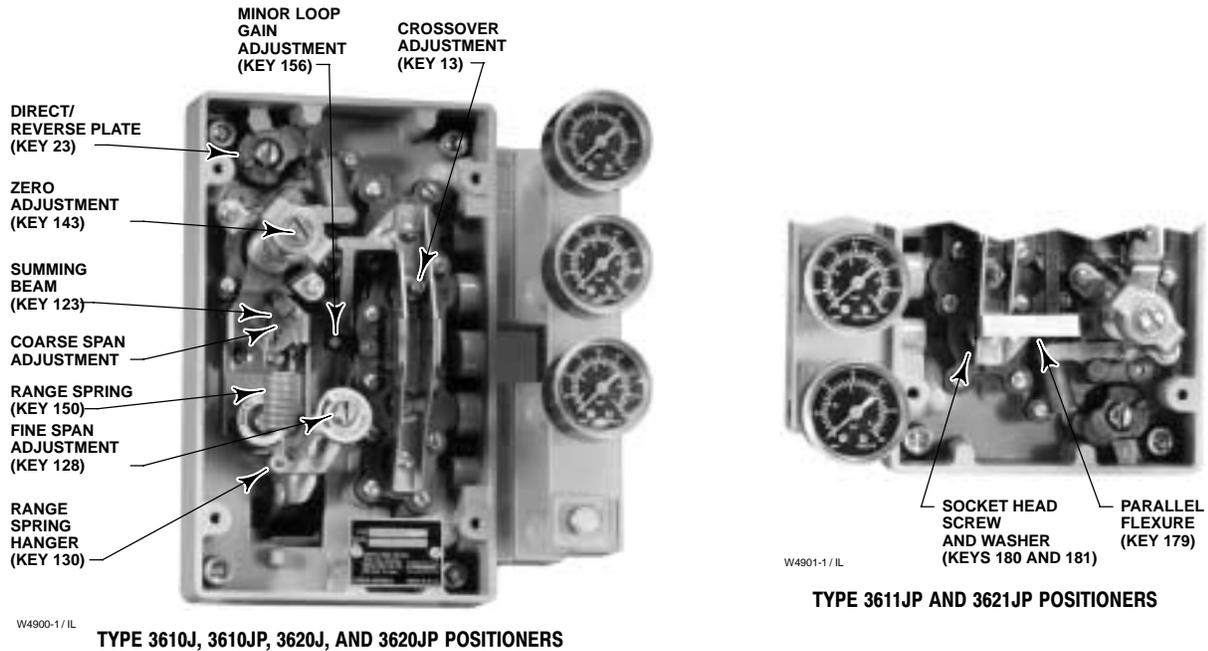


Figure 13. Calibration Adjustments

### Minor Loop Gain Adjustment

The minor loop gain adjustment varies the dynamic gain of the positioner to match the specific size and characteristic of the actuator. This adjustment allows tuning of the positioner transient response to the application without significantly affecting the static operating performance.

The minor loop gain adjustment is factory set for a positioner shipped with the actuator. However, additional adjustment should be made to suit the particular application requirement. The minor loop gain also may require adjustment if:

- the positioner was not installed on the actuator by the factory,
- installing the positioner on an actuator other than the type for which the positioner was originally set up,
- maintenance was performed on the positioner.

The minor loop gain should be adjusted before performing the other calibration procedures.

Figure 13 shows the minor loop gain adjustment location. As shown in figure 14, the adjustment is made by moving the flexure adjustment (key 156) along the top flexure.

ACTUATOR TYPE NUMBER	"X" DIMENSION	
	mm	Inches
1052/20	22	7/8
1051, 1052/30, 33, and 40	24	15/16
1051, 1052/60-	35	1-3/8
1052/70	38	1-1/2
1061/30	21	13/16
1061/40	22	7/8
1061/60	24	15/16
1061/80	27	1-1/16
1061/100	29	1-1/8
1069/100	44	1-3/4
585C/25 and 50	33	1-5/16
585/100		

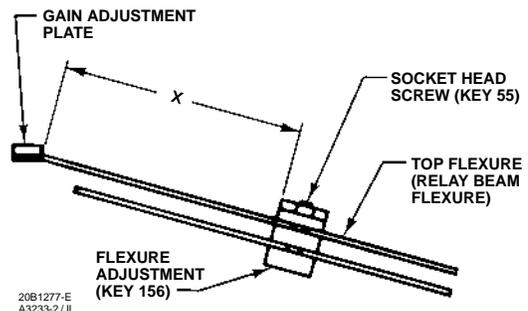


Figure 14. Minor Loop Gain Adjustment

# 3610J and 3620J Positioners

The table in figure 14 and a label inside the positioner cover (key 41, figure 28) recommend flexure adjustment starting positions for various actuator types. Start with the flexure adjustment set to the recommended starting distance from the gain adjustment plate, the X dimension in figure 14. To adjust the minor loop gain, proceed as follows:

1. Unscrew the four captive cover screws and remove the cover (key 41, figure 28).
2. Refer to figures 13 and 14 and identify the gain adjustment plate, the flexure adjustment (key 156), and the X dimension between the plate and the adjustment.
3. Loosen the flexure adjustment socket head screw (key 55, figure 14) and slide the flexure adjustment on the flexures to increase or decrease the X dimension. Moving the flexure adjustment in the direction of the arrow on the top flexure (decreasing the X dimension) slows the positioner response. Moving the flexure adjustment in the opposite direction speeds up the positioner response.
4. Tighten the flexure adjustment screw and check the positioner response. Repeat step 3 if readjustment is required.
5. If this is the only adjustment, replace the cover. If not, continue with the crossover adjustment.

## Crossover Adjustment

Perform one or the other of the following procedures, depending on the positioner and actuator type. When finished with the crossover adjustment, proceed to the zero and span adjustments.

### ***Spring and Diaphragm Actuators (Type 3610J or 3620J Positioners)***

#### Note

**Do not perform these steps 1 through 6 if calibrating a Type 3610JP, 3611JP, 3620JP, or 3621JP positioner. These 6 steps are only applicable to Type 3610J and 3620J positioners used on spring and diaphragm actuators.**

1. Unscrew the four captive cover screws and remove the cover (key 41, figure 28).
2. If the positioner does not have pressure gauges, connect a pressure gauge to OUTPUT A.
3. Apply supply pressure.

4. Apply an input signal (pneumatic or electrical) to the positioner to position the actuator at approximately mid-travel. If necessary, you can use the zero adjustment to position the actuator at approximately mid-travel. The actuator should not be under load during crossover adjustment.

#### Note

**Large step changes may cause the supply pressure gauge reading to momentarily drop.**

5. Using a screwdriver, turn the crossover adjusting screw (key 13, figure 13) counterclockwise until the OUTPUT A pressure gauge reads zero pressure; then turn it clockwise until full supply pressure is obtained. Once supply pressure is obtained, turn the adjusting screw an additional four, 360-degree turns clockwise. The gauge should read supply pressure.
6. Continue calibration by performing the zero and span adjustments.

### ***Piston Actuators (Type 3610JP, 3611JP, 3620JP, or 3621JP Positioners)***

#### Note

**Do not perform these steps 1 through 6 if calibrating a Type 3610J or 3620J positioner. These 6 steps are only applicable to Type 3610JP, 3611JP, 3620JP, and 3621JP positioners used on piston actuators.**

1. Unscrew the four captive cover screws and remove the cover (key 41, figure 28).
2. If the positioner does not have pressure gauges, connect pressure gauges to OUTPUT A and OUTPUT B.
3. Apply supply pressure.
4. Apply an input signal (pneumatic or electrical) to the positioner to position the actuator at approximately mid-travel. If necessary, you can use the zero adjustment to position the actuator at approximately mid-travel. The actuator should not be under load during crossover adjustment.

#### Note

**Large step changes may cause the supply pressure gauge reading to momentarily drop.**

5. Using a screwdriver, turn the crossover adjusting screw (key 13) until the sum of the OUTPUT A and

OUTPUT B pressure is 140 to 160 percent of supply pressure. Clockwise rotation increases the OUTPUT A and OUTPUT B pressures.

**Note**

**Make sure that neither the OUTPUT A pressure or the OUTPUT B pressure equal the supply pressure when adjusting the crossover screw. If either pressure is equal to supply, an accurate crossover setting cannot be achieved. This may occur with the Type 3611JP or 3621JP due to the spring(s) in the 585, 585R, 585C, or 585CR actuator. If one of the cylinder pressures equals supply pressure when adjusting the crossover, do one or both of the following:**

a. Move the actuator to some position other than mid-travel. This new position must be in the direction which decreases the difference between OUTPUT A and OUTPUT B (the direction which reduces compression of the actuator springs). The actuator or valve must not be contacting a stop, but must be somewhere between the up and down stops. With the lower differential between the OUTPUT A and OUTPUT B pressures, adjusting the crossover with neither the OUTPUT A pressure or OUTPUT B pressure equal to supply pressure should be possible. If not, the supply pressure must be increased.

b. Increase supply pressure noting the limitations in the Supply Connection section and repeat the cross-over adjustment. The actuator or valve must not contact the stop, but must be somewhere between the up and down stops. Increase supply pressure sufficiently, so that a crossover setting can be achieved with neither cylinder output pressure equal to supply pressure.

6. Continue calibration by performing the zero and span adjustments.

**Zero and Span Adjustments**

1. Unscrew the four captive cover screws, and remove the cover (key 41, figure 28).
2. Use tables 4 through 7 and figure 15 to select the desired range spring and coarse span

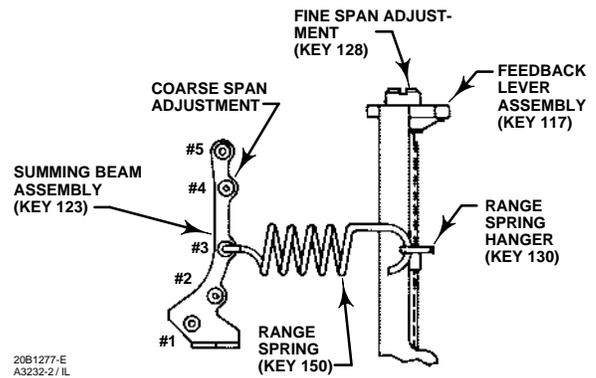


Figure 15. Span Adjustment

adjustment. (The tables and figure 15 are only valid for the standard valve travel/range spring combinations shown.) Insert one end of the range spring (key 150, figure 25) into the hole on the range spring hanger (key 130) as shown in figure 15. Insert the other end of the range spring into the hole selected on the summing beam assembly (key 123, figure 15).

**Note**

**Be sure the range spring hanger (key 130) passes under the feedback lever assembly (key 117) as shown in figure 15.**

3. Apply supply pressure.
4. Apply an input signal equal to the low value of the input signal range; for example, if the input signal range is 0.2 to 1.0 bar (3 to 15 psig), apply 0.2 bar (3 psig.)
5. Rotate the zero adjustment screw (key 143, figure 13) until the actuator is at the starting point position (fully up or down depending on the action selected) corresponding to the low input signal. Clockwise rotation of the zero adjustment screw retracts the actuator stem.
6. Slowly increase the input signal toward the high end of the input signal range and observe the actuator stroke. If the actuator stroke is short of its expected range, increase the travel by rotating the fine span adjustment screw (key 128, figure 13) counterclockwise with a screwdriver. If the actuator reaches the end of its desired travel with an input signal less than the high value of the input signal range, decrease the travel by rotating the fine span adjustment screw clockwise with a screwdriver.

# 3610J and 3620J Positioners

Table 4. Type 3610J and 3610JP Positioner Range Spring Selection and Coarse Span Adjustment<sup>(1)</sup>

Valve Rotation (Degrees)	INPUT SPAN <sup>(2)</sup>									
	0.8 bar (2 psi)		1.7 bar (24 psi)		0.3 bar (4 psi)		0.4 bar (6 psi)		0.6 bar (8 psi)	
	Range Spring	Hole Number	Range Spring	Hole Number	Range Spring	Hole Number	Range Spring	Hole Number	Range Spring	Hole Number
90	Blue	3	Blue	5	Blue	1	Blue	2	Blue	3
75	Yellow	4	Red	4	Yellow	2	Yellow	3	Yellow	3
60	Red	3	Red	5	Red	1	Red	2	Red	3

1. For positioners mounted on Type 1051, 1052, 1061 and 1069 actuators.  
 2. This table is only valid for the valve rotation and range spring combinations listed. Contact your Fisher sales office or the factory for rotations or input spans not shown for the valve rotation/range spring combination.

Table 5. Type 3611JP Positioner Range Spring Selection and Coarse Span Adjustment<sup>(1)</sup>

Valve Travel mm (Inches)	INPUT SPAN <sup>(2)</sup>									
	0.8 bar (12 psi)		1.7 bar (24 psi)		0.3 bar (4 psi)		0.4 bar (6 psi)		0.6 bar (8 psi)	
	Range Spring	Hole Number	Range Spring	Hole Number	Range Spring	Hole Number	Range Spring	Hole Number	Range Spring	Hole Number
11 (0.4375)	Blue	4	Red	5	Red	1	Red	2	Red	3
14 (0.5625)	Blue	4	Red	5	Red	1	Red	2	Red	2
19 to 51 (0.75 to 2)	Blue	3	Yellow	5	Yellow	1	Yellow	2	Yellow	3
51 to 102 (2 to 4) <sup>(3)</sup>	Blue	3	Yellow	5	Yellow	1	Yellow	2	Yellow	3

1. For positioners mounted on Type 585, 585R, 585C and 585CR actuators.  
 2. This table is only valid for the valve travel and range spring combinations listed. Contact your Fisher sales office or the factory for travels or input spans not shown for the valve travel/range spring combination.  
 3. For Type 585, size 100 only

7. Repeat steps 4, 5, and 6 until the actuator stroke corresponds to the input signal range.

8. Replace the cover on the positioner.

## Changing Positioner Action

This section explains how to change the positioner action from direct to reverse or reverse to direct. With direct action, the actuator stem extends as the input signal to the positioner increases. With reverse action, the actuator stem retracts as the input signal to the positioner increases.



**WARNING**

**Avoid personal injury or equipment damage from sudden release of process fluid and improper valve operation. Before reversing the action:**

- Always wear protective clothing and eyewear when performing any maintenance operations to avoid personal injury.

Table 6. Type 3620J and 3620JP Positioner Range Spring Selection and Coarse Span Adjustment<sup>(1)</sup>

Valve Rotation (Degrees)	INPUT SPAN <sup>(2)</sup>					
	16 mA		5.3 mA		8 mA	
	Range Spring	Hole Number	Range Spring	Hole Number	Range Spring	Hole Number
90	Blue	3	Blue	1	Blue	2
75	Yellow	4	Yellow	2	Yellow	3
60	Red	3	Red	1	Red	2

1. For positioners mounted on Type 1051, 1052, 1061 and 1069 actuators.  
 2. This table is only valid for the valve rotation and range spring combinations listed. Contact your Fisher sales office or the factory for rotations or input spans not shown for the valve rotation/range spring combination.

Table 7. Type 3621JP Positioner Range Spring Selection and Coarse Span Adjustment<sup>(1)</sup>

Valve Travel mm (Inches)	INPUT SPAN <sup>(2)</sup>					
	16 mA		5.3 mA		8 mA	
	Range Spring	Hole Number	Range Spring	Hole Number	Range Spring	Hole Number
11 (0.4375)	Blue	4	Red	1	Red	2
14 (0.5625)	Blue	4	Red	1	Red	2
19 to 51 (0.75 to 2)	Blue	3	Yellow	1	Yellow	2
51 to 102 (2 to 4) <sup>(3)</sup>	Blue	3	Yellow	1	Yellow	2

1. For positioners mounted on Type 585, 585R, 585C, and 585CR actuators.  
 2. This table is only valid for the valve travel and range spring combinations listed. Contact your Fisher sales office or the factory for travels or input spans not shown for the valve travel/range spring combination.  
 3. For Type 585, size 100 only

*Table 8. Split-Ranging Capabilities*

<b>3610J SERIES POSITIONERS<sup>(1)</sup></b>				
<b>Split</b>	<b>0.2 to 1.0 Bar or 3 to 15 Psig Input Signal</b>		<b>0.4 to 2.0 Bar or 6 to 30 Psig Input Signal</b>	
	<b>Bar</b>	<b>Psig</b>	<b>Bar</b>	<b>Psig</b>
Two-way	0.2 to 0.6	3 to 9	0.4 to 1.2	6 to 18
	0.6 to 1.0	9 to 15	1.2 to 2.0	18 to 30
Three-way	0.2 to 0.5	3 to 7	0.4 to 0.9	6 to 14
	0.5 to 0.7	7 to 11	0.9 to 1.5	14 to 22
	0.7 to 1.0	11 to 15	1.5 to 2.0	22 to 30
<b>3620J SERIES POSITIONERS<sup>(1)</sup></b>				
<b>Split</b>	<b>4 to 20 Milliampere dc Input Signal</b>			
Two-way	4 to 12			
	12 to 20			
Three-way	4 to 9.3			
	9.3 to 14.7			
	14.7 to 20			

1. This table is only valid for the standard valve rotation or travel and range spring combinations listed in tables 4 through 7. Contact your Fisher sales office or the factory for input signal ranges not listed.

- **Disconnect any operating lines providing air pressure, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure on both sides of the valve.**
- **Vent the actuator loading pressure and disconnect positioner supply pressure.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

***Changing to Direct Action***

1. Unscrew the four captive cover screws, and remove the cover (key 41, figure 28).
2. Loosen the reversing plate screw (key 49, figure 25), and adjust the reversing plate (key 23, figure 13) to expose the letter D and cover the letter R. Tighten the screw.

**Note**

**Direct acting Type 3610J and 3620J Series positioners require use of the counter spring (key 125, figure 25). Reverse acting Type 3610J and 3620J Series positioners set up for 60 degree valve rotation, or reverse acting Type 3611JP and 3621JP positioners set up for 11 mm (7/16-inch) actuator travel do not require use of the counter spring. Refer to the parts list for the counter spring part number to be ordered.**

3. Refer to the note above to determine if a counter spring is needed. If a counter spring is required, install the counter spring (key 125, figure 25) by first removing the machine screw (key 127, figure 25), and the spring seat (key 126, figure 25). Then install the counter spring and replace the spring seat and machine screw.
4. If using characterized cam B or C, refer to the Changing Cams procedures.
5. Perform the Zero and Span adjustment procedure.
6. Replace the cover.

***Changing to Reverse Action***

1. Unscrew the four captive cover screws, and remove the cover (key 41, figure 28).
2. Loosen the reversing plate screw (key 49, figure 25), and adjust the reversing plate (key 23, figure 13) to expose the letter R and cover the letter D.
3. For Type 3610J and 3620J positioners set up for 60 degree valve rotation, or for Type 3611JP and

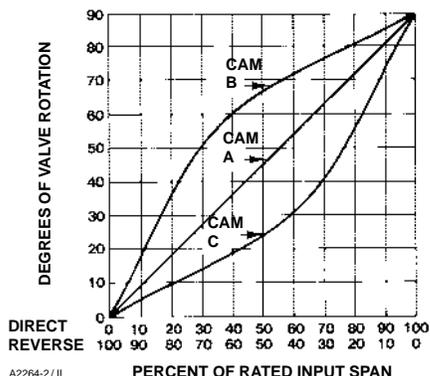


Figure 16. Input Signal Versus Valve Rotation

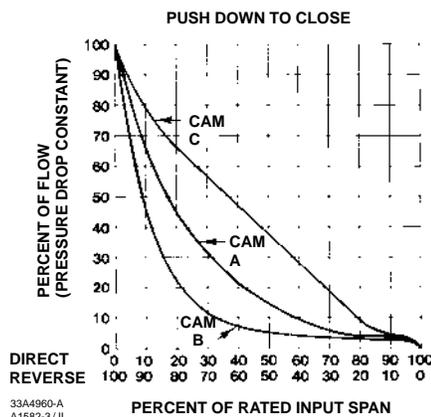


Figure 18. Flow Characteristics for the Various Cams When Used With an Equal Percentage Valve Characteristic Push-Down-to-Close Valve

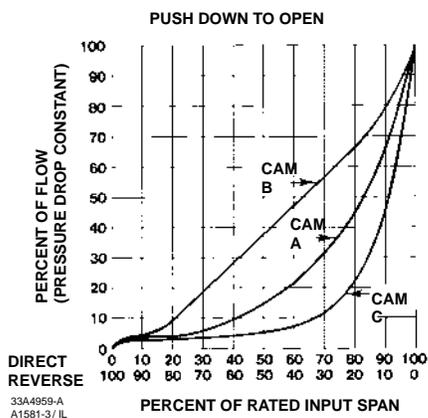


Figure 17. Flow Characteristics for the Various Cams When Used With an Equal Percentage Valve Characteristic, Push-Down-to-Open Valve

3621JP positioners set up for 11 mm (7/16-inch) actuator travel or less, a change to reverse action also requires that the counter spring (key 125, figure 25) be removed and discarded. To remove the counterspring, remove the machine screw (key 127, figure 25), the spring seat (key 126, figure 25), and the counter spring (key 125, figure 25). Then replace the spring seat and machine screw.

4. If using characterized cam B or C, refer to the Changing Cams procedures.
5. Perform the Zero and Span adjustment procedure.
6. Replace the cover.

### Split-Range Operation

Split-range operation is possible with the 3610J and 3620J Series positioners. With split-range operation, the input signal from a single control device is split between two or three control valves. The positioners will fully the actuator with an input signal span of 0.2 bar (3.2 psig) minimum to 2.0 bar (28.8 psig). The zero adjustment of the positioner is continuously adjustable between 0.07 to 1.5 bar (1 and 22 psig).

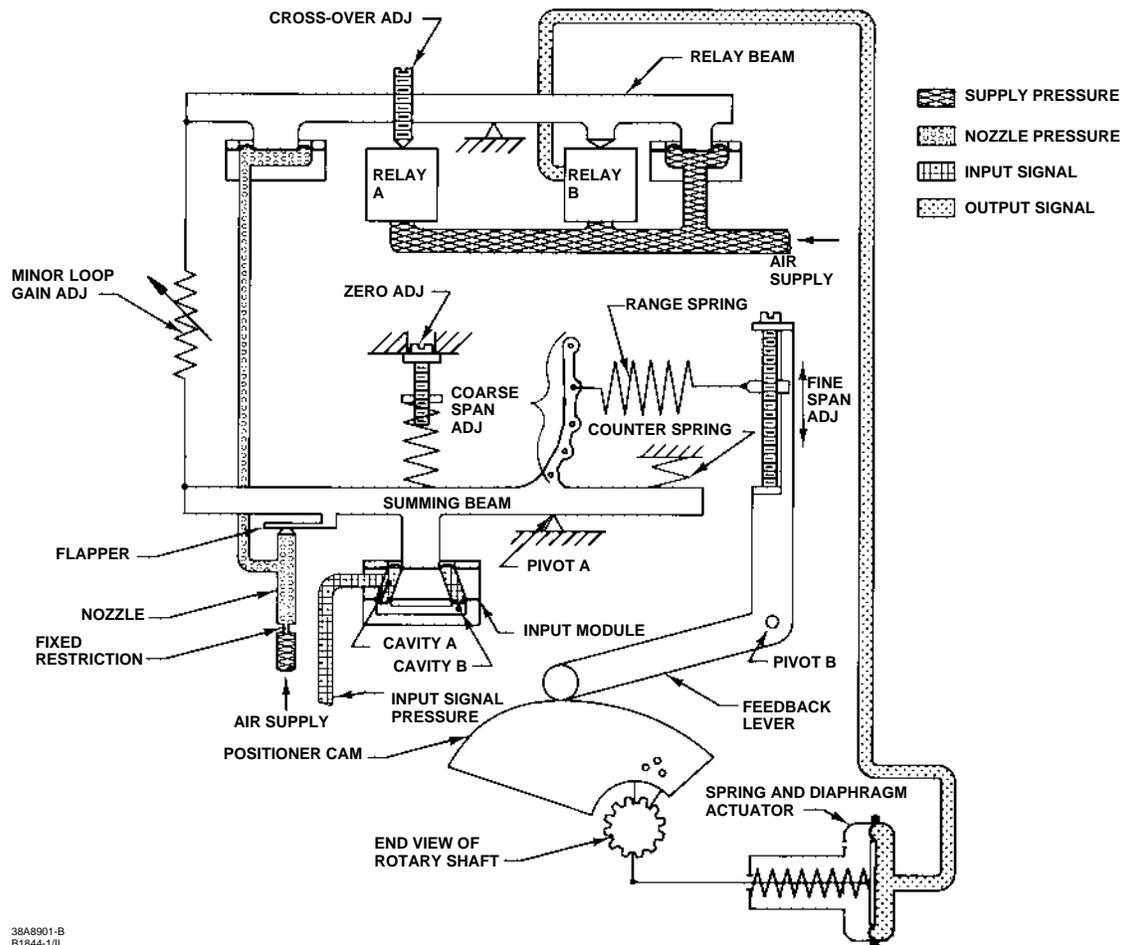
Table 8 shows some typical split ranges for the positioners. Refer to tables 4 through 7 and figure 15 for the correct range spring and range spring hole selection for the desired coarse span adjustment. Contact your Fisher sales office, or the factory for input signal ranges not shown in table 8.

#### Note

The following is an example of range spring and range spring hole selection in tables 4 through 7. Assume a 0.2 to 0.6 bar (3 to 9 psig) input. This is equivalent to a span of 0.4 bar (6 psi) [0.6 bar - 0.2 bar = 0.4 bar (9 psig - 3 psig = 6 psi)]. Therefore for a 90 degree valve rotation and a span of 0.4 bar (6 psi), select a blue range spring. Place the range spring in hole number 2 on the summing beam assembly.

### Characterized Cams for Type 3610J, 3610JP, 3620J, and 3620JP

The Type 3610J, 3610JP, 3620J, and 3620JP positioners are available with any one of three cams: a linear cam (cam A) and two characterized cams (cams B and C).



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Figure 19. Schematic of the Type 3610J Positioner

When the linear cam is used, there is a linear relationship between an incremental input signal change and the resultant valve rotation. The flow characteristic is that of the control valve.

When either of the characterized cams are used, the relationship between an incremental input signal change and the valve rotation is changed. Curves illustrating the relationship between the input signal and the valve rotation, and between the input signal and the flow characteristic of an equal percentage valve, are shown in figures 16, 17, and 18.

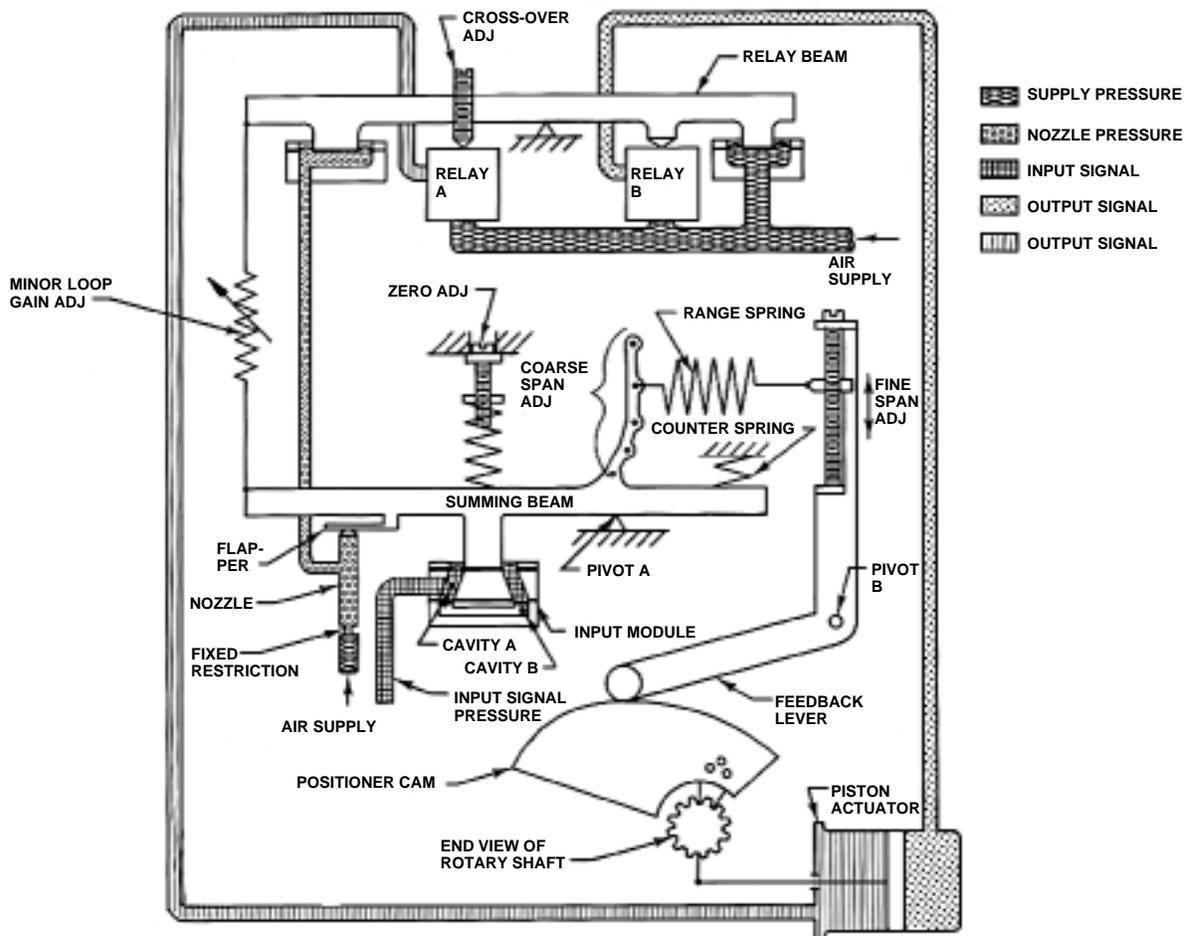
## Principle of Operation

The 3610J Series positioners accept a pneumatic input signal and the 3620J Series positioners accept a dc current input signal from a control device. The 3620J Series electro-pneumatic positioners use a

Type 3622 converter to provide a pneumatic input to the pneumatic portion (3610J Series) of the positioner. The 3610J Series positioners are force-balanced instruments that provide a control valve position proportional to the pneumatic input signal. The following describes the principle of operation for the Type 3610JP and 3620JP positioners. The principle of operation for the Type 3610J and 3620J positioners is similar except relay A is not used. The principle of operation for the Type 3611JP and 3621JP positioners is similar except the feedback linkage does not use a cam.

Refer to the schematic diagrams shown below:

- Type 3610J—figure 19
- Type 3610JP—figure 20
- Type 3611JP—figure 21
- Type 3620J—figure 22



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Figure 20. Schematic of the Type 3610JP Positioner

- Type 3620JP—figure 23
- Type 3621JP—figure 24

For direct action, input signal pressure from a control device is channeled to cavity A in the input module. An increase in input signal pressure results in a downward force on the summing beam, pivoting the summing beam counterclockwise. This moves the flapper slightly toward the nozzle, increasing the nozzle pressure. As nozzle pressure increases, the relay beam pivots clockwise, causing relay B to increase actuator upper cylinder pressure and relay A to exhaust actuator lower cylinder pressure to atmosphere.

As a result, the actuator rod extends and the actuator rotary shaft rotates clockwise. This causes the feedback lever to pivot clockwise increasing the force applied to the summing beam by the range

spring. This force, which opposes the downward force on the summing beam caused by the increasing input signal pressure, continues to increase until the summing beam torques are in equilibrium. At this point, the valve shaft is in the correct position for the specific input signal applied.

For reverse action, input signal pressure is channeled to both cavities A and B. An increase in input signal pressure results in an upward force on the summing beam, pivoting the summing beam clockwise and causing relay B to exhaust actuator upper cylinder pressure to atmosphere and relay A to increase actuator lower cylinder pressure. As a result, the actuator rod retracts and the actuator rotary shaft rotates counterclockwise. This causes the feedback arm to pivot counterclockwise reducing the force applied to the summing beam by the range spring.

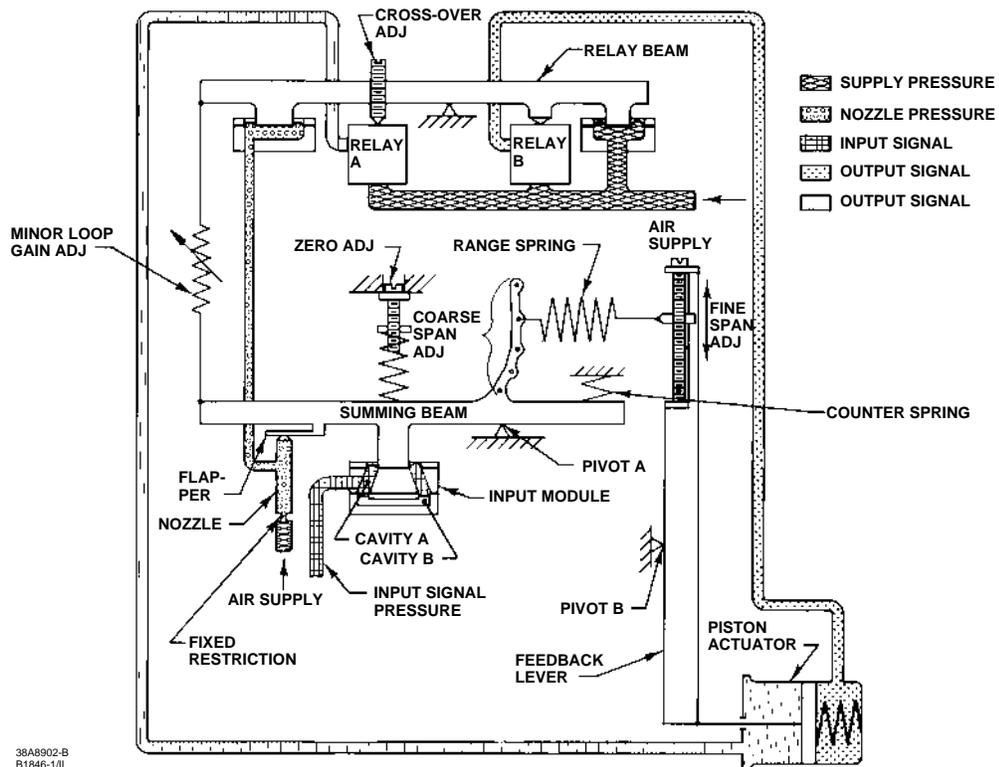


Figure 21. Schematic of the Type 3611JP Positioner

As the valve shaft rotates counterclockwise, the range spring force on the summing beam continues to reduce until the summing beam torques are in equilibrium. At this point, the valve shaft is in the correct position for the specific input signal applied.

The 3620J Series positioner is a combination of a 3610J Series positioner with a Type 3622 electro-pneumatic converter. The electro-pneumatic converter provides a 0.2 to 1.0 bar (3 to 15 psig) output pressure proportional to the 4 to 20 milliamper dc input signal. The 0.2 to 1.0 bar (3 to 15 psig) output pressure becomes the input signal pressure to the 3610J Series pneumatic positioner.

## Maintenance

Positioner parts are subject to normal wear and must be inspected and replaced as necessary. The frequency of inspection and replacement depends upon the severity of service conditions. The following procedure describes disassembly and reassembly of the positioner. When inspection or repairs are required, disassemble only those parts necessary to accomplish the task. When reassembly is complete, make adjustments as described in the Calibration section.

## WARNING

**Avoid personal injury or property damage from sudden release of process pressure. Before performing any maintenance operations:**

- Always wear protective clothing and eyewear when performing any maintenance operations to avoid personal injury.
- Disconnect any operating lines providing air pressure, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.
- Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure on both sides of the valve.

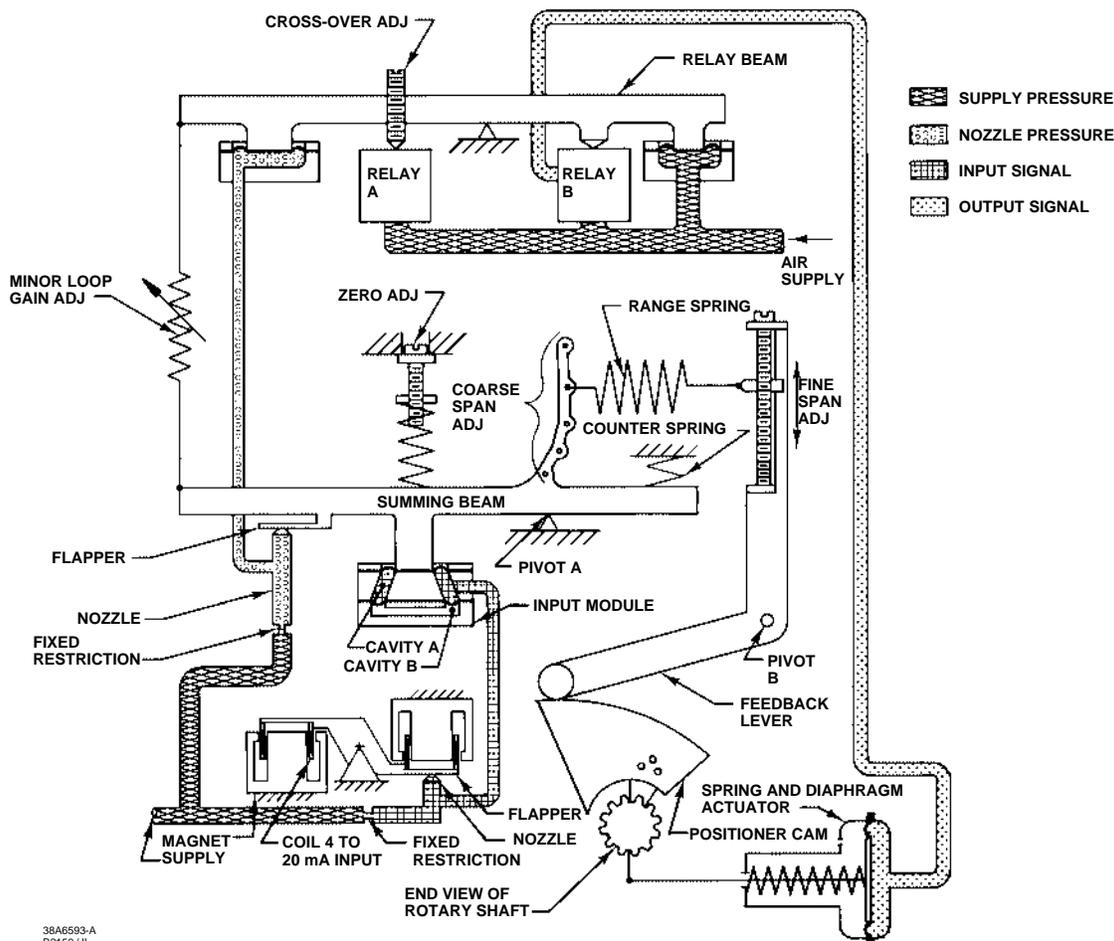


Figure 22. Schematic of the Type 3620J Positioner

- Vent the actuator loading pressure and disconnect positioner supply pressure.
- For explosion proof applications, disconnect power before removing the converter housing cap in an explosive atmosphere.
- Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
- Check with your process of safety engineer for any additional measures that must be taken to protect against process media.

## Positioner Disassembly

### Removing the Positioner from the Actuator

Refer to figure 28 or 29 for key number locations, unless otherwise indicated, while removing the positioner from the actuator.

1. Unscrew the four socket head screws (key 54), and remove the positioner from the actuator or positioner adaptor (key 113—the positioner adaptor is used only on selected actuator types and sizes).
2. Release all pressure to the positioner. Disconnect the supply, instrument, and output tubing.
3. Unscrew the four captive cover screws and remove the cover (key 41).
4. For the 3611JP or the 3621JP mounted on a Type 585 or 585R, size 100 with a 51- through 102-mm (2- through 4-inch) travel only, disconnect the extension spring (key 185) from the feedback lever.

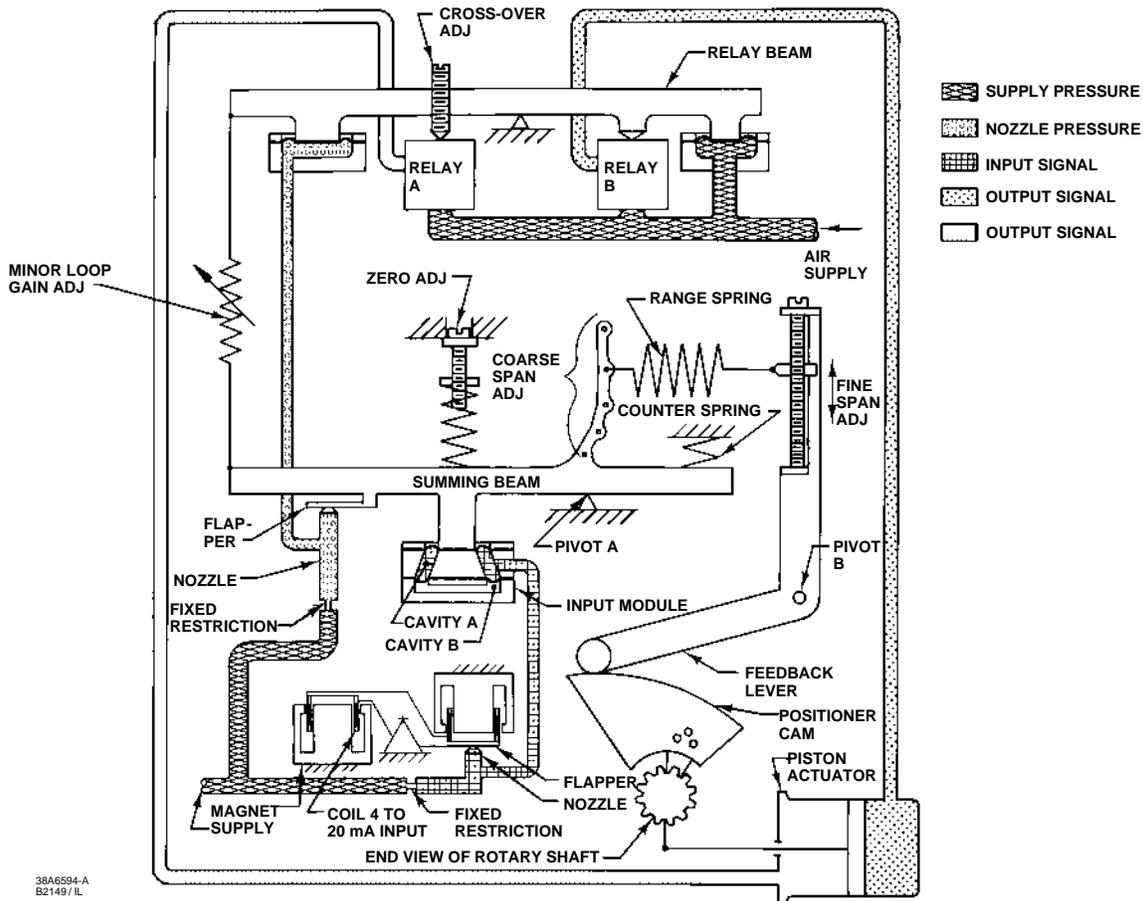


Figure 23. Schematic of the Type 3620JP Positioner

5. Unscrew the four socket head screws (key 54), and remove the positioner from the actuator or positioner adapter (key 113—the positioner adapter is used only on selected actuator types and sizes).

### Disassembling the Bypass Valve

Refer to figure 26 for key number locations while disassembling the bypass valve.

1. Remove all pressure from the positioner. Disconnect the supply, instrument, and output tubing.
2. Remove the four socket head screws (key 169), and lift the bypass body (key 161) and bypass body gasket (key 163) from the bypass body adaptor (key 162). Inspect the gasket and replace if necessary.
3. Remove the wire tie (key 166) and the retaining ring (key 165).
4. With a gentle pulling and turning motion, slide the bypass lever assembly (key 160) from the bypass

body (key 161). Inspect the O-rings (keys 159, 167, and 168) for nicks or wear and replace if necessary. Apply lubricant (key 153) to the O-rings before replacement.

5. Remove the two socket head screws (key 54) and remove the bypass body adaptor (key 162) and adaptor gasket (key 164) from the gauge block (key 158).

6. Inspect the adaptor gasket (key 164) and replace if necessary.

### Disassembling the Gauge Block

Refer to figure 26 for key number locations, unless otherwise indicated, while disassembling the gauge block.

1. If the positioner has a bypass valve, perform steps 1, 5, and 6 of the Disassembling the Bypass Valve procedures.

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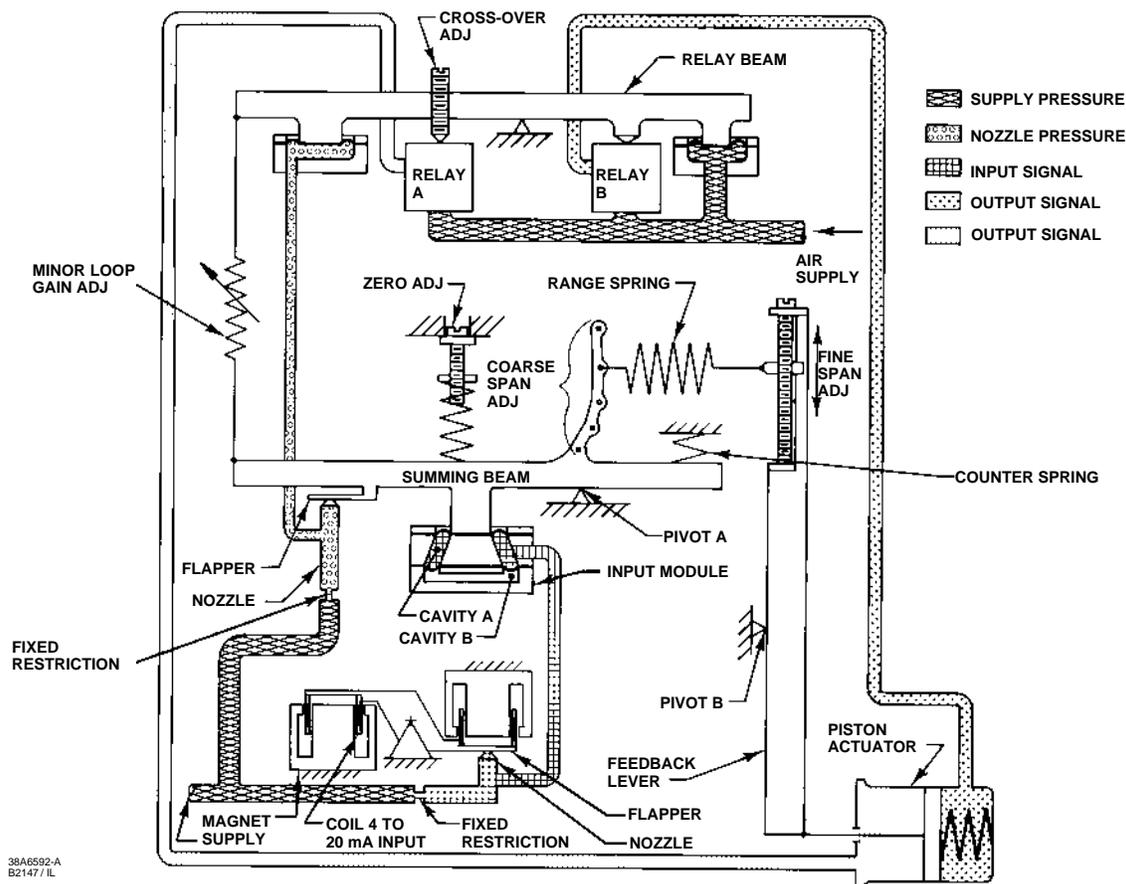


Figure 24. Schematic of the Type 3621JP Positioner

2. Release all pressure from the positioner. Disconnect the supply, instrument, and output tubing.
3. Remove all gauges [key 79 (not shown), 80 and 81], pipe plugs (key 72 and 78), or tire valves (key 73, not shown) from the gauge block (key 158).
4. Remove the two socket head screws (key 187) and remove the gauge block from the positioner case (key 115A, figure 25). Inspect the four O-rings (key 159) and replace if necessary. Apply lubricant (key 153) to the O-rings before replacement.

### Disassembling the Type 3622 Electro-Pneumatic Converter

Refer to figure 30 for key number locations while disassembling the converter.

### Note

To check the operation of the electro-pneumatic converter, remove the pipe plug nearest the converter (key 37, figure 30), and connect a pressure gauge. Provide a 1.4 bar (20 psig) supply pressure to the positioner. For a 4-milliamper dc input signal, the pressure gauge should read 0.17 to 0.23 bar (2.5 to 3.5 psig). For a 20-milliamper dc input signal, the pressure gauge should read 0.96 to 1.07 bar (14.0 to 15.5 psig).

1. Turn off electrical power to the converter. Release all supply pressure from the positioner.
2. Remove the cap (key 20), and disconnect the field wiring from the terminal block.
  - a. If a grounding wire is used inside the housing compartment, disconnect the wire from the interior housing ground screw (key 31).

- b. If an exterior grounding wire is used, disconnect the grounding wire from the external ground screw (key 31).
3. To remove the converter module, remove the two screws (key 30) and pull the module out of the housing. Inspect the O-ring (key 26) and replace it, if necessary.
  - a. If removing the Type 3622 electro-pneumatic converter assembly from the pneumatic positioner, continue with steps 4 through 6. Or,
  - b. If replacing the converter module only, obtain a replacement converter module and refer to the Assembling the Type 3622 Electro-pneumatic Converter procedure. If replacing the converter module, calibrate the pneumatic portion of the positioner by performing the Calibration procedures after module replacement. There is no converter module calibration.
4. Disconnect the supply tubing, output tubing, and conduit from the converter.
5. If the optional Type 67CFR filter regulator is used, remove the two screws (key 89, figure 27), and remove the filter regulator from the converter assembly. Inspect the O-ring (key 190, figure 27) and replace if necessary. Apply lubricant (key 17) to the O-ring before replacement.
6. Remove the two socket head screws (key 35) and remove the converter from the positioner case (key 115A, figure 25). Inspect the four O-rings (key 36) and replace them if necessary. Apply lubricant (key 17) to the O-rings before replacement.

### ***Disassembling the Feedback Lever Assembly***

Refer to figure 28 for key number locations, unless otherwise indicated, while disassembling the feedback lever assembly.

For Type 1051, 1052, 1061, 585, 585R, 585C, and 585CR actuators:

1. Remove the range spring (key 150, figure 25).
2. Turn the positioner over and unscrew the four machine screws (key 43) and remove the feedback lever assembly (key 117 or 170) from the positioner.
3. Remove the range spring hanger (key 130, figure 25) and the span adjustment screw (key 128, figure 25) from the feedback lever assembly (key 117 or 170) by removing the retaining ring (key 129, figure 25) and threading the span adjustment screw out of the spring hanger.

4. Remove the E-ring (key 61) and separate the pillow blocks (key 35), the spring (key 70), the spacer (key 149) and the mandrel (key 148) from the feedback lever assembly. For the Type 3610J, 3610JP, 3620J, and 3620JP positioners only, unscrew the hex nut (key 60) and remove the follower post (key 38) and roller (key 39).
5. Press out the two flange bearings (key 37) from the pillow blocks (key 35). Inspect them for wear and replace if necessary.

### ***Disassembling the Reversing Plate and Gasket***

Refer to figure 25 for key number locations. Remove the reversing plate screw (key 49), the reversing plate (key 23), and the gasket (key 24). Inspect the gasket, and replace if necessary.

#### **Note**

**When installing the gasket (key 24), ensure it is not reversed. Install the gasket so the slot in the case assembly (key 115A) aligns with one of the three holes in the gasket (key 24).**

### ***Disassembling the Relay***

During the following relay disassembly procedures, refer to figure 25 for key number locations.

1. Loosen the socket head screw (key 55) and remove the flexure adjustment (key 156) by carefully sliding it off the end of the two flexures (on earlier positioners, a stick-on label will have to be removed from the top flexure prior to removing the flexure adjustment). For Type 3611JP or 3621JP positioners only, remove the two socket head screws and lock washers (keys 180 and 181) and the parallel flexure (key 179) (not used on positioners for Type 585 size 100 actuators).
2. Unscrew the 12 machine screws (key 47) and lift the relay manifold (key 9) and relay beam assembly (key 122) from the positioner.
3. Remove the relay nozzle diaphragm assembly (key 8) and relay supply diaphragm assembly (key 7). Inspect them for wear and replace if necessary.
4. Unscrew the two screws (key 50) that hold the nozzle relay head (key 14) and the supply relay head (key 15), and separate them from the relay beam assembly (key 122).
5. Loosen the two set screws (key 57) in the relay manifold (key 9) and remove the pivot pin (key 10) and relay beam assembly (key 122) from the relay manifold.

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6. Turn the positioner over and remove the two body plugs (key 115E) and body plug gaskets (key 115F). The valve plug springs (key 115H), valve plug shrouds (key 115K), and valve plugs (key 115G) are now exposed and can also be removed. Inspect the valve plugs for wear and replace if necessary. Inspect the body plug gaskets (key 115F) and replace if necessary.

7. Unscrew the 10 machine screws (key 115J), and remove the pressure plate (key 115C) and gasket (key 115D). Inspect the pressure plate gasket and replace if necessary.

## Disassembling the Summing Beam Assembly

During the following summing beam disassembly procedures, refer to figure 25 for key number locations.

1. Loosen the socket head screw (key 55) and remove the flexure adjustment (key 156) by carefully sliding it off the end of the two flexures (on earlier positioners, a stick-on label will have to be removed from the top flexure prior to removing the flexure adjustment). For Type 3611JP or 3621JP positioners only, remove the two socket head screws and lock washers (keys 180 and 181) and the parallel flexure (key 179) (not used on positioners for Type 585 size 100 actuators).

### Note

**Early Type 3611JP positioners do not have the parallel flexure described in step 1. The parallel flexure should be added if absent. This may require a new summing beam assembly (key 123) and relay beam assembly (key 122) if these parts are not drilled and tapped to accept the parallel flexure. See figure 25 for the location of the parallel flexure mounting screws.**

2. Remove the range spring (key 150).
3. Relieve the tension on the zero spring (key 141) by rotating the zero adjustment screw (key 143) fully clockwise. Remove the two screws (key 139) which retain the zero spring bracket (key 144). Remove the zero spring bracket, the zero adjustment screw, and the spring seat (key 142). Remove the spring seat from the zero adjustment screw by rotating the screw counterclockwise.
4. Unscrew the counter spring screw (key 127), and remove the counter spring seat (key 126) and the counter spring (key 125).

5. Remove the machine screw (key 140) while holding the hex diaphragm connector (key 135) with an open end wrench to prevent rotation (rotation of the diaphragm connector will damage the input diaphragms).

6. Remove the two summing beam mounting screws (key 124). Lift the summing beam assembly (key 123) from the positioner case.

7. Remove the flapper (key 18) from the summing beam assembly by removing the flapper screw and washer (keys 51 and 176).

## Disassembling the Nozzle Assembly

During the following nozzle assembly disassembly procedures, refer to figure 25 for key number locations.

1. Perform steps 1 through 5 of the Disassembling the Summing Beam Assembly procedure.
2. Unscrew the two captive machine screws (key 45) in the nozzle block (key 146) and remove the nozzle block. Inspect the two O-rings (key 64) and replace them if necessary. Apply lubricant (key 153) to the O-rings before replacement.

## CAUTION

**To avoid damage to the nozzle during the next step, be careful not to apply force to the exposed nozzle primary orifice. Excess force may loosen or crack the orifice.**

3. Remove the nozzle (key 116) from the nozzle block (key 146) by carefully pushing on the nozzle tip with the thumb or other soft object until the base of the nozzle begins to protrude from the back of the nozzle block. Grasp the base of the nozzle and pull the nozzle from the nozzle block. Inspect the O-rings (keys 120 and 121) and replace them if necessary. Apply lubricant (key 153) to the O-rings before replacement.
4. Remove the core and wire assembly (key 147) from the nozzle block (key 146) by unscrewing the core from the nozzle block.

## Disassembling the Input Module

During the following input module disassembly procedures, refer to figure 25 for key number locations.

1. Perform steps 1 through 5 of the Disassembling the Summing Beam Assembly procedure.
2. Unscrew the remaining two input module machine screws (key 177) and remove the input diaphragm flange (key 138).

3. Remove the following as an assembly: the lower and upper diaphragms (keys 118 and 119), the lower and upper diaphragm plates (keys 132 and 134), the diaphragm spacer (key 133), the diaphragm connector (key 135), the diaphragm spacer (key 137), and the sealing screw (key 136). To disassemble this sub-assembly, unscrew the sealing screw (key 136) from the diaphragm connector (key 135) and separate the parts. Inspect the diaphragms and sealing screw O-ring and replace if necessary [earlier positioners use a standard machine screw instead of a sealing screw; replace the old standard screw with a sealing screw (key 136)].

## Positioner Reassembly

### Assembling the Input Module

Refer to figure 25 for key number locations while assembling the input module.

1. Orient the input module sub-assembly parts as shown in figure 25 and tighten the sealing screw (key 136) into the diaphragm connector (key 135).
2. Apply a light lubricant silicone spray to the sealing ribs on the lower and upper input diaphragms (keys 118 and 119). See figure 25 for location.

## CAUTION

**Failure to use the lubricant may cause damage to the sealing ribs during assembly and subsequent leakage.**

3. Place the input module sub-assembly into the positioner case (key 115A) and align the four lower diaphragm (key 118) screw holes with the four screw holes in the positioner case. Ensure that the hole in the lobe of the lower diaphragm is aligned with the instrument air passageway in the positioner case.
4. Install the two input module machine screws (key 177) in the two holes not used to mount the zero spring bracket (key 144) and tighten. These are the two shorter screws of the four which mount the input module.
5. If the nozzle assembly was previously removed, perform the Assembling the Nozzle Assembly procedure.
6. Perform the Assembling the Summing Beam Assembly procedure and then, continue with steps 7 through 9 below.

7. If the reversing plate (key 23) was previously removed, install the gasket (key 24) and reversing plate, and reversing plate screw (key 49). When installing the gasket, make sure one of the three gasket holes is over the exhaust slot in the positioner case (key 115A). Adjust the reversing plate so the letter R is showing and the letter D is entirely covered. Tighten the screw (key 49).

8. Connect an air line to the positioner instrument connection and apply 2.4 bar (35 psig). Check the input module sealing surfaces for air leaks using a soap solution or other suitable solution compatible with Nitrile rubber.

9. If reverse action is required, leave the reversing plate (key 23) as it is. If direct action is required, loosen the machine screw (key 49) and rotate the reversing plate so the letter D is showing and the letter R is entirely covered. Tighten the screw (key 49).

### Assembling the Nozzle Assembly

Refer to figure 25 for key number locations while assembling the nozzle assembly.

1. Thread the core and wire assembly (key 147) back into the nozzle block (key 146) if previously removed.
2. Apply a very light coat of lubricant (key 153) to the nozzle O-rings (keys 120 and 121). The lubricant must be applied very sparingly to avoid accidental plugging of the nozzle primary orifice.
3. Assemble the nozzle (key 116) into the nozzle block (key 146) with a gentle pushing and twisting motion to avoid nicking the O-rings. To fully seat the nozzle, align the flat at the nozzle base with the flat cast into the underside of the nozzle block.
4. Apply a very sparing amount of lubricant (key 153) to the two O-rings (key 64) and install them into the positioner case (key 115A).
5. Place the nozzle block (key 146) on the positioner case and tighten the two captive nozzle block mounting screws (key 45).
6. Perform the Assembling the Summing Beam Assembly procedure.

### Assembling the Summing Beam Assembly

Refer to figure 25 for key number locations while assembling the summing beam.

1. Install the flapper (key 18) into the summing beam assembly (key 123) with the flapper screw and washer (keys 51 and 176) so that the letter A is visible as shown in figure 25.

## 3610J and 3620J Positioners

2. If the nozzle (key 116) has been removed, perform the Assembling the Nozzle Assembly procedure.
3. If the relay beam assembly (key 122) is removed, perform steps 1 through 7 of the Assembling the Relay Beam Assembly procedure.
4. Place the summing beam assembly (key 123) in the positioner case (key 115A) and ensure the summing beam assembly flexure is under the relay beam (key 122) flexure.
5. Loosely install the two summing beam mounting screws (key 124).
6. The summing beam assembly (key 123) must simultaneously align with the relay beam assembly (key 122) and diaphragm connector (key 135) as follows:
  - a. Depress the summing beam assembly (key 123) until the flapper lightly touches the nozzle, then slide the summing beam assembly such that the hole for the machine screw (key 140) is centered over the tapped hole in the diaphragm connector (key 135).
  - b. While keeping the above hole centered, slide the summing beam assembly such that the summing beam assembly flexure is aligned with the relay beam assembly flexure along its entire length.
  - c. While maintaining the above orientations, tighten the two mounting screws (key 124).
  - d. After tightening the mounting screws check the alignments described in steps a and b and repeat if necessary.

For optimum positioner performance, be sure the summing beam assembly is aligned as described.

7. While holding the hex diaphragm connector (key 135) with an open end wrench to prevent rotation (rotation of the diaphragm connector may damage the input diaphragms or twist them and reduce positioner performance), install the machine screw (key 140).
8. Install the counter spring (key 125), counter spring seat (key 126), and counter spring screw (127) and tighten. Ensure that the counter spring seat does not rub against the summing beam assembly (key 123) as the summing beam assembly pivots.
9. If the zero adjustment spring seat (key 142), zero spring bracket (key 144), and zero adjustment screw

(key 143) were previously disassembled, place a light amount of lubricant (key 153) on the zero adjustment screw threads for smooth zero adjustment, insert the zero adjustment screw through the zero spring bracket, and thread the zero adjustment spring seat onto the zero adjustment screw.

10. Place the zero spring (key 141) and zero spring bracket (key 144) on the positioner input module and ensure that the zero spring ends are centered on the seats. Ensure that the tab on the zero adjustment spring seat (key 142) is inserted in the anti-rotator slot in the zero spring bracket. Insert the two machine screws (key 139) through the zero spring bracket, carefully compress the zero spring by pushing down on the zero spring bracket, and tighten the screws in the positioner case.

11. If the feedback lever assembly (key 117 or 170, figure 28) was previously removed, perform the Assembling the Feedback Lever Assembly procedure; then, continue with steps 13 through 15 below.

12. Install the range spring (key 150). Refer to tables 4 through 7 and figure 15 for the correct summing beam hole number.

13. Assemble the flexure adjustment (key 156) onto the two minor loop feedback flexures. Slide the flexure adjustment along the entire length of the flexures, making sure it does not rub against the relay at any point. If contact is made with the relay or diaphragm edges at any point, remove the flexure adjustment, loosen the twelve machine screws (key 47), slide the relay manifold slightly to provide clearance and tighten the machine screws (key 47). Perform steps 2 through 5 of the Disassembling the Summing Beam Assembly procedure and loosen the two machine screws (key 124). Perform steps 4 through 10 of the Assembling the Summing Beam Assembly procedure. Assemble the flexure adjustment on the minor loop feedback flexures and check for clearance.

14. Slide the flexure adjustment (key 156) to the proper X dimension per figure 14 and tighten the socket head screw (key 55). For Type 3611JP and 3621JP positioners only, install the parallel flexure (key 179) with the two socket head screws and lock washers (keys 180 and 181). The parallel flexure is not used on positioners with Type 585 size 100 actuators.

### **Assembling the Relay**

Refer to figure 25 for key number locations while assembling the relay.

1. Replace the pressure plate gasket (key 115D) and pressure plate (key 115C) with the ten machine screws (key 115J). Visually align the two large holes in the pressure plate with the two stainless steel pressed-in valve seats in the positioner case (key 115A) and tighten the machine screws.
2. Install the valve plugs (key 115G), valve plug springs (key 115H), and valve plug shrouds (key 115K) in the two relay holes. Place the body plug gaskets (key 115F) on the body plugs (key 115E) and tighten in the positioner case.
3. If the pivot pin (key 10) was removed from the relay manifold (key 9), apply a light coat of lubricant (key 153) to the pin and slide it into the relay manifold and relay beam assembly (key 122). Position the pivot pin so it is flush with the left side of the relay manifold as viewed in figure 13, and tighten the two set screws (key 57). The pivot pin must not rub against the flexure adjustment (key 156).
4. Assemble the supply relay head (key 15) and nozzle relay head (key 14) onto the relay beam assembly (key 122) with the two machine screws (key 50), but do not tighten the screws. The nozzle relay head is the larger in diameter of the two and is installed in the large manifold hole. Insert the nozzle relay head holder from the repair kit through the larger manifold hole and into the nozzle relay head (key 14). Insert the supply relay head holder from the repair kit through the smaller manifold hole and into the supply relay head (key 15). Tighten the two machine screws (key 50). Remove the nozzle relay head holder and supply relay head holder from the manifold. The nozzle relay head (key 14) and supply relay head (key 15) are now correctly aligned in the center of the manifold holes.
5. Dimple the relay nozzle diaphragm (key 8) and relay supply diaphragm (key 7). Place both diaphragms in the positioner case (key 115A) with the fabric side of the diaphragms showing and align the diaphragm holes with the mounting holes in the positioner case.
6. Carefully place the relay manifold/beam assembly over the relay diaphragms. Ensure the relay diaphragms are lying flat and the diaphragm edges are not doubled over. Ensure that the diaphragm convolutions are centered in the relay manifold holes and are not pinched. The relay beam assembly (key 122) flexure must be on top of the summing beam assembly (key 123) flexure as shown in figure 14).
7. Install the twelve relay manifold machine screws (key 47), but do not tighten them.
8. If the summing beam assembly (key 123) is removed, perform the Assembling the Summing Beam Assembly procedure, steps 1 through 12. Then, continue with steps 9 through 11 below.
9. Slide the relay manifold (key 9) slightly if necessary, to visually align the relay beam assembly (key 122) flexure with the summing beam assembly (key 123) flexure along their entire length. Tighten the twelve machine screws (key 47).
10. Assemble the flexure adjustment (key 156) onto the two minor loop feedback flexures. Slide the flexure adjustment along the entire length of the flexures making sure it does not rub against the relay at any point. If contact is made with the relay or diaphragm edges at any point, remove the flexure adjustment, loosen the twelve machine screws (key 47), slide the relay manifold slightly to provide clearance and tighten the machine screws (key 47). Perform steps 2 through 5 of the Disassembling the Summing Beam Assembly procedure and loosen the two machine screws (key 124). Perform steps 4 through 10 of the Assembling the Summing Beam Assembly procedure. Assemble the flexure adjustment on the minor loop feedback flexures and check for clearance.
11. Check the supply relay head (key 15) and nozzle relay head (key 14) to ensure they are centered in the diaphragms. If not, loosen the connecting screws (key 50) and center.
12. Slide the flexure adjustment (key 156) to the proper X dimension per figure 14 and tighten the socket head screw (key 55). For Type 3611JP and 3621JP positioners only, install the parallel flexure (key 179) with the two socket head screws and lock washers (keys 180 and 181). The parallel flexure is not used on positioners for Type 585 size 100 actuators.

### ***Assembling the Reversing Plate and Gasket***

Refer to figure 25 for key number locations while assembling the reversing plate and gasket.

Install the reversing plate gasket (key 24) and reversing plate (key 23) with the reversing plate screw (key 49). When installing the gasket, make sure one of the three gasket holes is over the exhaust slot in the positioner case (key 115A). If direct action is required, adjust the reversing plate so the letter D is showing and the letter R is entirely covered. If reverse action is required, adjust the reversing plate so the letter R is showing and the letter D is entirely covered. Tighten the screw (key 49).

# 3610J and 3620J Positioners

## **Assembling the Gauge Block**

Refer to figure 26 for key number locations, unless otherwise indicated, while assembling the gauge block.

1. Apply lubricant (key 153) to the four O-rings (key 159) and install in the positioner case (key 115A, figure 25). Attach the gauge block (key 158) with the two socket head screws (key 187). During assembly of the gauge block, ensure that the O-rings stay in place to avoid leaks.
2. Assemble gauges [keys 79 (not shown), 80, and 81], pipe plugs (keys 72 and 78), or tire valves (key 73, not shown) as applicable to the gauge block (key 158). Apply sealant (key 154) to the threads of the gauges, pipe plugs, or tire valves.
3. If other positioner components are removed, refer to the appropriate reassembly procedures and assemble the positioner completely.
4. Plug the relay A and relay B output connections and apply 2.0 bar (30 psig) to the instrument connection and 2.4 bar (35 psig) minimum supply pressure to the supply connection.
5. Using soap solution or some other solution compatible with Nitrile rubber, check the gauge block O-rings and any other O-rings, gaskets, or diaphragms which were disassembled for leaks.

## **Assembling the Type 3622 Electro-Pneumatic Converter**

Refer to figure 30 for key number locations, unless otherwise indicated, while assembling the converter.

1. If the Type 3622 electro-pneumatic converter was removed from the pneumatic positioner, apply lubricant (key 17) to the four O-rings (key 36), and install the O-rings in the case (key 115A, figure 25). Ensure that the O-rings remain in place. Attach the converter assembly to the case with the two socket head screws (key 35) and tighten the socket head screws.
2. Install gauges (key 43), pipe plugs (key 37), or tire valves (key 41, not shown) as applicable to the converter. Apply sealant (key 39) to the threads of the gauges, pipe plugs or tire valves.
3. If the converter module was removed from the pneumatic positioner, apply lubricant (key 17) to the O-ring (key 26) and insert the converter module into the housing.
4. Replace the two screws (key 30) and tighten them.

5. If other positioner components are removed, refer to the appropriate reassembly procedures and assemble the positioner completely.

6. Connect the supply tubing, output tubing, and conduit to the converter.
7. Connect the wiring to the terminal block by using installation procedures.
  - a. If an internal grounding wire is used inside the housing compartment, connect the wire to the housing ground screw (key 31) and replace the cap (key 20).
  - b. If an exterior grounding wire is used, connect the grounding wire to the exterior ground screw (key 31).
8. Plug relay A and relay B output connections and apply 2.4 bar (35 psig) to the supply pressure connection. Apply a 20 milliampere dc input signal to the converter.
9. Check for leaks using a soap solution or other solution compatible with Nitrile; check the O-rings (key 36) and any other components which were disassembled or disconnected.
10. If the converter module was replaced, calibrate the pneumatic portion of the positioner by performing the procedures in the Calibration section. There is no converter module calibration.

## **Assembling the Feedback Lever Assembly**

Refer to figure 28 for key number locations while assembling the feedback lever assembly.

1. Press the two flange bearings (key 37) into the pillow blocks (key 35) if removed.
2. Assemble the mandrel (key 148), the spacer (key 149), the spring (key 70), and the pillow blocks (key 35) onto the feedback lever assembly (key 117) and install the E-ring (key 61). For Type 3610J, 3610JP, 3620J, and 3620JP positioners only, assemble the roller (key 39) and follower post (key 38) onto the feedback lever assembly and tighten the hex nut (key 60).
3. If the span adjustment screw (key 128, figure 25) was disassembled, lightly coat the threads with lubricant (key 153) and insert the span adjustment screw into the feedback lever assembly (key 117) and thread into the spring hanger (key 130, figure 25). Ensure the tip of the span adjustment screw is in the guide hole and install the retaining ring (key 129, figure 25).
4. Assemble the feedback lever assembly (key 117) onto the positioner case (key 115A, figure 25) by

attaching the pillow blocks (key 35) with the four machine screws (key 43).

5. Turn the positioner over and install the range spring (key 150, figure 25). Refer to tables 4 through 7 and figure 15 for the correct summing beam hole number.

### **Assembling the Bypass Valve Assembly**

Refer to figure 26 for key number locations while assembling the bypass valve assembly.

1. If the gauge block (key 158) is removed, perform the Assembling the Gauge Block procedure.
2. Assemble the adaptor gasket (key 164) and bypass body adaptor (key 162) onto the gauge block (key 158) and tighten the two socket head screws (key 54).
3. Apply lubricant (key 153) to the O-rings (keys 159, 167, and 168) sparingly and install the O-rings on the bypass lever assembly (key 160). The two center O-rings are retained in the bypass lever assembly by applying a slight twist to the O-ring with the thumb and first finger while pushing the O-ring into place.
4. Install the bypass lever assembly (key 160) into the bypass body (key 161) with a gentle twisting and pushing motion to reduce the chance of nicking an O-ring.
5. Install the retaining ring (key 165) and the wire tie (key 166).
6. Assemble the bypass body (key 161) and the bypass body gasket (key 163) onto the bypass body adaptor (key 162) with the four socket head screws (key 169). Ensure that the holes in the gasket are aligned with the holes in the bypass body. If the gasket is installed upside down, the bypass valve will not work.
7. If the reversing plate (key 23, figure 25) is removed, install the reversing plate gasket (key 24, figure 25) and reversing plate (key 23, figure 25) with the reversing plate screw (key 49, figure 25). When installing the gasket, make sure one of the three gasket holes is over the exhaust slot in the positioner case (key 115A, figure 25). If direct action is required, adjust the reversing plate so the letter D is showing and the letter R is entirely covered. If reverse action is required, adjust the reversing plate so the letter R is showing and the letter D is entirely covered. Tighten the screw (key 49).
8. If the input module is removed, perform the Assembling the Input Module procedure.

9. Plug the relay A and relay B output connections and apply 2.4 bar (35 psig) to the Instrument connection. Using soap solution or some other solution compatible with Nitrile rubber, check the bypass assembly for leaks at the gasket and O-ring seals while rotating the bypass lever to both BYPASS and POSITIONER.

### **Changing Positioner Types**

#### **Changing a Type 3610J to a 3610JP Positioner, Changing a Type 3620J to a 3620JP Positioner, or Vice Versa:**

1. The nozzle (key 116, figure 25) must be changed. The Type 3610J, 3610JP, 3620J, and 3620JP nozzles can be identified by referring to figure 7. Refer to the Disassembling the Nozzle Assembly and Assembling the Nozzle Assembly maintenance procedures.
2. The supply and output gauges [keys 79 (not shown) and 81, figure 26] must be changed and possibly the instrument gauge (key 80, figure 26) depending on the instrument input signal. Apply sealant (key 154) to the threads of the gauges.
3. The feedback lever assembly (key 117, figure 28) may need to be changed or altered depending on actuator type and size. Refer to keys 117, 170, 171, 75, 76, 77, and 99 in the parts list. To change from key 117 to 170, or vice versa, refer to the disassembling the Feedback Lever Assembly and Assembling the Feedback Lever Assembly maintenance procedures.
4. The cam (key 82, figure 28) may need to be changed depending on actuator type and size. If the cam is changed, two screws (key 83, figure 28) may also be required and possibly a cam adjustment indicator (key 84, figure 28). The cam adjustment indicator is only used with the characterized cams B or C. Refer to the Changing Cams procedure.
5. The range spring (key 150, figure 25) may need to be changed depending on actuator type and size. Refer to tables 4 through 7 for range spring selection and hole position on the summing beam assembly for coarse span adjustment.
6. A positioner adaptor may be required depending on actuator type and size. Refer to key 113 in the parts list. If the positioner adaptor is required, four socket head screws (key 54, figure 28) will also be required for mounting.
7. Changing from a Type 3610JP to a 3610J or a Type 3620JP to a 3620J requires a pipe plug (key 78, figure 26) to plug output A. Apply sealant (key 154) to the threads of the pipe plugs.

## 3610J and 3620J Positioners

### **Changing a Type 3610JP to a 3611JP Positioner, Changing a Type 3620JP to a 3621JP Positioner, or Vice Versa:**

1. Change the feedback lever assembly (key 117 or 170, figure 28) as described in the Disassembling the Feedback Lever Assembly and Assembling the Feedback Lever Assembly maintenance procedures.
2. Changing from a Type 3610JP to a 3611JP or a Type 3620JP to a 3621JP requires the following feedback parts: keys 172, 173, 174, 175, 184 (Type 585, size 100 only), and 185 [Type 585, size 100 with 51- through 102-mm (2- through 4-inch) travels only, see figure 29].
3. Changing from a Type 3610JP to a 3611JP, or a Type 3620JP to a 3621JP requires installing a parallel flexure (key 179, figure 25). The parallel flexure is not used on positioners for Type 585 size 100 actuators. Earlier Type 3611JP positioners do not have this part. Therefore, the summing beam assembly (key 123, figure 25) or relay beam assembly (key 122, figure 25) or both may be required if they are not drilled and tapped to accept this parallel flexure. Refer to figure 25 for the location of the required tapped holes. The following parts are required: keys 179, 180, and 181, figure 25.
4. Changing from a Type 3610JP to a 3611JP or a Type 3620JP to a 3621JP requires a positioner adaptor (key 113, figure 29). Use four socket head screws (key 54, figure 29) to mount the adaptor.
5. Changing from a Type 3611JP to a 3610JP or a Type 3621JP to a 3620JP requires the following feedback parts: keys 38, 39, and 60, figure 28.
6. Changing from a Type 3611JP to a 3610JP or a Type 3621JP to a 3620JP requires a cam (key 82, figure 28). Two screws (key 83, figure 28) mount the cam and a cam adjustment indicator (key 84, figure 28—used only with characterized cams B or C). Refer to the Mounting Type 3610J, 3610JP, 3620J, and 3620JP Positioners procedures for correct cam mounting.
7. Changing from a Type 3611JP to a 3610JP or a Type 3621JP to a 3620JP may require additional feedback parts depending on actuator type and size. Refer to keys 75, 76, 77, 99, and 171 in the parts list and figure 28 to determine if they are required.
8. The range spring (key 150, figure 25) may need to be changed depending on actuator type and size. Refer to tables 4 through 7 for range spring selection and hole position on the summing beam assembly for coarse span adjustment.

9. The instrument gauge (key 80, figure 26) may need to be changed depending on the input signal. Apply sealant (key 154) to the threads of the gauge.

### **Changing a Type 3610J to a 3611JP Positioner, Changing a Type 3620J to a 3621JP Positioner, or Vice Versa:**

1. Change the feedback lever assembly (key 117, figure 28) by performing the Disassembling the Feedback Lever Assembly and Assembling the Feedback Lever Assembly maintenance procedures.
2. The nozzle (key 116, figure 25) must be changed. Refer to the parts list for the correct nozzle assembly part number. Refer to figure 7 to identify the Type 3610J, 3620J, 3611JP, and 3621JP nozzles. Refer to the Disassembling the Nozzle Assembly and Assembling the Nozzle Assembly maintenance procedures.
3. The supply and output gauges [keys 79 (not shown) and 81, figure 26] must be changed and possibly the instrument gauge (key 80, figure 26) depending on the input signal. Apply sealant (key 154) to the threads of the gauges.
4. Changing from a Type 3610J to a 3611JP or a Type 3620JP to a 3621JP requires the following feedback parts: keys 172, 173, 174, 175, 184 (Type 585, size 100 only), and 185 [Type 585, size 51-through 102-mm (100 with 2- through 4-inch) travels only, see figure 29].
5. Changing from a Type 3610J to a 3611JP or a Type 3620J to a 3621JP requires installing a parallel flexure (key 179, figure 25). The parallel flexure is not used on positioners for Type 585 size 100 actuators. Earlier Type 3611JP positioners do not have this part. Therefore, the summing beam assembly (key 123, figure 25) or relay assembly (key 122, figure 25) or both may be required if they are not drilled and tapped to accept this parallel flexure. The following parts are required: keys 179, 180, and 181, figure 25.
6. Changing from a Type 3610J to a 3611JP or a Type 3620JP to a 3621JP may require a positioner adaptor (key 113, figure 28). Use four socket head screws (key 54, figure 28) to mount the adaptor.
7. Changing from a Type 3611JP to a 3610J or a Type 3621JP to a 3620J requires the following feedback parts: keys 38, 39, and 60 in figure 28.
8. Changing from a Type 3611JP to a 3610J or a Type 3621JP to a 3620J, requires a cam (key 82, figure 28). Mount the cam with two screws (key 83, figure 28) and a cam adjustment indicator (key 84, used only with characterized cams B or C, figure 28). Refer to the Mounting Type 3610J, 3610JP,

3620J, and 3620JP Positioners procedures for correct cam mounting.

9. Changing from a Type 3611JP to a 3610J or a Type 3621JP to a 3620J requires a pipe plug (key 78, figure 26) to plug output A. Apply sealant (key 154) to the threads of the pipe plug.

10. The range spring (key 150, figure 25) may need to be changed depending on actuator type and size. Refer to tables 4 through 7 for range spring selection and hole position on the summing beam assembly for coarse span adjustment.

## Parts Ordering

When corresponding with the Fisher sales office about this equipment, always mention the positioner serial number. When ordering replacement parts, refer to the part number of each required part as found in the following parts list.

### Note

**Use only genuine Fisher replacement parts. Components that are not supplied by Fisher should not, under any circumstances, be used in any Fisher instrument. Use of components not supplied by Fisher will void your warranty, might adversely affect the performance of the instrument, and might jeopardize worker and workplace safety.**

### Note

**Emerson Process Management does not assume responsibility for the selection, use, or maintenance of any product. Responsibility for the selection, use, and maintenance of any Fisher product remains with the purchaser and end-user.**

## Parts Kits

Key	Description	Part Number
	For Type 3610J w/bypass (kit contains keys 7, 8, 10, 18, 24, 64, 115D, 115F, 115G, 115H, 116, 118, 119, 120, 121, 136, 159, 163, 164, 167, 168, instructions, and supply and nozzle relay head holders)	R3610JX0012

Key	Description	Part Number
	For Type 3610JP, 3611JP, 3620JP, and 3621JP (kit contains keys 7, 8, 10, 18, 24, 64, 115D, 115F, 115G, 115H, 116, 118, 119, 120, 121, 136, 159, instructions, and supply and nozzle relay head holders)	R3610JPX012
	For Type 3610J bypass valve (kit contains keys 54, 164, and bypass valve assembly 38A5114T012)	R3610JXBP12
	For Type 3622 converter, the kit contains keys 22, 23, 24, 26, 27, 29, and 36. An additional O-ring is also included for the I/P converter outlet.	R3622X00012

## Parts List

Key	Description	Part Number
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### Diagnostic Connections

FlowScanner™ valve diagnostics system hook-up  
Includes connector body and body protector. If ordered for units with gauges, a stem is also included. Also, the part number provides the correct quantities of each item.

For Type 3610J Positioners		
For units w/gauges		
	SST Fittings	12B8048X012
	Brass fittings	12B8048X022
For units w/o gauges		
	SST Fittings	12B8048X032
	Brass fittings	12B8048X042
For Type 3610JP Positioners		
For units w/gauges		
	SST Fittings	12B8050X012
	Brass fittings	12B8050X022
For units w/o gauges		
	SST Fittings	12B8050X032
	Brass fittings	12B8050X042
For Type 3620J Positioners		
For units w/gauges		
	SST Fittings	12B8049X012
	Brass fittings	12B8049X022
For units w/o gauges		
	SST Fittings	12B8049X032
	Brass fittings	12B8049X042
For Type 3620JP Positioners		
For units w/gauges		
	SST Fittings	12B8051X012
	Brass fittings	12B8051X022
For units w/o gauges		
	SST Fittings	12B8051X032
	Brass fittings	12B8051X042

### Positioner Common Parts

7*	Relay supply diaphragm assembly, Nitrile/stainless steel	28A2165X012
8*	Relay nozzle diaphragm assembly, Nitrile/stainless steel	28A2166X012
9	Relay manifold, aluminum	38A2101X022
10	Pivot pin, SST	18A2155X032
13	Crossover screw, stainless steel	18A2153X022
14	Nozzle relay head, aluminum	18A2157X012

# 3610J and 3620J Positioners

Key	Description	Part Number	Key	Description	Part Number
15	Supply relay head, aluminum	18A2158X012	81*	Output gauge, plastic case w/brass chrome plated conn (2 req'd)	
18*	Flapper, stainless steel	18A2112X022		Triple scale	
23	Reversing plate, aluminum	28A2107X022		0 to 2 bar/0 to 0.2 MPa/0 to 30 psig	11B4036X012
24*	Reversing plate gasket, neoprene	28A2145X022		0 to 4 bar/0 to 0.4 MPa/0 to 60 psig	11B4036X022
35	Pillow block, aluminum, (2 req'd)	13A1535X012		0 to 11 bar/0 to 1.1 MPa/0 to 160 psig	11B4036X032
37	Flange bearing, Rulon(1), (2 req'd)	13A1592X012	82	Cam, stainless steel	
38	Follower post, stainless steel			w/Type 1051, size 40 or 60	
	For Type 3610J, 3610JP, 3620J, and 3620JP	13A1656X012		w/Type 1052, size 40, 60, or 70	
39	Roller, stainless steel			w/Type 1061, size 30 through 68	
	For Type 3610J, 3610JP, 3620J, and 3620JP	13A1657X012		Cam A (linear)	33A1613X022
41	Cover assembly, plastic (includes cover screws)	18A2128X012		Cam B (direct acting)/Cam C (reverse acting)	43A1614X012
43	Machine screw, pl steel (4 req'd)	11B8040X012		Cam C (direct acting)/Cam B (reverse acting)	43A1615X012
45	Access cover screw, pl steel (2 req'd)	13A1586X012		w/Type 1052 size 20	
47	Machine screw, pl steel (12 req'd)	11B8039X012		Cam A (linear)	36A4653X022
49	Machine screw, pl steel	1B4638X0012		Cam B (direct acting)/Cam C (reverse acting)	47A5776X012
50	Machine screw, pl steel (2 req'd)	1F476928982		Cam C (direct acting)/Cam B (reverse acting)	47A2670X012
51	Machine screw, pl steel	1A346128982		w/Type 1051, size 33	
54	Cap screw, pl steel, (number required per assembly varies; maximum req'd for any assembly is 10)	1P7146X0022		w/Type 1052, size 33	
55	Machine screw, stainless steel	11B4322X012		Cam A (linear)	30B1529X022
56	Self tapping screw, pl steel (2 req'd)	1P426928982		Cam B (direct acting)/Cam C (reverse acting)	40B1540X012
57	Set screw, pl steel (2 req'd)	1F3536X0012		Cam C (direct acting)/Cam B (reverse acting)	40B1538X012
60	Hex nut			w/Type 1061 size 80, 100, or 130	
	For Type 3610J, 3610JP, 3620J and 3620JP			Cam A (linear)	33A1648X012
	pl steel	1A839628982		Cam B (direct acting)/Cam C (reverse acting)	43A1649X012
61	E-ring, pl steel	1E455328982		Cam C (direct acting)/Cam B (reverse acting)	43A1650X012
64*	O-ring, nitrile, (2 req'd)	1H291906992		w/Type 1069 size 100	
70	Spring, pl steel	1J394927012		Cam A (linear)	48A8031X012
72	Pipe plug, 1/8 NPT			Cam B (direct acting)/Cam C (reverse acting)	48A8032X012
	(None req'd w/supply gauge option)			Cam C (direct acting)/Cam B (reverse acting)	48A8033X012
	1 req'd for gauge option w/o supply gauge or tire valve option		83	Machine screw, pl steel (2 req'd)	
	4 req'd w/o gauges or tire valves, w/pipe plug option			w/Type 1051, size 40 or 60	13A1618X012
	pl steel	1D829328982		w/Type 1052, size 40, 60, or 70	13A1618X012
	316 SST	1D8293X0012		w/Type 1061, size 30 through 68	13A1618X012
73	Tire valve, w/tire valve option (3 req'd)	1N908899012		w/Type 1052, size 20 or 33	13A1617X012
75	Machine screw, pl steel (2 req'd)			w/Type 1051, size 33	13A1617X012
	For Type 3610JP and 3620JP			w/Type 1061, size 80 100, or 130	1B290524052
	w/Type 1061, size 80, 100, or 130	1D713224192		w/Type 1069, size 100	1B290524052
76	Follower arm extension, stainless steel		84	Cam adjustment indicator, stainless steel	
	For Type 3610JP and 3620JP			For Type 3610J, 3610JP, 3620J, and 3620JP	
	w/Type 1061, size 80 or 100	13A1651X012		(w/Cams B or C only, not req'd w/Cam A or w/Type 1069, size 100)	
	w/Type 1061, size 130	28B3053X012		w/Type 1051, size 33, 40 or 60	13A1629X012
77	Hex nut, pl steel (2 req'd),			w/Type 1052, size 20, 33, 40, 60, or 70	13A1629X012
	For Type 3610JP and 3620JP			w/Type 1061, size 30 through 68	13A1629X012
	w/Type 1061, size 80, 100, or 130	1A662228992		w/Type 1061, size 80, 100, or 130	13A1652X012
78	Pipe Plug, for Type 3610J and 3620J w/o bypass		87	Tubing connector, (specify quantity required) (not shown)	
	pl steel	1C333528992		Brass, 1/4-inch NPT x 3/8-inch O.D.	15A6002X202
	316 SST	1C3335X0012		Stainless steel, 1/4-inch NPT x 3/8-inch O.D.	15A6002X602
79*	Supply gauge, plastic case w/brass chrome plated conn (w/supply gauge option)		88	Tubing elbow (specify quantity required)	
	Triple scale			Brass, 1/4-inch NPT x 3/8-inch O.D.	15A6002X162
	0 to 2 bar/0 to 0.2 MPa/0 to 30 psig	11B4036X012		Stainless steel, 1/4-inch NPT x 3/8-inch O.D.	15A6002X612
	0 to 4 bar/0 to 0.4 MPa/0 to 60 psig	11B4036X022	89	Cap screw, pl steel (2 req'd)	
	0 to 11 bar/0 to 1.1 MPa/ 0 to 160 psig	11B4036X032		For mounting regulator	T14109T0012
80*	Instrument gauge, plastic case w/brass chrome plated conn		92	Lockwasher, pl steel (not shown) (specify quantity)	
	Triple scale			Yoke or casing mounted filter regulator	1C225728982
	0 to 2 bar/0 to 0.2 MPa/0 to 30 psig	11B4036X012	99	Lockwasher, stainless steel (2 req'd)	
	0 to 4 bar/0 to 0.4 MPa/0 to 60 psig	11B4036X022		For Type 3610JP and 3620JP	
				w/Type 1061 size 80, 100, or 130	1K623638992
			109	Lubricant, Never-Seez (not furnished with the positioner)	

# Instruction Manual

Form 5208  
February 2005

# 3610J and 3620J Positioners

Key	Description	Part Number	Key	Description	Part Number
113	Positioner adaptor, aluminum For Type 3610J and 3620J w/Type 1051, size 33 w/Type 1052, size 20 and 33 For Type 3610JP w/Type 1069 size 100 For Type 3611JP and 3621JP! w/Type 585, 585C, 585CR and 585R	46A4666X032 46A4666X032 46A4666X032 46A4666X032	143	Zero adjustment screw, stainless steel	19A4897X012
115	Valve seat assembly, aluminum/stainless steel (includes keys 115A, 115B, 115C, 115D, 115E, 115F, 115G, 115H, 115J, & 115K)	28A7802X022	144	Zero spring bracket, stainless steel	28A7838X022
115A	Case assembly [includes case (key 115A) and valve seats (key 115B), aluminum /stainless steel	58A7803X022	146	Nozzle block, aluminum	38A7840X012
115B*	Valve seat (2 req'd)	18A2149X012	147	Core & wire assembly, stainless steel	18A7841X012
115C	Pressure plate, aluminum	48A2106X012	148	Mandrel, Ryton	18A7843X012
115D*	Pressure plate gasket, neoprene	38A2167X022	149	Spacer, phenolic	18A7844X012
115E	Body plug, aluminum (2 req'd)	1B797509032	150	Range spring, pl steel (color coded blue) (color coded red) (color coded yellow)	18A7845X012 18A5118X012 18A7846X012
115F*	Body plug gasket, composition, (2 req'd)	1C495704022	151	Warning label, plastic film	18A7847X012
115G*	Valve plug, stainless steel, (2 req'd)	18A2152X022	153	Lubricant, Lubriplate MAG-1 (not furnished with positioner)	
115H	Valve plug spring, stainless steel, (2 req'd)	19A6274X022	154	Sealant, John Crane PLS No. 2, (not furnished with positioner)	
115J	Machine screw, pl steel (10 req'd)	11B8039X012	155	Pipe Nipple, pl steel 316 SST	1D2397 26232 1B2927 38322
115K	Shroud, stainless steel (2 req'd)	19A6030X012	156	Flexure adjustment, Ryton	29A0181 X032
116*	Nozzle assembly, stainless steel/synthetic sapphire For Type 3610J and 3620J For Type 3610JP, 3620JP, 3611JP, and 3621JP	27B5969X012 27B5970X012	157	Nameplate	
117	Feedback lever assembly, stainless steel For Type 3610J, 3610JP, 3620J, and 3620JP w/Type 1051, all sizes, except size 33 w/Type 1052, all sizes, except size 20 and 33 w/Type 1051, size 33 w/Type 1052, size 20 and 33 For Type 3611JP and 3621JP w/Type 585C, size 25 and 50 See key 170 for Type 585, size 100 and Type 1069, size 100	18A7796X012 18A7796X012 18A7798X012 18A7798X012 29A4633X022	158	Gauge block, for Type 3610J, 3610JP, and 3611JP only, aluminum	46A5911X022
118*	Lower input diaphragm, nitrile	28A7804X012	159*	O-Ring, (4 req'd w/gauge block, or 5 req'd w/gauge block and bypass valve), nitrile	11A8741X052
119*	Upper input diaphragm, nitrile	28A7805X012	160	Bypass lever assembly, Ryton	18A5117X012
120*	O-Ring, nitrile	1D134606992	161	Bypass body, aluminum	38A5114X012
121*	O-Ring, nitrile	1C854606992	162	Bypass body adapter, aluminum	46A5908X022
122	Beam assembly, stainless steel/plastic	20C2249X012	163*	Bypass body gasket, nitrile	16A5910X012
123	Summing beam assembly, stainless steel	38A7809X022	164*	Adapter gasket, nitrile	26A5909X032
124	Machine screw, pl steel (2 req'd)	1V4131X0012	165	Retaining ring, stainless steel	1R663138992
125	Counterspring, pl steel	18A7817X012	166	Wire tie, nylon	16A5907X012
126	Spring seat, Ryton	18A7818X012	167*	O-ring, nitrile	1J4888X0052
127	Machine screw, pl steel	10B6188X012	168*	O-ring, nitrile, (2 req'd)	11B8085X012
128	Span adjustment screw stainless steel	18A7820X022	169	Machine screw, steel, (4 req'd)	1H328432992
129	Prong-lock ring, pl steel	18A7823X012	170	Feedback lever assembly, stainless steel For Type 3611JP and 3621JP w/Type 585, size 100 19 to 51 mm travel (3/4 to 2-inch) 51 to 102 mm travel (2 to 4-inch) For Type 3610JP and 3620JP w/Type 1069, size 100	20B7077X012 20B7656X012 28A8622X012
130	Range spring hanger, stainless steel	28A7824X012	171	Torsion spring, pl steel For Type 3610J and 3620JP w/Type 1069, size 100	19A0758X012
131	Instruction label, plastic film	18A7825X012	172	Retaining ring, pl steel For Type 3611JP and 3621JP	1H153828982
132	Lower diaphragm plate, aluminum	18A7827X012	173	Button head screw, pl steel For Type 3611JP and 3621JP	19A3799X012
133	Diaphragm spacer, Ryton	28A7828X012	174	Adjuster assembly, stainless steel For Type 3611JP and 3621JP w/Type 585C, size 25 or 50 w/Type 585, size 100	19A3795X012 11B1187X012
134	Upper diaphragm plate, aluminum	18A7829X012	175	Roller, stainless steel For Type 3611JP and 3621JP	19A3798X012
135	Diaphragm connector, aluminum	18A7830X012	176	Lockwasher, pl steel	1B465328982
136	Sealing screw, stainless steel/fluorsilicone	10B8014X012	177	Machine screw, pl steel (2 req'd)	10B6187X012
137	Diaphragm spacer, aluminum	38A7831X012	178	Anti-seize Compound, Zink Plate No. 770 (not furnished with positioner)	
138	Input diaphragm flange, aluminum	28A7832X012	179	Parallel flexure, stainless steel, For Type 3611JP and 3621JP w/Type 585C, size 25 w/Type 585C, size 50 None req'd for Type 585 size 100	29A7553X012 21B5997X012
139	Machine screw, pl steel (2 req'd)	10B6188X012			
140	Machine screw, pl steel	11B8041X012			
141	Zero spring, pl steel	18A7833X012			
142	Spring seat, stainless steel	19A4898X012			

# 3610J and 3620J Positioners

Key	Description	Part Number	Key	Description	Part Number
180	Machine screw, pl steel (2 req'd) For Type 3611JP and 3621JP w/Type 585C, size 25 or 50 None req'd for Type 585 size 100	13A7134X012	21	Filter plug, used w/o integrally mounted Type 67CFR filter regulator, stainless steel	11B2306X012
181	Lockwasher, pl steel (2 req'd) For Type 3611JP and 3621JP w/Type 585C, size 25 or 50 actuator None req'd for Type 585 size 100	18A3666X012	22*	Filter, 40 micron cellulose, used w/o integrally mounted Type 67CFR filter regulator	11B2307X012
184	Washer, pl steel (2 req'd) For Type 3611JP or 3621JP w/Type 585, size 100	11B1197X012	23*	O-ring, nitrile	1E591406992
185	Extension spring, pl steel For Type 3611JP or 3621JP w/Type 585, size 100, w/51-102 mm (2-4 inch) travel	10B7658X012	24*	O-ring, nitrile, used w/o integrally mounted Type 67CFR filter regulator	11B2308X012
187	Machine screw, pl steel (2 req'd)	1N400628982	25	Nozzle restriction, Aluminum/synthetic sapphire	13B7116X022
188	Adhesive, Loctite 242, (not furnished with positioner)		26*	O-ring, nitrile	19A8597X012
190*	O-ring	1E5914 06992	27*	O-ring, nitrile	1C8538X0162
191	Pipe Plug, used with integral mounted filter/regulator plated steel stainless steel	1A7675 24662 1A7675 35072	28	Vent, plastic/stainless steel	11B8279X012
193	Sealant, silicone Dow Corning 111 (not furnished with positioner)		29*	O-ring, nitrile	1H8762X0012
194	Mounting bracket, steel For Type 3611JP and 3621JP w/Type 585C	47B3047 X012	30	Machine screw, stainless steel, (2 req'd)	1A9021X0012
195	Stem bracket, pl steel For Type 3611JP and 3621JP w/Type 585C	47B3046 X012	31	Wire retaining screw, pl steel, (2 req'd)	16A2821X012
196	Cap screw, pl steel (3 req'd) For Type 3611JP and 3621JP w/Type 585C	1A3816 24052	32	Nameplate, non-approved, stainless steel	
197	Hex Nut, pl steel (6 req'd) For Type 3611JP and 3621JP w/Type 585C	1E9440 X0312	33	Drive screw, stainless steel (2 req'd)	1P426928982
<b>Type 3622 Electro-Pneumatic Converter</b>			35	Cap screw, pl steel (2 req'd)	1N400628982
	I/P Converter module	33B7073X032	36*	O-ring, nitrile, (4 req'd)	11A8741X052
17	Lubricant, Lubriplate MAG-1 (not furnished with positioner)		37	Pipe plug, pl steel, use only when specified w/o gauges or tire valves (3 req'd) pl steel SST	1D829328982 1D8293X0012
19	Housing, aluminum 1/2-inch NPT conduit connection	22B0904X012		w/o gauges and w/tire valves (1 req'd) pl steel SST	1D829328982 1D8293X0012
20	Cap, aluminum	37B7575X012	38*	Supply gauge, plastic case w/brass chrome plated conn (w/supply gauge option) Triple scale 0 to 2 bar/0 to 0.2 MPa/0 to 30 psig 0 to 4 bar/0 to 0.4 MPa/0 to 60 psig 0 to 11 bar/0 to 1.1 MPa/0 to 160 psig	11B4036X012 11B4036X022 11B4036X032
			39	Anti-seize Compound, Zink plate No. 770 (not furnished with positioner)	
			41	Tire valve, use only when specified, (2 req'd)	1N908899012
			42	Lubricant, Never-Seez Nickel Lubricant (not furnished with positioner)	
			43*	Output gauge, plastic case w/brass chrome plated conn (2 req'd) Triple scale 0 to 2 bar/0 to 0.2 MPa/0 to 30 psig 0 to 4 bar/0 to 0.4 MPa/0 to 60 psig 0 to 11 bar/0 to 1.1 MPa/0 to 160 psig	11B4036 X012 11B4036 X022 11B4036 X032
			48	Pipe plug, used with Type 3620J only plated steel stainless steel	1A7675 24662 1A7675 35072
			49	Cable gland, plastic M20 thread conduit connection	12B0908 F022
			53	Screw, hex socket, SST	11B8574 X012

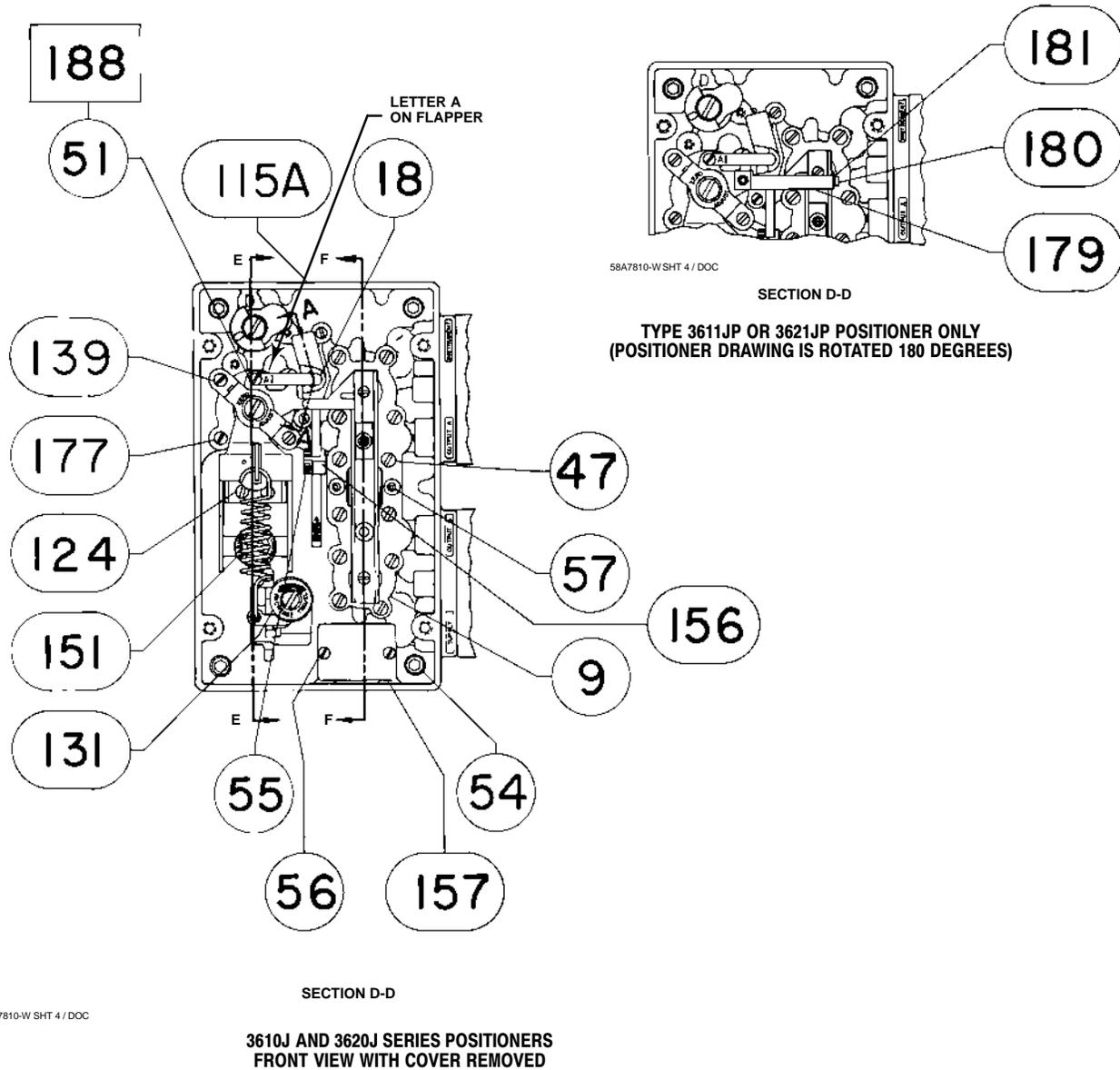
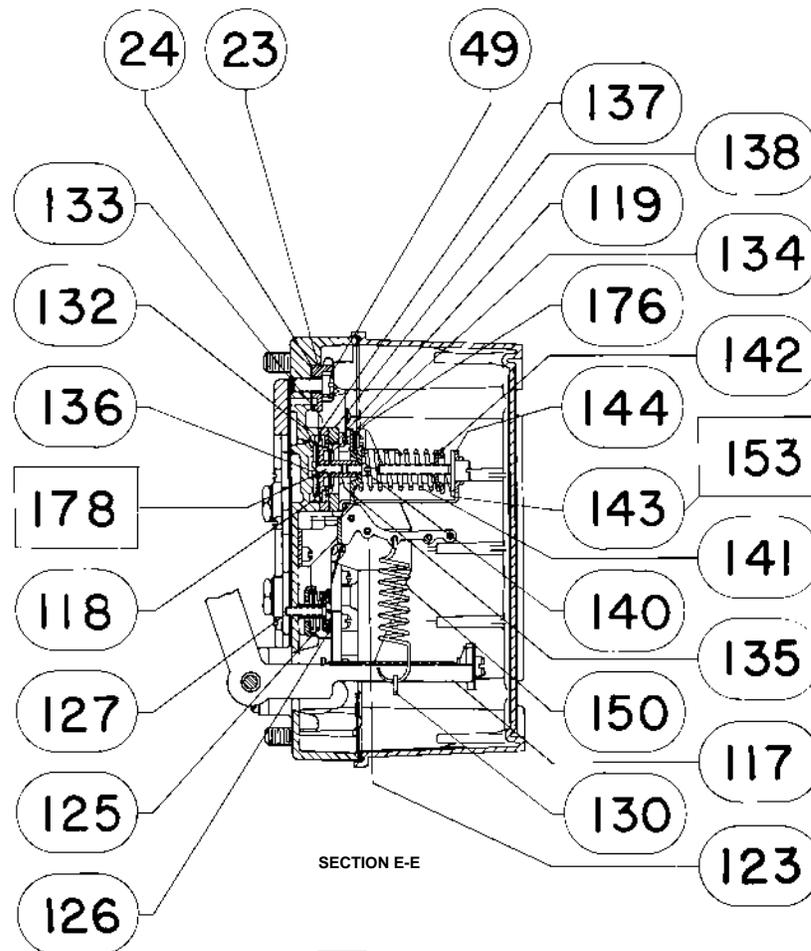
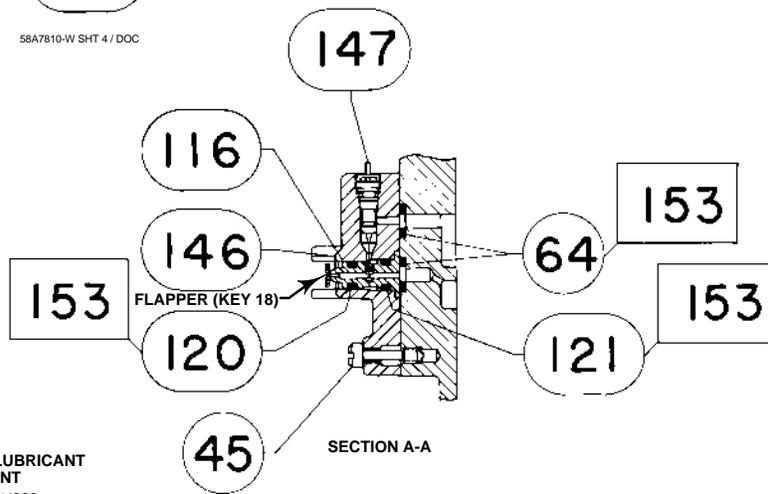


Figure 25. Positioners Assembly



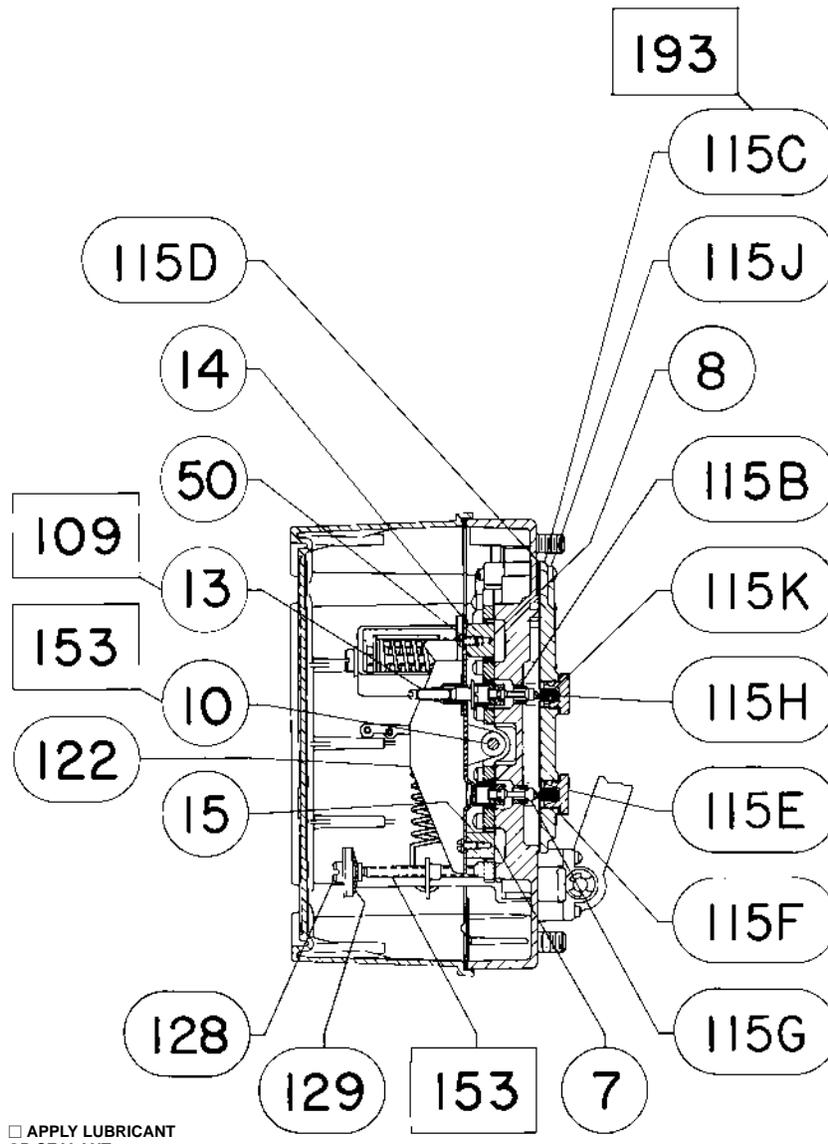
58A7810-W SHT 4 / DOC



□ APPLY LUBRICANT  
OR SEALANT  
58A7810-W SHT 4 / DOC

NOZZLE/FLAPPER

Figure 25. Positioners Assembly (continued)



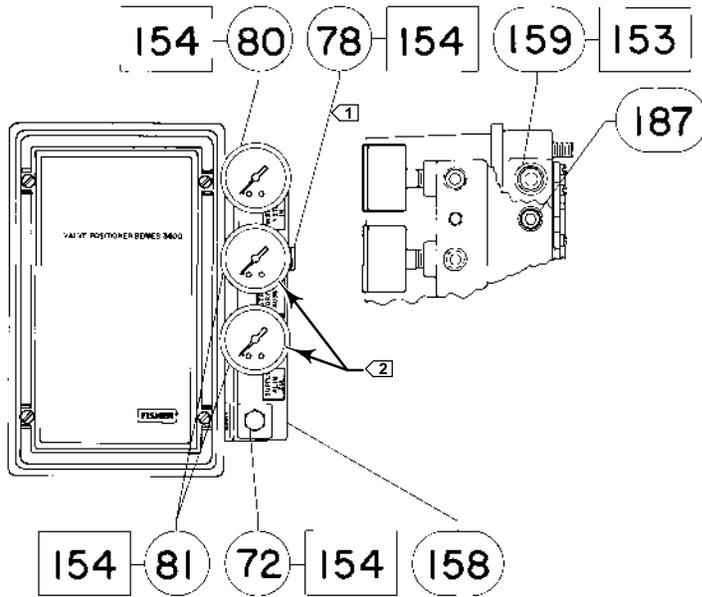
□ APPLY LUBRICANT  
OR SEALANT

58A7810-W/SHT 4 / DOC

SECTION F-F

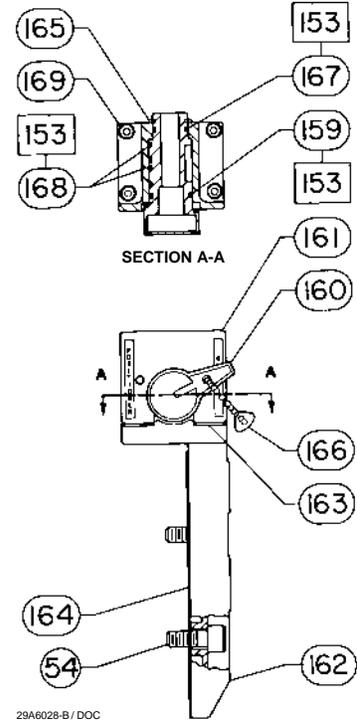
Figure 25. Positioners Assembly (continued)

# 3610J and 3620J Positioners



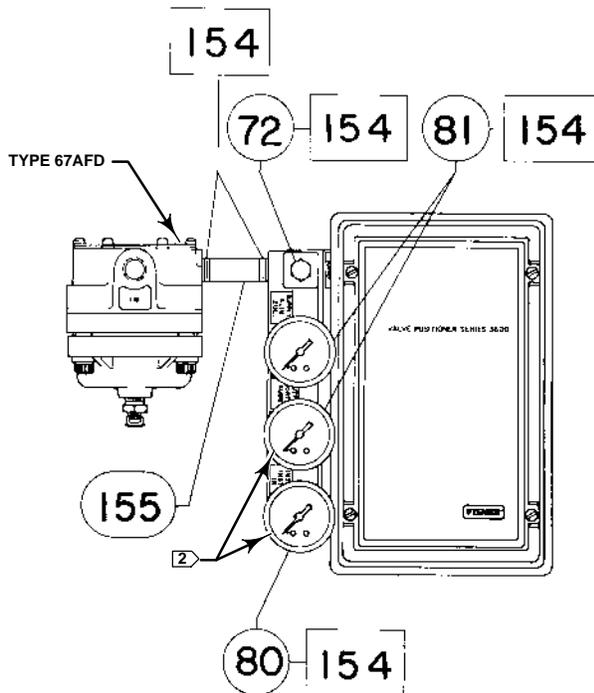
58A7810W-SHT 1 / DOC

TYPE 3610J AND 3610JP POSITIONER



29A6028-B / DOC

BYPASS VALVE ASSEMBLY FOR THE 3610J POSITIONERS



58A7810-W-SHT 3 / DOC

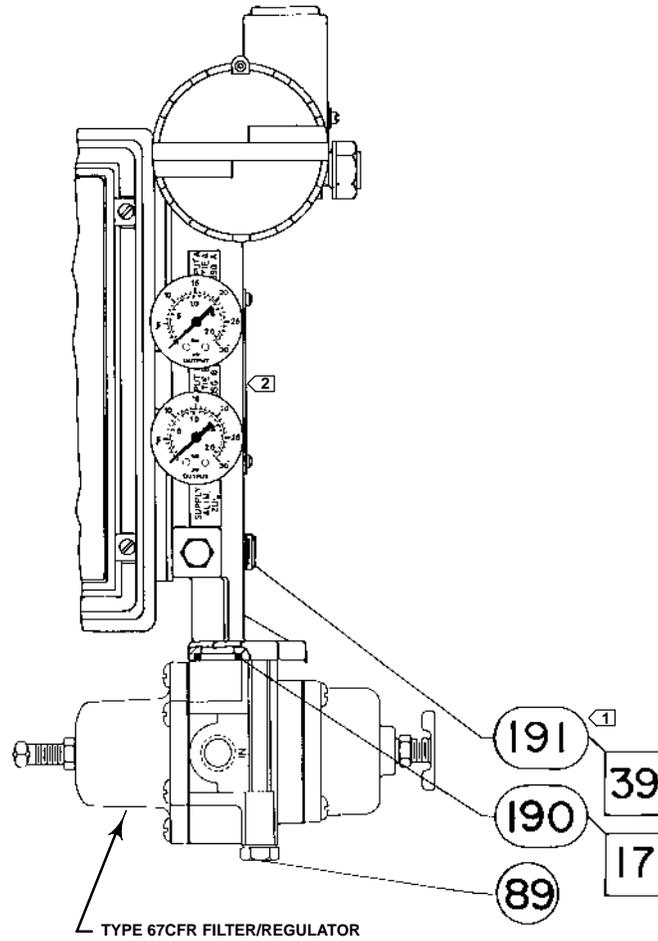
TYPE 3611JP POSITIONER WITH GAUGES

□ APPLY LUBRICANT OR SEALANT

NOTES:

- 1 KEY 78 IS USED FOR TYPE 3610J ONLY.
- 2 GAUGES MAY BE REPLACED BY PIPE PLUGS (KEY 72) OR TIRE VALVES (KEY 73).

Figure 26. Gauge Block and Bypass Valve Assemblies



NOTES:

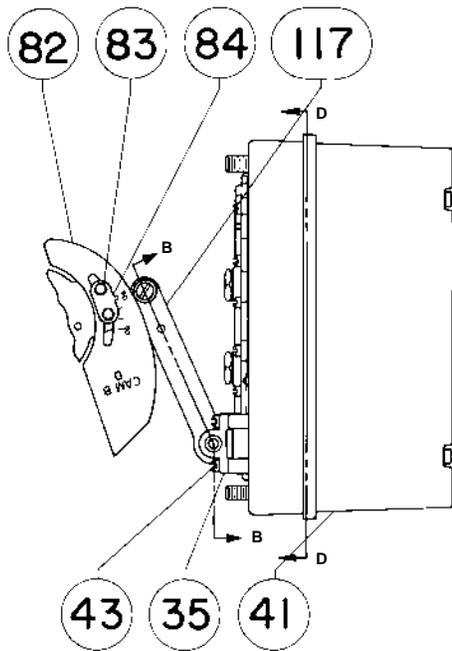
- 1 THIS PIPE PLUG IS USED ONLY WITH INTEGRAL MOUNTED FILTER/REGULATOR.
- 2 SEE FIGURE 30 FOR TYPE 3622 KEY NUMBERS.

41B2337-K SHT 1 / DOC

3620J SERIES POSITIONERS WITH GAUGES AND  
INTEGRAL MOUNTED FILTER/REGULATOR

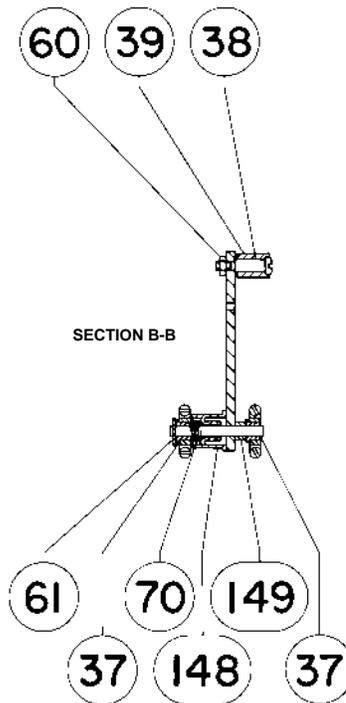
Figure 27. 3620J Series Positioner with Integral Mounted Filter/Regulator

# 3610J and 3620J Positioners



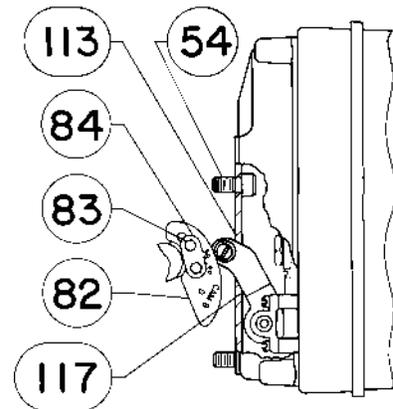
58A7810-W SHT 1 / DOC

**TYPE 3610J AND 3620J POSITIONERS  
FOR TYPE 1051 ACTUATORS SIZE 40 AND 60  
FOR TYPE 1052 ACTUATORS SIZE 40, 60, AND 70  
TYPE 3610JP AND 3620JP POSITIONERS  
FOR TYPE 1061 ACTUATORS SIZE 30-60**



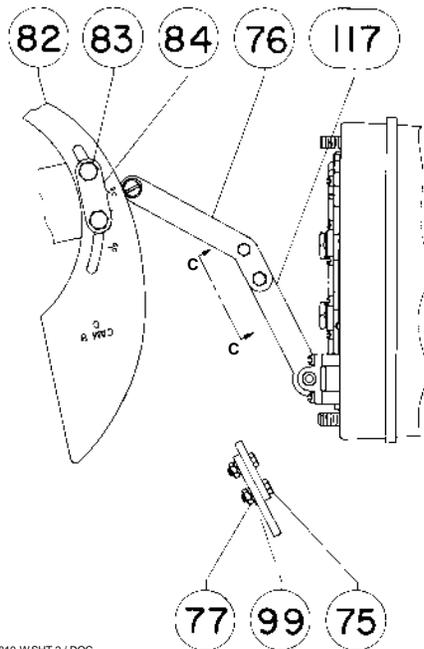
58A7810-W SHT 1 / DOC

**TYPE 3610J AND 3620J POSITIONERS  
FOR ALL TYPE 1051 AND 1052 ACTUATORS  
TYPE 3610JP AND 3620JP POSITIONERS  
FOR TYPE 1061 ACTUATORS SIZE 30-60**



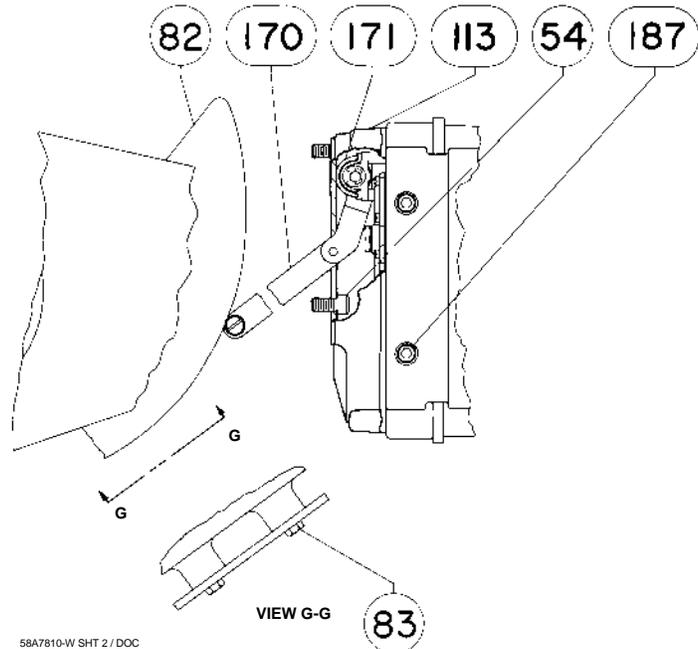
58A7810-W SHT 1 / DOC

**TYPE 3610J AND 3620J POSITIONERS  
FOR TYPE 1051 ACTUATOR SIZE 33  
FOR TYPE 1052 ACTUATORS SIZE 20 AND 33**



58A7810-W SHT 2 / DOC

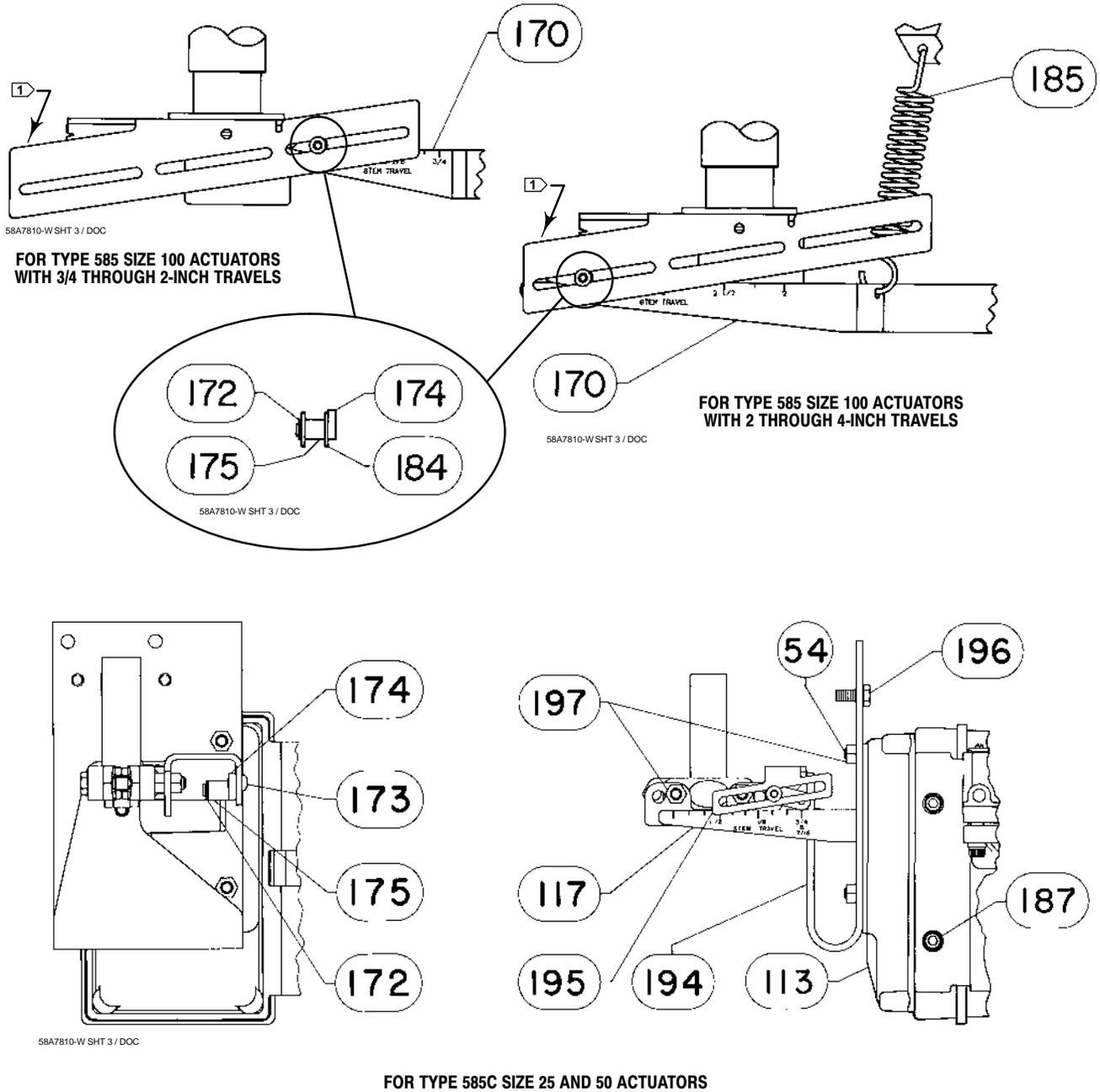
**TYPE 3610JP AND 3620JP POSITIONERS  
FOR TYPE 1061 ACTUATORS SIZE 80 - 100**



58A7810-W SHT 2 / DOC

**TYPE 3610JP AND 3620JP POSITIONERS  
FOR TYPE 1069 ACTUATORS SIZE 100**

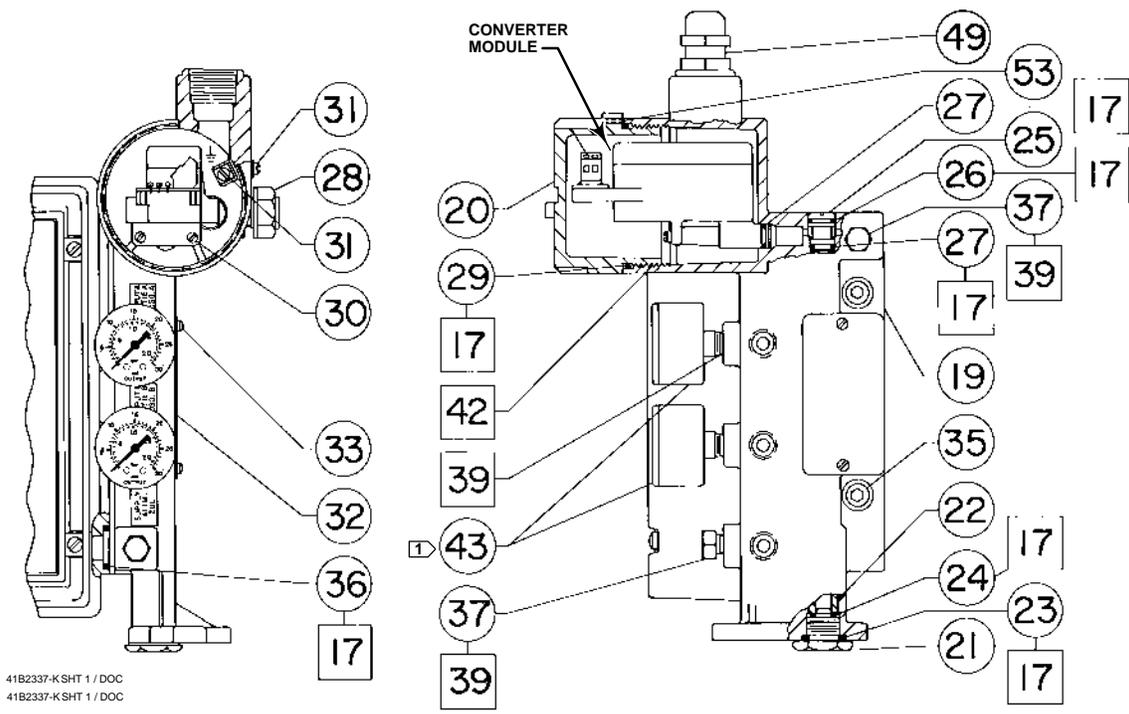
Figure 28. Feedback Assemblies for Type 3610J, 3610JP, 3620J, and 3620JP Positioners



**NOTE:**  
 1 FOR THE STEM BRACKET ASSEMBLY, REFER TO THE ACTUATOR INSTRUCTION MANUAL.

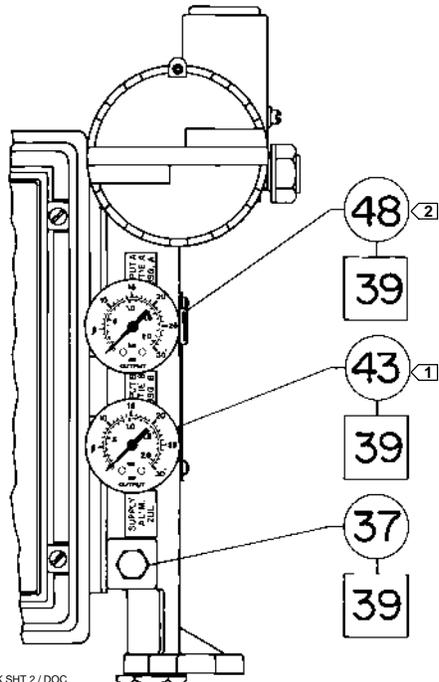
Figure 29. Feedback Assemblies for Type 3611JP and 3621JP Positioners

# 3610J and 3620J Positioners



41B2337-K SHT 1 / DOC  
41B2337-K SHT 1 / DOC

## 3620P SERIES POSITIONERS



41B2337-K SHT 2 / DOC

### TYPE 3620J POSITIONER WITH GAUGES

□ APPLY LUBRICANT OR SEALANT

**NOTE:**

- 1 GAUGES MAY BE REPLACED BY PIPE PLUGS (KEY 37) OR TIRE VALVES (KEY 41)
- 2 KEY 48 IS USED FOR TYPE 3620J ONLY

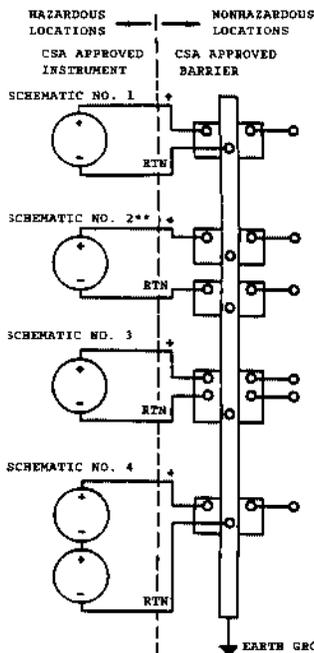
2

Figure 30. Type 3622 Electro-Pneumatic Converter Assembly

## Loop Schematics

This section includes loop schematics required for wiring of intrinsically safe installations. If you have any questions, contact your Fisher sales office.

## CSA Schematics



TYPE 3622, 5821, 3661, AND 646: CSA PARAMETRIC RATINGS\* (SCHEMATICS 1 AND 4)

- CLASS I, GROUP A,B,C,D CSA RATING 30 V MAX., 330 OHM MIN., SINGLE INSTRUMENT
- CLASS I, GROUP A,B,C,D CSA RATING 28 V MAX., 300 OHM MIN., SINGLE INSTRUMENT
- CLASS I, GROUP A,B,C,D CSA RATING 22 V MAX., 150 OHM MIN., SINGLE INSTRUMENT
- CLASS I, GROUP C,D CSA RATING 30 V MAX., 150 OHM MIN., SINGLE INSTRUMENT OR SPLIT RANGE

APPROVED BARRIER	BARRIER TYPE	MFG. INST. MANUAL	SCHEM. NO.	APPLICABLE HAZARDOUS LOCATIONS	CSA BARRIER RATING
FOXBORO	2A0-V2I-CGE	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2A0-V3I-CGE	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2A0-V5I-CGE	MI 200-255	3	CL X, DIV 1, GP A,B,C,D	
FOXBORO	2A0-V6I-CGE	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	3A2-D3I-CS-E/CGE-A	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	3A2-D3I-CS-E/CGE-A	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2A5-T3I-CGE	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
STANL	8903/31-200/050/7	89 036 01 31 0	2	CL I, DIV 1, GP A,B,C,D	20.41V, 300 OHM
STANL	8901/33-293/000/7	89 016 02 31 0			28.1V, 470 OHM
STANL	8901/31-280/165/8	89 016 03 31 0	2	CL I, DIV 1, GP C,D	27.3V, 179 OHM
STANL	8901/33-293/000/7	89 016 03 31 0			28.1V, 470 OHM
STANL	8901/31-199/100/7	89 016 03 31 0	1.4	CL I, DIV 1, GP A,B,C,D	19V, 220 OHM
STANL	8902/31-200/050/7	89 036 01 31 0	1.4	CL I, DIV 1, GP A,B,C,D	19.99V, 285.7 OHM
STANL	8902/31-243/050/7	89 036 01 31 0	1	CL I, DIV 1, GP A,B,C,D	26.5V, 386 OHM
HAILEY	766810AANV1	4576K16-034	3	CL I, DIV 1, GP C,D	27V, 345 OHM/10V, 60 OHM

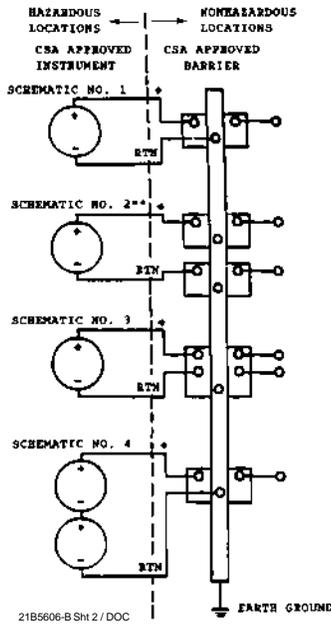
\* ALSO APPLICABLE FOR CLASS II, GROUPS E, F, G WITH APPROPRIATE INSTRUMENT AND BARRIER APPROVAL

\*\* SCHEMATIC 2 REQUIRES THAT BARRIERS MUST BE USED IN PAIRS AS LISTED

LOOPS MUST BE CONNECTED ACCORDING TO THE BARRIER MANUFACTURER'S INSTRUCTIONS  
SEE ANSI/ISA RPL2.6 FOR GUIDANCE ON INSTALLATION

# 3610J and 3620J Positioners

## CSA Schematics (continued)



APPROVED BARRIER	BARRIER TYPE	MFG. INST. MANUAL	SCHEM. NO.	APPLICABLE HAZARDOUS LOCATIONS	CSA BARRIER RATING
TAYLOR	5850FL84100	IB-21E600	1	CL I, DIV 1, GP A,B,C,D	25.75V, 350 OHM
TAYLOR	5851FL84100	IB-21E600	1	CL I, DIV 1, GP A,B,C,D	25.75V, 350 OHM
TAYLOR	1130FG21000	IB-17E211	1	CL I, DIV 1, GP C,D	30V, 266 OHM
TAYLOR	1135FG21000	IB-17E212	1	CL I, DIV 1, GP C,D	30V, 266 OHM
TAYLOR	1150FS81010	IB-17E220	1	CL I, DIV 1, GP A,B,C,D	26V, 342 OHM
MTL	128+	PS-300-13	1	CL I, DIV 1, GP A,B,C,D	28V, 300 OHM
MTL	122+	PS-300-13	1	CL I, DIV 1, GP A,B,C,D	22V, 150 OHM
MTL	187+	PS-300-13	3	CL I, DIV 1, GP A,B,C,D	28V, 300 OHM/30V (DIODE)
MTL	787+	PS-700-2	3	CL I, DIV 1, GP A,B,C,D	28V, 300 OHM/28V (DIODE)
MTL	728+	PS-700-2	1	CL I, DIV 1, GP A,B,C,D	28V, 300 OHM
MTL	722+	PS-700-2	1	CL I, DIV 1, GP A,B,C,D	22V, 150 OHM
HONEYWELL	38545-0000-0110-113-C5D5	S 385-22	1	CL I, DIV 1, GP A,B,C,D	20V, 150 OHM
HONEYWELL	38545-0000-0110-111-C5D5	S 385-22	1	CL I, DIV 1, GP C,D	28V, 200 OHM
HONEYWELL	38545-0000-0110-111-C5D5	S 385-22	2	CL I, DIV 1, GP C,D	28V, 200 OHM
HONEYWELL	38545-0000-0110-112-C5D5	S 385-22	2	CL I, DIV 1, GP C,D	28V, 200 OHM

\* ALSO APPLICABLE FOR CLASS II, GROUPS E, F, G WITH APPROPRIATE INSTRUMENT AND BARRIER APPROVAL

\*\* SCHEMATIC 2 REQUIRES THAT BARRIERS MUST BE USED IN PAIRS AS LISTED

LOOPS MUST BE CONNECTED ACCORDING TO THE BARRIER MANUFACTURER'S INSTRUCTIONS  
SEE ANSI/ISA RP12.6 FOR GUIDANCE ON INSTALLATION

## FM Schematics



FOR TYPES 3622, 582i, 3661 & 646:  
CLASS I, DIV 1, GROUPS A,B,C,D,E,F,G  
N.I. CLASS I, DIV 2, GROUPS A,B,C,D

FOR TYPES 3622, 582i & 646  
S CLASS II, DIV 2, GROUPS F,G

TYPE: 3622, 582i, 3661, 646 ENTITY PARAMETERS

$V_{max} = 40Vdc$      $I_{max} = 200mA$      $C = 0$      $L_i = 0$

NOTES

-LOOPS MUST BE CONNECTED ACCORDING TO THE BARRIER MANUFACTURER'S INSTRUCTION

-SEE ANSI/ISA RP12.6 FOR GUIDANCE ON INSTALLATION

-BARRIER PARAMETERS MUST MEET THE FOLLOWING REQUIREMENTS

$V_{dc}$  OR  $V_i < V_{max}$      $I_{dc}$  OR  $I_i < I_{max}$      $C_0 (\mu F) > 0.0$      $L_0 (mH) > 0.0$

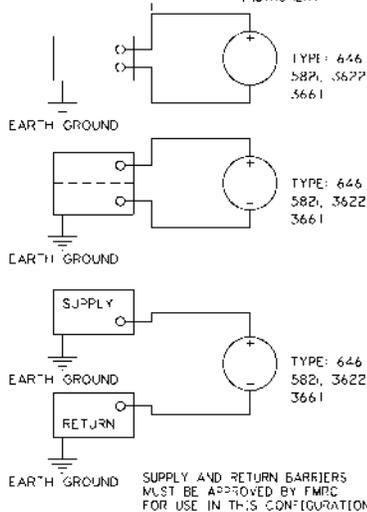
-THE  $C_0$  AND  $L_0$  PARAMETERS FOR THE BARRIER MUST BE GREATER THAN THE SUM OF THE CONNECTING CABLE PARAMETERS AND  $C_i$  AND  $L_i$  OF THE I.S. APPARATUS

-MAXIMUM SAFE AREA VOLTAGE SHOULD NOT EXCEED  $250 V_{rms}$

-RESISTANCE BETWEEN BARRIER GROUND AND EARTH GROUND MUST BE LESS THAN ONE OHM

-CL I, DIV 2 APPLICATIONS MUST BE INSTALLED AS SPECIFIED IN NEC SECTION 501-4 (b) WHEN BARRIERS ARE NOT USED

NORMAL OPERATING CONDITIONS 30 VDC, 20 mADC



SUPPLY AND RETURN BARRIERS MUST BE APPROVED BY FMRC FOR USE IN THIS CONFIGURATION

21B5607-D/DOC

**FISHER** TYPE 3622

SERIAL NO. [ ]

INPUT: 20 mADC MAX, 30 VDC MAX; AMB TEMP: -40 TO 82°C; CSA ENC 3; NEMA 3  
 CSA: CL I, DIV 12 GP A,B,C,D; CL II, DIV 12, GP E,F,G  
 FM: EXP CL I, DIV 1, GP A,B,C,D; DI CL II, DIV 1, GP E,F,G; NI CL I, DIV 2, GP A,B,C,D;  
 S CL II, DIV 2, GP F,G  
 POURED SEAL REQUIRED WITHIN 18 INCHES FOR CL I, DIV 1 ONLY  
 CAUTION: KEEP COVER TIGHT WHILE CIRCUITS ARE ALIVE.  
 ATTENTION: GARDER LE COUVERCLE BIEN FERME TANT QUE LES CIRCUITS SONT  
 SOUS TENSION

CSA: Ex ia INTRINSICALLY SAFE, SECURITE INTRINSIQUE, CL I, II, DIV 1  
 APPLICABLE GROUPS PER DWG 21B5606  
 FM: IS CL I, II, DIV 1, ENTITY APPLICABLE GROUPS PER DWG 21B5607  
 WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.  
 AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT  
 COMPROMETTRE LA SECURITE INTRINSIQUE.

FOR AMBIENT TEMP GREATER THAN 60° USE WIRING SUITABLE FOR AMBIENT  
 CONDITION. REFER TO INSTRUCTION MANUAL FOR ENCLOSURE MOUNTING  
 ORIENTATION AND MAX SUPPLY PRESSURE.  
 US PATENT 4,995,029

3789285

FM/CSA

TYPE 3622

SERIAL NO. [ ]

INPUT 20 mADC MAX, 30 VDC MAX  
 AMBIENT TEMP -40 TO 82°C; IP54 IFC 579  
 Ex ia IIC T4 (Tamb 40°C); AUS Ex II 1X  
 Ui=32 VDC, Ii=150 mA, Ci=0 F, Li=0 H  
 WARNING: SUBSTITUTION OF COMPONENTS MAY  
 IMPAIR INTRINSIC SAFETY.  
 Ex n TC T4 (Tamb 40°C); AUS Ex II 1X  
 SUITABLE FOR NON-INCENDIVE "FIELD CIRCUIT" WIRING.  
 Ex d IB T6 (Tamb 40°C); AUS Ex 1000X  
 WARNING: ISOLATE ELSEWHERE BEFORE REMOVING COVER.  
 CONDUIT ENTRY 1/2-14 NPT  
 REFER TO INSTRUCTION MANUAL FOR ENCLOSURE  
 MOUNTING ORIENTATION AND MAX SUPPLY PRESSURE.

US PATENT 4,995,029

3789285

SAA

**FISHER** TYPE 3622

SERIAL NO. [ ]  
 SERIE NO. [ ]  
 SFRIFR NO. [ ]

MAX INPUT MAX VOLTAGE AVE TEMP  
 MAX INTERR MAX TENSION AVE TEMP  
 MAX ENERGIE MAX SPANNUNG UMG TEMP

IP54

LCIE 03 ATEX 6001X Ex II 1 G

EEEx ia IIC T4(Tamb 82°C) T5(Tamb 62°C) T6(Tamb 47°C)

Ui = 30V Ii = 150mA P = 1.25W Ci = 0F Li = 0H

DISCONNECT POWER BEFORE OPENING REFER TO MANUAL FOR MAX SUPPLY PRESSURE  
 NE PAS OUVRIR SOUS TENSION VOIR LE MANUEL D'INSTRUCTION POUR LA PRESSION ALIM. MAX  
 VOR OFFEN SPANNUNG ABSCHALTEN MAX VERSORGDUNGSPRUCK, SIEHE BEDEHUNGS ANLEITUNG

CE 1180

30C2207

**FISHER** TYPE 3622

SERIAL NO. [ ]  
 SERIE NO. [ ]  
 SFRIFR NO. [ ]

MAX INPUT MAX VOLTAGE AVE TEMP  
 MAX INTERR MAX TENSION AVE TEMP  
 MAX ENERGIE MAX SPANNUNG UMG TEMP

IP54

KEMA 04ATEX2137 Ex II 2 G

EEEx d IIB T5(Tamb 82°C) T6(Tamb 74°C)

DISCONNECT POWER BEFORE OPENING REFER TO MANUAL FOR MAX SUPPLY PRESSURE  
 NE PAS OUVRIR SOUS TENSION VOIR LE MANUEL D'INSTRUCTION POUR LA PRESSION ALIM. MAX  
 VOR OFFEN SPANNUNG ABSCHALTEN MAX VERSORGDUNGSPRUCK, SIEHE BEDEHUNGS ANLEITUNG

CE 1180

16E0744

**SPECIAL CONDITIONS FOR SAFE USE: THIS EQUIPMENT IS INTRINSICALLY SAFE AND CAN BE USED IN POTENTIALLY EXPLOSIVE ATMOSPHERES.**

**THE ELECTRICAL PARAMETERS OF CERTIFIED EQUIPMENT WHICH CAN BE CONNECTED TO THE DEVICE MUST NOT EXCEED THE FOLLOWING VALUES:**  
 $U_0 \leq 30 \text{ Vdc}$ ;  $I_0 \leq 150 \text{ mA}$ ;  $P_0 \leq 1 \text{ W}$

**AMBIENT TEMPERATURE:**  
 T6, AT Tamb = 47°C  
 T5, AT Tamb = 62°C  
 T4, AT Tamb = 71°C

**ATEX LCIE / INTRINSICALLY SAFE**

**FISHER** TYPE 3622

SERIAL NO. [ ]  
 SERIE NO. [ ]  
 SFRIFR NO. [ ]

MAX INPUT MAX VOLTAGE AVE TEMP  
 MAX INTERR MAX TENSION AVE TEMP  
 MAX ENERGIE MAX SPANNUNG UMG TEMP

IP54

LCIE 03 ATEX 6002X EEEx nA IIC T6(Tamb 82°C) Ex II 3 G

DISCONNECT POWER BEFORE OPENING REFER TO MANUAL FOR MAX SUPPLY PRESSURE  
 NE PAS OUVRIR SOUS TENSION VOIR LE MANUEL D'INSTRUCTION POUR LA PRESSION ALIM. MAX  
 VOR OFFEN SPANNUNG ABSCHALTEN MAX VERSORGDUNGSPRUCK, SIEHE BEDEHUNGS ANLEITUNG

CE 1180

**ATEX LCIE / TYPE n**

Figure 31. Approvals Nameplates

# 3610J and 3620J Positioners

**Instruction Manual**

Form 5208  
February 2005

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