Type 3660 and 3661 Positioners

Contents


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Figure 1. Type 3660 Positioner Mounted on a Baumann Actuator

Introduction

Scope of Manual

This instruction manual includes installation, operation, calibration, maintenance, and parts ordering information for the Type 3660 and 3661 positioners. Refer to separate instruction manuals for information on the actuator and control valve.

Table 1. Specifications

Available Configuration

Type 3660: Single-acting pneumatic valve positioner
Type 3661: Single-acting electro-pneumatic valve positioner

Input Signal(1)

Type 3660
■ 0.2 to 1.0 bar (3 to 15 psig),
■ 0.4 to 2.0 bar (6 to 30 psig), or
■ split range (see tables 3 and 4)
Type 3661:
■ 4 to 20 mA dc constant current with 30 V dc maximum compliance voltage.
■ split range is also available, see tables 3 and 4

Equivalent Circuit (Type 3661)

120 ohms shunted by three 5.6 V zener diodes

Output Signal(1)

Type: Pneumatic pressure as required by the actuator up to full supply pressure
Action:
■ Direct (increasing input signal pressure increases positioner output),
■ Reverse (increasing input signal pressure decreases positioner output)

Supply Pressure(1)(7)

Recommended: 10% above actuator requirements
Maximum: 6.2 bar (90 psig) or pressure rating of actuator, whichever is lower

Performance(1)

Independent Linearity: ±1% of output span
Hysteresis: 0.5% of output span(4)
Deadband: 0.1% of input span
Electromagnetic Interference (EMI) (Type 3661): Tested per IEC 61326-1 (Edition 1.1). Meets emission levels for Class A equipment (industrial locations) and Class B equipment (domestic locations). Meets immunity requirements for industrial locations (Table A.1 in the IEC specification document). Immunity performance is shown in table 2.

Positioner Adjustments

Span: ■ Adjustable up to 20 mm (0.75 inch) stem travel, or ■ Adjustable from 20 mm (0.75 inch) to 50 mm (2 inch) stem travel
Zero: 0 to 100%
Gain: 0.5 to 6% PB (proportional band)(5)
Output Volume Damping: Loop dynamic response adjustment

Delivery Capacity(2)

1.4 Bar (20 Psig) Supply: 4.3 normal m^3/hour (150 scfh)
2.4 Bar (35 Psig) Supply: 6.6 normal m^3/hour (230 scfh)

Exhaust Capacity(2)

1.4 Bar (20 Psig) Supply: 4.8 normal m^3/hour (170 scfh)
2.4 Bar (35 Psig) Supply: 7.4 normal m^3/hour (260 scfh)

Steady-State Air Consumption(1)(2)(3)

Type 3660: 0.16 normal m^3/hour (6.0 scfh) at 1.4 bar (20 psig) supply pressure. 0.21 normal m^3/hour (7.9 scfh) at 2.4 bar (35 psig) supply pressure
Type 3661: 0.24 normal m^3/hour (8.8 scfh) at 1.4 bar (20 psig) supply pressure. 0.33 normal m^3/hour (12.3 scfh) at 2.4 bar (35 psig) supply pressure

Operating Influence(1)

Supply Pressure: 70 mbar (1 psig) change in supply pressure changes the actuator stem position less than 0.16%(6) of travel

Operative Temperature Limits(1)(7)

Type 3660 without Pressure Gauges: –40 to 120°C (–40 to 250°F)
Type 3660 with Pressure Gauges: –40 to 82°C (–40 to 180°F)
Type 3661 with or without Pressure Gauges: –40 to 82°C (–40 to 180°F)

Hazardous Area Classification (Type 3661)

Intrinsically Safe, and Non-incendive

Non-incendive, Intrinsically Safe

ATEX Intrinsically Safe and Type n (Gas Atmospheres Only)

SAA Intrinsically Safe and Type n

Refer to figures 27, 28 and 29 for available nameplates and specific approval information, and Hazardous Area Classification bulletins for additional information.

– Continued –

Table 1. Specifications (Continued)

Housing Classification (Type 3661)

IP 54 per IEC 60529, NEMA 3 (FM) and Enclosure 3 (CSA): Mounting orientation requires vent location to be below horizontal.

Mounting

The positioner can be mounted in one of four different configurations. See figure 2 for mounting.

Pressure Connections

1/4-inch NPT female

Conduit Connection for Type 3661

1/2-inch NPT (M20 or PG13 adaptors, optional)

Maximum Valve Stem Travel

Two ranges:
■ 50 mm (2 inch) to 20 mm (0.75 inch) minimum;
■ 20 mm (0.75 inch) adjustable to lesser travel with standard input signal

Options

Type 3660:
■ Instrument and output pressure gauges,
■ Integrally mounted bypass valve
Type 3661: Output pressure gauge

Approximate Weight

Type 3660: 1.2 kg (2.6 pounds)
Type 3661: 1.4 kg (3.0 pounds)

Vent Connection

1/4-inch NPT female

1. This term is defined in ISA Standard S51.1.
2. Normal m^3/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).
3. Air consumption at a gain setting of 1/2 turn.
4. Hysteresis value at a gain setting of 1/2 turn.
5. Adjusting the gain (PB) adjustment changes the nozzle flapper relationship. This nozzle flapper change affects the actuator/positioner response time.
6. At supply pressure of 2.4 bar (35 psig).
7. The pressure/temperature limits in this manual and any applicable standard or code limitation should not be exceeded.

Table 2. Immunity Performance

Port	Phenomenon	Basic Standard	Performance Criteria(1)
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

1. A = No degradation during testing. B = Temporary degradation during testing, but is self-recovering.

No person may install, operate, or maintain a Type 3660 or 3661 positioner without first ● being fully trained and qualified in valve, actuator, and accessory installation, operation and maintenance, and ● carefully reading and understanding the contents of this manual. If you have any questions concerning these instructions, contact your Fisher sales office before proceeding.

Note

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

Description

The Type 3660 pneumatic and Type 3661 electro-pneumatic, single-acting positioners are used with Fisher Type 657, 667, 1250, 1250R, and GX actuators. These positioners can also be mounted on Gulde 3024S and Baumann actuators. Figure 1 shows a Type 3660 positioner mounted on a Baumann actuator.

The positioner mounts on the actuator and provides the desired plug position for a specific input signal. The Type 3660 positioner accepts a pneumatic signal and the Type 3661 accepts a 4 to 20 milliampere dc input signal.

Specifications

Specifications for the Type 3660 and 3661 positioners are shown in table 1.

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. Refer to the appropriate instruction manuals for actuator and valve installation procedures.

WARNING

Avoid personal injury and property damage from sudden release of process pressure. Before mounting the positioner on a valve in service:

- **Always wear protective clothing and eyewear when performing any maintenance procedures 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.**

Drain the process media from both sides of the valve.

- **Vent the power actuator loading pressure and relieve any actuator spring precompression.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **For 3661 positioners in intrinsically safe areas, current monitoring during operation must be with an approved meter for hazardous areas in order to avoid personal injury or property damage caused by an explosion or fire.**
- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

Positioner Mounting

Mounting on the Type 1250, 1250R, 3024S, and GX Actuators

During the following mounting procedures, refer to figures 3, 24, and 25 for key number locations.

Figure 3 shows keys 61 through 78 and 101 through 104. Other key numbers are shown in either figure 24 for the Type 3660 positioner or figure 25 for the Type 3661 positioner. Two mounting methods are available, center-bolt mounting and clamp mounting.

1. Determine the positioner mounting configuration from figure 2. The actuator size, actuator travel, and positioner action must be known. If center-bolt mounting is desired, be certain the actuator is equipped with tapped holes in the posts.

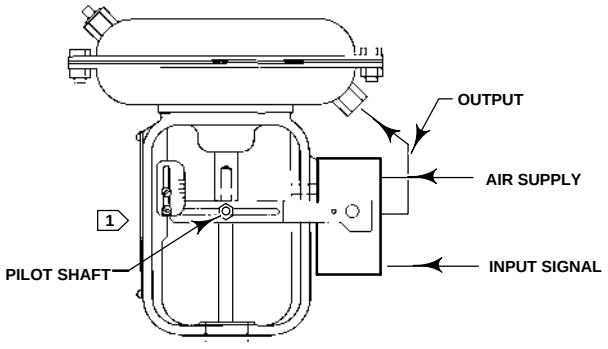
2. Thread the hex head screws with washers (keys 69 and 70) several turns into the stem connector. The feedback plate (key 68) is reversible and must be positioned so that the pilot shaft (key 19A) will operate correctly in the slot of the feedback plate. For actuator travels between 20 and 30 mm (0.787 and 1.18 inches) (for 3024S actuators, travel ranges between 16 and 32 mm), position the feedback plate so the long portion of its slot, when bolted to the stem connector, is closest to the positioner as shown in figure 4. For travels greater than 30 mm (1.18 inches), reverse the position of the feedback plate as shown in figure 4.

   a. For size 30 and 34 actuators with all travels and for size 45 actuators with travel greater than 30 mm (1.18 inches), position the feedback plate (key 68) between the stem connector and washers and tighten the hex head screws (key 69).

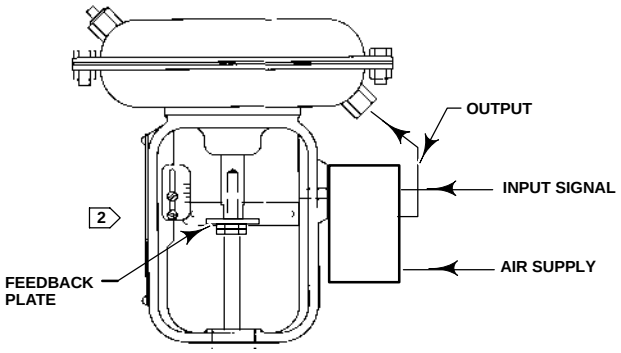
   b. For size 45 actuators with travel between 20 and 30 mm (0.787 and 1.18 inches) (16 and 32 mm for 3024S actuators), attach the feedback adaptor (key 103) to the feedback plate (key 68) using machine screws, lockwashers, and wedge nuts (keys 102, 101, and 104). The feedback plate and the wedge nuts must be assembled as shown in the lower right portion of figure 3. Use the mounting holes in the feedback adaptor and position it as indicated in figure 4. Then, position the feedback plate between the stem connector and washers and tighten the hex head screws (key 69).

3. Unscrew the two machine screws (key 24), and remove the positioner cover (key 21).

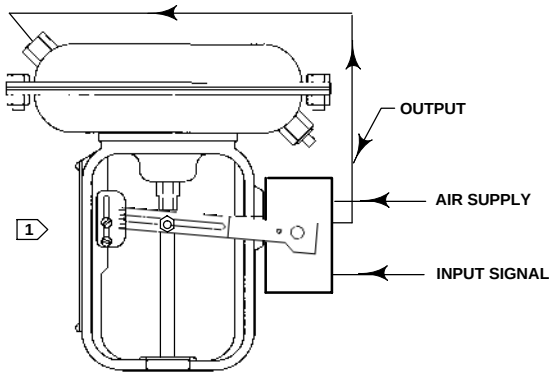
Input Signal	Positioner Output
Direct 0.2 to 1.0 bar (3 to 15 psig) 0.4 to 2.0 bar (6 to 30 psig) 4 to 20 mA	Up to 6.2 bar (90 psig)
Reverse 1.0 to 0.2 bar (15 to 3 psig) 2.0 to 0.4 bar (30 to 6 psig) 20 to 4 mA	
For split range signal refer to tables 3 and 4	



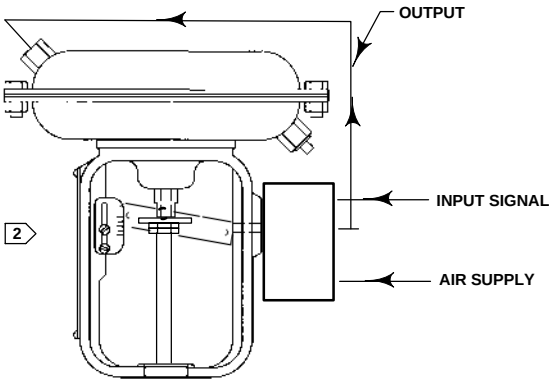
ACTUATOR: AIR-TO-RETRACT
POSITIONER ACTION: DIRECT
(INCREASING INPUT SIGNAL INCREASES OUTPUT PRESSURE TO ACTUATOR)



ACTUATOR: AIR-TO-RETRACT
POSITIONER ACTION: REVERSE
(INCREASING INPUT SIGNAL DECREASES OUTPUT PRESSURE TO ACTUATOR)



ACTUATOR: AIR-TO-EXTEND
POSITIONER ACTION: REVERSE
(INCREASING INPUT SIGNAL DECREASES OUTPUT PRESSURE TO ACTUATOR)



ACTUATOR: AIR-TO-EXTEND
POSITIONER ACTION: DIRECT
(INCREASING INPUT SIGNAL INCREASES OUTPUT PRESSURE TO ACTUATOR)

NOTES:
1 WHEN MOUNTING ON BAUMANN ACTUATORS, INSTALL FEEDBACK PLATE SO LIP IS UP. INSTALL FEEDBACK LEVER ARM ASSEMBLY, PRELOADED, SO PILOT SHAFT IS ON TOP OF THE FEEDBACK PLATE.
2 WHEN MOUNTING ON BAUMANN ACTUATORS, INSTALL FEEDBACK PLATE SO LIP IS DOWN. INSTALL FEEDBACK LEVER ARM ASSEMBLY, PRELOADED, SO PILOT SHAFT IS UNDERNEATH THE FEEDBACK PLATE.

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Figure 2. Mounting Configurations

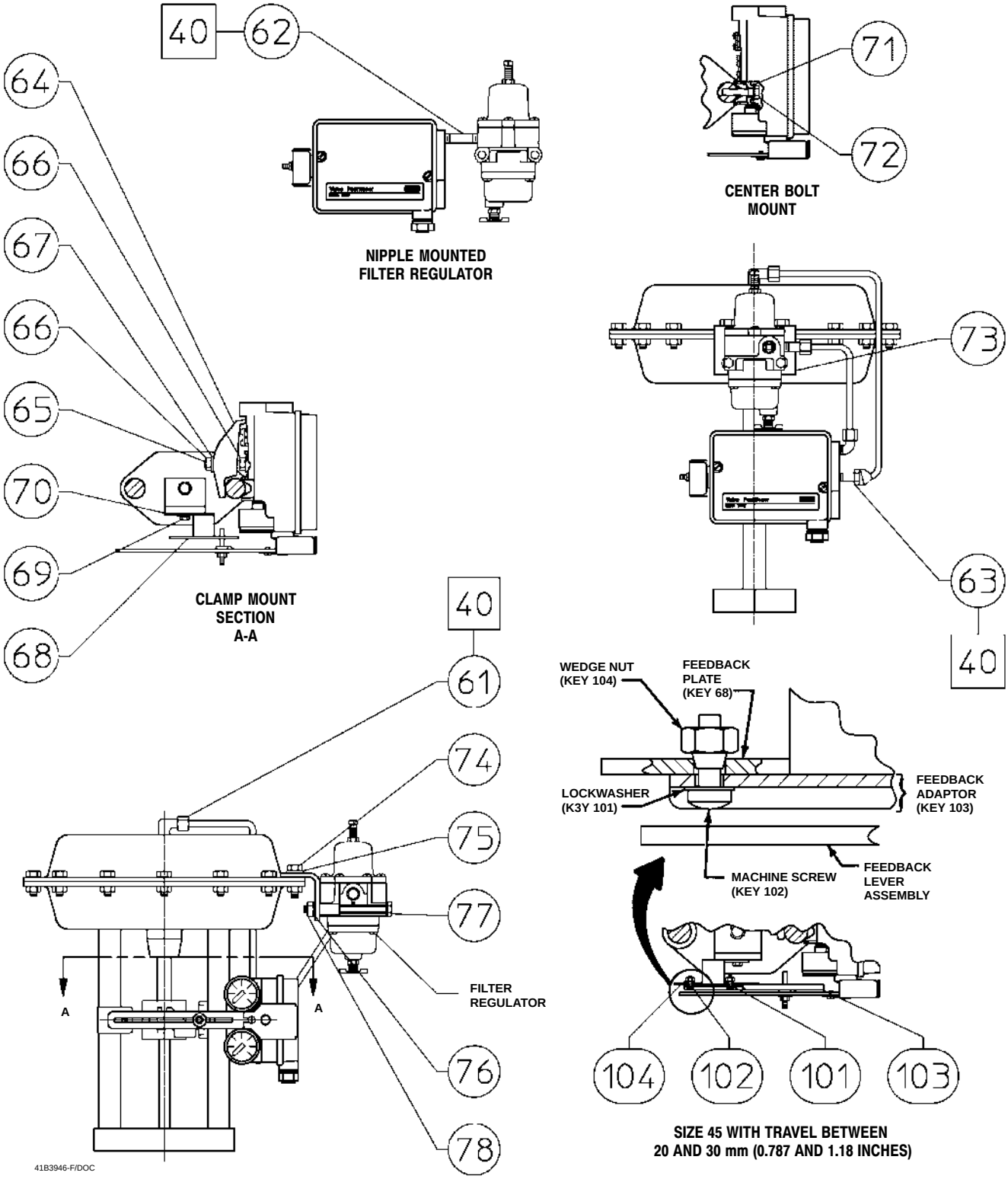
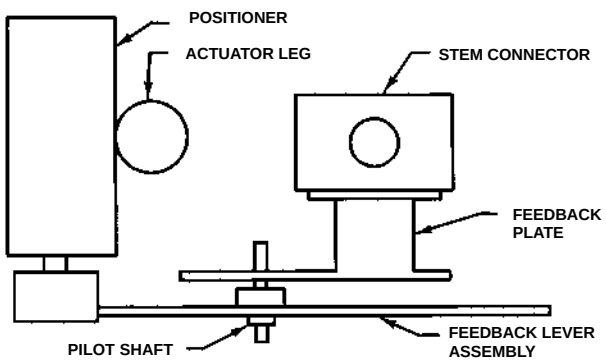
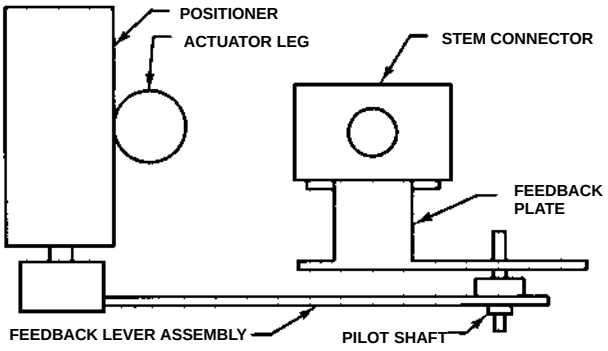


Figure 3. Positioner Mounting on Type 1250, 1250R, and 3024S Actuators





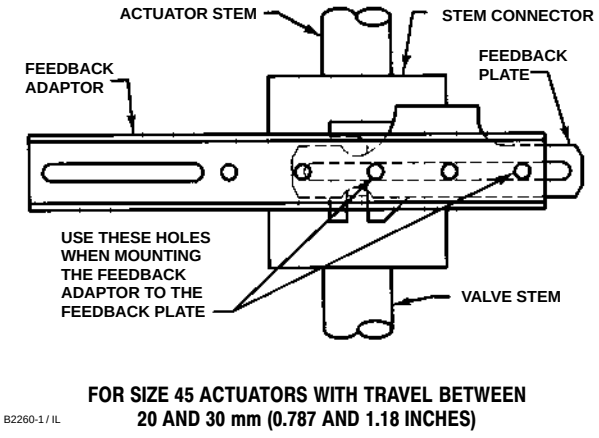


Figure 4. Feedback Plate Orientation with Positioner Mounted on Type 1250, 1250R, and 3024S Actuators

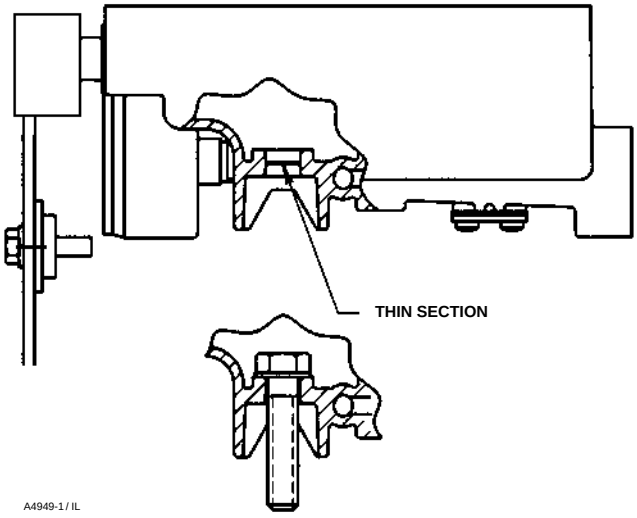


Figure 5. Actuator Center-Bolt Mounting

Center-Bolt Mounting (GX Actuator)

a. As shown in figure 5, a thin knockout section is cast across the mounting hole in the housing. Check to make certain this knockout section has been removed. If the knockout section has not been removed, use a punch to knock it out.

b. Attach the positioner to the actuator using a sealing washer and hex head screw (keys 71 and 72).

c. Install the feedback lever assembly and range spring.

Clamp Mounting

a. Install a hex nut (key 66) on one end of each of two studs (key 65). Turn the nuts all the way to the end of the threads.

b. Thread the end of each stud (key 65), (the end with hex nut—key 66), into the back of the positioner housing (key 1) as far as the studs will go. Tighten both nuts against the housing.

c. Set the actuator at mid-travel using a manual loading regulator.

d. With the finger end of the bracket (key 64) toward the positioner pressure connections as shown in figure 3, place the bracket and washers (key 67) over the studs (key 65). Thread the hex nuts (key 66) several turns onto the studs.

Note

Do not install the range spring in the following step. Feedback lever assembly (key 19) installation in the next step is only temporary to permit verifying alignment.

e. Install the positioner on the actuator by placing the bracket (key 64) around the appropriate actuator leg. Visually center the center line of the slot in the feedback plate (key 68) with the center line of the hole in the housing. Then, tighten the nuts (key 66) only tight enough to prevent the positioner from moving on the actuator leg. Locate the feedback lever assembly (key 19) so that it may be temporarily installed into the positioner housing (key 1) and the feedback plate (key 68) to verify alignment. Do not install the range spring at this time. Place the pilot shaft (key 19A) in the slot of the feedback plate, and, at the same time, insert the feedback shaft in the hole of the positioner housing. Depress the feedback lever assembly inward until it stops against the housing. Make certain the slots in both the feedback lever assembly and the feedback plate are horizontal with each other and that the feedback lever assembly and the feedback plate are parallel with each other. If necessary, correct alignment by loosening the hex nuts (key 66) and moving the positioner on the actuator leg as required.

f. Tighten the two hex nuts (key 66) to secure the positioner to the actuator leg.

g. Install the feedback lever assembly and range spring.

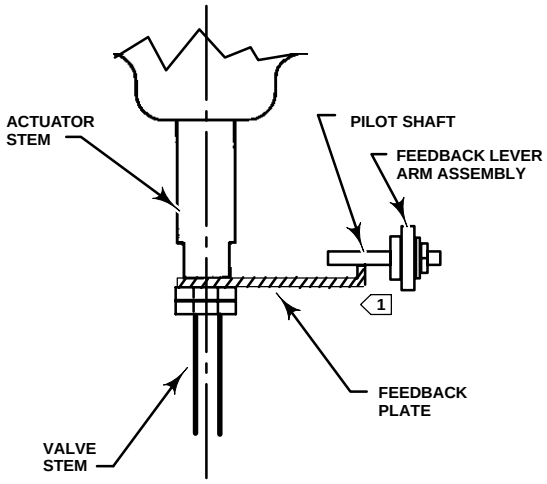
Mounting on Baumann Actuators

During the following mounting procedures, refer to figures 2, 5, 6, 24, and 25. Key numbers are shown in either figure 24 for the Type 3660 positioner or figure 25 for the Type 3661 positioner.

1. Determine the positioner mounting configuration from figure 2. The actuator size, actuator travel, and positioner action must be known.

2. Attach the feedback plate to the actuator stem connector by locating the feedback plate between the actuator stem and valve stem nuts (figure 6) as follows:

- If after the positioner is mounted the feedback lever assembly will be on the left side of the positioner, install the feedback plate so the lip is up.



1 IF AFTER MOUNTING POSITIONER, THE FEEDBACK LEVER ARM ASSEMBLY WILL BE ON THE LEFT SIDE OF THE POSITIONER, INSTALL THE FEEDBACK PLATE SO THE LIP IS UP. INSTALL THE FEEDBACK LEVER ARM ASSEMBLY, PRELOADED, SO THE PILOT SHAFT IS ABOVE THE PLATE.
IF AFTER MOUNTING POSITIONER, THE FEEDBACK LEVER ARM ASSEMBLY WILL BE ON THE RIGHT SIDE OF THE POSITIONER, INSTALL THE FEEDBACK PLATE SO THE LIP IS DOWN. INSTALL THE FEEDBACK LEVER ARM ASSEMBLY, PRELOADED, SO THE PILOT SHAFT IS BELOW THE PLATE.
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Figure 6. Feedback Plate Installation for Baumann Actuators

- If after the positioner is mounted the feedback lever assembly will be on the right side of the positioner, install the feedback plate so the lip is down.

3. Unscrew the two machine screws (key 24), and remove the positioner cover (key 21).

4. As shown in figure 5, a thin knockout section is cast across the mounting hole in the housing. Check to make certain this knockout section has been removed. If the knockout section has not been removed, use a punch to knock it out.

5. For air to extend actuators, the feedback lever assembly must be installed into the positioner and preloaded before attaching the positioner to the actuator.

6. Attach the positioner to the actuator using a sealing washer and hex head screw (keys 71 and 72).

7. Install the feedback lever assembly and range spring.

Mounting on the Type 657 and 667 Actuators

During the following mounting procedures, refer to figures 7, 24, and 25 for key number locations. Figure 7 shows keys 61 through 63, 69 and 70, 73 through 78, and 82 through 93. Other key numbers are shown in either figure 24 for the Type 3660 positioner or figure 25 for the Type 3661 positioner.

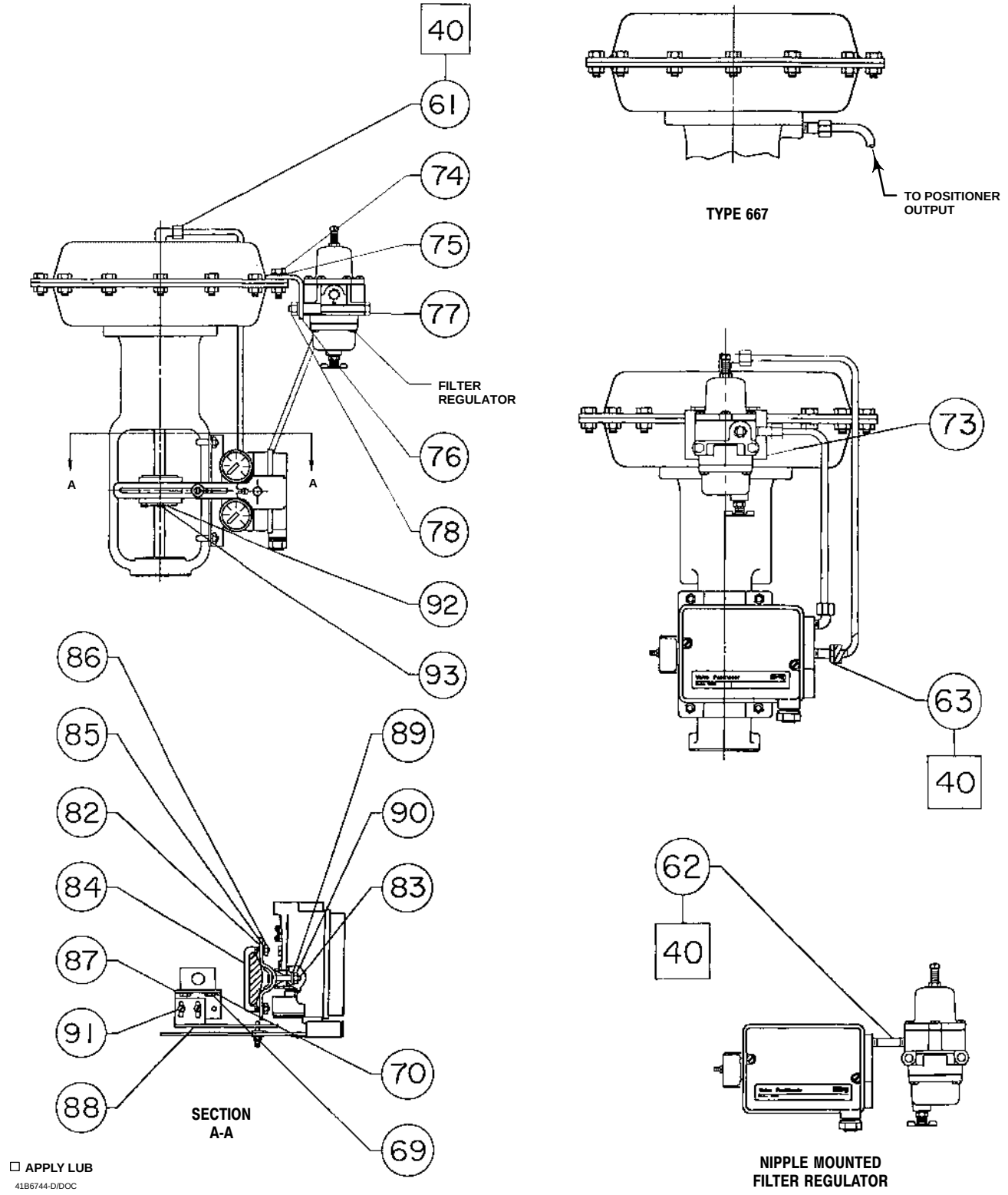


Figure 7. Positioner Mounting on Type 657 and 667 Actuators

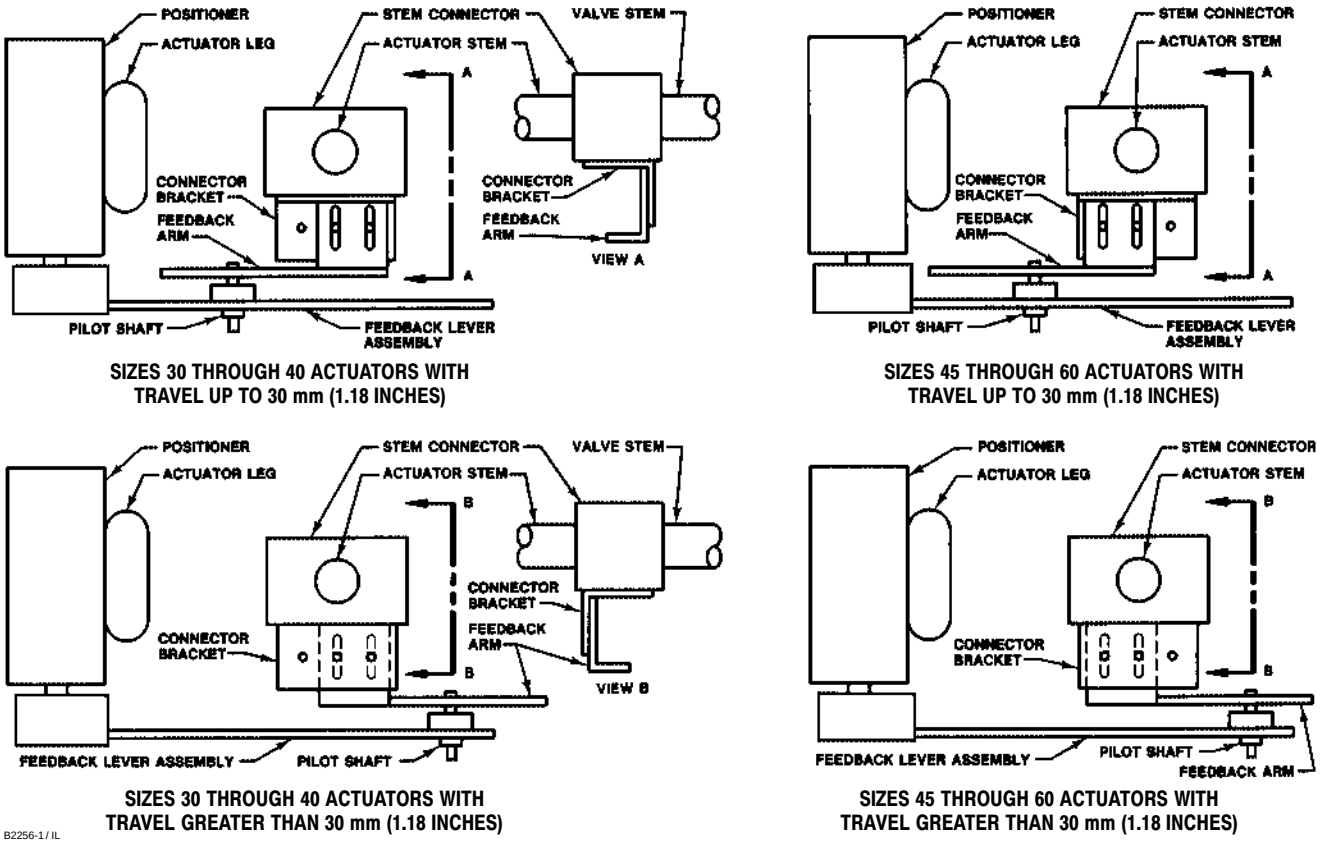


Figure 8. Feedback Arm Orientation with Positioner Mounted on Type 657 and 667 Actuators

1. Determine the positioner mounting configuration from figure 2. The actuator size, actuator travel, and positioner action must be known.

Note

The actuator bench set spring load must be released before removing the stem connector cap screws. Refer to the appropriate actuator instruction manual for this procedure. After installing the positioner and mounting hardware, reset the actuator bench set.

2. Attach the connector bracket (key 87) to the actuator stem connector using washers and cap screws (keys 70 and 69), but do not tighten the screws. Refer to figures 7 and 8 for the proper orientation of the connector bracket with respect to the actuator stem connector. The face of the stem connector should be perpendicular to the legs of the actuator yoke.

3. Refer to figure 8 for the feedback arm (key 88) location with respect to the connector bracket (key 87). Position the feedback arm so that the pilot shaft (key 19A) will operate correctly in the slot of the feedback arm. For actuator travels between 19 and 30 mm (0.75 and 1.18 inches), position the feedback arm so that the long portion of the feedback arm slot, when fastened to the connector bracket, is closest to the positioner (see figure 8). For travels greater than 30 mm (1.18 inches) reverse the feedback arm so the slot in the feedback arm is opposite the positioner (see figure 8).

4. Attach the feedback arm (key 88) to the connector bracket (key 87) using machine screws, washers and hex nuts (keys 91, 92 and 93), but do not tighten the hex nuts.

5. Unscrew the two machine screws (key 24), and remove the positioner cover (key 21).

6. As shown in figure 5, a thin knockout section is cast across the mounting hole in the housing. Check to make certain that this knockout section has been removed. If the knockout section has not been removed, use a punch to knock it out.

7. Set the actuator at mid-travel using a manual loading regulator.

8. Install the stud clamp (key 83) in the mounting bracket (key 82). Place the mounting bracket against the outside of the actuator leg. Attach the two U-bolts (key 84) and the mounting bracket to the actuator leg using washers and hex nuts (key 85 and 86), but do not tighten the nuts. Depending on the positioner action, it may be necessary to straddle the travel indicator scale located on the inside of the actuator leg.

Note

Do not install the range spring in the following step. Feedback lever assembly (key 19) installation in the next step is only temporary to permit verifying alignment.

9. Attach the positioner to the stud clamp (key 83) using the sealing washer and hex nut (keys 89 and 90), but do not tighten the nut. Visually center the center line of the slot in the feedback arm (key 88) with the center line of the hole in the housing. Then, tighten the nuts (keys 90 and 86) only tight enough to prevent the positioner and mounting bracket from moving on the actuator leg. Locate the feedback lever assembly (key 19) so it may be temporarily installed into the positioner housing (key 1) and the feedback arm (key 88) to verify alignment. Do not install the range spring at this time. Place the pilot shaft (key 19A) in the slot of the feedback arm, and, at the same time, insert the feedback shaft in the hole of the positioner housing. Depress the feedback lever assembly inward until it stops against the housing. Make certain the slots in both the feedback lever assembly and feedback arm are horizontal and that the feedback lever assembly and the feedback arm are parallel with each other. If necessary, correct alignment by loosening the hex nuts (keys 86 and 90) and either moving the stud clamp in the mounting bracket or moving the mounting bracket on the actuator leg.

10. Tighten the nuts that were not tightened in the previous steps.

a. Tighten the hex nut (key 90) to secure the positioner to the stud clamp (key 83).

b. Tighten the four hex nuts (key 86) to secure the mounting bracket (key 82) to the actuator leg.

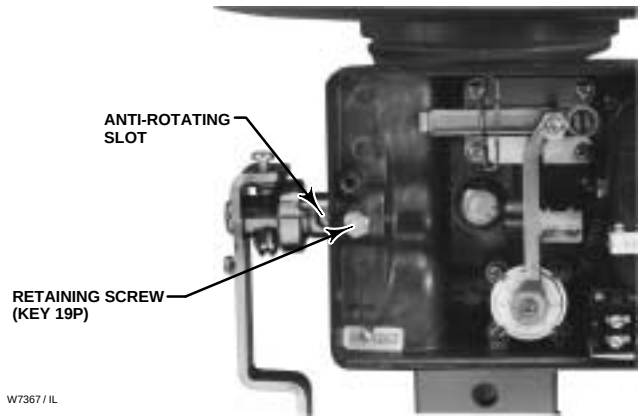


Figure 9. Installing the Feedback Lever Assembly (Key19) on the Positioner

c. Tighten the machine screws and hex nuts (key 91 and 93) to secure the feedback arm (key 88) to the connector bracket (key 87).

d. Tighten the hex head screws (key 69) to secure the connector bracket (key 87) to the actuator stem connector.

11. Install the feedback lever assembly and range spring.

Feedback Lever Assembly and Range Spring Installation

Key numbers are shown in either figure 24 for the Type 3660 positioner or figure 25 for the Type 3661 positioner. Key numbers for the feedback lever assembly are shown in figure 26.

CAUTION

The range spring (key 30) and feedback lever assembly (key 19) must be installed together. Installing the range spring after the feedback lever assembly is installed may result in damage to the lever assembly (key 17) flexures.

1. Refer to figure 9. Loosen the retaining screw (key 19P) located in the positioner housing until it is fully retracted into the housing.

2. On the feedback lever assembly (key 19), loosen the zero adjustment screw (key 19S) until it is fully retracted into the clinch nut.

3. On the feedback lever assembly, loosen the hex nut (key 19D) so the pilot shaft (key 19A) moves freely in the slot.

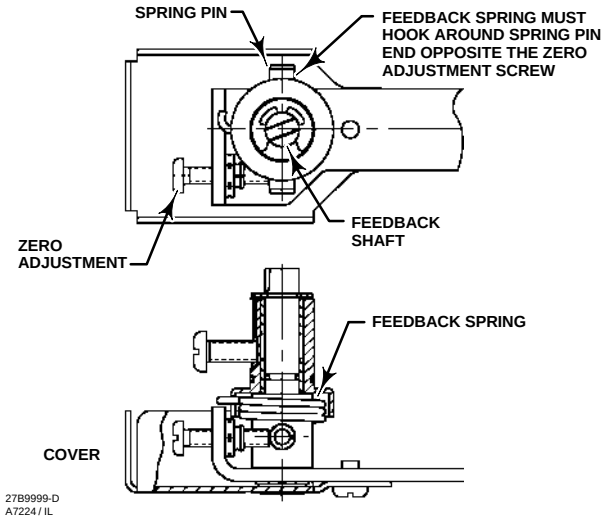


Figure 10. Positioning Feedback Spring

CAUTION

In the next step, be sure the feedback spring (key 19N) hooks on the spring pin (key 19R) opposite the zero adjustment screw. If the feedback spring does not hook on the spring pin correctly, the feedback spring may be damaged during feedback lever assembly (key 19) installation.

4. Refer to figure 10. Verify that the feedback spring in the feedback lever assembly bushing is hooked on the end of the spring pin opposite the zero adjustment screw.

Note

When installing the feedback lever assembly bushing, be sure the anti-rotating slot aligns with the retaining screw (key 19P).

5. Position the feedback lever assembly (key 19) so that the pilot shaft (key 19A) will rest on the feedback plate or slide into the slot of the feedback arm (key 88) after installation.

6. Be sure the anti-rotating slot aligns with the retaining screw (key 19P), then install the feedback lever assembly bushing partially into the positioner.

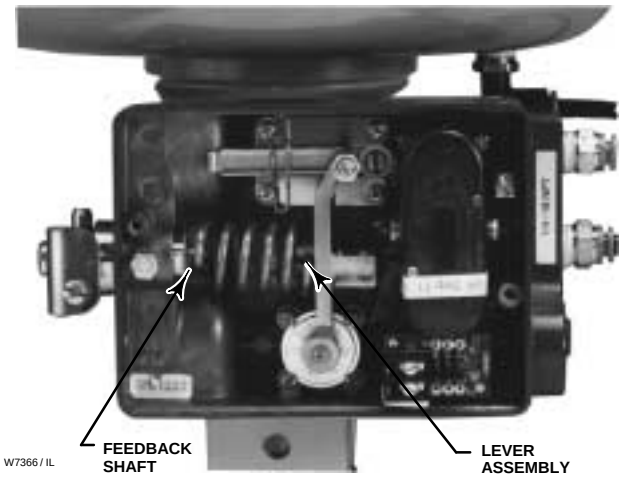


Figure 11. Range Spring Installation

Slight tension on the feedback spring (key 19N) may be required to get the anti-rotating slot to align with the retaining screw.

CAUTION

The reason for partially sliding the feedback lever assembly (key 19) into the housing is to permit installing the range spring (key 30) without damaging the lever assembly (key 17) flexures. Installing the range spring after the feedback lever assembly is completely installed may damage the lever assembly flexures.

7. Tighten the retaining screw (key 19P) until the screw engages the anti-rotating slot so that the bushing does not rotate, but leave the screw loose enough so that the bushing can slide freely into the housing.

8. Refer to figures 11 and 12. Select the appropriate range spring (key 30) from tables 3 and 4. Place the range spring in the positioner so that one end of the spring is fully in the lever assembly slot. Next, rotate the feedback lever assembly so that:

- the other end of the range spring aligns with the slot in the feedback shaft, and

- the pilot shaft (key 19A) is either above or below the actuator feedback plate or engages the slot in the feedback arm (key 88).

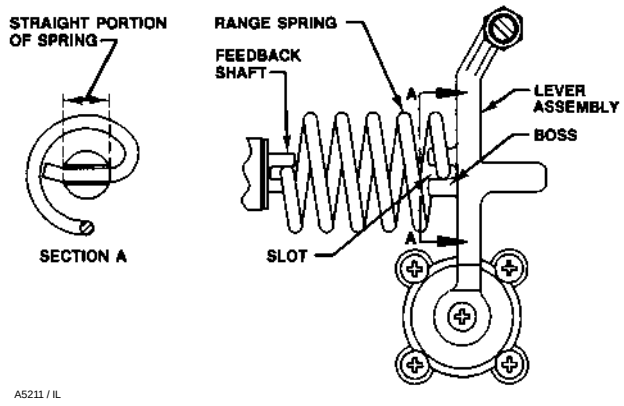


Figure 12. Range Spring Alignment

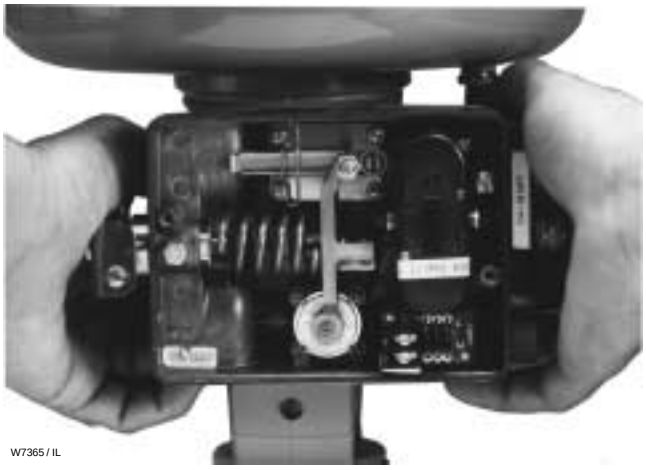


Figure 13.Pressing the Feedback Lever Assembly Bushing into the Positioner

Note

The feedback lever assembly bushing will no longer slide freely in the housing after it is placed in the normal operating position due to the side loading of the retaining screw (key 19P) on the anti-rotating slot.

9. Center the range spring (key 30) in the lever assembly (key 17) and feedback shaft slots; then push the feedback lever assembly bushing into the housing far enough so that the spring is retained without holding it.

CAUTION

Installation of the feedback lever assembly (key 19) prior to installation of the range spring (key 30) may result in damage to the lever assembly (key 17) flexures. The range spring must be in place before pushing the feedback lever assembly bushing fully into the positioner housing.

10. Ensure the range spring (key 30) is properly aligned as shown in figure 12, then, as shown in figure 13, place hands on both sides of the positioner and press firmly until the feedback lever assembly bushing shoulder is against the positioner housing (figure 14).

11. While holding the feedback lever assembly bushing securely against the housing, tighten the retaining screw (key 19P). The feedback lever assembly bushing should be tight against the positioner housing as shown in figure 14.

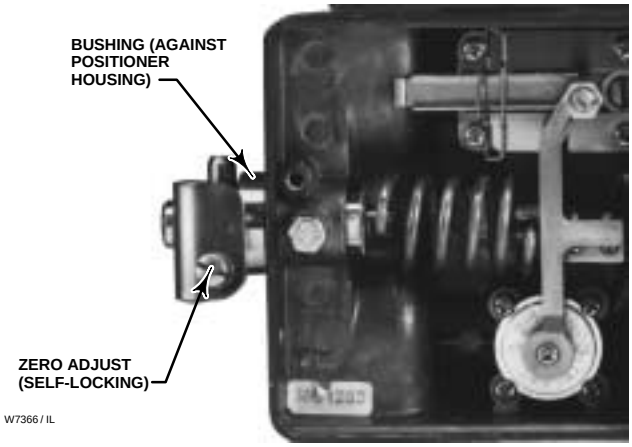


Figure 14. Feedback Lever Assembly in Operating Position

12. Move the pilot shaft (key 19A) to the approximate span position shown in table 4

Note

To ensure proper positioner performance, make certain, after alignment and all tightening is completed, that there is clearance between the face of the pilot shaft and the feedback arm.

13. Install the feedback lever assembly cover (key 19T) with cover screw (key 19U).

14. Verify the positioner action. Note the letters D and R on the flapper (key 10). If the letter D is nearest the adjustment screw (key 18), the positioner is set for direct action. To change the positioner action, refer to the Changing Positioner Action procedure in the Maintenance section. If the action is changed, complete the Calibration section before putting the unit into operation.

15. Install the positioner cover (key 21) and secure with the two machine screws (key 24). Make certain the Fisher logo reads correctly and the vent is pointing downward. Continue with the Pressure Connections section.

Pressure Connections

Installing a Type 3660 or 3661 positioner requires tubing and pressure fittings. The fittings, tubing, and mounting parts required depend on the type number and optional equipment, such as filter/regulator and bypass valve. See figure 15 for the location of the positioner pressure connections.

WARNING

The positioner is capable of providing full supply pressure to connected equipment. To avoid personal injury and property damage caused by parts bursting from system overpressure, make sure the supply pressure never exceeds the maximum safe working pressure of any connected equipment.

Supply Connection

WARNING

Severe personal injury or property damage may occur if the instrument air supply is not clean, dry and oil-free. While use and regular maintenance or 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 of filter maintenance.

Connect a clean, dry air source to the supply connection of the positioner. Use 3/8-inch tubing or 1/4-inch pipe for the supply line. A supply air filter or a filter regulator capable of removing particles 40 microns in diameter is recommended. The supply pressure should not exceed the following limits:

1. For the positioner, do not exceed the maximum pressure rating of 6.2 bar (90 psig).

2. For actuator pressure, refer to the appropriate actuator instruction manual for maximum allowable pressures.

3. For the valve body assembly, do not exceed the maximum allowable thrust of the specific valve.

Output Connection

Connect the OUTPUT connection to the actuator diaphragm casing connection. Use 3/8-inch, 1/4-inch, or 6 mm tubing, or 1/4-inch pipe between the actuator and the positioner.

Instrument Connection

Connect the control device output to the positioner INSTRUMENT connection. Use 3/8-inch tubing to 1/4-inch pipe.

The Type 3661 electro-pneumatic positioner requires a 4 to 20 milliampere dc current input signal from the control device. For connections to the Type 3661, refer to the Electrical Connections for Type 3661 Positioners section.

Diagnostic Connections

To support diagnostic testing of valve/actuator/positioner packages, special connectors and hardware are available. Typical connector installations are shown in figure 16. The hardware used includes 1/4-inch NPT pipe nipples and pipe tees with 1/8-inch NPT pipe bushings for the connectors. The connectors consist of 1/8-inch NPT 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 and hardware between the Type 3660 or Type 3661 positioner and the actuator.

1. Before assembling the pipe nipple, pipe tee, pipe bushings, actuator piping, and connector body, apply sealant to all threads. Sealant is provided with the diagnostic connectors and hardware.

ACTUATOR CENTERLINE TO POSITIONER			
Type	**Size**	**Dimension X**	
		mm	**Inch**
657/667	30	92.2	3.63
	34	95.3	3.75
	40	104.9	4.13
	45/46	108.0	4.25
	50/60	128.5	5.06
1250	30	86.0	3.39
	34	86.0	3.39
	45	110.0	4.33
3024S	1.21	83.5	3.29
	1.31	87.5	3.44
	1.41	87.5	3.44
Baumann	16in^2	53.8	2.12
	32in^2	71.4	2.81
	54in^2	71.4	2.81
	70in^2	71.4	2.81
GX	225	81.0	3.19
	750	81.0	3.19
	1200	81.0	3.19

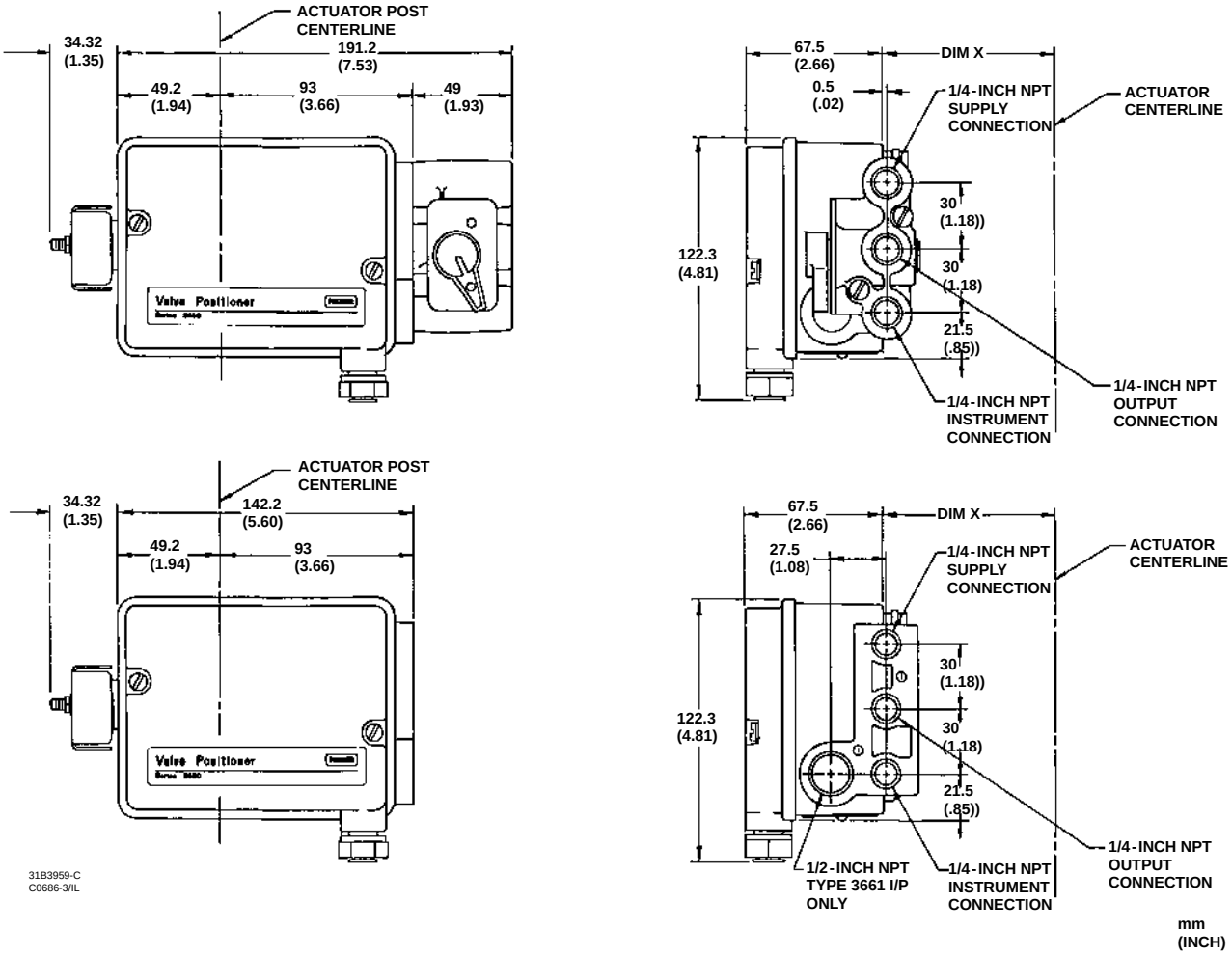


Figure 15. Typical Mounting Dimensions and Connections

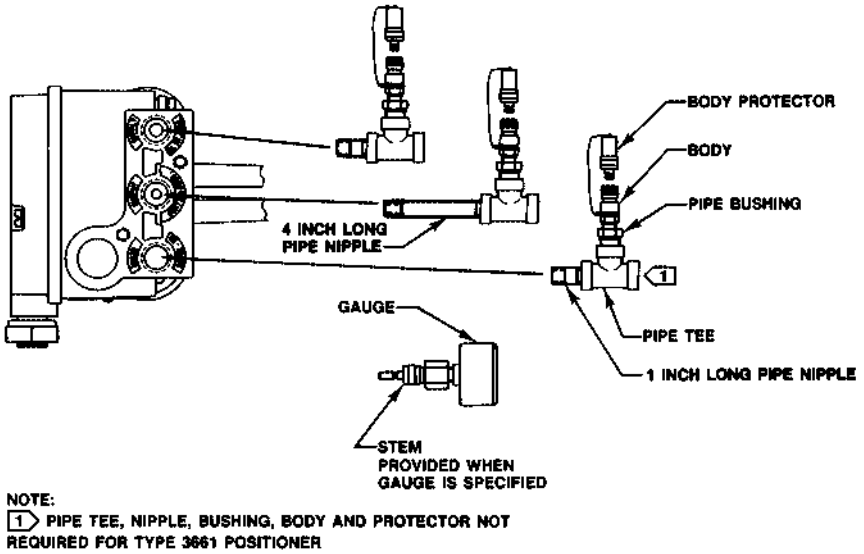


Figure 16. FlowScanner ™ Valve Diagnostic System Connections

2. Turn the pipe tee to position the connector body and body protector for easy access when doing the diagnostic testing.

Vent Connection

The Type 3660 and 3661 positioners are equipped with a 1/4-inch NPT vent connection in the cover.

WARNING

If a flammable, hazardous or corrosive, gas is to be used as the supply pressure medium, personal injury or property damage could result from fire or explosion of accumulated gas or from contact with hazardous or corrosive gas. The positioner/actuator assembly does not form a gas-tight seal, and when the assembly is enclosed, a remote vent line, adequate ventilation, and necessary safety measures should be used. A remote vent pipe alone cannot be relied upon to remove all hazardous gas. 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.

Electrical Connections for Type 3661 Positioners

Refer to figures 17 and 18 when making electrical connections. Use the 1/2-inch NPT (or M20 thread) conduit connection for installation of field wiring. Run the input wires through the conduit, and connect the positive wire from the control device to the positioner + terminal and the negative wire from the control device to the positioner - terminal. Do not over tighten the terminal screws. The maximum torque is 0.45 N•m (4 lbf•in.).

Calibration

The following calibration procedures are for the adjustment of the pneumatic positioner. For the Type 3661 positioner, there are no adjustments within the converter portion of the positioner. All adjustments are accomplished within the pneumatic portion of the positioner.

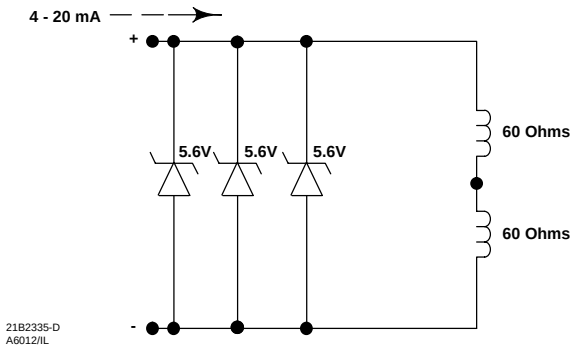


Figure 17. Equivalent Circuit

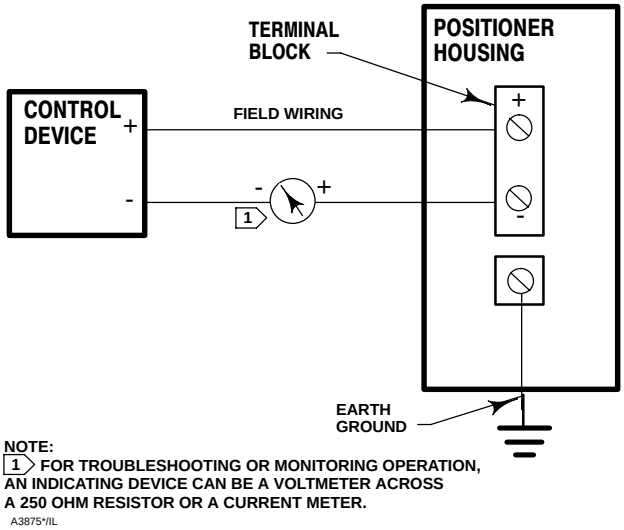


Figure 18. Typical Field-Wiring Diagram

WARNING

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

- **Isolate the valve from the process, and**
- **Release process pressure.**

Refer to figure 24 (Type 3660) or figure 25 (Type 3661) for key number locations unless otherwise indicated. Adjustment locations are shown in figure 19.

1. If mounting a new positioner on an actuator or if the positioner action has not been changed, do not perform steps 2 through 7.

2. If the positioner action has been changed or if the positioner has had maintenance performed on it, complete steps 3 through 17.

3. If the cover (key 21) has not been removed, unscrew the two machine screws (key 24), and remove the cover.

4. Release all pressure from the positioner. Disconnect the positioner output tubing to the actuator. If the positioner is equipped with an output gauge, plug the positioner output connection. If the positioner is not equipped with an output gauge, provide a gauge to monitor positioner output and connect it to the positioner output connection.

5. Set the supply pressure to the required setting. Set the gain(1) (proportional band) adjustment screw at a nominal value by turning it clockwise until it stops, and then turning it counterclockwise 1 turn.

Note

To improve holding of the calibration tool as used in step 6, the actuator may be used to create the load (manual pressure) by winding up the positioner range spring. The direction of windup, looking at the spring from outside the housing, must be clockwise. This windup will create a torsional force over the input diaphragm through the lever assembly. The spring is automatically wound up in two of the positioner/actuator mounting positions when the loading pressure is removed. These are left-hand mounting on a spring-to-close actuator and right-hand mounting on a spring-to-open actuator (refer to figure 2). In the other two mounting positions, the actuator must be pressurized to 100 percent input to create the spring holding force.

1. Adjusting the gain (PB) adjustment changes the nozzle flapper relationship. This nozzle flapper change affects the actuator/positioner response time.

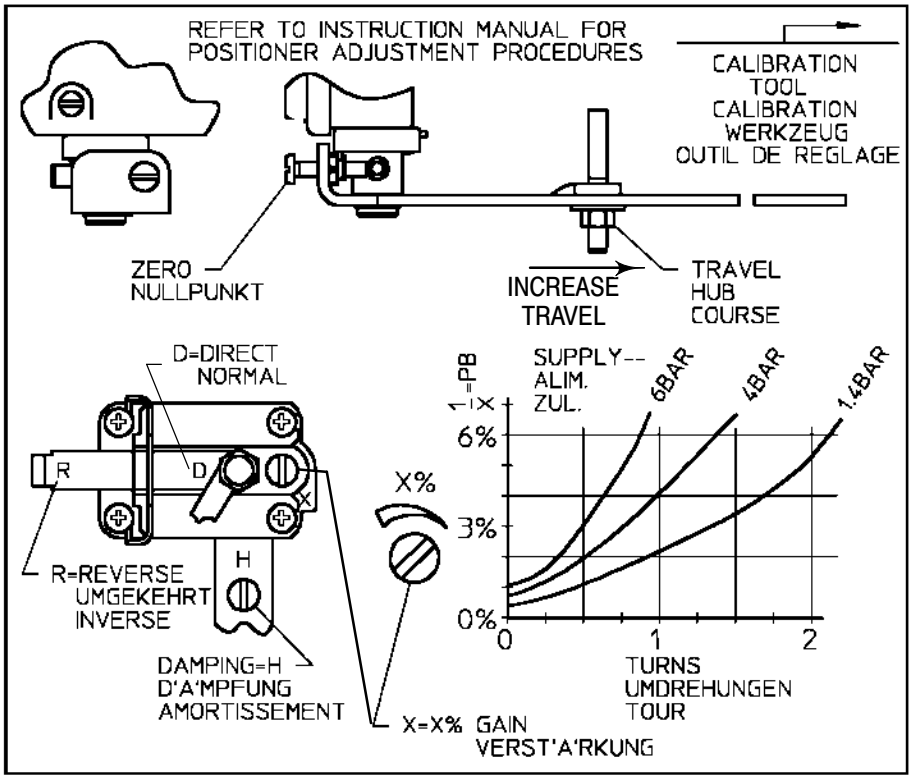


Figure 19. Adjustment Locations (Equivalents of Pressures Shown in This Drawing are:6 bar = 86 psig, 4 bar = 58 psig, and 1.4 bar = 20 psig)

6. Remove the calibration tool (key 6) from the cover. Place the calibration tool between the lever assembly (key 17) and the input diaphragm assembly (key 28). When making the following adjustment, apply manual pressure to the lever assembly over the input diaphragm assembly to hold the calibration tool in place. Loosen the lock nut (key 57), and turn the adjusting screw (key 18) until the output is 50% ± 10% of supply pressure. For example, if supply pressure is 2.4 bar, set the output to 1.2 bar ± 0.24 bar.

7. Lock the adjusting screw (key 18) with the lock nut (key 57). After the adjustment is complete, remove the calibration tool and replace it in the positioner cover.

8. Release all pressure from the positioner. Remove the plug or the gauge that was installed in step 4, and reconnect the output tubing to the actuator.

9. Turn on supply pressure. Set the input signal to the minimum value.

10. Remove the cover (key 19T) from the feedback lever assembly (key 19).

11. Set the travel (span) adjustment to the desired actuator travel by loosening the hex nut (key 19D) and sliding the pilot shaft (key 19A) to the desired setting on the feedback lever assembly (key 19). The travel settings are marked in millimeters on the feedback lever assembly.

12. Set the gain (PB) adjustment and/or the output volume damping adjustment to a setting that provides the best actuator/positioner response. Observe the gain dependency on the air supply pressure as shown in the graph of figure 19. The gain adjustment restrictor for air delivery should be fully open for large size actuators and adjusted to a mid-value for smaller size actuators with 225 cm^2 (35 square inches) or less diaphragm area. Start bysetting the gain adjustment at approximately one turn open, and, if the output volume damping adjustment is used, turn it clockwise to decrease the air delivery.

Table 3. Range Spring Selection for Fisher Actuators

TYPE	3660		3660		3661	VALVE STEM TRAVEL WHEN USING TYPES 3660 AND 3661		RANGE SPRING PART NUMBER (KEY 30)
Split	0.2 to 1.0 bar (3 to 15 psig) Input Signal		0.4 to 2.0 bar (6 to 30 psig) Input Signal		4 to 30 mAdc Input Signal			
	Bar	Psig	Bar	Psig		mm	Inches	
One Way 1:1	0.2 to 1.0	3 to 15	0.4 to 2.0	6 to 30	4 to 20	20 to 50	0.787 to 1.969	11B3880 X012
Two Way 2:1	0.2 to 0.6 0.6 to 1.0	3 t0 9 9 to 15	0.4 to 1.2 1.2 to 2.0	6 to 18 18 to 30	4 to 12 12 to 20	20 to 50	0.787 to 1.969	11B3881 X012
Three Way 3:1	0.2 to 0.5 0.5 to 0.8 0.8 to 1.0	3 to 7 7 to 11 11 to 15	0.4 to 1.0 1.0 to 1.5 1.5 to 2.0	6 to 14 14 to 22 22 to 30	4 to 9.33 9.33 to 14.66 14.66 to 20	15 to 33.3	0.591 to 1.311	11B3881 X012

Table 4. Range Spring Selection for Baumann Actuators

TYPE	3660				3661		VALVE STEM TRAVEL			
Split	0.2 to 1.0 bar (3 to 15 Psig) Input Signal		0.4 to 2.0 bar (6 to 30 Psig) Input Signal		4 to 20 mA dc Input Signal		12.7 to 19.1 mm (1/2 to 3/4 inch)		19.1 to 50 mm (3/4 to 2 inch)	
	Range Bar (Psig)	Span Bar (Psi)	Range Bar (Psig)	Span Bar (Psi)	Range mA	Span mA	Range Spring Part Number (key 30)	Approximate Pilot Shaft Setting(1) mm (Inch)	Range Spring Part Number (key 30)	Approximate Pilot Shaft Setting(1) mm (Inch)
One Way 1:1	0.2 to 1.0 (3 to 15)	0.8 (12)	0.4 to 2.0 (6 to 30)	1.6 (24)	4 to 20	16	17B0662X012	89 (3.50)	17B0662X012	129 (5.09)
Two Way 2:1	0.2 to 0.6 (3 to 9) 0.6 to 1.0 (9 to 15)	0.4 (6)	0.5 to 1.2 (6 to 18) 1.2 to 2.0 (18 to 30)	0.8 (12)	4 to 12 12 to 20	8	11B3880X012	92 (3.63)	11B3881X012	92 (3.63)
Three Way 3:1	0.2 to 0.5 (3 to 7) 0.5 to 0.8 (7 to 11) 0.8 to 1.0 (11 to 15)	0.3 (4)	0.5 to 1.0 (6 to 14) 1.0 to 1.5 (14 to 22) 1.5 to 2.0 (22 to 30)	0.6 (8)	4 to 9.33 9.33 to 14.66 14.66 to 20	5.33	11B3881X012	70 (2.75)	11B3881X012	137 (5.38)
Four Way 4:1	0.2 to 0.4 (3 to 6) 0.4 to 0.5 (6 to 9) 0.5 to 0.8 (9 to 12) 0.8 to 1.0 (12 to 15)	0.2 (3)	0.5 to 0.8 (6 to 12) 0.8 to 1.2 (12 to 18) 1.2 to 1.6 (18 to 24) 1.6 to 2.0 (24 to 30)	0.4 (6)	4 to 8 8 to 12 12 to 16 16 to 20	4	11B3881X012	95 (3.75)	- - -	- - -

1. Pilot shaft setting is the A dimension in figure 20.

13. Adjust the valve stem position by rotating the zero adjustment screw (key 19S).

14. Set the input signal to the maximum value.

15. Readjust the travel (span) adjustment to achieve correct actuator travel.

Note

When a travel (span) adjustment is made, there will be a zero shift.

16. Repeat steps 11 through 15 as necessary to achieve correct actuator travel.

17. Install the cover (key 19T) on the feedback lever assembly (key 19) with cover screw (key 19U).

18. Install the positioner cover (key 21) and secure with the machine screws (key 24). Make sure the Fisher logo reads correctly and the vent is pointing downward.

Split-Range Operation

Type 3660 and 3661 positioners can be used for split-range operation with the instrument input signal from a single controller or another instrument split between two or three control valves. Tables 3 and 4

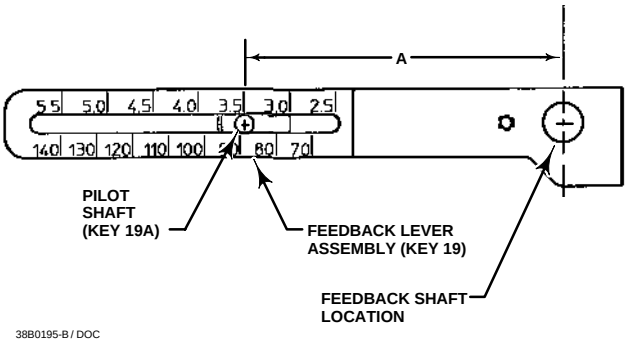


Figure 20. Pilot Shaft Setting

show some typical split ranges for the positioners. To change from a full range to a split range, change the range spring (key 30, figure 24 or 25) to the appropriate spring shown in the tables. Complete the Changing Range Spring portion of the Maintenance section. Refer to tables 3 and 4 for valve stem travel available with split range operation.

Type 3660 Bypass Operation

Type 3660 positioners may be supplied with a bypass assembly.

CAUTION

Do not use bypass operation when the positioner is reverse acting or is in split-range operation. In these cases, bypassing the positioner sends the input signal directly to the actuator. Such a change will affect the desired operation and possibly upset the system. Use bypass operation only when the instrument signal range is the same as the positioner output range required for normal actuator operation.

Labels on the bypass body assembly (key 41, figure 23), and a pointer on the bypass lever (key 42 in figure 23) indicate if the input signal from the instrument goes to the positioner or directly to the control valve actuator.

With the pointer of the bypass lever over the word POSITIONER, the instrument pressure goes to the positioner and the output pressure of the positioner goes to the actuator.

With the pointer of the bypass lever over the word BYPASS, the instrument pressure goes directly to the actuator.

Note

A difference between the input signal pressure and the positioner output pressure could cause a transient bump in the controlled system when the bypass lever is moved to BYPASS.

With a reverse-acting or split-range positioner, the bypass lever may be secured in the POSITIONER position so that bypass cannot be used. To lock the bypass lever in the POSITIONER position, shut off the instrument and supply pressure to the positioner. Then, move the bypass lever (key 42 in figure 23) so the pointer is over the word POSITIONER. Align the hole in the pointer with the hole in the body assembly and thread the plastic wire tie (key 79 in figure 23) through both holes to secure the bypass lever.

Principle of Operation

Refer to figure 21 for the operational schematic.

The instrument pressure acts on the input module, which controls the flapper-nozzle system of the relay. Supply pressure is applied to the relay, and the output pressure of the relay is supplied to the control valve actuator.

For a direct-acting positioner, increases in instrument pressure cause the input module to pivot the beam. The beam pivots the flapper and restricts the nozzle. The nozzle pressure increases and causes the relay assembly to increase output pressure to the actuator. With a direct-acting actuator, this increased pressure moves the actuator stem downward. Stem movement is fed back to the beam by means of a feedback lever and range spring, which causes the flapper to pivot slightly away from the nozzle to prevent any further increases in relay output pressure. The positioner is once again in equilibrium but at a higher instrument pressure, a slightly different flapper position, and a new actuator stem position.

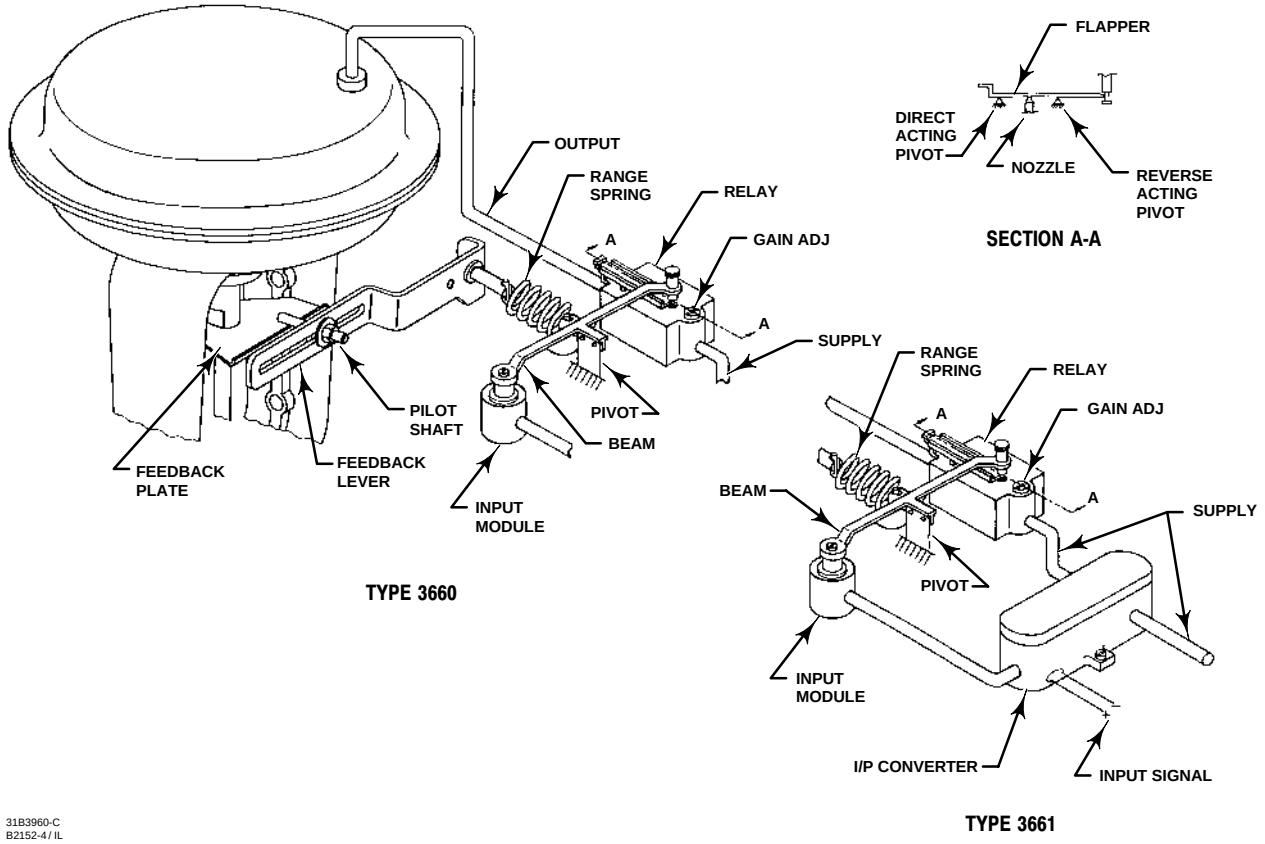


Figure 21. Operational Schematic

A decrease in instrument pressure decreases nozzle pressure, which allows the relay to bleed off actuator loading pressure.

Operation of a reverse-acting positioner is similar except that the position of the flapper is reversed from that shown in figure 21. The reversed position uses the alternate flapper pivot point so that increases in instrument pressure rotate the flapper away from the nozzle to reduce nozzle pressure.

With a Type 3661 electro-pneumatic positioner, the electro-pneumatic (I/P) converter provides a 0.2 to 1.0 bar (3 to 15 psig) output pressure proportional to the 4 to 20 milliampere input signal. The 0.2 to 1.0 bar (3 to 15 psig) output pressure becomes the input signal pressure to the input module.

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 job. When reassembly is complete, make adjustments as described in the Calibration section.

WARNING

Avoid personal injury or property damage from sudden release of process fluid. Before disassembly:

- **Isolate the valve from the process,**
- **Release process pressure, and**
- **Vent the actuator loading pressure.**

For intrinsically safe areas, current monitoring during operation must be with an approved meter for hazardous

areas in order to avoid personal injury or property damage caused by an explosion or fire.

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

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

Changing the Positioner Action

This section explains changing the positioner action from direct to reverse or reverse to direct. With direct action, the positioner output pressure increases as the instrument input signal to the positioner increases. With reverse action, the positioner output pressure decreases as the input signal to the positioner increases. To change the action of a positioner that is already mounted on an actuator, remove the positioner from the actuator. Refer to the Removing the Positioner from Actuator section. Refer to figure 24 or 25 for key number locations.

1. Unscrew the two captive cover screws and remove the cover (key 21). Carefully lift the flapper spring at the location shown by key 10.

2. Slide out the flapper (key 9) and rotate it so that the desired letter (D or R for direct and reverse) is nearest the adjusting screw (key 18). When inserting the flapper, be sure the end of the flapper engages the groove in the end of the screw and that the flapper spring (key 10) sets into the V-notches of the flapper.

3. Mount the positioner to the opposite actuator leg as explained in the Positioner Mounting section and shown in figure 2.

4. Refer to the Calibration section of this manual for the calibration procedure.

Changing the Range Spring

Refer to figure 24 or 25 for key number locations.

1. Unscrew the two captive cover screws and remove the cover (key 21). Loosen the retaining screw (key 19P) and pull the feedback lever assembly (key 19) out slightly to release the range spring (key 30) tension.

2. Remove and replace the range spring (key 30).

3. Push the feedback lever assembly (key 19) back into position and retighten the retaining screw (key 19P).

4. Refer to the Calibration section for the calibration procedure.

Changing the Input Signal Range on Type 3660 Positioners

To change the input signal range from 0.2 to 1.0 bar (3 to 15 psig) to 0.4 to 2.0 bar (6 to 30 psig) or vice versa, change the input diaphragm assembly (key 28, figure 24) by performing the Changing the Input Module Diaphragm Assembly procedure in this Maintenance section.

Removing the Positioner from the Actuator

Center-Bolt Mounting on Type 1250, 1250R, 3024S, and Baumann Actuators

Refer to figure 24 or 25 for key number locations unless otherwise indicated.

WARNING

To avoid personal injury caused by electrical shock, disconnect electrical power to the Type 3661 positioners.

1. Release all pressure from the positioner. Disconnect the supply, instrument, and output tubing. For Type 3661 positioners, disconnect the input wires and conduit.

2. Unscrew the two captive cover screws and remove the cover (keys 24 and 21). Loosen the retaining screw (key 19P).

3. Pull the feedback lever assembly (key 19) out slightly to release the range spring tension, and remove the range spring (key 30).

4. Loosen and remove the hex head screw and sealing washer (keys 72 and 71 in figure 3), and remove the positioner.

5. To mount the positioner on the actuator, refer to the Positioner Mounting section of this manual.

Clamp Mounting on Type 1250, 1250R, and 3024S Actuators

WARNING

To avoid personal injury caused by electrical shock, disconnect electrical power to the Type 3661 Positioners.

1. Release all pressure from the positioner. Disconnect the supply, instrument, and output tubing. For Type 3661 positioners, disconnect the input wires and conduit.

2. Unscrew and remove the hex nut and washer (keys 66 and 67 in figure 3), and remove the positioner.

3. To mount the positioner on the actuator, refer to the Positioner Mounting section.

Mounting Bracket/U-Bolt Mounting on Type 657, and 667 Actuators

Refer to figure 24 or 25 for key number locations unless otherwise indicated.

1. Release all pressure from the positioner. Disconnect the supply, instrument, and output tubing. For Type 3661 positioners, disconnect the input wires and conduit.

2. Unscrew the two captive cover screws and remove the cover (keys 24 and 21). Loosen the retaining screw (key 19P).

3. Pull the feedback lever assembly (key 19) out slightly to release the range spring tension, and remove the range spring (key 30).

4. Loosen and remove the hex nut and washer (keys 90 and 89, figure 7), and remove the positioner.

5. To mount the positioner on the actuator, refer to the Positioner Mounting section.

Changing the Input Module Diaphragm Assembly

Refer to figure 24 or 25 for key number locations.

1. Unscrew the two captive cover screws, and remove the cover (key 21). Loosen the retaining screw (key 19P) and pull the feedback lever assembly (key 19) out slightly to release the range spring (key 30) tension.

2. Remove the cheese head screw (key 7) from the beam and diaphragm assembly (key 28).

3. There are four cheese head screws (key 7) holding the diaphragm assembly (key 28) to the housing. Remove the two cheese head screws (key 7) nearest the feedback lever assembly (key 19) and loosen the two remaining cheese head screws (key 7). Slide the diaphragm assembly (key 28) out from between the lever assembly (key 17) and the housing.

4. Install the new diaphragm assembly (key 28), and secure with the four cheese head screws (key 7).

5. Depress the feedback lever assembly (key 19) inward until it stops on the housing, and tighten with the retaining screw (key 19P).

6. With the input pressure set at either 1.4 or 2.4 bar (20 or 35 psig), check for leaks between the diaphragm assembly and the housing.

7. Refer to the Calibration section for the calibration procedure.

Disassembling and Assembling Relay Components

Before disassembling the relay components, remove the positioner from the actuator. Refer to the Removing the Positioner from the Actuator section. Refer to figure 24 or 25 for key number locations.

1. To disassemble the relay valve assembly (key 2) or restrictor assembly (key 4), unscrew these parts from the back of the positioner and replace with new parts.

The relay valve assembly (key 2) and the restrictor assembly (key 4) are marked with the letters V and P, respectively on the removal screws. For correct location purposes, these same letters appear on the back of the positioner case.

2. Unscrew the two captive cover screws, and remove the cover. Loosen the retaining screw (key 19P) and pull the feedback lever assembly (key 19) out slightly to release the range spring (key 30) tension. Remove the range spring (key 30).

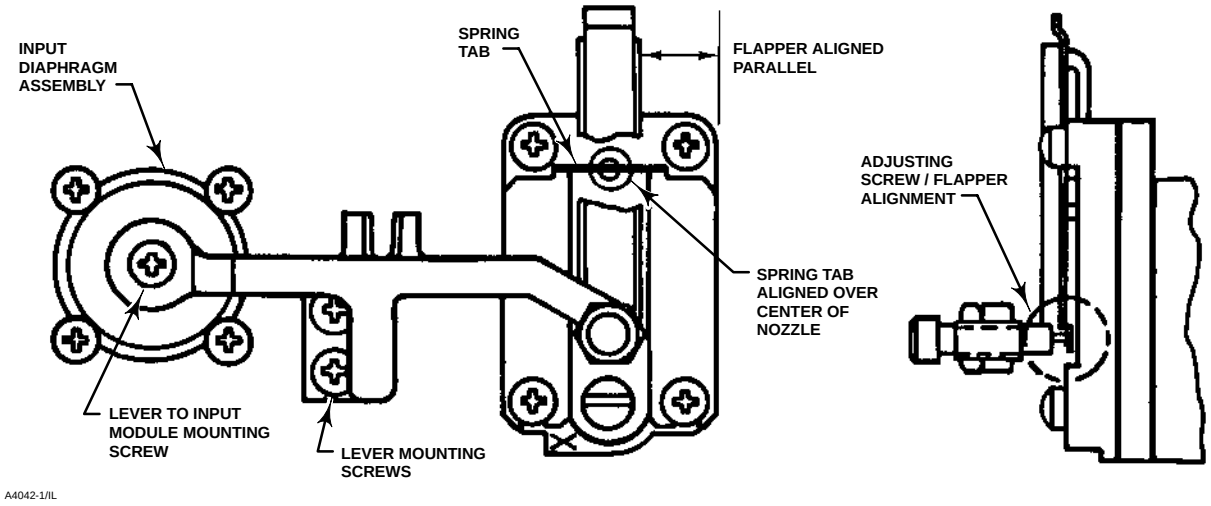


Figure 22. Flapper and Lever Alignment

3. Remove the cheese head screw (key 7) from the lever assembly (key 17) and the diaphragm assembly (key 28).

4. Remove the two cheese head screws (key 7) that hold the lever assembly (key 17) to the housing and lift off the lever.

5. Remove the four cheese head screws (key 11) and four washers (key 98). Lift off the flapper (key 9), flapper spring stop (key 99), flapper spring (key 10) and cover plate assembly (key 8). Lift out the output diaphragm assembly (key 29) and spring (key 3).

6. Reassemble the relay parts in the following order, spring (key 3), output diaphragm assembly (key 29), cover plate assembly (key 8), flapper spring (key 10), and flapper spring stop (key 99). Install the four washers (key 98) and four cheese head screws (key 11), and then tighten the screws. When tightening the two screws that secure the flapper spring (key 10), position the spring so the spring tab is aligned over the center of the nozzle and the flapper is parallel as shown in figure 22.

7. Reassemble the lever assembly (key 17) with the two cheese head screws (key 7). Do not tighten the screws until the adjusting screw (key 18) to flapper (key 9) and tapped hole in the diaphragm assembly (key 28) are aligned (refer to figure 22). Then, tighten the lever assembly and install the screw in the diaphragm assembly.

8. Carefully lift the flapper spring at the location shown by key 10. Install the flapper (key 9) so that the desired letter (D or R for direct and reverse) is nearest the adjusting screw (key 18). When inserting the flapper, be sure the end of the flapper engages the grove in the end of the screw, and that the flapper spring (key 10) sets into the V-notches of the flapper.

9. With the flapper (key 9) in place, visually ensure that it is aligned parallel to the cover plate assembly (key 8) as shown in figure 22. Realign if necessary by repositioning the flapper spring (key 10). The flapper alignment affects the performance of the positioner. Be careful not to damage the lapped surfaces on the cover plate and nozzle.

10. Reinstall the range spring (key 30). Push the feedback lever assembly (key 19) back into position and retighten the retaining screw (key 19P).

11. With the output at supply pressure, check the output diaphragm assembly joints for leaks.

12. Refer to the Calibration section for the calibration procedure.

Disassembling and Assembling the Bypass Valve

During the following bypass valve disassembly and assembly procedures, refer to figure 23, unless otherwise indicated.

1. Remove all pressure from the positioner. Disconnect the supply, instrument and output tubing.

2. Remove the two cheese head screws (key 47). Lift the bypass valve from the positioner being careful not to loose the three O-rings (key 49).

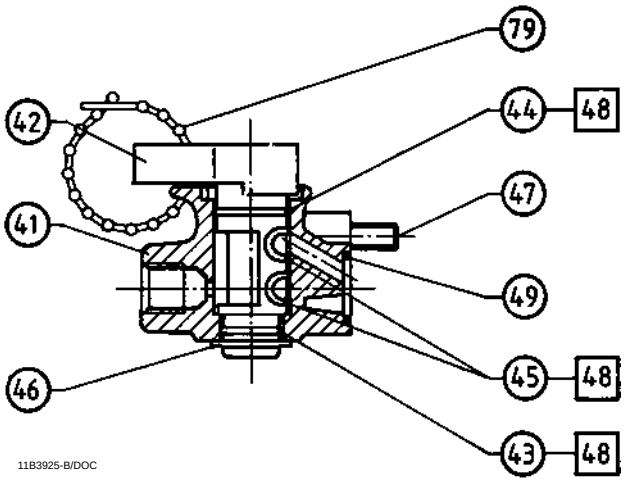


Figure 23. Type 3660 Bypass Valve

3. Remove the plastic wire tie (key 79) and retaining ring (key 46).

4. Using a gentle pulling and turning motion, slide the bypass lever assembly (key 42) from the bypass body (key 41).

5. Inspect the O-rings (keys 43, 44, 45 and 49) for nicks and wear, and replace as necessary. When installing new O-rings (keys 43, 44 and 45) on the shaft of the bypass lever assembly, lubricate them sparingly using lubricant (key 48).

6. Install the bypass lever assembly (key 42) into the body assembly (key 41) using a gentle turning and pushing motion to avoid nicking an O-ring.

7. Install the retaining ring (key 46).

8. Install the three O-rings (key 49) into the body assembly (key 41) and then carefully attach the body assembly to the positioner using the two cheese head screws (key 47).

9. Turn the bypass lever (key 42) to the appropriate POSITIONER or BYPASS position, and secure with the plastic wire tie (key 79).

10. Reconnect the supply, instrument and output tubing, and turn on pressure to the positioner.

Replacing the Type 3661 Converter Module

Refer to figure 25 for key number locations. After replacing the converter module, re-calibrate the positioner.

1. Remove the cover and disconnect the input signal wires from the terminal strip.

2. Loosen the two captive screws securing the converter to the positioner housing, and lift out the converter module (key 100).

3. When replacing the converter module, the restrictor assembly (key 35) also should be replaced. Before the restrictor assembly can be removed, remove the positioner from the actuator. Refer to the Removing the Positioner from the Actuator section.

4. Remove and replace the restrictor assembly (key 35). This assembly is marked with the letters EP on the removal screw. For location purposes, the same letters appear on the back of the positioner case.

5. To mount the positioner on the actuator, refer to the Positioner Mounting section.

6. Install a new converter, and secure to the housing with the two captive screws. Reconnect the input signal wires.

7. Refer to the Calibration section for the calibration procedure.

Parts Ordering

When corresponding with the Fisher sales office about this equipment, always mention the positioner type 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 proper selection, use, and maintenance of any Fisher product remains solely with the purchaser and end-user.

Parts Kits

Repair Kits

Key	Description	Part Number
	Type 3660 w/0.2 to 1 bar (3 to 15 psig) input	R3660X00012
	Type 3660 w/0.4 to 2 bar (6 to 30 psig) input	R3660X00022
	For Type 3660, the kits contain keys 9, 26, 27, 28, 29, 43, 44, 45, 49, 95, and 97. Keys 43, 44, 45 and 49 are used for Type 3660 with bypass only. An additional O-ring is included in kit R3660X00012, but is not used for the Type 3660.	
	Type 3661	R3660X00012
	For Type 3661, the kit contains keys 9, 26, 27, 28, 29, 43, 44, 45, 49, 95, and 97. Keys 43, 44, 45, and 49 are included in kit R3660X00012, but they are not used for the Type 3661. An additional O-ring is also included in the kit for the I/P converter outlet.	

Mounting Kits

	Types 1250 and 1250R, sizes 30 and 34	
	Clamp mounting (kit contains key numbers 64, 65, 66, 67, 68, 69, and 70)	21B3931X0A2
	Center-bolt mounting (kit contains key numbers 68, 69, 70, 71, and 72)	21B3932X0A2
	Types 1250 and 1250R, size 45	
	Clamp mounting (kit contains key numbers 64, 65, 66, 67, 68, 69, 70, and 101 through 104)	21B3931X0B2
	Center-bolt mounting (kit contains key numbers 68, 69, 70, 71, 72, and 101 through 104)	21B3932X0B2
	Types 657 and 667	
	Sizes 30, 34, and 40 (kit contains key numbers 69, 70, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, and 93)	31B6741X0A2
	Sizes 45 and 46 (kit contains key numbers 70, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, and 93)	31B6741X0B2
	Sizes 50 and 60 (kit contains key numbers 70, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, and 93)	31B6741X0C2
	Type 3024S (kit contains key numbers 64, 65, 66, 67, 68, 69, and 70)	37B0692X0A2

Parts List

Positioner Common Parts

Key	Description	Part Number
1	Housing assembly, A03600	
	For Type 3660	31B7319X012
	For Type 3661	41B7321X012
2*	Valve assembly, A96061	11B3889X012
3	Spring, 316 stainless steel	11B3892X012
4*	Restrictor assembly, aluminum (includes filtration screen)	11B3887X012
5	Damping screw, stainless steel	11B3893X012
6	Calibration tool, aluminum	11B3950X012
7	Cheese head screw stainless steel (7 req'd for Type 3660; 13 req'd for Type 3661)	11B3938X012
8	Cover plate assembly, aluminum	11B3894X012
9*	Flapper, A95052	11B3903X012
10	Flapper spring, stainless steel	21B3904X012
11	Cheese head screw, stainless steel (4 req'd)	11B3939X012
12	Restrictor screw, stainless steel	21B3905X012
17	Lever assembly, aluminum	11B3908X012
18	Adjusting screw, stainless steel	11B3906X012
19	Feedback lever assembly, stainless steel	
	Standard	28B9418X012
	For Baumann actuators	28B9423X012

Note

Parts 19A through 19U are shown in figure 26.

19A	Pilot Shaft	18B0298X012
19B	Locknut	18B0197X012
19C	Washer	18B0320X012
19D	Nut	18B0324X012
19E	Lever Sub-assembly	
	Standard	18B9417X012
	For Baumann actuators	18B9422X012
19F	Zero Shaft	38B9414X012
19G	Slide Bearing (2 req'd)	11B3916X012
19H	Housing Bushing	38B0196X012
19J	Retaining Ring	11B3919X012
19K	Disc	11B3918X012
19L	O-ring	11B8369X012
19M	O-ring	11B8368X012
19N	Spring	28B0326X012
19P	Retaining Screw	18B0080X012
19Q	Retaining Ring	18B0082X012
19R	Roll Pin	18B0194X012
19S	Zero Adjust Screw	18B0081X012
19T	Cover	28B9415X012
19U	Cover Screw	17B9995X012
21	Cover assembly, aluminum	28B0007X012
24	Machine screw, stainless steel (2 req'd)	11B3924X012
26*	O-ring, ethylene/propylene (2 req'd for Type 3660; 3 req'd for 3661)	11B3935X012
27*	O-ring, ethylene/propylene (2 req'd)	11B3936X012
28*	Diaphragm assembly, aluminum	
	Types 3660 and 3661	
	0.2 to 1.0 bar (3 to 15 psig)	11B3871X012
	Type 3660 only, 0.4 to 2.0 bar (6 to 30 psig)	11B3875X012
29*	Output diaphragm assembly, aluminum	11B3897X012
30	Range spring, stainless steel	
	Standard	11B3880X012
	Split range	11B3881X012
	For Baumann actuators, less than 20 mm travel, full range input signal	17B0662X012

*Recommended spare parts

Key	Description	Part Number
32	Nameplate, A91100	
	Type 3660	11B3952X0A2
	Type 3661	11B3953X0A2
33	Ground terminal for Type 3661 (2 req'd)	1N10136G012
34	Cable gland for Type 3661, plastic	11B3870X012
35	I/P restrictor ass'y for Type 3661, aluminum	13B7114X012
36	Pipe plug for Type 3661, stainless steel	1C3335X0012
37	Machine screw, stainless steel	12B7285X012
38*	Output gauge (optional)	
	Dual scale	
	0 to 2 Kg/cm^2/0 to 30 psig	11B4036X042
	0 to 11 Kg/cm^2/0 to 160 psig	11B4036X062
	Triple scale	
	0 to 2 bar/0 to 0.2 MPa/0 to 30 psig	11B4036X012
	0 to 11 bar/0 to 1.1 MPa/0 to 160 psig	11B4036X032
39*	Instrument gauge (optional for Type 3660 Only)	
	Dual Scale	
	0 to 2 Kg/cm^2/0 to 30 psig	11B4036X042
	0 to 4 Kg/cm^2/0 to 60 psig	11B4036X052
	Triple scale	
	0 to 2 bar/0 to 0.2 MPa/0 to 30 psig	11B4036X012
	0 to 4 bar/0 to 0.4 MPa/0 to 60 psig	11B4036X022
40	Sealant, Zink-Plate No. 770 (not furnished with positioner)	- - -

Note

Keys 41 through 49 and key 79 apply to Type 3660 with bypass valve only. Refer to figure 23

41	Bypass body assembly, aluminum	32B1902X012
42	Bypass lever assembly, plastic	18A5117X012
43*	O-ring, ethylene/propylene	1J4888X0022
44*	O-ring, ethylene/propylene	11A8741X032
45*	O-ring, (2 req'd)	11B8420X012
46	Retaining ring, stainless steel	1R663138992
47	Cheese head screw, (2 req'd)	11B3930X012
48	Lubricant, Dow Corning 111 (not furnished with positioner)	- - -
49*	O-ring, ethylene/propylene (3 req'd)	10A3716X032
50	Lubricant, Dow Corning 111 (not furnished with positioner)	- - -
51	Adhesive, Loctite Speedbond 324 (not furnished with positioner)	- - -
54	Self-tapping screw, stainless steel (2 req'd)	1P426928982
55	Cover plate for Type 3661, A95052	11B3868X012
56*	Cover plate gasket for Type 3661, silicone	11B3869X012
57	Hex nut, aluminum/chromate	11B3907X012
58	Pipe plug, stainless steel	
	1 req'd for Type 3661 w/o output gauge option	
	2 req'd for Types 3660 & 3661 w/o instrument and output gauge option	1E8231X0022
79	Wire tie for Type 3660 with bypass valve only, plastic	16A5907X012
95*	O-ring, ethylene propylene (2 req'd for Type 3660; 3 req'd for Type 3661)	11B8302X012
96	Plain washer, stainless steel	11B8415X012
97*	Cover screw gasket, silicone (2 req'd)	11B8414X012
98	Washer, stainless steel (4 req'd)	11B8281X012
99	Flapper spring stop, stainless steel	21B8280X012
100*	I/P converter module for Type 3661	33B7075X022

Diagnostic Connections

FlowScanner™ Valve Diagnostic System Hookup Includes pipe tees, pipe nipples, pipe bushings, connector bodies, and body protectors. Part number provides correct quantities of each item.

For 3660 Positioner	
For units with supply gauge	
SST fittings	12B8052X012
Brass fittings	12B8052X022
For units without supply gauge	
SST fittings	12B8052X032
Brass fittings	12B8052X042
For 3661 Positioner	
For units with supply gauge	
SST fittings	12B8053X012
Brass fittings	12B8053X022
For units without supply gauge	
SST fittings	12B8053X032
Brass fittings	12B8053X042

Mounting Parts

Common Mounting Parts

61	Elbow, brass	
	2 req'd for Types 657, 1250 and 1250R	
	1 req'd for Type 667	
	1/4-inch NPT-6 mm tubing	19A5602X032
	1/4-inch NPT-1/4 tubing	1H229118992
	1/4-inch NPT-3/8 tubing	1H550418992
62	Pipe nipple, regulator mounting part for nipple mounted only	1P970726012
63	Connector, brass	
	2 req'd for Types 657, 1250 and 1250R	
	1 req'd for Type 667 w or w/o positioner mounted Type 67CFR	
	3 req'd for 667 w/casing mounted Type 67CFR	
	1/4 inch NPT-6 mm tubing	19A5602X012
	1/4 inch NPT-1/4 tubing	1H229018992
	1/4 inch NPT-3/8 tubing	1H498218992

*Recommended spare parts

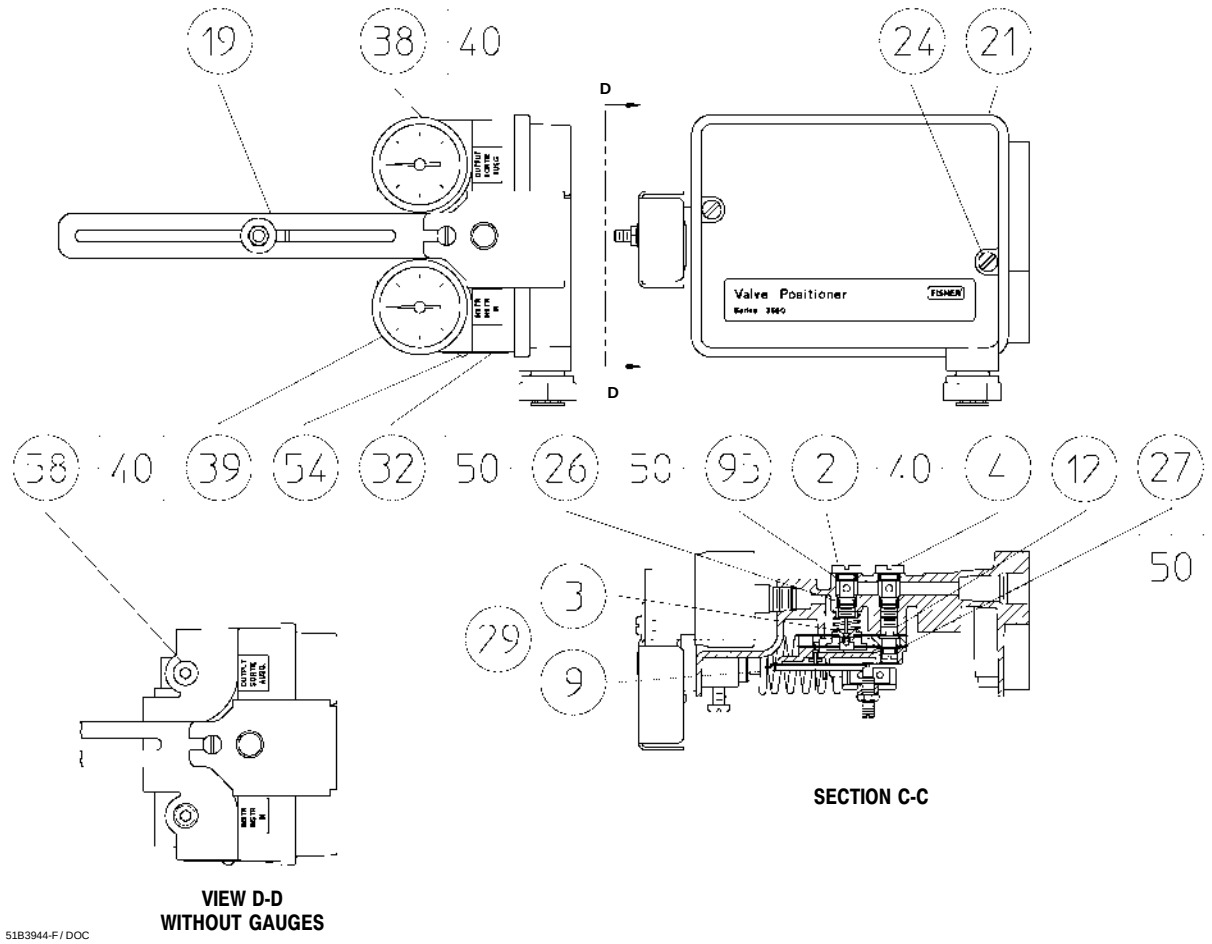


Figure 24. Type 3660 Positioner Assembly

Key	Description	Part Number
	Note	
	Keys 73 through 78 apply to regulator mounting parts (casing mounted only).	
73	Bracket, pl steel	
	Types 657, 667, 1250, 1250R, and 3024S	1F401225072
	Design GX	30C2060X012
74	Cap screw, 304 stainless steel (2 req'd)	
	Types 1250, 1250R, and Type 3024S Sizes 1.31 and 1.41	19A4789X012
	Type 3024S, Size 1.21	10B6607X012
75	Washer, pl steel (2 req'd)	
	Types 1250, 1250R, and Type 3024S Sizes 1.31 and 1.41	10B6633X012
	Type 3024S, Size 1.21	013976
76	Lockwasher, pl steel (2 req'd	
	Types 1250, 1250R and Type 3024S Sizes 1.31 and 1.41)	1C225728982
76	Lockwasher, pl steel (2 req'd) (cont'd)	
	Design GX	17B6150X022
	Lockwasher	11Y8560R102
	Hex Nut	19A4838X042
	Type 3024S, Size 1.21 (none req'd)	- - -
77	Cap screw, pl steel (2 req'd)	
	Types 657, 667, 1250, 1250R, and 3024S	T14109T0012
	Design GX	1Q57126X012
78	Hex nut, zinc pl steel (2 req'd)	
	Types 657, 667, 1250, 1250R, and 3024S	1A352724122
	Design GX	19A4788X082

Parts For Use With Type 1250 and 1250R Actuators

64	Bracket, clamp mounting only, A03600	21B3931X012
65	Stud, clamp mounting only, stainless steel (2 req'd)	11B3934X012
66	Hex nut, clamp mounting only, steel (4 req'd)	19A4788X082
67	Washer, clamp mounting only, steel (2 req'd)	10B6633X022
68	Feedback plate, stainless steel	21B3932X012
69	Hex head screw, stainless steel (2 req'd)	11B3943X012
70	Washer, stainless steel (2 req'd)	10B6609X022

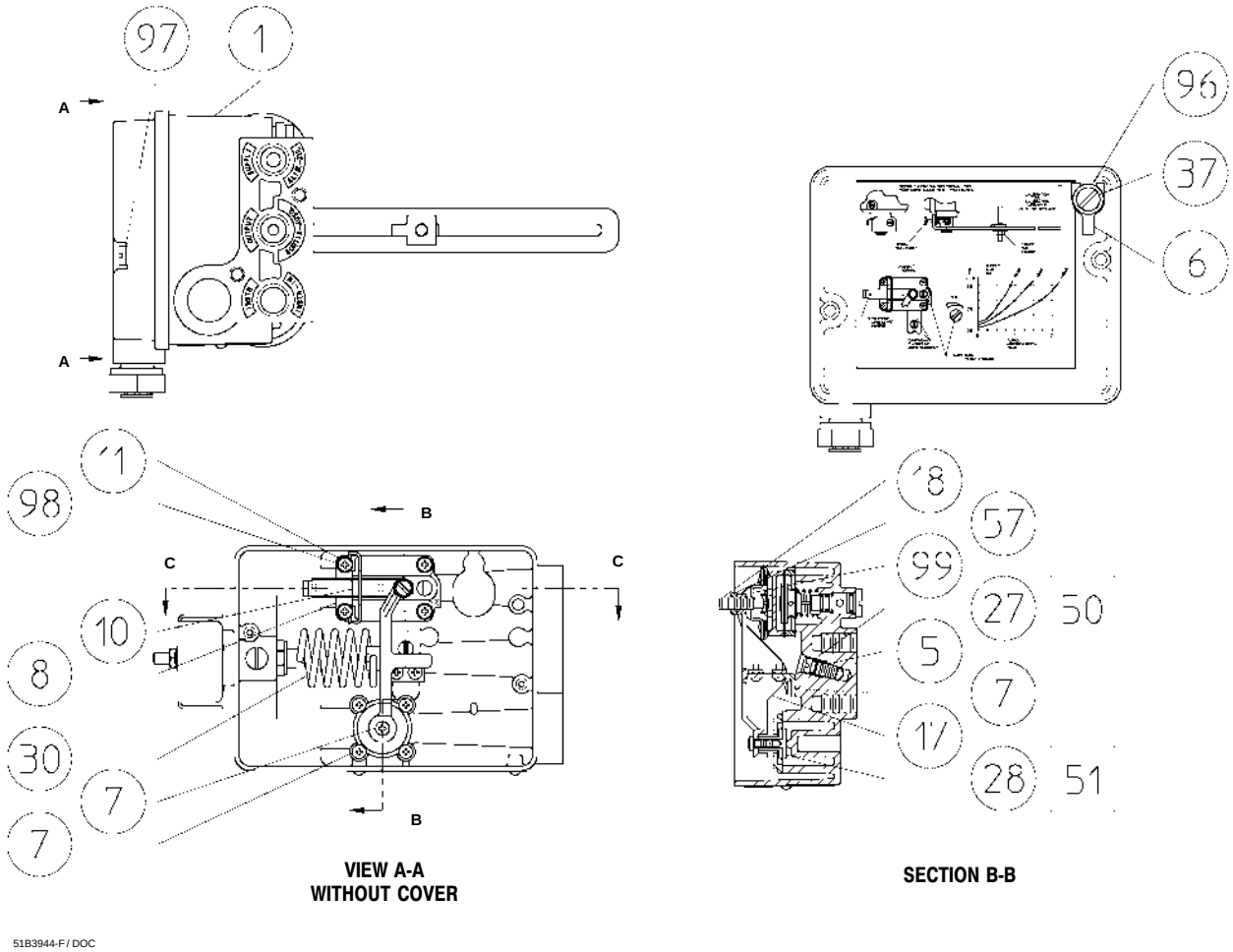


Figure 24. Type 3660 Positioner Assembly(continued)

Key	Description	Part Number
71	Washer, center bolt mounting only	1U984499012
72	Hex head screw, center bolt mounting only, stainless steel	11B3942X012
101	Lockwasher, stainless steel (2 req'd) For size 45, 20 to 30 mm travel only	12B1230X012
102	Machine screw, stainless steel (2 req'd) For size 45, 20 to 30 mm travel only	12B1229X012
103	Feedback adaptor, stainless steel For size 45, 20 to 30 mm travel only	22B1228X012
104	Wedge nut, stainless steel (2 req'd) For size 45, 20 to 30 mm travel only	12B1227X012

Parts For use With Type 3024S

64	Mounting Bracket	21B3931X012
65	Stud, stainless steel (2 req'd)	11B3934X012
66	Hex nut, steel (4 req'd)	19A4788X082
67	Washer, steel (2 req'd)	10B6633X022
68	Feedback plate, stainless steel	37B0692X012
69	Hex head screw, stainless steel (2 req'd)	11B3943X012
70	Washer, stainless steel (2 req'd)	10B6609X022

Key	Description	Part Number

Parts For Use With Type 657 and 667 Actuators

69	Hex head screw, stainless steel (2 req'd) Sizes 30, 34 and 40	1A352524052
70	Washer, pl steel (2 req'd)	1D716228982
82	Mounting Bracket, stainless steel	31B6741X012
83	Stud clamp, stainless steel	11B6739X012
84	U-bolt, stainless steel (2 req'd)	
	Sizes 50 and 60	11B6737X012
	Sizes 30, 34, 40, 45 and 46	11B6738X012
85	Washer, stainless steel (4 req'd)	1F1280X0022
86	Hex nut, stainless steel (4 req'd)	1A3457K0012
87	Connector bracket, stainless steel	21B6742X012
88	Feedback arm, stainless steel	21B6740X012
89	Sealing washer	1U984499012
90	Hex nut, stainless steel	1A3527K0032
91	Machine screw, stainless steel (2 req'd)	13A1618X022
92	Washer, stainless steel (2 req'd)	1K6236X0012
93	Hex nut, stainless steel (2 req'd)	1A4188X0012

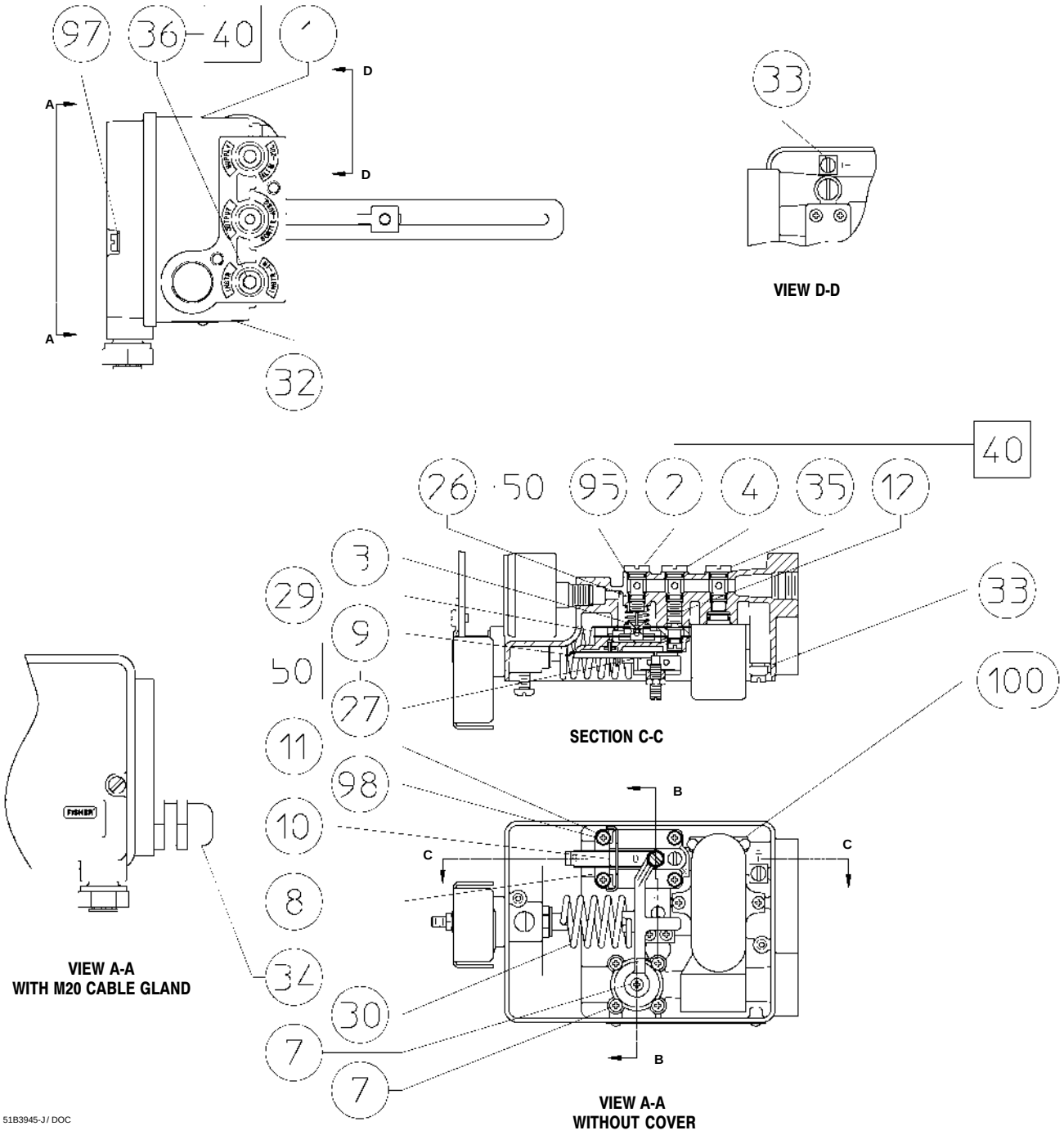


Figure 25. Type 3661 Positioner Assembly

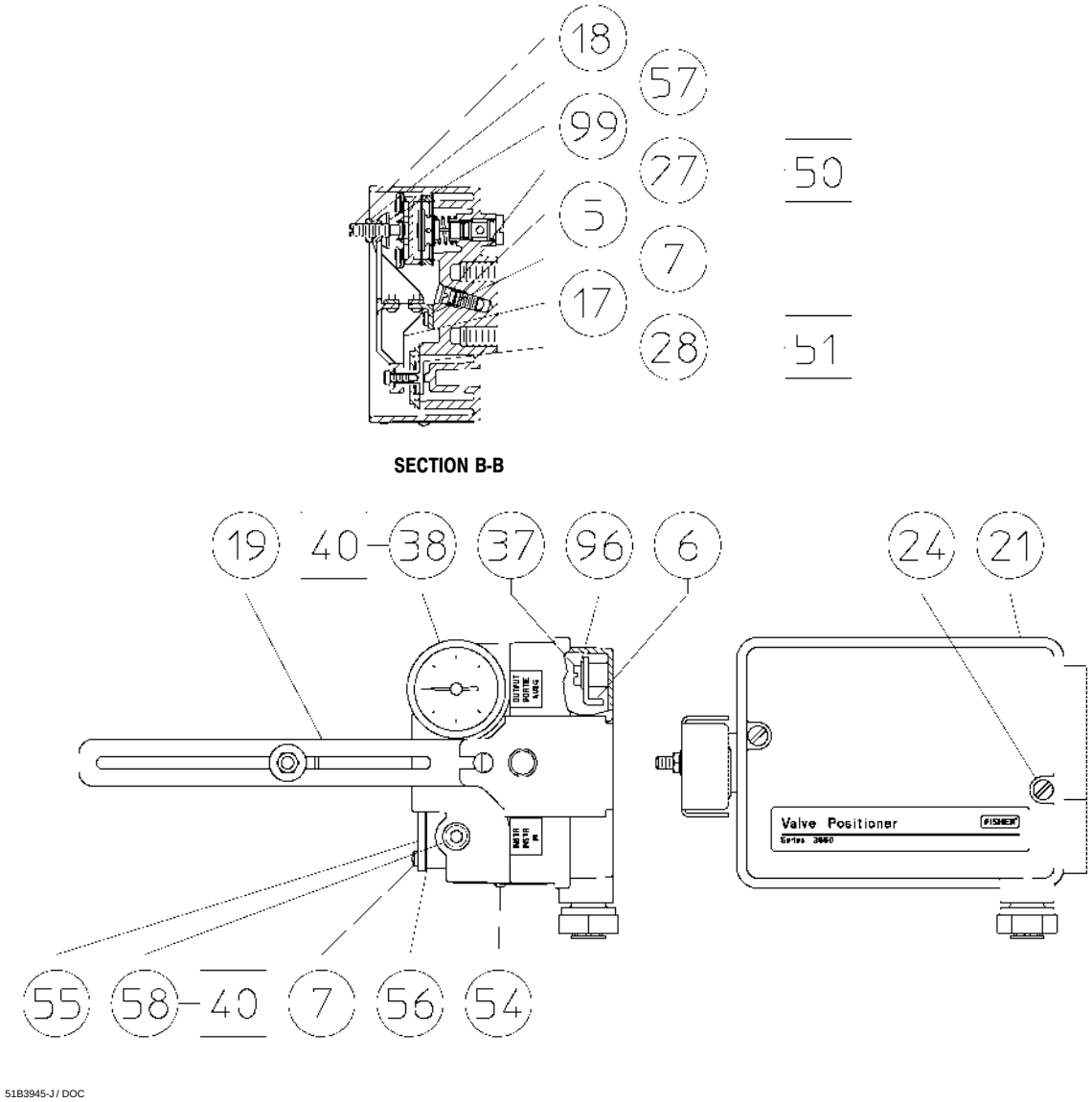
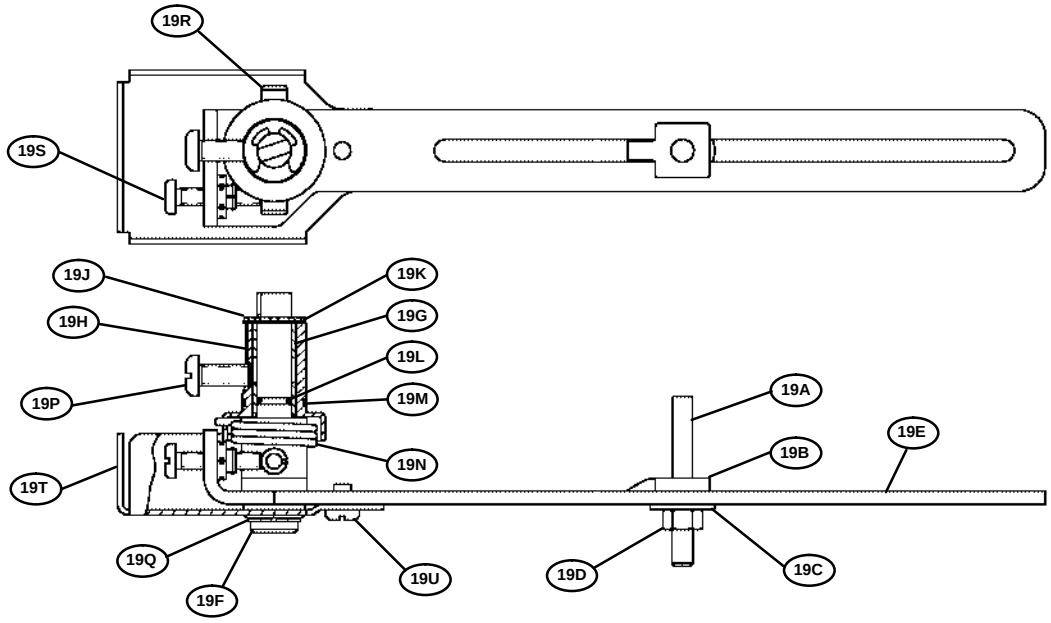
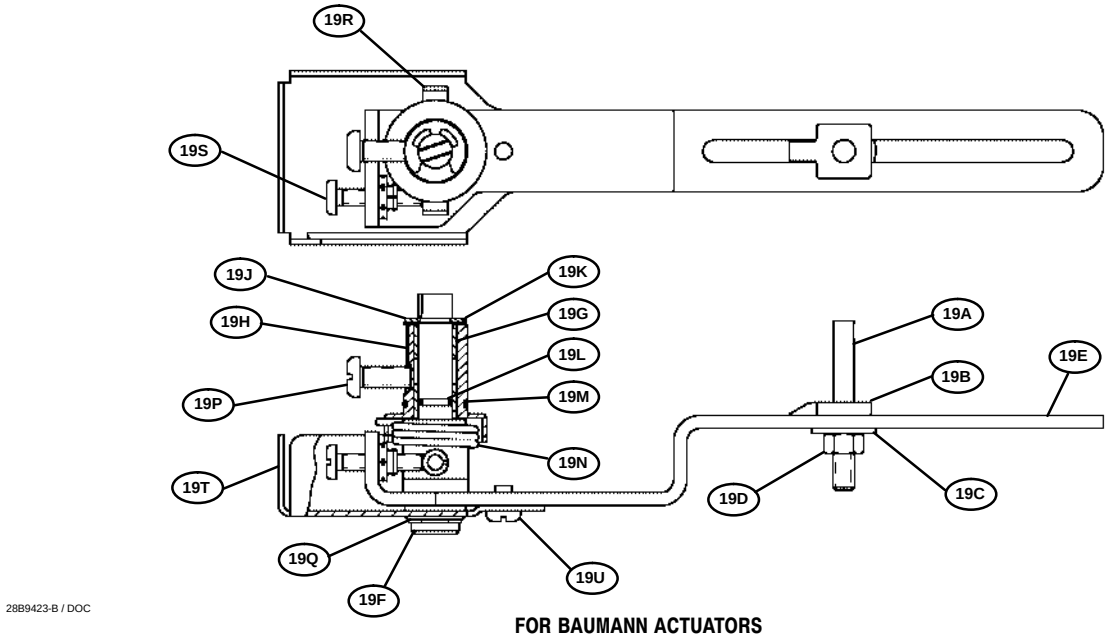


Figure 25. Type 3661 Positioner Assembly (continued)

Key	Description	Part Number
Parts For Use With Design GX		
68	Feedback Plate	GE04613X012
69	Socket head screw (2 req'd)	GE04766X012
71	Washer, sealing	1U984499012
72	Screw, Hex Head	19A4775X042



STANDARD



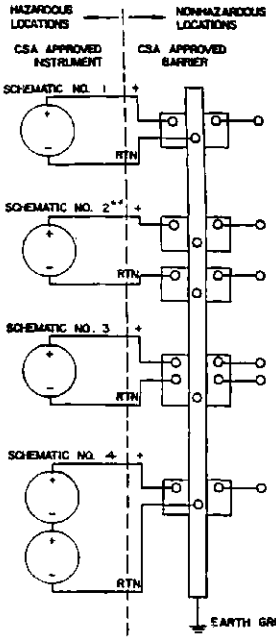
FOR BAUMANN ACTUATORS

Figure 26. Feedback Lever Assembly

Loop Schematics/Nameplates

This section includes loop schematics required for wiring of intrinsically safe installations, in addition to the various approvals nameplates. If you have any questions, contact your Fisher sales office.

CSA Schematics



TYPE 3622, 582I, 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-CGB	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2A0-V3I-CGB	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2A0-V5I-CGB	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2A0-VAI-CGB	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	3A2-D2I-CS-E/CGB-A	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	3A2-D3I-CS-E/CGB-A	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2AS-I3I-CGB	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
STAHL	8903/51-200/050/7	89 036 01 31 0	2	CL I, DIV 1, GP A,B,C,D	20.41V, 300 OHM
	8901/33-293/000/7	89 016 03 31 0			28.1V, 470 OHM
STAHL	8901/31-280/165/8	89 016 03 31 0	2	CL I, DIV 1, GP C,D	27.3V, 179 OHM
	8901/33-293/000/7	89 016 03 31 0			28.1V, 470 OHM
STAHL	8901/31-199/100/7	89 016 03 31 0	1,4	CL I, DIV 1, GP A,B,C,D	19V, 220 OHM
STAHL	8903/31-200/050/7	89 036 01 31 0	1,4	CL I, DIV 1, GP A,B,C,D	19.95V, 286.7 OHM
STAHL	8903/31-263/050/7	89 036 01 31 0	1	CL I, DIV 1, GP A,B,C,D	26.5V, 386 OHM
BAILEY	766610AAAV1	4576K16-034	3	CL I, DIV 1, GP C,D	27V, 345 OHM/10V, 40 OHM

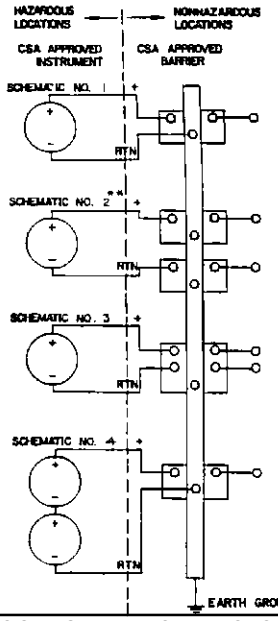
* ALSO APPLICABLE FOR CLASS II, GROUPS E,F,G WITH APPROPRIATE INSTRUMENT AND BARRIER APPROVAL

** 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

NO CHANGE IN PART OR VENDOR OF PART ALLOWED WITHOUT PRIOR APPROVAL OF : CSA

21B5606-B Sheet 1 of 2 / DOC



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, 206 OHM
TAYLOR	1135FG21000	IB-17E212	1	CL I, DIV 1, GP C,D	30V, 266 OHM
TAYLOR	1150FZ81010	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
	38545-0000-0110-112-C5D5				28V, 200 OHM

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

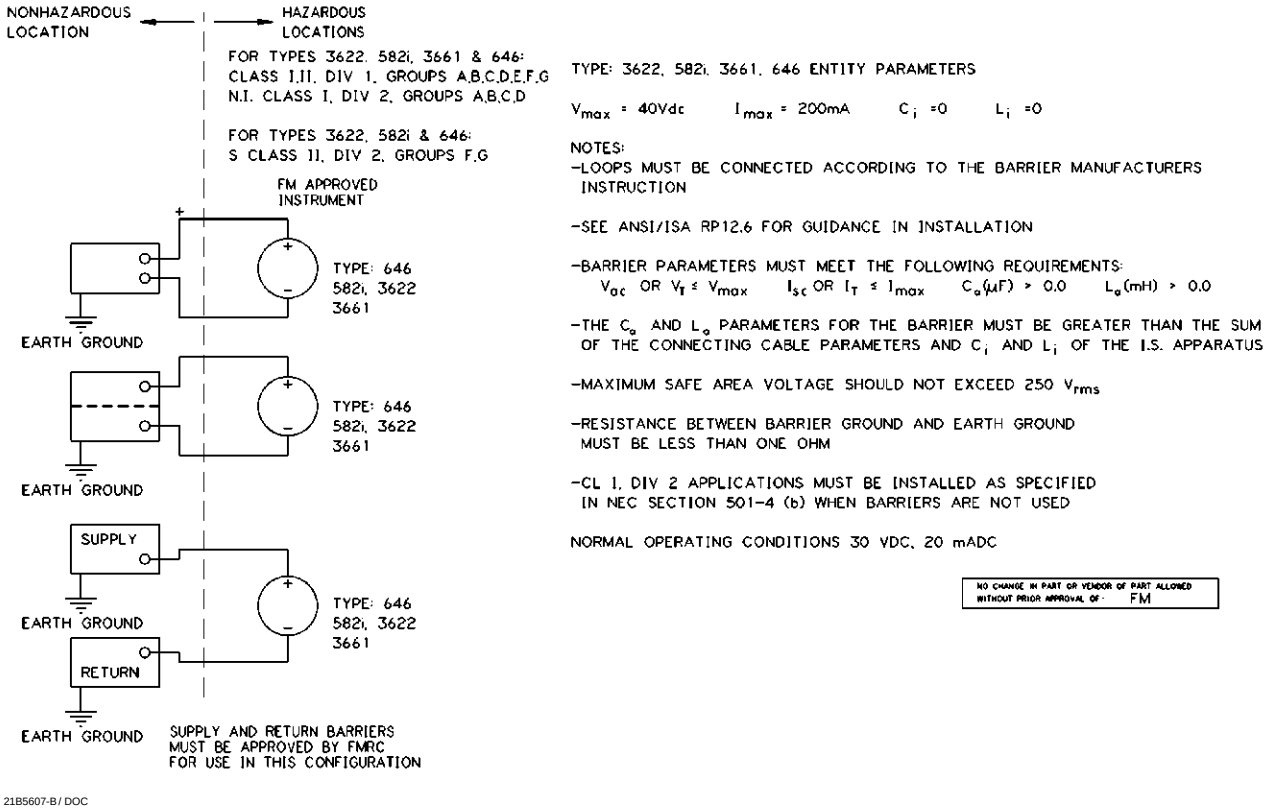
** SCHEMATIC 2 REQUIRES THAT BARRIERS MUST BE USED IN PAIRS AS LISTED

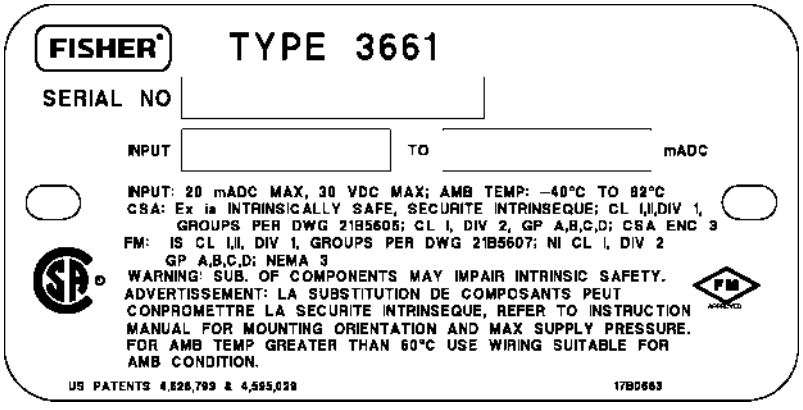
LOOPS MUST BE CONNECTED ACCORDING TO THE BARRIER MANUFACTURER'S INSTRUCTIONS
SEE ANSI/ISA RP12.6 FOR GUIDANCE ON INSTALLATION

NO CHANGE IN PART OR VENDOR OF PART ALLOWED WITHOUT PRIOR APPROVAL OF : CSA

21B5606-B SHT 2 / DOC

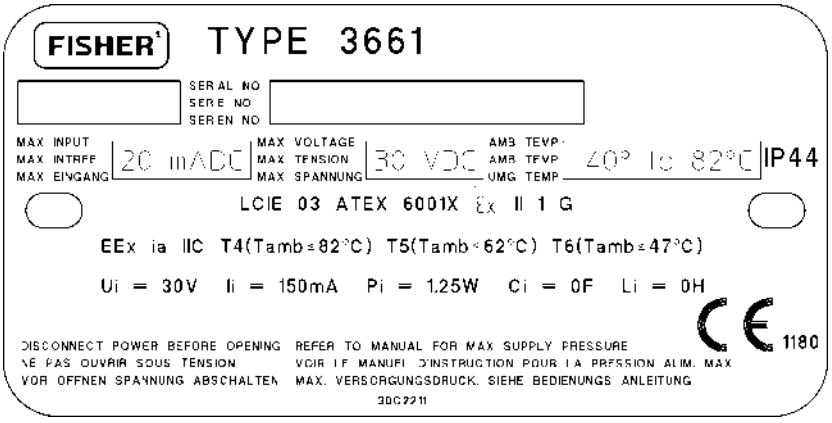
FM Schematics





TYPE 3661— FM AND CSA, INTRINSICALLY SAFE, NON-INCENDIVE

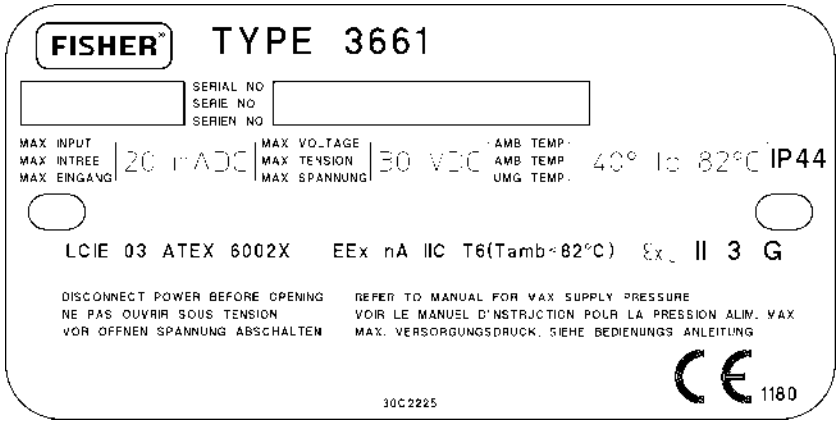
Figure 27. FM and CSA Nameplate



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 VALUE:
$U_0 \leq 30$ Vdc; $I_0 \leq 150$ mA; $P_0 \leq 1$W.

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

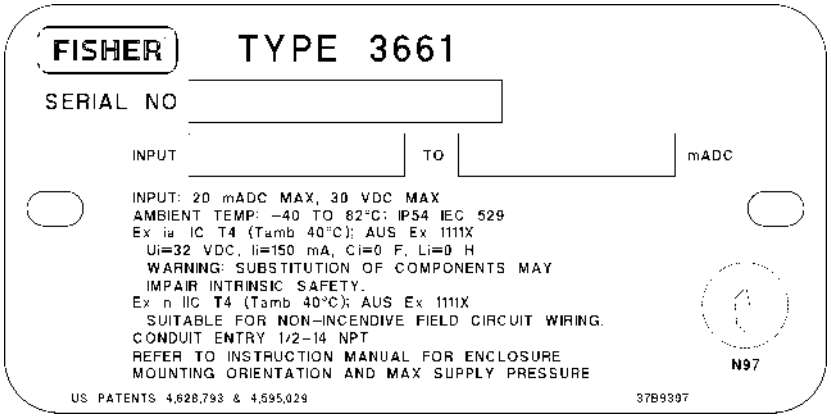
TYPE 3661— LCIE, INTRINSICALLY SAFE



SPECIAL CONDITIONS FOR SAFE USE:
THE TYPE 3661 HAS AN IP44 INGRESS PROTECTION: IT IS ONLY INTENDED TO BE INSTALLED IN AN AREA WHERE A CONVENIENT PROTECTION IS ENSURED AGAINST THE ENTRY OF FOREIGN BODIES AND LIQUIEDS WHICH MAY DECREASE THE SAFETY.

TYPE 3661— LCIE, TYPE N

Figure 28. ATEX Nameplates



CONDITIONS OF CERTIFICATION:

IT IS A CONDITION OF SAFE USE THAT THE ENCLOSURE MUST BE CONNECTED TO EXTERNAL CIRCUITS VIA STANDARDS AUSTRALIA CERTIFIED Ex d CABLE GLAND OR CONDUIT ADAPTOR WITH A MINIMUM RATING OF IP54.

IT IS A CONDITION OF SAFE USE THAT THE EQUIPMENT MUST BE MOUNTED IN POSITION BETWEEN UPWARD AND HORIZONTAL SUCH THAT THE VENT IS FACING DOWNWARDS OR HORIZONTALLY.

IT IS A CONDITION OF SAFE USE THAT THE IRRELEVANT EXPLOSION PROTECTION MARKING CODES ON THE CERTIFICATION LABEL ARE PERMANENTLY SCRIBED OFF UPON COMPLETION OF COMMISSIONING.

TYPE 3661— INTRINSICALLY SAFE AND TYPE n

Figure 29. SAA Nameplate

Emerson Process Management

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