

3582 Series Valve Positioners, Type 3582i Valve Positioner, and 3583 Series Valve Stem Position Transmitters

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W5498-1

CONTROL VALVE WITH
TYPE 3582 POSITIONER



W8424

CONTROL VALVE WITH
TYPE 3582i POSITIONER



W5499-1

CONTROL VALVE WITH
TYPE 3583 TRANSMITTER

Figure 1. Typical Mounting for the 3582 Series, Type 3582i, and 3583 Series Positioners and Transmitters



3582 and 3583 Series

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Introduction

Scope of Manual

This instruction manual includes installation, operation, calibration, maintenance, and parts ordering information for the 3582 Series pneumatic valve positioners, the Type 3582i electro-pneumatic valve positioner, and the 3583 Series pneumatic valve stem position transmitters. Refer to separate instruction manuals for information on the control valve, actuator, and accessories.

Only personnel qualified through training or experience should install, operate, or maintain the valve positioner or valve stem position transmitter. If there are any questions concerning the instructions in this manual, contact your Fisher sales office or representative before proceeding.

Description

The 3582 Series pneumatic valve positioners and the Type 3582i electro-pneumatic valve positioner shown in figure 1 are used with diaphragm-actuated, sliding-stem control valve assemblies. The pneumatic valve positioners receive a pneumatic input signal from a control device and modulate the supply pressure to the control valve actuator. The positioner adjusts the actuator supply pressure to maintain a valve stem position proportional to the pneumatic input signal.

Type 3582NS positioners meet typical requirements of the nuclear power industry. The Type 3582NS

construction includes materials that provide superior performance at elevated temperature and radiation levels. The O-rings are EPDM (ethylene propylene) and the diaphragms are EPDM/Nomex. EPDM⁽¹⁾ demonstrates superior temperature capability and shelf life over nitrile. The Nomex diaphragm fabric demonstrates improved strength retention at elevated temperature and radiation conditions.

In addition, the Type 3582NS positioner is qualified "commercial grade dedicated" under Fisher's 10CFR50, Appendix B, quality assurance program. These can be supplied as 10CFR21 items.

The Type 3582i is an electro-pneumatic valve positioner, consisting of a Type 582i electro-pneumatic converter installed on a Type 3582 pneumatic valve positioner. The Type 3582i valve positioner provides an accurate valve stem position that is proportional to a dc current input signal.

The Type 582i electro-pneumatic converter is a modular unit that can be installed at the factory or in the field. However, do not plan to install a Type 582i converter on an existing positioner until you contact your Fisher sales office or representative for application assistance.

The Type 582i converter receives the dc current input signal and, through a nozzle/flapper arrangement, provides a proportional pneumatic output signal. This pneumatic output signal provides the input signal to the pneumatic valve positioner, eliminating the need for a remote-mounted transducer.

1. Use a clean, dry, oil-free air supply with instruments containing EPDM components. EPDM is subject to degradation when exposed to petroleum-based lubricants.



Figure 2. Typical Nameplates

The 3583 Series pneumatic valve stem position transmitters are for use with sliding-stem diaphragm actuators. These units provide an output signal that is directly proportional to the valve stem position.

Refer to the type number description for a detailed explanation of type numbers.

Type Number Descriptions

The following descriptions provide specific information on the different valve positioner or valve stem position transmitter constructions. If the type number is not known, refer to the nameplate on the positioner. For the location of the nameplate, refer to key 25 in figure 21.

Type 3582—Pneumatic valve positioner with bypass and instrument, supply, and output pressure gauges.

Type 3582A—Pneumatic valve positioner without bypass and without pressure gauges.

Type 3582C—Pneumatic valve positioner without bypass and with automotive tire valves instead of pressure gauges.

Type 3582D—Pneumatic valve positioner with bypass and with automotive tire valves instead of pressure gauges.

Type 3582G—Pneumatic valve positioner without bypass and with instrument, supply, and output pressure gauges.

Type 3582NS—Pneumatic valve positioner for nuclear service applications with or without bypass and with automotive tire valves instead of pressure gauges.

Type 3582i—Electro-pneumatic valve positioner without bypass; with Type 582i converter; and with:

supply and output pressure gauges, automotive tire valves, or pipe plugs.

Type 582i—Electro-pneumatic converter with: supply and output pressure gauges, automotive tire valves, or pipe plugs. Used for conversion of a 4 to 20 milliampere input signal to a 0.2 to 1.0 bar (3 to 15 psig) input signal for the pneumatic valve positioner.

Type 3583—Pneumatic valve stem position transmitter with supply and output pressure gauges.

Type 3583C—Similar to the Type 3583 valve stem position transmitter except with automotive tire valves in place of pressure gauges.

Specifications

Specifications for the valve positioners are shown in table 1. Specifications for the valve stem position transmitters are shown in table 3.

Refer to the unit nameplate to determine the type of positioner or transmitter, supply pressure, etc. A typical nameplate is shown in figure 2.

Table 1. Specifications for 3582 Series and Type 3582i Valve Positioners

<p>Input Signal⁽¹⁾,</p> <p>3582 Series: ■ 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 6</p> <p>Type 3582i: 4 to 20 mA dc constant current with 30 V dc maximum compliance voltage, can be split range, see table 6</p> <p>Equivalent Circuit for Type 3582i The Type 582i converter equivalent circuit is 120 ohms, shunted by three 5.6-volt zener diodes (see figure 11)</p> <p>Output Signal⁽¹⁾ Type: Pneumatic pressure as required by actuator up to 95 percent of maximum supply Action⁽¹⁾: Field-reversible between ■ direct and ■ reverse within the pneumatic valve positioner</p> <p>Supply Pressure⁽¹⁾ Recommended: 0.3 bar (5 psi) above actuator requirement Maximum: 3.4 bar (50 psig) or pressure rating of actuator, whichever is lower</p> <p>Input Bellows Pressure Rating⁽²⁾ See table 5 for minimum and maximum pressure ratings (allowable input signal) for each available range spring</p> <p>Maximum Steady-State Air Consumption⁽¹⁾⁽³⁾ For 3582 Series 1.4 bar (20 psig) Supply: 0.38 normal m³/hr (14.0 scfh) 2.0 bar (30 psig) Supply: 0.48 normal m³/hr (18.0 scfh) 2.4 bar (35 psig) Supply: 0.54 normal m³/hr (20.0 scfh) For Type 3582i Only 1.4 bar (20 psig) Supply: 0.46 normal m³/hr (17.2 scfh) 2.0 bar (30 psig) Supply: 0.58 normal m³/hr (21.4 scfh) 2.4 bar (35 psig) Supply: 0.64 normal m³/hr (23.8 scfh)</p> <p>Maximum Supply Air Demand⁽¹⁾ For 3582 Series and Type 3582i 1.4 bar (20 psig) Supply: 4.7 normal m³/hr (164.5</p>	<p>scfh) 2.0 bar (30 psig) Supply: 7.0 normal m³/hr (248.5 scfh) 2.4 bar (35 psig) Supply: 8.1 normal m³/hr (285.5 scfh)</p> <p>Performance</p> <p>For 3582 Series Independent Linearity⁽¹⁾: ±1 percent of output signal span Hysteresis⁽¹⁾: 0.5 percent of span For Type 3582i Only Independent Linearity⁽¹⁾: ±2 percent of output signal span Hysteresis⁽¹⁾: 0.6 percent of span</p> <p>EMC Effects: These instruments have the CE mark in accordance with the European Electromagnetic Compatibility (EMC) Directive. They meet the emissions requirements of IEC 61326-1 (Edition 1.1) for Class A equipment for use in industrial locations and Class B equipment for use in domestic locations. They also meet the immunity requirements listed in table 2. This table is in accordance with Annex A of IEC 61326-1 for equipment intended for use in industrial locations.</p> <p>For 3582 Series and Type 3582i Open Loop Gain (Output Signal)⁽¹⁾: ■ 100 in the range of 0.2 to 1.0 bar (3 to 15 psig) ■ 55 in the range of 0.4 to 2.0 bar (6 to 30 psig)</p> <p>Operating Influences⁽¹⁾</p> <p>Supply Pressure, For 3582 Series Units: Valve travel changes less than 1.67 percent per bar (0.25 percent per 2 psi) change in supply pressure Supply Pressure, For Type 3582i Units: Valve travel changes less than 3.62 percent per bar (1.5 percent per 2 psi) change in supply pressure</p> <p>Operative Temperature Limits⁽¹⁾⁽²⁾</p> <p>Standard Construction, For 3582 Series and Type 3582i Units: -40 to +71°C (-40 to +160°F) Type 3582NS Units: -40 to +82°C (-40 to +180°F) with EPDM elastomers High-Temperature Construction, For Types 3582A and C only: -18 to +104°C (0 to +220°F) without gauges</p>
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- Continued -

Table 1. Specifications for 3582 Series and Type 3582i Valve Positioners (Continued)

<p>Electrical Classification for Type 3582i</p> <p>Please refer to the Hazardous Area Classifications Bulletins for specific approvals. Also, refer to the nameplates shown in figure 2 for the location of positioner or transmitter classification information and approval descriptions.</p> <p>Housing Classification for Type 3582i</p> <p>NEMA 3, IEC 529 IP54: Mount instrument with vent on the side or bottom if weatherproofing is a concern.</p> <p>Pressure Gauges</p> <p>40 mm (1-1/2 inch) diameter with plastic case and brass connection ■ triple scale (PSI, MPa, and bar) or ■ dual scale (PSI and kg/cm²)</p>	<p>Pressure Connections</p> <p>1/4-inch NPT female</p> <p>Electrical Connection for Type 3582i</p> <p>1/2-14 NPT conduit connection</p> <p>Maximum Valve Stem Travel</p> <p>105 mm (4-1/8 inches); adjustable to obtain lesser travels with standard input signals</p> <p>Characterized Cams</p> <p>See characterized cams section</p> <p>Approximate Weight</p> <p>3582 Series Units: 2.5 kg (5-1/2 pounds) Type 3582i: 3.6 kg (8 pounds)</p>
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1. This term is defined in ISA Standard S51.1-1979.

2. Do not exceed any of the pressure or temperature limits in this instruction manual. Also, any applicable standard or code should not be exceeded.

3. Normal m³/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).

Table 2. EMC Immunity Performance Criteria

Port	Phenomenon	Basic Standard	Test Level	Performance Criteria
Enclosure	Electrostatic Discharge (ESD)	IEC 61000-4-2	4 KV contact 8 KV air	A
	Radiated EM field	IEC 61000-4-3	80 to 1000 MHz, 10 V/m 1 KHz AM at 80%	A
	Rated power frequency magnetic field	IEC 61000-4-8	60 A/m at 50 Hz	A
I/O signal/control	Burst (fast transients)	IEC 61000-4-4	1 KV	A
	Surge	IEC 61000-4-5	1 KV (line to ground only)	B
	Conducted RF	IEC 61000-4-6	150 kHz to 80 MHz at 3 volts	A
Specification limit = ±1% of span				

Note

Fisher 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.

Table 3. Specifications for 3583 Series Valve Stem Position Transmitters

<p>Input Signal⁽¹⁾</p> <p>105 mm (4-1/8 inches) of valve stem travel; adjustable to obtain full output signal with lesser stem travels</p> <p>Output Signal⁽¹⁾</p> <p>Type: ■ 0.2 to 1.0 bar (3 to 15 psig) or ■ 0.4 to 2.0 bar (6 to 30 psig) pneumatic pressure</p> <p>Action: Field-reversible between direct and reverse</p> <p>Output Bellows Pressure Rating⁽²⁾</p> <p>See table 5 for minimum and maximum pressure ratings (allowable input signal) for each available range spring</p> <p>Supply Pressure⁽¹⁾</p> <p>Recommended: 0.3 bar (5 psi) above upper limit of output signal range</p> <p>Maximum: 2.4 bar (35 psig) or pressure rating of connected equipment, whichever is lower</p> <p>Maximum Steady-State Air Consumption⁽¹⁾⁽³⁾</p> <p>1.4 bar (20 psig) Supply: 0.38 normal m³/hr (14.0 scfh)</p> <p>2.0 bar (30 psig) Supply: 0.48 normal m³/hr (18.0 scfh)</p> <p>2.4 bar (35 psig) Supply: 0.54 normal m³/hr (20.0 scfh)</p>	<p>Reference Accuracy⁽¹⁾</p> <p>±1 percent of output signal span</p> <p>Operating Influence⁽¹⁾</p> <p>Output signal changes 1.67 percent per bar (0.23 percent per 2 psig) change in supply pressure</p> <p>Operative Ambient Temperature Limits⁽¹⁾⁽²⁾</p> <p>Standard Construction, 3583 Series: –40 to +71°C (–40 to +160°F)</p> <p>High-Temperature Construction, Type 3583C only: –18 to +104°C (0 to +220°F)</p> <p>Pressure Connections</p> <p>Supply and output pressure connections are 1/4-inch NPT female</p> <p>Maximum Valve Stem Travel</p> <p>105 mm (4-1/8 inches); adjustable to obtain full output signal with lesser stem travels</p> <p>Cam</p> <p>Linear</p> <p>Approximate Weight</p> <p>2.5 kg (5-1/2 pounds)</p>
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1. This term is defined in ISA Standard S51.1-1979.

2. Do not exceed any of the pressure or temperature limits in this instruction manual. Also, any applicable standard or code should not be exceeded.

3. Normal m³/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).

Installation

Note

All valve positioners and valve stem position transmitters are shipped with foam rubber packing material inside the case. Remove the cover (key 33, figure 21) and the packing material before attempting to operate the unit. Make sure all vent openings are clear before installation of the unit and that they remain clear during use.

Typically, the positioner or transmitter is ordered with the actuator. If so, the factory mounts the valve positioner or valve stem position transmitter and connects the valve positioner output to the actuator. If a Type 67CFR filter-regulator is specified, it may be integrally mounted to the valve positioner or valve

stem position transmitter, except for the Type 3582NS positioner. For the Type 3582NS, the Type 67CFR is separately mounted, not integrally mounted to the positioner.

Note

In some cases, alignment and calibration of the valve positioner or valve stem position transmitter at the factory may not be possible, and field alignment and calibration is required. Before putting the valve positioner or valve stem position transmitter into service, check the operation of the unit to be sure it is calibrated. If the valve positioner or valve stem position transmitter requires alignment or calibration, refer to the appropriate calibration instructions in this manual.

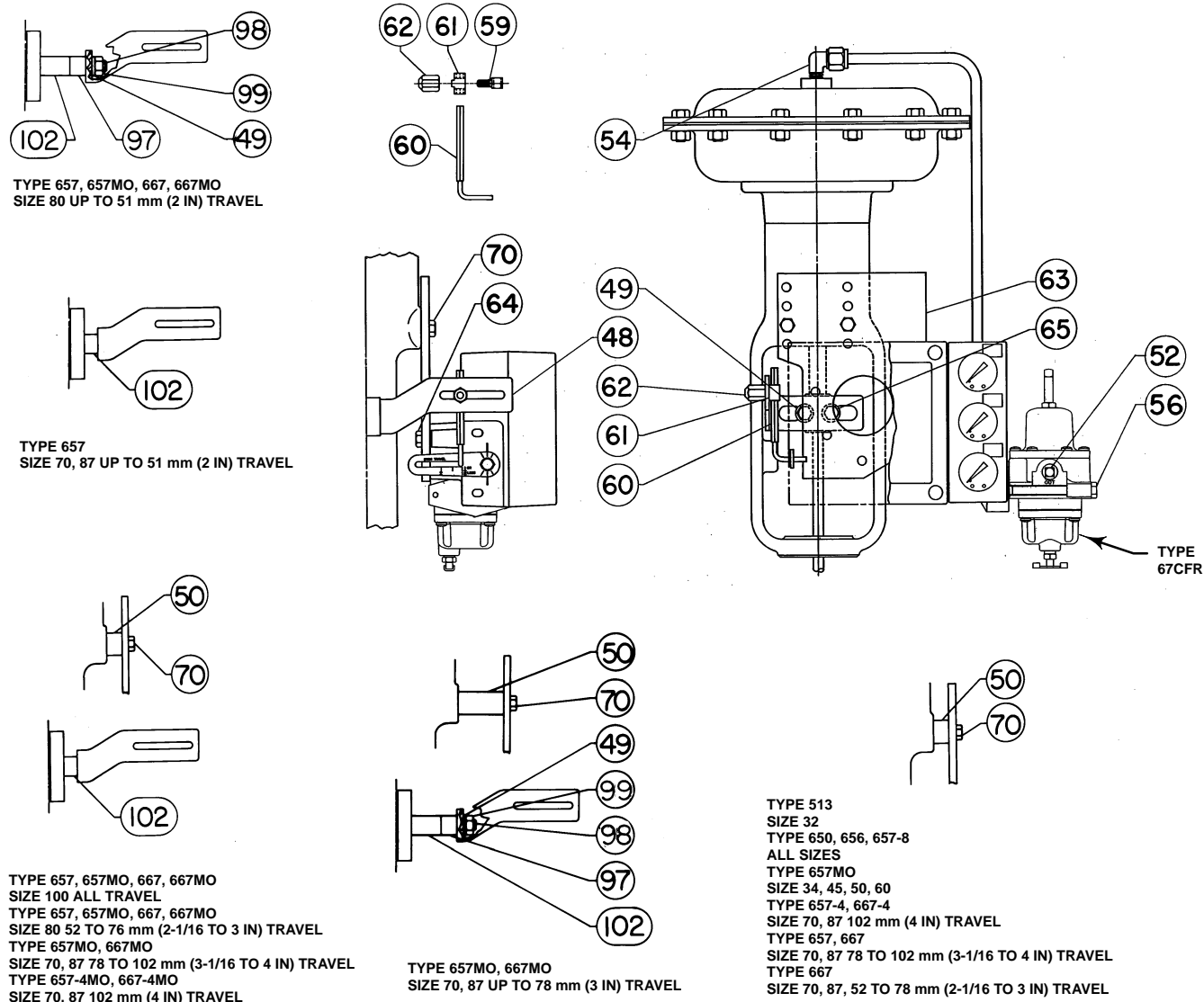


Figure 3. Mounting Assembly

If the valve positioner or valve stem position transmitter is ordered separately, disconnected, or removed from the actuator, refer to the appropriate sections of this manual for installation information.

Mounting

Key numbers used in this procedure are shown in figure 3 except where indicated.

1. Figure 3 shows the various mounting parts required for mounting on Fisher actuators. Mounting parts for Fisher actuators that require spacers have

the spacers (key 50) included. Type 657 and 667 actuators, sizes 70 through 100, with or without a side-mounted handwheel, use spacers (keys 97 and 102) between the stem connector and the connector arm (key 48). On all other actuators that use spacers, place the spacers (key 50) between the mounting plate (key 63) and the actuator mounting boss.

When mounting the valve positioner or valve stem position transmitter on an actuator by another manufacturer, provide spacers, if necessary, by cutting sections from 1/2- or 3/8-inch pipe so that the "X" dimension matches the value given in figure 6.

Table 4. 3582 and 3583 Series Mounting Information

ACTUATOR TYPE	ACTUATOR SIZE	MAXIMUM TRAVEL		MOUNTING HOLES SET NO.(1)	TRAVEL PIN POSITION(2)	ACTUATOR TYPE	ACTUATOR SIZE	MAXIMUM TRAVEL		MOUNTING HOLES SET NO.(1)		TRAVEL PIN POSITION(2)
		mm	Inch					mm	Inch	657	667	
513 & 513R	20	19	3/4	2	Normal	657 & 667 Without Side-Mounted Handwheel	30	19	3/4	3	4	Normal
	32	19	3/4	2	Normal		34	19	1-1/8	3	2	Normal
656							40	38	1-1/2	2	3	Normal
	30	51	2	4	Inverted		45	19	3/4	1	4	Inverted(3)
	40	89	3-1/2	4	Inverted		45	51	2	1	1	Normal
	60	102	4	4	Inverted		50	51	2	1	2	Normal
657-4 Without Side-Mounted Handwheel	70	102	4	3	Inverted		60	51	2	1	2	Normal
							70	51	2	2	1	Normal
657-4 With Side-Mounted Handwheel	70	102	4	2	Inverted			52-76	2-1/16-3	3	2	Normal
	87	102	4	1	Inverted			78-102	3-1/16-4	3	1	Inverted(4)
657-8	30	54	2-1/8	3	Normal		80	76	3	2	2	Normal
	34	54	2-1/8	3	Normal		87	51	2	2	2	Normal
	40	79	3-1/8	3	Normal			52-76	2-1/16-3	2	2	Normal
	40	89	3-1/2	3	Normal			78-102	3-1/16-4	3	1	Inverted(4)
	46	79	3-1/8	2	Normal		100	102	4	4	4	Inverted
	46	105	4-1/8	2	Normal							
	47	79	3-1/8	2	Inverted							
	47	105	4-1/8	1	Inverted	657 & 667 With Side-Mounted Handwheel	34	19	3/4	2	2	Normal
	60	105	4-1/8	4	Inverted		40	38	1-1/2	1	2	Normal
	70	105	4-1/8	2	Inverted		45	51	2	1	4	Normal
667-4 Without Side-Mounted Handwheel	70	102	4	1	Normal		50	51	2	4	1	Inverted(4)
	87	102	4	1	Normal		60	51	2	3	1	Inverted(4)
							70	102	4	2	2	Inverted
							80	76	3	2	2	Normal
							87	76	3	2	2	Normal
								78-102	3-1/16-4	2	1	Inverted

1. The indicated set number should be considered a reference point only, due to the variables related to making up the stem connection.

2. Normal position is shown in figure 4.

3. Travel pin position for Type 657 is normal.

4. Travel pin position for Type 667 is normal.

2. As shown in figures 3 and 4, attach the connector arm (key 48) to the stem connector so that the connector arm extends through the yoke legs on the side of the lower mounting boss.

3. Attach the valve positioner or valve stem position transmitter to the mounting plate (key 63) using the holes shown in figure 5.

4. Mount the Type 67CFR regulator:

- **3582 Series valve positioners (except Type 3582NS) and 3583 Series valve stem position transmitters**, mount the regulator on the integral boss on the bypass block.

- **Type 3582NS valve positioners**, use the mounting plate with provision for separately mounting the Type 67CFR regulator. Separately mount the positioner and the regulator on the mounting plate.

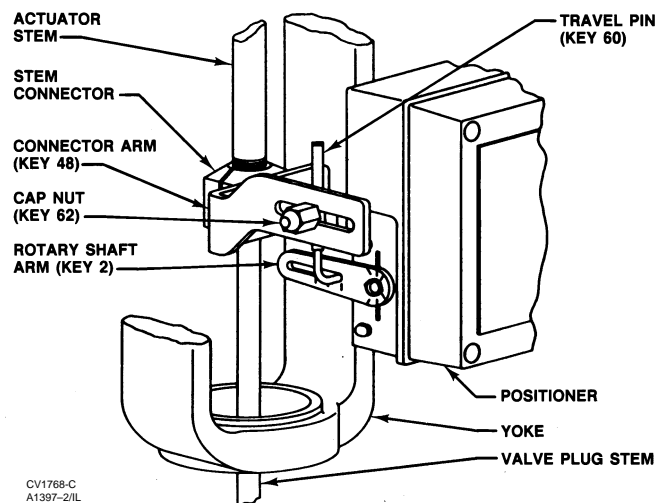


Figure 4. Isometric View Showing Motion Feedback Arrangement and Typical Stem Connection

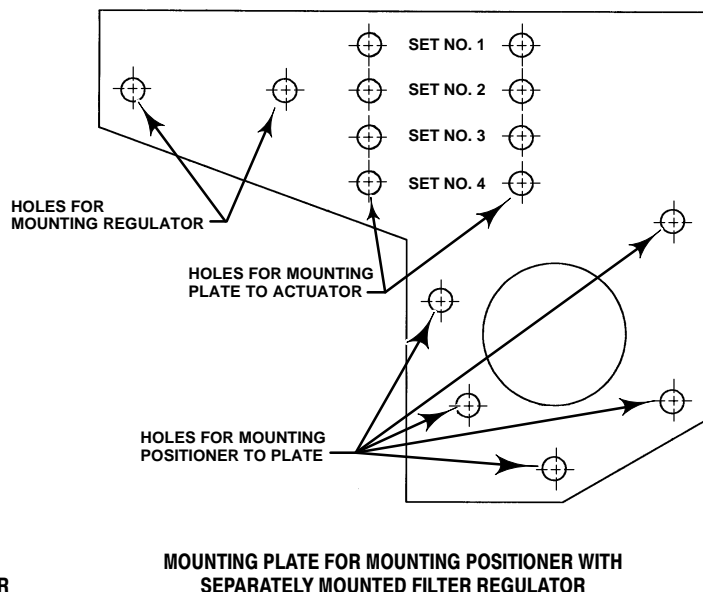
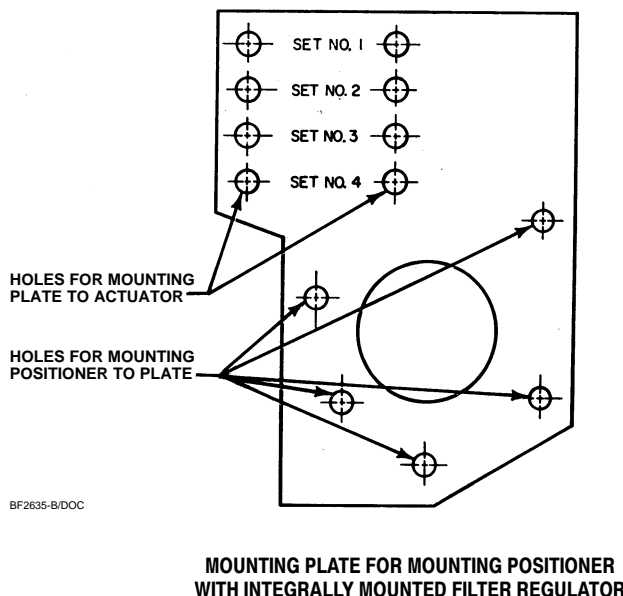


Figure 5. Mounting Plates Used with 3582 Series Valve Positioners and 3583 Series Valve Stem Position Transmitters

- **Type 3582i valve positioners**, mount the regulator on the integral boss that is part of the Type 582i converter housing.

5. As shown in figure 5, the mounting bracket has four sets of holes for mounting the assembly to the actuator. Refer to table 4 to determine which set of mounting holes to use, then attach the assembly to the lower mounting pad on the actuator.

CAUTION

To avoid equipment damage, be certain the connector arm clears the valve positioner or valve stem position transmitter case as the actuator moves through its complete stroke.

6. Position the actuator to its mid-travel position using a handwheel or manual loading regulator.
7. Slip the round end of the travel pin (key 60) into the rotary shaft arm (key 2) slot as shown in figure 4.
8. Slide the square end of the travel pin into the pin holder and pin lock (keys 61 and 59). Place the pin lock and holder into the slot in the connector arm (key 48). Screw the cap nut (key 62) onto the pin lock (key 59), but do not tighten.
9. With the actuator at its mid-travel position, lift the rotary shaft arm so that the 0-degree index marks on

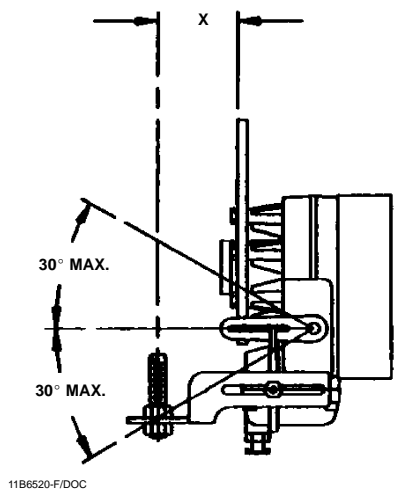
the rotary shaft arm are aligned with the case index marks as shown in figure 7.

CAUTION

Never set the travel pin at a setting that is less than the actual actuator stroke. Setting the travel pin at a setting that is less than the actual actuator stroke will cause the cam to rotate more than 60 degrees, causing damage to the cam or other parts.

10. Position the travel pin so that it is perpendicular to the connector arm and aligns with the correct actuator stem travel index on the rotary shaft arm. Tighten the cap nut (key 62 in figure 4).
11. Check the travel pin setting using the following procedures:

- **For standard travel pin setting** (that is, with the travel pin setting equal to total actuator travel). Stroke the actuator to each end of its travel. At each end of travel, the 30-degree index marks on the rotary shaft arm should align with the case index marks. If the index marks are not in line, loosen the cap nut (key 62) and slide the travel pin (key 60) in the rotary shaft arm slot until the 30-degree index marks align with the case index marks. Be sure the



STEM TRAVEL	X		
	9.5 mm (3/8-Inch) Stem	12.7 mm (1/2-Inch) Stem	19.1 mm (3/4-Inch) Stem
Millimeters			
29 or less	81	87	100
38	90	97	109
51	102	108	121
64	113	119	132
76	124	130	143
89	135	141	154
102	146	152	165
Inches			
1-1/8 or less	3.19	3.44	3.94
1-1/2	3.56	3.81	4.31
2	4.00	4.25	4.75
2-1/2	4.44	4.69	5.19
3	4.88	5.12	5.62
3-1/2	5.31	5.56	6.06
4	5.75	6.00	6.50

Figure 6. Spacing for Mounting on Other Than Fisher Actuators

travel pin remains perpendicular to the connector arm. After making this adjustment, tighten the cap nut and re-check the arm at the mid-travel position. If the 0-degree index marks do not align, repeat this procedure.

- **For special travel pin setting** (that is, with the travel pin setting greater than total actuator travel). Check the index marks using a procedure similar to the standard settings procedure. The arm will not rotate a full 60 degrees as the actuator is stroked, and the 30-degree index marks on the cam will be short of aligning with the case index marks. If necessary, adjust the travel pin position so that the 30-degree marks are the same distance from the respective case index mark at each end of actuator travel.

Changing Cam Position

Refer to figure 21 for a typical cam illustration and key number locations.

Note

- **For Valve Positioners: The small arrow on the cam must point in the direction of stem movement with increasing actuator diaphragm pressure.**

- **For Valve Stem Position**

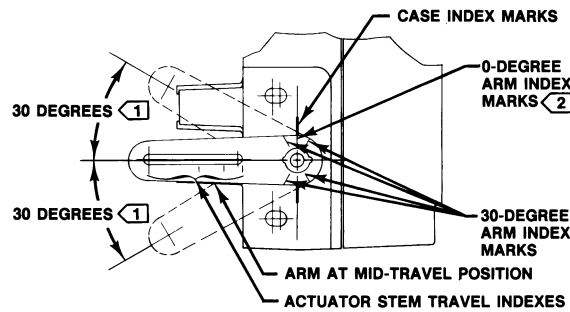
Transmitters: If the arrow on the cam points up toward the nozzle, output pressure increases with downward stem movement. If the arrow points down, output pressure decreases with downward stem movement.

If the arrow is pointing in the wrong direction, use the following procedure to remove, reverse, and re-install the cam.

When mounting a valve positioner or valve stem position transmitter, check to see if the correct cam (key 4) and cam position has been selected. To change the cam or cam position, unhook the extension spring (key 38), and remove the cam bolt and locking nut (keys 6 and 45). Remove the cam and spring retainer bracket (key 43).

To install the cam, screw the locking nut all the way onto the cam bolt. Attach the cam and spring retainer bracket to the shaft assembly with the cam bolt. Tighten the bolt to secure the cam. Then, tighten the locking nut against the spring retainer bracket. Hook the spring into the spring retainer bracket.

Details on cam characteristics can be found in the cam information portion of the operating information section.



NOTES:

- ① MAXIMUM ROTATION FROM MID-TRAVEL POSITION.
- ② ALIGN INDEX MARKS AS SHOWN FOR MID-TRAVEL POSITION.

70CA0750-C
A2452-2/IL

Figure 7. Rotary Shaft Arm and Case Index Marks

Pressure Connections



WARNING

Valve positioners and valve stem position transmitters are capable of providing full supply pressure to connected equipment. To avoid personal injury and equipment damage, make sure the supply pressure never exceeds the maximum safe working pressure of any connected equipment.

Pressure connections are shown in figure 8. All pressure connections are 1/4-inch NPT female. Use 3/8-inch tubing for all pressure connections. After making pressure connections, turn on the supply pressure and check all connections for leaks.

Supply Connection



WARNING

Personal injury or property damage may occur from an uncontrolled process if the supply medium is not clean, dry, oil-free air, or non-corrosive gas. Industry instrument air quality standards describe acceptable dirt, oil, and moisture content. Due to the variability in nature of the problems these influences can have on pneumatic equipment, Fisher Controls has no technical basis to recommend

the level of filtration equipment required to prevent performance degradation of pneumatic equipment. A filter or filter regulator capable of removing particles 40 microns in diameter should suffice for most applications. Use of suitable filtration equipment and the establishment of a maintenance cycle to monitor its operation is recommended.

Supply pressure must be clean, dry, oil-free⁽²⁾ air or noncorrosive gas. Use a Fisher Type 67CFR Filter Regulator, or equivalent, to filter and regulate supply air. Except for the Type 3582NS, the filter regulator can be mounted on the positioner. For the Type 3582NS the regulator can be mounted on the mounting plate with the positioner but not on the positioner. 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 3.4 bar (50 psig) nor the pressure rating of any connected equipment.

Connect the nearest suitable supply source to the 1/4-inch NPT IN connection on the filter regulator (if furnished) or to the 1/4-inch NPT SUPPLY connection on the positioner block assembly.

Output Connection

A factory mounted valve positioner has the valve positioner output piped to the supply connection on the actuator. If mounting the valve positioner in the field, connect 3/8-inch tubing between the 1/4-inch NPT valve positioner connection marked OUTPUT and the actuator supply pressure connection. Connect the valve stem position transmitter connection marked OUTPUT to an instrument that indicates valve stem position.

Instrument Connection

For a 3582 Series pneumatic valve positioner connect 3/8-inch tubing from the control device to the 1/4-inch NPT INSTRUMENT connection. If the control device is mounted on the control valve assembly by the factory, this connection is made.

The Type 3582i electro-pneumatic valve positioner requires a 4 to 20 milliampere dc current input signal from the control device. A 1/2-inch NPT conduit connection is provided for properly wiring electrical installations. For more information, see the electrical connections section.

2. Use a clean, dry, oil-free air supply with instruments containing EPDM components. EPDM is subject to degradation when exposed to petroleum-based lubricants.

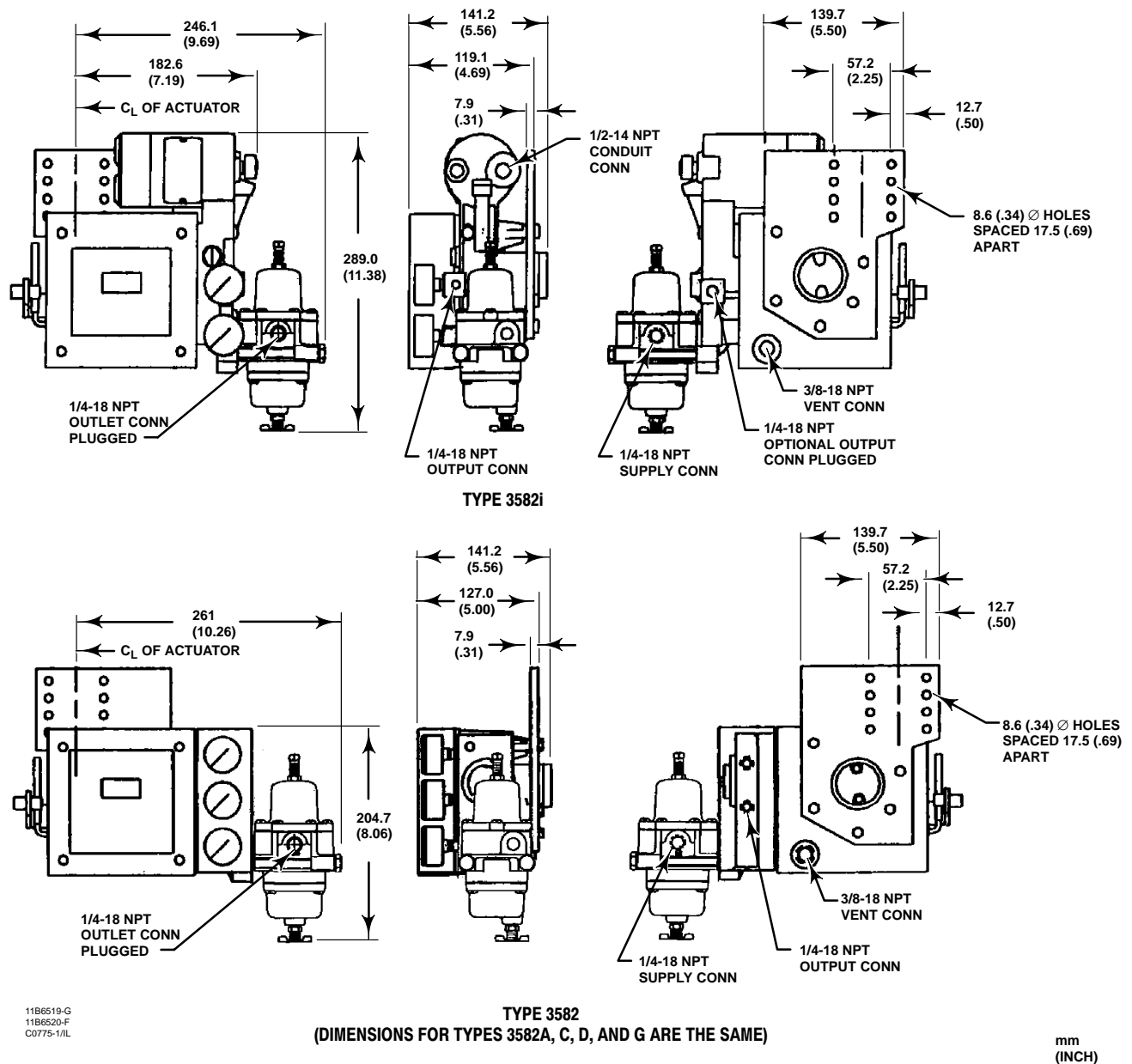


Figure 8. Typical Dimensions and Connections

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 3582 block assembly or Type 582i housing as shown in figure 9. Before installing the connectors on the positioner, apply sealant to the threads. Sealant is provided with the diagnostic connections and hardware.

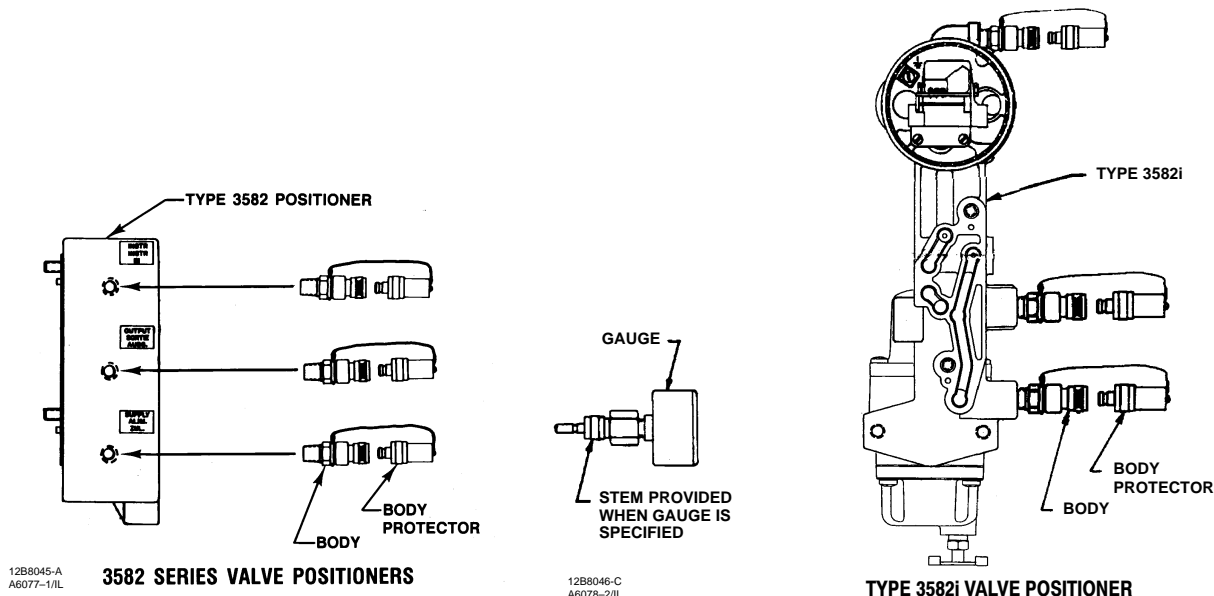


Figure 9. Diagnostic Connections

Vent



WARNING

If a flammable or hazardous 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 a hazardous 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. For leakage rates, see the Maximum Steady-State Air Consumption specification. 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.

CAUTION

When installing a remote vent pipe, take care not to overtighten the pipe in

the vent connection. Excessive torque will damage the threads in the connection.

The vent opening at the back of the case marked VENT should be left open to prevent pressure buildup inside the case and to provide a drain hole for any moisture that might collect inside the case. The perforated section of the nameplate normally covers this opening to prevent blockage from debris or insects.

If a remote vent is required, the vent line must be as short as possible with a minimum number of bends and elbows. The vent connection is 3/8-inch NPT female. Use 3/8-inch or larger tubing to provide a remote vent. The 582i has a 1/4-inch NPT female vent connection.

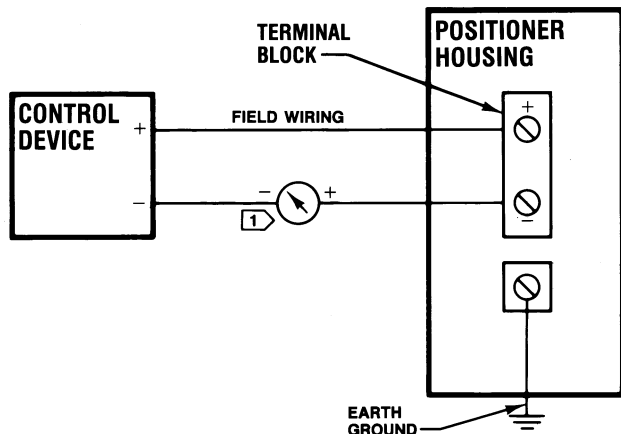
Also, be certain that the exhaust holes in the relay (key 32 in figure 21) are kept open.

Electrical Connections for Type 3582i Valve Positioner



WARNING

For explosion-proof applications, disconnect power before removing the converter housing cap.


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 10. Typical Field Wiring Diagram

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

For intrinsically safe installations, refer to the loop schematics at the end of this manual, factory drawings, or to instructions provided by the barrier manufacturer for proper wiring and installation.

Use the 1/2-inch NPT conduit connection on the Type 582i converter housing for installation of field wiring. For Class I, Division I explosion-proof applications, install rigid metal conduit and a seal no more than 457 mm (18 inches) from the converter. Also, install conduit according to local and national electrical codes which apply to the application.

Refer to figures 10, 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 positive (+) terminal, and the negative wire from the control device to the converter negative (-) terminal. Do not overtighten the terminal screws. Maximum torque is 0.45 N•m (4 lbf•in.). Connect the converter grounding terminal to an earth ground.

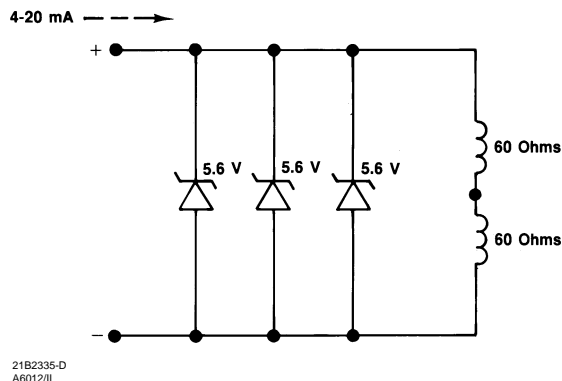
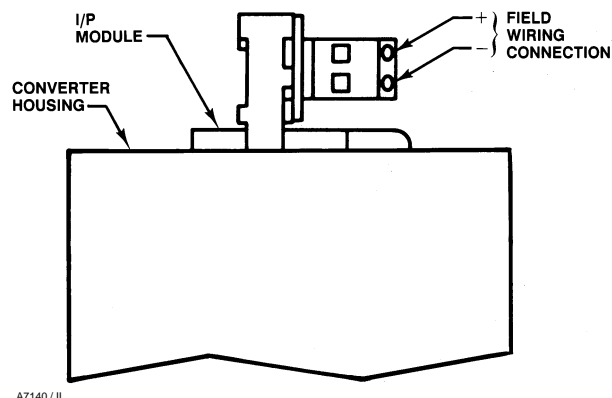

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Figure 11. Type 582i Input Equivalent Circuit



A7140/IL

Figure 12. Type 582i Converter Wiring Connections

Installation Of Type 582i Converter⁽³⁾

WARNING

Avoid personal injury from sudden release of process pressure. Before mounting the Type 582i converter:

- 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. Drain the process media from both sides of the valve.
- Vent actuator loading pressure and relieve any actuator spring precompression.

3. Please contact your Fisher sales office or representative before planning to upgrade any existing 3582 Series valve positioner by field installation of a Type 582i electro-pneumatic converter. Also, refer to this section of the instruction manual which describes field installation of a Type 582i converter.

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

Note

Before planning to retrofit an installed 3582 Series positioner, refer to the positioner mounting plate illustrations shown in figure 5. Mounting plates with a three-hole mounting pattern (positioner to mounting plate) cannot support a Type 582i converter. Do not attempt to mount a Type 582i converter on an existing 3582 Series positioner which has a three-hole mounting pattern.

Isolate the control valve from the line pressure, release pressure from both sides of the valve body, and drain the process media from both sides of the valve. Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.

If a 3582 Series pneumatic valve positioner has previously been installed using a mounting plate with a five-hole mounting pattern (positioner to mounting plate), either at the factory or in the field, it can be upgraded to a Type 3582i electro-pneumatic valve positioner by installation of a Type 582i converter. To install a Type 582i converter, refer to the following instructions.

Note

Inspect the existing valve positioner to determine the input signal range. If the input signal range is not 0.2 to 1.0 bar (3 to 15 psig), refer to the appropriate sections of this manual describing input signal ranges and how to change the range spring.

1. Inspect the positioner mounting plate. Be certain that five screws fasten the positioner to the mounting plate. Two additional screws fasten the plate to the actuator.

When the positioner is correctly attached to the mounting plate, proceed with the installation by taking the control valve/actuator/positioner package out of service.

2. Properly vent the actuator loading pressure and the supply pressure. Disconnect the pressure tubing connections to the valve positioner.
3. Remove the two screws (key 105 in figures 25 or 26) holding the bypass block (key 34A in figures 25 or 26) to the valve positioner case and remove the bypass block. Save the screws to reattach the Type 582i converter.
4. Remove and discard the existing gasket (key 104 in figures 25 or 26) between the bypass block and valve positioner case.
5. Unpack the Type 582i converter to be installed.
6. Position the new gasket on the Type 582i converter as shown in figure 27. Insert the existing screws (key 105 in figures 25 or 26) through the appropriate holes in the Type 582i converter housing and new gasket.
7. Mate the converter and new gasket to the side of the valve positioner case using the alignment pins on the converter housing.
8. Tighten the screws.
9. Reconnect the pressure connections according to the instructions given in the pressure connections section of this manual.
10. Make the electrical connections according to the instructions given in the electrical connections section of this manual.
11. Complete the standard calibration procedure described in the calibration section of this manual.
12. Return the control valve package to service.

Operating Information

Instructions for setting the zero and span are found in the calibration section.

Valve Positioner Cam Information

Note

The small arrow on the valve positioner cam must point in the direction of stem movement with increasing actuator diaphragm pressure. If the arrow is pointing in the wrong direction, remove, reverse, and re-install the cam.

Isolate the control valve and shut off pressure lines to the valve positioner.

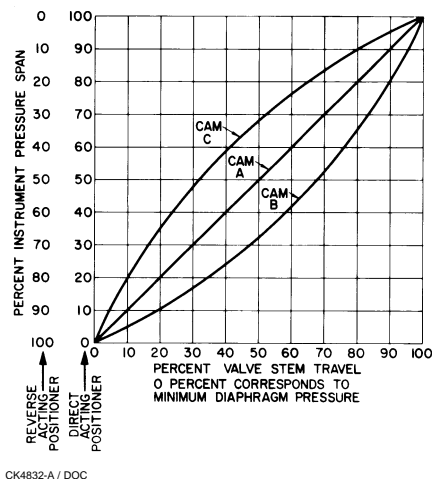


Figure 13. Cam Characteristic Curves

Refer to figure 21 for key number locations. Unhook the spring (key 38), and remove the cam bolt and locking nut (keys 6 and 45). Remove the cam (key 4) and spring retainer bracket (key 43). To install the cam, screw the locking nut all the way onto the cam bolt. Attach the cam and spring retainer bracket with the cam bolt. Tighten the bolt to secure the cam. Then, tighten the locking nut against the spring retainer bracket. Hook the spring into the spring retainer bracket.

When shipped from the factory, 3582 Series valve positioners and the Type 3582i valve positioner have a linear cam, Cam A, installed in the operating position. Two characterized cams, Cams B and C, are available. These characterized cams may be used to modify the valve flow characteristics.

Figure 13 shows resultant stem travel due to an incremental instrument pressure change for each cam. In figure 13, the curves are based on 60 degrees cam rotation for 100 percent stem travel. At 50 percent of the input signal span, for example, the stem will travel 50 percent with cam A, 68 percent with cam B, and 32 percent with cam C. Figure 14 shows how the flow characteristics change when using the cams with a valve that has equal percentage characteristics. Figure 15 shows how the flow characteristics change when using the cams with a valve that has linear characteristics.

When cam A is the operating cam, there is a linear relationship between an incremental instrument pressure change and the resultant valve stem travel.

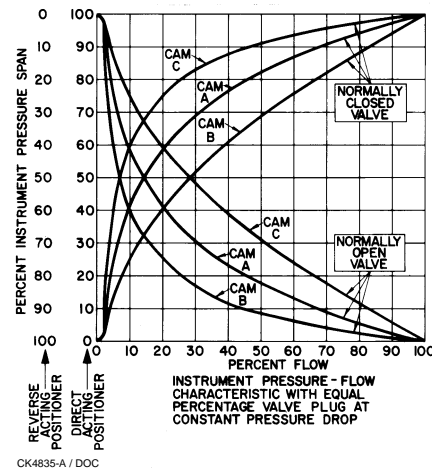


Figure 14. Flow Characteristics with Different Cams and Equal Percentage Valve Plug

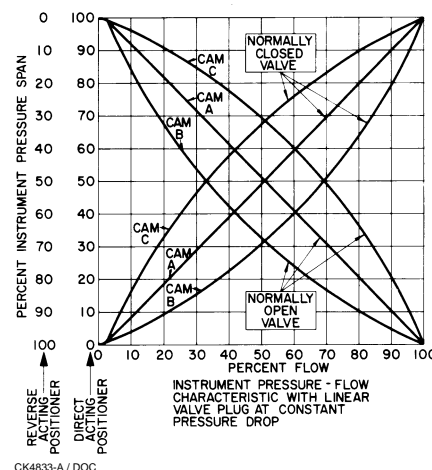


Figure 15. Flow Characteristics with Different Cams and Linear Valve Plug

The flow characteristic is that of the control valve. Installing either cam B or C as the operating cam, changes the relationship between the incremental instrument pressure change and valve stem travel, thereby modifying the valve flow characteristic.

Valve Stem Position Transmitter Cam Information

Note

If the small arrow on the valve stem position transmitter cam points up toward the nozzle, output pressure increases with downward stem movement. If the arrow points down,

output pressure decreases with downward stem movement. If the arrow is pointing in the wrong direction, remove, reverse, and re-install the cam.

Isolate the control valve and shut off pressure lines to the valve positioner. Refer to figure 21 for key number locations. Unhook the spring (key 38), and remove the cam bolt and locking nut (keys 6 and 45). Remove the cam (key 4) and spring retainer bracket (key 43). To install the cam, screw the locking nut all the way onto the cam bolt. Attach the cam and spring retainer bracket with the cam bolt. Tighten the bolt to secure the cam. Then, tighten the locking nut against the spring retainer bracket. Hook the spring into the spring retainer bracket.

The linear cam is the only cam available for the 3583 Series valve stem position transmitter. There is always a linear relationship between stem travel and the stem position transmitter output.

Valve Positioner Bypass Operation

Type 3582 and 3582D valve positioners, and Type 3582NS positioners with bypass, are supplied with a bypass assembly. A handle on the bypass assembly permits selecting positioner or bypass operation. Refer to figure 25 for key number locations.

CAUTION

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

Labels on the bypass block (key 34A) and a pointer on the bypass handle (key 34D) indicate if the input signal from the instrument goes to the positioner or directly to the control valve actuator. Push the bypass handle toward the back of the positioner to move the pointer over the word POSITIONER. With

the bypass handle in this position, the input signal goes to the valve positioner bellows and the output pressure of the valve positioner goes to the actuator. Pull the bypass handle forward to move the pointer over the word BYPASS. In this position, the input signal goes directly to the actuator.

Note

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

With a reverse-acting or split-range valve positioner, the bypass handle may be locked in the POSITIONER position so that bypass cannot be used. To lock the bypass handle in the POSITIONER position, first shut off the instrument and supply pressure to the valve positioner. Then, remove the hex head shoulder screw from the center of the handle. Remove the handle and rotate it 180 degrees and re-install it with the handle between the two lugs cast on the bypass block. Replace the shoulder screw.

Input Signal Ranges

Standard input signal ranges for valve positioners and valve stem position transmitters are shown in table 5. Changing from one standard range to another requires changing the range spring. To change the range spring, refer to the instructions for changing the range spring in the maintenance section of this manual. Split-range operation of 3582 Series valve positioners or the Type 3582i valve positioner normally does not require changing the spring. Refer to the section below for split-range information.

Valve Positioner Split-Range Operation

The 3582 Series valve positioners and the Type 3582i valve positioner are suitable for split-range operations. In split-range operation, the input signal, either pneumatic or dc current, from a single control device is split between two or more control valves. No additional parts are required to use an existing valve positioner for split-range operation.

Table 6 shows some typical split-ranges for the valve positioners.

3582 and 3583 Series

Instruction Manual

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Table 5. Standard Instrument Input Signals and Range Springs

INSTRUMENT INPUT SIGNAL RANGE	STANDARD SPAN	ALLOWABLE INPUT SIGNAL ⁽¹⁾		RANGE SPRING COLOR	RANGE SPRING PART NUMBER
		Minimum	Maximum		
0.2–1.0 bar (3–15 psig)	0.8 bar (12 psig)	0.07 bar (1 psig)	1.4 bar (21 psig)	Silver	1V621727012
4–20 mA ⁽²⁾	16 mA	2 mA	22 mA		
0.4–2.0 bar (6–30 psig)	1.6 bar (24 psig)	0.07 bar (1 psig)	2.4 bar (35 psig)	Red	1V621927012

1. Minimum and maximum allowable input signals ensure functional operation.

2. For Type 3582i, only.

Table 6. Split-Range Capabilities

3582 SERIES POSITIONERS				
Split	0.2 to 1.0 Bar or 3 to 15 Psig Input Signal		0.4 to 2.0 Bar or 6 to 30 Psig Input Signal	
	Bar	Psig	Bar	Psig
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
TYPE 3582i POSITIONER				
Split	4 to 20 Milliampere Input Signal			
Two-way	4 to 12			
	12 to 20			
Three-way	4 to 9.3			
	9.3 to 14.7			
	14.7 to 20			

To change to split-range operation, perform the beam alignment procedures then perform the calibration procedure using the desired split range inputs that result in full valve travel. For example, for a 3582 Series positioner with a 0.2 to 1.0 bar (3 to 15 psig) input signal range in a two-way split, a 0.6 bar (9 psig) input signal should completely stroke the valve for a 0.2 to 0.6 bar (3 to 9 psig) signal range.

Note

The flapper must approach the nozzle squarely at the midpoint value of the input signal range for proper operation.

On some applications where the input signal span is comparatively small (as found with split-range applications), the nozzle adjustment may not be enough to set the proper starting point. Also, some difficulty may be experienced in keeping a valve positioner from unloading when the input signal continues to increase above the split-range.

For example, for a 0.2 to 0.6 bar (3 to 9 psig) input signal range, the input signal could increase to 1.0 bar (15 psig). Continued bellows travel due to the increased input signal over the split-range would drive the flapper into the nozzle. The impact could possibly cause misalignment between the flapper and nozzle. Such a misalignment, in turn, could affect split-range calibration.

In these cases, adjust the follower assembly screw in addition to the nozzle adjustment to obtain satisfactory results.

Note

The 3582 Series valve positioners require a relatively small percentage of the instrument pressure span to obtain full valve travel. With the travel pin set to equal the valve travel, the input signal change required to fully stroke the valve can be reduced to 33 percent of normal input signal change. With the travel pin set to a value greater than the valve travel, the input signal change required to fully stroke the valve can be reduced to a minimum of 20 percent of normal input signal change.

Changing Valve Positioner Action

Converting a 3582 Series valve positioner or Type 3582i valve positioner from direct acting (an increasing input signal, either pneumatic or electrical, increases output pressure) to reverse acting (increasing input signal decreases output pressure) or vice versa requires no additional parts. The position of the flapper assembly on the beam determines the action. As shown in figure 16, the beam is divided into quadrants. The direct-acting quadrant of the beam is labeled DIRECT and the reverse-acting quadrant is labeled REVERSE. To

change the positioner action, simply move the flapper assembly to the opposite quadrant of the beam. Perform the calibration procedures in the valve positioner calibration section.

Changing Valve Stem Position Transmitter Action

Refer to figure 21 for key number locations unless otherwise indicated.

The flapper of the 3583 Series valve stem position transmitter is always positioned in the reverse-acting quadrant as shown in figure 20. To reverse the signal, reverse the cam as follows:

1. Unhook the spring (key 38), and remove the cam bolt (key 6), cam (key 4), and spring retainer bracket (key 43).
2. Screw the locking nut (key 45) all the way onto the cam bolt.

Note

If the arrow stamped on the cam points toward the nozzle, output pressure increases with downward stem movement. If the arrow points down away from the nozzle, output pressure decreases with downward stem movement.

3. Reverse the cam (key 4) from its original position. Attach the cam and spring retainer bracket with the cam bolt. Tighten the cam bolt to secure the cam. Then tighten the locking nut against the spring retainer bracket.
4. Hook the spring into the spring retainer bracket.
5. After reversing the cam, perform the calibration procedures in the calibration of valve positioners and transmitters section.

Calibration Of Valve Positioner Or Valve Stem Position Transmitter

Note

The following beam alignment and calibration procedures are applicable for both the 3582 Series and the Type 3582i valve positioners and 3583 Series valve stem position transmitters.

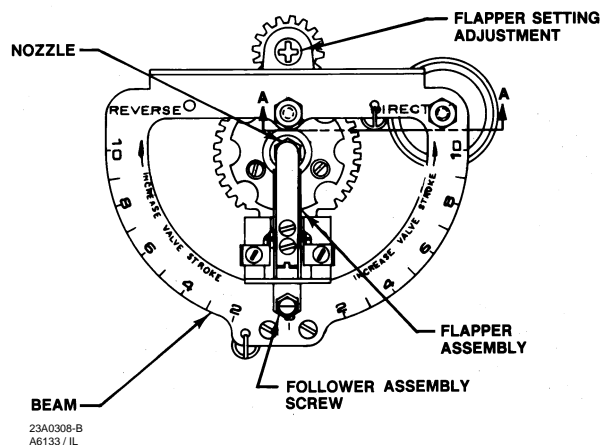
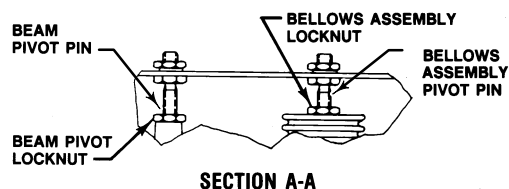


Figure 16. Partial View for Beam Leveling and Calibration

Beam Alignment

Note

The beam is leveled at the factory prior to shipment. Once the beam is leveled, no additional leveling should be required unless the beam pivot pin or the bellows assembly pivot pin are changed, the bellows assembly or range spring are replaced, or the valve positioner is changed to split range operation.

The purpose of beam alignment is to ensure the correct mechanical position of parts so the valve positioner can be calibrated. Provide the appropriate supply pressure. Also, provide an input signal to the positioner which can be manually set at the midpoint of the desired input signal range.

Refer to figure 16 for parts locations. Refer to figure 21 for key number locations unless otherwise indicated. Position the flapper assembly by hand to different settings on the beam assembly or by using a screwdriver in the slot of the flapper setting adjustment.

To level the beam, proceed as follows:

Note

In the following steps, if the required rotary shaft arm position cannot be attained when adjusting a pivot point, adjust one of the other pivot points slightly. Then, repeat the original pivot adjustment. Continue this process until the required arm position can be attained.

1. Stroke the actuator to its mid-travel position with a handwheel or a manual loader. Refer to figures 4 and 7. Lift the rotary shaft arm (key 2) so that the 0-degree index marks on the rotary shaft arm align with the case index marks as shown in figure 7. Then, position the travel pin (key 60) so that it is perpendicular to the arm and aligns with the appropriate total actuator travel index mark on the rotary shaft arm. Tighten the locking nut (key 62).

Note

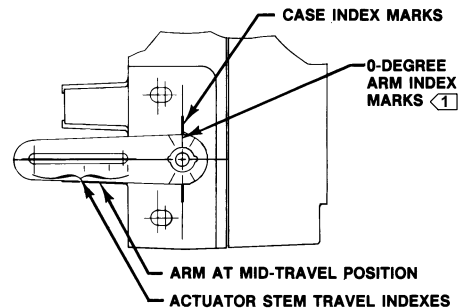
Valve stem travels less than 29 mm (1-1/8 inches) require that the travel pin be set at the 1-1/8 inches travel index mark on the rotary shaft arm.

2. Loosen the nozzle locknut and turn the nozzle clockwise to its lowest position. Then screw the nozzle out (counterclockwise) approximately 2 turns and tighten the locknut.

Note

For proper operation, the flapper must approach the nozzle squarely. Inspect the nozzle/flapper alignment. Be sure the flapper is not loose, bent, or twisted.

3. Remove any loading pressure and/or disengage any handwheel used to position the actuator. Connect the necessary tubing from the valve positioner output to the actuator pressure connection.
4. Connect the input to the valve positioner and set the input signal value at midrange. For example, for a 3582 Series valve positioner with a 0.2 to 1.0 bar (3 to 15 psig) input signal range, set the input signal at 0.6 bar (9 psig). Then apply supply pressure to the valve positioner.
5. Move the flapper assembly to zero on the beam scale. The 0-degree index marks on the rotary shaft arm should align with the case index marks as



NOTE:

1 ALIGN INDEX MARKS AS SHOWN FOR MID-TRAVEL POSITION.

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Figure 17. Rotary Shaft Arm 0-Degree and Case Index Marks, Location and Alignment

shown in figure 17. If not, loosen the follower assembly screw locknut and adjust the follower assembly screw until the 0-degree index marks on the rotary shaft arm align with the case index marks. Tighten the locknut.

6. Move the flapper assembly to position 10 on the direct-acting side of the beam scale. The 0-degree index marks on the rotary shaft arm should align with the case index marks as shown in figure 17. If not, loosen the bellows assembly locknut and adjust the bellows pivot pin until the 0-degree index marks on the rotary shaft arm align with the case index marks. Tighten the locknut.

7. Move the flapper assembly to the left to position 10 on the reverse-acting side of the beam. The 0-degree index marks on the rotary shaft arm should align with the case index marks as shown in figure 17. If not, loosen the beam pivot pin locknut and adjust the beam pivot pin until the 0-degree index marks on the rotary shaft arm align with the case index marks. Tighten the locknut.

8. Repeat steps 5, 6, and 7 to optimize alignment. Recheck to make sure the flapper approaches the nozzle squarely. If it does not, adjust the nozzle and re-level the beam. After alignment, the valve positioner is ready for calibration.

Calibration

1. Shut off the supply pressure to the valve positioner. Connect or reconnect the necessary tubing from the valve positioner output to the actuator supply connection. Connect the input to the valve positioner and set the input signal value at midrange.
2. Move the flapper assembly to approximately position 6 in the proper operating quadrant of the

Table 7. Minimum Travel with Given Pin Position

TRAVEL PIN POSITION ALONG ROTARY SHAFT ARM	MINIMUM TRAVEL AVAILABLE	
	mm	Inch
1-1/8	6	1/4
1-1/2	8	5/16
2	11	7/16
2-1/2	13	1/2
3	16	5/8
4	22	7/8

beam (direct or reverse acting), and apply supply pressure to the valve positioner. The 0 degree index marks on the rotary shaft arm should align with the case index marks as shown in figure 17 and the actuator should be at its midtravel position. If not, first check for loose linkage or improper cam installation. A minor nozzle height adjustment might be necessary to make the desired input signal value correspond to the starting point of travel.

3. Apply an input signal equal to the low value of the input signal range. For example, for a 3582 Series valve positioner with a 0.2 to 1.0 bar (3 to 15 psig) input signal range, set the input signal at 0.2 bar (3 psig). Loosen the nozzle locknut and adjust the nozzle until the actuator moves to the proper end of its travel. Changing the nozzle position is intended only as a means of zero trim adjustment. Whenever nozzle position is changed, the zero reference point is changed.

4. Apply an input signal equal to the high value of the input signal range and observe the actuator stem travel. If the stem travel is short of its expected range, increase the travel by moving the flapper assembly to a higher number on the beam. If the desired stem travel occurs before the input signal reaches the high value of the input signal range, decrease the travel by moving the flapper assembly toward a lower number on the beam.

5. Repeat steps 3 and 4 until the correct travel is achieved. Each time the flapper position is changed in step 4, repeat step 3 to provide proper zero.

Moving the flapper assembly toward zero on the beam scale decreases stem travel. Table 7 lists the minimum stem travel available for different travel pin settings. For example, with a travel pin setting of 2 the minimum stem travel possible, for the full input signal range, would be 11 mm (7/16-inch).

Note

The positioner will fully vent or pressurize the actuator to supply pressure at the ends of actuator travel

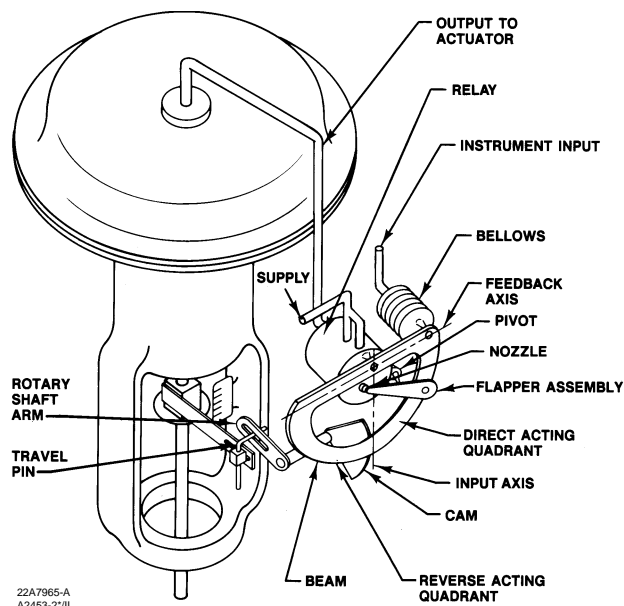


Figure 18. Schematic Illustration of 3582 Series Positioner

when the positioner is calibrated correctly. Failure to properly calibrate the positioner may result in reduced seat loading.

Principle of Operation

3582 Series Valve Positioners

The 3582 Series (the Type 3582, 3582NS and Types 3582A, C, D, and G pneumatic valve positioners) accept a pneumatic input signal from a control device. Figure 18 is an operational schematic for a direct-acting pneumatic valve positioner.

As shown in figure 18, in a diaphragm-actuated, sliding stem control valve package with a 3582 Series valve positioner, supply pressure is connected to the Type 83L relay. A fixed restriction in the relay limits flow to the nozzle so that when the flapper is not restricting the nozzle, air can bleed out faster than it is being supplied.

The input signal from the control device is connected to the bellows. When the input signal increases, the bellows expands and moves the beam. The beam pivots about the input axis moving the flapper closer to the nozzle. The nozzle pressure increases and, through relay action, increases the output pressure to the actuator. The increased output pressure to the

3582 and 3583 Series

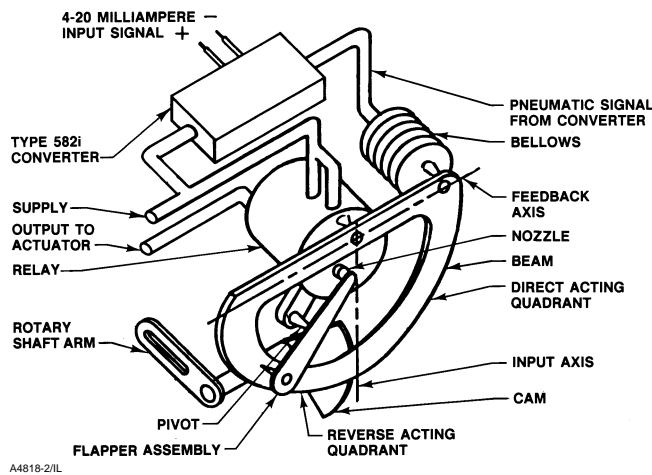


Figure 19. Schematic Illustration of Type 3582i Positioner

actuator causes the actuator stem to move downward. Stem movement is fed back to the beam by means of a cam. As the cam rotates, the beam pivots about the feedback axis to move the flapper slightly away from the nozzle. The nozzle pressure decreases and reduces the output pressure to the actuator. Stem movement continues, backing the flapper away from the nozzle, until equilibrium is reached.

When the input signal decreases, the bellows contracts (aided by an internal range spring) and the beam pivots about the input axis to move the flapper away from the nozzle. Nozzle pressure decreases and the relay permits the release of diaphragm casing pressure to atmosphere. The actuator stem moves upward. Through the cam, stem movement is fed back to the beam to reposition the flapper closer to the nozzle. When equilibrium conditions are obtained, stem movement stops and the flapper is positioned to prevent any further decrease in diaphragm case pressure.

The principle of operation for reverse acting units is similar except that as the input signal increases, the diaphragm casing pressure is decreased. Conversely, a decreasing input signal causes an increase in the pressure to the diaphragm casing.

Type 3582i Valve Positioner

As shown in figure 19, the Type 3582i electro-pneumatic valve positioner has a Type 582i electro-pneumatic converter attached to the valve positioner. The 582i contains an I/P module which provides a pneumatic output proportional to a dc

current input signal. The dc current input operates coils in a force balanced beam system which in turn, control bleed air through an integral nozzle/flapper arrangement. The nozzle pressure provides the pneumatic input signal pressure used by the pneumatic valve positioner.

3583 Series Valve Stem Position Transmitters

3583 Series (Type 3583, 3583C) pneumatic valve stem position transmitters are mechanically linked to the valve stem in a diaphragm-actuated, sliding-stem control valve package. A change in the position of the valve stem changes the output pressure produced by the position transmitter. This signal is then piped to a reporting or recording device to indicate valve stem position.

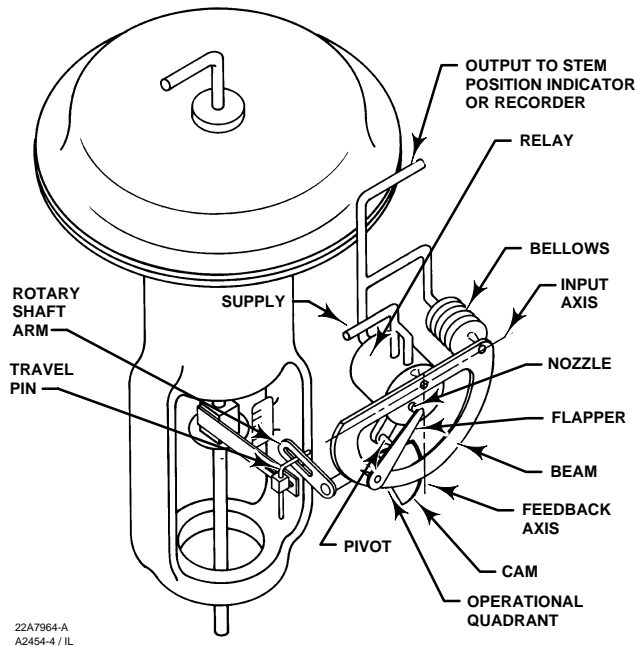
The action of a valve stem position transmitter can be changed by reversing the internal cam. The valve stem position transmitter cam is supplied with an arrow stamped on one side. The cam can be positioned to obtain either increasing or decreasing output pressure with downward stem motion. If the cam arrow points toward the nozzle, the output pressure increases; if the cam points away, the output pressure decreases with downward stem motion.

Figure 20 depicts a diaphragm actuator which produces downward stem motion for increasing actuator pressure. For a stem position transmitter, the flapper assembly is always positioned in the reverse-acting quadrant of the beam. Supply pressure is connected to the Type 83L relay. A fixed restriction in the relay limits flow to the nozzle so that when the flapper is not restricting the nozzle, air can bleed out faster than it is being supplied.

As the pressure to the diaphragm actuator increases, the valve stem moves downward, causing the internal cam to rotate. Cam rotation causes the beam to pivot about the input axis moving the flapper closer to the nozzle. The nozzle pressure increases which, through relay action, increases the output pressure.

The output pressure is also connected to the bellows. As the output pressure increases, the bellows expands, causing the beam to pivot about the feedback axis moving the flapper slightly away from the nozzle until equilibrium is reached. The position transmitter output pressure is now proportional to the valve stem position.

As the pressure to the diaphragm actuator decreases, the valve stem moves upward, causing



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Figure 20. Schematic Illustration of 3583 Series Transmitter

the internal cam to rotate. Cam rotation causes the beam to pivot about the input axis moving the flapper away from the nozzle. The nozzle pressure decreases which, through relay action, decreases the output pressure. The bellows contracts, causing the beam to pivot about the feedback axis and moving the flapper closer to the nozzle until equilibrium is reached. The position transmitter output pressure is again proportional to the valve stem position.

Maintenance



WARNING

Avoid personal injury from sudden release of process pressure. Before performing any maintenance 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.

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

For explosion proof applications, disconnect power before removing the converter housing cap in an explosive atmosphere.

Due to normal wear or damage from external sources (such as debris in the supply medium), periodic maintenance or repair of the valve positioner or valve stem position transmitter may be necessary. Maintenance of these units consists of troubleshooting, removal for inspection, and replacement of component parts.

CAUTION

When replacing components, use only components specified by Fisher Controls. Substitution with other components may result in the positioner or transmitter no longer meeting safety certification requirements. Also, always use proper component replacement techniques. Improper techniques and poor quality repairs can impair the safety features of the device.

In case of operational difficulties, the valve positioner or valve stem position transmitter should first be checked to see that adjustments have been properly made. All pressure lines and connections should be checked for leaks.

The pneumatic relay and gaskets should also be inspected and replaced if necessary.

Instructions are given below for:

- changing the range spring;
- replacing gaskets, nozzle O-rings, and the relay;
- adjusting the flapper pivot;
- replacing the Type 582i converter primary O-ring and filter;

3582 and 3583 Series

- replacing the Type 582i converter cover O-ring;
- removing the Type 582i converter; and
- reassembling the Type 582i converter.

Changing the Range Spring

Unless otherwise noted, key number locations are shown in figure 21.

The range spring is inside the bellows assembly. Standard range spring data is given in table 5. When an input signal range is split to operate two or more control valves, normally changing the range spring is not necessary. The input signal range for the range spring is stamped on the nameplate.

Perform the following procedure to change the range spring in a valve positioner or valve stem position transmitter.

1. Unhook the extension springs (keys 27, 77) from the beam (key 29).
2. Loosen and remove the two screws (key 13), and lock washers (key 12) that hold the bellows assembly (key 7) in place.
3. Lift out the beam and bellows assembly. Be careful not to lose the small O-ring (key 11).
4. Loosen the machine screw (key 10), and remove the range spring (key 8).
5. Install a new range spring, making sure the small end of the spring is against the spring seat (key 9). Replace the spring seat and tighten the screw.
6. If the O-ring (key 11) is worn or damaged, replace it with a new one after applying lubricant (key 94). Make sure the O-ring is in place, then install the bellows assembly, securing it with two mounting screws and lock washers.
7. Install the beam over the pivots and hook the springs to the beam.
8. Make any minor adjustments that may be necessary to re-level the beam as outlined in the beam alignment procedures of the valve positioners or the valve stem position transmitters calibration section. After leveling the beam, calibrate the unit according to the appropriate calibration instructions.

Replacing Gaskets

Unless otherwise noted, key numbers used in this procedure are shown in figures 25 and 26.

A gasket (key 34C) is located behind the bypass handle (key 34D) of the 3582 Series valve positioners or manifold (key 34D) of the 3583 Series valve stem position transmitters.

1. Remove the screw (key 34G), and lift out the bypass handle or manifold.
2. Remove the gasket.
3. Apply lubricant (key 94) to both sides of the replacement gasket when used with the bypass assembly of the 3582 Series valve positioners. Do not apply lubricant to the gasket when the bypass assembly is not used.
4. Set the new gasket in place on the four locating pins and replace the bypass handle or manifold.

The case gasket (key 104) is located between the case (key 1 in figure 21) and the bypass block (key 34A) in a 3582 Series valve positioner or a 3583 Series valve stem position transmitter or the housing of the Type 582i converter (key 1 in figure 27).

5. Remove the two mounting screws (key 105 in figures 25 and 26; key 11 in figure 27) that hold the bypass block or converter housing to the case and remove the unit to expose the case gasket.
6. Install a new gasket and replace the bypass block or converter housing.

Replacing the Nozzle O-Ring

Unless otherwise noted, key numbers are shown in figures 22 and 24.

1. Remove the two screws (key 19C) that hold the flapper and follower assembly (keys 19B and 19G) to the adjustment arm (key 19A).

CAUTION

For proper operation, be careful not to bend or twist the flapper or nick the nozzle orifice during reassembly.

2. Carefully remove the flapper and follower assembly for access to the nozzle (key 18 in figure 21).
3. Loosen the locking nut (key 71), and unscrew the nozzle (key 18).

4. Remove the locking sleeve (key 72) from the nozzle adaptor (key 3). The nozzle adaptor is bonded to the positioner case with adhesive (key 96) and should not be removed.
5. Inspect the O-ring (key 73) on the nozzle adapter and replace the O-ring, if necessary. If replacing the O-ring, apply lubricant (key 94) to the O-ring before installing it on the nozzle adapter.
6. Reinstall the nozzle onto the nozzle adapter, leaving the locking nut loose.
7. Replace the flapper and follower assembly. Make sure the letter "T" on the flapper is visible from the front of the positioner or transmitter.
8. Perform the beam alignment and calibration procedures in the Calibration of Valve Positioner or Valve Stem Position Transmitter section.

Replacing the Relay

Note

The relay is not field repairable. If the relay is defective, replace the relay.

Use the following procedure to replace the relay assembly. Refer to figure 21 for key number locations, unless otherwise noted.

1. For valve positioners using a bypass, direct action, and a full-range input signal, place the positioner in bypass operation by moving the bypass handle to BYPASS. Then, shut off the supply pressure. For all other valve positioners and valve stem position transmitters, isolate the control valve from the system and shut off all pressure lines.

Note

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

2. Remove the Type 83L relay (key 32) from the back of the case by loosening the two mounting screws (key 10, figure 23).
3. Reinstall the new relay assembly on the case, making sure the O-rings (keys 13 and 15, figure 23) are in place. Secure with the two mounting screws (key 10, figure 23).
4. Resume operation by moving the bypass handle to the POSITIONER position or by connecting the

valve positioner or valve stem position transmitter and control valve to the system.

Adjusting the Flapper Pivot

Key numbers used in this procedure are shown in figure 24.

1. Loosen the two screws (key 19C).
2. Tighten the pivot pin (key 19L) by compressing the upturned ears of the arm support (key 19K). Tighten the screws (key 19C) and make sure the flapper (key 19B) does not rub on the supports.
3. The flapper should be snug, but not constricting to pivot action.

Replacing the Type 582i Converter Primary O-Ring and Filter

Key numbers used in this procedure are shown in figure 27.

1. Locate and remove the nozzle restriction adaptor assembly (key 4).
2. Inspect and replace, if necessary, the O-rings (keys 5 and 6). Apply lubricant (key 15) to the O-ring before replacing.
3. Inspect and replace the filter cartridge (key 23).

Replacing the Type 582i Converter Housing Cap O-Ring

Key numbers used in this procedure are shown in figure 27.

1. Unscrew and remove the converter housing cap (key 2). Inspect and replace the O-ring (key 8), if necessary. Apply lubricant (key 15) to the O-ring before replacing.

Removing the Type 582i Converter

During the following converter removal procedures, refer to figure 27 for key number locations.

CAUTION

The I/P module should never be disassembled because the magnetism in the coils will decrease permanently. If troubleshooting or alignment attempts indicate a faulty I/P module,

replace the module or return the converter to your Fisher sales representative or sales office for repair.

Note

To check the operation of the I/P module, remove the pipe plug (key 12), and connect a pressure gauge. Provide a 1.4 bar (20 psig) supply pressure to the converter. With a 4-milliampere input signal the pressure output should read 0.16 to 0.24 bar (2.3 to 3.5 psig). With a 20-milliampere input signal the pressure output should read 0.96 to 1.07 bar (14.0 to 15.5 psig).

1. Turn off the input signal to the converter. Release all supply pressure from the valve positioner.
2. Remove the housing cap (key 2).
3. Note the location of the wires, disconnect the field wiring from the terminal block. Disconnect the grounding wire from the external ground screw (key 10).
4. To remove the I/P module, remove the two screws (key 9), and pull the module out of the housing. Inspect the O-ring (key 6) and replace it, if necessary. Apply lubricant (key 15) to the O-ring before replacing.
 - a. To remove the entire Type 582i converter from the Type 3582i valve positioner, continue with steps 5 through 7.
 - b. To replace the I/P module only, obtain a replacement I/P module listed in the parts list and refer to the procedures for reassembling the Type 582i converter.
5. Disconnect the supply tubing, output tubing, and electrical conduit from the converter.
6. If necessary, remove the Type 67CFR regulator by removing the two screws (key 13). Then, remove the regulator from the converter assembly. Inspect the O-ring (key 3) and replace it if necessary. Apply lubricant (key 15) to the O-ring before replacing.
7. Remove the two screws (key 11) holding the Type 582i converter to the valve positioner case. Remove the converter from the valve positioner case (key 1 in figure 21). Inspect the gasket (key 20) and replace it if necessary.

Reassembling the Type 582i Converter

During the following converter reassembly procedures, refer to figure 27 for key number locations.

1. If the Type 582i converter was removed from the valve positioner, install a new gasket (key 20) between the converter housing and the valve positioner case. Attach the converter housing to the valve positioner case with the screws (key 11) and tighten the screws.
2. If the I/P module was removed from the Type 582i converter, reinstall the I/P module in the converter housing. Secure the I/P module with the two screws (key 9).
3. If other valve positioner components are removed, refer to the appropriate reassembly procedures and assemble the valve positioner completely.
4. Reconnect the supply tubing, output tubing, and conduit to the valve positioner.
5. Reconnect the wiring to the terminal block. Do not overtighten the terminal screws. Maximum torque is 0.45 N•m (4 lbf•in.). Reconnect the grounding wire to the housing ground screw (key 10) and replace the cap (key 2).

Note

To check the operation of the I/P module, remove the pipe plug (key 12), and connect a pressure gauge. Provide a 1.4 bar (20 psig) supply pressure to the converter. With a 4-milliampere input signal the pressure output should read 0.16 to 0.24 bar (2.3 to 3.5 psig). With a 20-milliampere input signal the pressure output should read 0.96 to 1.07 bar (14.0 to 15.5 psig).

6. Plug the output connection and apply 2.4 bar (35 psig) to the supply pressure connection.

CAUTION

Do not apply a signal greater than 35 milliamperes to the I/P module. Higher signal values may damage the converter module.

7. Apply a 20 milliampere dc current input signal to the converter.

8. Check for leaks using a soap solution. Check any components which were disassembled or disconnected.

Parts Ordering

A serial number is assigned to each valve positioner or valve stem position transmitter and is stamped on the nameplate. Always refer to this number when corresponding with your Fisher representative regarding spare parts or technical information. When ordering parts, also give the eleven-digit part number shown in the following parts list.

Parts Kits

Key	Description	Part Number
	Repair kit for positioner/transmitter (not for 3582NS)	
	Kit contains keys 11, 16, 17, 33B, 34C, 73, and 104.	
	This kit also contains keys 18C, 18E, and 18F for 3580 and 3581 Series positioners	
	For standard temperature applications	R3580X00022
	For high temperature applications	R3580X00032
	Repair kit w/nozzle and flapper for Type 3582 Positioner	
	Kit contains keys 11, 16, 17, 18, 19B, 19E, 33B, 34C, 73, and 104.	
	For standard temperature applications, not for 3582NS	R3582X00012
	For high temperature applications, not for 3582NS	R3582X00022
	For Type 3582NS, contains EPDM parts	R3582X00032
	Repair kit for Type 582i electro-pneumatic converter	
	Kit contains keys 3, 5, 6, 8, 20, and 23	R582X000012
	Replacement kit for Type 83L Relay	
	Kit contains relay, gaskets and mounting screws (key 32 in figure 21, keys 10, 13, and 15 in figure 23)	
	For 3582 Series except 3582NS, std. const.	R3580XRS012
	For 3582 Series except 3582NS, hi-temp. const.	R3580XRH012
	For 3582NS	R3580XNS012
	For 3583 Series, std. const.	R3580XRS022
	For 3583 Series, hi-temp. const.	32B0255X0E2

Parts List

Note

Parts in the following list are common to both the 3582 Series valve positioners and the 3583 Series position transmitters, unless identified by specific type or series number.

Diagnostic Connections (figure 9)

FlowScanner™ valve diagnostics system hook-up.

Includes connector body and body protector. If ordered for units with gauges, a stem is also included. Also, part number provides correct quantities of each item.

Key	Description	Part Number
	For 3582 Series pneumatic valve positioners	
	For units w/gauges	
	SST fittings	12B8045 X012
	brass fittings	12B8045 X022
	For units w/o gauges	
	SST fittings	12B8045 X032
	brass fittings	12B8045 X042
	For 3582i electro-pneumatic valve positioners	
	For units w/gauges	
	SST fittings	12B8046 X012
	brass fittings	12B8046 X022
	For units w/o gauges	
	SST fittings	12B8046 X032
	brass fittings	12B8046 X042

Positioner/Transmitter Common Parts (figure 21)

Key	Description	Part Number
1	Case Assembly	
	All except Type 3582NS, Aluminum and PEEK	19B3103 X012
	Type 3582NS, SST/Bronze	13B8769 X022
2*	Shaft Assembly, SST/steel	
	For all except 3582NS and high vibration	
	For travel up to 54 mm (2-1/8 inch)	15A9609 X012
	For travel up to 102 mm (4-inch)	15A9609 X022
	For 3582NS and high vibration	
	For travel up to 54 mm (2-1/8 inch)	15A9609 X062
	For travel up to 102 mm (4-inch)	15A9609 X072
3	Nozzle Adaptor, SST	12A2613 X012
4	Cam, SST	
	Cam A (For all types except 3582NS)	45A9614 X012
	Cam B	
	(For all except Types 3582NS, 3583, 3583C)	45A9615 X012
	Cam C	
	(For all except Types 3582NS, 3583, 3583C)	45A9616 X012
4	Cam (for Type 3582NS and high vibration)	
	Cam A (for all types)	12B3642 X012
	Cam B (For all except Types 3583, 3583C)	12B3643 X012
	Cam C (For all except Types 3583, 3583C)	12B3644 X012
6	Cam Bolt, 416 SST	12A2616 X012
7*	Bellows Assembly	
	Standard brass	13B8783 X012
	For sour gas	13B8783 X022
8	Range Spring, pl steel (also see table 5)	
	0.2 to 1.0 bar (3 to 15 psi)	1V6217 27012
	0.4 to 2.0 bar (6 to 30 psi)	1V6219 27012
9	Spring Seat, aluminum	12A7355 X012
10	Machine Screw, pl steel	T13305 T0012

3582 and 3583 Series

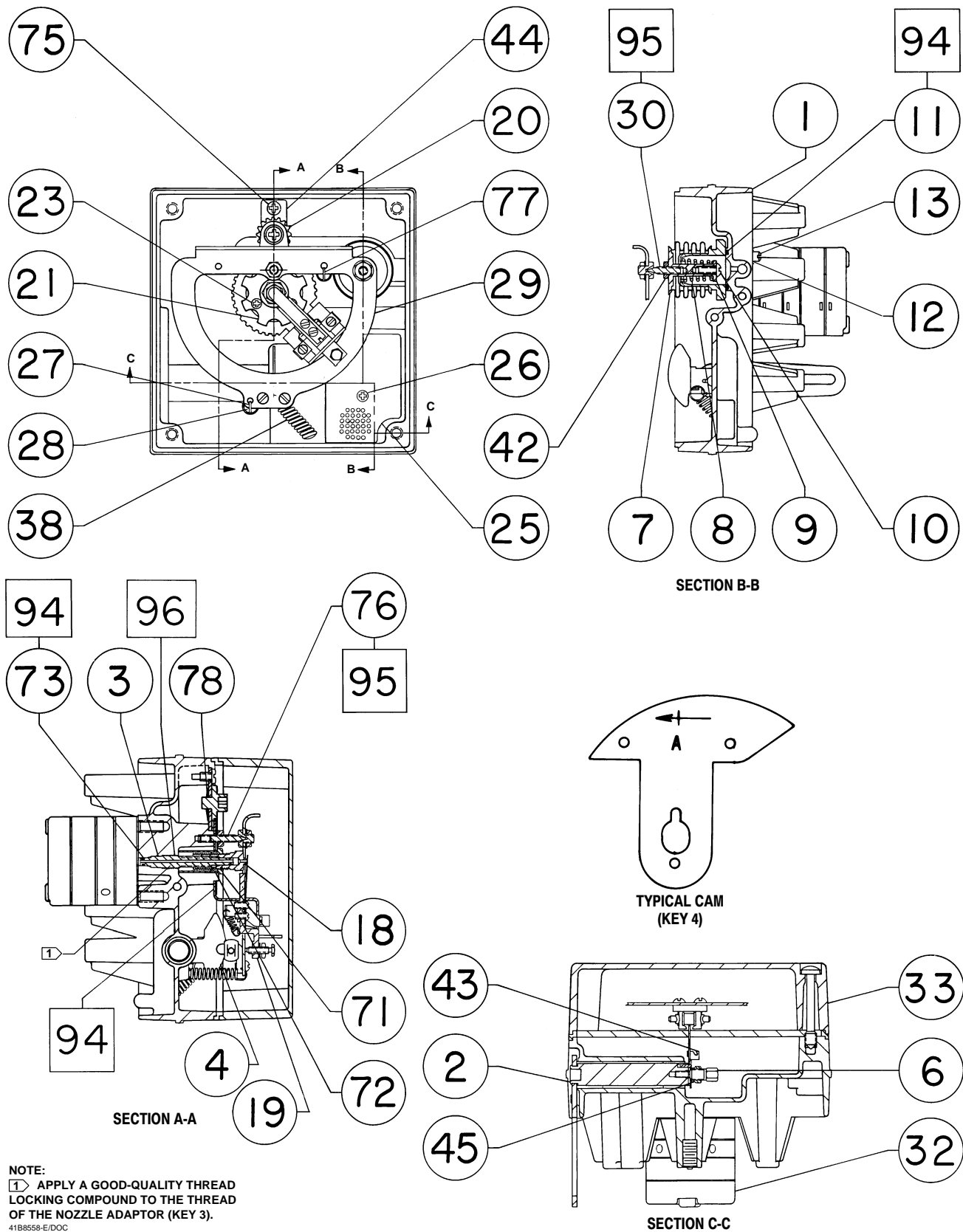


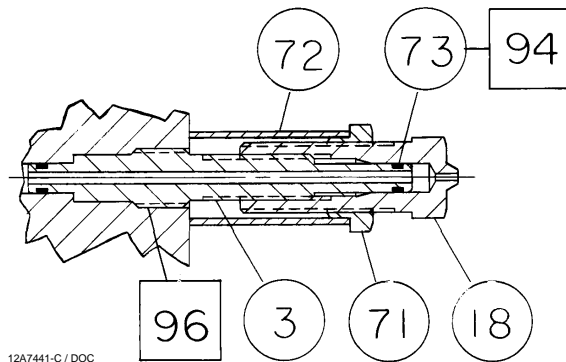
Figure 21. 3582 and 3583 Series Positioners and Transmitters Assembly Drawing

Instruction Manual

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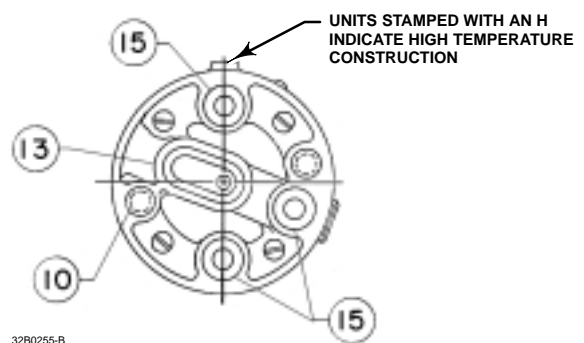
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3582 and 3583 Series



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Figure 22. Nozzle Sub-Assembly



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Figure 23. Type 83L Relay

Key	Description	Part Number
11*	O-Ring	
	Std. const., Nitrile	
	All except Type 3582NS	1F4636 06992
	Hi-temp. const., Fluoroelastomer	
	Types 3582A, 3582C & 3583C	1N5714 06382
	Type 3582NS, EPDM Duro 80A	17B4784 X012
12	Lockwasher, pl steel (2 req'd)	1H3223 28982
13	Machine Screw, pl steel (2 req'd)	12B6351 X012
18	Nozzle, SST	
	3582 Series	12A9840 X012
	3583 Series	12A9841 X012
19	Flapper Sub-Assembly	
	All except Type 3582NS	13A1451 X012
	Type 3582NS	13A1451 X022

Note

Parts 19A through 19L are shown in figure 24.

19A	Adjustment Arm, pl steel	2V6066 25182
19B	Flapper, SST	13A1314 X012
19C	Machine Screw, pl steel (2 req'd)	14A7797 X012
19D	Flapper Arm, aluminum	23A1318 X012
19E	Machine Screw, pl steel (2 req'd)	13B8786 X012
19F	Flapper Spring, SST	13A1316 X012
19G	Zero Adjustment Screw,	
	All except Type 3582NS 416 SST/nylon	13B8777 X012
	Type 3582NS, 316 SST	17B4786 X012
19H	Hex Nut, pl steel	1A3303 28982
19J	Lockwasher, pl steel	1H2671 28982
19K	Arm Support, SST	13A1315 X012
19L	Pivot Pin, 440C SST	13A1317 X012
20	Setting Adjustment Gear,	
	All except Type 3582NS, nylon	2U9052 06162
	Type 3582NS, 316 SST	27B4787 X012
21	Flapper Assembly Retainer, SST	2U9053 36012
23	Self Tapping Screw, pl steel (2 req'd)	13B8764 X012
25	Nameplate, aluminum	13B8758 X0A2
26	Self Tapping Screw, steel (2 req'd)	13B8764 X012
27	Extension Spring, SST	14A8214 X022
28	Machine Screw, pl steel (3 req'd)	13B8765 X012
29	Beam Sub-Assembly	
	For all except 3582NS and high vibration	19B3119 X012
	For 3582NS and high vibration	22B3645 X012
30	Bellows Pivot Pin, SST	12A7357 X012
32	Type 83L Relay	
	See "Parts Kits," Replacement Kit for Type 83L Relay	

Key	Description	Part Number
33	Cover Assembly	
	Plastic	
	For all types except 3582NS	22B4905 X012
	Aluminum	
	For all types except 3583, 3583C	1U9065 000A2
	For 3583 and 3583C	1U9065 X00A2

Note

Bypass block assembly (key 34) and parts are listed later in this parts list. Non-bypass block assembly (also key 34) and parts are listed following the bypass block assembly and parts.

Parts 35, 36 and 37 are shown in figures 25 and 26.

35	Pipe Plug, pl steel	
	Req'd when gauges or test connections are not used:	
	3 req'd for 3582 Series,	
	Plated carbon steel	1D8293 28982
	316 SST	1D8293 X0012
36*	Output Gauge, Dual Scale	
	Types 3582, 3582G, 3583	
	0-30 psig/0-2 kg/cm ²	11B4040 X042
	0-60 psig/0-4 kg/cm ²	11B4040 X052
36*	Output Gauge, Triple Scale	
	Types 3582, 3582G, 3583	
	0-30 psig/0-0.2 MPa/0-2 bar	11B4040 X012
	0-60 psig/0-0.4 MPa/0-4 bar	11B4040 X022
37*	Supply Gauge, Dual Scale	
	Types 3582, 3582G, 3583	
	0-30 psig/0-2 kg/cm ²	11B4040 X042
	0-60 psig/0-4 kg/cm ²	11B4040 X052
37*	Supply Gauge, Triple Scale	
	Types 3582, 3582G, 3583	
	0-30 psig/0-0.2 MPa/0-2 bar	11B4040 X012
	0-60 psig/0-0.4 MPa/0-4 bar	11B4040 X022
38	Extension Spring, SST	12A2937 X022
39	Shipping Stop (not shown)	1V4517 06992
42	Hex Nut, pl steel (2 req'd)	1A5735 28982
43	Spring Retainer Bracket, SST	25A9611 X012
44	Gear Mounting Plate, aluminum	12A2611 X012
45	Locking Nut, aluminum	12A2618 X012

Key	Description	Part Number
Note		
Parts 46 and 47 are shown in figures 25 and 26.		
46*	Instrument Gauge, Dual Scale 0–30 psig/0–2 kg/cm ² (3–15 psig/0.2–1.0 kg/cm ² ranges) 0–60 psig/0–4 kg/cm ² (6–30 psig/0.4–2.0 kg/cm ² ranges)	11B4040 X042 11B4040 X052
46*	Instrument Gauge, Triple Scale 0–30 psig/0–0.2 MPa/0–2 bar (3–15 psig/20–100 kPa/0.2–1 bar ranges) 0–60 psig/0–0.4 MPa/0–4 bar (6–30 psig/40–200 kPa/0.4–2 bar ranges)	11B4040 X012 11B4040 X022
47	Test Connection Types 3582C, 3582D (3 req'd) Type 3583C (2 req'd) Type 3582NS (3 req'd)	1N9088 99012 17B4809 X012
71	Locking Nut, aluminum	12A2615 X012
72	Locking Sleeve, aluminum	12A2619 X012
73*	O-Ring (2 req'd) Std. const., Nitrile All except Type 3582NS Hi-temp. const., Fluoroelastomer Types 3582A, 3582C & 3583C Type 3582NS, EPDM	10A0871 X012 14A0592 X012 17B4783 X012
75	Machine Screw, pl steel	13B8763 X012
76	Beam Pivot Pin, SST	12A7358 X012
77	Extension Spring, SST	14A8215 X022
78	Speed Nut, SST	12A0801 X012
93	Anti-seize Compound, Zink Plate No. 770 (not furnished with positioner)	
94	Lubricant, Dow Corning 111 (not furnished with positioner)	
95	Lubricant, All except Type 3582NS Lubriplate MAG-1 (not furnished with positioner) Type 3582NS, Molykote No. 33 (not furnished with positioner)	
96	Adhesive, Loctite No. 680 (not furnished with positioner)	

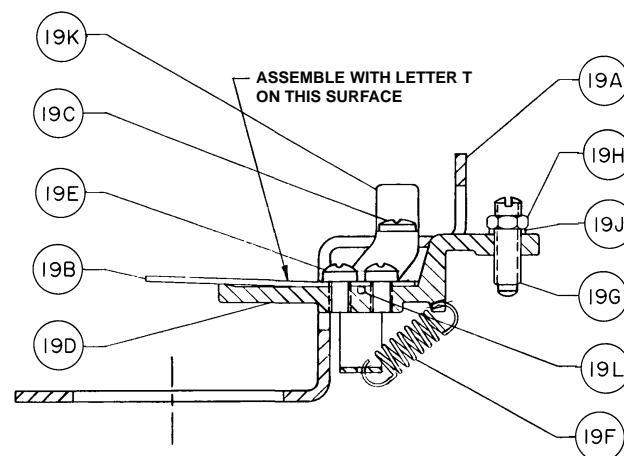
Note**Parts 104 and 105 shown in figures 25 and 26.**

103*	O-Ring, nitrile, (not shown) used with integrally mounted Type 67CFR filter regulator	1E5914 06992
104*	Case Gasket, Std. const. Hi-temp. const. Type 3582NS, EPDM	1U9078 04132 1U9078 X0012 17B4782 X012
105	Machine Screw, SST (2 req'd)	12B0909 X012
108	Shipping tag (not shown)	1N5864 06992

For Units With Bypass (figure 25)**Note**

Bypass block assembly (key 34) and parts are listed below. Non-bypass block assembly (also key 34) and parts are listed following the bypass block assembly and parts.

34	Block Assembly Types 3582, 3582D Type 3582NS	21B8557 X012 21B8557 X032
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**Figure 24. Flapper Sub-Assembly (Key 19)**

Key	Description	Part Number
34A	Bypass Block, aluminum	41B5987 X012
34B	Groove-Pin, pl steel (not shown) (4 req'd)	1L9428 28992
34C*	Bypass Gasket Types 3582, 3582D, neoprene Type 3582NS, EPDM	1V6062 04132 17B4780 X012
34D	Bypass Handle, aluminum	2V6071 08012
34E	Spring, pl steel	1V6063 X0022
34F	Washer, polyethylene	1V6061 06992
34G	Screw, pl steel	1V6058 24642
34K	Spring Seat, SST	1V6060 35032
34L	Spring Retainer, pl steel	1V6059 25072

For Units Without Bypass (figure 26)

34	Non-Bypass Block Assembly Std. const. Types 3582A, 3582C, 3582G Types 3583, 3582C Hi-temp. const. Types 3582A, 3582C Type 3583C Type 3582NS	21B8555 X012 21B8554 X012 21B8555 X022 21B8554 X022 21B8555 X052
34A	Bypass Block, aluminum	41B5987 X012
34C*	Gasket Std. const., neoprene Hi-temp. const. Type 3582NS, EPDM	1V6062 04132 1V6062 X0012 17B4780 X012
34D	Manifold 3582 Series, std. and hi-temp. const. 3583 Series, std. and hi-temp. const.	1V9429 08012 10A0746 X012
34G	Cap Screw, pl steel	1J5241 28982
106	Pipe Plug, pl steel For Types 3583 & 3583C (2 req'd)	1A7675 24662

Type 582i (figure 27)

—*	I/P Module	33B7073 X012
1	Housing 1/2-inch NPT conduit connection	22B0901 X012
2	Cap, aluminum	37B7575 X012
—	Screw, (not shown) Used to lock cap	11B8574 X012

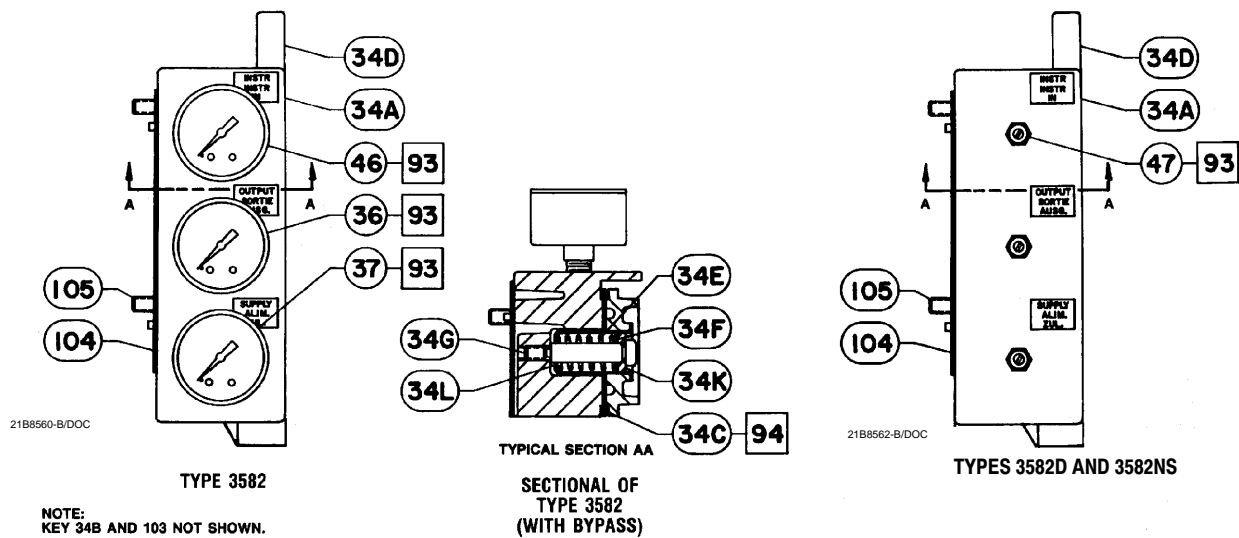


Figure 25. 3582 Series Block Assembly with Bypass

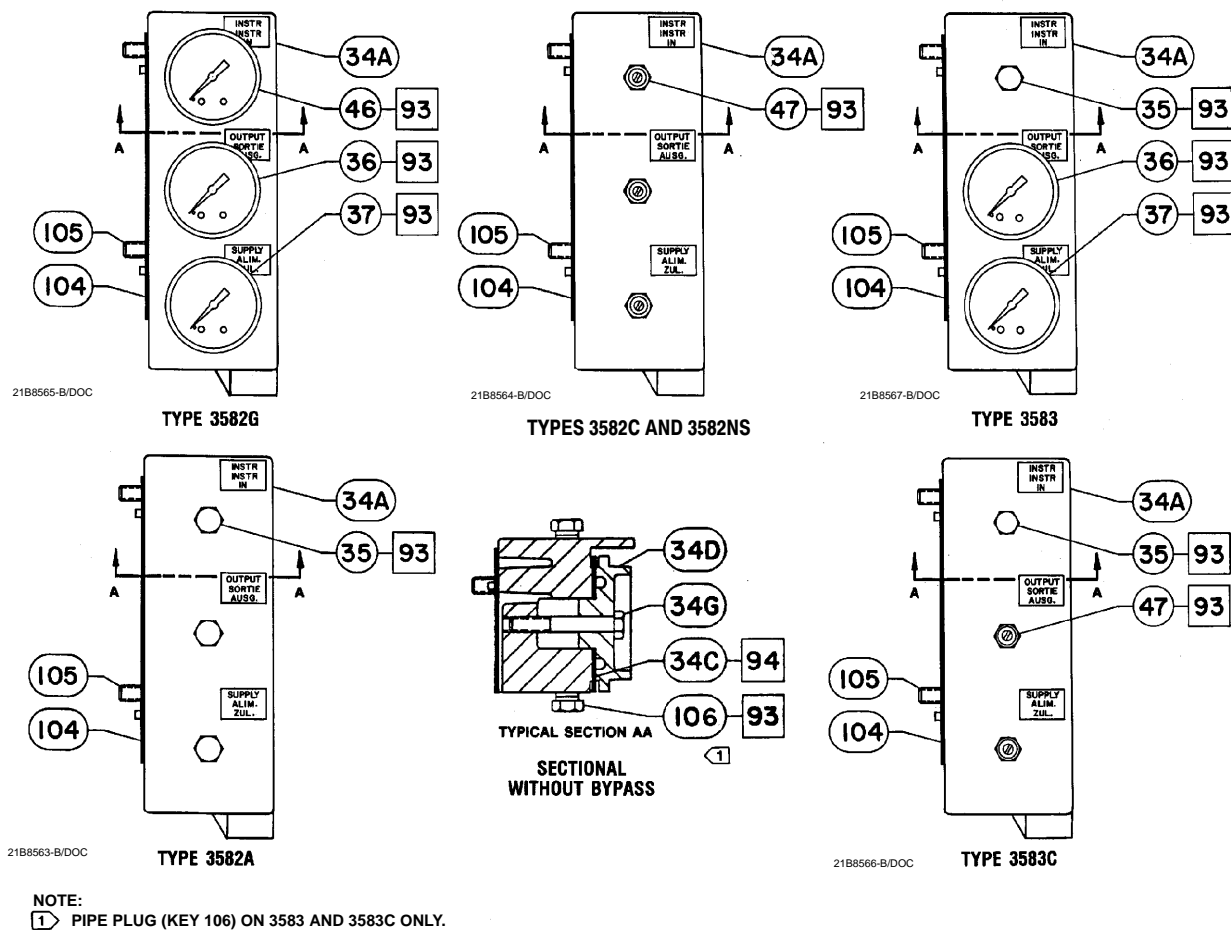


Figure 26. 3582 and 3583 Series Block Assemblies without Bypass

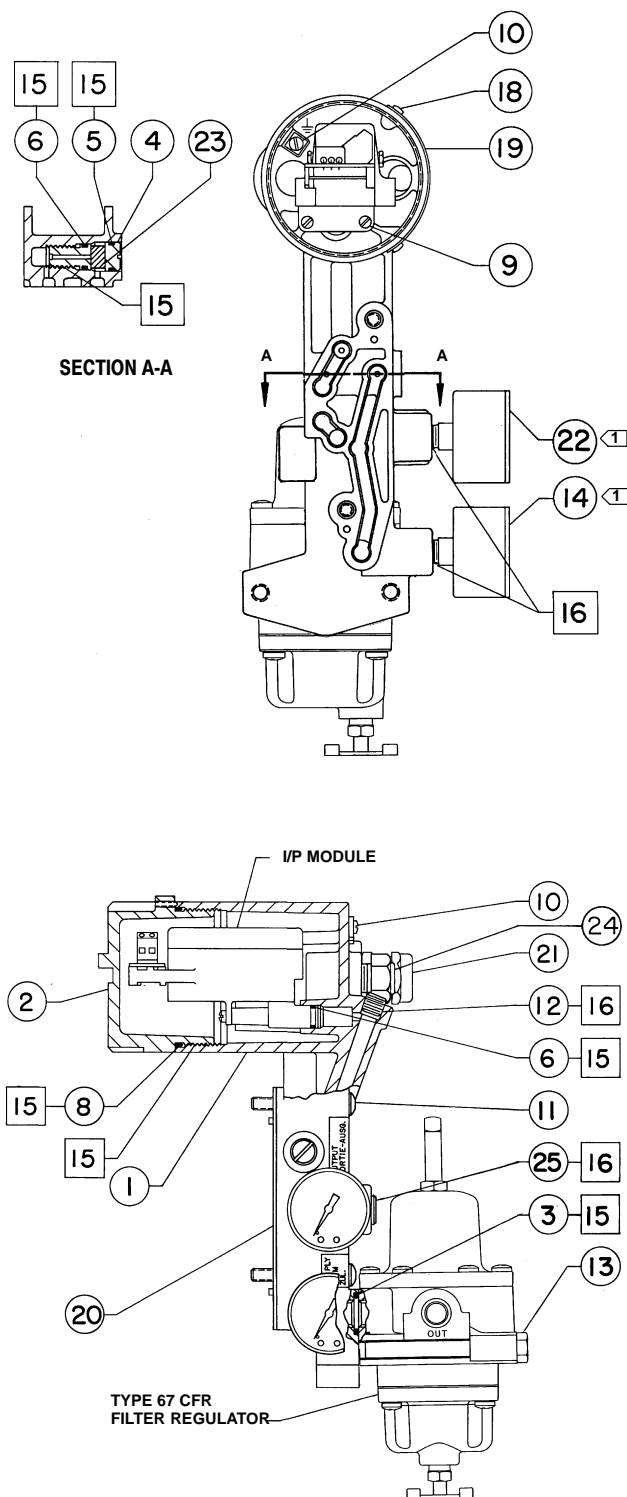


Figure 27. Type 582i Converter

Key	Description	Part Number
3*	O-Ring, nitrile, used with integrally-mounted Type 67CFR filter regulator	1E5914 06992
4	Nozzle Restriction Assembly, Aluminum/Brass/SST	13B7116 X022
5*	O-Ring, Nitrile	1P4207 06992
6*	O-Ring, Nitrile (2 req'd)	1C8538 X0022
7	Tire Valve (not shown) (2 req'd w/tire valve option)	1N9088 99012
8*	O-Ring, Nitrile	1H8762 X0012
9	Machine Screw, 304 SST (2 req'd)	1A9021 X0012
10	Wire Retaining Screw (2 req'd)	16A2821 X012
11	Machine Screw, SST (2 req'd)	12B0909 X012
12	Pipe Plug, steel (2 req'd w/pipe plug option)	1E8231 28982
13	Screw, pl steel, used with integrally-mounted Type 67CFR filter/regulator (2 req'd)	T14109 T0012
14*	Supply Gauge, Dual Scale 0-30 psig/0-2 kg/cm ² 0-60 psig/0-4 kg/cm ²	11B4040 X042 11B4040 X052
14*	Supply Gauge, Triple Scale 0-30 psig/0-0.2 MPa/0-2 bar 0-60 psig/0-0.4 MPa/0-4 bar	11B4040 X012 11B4040 X022
15	Lubricant, Lubriplate MAG-1 (not furnished with positioner)	
16	Anti-seize compound, Zink Plate No. 770 (not furnished with positioner)	
18	Self-Tapping Screw, SST (2 req'd)	1P4269 28982
19	Nameplate, SST, without 3rd party approvals	11B5625 X0A2
20*	Case Gasket, cork	1U9078 04132
21	Cable Gland, plastic, for use with M20 housing	12B0908 F022
22*	Output Gauge, Dual Scale 0-30 psig/0-2 kg/cm ² 0-60 psig/0-4 kg/cm ²	11B4040 X042 11B4040 X052
22*	Output Gauge, Triple Scale 0-30 psig/0-0.2 MPa/0-2 bar 0-60 psig/0-0.4 MPa/0-4 bar	11B4040 X012 11B4040 X022
23*	Filter	11B5996 X012
24	Vent Assembly	11B8279 X012
25	Pipe Plug (required when a Type 582i is used without an integrally-mounted Type 67CFR filter/regulator)	1C3335 28992 1C3335 X0012

Mounting Parts

For Mounting 3582, 3582i, or 3583 Only (figure 3)

Note

Part 48 also shown in figure 28.

48	Connector Arm, pl steel	
	Type 478 (Type 3583 only)	
	Size 40	30A4897 X012
	Sizes 46 & 60	3V4796 25212
	Type 513	
	Size 20	2V6722 25212
	Size 32	2U9099 25212

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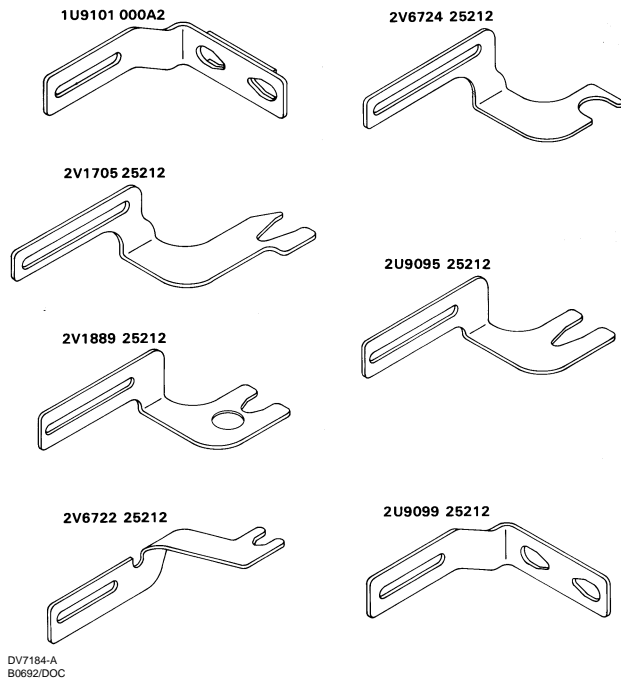


Figure 28. Connector Arm (Key 48)

Key	Description	Part Number
48	Connector Arm, pl steel (cont'd)	
	Type 650	
	Size 30	20A5177 X012
	Size 40	10A4870 X012
	Size 60	10A4871 X012
	Type 656	
	Sizes 30, 40, & 60	2V1705 25212
	Types 657 or 667	
	W/o side-mtd. h'wheel	
	Sizes 30 & 34	1U9101 000A2
	Sizes 40 thru 100	2U9099 25212
	W/side-mtd. h'wheel	
	Size 34	2V1889 25212
	Sizes 40, 50, & 60	2U9095 25212
	Size 45 & 46	2V1705 25212
	Sizes 70 thru 100	2U9099 25212
	Type 657NS or 667NS	
	Size 40	25A8816 X012
	Size 45	26A9366 X012
	Size 70	25A8824 X012
	Size 80	25A8822 X012
	Type 657-4, 667-4	2U9099 25212
	Type 657-8	
	Sizes 30 & 34	2V1889 25212
	Sizes 40 thru 70	2V6724 25212
	Type 1250 or 1250R	
	Sizes 225 & 450	39A7853 X012
	Size 675	30B7285 X012
	For Competitor's Actuators	
	3/8 to 3/4 stem	2U9095 25212
49	Washer, pl steel	
	Type 478 (none req'd)	---

Key	Description	Part Number
49	Washer, pl steel (cont'd)	
	Type 513	
	Size 20	
	6.4 mm (1/4 inch) stem (none req'd)	---
	7.9 mm (5/16 inch) stem (1 req'd)	1B8659 28982
	9.5 mm (3/8 inch) stem (1 req'd)	1E7941 28992
	Size 32 (2 req'd)	1D7162 28982
	Type 650 (2 req'd)	
	Size 30	1B8659 28982
	Size 40	1K8995 25072
	Size 60	1P5057 25072
	Type 656	
	Sizes 30, 40, & 60	
	12.7 mm (1/2 inch) stem (1 req'd)	1K8995 25072
	19.1 mm (3/4 inch) stem (none req'd)	---
	Type 657	
	W/o side-mtd. h'wheel	
	Sizes 30, 34, & 40 (2 req'd)	1D7162 28982
	Size 45 thru 70, & 100 (2 req'd)	1H7231 25072
	Sizes 80 & 87 (2 req'd)	1K8995 25072
	W/side-mtd. h'wheel	
	Size 34 thru 60 (none req'd)	---
	Size 70 (2 req'd)	
	up to 76 mm (3-inch) travel	1K8995 25072
	78 to 102 mm (3-1/16 to 4-inch) travel	1H7231 25072
	Sizes 80 & 87 (2 req'd)	1K8995 25072
	Size 100 (2 req'd)	1H7231 25072
	Type 657-4 (2 req'd)	
	W/o side-mtd. h'wheel	
	Size 70	1H7231 25072
	W/side-mtd. h'wheel	
	Size 70	1H7231 25072
	Size 87	1K8995 25072
	Type 657-8	
	Sizes 30 & 34 (2 req'd)	1K8995 25072
	Sizes 40 thru 70 (none req'd)	---
	Type 667	
	W/o side-mtd. h'wheel	
	Sizes 30, 34, & 40 (2 req'd)	1D7162 28982
	Size 45 thru 70, & 100 (2 req'd)	1H7231 25072
	Size 80 (2 req'd)	1K8995 25072
	Size 87	
	up to 51 mm (2-inch) travel	1K8995 25072
	52 to 76 mm (2-1/16 to 3-inch) travel	1H7231 25072
	78 to 102 mm (3-1/16 to 4-inch) travel	1K8995 25072
	W/side-mtd. h'wheel	
	Size 34 thru 60 (none req'd)	---
	Size 70 (2 req'd)	
	up to 76 mm (3 inch) travel	1K8995 25072
	78 to 102 mm (3-1/16 to 4-inch) travel	1H7231 25072
	Size 80 & 87 (2 req'd)	1K8995 25072
	Size 100 (2 req'd)	1H7231 25072
	Type 657NS or 667NS	
	Size 40 (2 req'd)	1B8659 28982
	Size 45 (2 req'd)	1H7231 25072
	Size 70 (none req'd)	---
	Size 80 (none req'd)	---
	Type 667-4 (2 req'd)	
	W/ or w/o side-mtd h'wheel	
	Size 70	1H7231 25072
	Size 87	1K8995 25072
	Type 1250 or 1250R (1 req'd)	10B6609 X012

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Key	Description	Part Number	Key	Description	Part Number
50	Spacer, steel		50	Spacer, steel (cont'd)	
	Type 478 (none req'd)	---		Size 100 (2 req'd)	
	Type 513			up to 64 mm (2-1/2 inch) travel	1J8307 24092
	Size 20 (none req'd)	---		65 to 102 mm (2-9/16 to 4-inch) travel	1C5590 24092
	Size 32 (2 req'd)	1J8307 24092		W/side-mtd. h'wheel	
	Type 650 (2 req'd)			Size 34 (2 req'd)	1J8307 24092
	Sizes 30 & 60	1J8307 24092		Sizes 40, 50, & 60 (none req'd)	---
	Size 40	1C5590 24092		Size 45 & 46 (2 req'd)	1V1026 24092
	Type 656 (2 req'd)			Sizes 70 & 87	1R8019 24092
	Sizes 30, 40, & 60	1L2006 24092		Size 80	
	Type 657			up to 51 mm (2-inch) travel (none req'd)	---
	W/o side-mtd. h'wheel			over 51 mm (2-inch) travel (2 req'd)	1J8307 24092
	Size 30 thru 60 (none req'd)	---		Size 100	
	Size 70			up to 64 mm (2-1/2 inch) travel	1J8307 24092
	up to 51 mm (2-inch) travel (2 req'd)	1J8307 24092		65 to 102 mm (2-9/16 to 4-inch) travel	1C5590 24092
	52 to 76 mm (2-1/16 to 3-inch) travel			Type 657NS or 667NS	
	(none req'd)	---		All except size 80 (3 req'd)	1N8229 24092
	78 to 102 mm (3-1/16 to 4-inch) travel			Size 80 (none req'd)	---
	(2 req'd)	1C5590 24092		Type 667-4	
	Size 80			W/ or w/o side-mtd h'wheel	
	up to 51 mm (2-inch) travel (none req'd)	---		Sizes 70 & 87	1R8019 24092
	over 51 mm (2-inch) travel (2 req'd)	1J8307 24092		Type 1250 or 1250R (none req'd)	---
	Size 87 (2 req'd)		52	Pipe Plug, 316 SST	1A6495 38992
	up to 76 mm (3-inch) travel	1J8307 24092	54	Elbow, 3/8 inch, brass (specify quantity)	15A6002 X162
	78 to 102 mm (3-1/16 to 4-inch) travel	1C5590 24092	55	Connector, 3/8 inch brass (not shown)	
	Size 100 (2 req'd)			(specify quantity)	15A6002 X202
	up to 64 mm (2-1/2 inch) travel	1J8307 24092	56	Cap Screw, pl steel (2 req'd)	
	65 to 102 mm (2-9/16 to 4-inch) travel	1C5590 24092		Type 657NS or 667NS	
	W/side-mtd. h'wheel			Sizes 40, 45, & 70	1C1970 24052
	Sizes 34, 50, & 60 (2 req'd)	1J8307 24092		All other types	T14109 T0012
	Size 40 (none req'd)	---	57	Hex Nut	
	Size 45 & 46 (2 req'd)	1V1026 24092		Type 657NS or 667NS	
	Sizes 70 & 87 (2 req'd)	1R8019 24092		Size 80 (none req'd)	---
	Size 80			All other types and sizes (2 req'd)	1A3527 24122
	up to 51 mm (2-inch) travel (none req'd)	---	58	Lockwasher	
	over 51 mm (2-inch) travel (2 req'd)	1J8307 24092		Type 657NS or 667NS	
	Size 100 (2 req'd)			Size 80 (none req'd)	---
	up to 64 mm (2-1/2 inch) travel	1J8307 24092		All other types and sizes (2 req'd)	1C2257 28982
	65 to 102 mm (2-9/16 to 4-inch) travel	1C5590 24092	59	Pin Lock, SST	
	Type 657-4 (2 req'd)			Type 650 , Sizes 30, 40, & 60 (none req'd)	---
	W/o side-mtd. h'wheel			All other types	1U9098 35032
	Size 70	1C5590 24092	60	Travel Pin, SST	
	W/side-mtd. h'wheel			Type 650 , Sizes 30, 40, & 60 (none req'd)	---
	Size 70 & 87	1R8019 24092		Type 657-8	
	Type 657-8 (2 req'd)			Size 30 & 34	1U9096 46332
	Sizes 30, 34, 47, & 70	1C5590 24092		Sizes 40 thru 70	10A2167 X012
	Size 40	1N9524 24092		Type 657NS or 667NS	
	Sizes 46 & 60	1R8019 24092		Size 80	15A8823 X012
	Type 667			All other types	1U9096 46332
	W/o side-mtd. h'wheel		61	Pin Holder, SST	
	Sizes 30 thru 60 (none req'd)	---		Type 650 , Sizes 30, 40, & 60 (none req'd)	---
	Size 70			All other types	1U9097 35032
	up to 51 mm (2-inch) travel (none req'd)	---	62	Cap Nut, SST	
	52 to 76 mm (2-1/16 to 3-inch) travel			Type 650 , Sizes 30, 40, & 60 (none req'd)	---
	(2 req'd)	1J8307 24092		All other types	1U9102 35032
	78 to 102 mm (3-1/16 to 4-inch) travel		63	Mounting Plate, steel	
	(2 req'd)	1R8019 24092		Type 650 , Sizes 30, 40, & 60	31B8553 X012
	Size 80		63	Mounting Plate, steel (cont'd)	
	up to 51 mm (2-inch) travel (none req'd)	---		Type 1250 & 1250R	39A7852 X012
	over 51 mm (2-inch) travel (2 req'd)	1J8307 24092		All other types	
	Size 87 (2 req'd)			For integrally mounted Type 67CFR	31B5993 X012
	up to 76 mm (3-inch) travel	1J8307 24092		For separately mounted Type 67CFR	37B1933 X012
	78 to 102 mm (3-1/16 to 4-inch) travel	1R8019 24092			

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Key	Description	Part Number	Key	Description	Part Number
64	Cap Screw, pl steel		65	Cap Screw, pl steel (cont'd)	
	Types 1250 and 1250R (3 req'd)	1A3816 24052		Size 70	
	All other types (5 req'd)	1A3816 24052		up to 76 mm (3-inch) travel (none req'd)	---
65	Cap Screw, pl steel			78 to 102 mm (3-1/6 to 4-inch) travel	
	Type 478 (none req'd)	---		(2 req'd)	1B3664 24052
	Type 513			Size 80	
	Size 20 (none req'd)	---		up to 51 mm (2-inch) travel (none req'd)	---
	Size 32 (2 req'd)	1B7624 24052		over 51 mm (2-inch) travel (2 req'd)	1U6256 31192
	Type 650, Sizes 30, 40, & 60 (none req'd)	---		Size 87	
	Type 656 (none req'd)	---		up to 76 mm (3-inch) travel (none req'd)	---
	Type 657			78 to 102 mm (3-1/6 to 4-inch) travel	
	W/o side-mtd. h'wheel			(2 req'd)	1A9503 24052
	Sizes 30, 34, & 40 (2 req'd)	1A3525 24052		Size 100 (2 req'd)	
	Sizes 45 thru 60 (none req'd)	---		up to 64 mm (2-1/2 inch) travel	1C3979 24052
	Size 70 (2 req'd)			65 to 102 mm (2-9/16 to 4-inch) travel	1A6430 24052
	up to 51 mm (2-inch) travel	1A3751 24052		Type 657NS or 667NS	
	52 to 102 mm (2-1/16 to 4-inch) travel	1A9145 24052		Size 40 (2 req'd)	1U7648 35532
	Size 80			Size 45, 70, & 80 (none req'd)	---
	up to 51 mm (2-inch) travel (none req')	---		Type 667-4	
	over 51 mm (2-inch) travel (2 req'd)	1U6256 31192		W/o side-mtd. h'wheel	
	Size 87			Size 70 & 87 (none req'd)	---
	up to 51 mm (2-inch) travel (2 req'd)	1A9503 24052		W/ side-mtd. h'wheel	
	52 to 102 mm (2-1/16 to 4-inch) travel			Size 70 (2 req'd)	1B3664 24052
	(none req'd)	---		Size 87 (2 req'd)	1A9503 24052
	Size 100 (2 req'd)			Type 1250 or 1250R (2 req'd)	10B6605 X012
	up to 64 mm (2-1/2 inch) travel	1C3979 24052	66	Actuator Rod, pl steel (not shown)	
	65 to 102 mm (2-9/16 to 4-inch) travel	1A6430 24052			Type 650
	W/side-mtd. h'wheel			Size 30	10A5176 X012
	Sizes 34 thru 60 (none required)	---		Size 40	10A4872 X012
	Size 70			Size 60	10A4873 X012
	up to 76 mm (3-inch) travel (none req'd)	---		All other types (none req'd)	---
	78 to 102 mm (3-1/16 to 4-inch) travel		67	Hex Nut, pl steel (not shown)	
	(2 req'd)	1B3664 24052			Type 650
	Size 80			Size 30 (2 req'd)	1A9463 24122
	up to 51 mm (2-inch) travel (none req'd)	---		Size 40 & 60 (none req'd)	---
	over 51 mm (2-inch) travel (2 req'd)	1U6256 31192		All other types (none req'd)	---
	Size 87		68	Anti-Torque Rod, steel (not shown)	
	up to 76 mm (3-inch) travel (none req'd)	---			Type 478 (Type 3583 only)
	78 to 102 mm (3-1/16 to 4-inch) travel			Sizes 40, 46, & 60	1V4738 24092
	(2 req'd)	1A9503 24052		All other types (none req'd)	---
	Size 100 (2 req'd)		69	Damper Control Swivel (not shown)	
	up to 64 mm (2-1/2 inch) travel	1C3979 24052			Type 650
	65 to 102 mm (2-9/16 to 4-inch) travel	1A6430 24052		Size 30, 40, & 60 (2 req'd)	10A4874 X012
	Type 657-4 (2 req'd)			All other types (none req'd)	---
	W/o side-mtd. h'wheel		70	Cap Screw, pl steel (2 req'd)	
	Size 70	1A9145 24052			Type 478 (Type 3583 only)
	W/ side-mtd. h'wheel			Sizes 40, 46, & 60 (2 req'd)	1A3816 24052
	Size 70	1B3664 24052		Type 513	
	Size 87	1A9503 24052		Sizes 20 & 32 (2 req'd)	1A3816 24052
	Type 657-8 (none req'd)	---		Type 650	
	Type 667			Sizes 30, 40, & 60 (2 req'd)	1A3525 24052
	W/o side-mtd. h'wheel			Type 656	
	Sizes 30, 34, & 40 (2 req'd)	1A3525 24052		Sizes 30, 40, & 60 (2 req'd)	1P7937 X0012
	Sizes 45 thru 70, & 87 (none req'd)	---		Type 657	
	Size 80			W/o side-mtd. h'wheel	
	up to 51 mm (2-inch) travel (none req'd)	---		Sizes 30 thru 60	1A3816 24052
	over 51 mm (2-inch) travel (2 req'd)	1U6256 31192		Size 70	
	Size 100 (2 req'd)			Up to 51 mm (2-inch) travel	1A3525 24052
	Up to 64 mm (2-1/2 inch) travel	1C3979 24052		52 to 76 mm (2-1/16 to 3-inch) travel	1A3816 24052
	65 to 102 mm (2-9/16 to 4-inch) travel	1A6430 24052		78 to 102 mm (3-1/16 to 4-inch) travel	1A5534 24052
	W/side-mtd. h'wheel			Size 80	
	Sizes 34 thru 60 (none required)	---		up to 51 mm (2-inch) travel	1A3816 24052
				over 51 mm (2-inch) travel	1A3525 24052

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70	Cap Screw, pl steel (2 req'd) (cont'd)		86	Mounting Bracket (657NS and 667NS only)	
	Size 87			Type 657NS	
	up to 76 mm (3-inch) travel	1A3525 24052		Size 45	45A8814 X012
	78 to 102 mm (3-1/16 to 4-inch) travel	1A5534 24052		Type 667NS	
	Size 100			Size 45	45A8815 X012
	up to 64 mm (2-1/2 inch) travel	1A3525 24052		Type 657NS or 667NS	
	65 to 102 mm (2-9/16 to 4-inch) travel	1B7624 24052		Size 40	45A8814 X012
	W/side-mtd. h'wheel			Size 70	45A8817 X012
	Sizes 34, 50, & 60	1A3525 24052		Size 80	35A8821 X012
	Size 40	1A3816 24052	97	Spacer, steel	
	Size 45 & 46	1C8702 24052		Type 657 or 667	
	Sizes 70 & 87	1B9896 24052		W/ side-mtd. h'wheel	
	Size 80			Sizes 70 & 87	
	up to 51 mm (2-inch) travel	1A3816 24052		up to 51 mm (2-inch) travel (2 req'd)	1R4093 24092
	over 51 mm (2-inch) travel	1A3525 24052		52 to 76 mm (2-1/16 to 3-inch) travel	
	Size 100			(2 req'd)	1R4095 24092
	up to 64 mm (2-1/2 inch) travel	1A3525 24052		78 to 102 mm (3-1/16 to 4-inch) travel	
	65 to 102 mm (2-9/16 to 4-inch) travel	1B7624 24052		(none req'd)	---
	Type 657-4			W/ or W/o side-mtd. h'wheel	
	W/o side-mtd. h'wheel			Size 80	
	Size 70	1A5534 24052		up to 51mm (2-inch) travel (2 req'd)	1R4096 24092
	W/side-mtd. h'wheel			over 51 mm (2-inch) travel (none req'd)	---
	Sizes 70 & 87	1B9896 24052		All other types and sizes (none req'd)	---
	Type 657-8		98	Stud, continuous thread, steel (2 req'd)	
	Sizes 30, 34, 47, & 70	1A5534 24052		Type 657 or 667	
	Size 40	1C1970 24052		W/ side-mtd. h'wheel	
	Sizes 46 & 60	1B9896 24052		Sizes 70 & 87	
	Type 667			up to 76 mm (3-inch) travel (2 req'd)	1R1661 31012
	W/o side-mtd. h'wheel			78 to 102 mm (3-1/16 to 4-inch) travel	
	Sizes 30 thru 60	1A3816 24052		(none req'd)	---
	Size 70			W/ or W/o side-mtd. h'wheel	
	Up to 51 mm (2-inch) travel	1A3816 24052		Size 80	
	52 to 76 mm (2-1/16 to 3-inch) travel	1A3525 24052		up to 51 mm (2-inch) travel	1R1661 31012
	78 to 102 mm (3-1/16 to 4-inch) travel	1B9896 24052		over 51 mm (2-inch) travel (none req'd)	---
	Size 80			All other types and sizes (none req'd)	---
	up to 51 mm (2-inch) travel	1A3816 24052	99	Hex Nut, pl steel	
	over 51 mm (2-inch) travel	1A3525 24052		Type 657 or 667	
	Size 87			W/ side-mtd. h'wheel	
	Up to 76 mm (3-inch) travel	1A3525 24052		Sizes 70 & 87	
	78 to 102 mm (3-1/16 to 4-inch) travel	1B9896 24052		up to 76 mm (3-inch) travel (2 req'd)	1A3412 24112
	Size 100			78 to 102 mm (3-1/16 to 4-inch) travel	
	up to 64 mm (2-1/2 inch) travel	1A3525 24052		(none req'd)	---
	65 to 102 mm (2-9/16 to 4-inch) travel	1B7624 24052		W/ or W/o side-mtd. h'wheel	
	W/side-mtd. h'wheel			Size 80	
	Size 34	1A3525 24052		up to 51 mm (2-inch) travel (2 req'd)	1A3412 24112
	Sizes 40, 50, 60	1A3816 24052		over 51 mm (2-inch) travel (none req'd)	---
	Size 45 & 46	1C8702 24052		All other types and sizes (none req'd)	---
	Size 70 & 87	1B9896 24052	102	Spacer, steel	
	Size 80			Type 657	
	up to 51 mm (2-inch) travel	1A3816 24052		W/o side-mtd h'wheel	
	over 51 mm (2-inch) travel	1A3525 24052		Size 34 to 60 (none req'd)	---
	Size 100			Size 70	
	up to 64 mm (2-1/2 inch) travel	1A3525 24052		up to 51 mm (2-inch) travel (2 req'd)	1U8307 24092
	65 to 102 mm (2-9/16 to 4-inch) travel	1B7624 24052		52 to 102 mm (2-1/16 to 4-inch) travel	
	Type 657NS or 667NS			(none req'd)	---
	Sizes 40, 45, & 70 (3 req'd)	1A3525 24052		Size 87	
	Size 80 (3 req'd)	1A3816 24052		up to 51 mm (2-inch) travel (2 req'd)	1R762324092
	Type 667-4			52 to 102 mm (2-1/16 to 4-inch) travel	
	Sizes 70 & 87	1B9896 24052		(none req'd)	---
	For Competitor's Actuators			Type 667	
	3/8 to 3/4-inch stem	1A3816 24052		W/o side-mtd h'wheel	
	Type 1250 or 1250R (none req'd)	---		Size 34 thru 70 & 87 (none req'd)	---

Instruction Manual

Form 5054
June 2002

3582 and 3583 Series

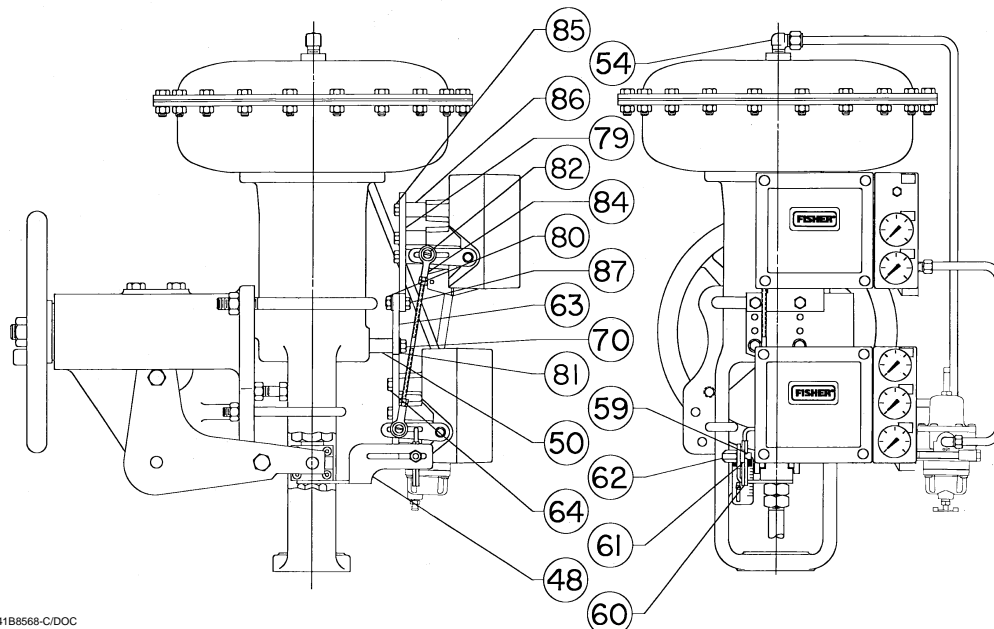
Key	Description	Part Number	Key	Description	Part Number
102	Spacer, steel (cont'd)		50	Spacer, steel	
	Type 657 or 667			Type 657	
	W/ side-mtd. h'wheel			Size 70 & 87	
	Size 34 thru 60 (none req'd)	---		up to 76 mm (3-inch) travel (none req'd)	---
	Size 70 & 87			77 to 102 mm (3-1/16 to 4-inch) travel	
	up to 76 mm (3-inch) travel (2 req'd)	1V6833 24092		(4 req'd)	1C5590 24092
	Size 70			Type 667	
	78 to 102 mm (3-1/16 to 4-inch) travel			Size 70 & 87	
	(4 req'd)	1R7370 24092		up to 51 mm (2-inch) travel (none req'd)	---
	Size 87			52 to 76 mm (2-1/16 to 3-inch) travel	
	78 to 102 mm (3-1/16 to 4-inch) travel,			(4 req'd)	1J8307 24092
	(2 req'd)	1R4096 24092		77 to 102 mm (3-1/16 to 4-inch) travel	
	W/ or W/o side-mtd. h'wheel			(4 req'd)	1V1026 24092
	Size 80 (2 req'd)	1V6833 24092		Type 657 or 667	
	Size 100			Sizes 30 thru 60, & 80 (none req'd)	---
	up to 64 mm (2-1/2 inch) travel (4 req'd)	10A2567 X012		Size 100 (4 req'd)	
	65 mm to 102 mm (2-9/16 to 4-inch) travel			up to 64 mm (2-1/2 inch) travel	1J8307 24092
	(2 req'd)	10A5252 X012		65 to 102 mm (2-9/16 to 4-inch) travel	1C5590 24092
	Types 657-4 or 667-4		59	Pin Lock, SST, all sizes (2 req'd)	1U9098 35032
	W/o side-mtd h'wheel		60	Travel Pin, SST, all sizes (2 req'd)	1U9096 46332
	Size 70 (none req'd)	---	61	Pin Holder, SST, all sizes (2 req'd)	1U9097 35032
	W/ side-mtd. h'wheel		62	Cap Nut, SST, all sizes (2 req'd)	1U9102 35032
	Size 70 (4 req'd)	1R7370 24092	63	Mounting Plate, steel, all sizes (2 req'd)	
	Size 87 (2 req'd)	1R4096 24092		For integrally mounted Type 67CFR	31B5993 X012
	All other types (none req'd)	---		For separately mounted Type 67CFR	37B1933 X012
			64	Cap Screw, pl steel, all sizes (8 req'd)	1A3816 24052
			65	Cap Screw, pl steel	
				Size 30 thru 87 (none req'd)	---
				Size 100 (4 req'd)	
				up to 64 mm (2-1/2 inch) travel	1C3979 24052
				65 to 102 mm (2-9/16 to 4-inch) travel	1A6430 24052
			70	Cap Screw, pl steel (4 req'd)	
				Type 657	
				Size 70 & 87	
				Up to 76 mm (3-inch) travel	1A3816 24052
				78 to 102 mm (3-1/16 to 4-inch) travel	1A5534 24052
				Type 667	
				Size 70 & 87	
				Up to 51 mm (2-inch) travel	1A3816 24052
				52 to 76 mm (2-1/16 to 3-inch) travel	1A3525 24052
				77 to 102 mm (3-1/16 to 4-inch) travel	1D7704 24052
				Type 657 or 667	
				Sizes 30 thru 60, & 80	1A3816 24052
				Size 100	
				up to 64 mm (2-1/2 inch) travel	1A3525 24052
				65 to 102 mm (2-9/16 to 4-inch) travel	1B7624 24052
			71	Stud, continuous thread, steel (not shown) (2 req'd)	
				Type 657	
				Size 70	12A1492 X012
				Size 87	
				Up to 51 mm (2-inch) travel	1R1661 31012
				52 to 102 mm (2-1/16 to 4-inch) travel	1A5190 X0012
				Type 667	
				Size 70	
				Up to 76 mm (3-inch) travel	1V6023 X0012
				77 to 102 mm (3-1/16 to 4-inch) travel	12A1492 X012
				Size 87	
				Up to 76 mm (3-inch) travel	1A5190 X0012
				77 to 102 mm (3-1/16 to 4-inch) travel	1R1661 31012
				Type 657 or 667	
				Sizes 30, 34, & 40	12A1491 X012
				Sizes 45 thru 60	12A1493 X012
				Size 80	1U4216 31012
				Size 100 (none req'd)	---

For Mounting 3582, 3582i, and 3583 on Type 657 or 667 Actuator without Side-Mounted Handwheel

Note

The following parts (key numbers 48 through 102) are used when mounting both a 3582 Series positioner and a 3583 Series transmitter on a Type 657 or 667 actuator without a side-mounted handwheel.

48	Connector Arm, pl steel (2 req'd)	
	Sizes 30 & 34	1U9101 000A2
	Sizes 40 thru 100	2U9099 25212
49	Washer, pl steel (4 req'd)	
	Type 657	
	Size 70	
	up to 51 mm (2-inch) travel	1D7162 28982
	52 mm to 76 mm (2-1/16 to 3-inch) travel	1H7231 25072
	77 to 102 mm (3-1/16 to 4-inch) travel	1D7162 28982
	Size 87	1K8995 25072
	Type 667	
	Size 70, all travels	1D7162 28982
	Size 87	
	up to 76 mm (3-inch) travel	1K8995 25072
	77 to 102 mm (3-1/16 to 4-inch) travel	1D7162 28982
	Type 657 or 667	
	Sizes 30 thru 40	1D7162 28982
	Sizes 45 thru 60	1H7231 25072
	Size 80	1K8995 25072
	Size 100	
	up to 64 mm (2-1/2 inch) travel	1H7231 25072
	65 to 102 mm (2-9/16 to 4-inch) travel	1D7162 28982



41B8568-C/DOC

Figure 29. Typical Application of Transmitter and Positioner

Key	Description	Part Number
72	Hex Nut, pl steel (not shown) (4 req'd) Type 657 or 667 Sizes 30, 34, & 40 Sizes 45 thru 60 Size 70 Size 80 & 87 Size 100 (none req'd)	1E9440 24112 1A3753 24122 1A3753 24122 1A3412 24122 ---
102	Spacer Type 657 Size 70 Up to 51 mm (2-inch) travel (4 req'd) 52 to 102 mm (2-1/16 to 4-inch) travel (none req'd) Size 87 Up to 51 mm (2-inch) travel 52 to 102 mm (2-1/16 to 4-inch) travel (none req'd) Type 667 Size 70 Up to 76 mm (3-inch) travel (none req'd) 77 to 102 mm (3-1/16 to 4-inch) travel (4 req'd) Size 87 Up to 76 mm (3-inch) travel (none req'd) 77 to 102 mm (3-1/16 to 4-inch) travel (4 req'd) Type 657 or 667 Sizes 30 thru 60 (none req'd) Size 80 (4 req'd) Size 100 up to 64 mm (2-1/2 inch) travel (8 req'd) 65 to 102 mm (2-9/16 to 4-inch) travel (4 req'd)	1U4371 24092 --- 1R7623 24092 --- 1U4371 24092 --- 1R7623 24092 --- 1V6833 24092 10A2567 X012 10A5252 X012

Key	Description	Part Number
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**For Mounting 3582, 3582i, and 3583 on
Type 657 or 667 Actuator with
Side-Mounted Handwheel**

Note

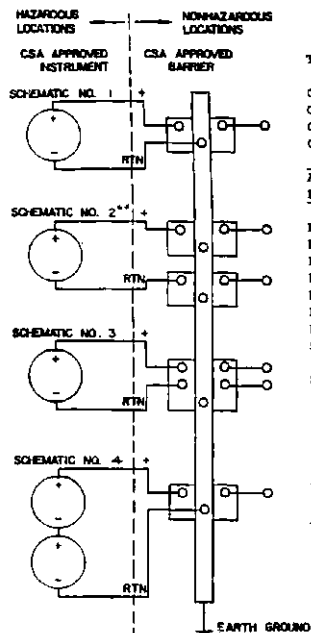
The following parts (key numbers 48 through 87) are used when mounting both a 3582 Series positioner and a 3583 Series transmitter on a Type 657 or 667 Size 45 actuator with side-mounted handwheel.

48	Connector Arm, pl steel	2V1705 25212
50	Spacer, steel (2 req'd)	1V1026 24092
54	Elbow, 3/8 inch, brass	15A6002 X162
55	Connector, 3/8 inch brass (not shown)	15A6002 X202
59	Pin Lock, SST (2 req'd)	1U9098 35032
60	Travel Pin, SST (2 req'd)	10A2167 X012
61	Pin Holder, SST (2 req'd)	1U9097 35032
62	Cap Nut, SST (2 req'd)	1U9102 35032
63	Mounting Plate, steel (2 req'd) For integrally mounted Type 67CFR For separately mounted Type 67CFR	31B5993 X012 37B1933 X012
64	Cap Screw, pl steel (8 req'd)	1A3816 24052
70	Cap Screw, pl steel (2 req'd)	1C8702 24052
79	Mounting Plate, steel	22A6848 X012
80	Hex Nut, pl steel, for Type 667 only (2 req'd)	1A3527 24122
81	Lockwasher, pl steel Type 657 (2 req'd) Type 667 (4 req'd)	1C2257 28982 1C2257 28982
82	Machine Screw, pl steel (2 req'd)	1V4058 28982
83	Elastic Stop Nut, pl steel (not shown) (2 req'd)	1J7192 28982
84	Connecting Linkage, pl steel	1R6839 99012
85	Cap Screw, pl steel, for Type 667 only (5 req'd)	1A5534 24052
86	Spacer, pl steel for Type 667 only (5 req'd)	1C5590 24092
87	Cap Screw, pl steel for Type 667 only (2 req'd)	1A3526 24052

Loop Schematics

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

CSA Loop Schematic



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

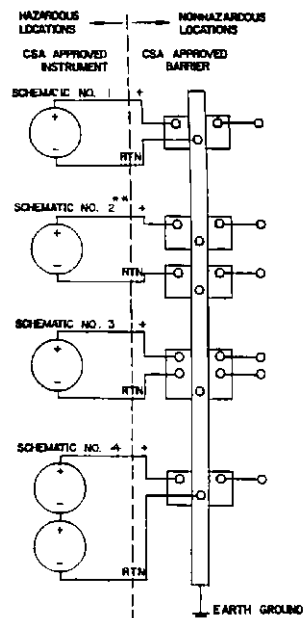
APPROVED BARRIER	BARRIER TYPE	MFG. INST. MANUAL	SCHEM NO.	APPLICABLE HAZARDOUS LOCATIONS	CSA BARRIER RATING
FOXBORO	2A0-V21-CGB	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2A0-V31-CGB	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2A0-V51-CGB	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2A0-V41-CGB	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	3A2-D21-CS-E/CGB-A	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	3A2-D31-CS-E/CGB-A	MI 200-255	3	CL I, DIV 1, GP A,B,C,D	
FOXBORO	2AS-131-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
STAHL	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
STAHL	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	766610AAV1	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

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	1130PG21000	IB-17E211	2	CL I, DIV 1, GP C,D	30V, 206 OHM
TAYLOR	1135FG11000	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
HONEYWELL	38545-0000-0110-112-C5D5	S 385-22	2	CL I, DIV 1, GP C,D	28V, 200 OHM

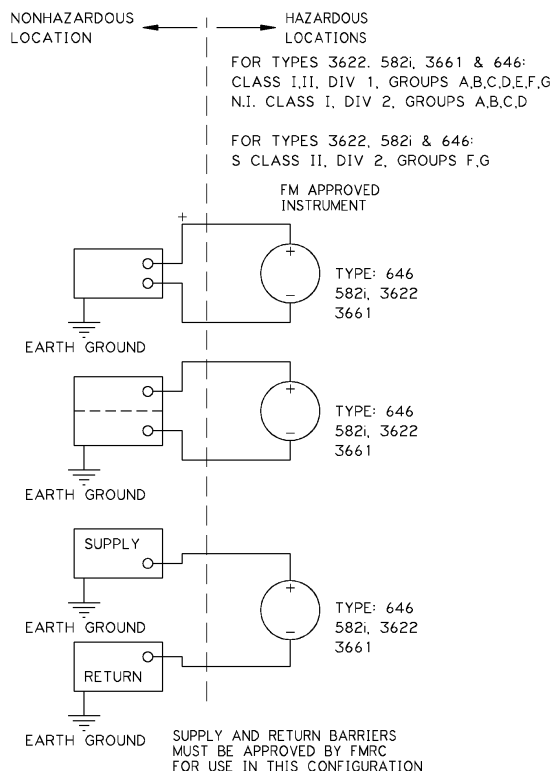
* ALSO APPLICABLE FOR CLASS II, GROUPS E,F,G WITH APPROPRIATE INSTRUMENT AND BARRIER APPROVAL

** 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

21B5606-B SHT 2 / DOC

FM Loop Schematic



21B5607-D / DOC

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

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

NOTES:

-LOOPS MUST BE CONNECTED ACCORDING TO THE BARRIER MANUFACTURERS INSTRUCTION

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

-BARRIER PARAMETERS MUST MEET THE FOLLOWING REQUIREMENTS:

V_{oc} OR $V_T \leq V_{max}$ I_{sc} OR $I_T \leq I_{max}$ $C_o(\mu F) > 0.0$ $L_o(mH) > 0.0$

-THE C_o AND L_o 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



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