

March 2023

Type OS2 Slam-Shut Device

WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.

Fisher™ slam-shut devices must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations and Emerson Process Management Regulator Technologies, Inc. instructions.

If the slam-shut device vents gas or a leak develops in the system, service to the unit may be required. Failure to correct trouble could result in a hazardous condition.

Call a gas service person to service the unit. Only a qualified person must install or service the slam-shut devices.

Introduction

Scope of the Manual

This instruction manual provides installation, maintenance and parts ordering information for the Types OS2 and OSD2 slam-shut devices for the Types OSE, 627-OSX, EZH-OSX, EZHSO-OSX, EZL-OSX and EZR-OSX. For further instructions on the Types 627, EZH, EZHSO, EZL or EZR refer to the corresponding instruction manual of these products.

Description

Slam-shut devices are used to totally and rapidly cut off gas flow when the inlet and/or outlet pressure in the system either exceeds or drops below the setpoints. The Types OS2 and OSD2 slam-shut devices consist of a valve, mechanism box (BM1 or BM2) and either one or two modular sensing elements called manometric devices (Type BMS1 or BMS2) (see Figure 2).

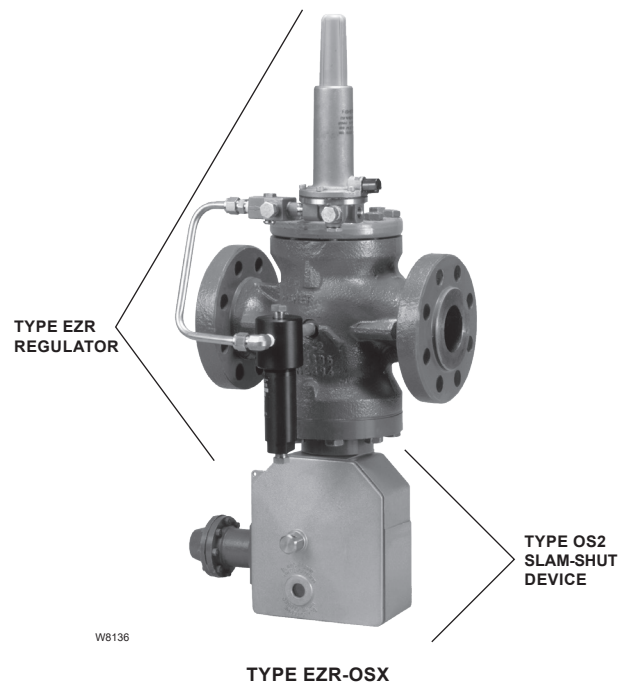
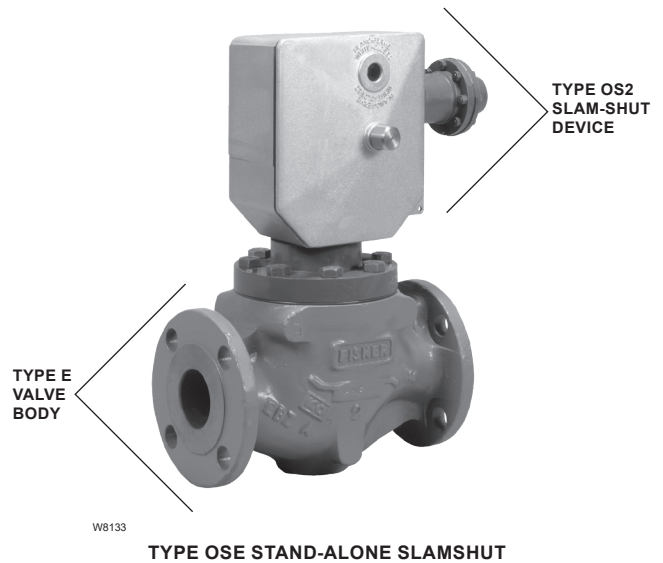


Figure 1. Type OS2 Slam-Shut Device on Types OSE and EZR-OSX Constructions

North America Only

Type OS2

Specifications

This section lists the specifications for the Type OS2 slam-shut valve. Factory specifications are stamped on the nameplate fastened on the valve at the factory.

<p>Body Sizes and End Connection Styles⁽¹⁾</p> <p>Type OSE <i>WCC Steel</i> 1 and 2 NPT; NPS 1, 2, 3, 4 and 6 / DN 25, 50, 80, 100 and 150 CL150 RF, CL300 RF or CL600 RF</p> <p><i>LCC Steel</i> NPS 8 and 10 / DN 200 and 250 CL150 RF, CL300 RF or CL600 RF</p> <p><i>Cast Iron</i> 1 and 2 NPT; NPS 1, 2, 3, 4 and 6 / DN 25, 50, 80, 100 and 150 CL125 FF</p> <p>Type 627-OSX <i>WCC Steel</i> NPS 1 and 2⁽²⁾ / DN 25 and 50⁽²⁾ NPT or SWE</p> <p>Type EZL-OSX <i>LCC Steel</i> NPS 2, 3 and 4 / DN 50, 80 and 100 CL150 RF, CL300 RF or CL600 RF</p> <p>Types EZH-OSX, EZHSO-OSX and EZR-OSX <i>LCC Steel</i> NPS 1, 2, 3, 4, 6 and 8 / DN 25, 50, 80, 100, 150 and 200 CL150 RF, CL300 RF or CL600 RF</p> <p>Maximum Inlet Pressure⁽³⁾ NPT Cast Iron: 400 psig / 27.6 bar CL125 FF Cast Iron: 200 psig / 23.8 bar CL150 RF Steel: 290 psig / 20 bar CL300 RF Steel: 750 psi / 51.7 bar CL600 RF and NPT Steel: 1470 psi / 101 bar</p>	<p>Maximum Set Pressure 1470 psig / 101 bar or maximum body rating, whichever is lower</p> <p>Minimum Set Pressure 4.0 in. w.c. / 10 mbar</p> <p>Outlet Pressure Ranges See Table 2</p> <p>Process Temperature Capabilities⁽³⁾ -22 to 180°F / -30 to 82°C</p> <p>Accuracy +/-2.5% for set pressures at or below 1.45 psig / 0.1 bar or +/-1% for set pressures above 1.45 psig / 0.1 bar, +/-5% for the piston Types 27 and 17</p> <p>Maximum Shutoff Pressure Differential 1470 psig / 101 bar or maximum body rating, whichever is lower</p> <p>Pressure Sensing Connections 1/4 NPT</p> <p>Response Time <1 second</p> <p>Pressure Registration External</p> <p>Options</p> <ul style="list-style-type: none"> Explosion-proof limit switch for Remote Alarm Additional manometric device for extra pressure sensing Manual Push Button Trigger Switch⁽⁴⁾ Up to 25% Hydrogen Blend (by volume) Construction 100% Hydrogen Construction
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1. End connections for other than ASME standard can usually be provided. Contact your local Sales Office for assistance.
 2. The NPS 2 / DN 50 Type 627-OSX utilizes NPS 1 / DN 25 Type OS2 slamshut components.
 3. The pressure/temperature limits in this Instruction Manual or any applicable standard limitation should not be exceeded.
 4. The push button connects at the same Type BM2 port as a Type BMS2.

The Types OS2 and OSD2 slam-shut devices can be used for all pressure ranges from 4.0 in. w.c. to 1470 psig / 10 mbar to 101 bar by simply replacing the manometric sensing device. The Type OS2 can be configured for **OverPressure ShutOff (OPSO)**, **UnderPressure ShutOff (UPSO)**, **OverPressure Shutoff** and **UnderPressure ShutOff (OPSO/UPSO)**, manual shutoff or remote shutoff.

Mechanism Box (BM1 or BM2)

The mechanism box (BM1 or BM2, see Figure 2) is designed to close the slam-shut valve. The detection of pressure variances is sensed by a double-stage trip mechanism (see Figure 7). The first stage is the detection stage and will only trip when the system pressure reaches the set pressure of the manometric sensing device. The second stage is the power stage and once tripped by the first stage, the closing spring causes the valve plug to slam-shut and remain closed until the valve is manually reset. If there are any inlet pressure variances or vibrations subjected to the second

stage components, they are not transmitted to the first stage trip mechanism. This unique double-stage trip mechanism virtually eliminates nuisance tripping commonly found in other shutoff devices.

Manometric Sensing Device (Type BMS1 or BMS2) (See Figure 2)

Pressure from the system is sensed through control lines into the manometric sensing device (Type BMS1, BMS2 or Types BMS1 and BMS2). If the sensed pressure reaches the setpoint of the manometric sensing device, the device will activate the tripping mechanism in the mechanism box and cause the valve to slam-shut.

Remote Shutoff

Remote Tripping is accomplished using a 3-way solenoid valve installed in the control line of a Type BMS1 or BMS2 manometric device configured for underpressure

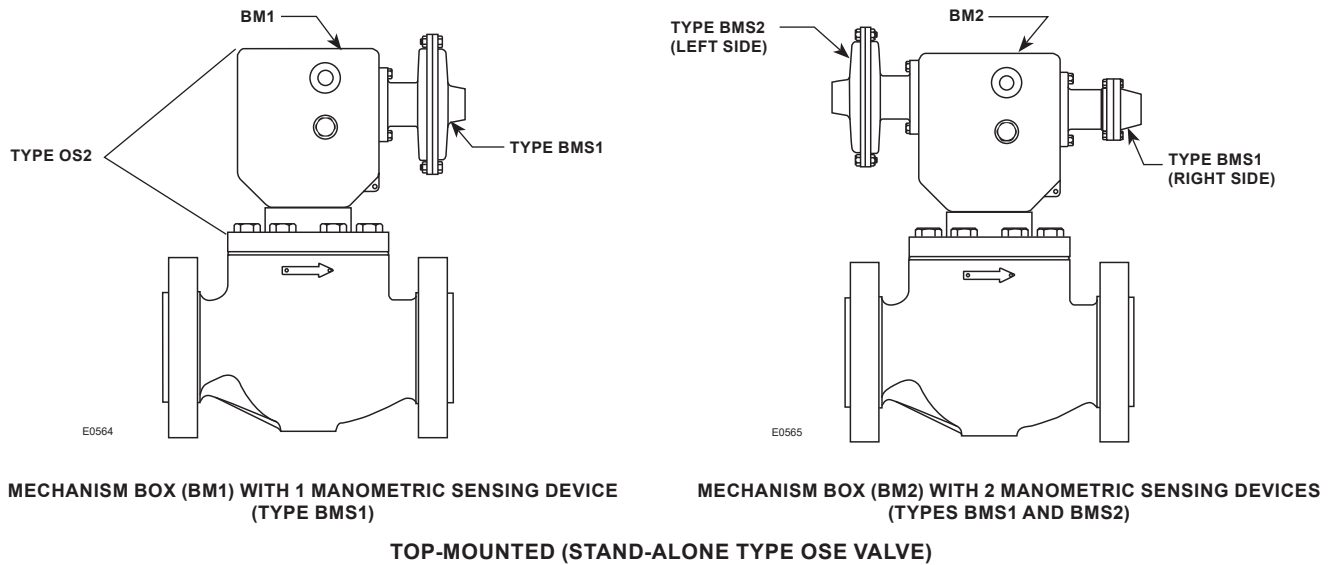


Figure 2. Types of Installation

Table 1. Applications and Construction Guide (See Figure 2)

APPLICATION	MECHANISM BOX REQUIRED	MANOMETRIC SENSING DEVICE REQUIRED	
Overpressure Shutoff (OPSO)	BM1	BMS1	----
Underpressure Shutoff (UPSO)		BMS1	----
Overpressure Shutoff (OPSO) and Underpressure Shutoff (UPSO)		BMS1 ⁽¹⁾	----
Overpressure Shutoff (OPSO) and Underpressure Shutoff (UPSO)	BM2	BMS1 ⁽²⁾	BMS2
Overpressure Shutoff (OPSO), Overpressure Shutoff (OPSO) and Underpressure Shutoff (UPSO)		BMS1 ⁽²⁾	BMS2 ⁽¹⁾

1. When using one manometric sensing device for both overpressure and underpressure shutoff, make sure that the difference between set pressures falls within the maximum range shown in Table 2.
 2. When using two manometric sensing devices (Types BMS1 and BMS2), the Type BMS1 can only be used for high trip.

protection (UPSO) or overpressure and underpressure protection (OPSO/UPSO). When de-energized, the solenoid valve allows the Type BMS manometric device to monitor the controlled pressure as if the solenoid valve was not present. When energized, the solenoid valve will be repositioned to connect the Type BMS manometric device to atmospheric pressure tripping the underpressure protection slam-shut setting.

Principle of Operation (See Figure 3)

The Type OS2 slam-shut device used on Types OSE, 627-OSX, EZH-OSX, EZL-OSX and EZR-OSX provides overpressure and/or underpressure protection by shutting off the flow to the downstream system. The slam-shut valve is typically installed upstream of a pressure reducing regulator as shown in Figures 3 and 4.

Pressure is registered on one side of the diaphragm, piston or bellows and is opposed by the setpoint control spring of the manometric sensing device. The Type OS2 slam-shut device tripping pressure is determined by the setting of the control spring.

Overpressure: when the sensed pressure increases above the setpoint, the pressure on top of the diaphragm overcomes the spring setting and moves the manometric device stem.

Underpressure: when the sensed pressure decreases below the setpoint, the control spring pressure below the diaphragm overcomes the downstream pressure and pushes the diaphragm which moves the manometric device stem.

When the sensed pressure reaches the OPSO or UPSO setpoint, the manometric device stem contacts Pin D1 or D2 and triggers the detection stage which activates the second stage, releasing the slam-shut valve plug. A tight and total shutoff is ensured by the plug seal O-ring closing on the orifice and is helped by the “dash pot” effect between the bonnet skirt and the valve plug. A “dash pot” effect occurs when the valve plug closes by having both the closing spring and the inlet pressure pushing on top of the valve plug. This is accomplished by ports around the skirt of the bonnet allowing inlet pressure above the valve plug.

Type OS2

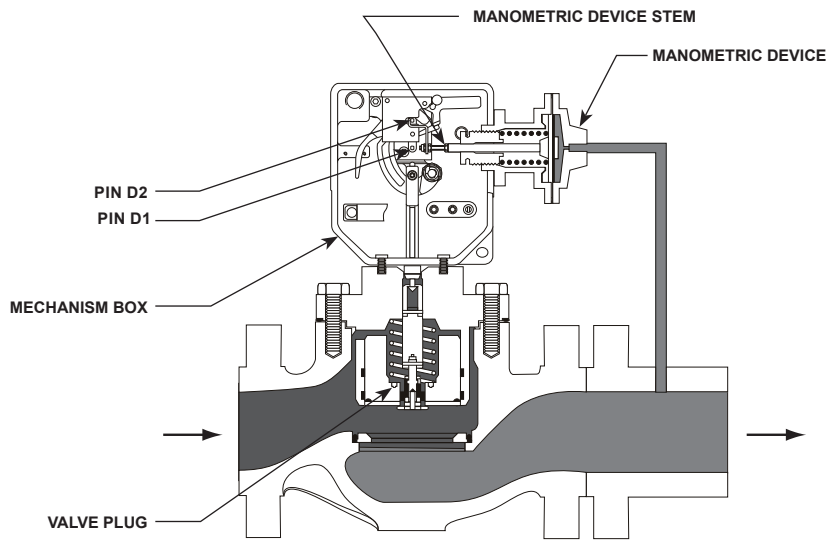
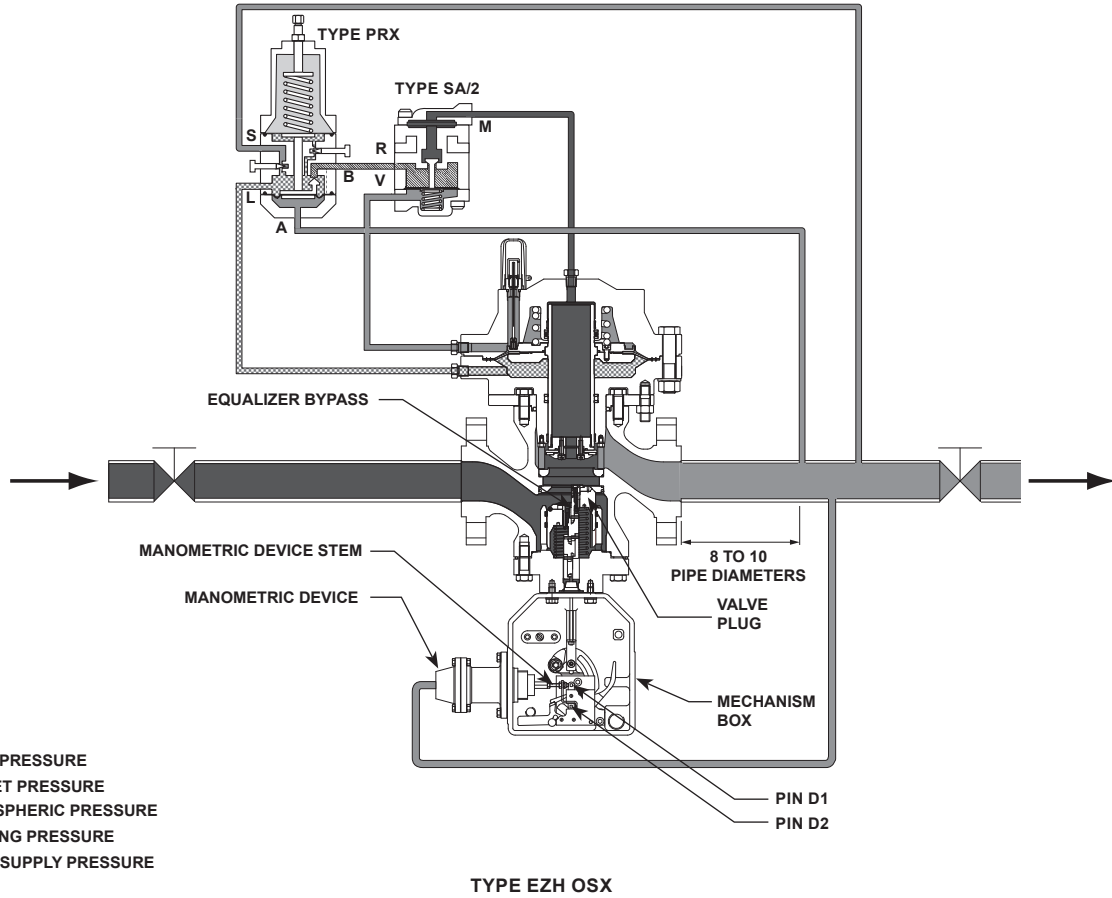


Figure 3. Operational Schematics

North America Only

Table 2. Spring Ranges, Part Numbers and Maximum and Minimum Pressures for the Manometric Sensing Devices (Types BMS1 and BMS2)

SPRING RANGE	SPRING COLOR	SPRING PART NUMBER	MANOMETRIC SENSING DEVICE TYPE	MANOMETRIC SENSING DEVICE STYLE	MAXIMUM SENSING INLET PRESSURE, psig / bar	RECOMMENDED SETPOINT DEADBAND, psig / bar ⁽¹⁾	MAXIMUM DIFFERENCE BETWEEN OVERPRESSURE AND UNDERPRESSURE, psig / bar ⁽²⁾
4.0 to 14 in. w.c. / 10 to 35 mbar	Purple	FA113195X12	162	Diaphragm	74 / 5.1	1.6 in. w.c. / 4 mbar	4.0 in. w.c. / 10 mbar
10 to 33 in. w.c. / 25 to 83 mbar	Orange	FA113196X12				2.0 in. w.c. / 5 mbar	10 in. w.c. / 25 mbar
18 in. w.c. to 2.0 psig / 45 mbar to 0.14 bar	Red	FA113197X12				4.0 in. w.c. / 10 mbar	20 in. w.c. / 50 mbar
1.0 to 3.5 psig / 70 mbar to 0.24 bar	Yellow	FA113198X12				5.6 in. w.c. / 14 mbar	24 in. w.c. / 60 mbar
1.7 to 5.6 psig / 0.12 to 0.39 bar	Green	FA113199X12				7.2 in. w.c. / 18 mbar	2.2 / 0.15
2 to 11 psig / 0.14 to 0.76 bar	Gray	FA113201X12				20 in. w.c. / 50 mbar	5.1 / 0.35
4 to 19 psig / 0.28 to 1.3 bar	Brown	FA113202X12				1.16 / 80 mbar	8.7 / 0.60
7 to 33 psig / 0.48 to 2.3 bar	Black	FA114139X12				2.47 / 0.17	16.0 / 1.1
15 to 75 psig / 1.0 to 5.2 bar	Blue	FA113200X12				5.08 / 0.35	36.3 / 2.5
31 to 161 psig / 2.1 to 11.1 bar	Brown	FA113202X12				71	235 / 16.2
59 to 235 psig / 4.1 to 16.2 bar	Black	FA114139X12	27	Piston	1470 / 101	23.2 / 1.6	145 / 10.0
235 to 323 psig / 16.2 to 22.3 bar	Brown	FA113202X12				43.5 / 3.0	Requires use of Type BMS1 or BMS2
323 to 588 psig / 22.3 to 40.5 bar	Black	FA114139X12				94.3 / 6.5	
588 to 808 psig / 40.5 to 55.7 bar	Brown	FA113202X12	102 / 7.0				
808 to 1470 psig / 55.7 to 101 bar	Black	FA114139X12	17	Bellows	514 / 35.4	174 / 12.0	145 / 10.0
81 to 323 psig / 5.60 to 22.3 bar	Brown	FA113202X12	236			514 / 35.4	14.5 / 1.00
122 to 514 psig / 8.41 to 35.4 bar	Black	FA114139X12		36.3 / 2.5	479 / 33.0		
257 to 1058 psig / 17.7 to 73.0 bar	Gray	FA113201X12		315	1058 / 73.0		72.5 / 5.0

1. Minimum suggested difference between slam-shut set pressure and normal operating pressure of the system.
 2. Maximum difference between overpressure and underpressure when using one manometric device (Type BMS1) with tripping hook (see Figure 5). For underpressure and overpressure points greater than this maximum number, use a second manometric device (Type BMS2) for underpressure protection.

Installation*



WARNING

Personal injury, equipment damage or leakage due to escaping gas or bursting of pressure-containing parts may result if the slam-shut valve is installed where its capabilities can be exceeded or where conditions exceed any ratings of the adjacent piping or piping connections. To avoid this, install the slam-shut valve where service conditions are within unit capabilities and applicable codes, regulations or standards. Additionally, physical damage to the slam-shut valve could break the mechanism box off the main valve, causing personal injury and property damage due to escaping gas. To avoid such injury or damage, install the unit in a safe location.

Installation, operation and maintenance procedures performed by unqualified personnel may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Use qualified personnel when installing, operating and maintaining the unit.

Clean out all pipelines before installation and check to be sure the valve has not been damaged or collected foreign material during shipment. Use suitable line gaskets and good bolting practices with a flanged body. The Type OSE must be installed in a horizontal position with the mechanism box above the body (see Figure 2). The Types 627-OSX,

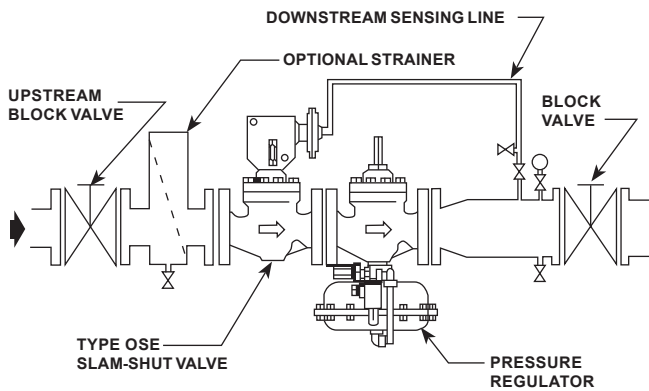
EZH-OSX, EZL-OSX and EZR-OSX are installed with the mechanism box typically below the pipe. Type OS2 slam-shut device can also be installed in a pit that is subject to flooding by venting the mechanism box above the maximum possible flood level. When used below ground, the vent must be relocated (piped) to keep the mechanism box from collecting moisture and/or other foreign material. Install obstruction-free tubing or piping into the 1/4 NPT vent tapping. Provide protection on the relocated vent by installing a screened vent cap into the end of the vent pipe.

Type OS2 can be used along with a token relief valve to minimize unnecessary shutoff. The relief valve is set to open before the Type OS2 slam-shut device activates. This arrangement allows the relief valve to handle minor overpressure problems such as gas thermal expansion or seat leakage due to dirt moving through the system which may move out of the regulator during the next operating cycle. The slam-shut device does activate if the regulator has a major malfunction with excessive gas flow that exceeds the token relief capacity.

The manometric device requires an external sensing line which should be tapped into a straight run of pipe 8 to 10 pipe diameters downstream or upstream of the slam-shut device. If impossible to comply with this recommendation due to the pipe arrangement, it may be better to position the sensing line tap nearer the regulator or slam-shut outlet rather than downstream of a block valve. Do not position the tap near any elbow, swage or nipple which might cause turbulence. It is recommended to install an isolation valve and a vent valve on the sensing line, which can be useful for tripping and verifications.

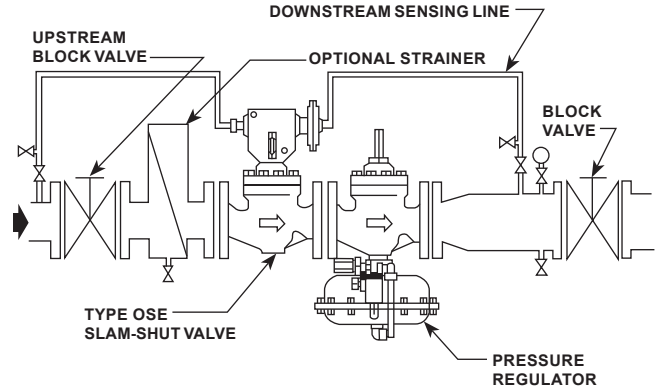
*For further instructions on Types 627, EZR, EZH and EZL, refer to the corresponding instruction manual of these products.

Type OS2



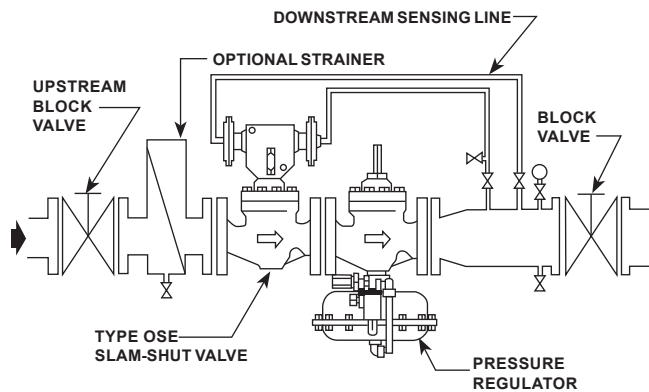
E0560

OVERPRESSURE AND UNDERPRESSURE SHUTOFF USING ONE MANOMETRIC DEVICE



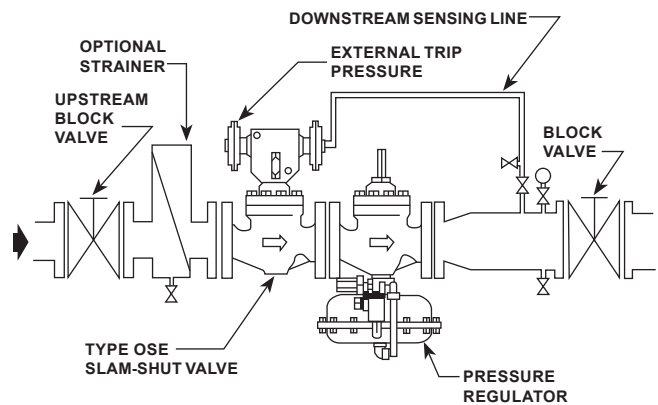
E0561

MINIMUM/MAXIMUM UPSTREAM AND DOWNSTREAM PRESSURE



E0562

OVERPRESSURE AND UNDERPRESSURE SHUTOFF USING TWO MANOMETRIC DEVICES



E0563

EXTERNAL SIGNAL

Figure 4. Typical Installations

Startup*



WARNING

To avoid personal injury or property damage due to explosion or damage to regulator or downstream components during startup, release downstream pressure to prevent an overpressure condition on the diaphragm of the regulator. In order to avoid an overpressure condition and possible equipment damage, pressure gauges should always be used to monitor pressures during startup.

These startup procedures are for the Type OSE only.

1. Make sure the upstream and downstream shutoff valves are closed.
2. Slowly open the upstream shutoff valve.
3. The slam-shut valve is shipped with the slam-shut device in the tripped position. To reset the slam-shut,

follow the procedure in the Resetting the Trip Mechanism section.

4. Slowly open the downstream shutoff valve.
5. Check all connections for leaks.
6. Adjust the slam-shut pressure setting by following the appropriate procedures in the Adjustment section.

Adjustment

Typically, adjustments are carried out with the slam-shut valve closed. Only the detection stage is reset (see Figure 7 and the section on Resetting the Tripping Mechanism). Follow the procedures below for setpoint adjustment and use the resetting tool (see Figure 8) to move the adjusting screw.



CAUTION

Before any adjustment, check that the spring range installed corresponds to the required setpoint.

*For further instructions on Types 627, EZR, EZH and EZL, refer to the corresponding instruction manual of these products.

Type BMS1 (Figure 5)*Overpressure Shutoff Only***Adjusting the Threaded Stem:**

1. Remove the tripping hook or rotate so it cannot contact Pin D2.
2. Turn in the adjusting screw until the distance between the threaded stem and Pin D1 stops increasing.
3. Reset the detection stage only. (See Figure 7 and the section on Resetting the Trip Mechanism.)
4. Adjust the threaded stem to a distance of 1/16 in. / 1.6 mm from Pin D1 (detection stage set).
5. Tighten threaded stem locknut.

Adjusting the Overpressure Trip Point:

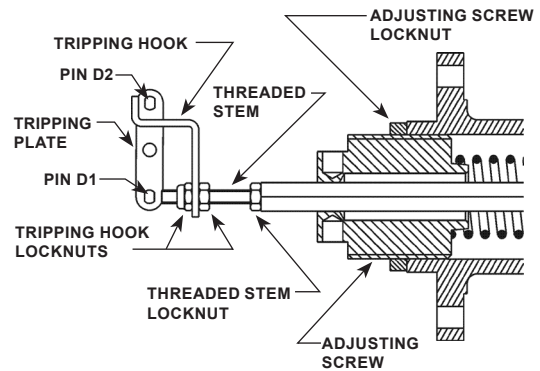
1. Pressurize the Type BMS1 to the desired trip pressure.
2. Turn in the adjusting screw until the detection stage can be reset.
3. Turn out the adjusting screw until the detection stage trips.
4. Verify that the trip pressure is equal to the desired pressure setting by reducing pressure to the Type BMS1, resetting the detection stage and then increasing pressure to the Type BMS1 until the detection stage trips. Adjust trip pressure setting if necessary.
5. Tighten adjusting screw locknut.

*Underpressure Shutoff Only***Adjusting the Threaded Stem and Tripping Hook:**

1. Rotate the tripping hook so that it cannot contact Pin D2.
2. Turn out the adjusting screw.
3. Pressurize the Type BMS1 to the desired trip pressure.
4. Reset the detection stage only. (See Figure 7 and the section on Resetting the Trip Mechanism)
5. Adjust the threaded stem to a distance of 1/16 in. / 1.6 mm from Pin D1 (detection stage set).
6. Tighten threaded stem locknut.
7. Rotate the tripping hook into position and adjust the tripping hook locknuts until the hook is at a distance of 1/16 in. / 1.6 mm from Pin D2.
8. Tighten tripping hook locknuts.

Adjusting the Underpressure Trip Point:

1. Maintain the desired trip pressure in Type BMS1.
2. Turn in the adjusting screw until the detection stage is tripped.
3. Verify that the trip pressure is equal to the desired pressure setting by increasing pressure to the Type BMS1, resetting the detection stage and then



E0606

Figure 5. Type BMS1 Construction

reducing pressure to the Type BMS1 until the detection stage trips. Adjust trip pressure setting if necessary.

4. Tighten adjusting screw locknut.

*Overpressure and Underpressure Shutoff***Adjusting the Threaded Stem:**

1. Rotate the tripping hook so that it cannot contact Pin D2.
2. Turn out the adjusting screw.
3. Pressurize the Type BMS1 to the desired overpressure trip pressure.
4. Reset the detection stage only. (See Figure 7 and the section on Resetting the Trip Mechanism.)
5. Adjust the threaded stem until it just touches Pin D1.
6. Manually trip the detection stage by moving Pin D1.
7. Unscrew the threaded stem two turns which is a distance of approximately 1/16 in. / 1.6 mm.
8. Tighten threaded stem locknut.

Adjusting the Overpressure Trip Point:

Same procedure as overpressure shutoff only.

Adjusting the Underpressure Trip Point:

1. Pressurize the Type BMS1 to a pressure between the desired overpressure and underpressure trip points.
2. Reset the detection stage only. (See Figure 7 and the section on Resetting the Trip Mechanism.)
3. Pressurize the Type BMS1 to the desired underpressure trip pressure.
4. Adjust the hook by progressively moving the tripping hook locknuts until the detection stage trips.
5. Tighten tripping hook locknuts.
6. Verify that the trip pressure is equal to the desired pressure setting by increasing pressure to the Type BMS1, resetting the detection stage and then reducing pressure to the Type BMS1 until the detection stage trips. Adjust trip pressure setting if necessary.

Type OS2

Type BMS2 (Figure 6)

Overpressure Shutoff Only

Adjusting the Overpressure Push Button:

1. Remove the tripping hook.



CAUTION

Be sure there is no pressure in the manometric sensing device before doing the following steps.

2. Turn in the adjusting screw until the distance between the threaded stem and Pin D2 stops increasing.
3. Reset the detection stage only. (See Figure 7 and the section on Resetting the Trip Mechanism.)
4. Adjust the push button to a distance of 1/16 in. / 1.6 mm from Pin D2.
5. Tighten push button locknut.

Adjusting the Overpressure Trip Point:

Same procedure as adjusting the Type BMS1 for overpressure shutoff only.

Underpressure Shutoff Only

Adjusting the Underpressure Tripping Hook:

1. Remove the overpressure push button or move it so that it cannot contact Pin D2.
2. Turn out the adjusting screw.
3. Pressurize the Type BMS2 to the desired underpressure trip pressure.
4. Reset the detection stage only. (See Figure 7 and the section on Resetting the Trip Mechanism.)
5. Adjust the tripping hook to a distance of 1/16 in. / 1.6 mm from Pin D1.
6. Tighten tripping hook locknut.

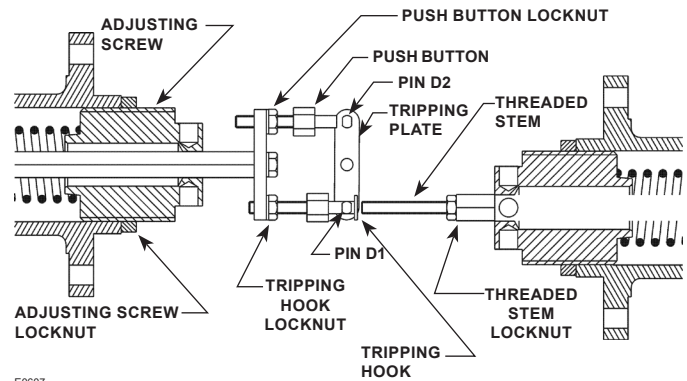
Adjusting the Underpressure Trip Point:

Same procedure as adjusting the Type BMS1 for underpressure shutoff only.

Overpressure and Underpressure Shutoff

Adjusting the Push Button:

1. Remove the tripping hook.
2. Turn out the adjusting screw.
3. Pressurize the Type BMS2 to the overpressure shutoff trip pressure.
4. Reset the detection stage only. (See Figure 7 and the section on Resetting the Trip Mechanism.)
5. Adjust the push button until it just touches Pin D2.



E0607

Figure 6. Type BMS2 Construction

6. Manually trip the detection stage by moving Pin D2 (see Figure 5).
7. Unscrew the push button two turns which is a distance of approximately of 1/16 in. / 1.6 mm.
8. Tighten push button locknut.

Adjusting the Overpressure Trip Point:

Same procedure as overpressure shutoff only.

Adjusting the Underpressure Trip Point:

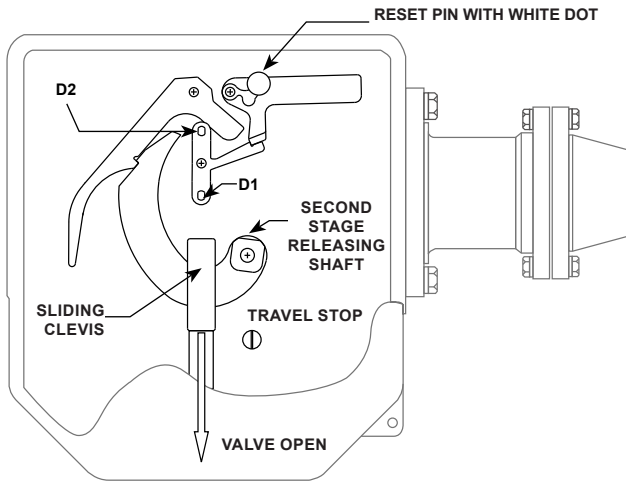
1. Pressurize the Type BMS2 to a pressure between the desired overpressure and underpressure trip points.
2. Reset the detection stage only. (See Figure 7 and the section on Resetting the Trip Mechanism.)
3. Pressurize the Type BMS2 to the desired underpressure trip pressure.
4. Turn in the tripping hook until the detection stage trips.
5. Tighten tripping hook locknut.
6. Verify that the trip pressure is equal to the desired pressure setting by increasing pressure to the Type BMS2, resetting the detection stage and then reducing pressure to the Type BMS2 until the detection stage trips. Adjust trip pressure setting if necessary.

Resetting the Trip Mechanism

Resetting of the Type OS2 slam-shut device is done manually and, for NPS 8 and 10 / DN 200 and 250 body sizes, with the bypass valve open. After the Type OS2 has tripped, it must be manually reset before it can be placed back in service. Before resetting the Type OS2, check for and correct the reason for the overpressure/underpressure condition. For the following procedures, see Figures 7 and 8.

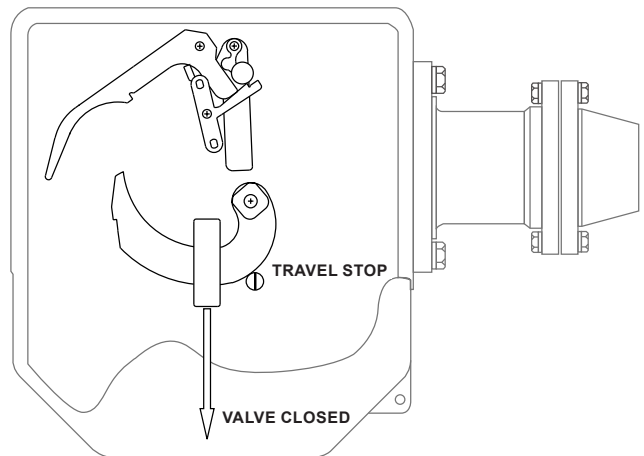
Note

To reset the detection stage, the pressure in the manometric sensing device must be below the overpressure trip point and/or above the underpressure trip point. Otherwise the detection stage cannot be reset.



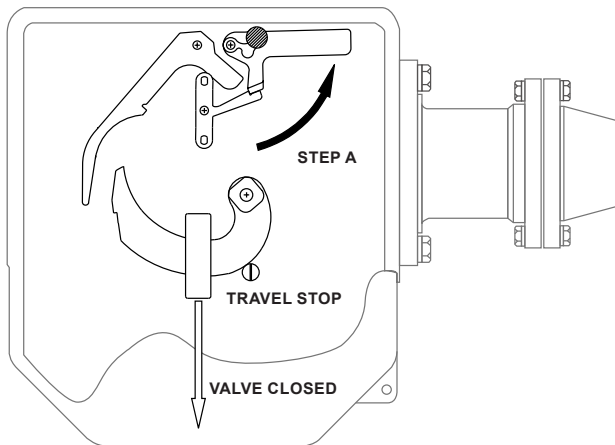
E0611

SLAM-SHUT VALVE OPEN



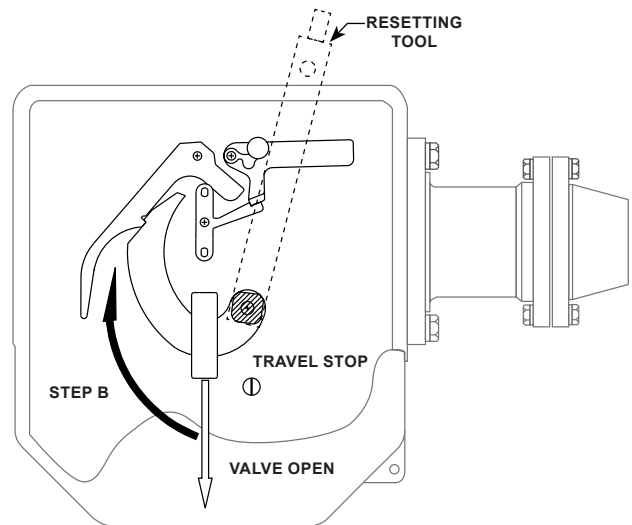
E0612

SLAM-SHUT VALVE CLOSED



E0613

RESET DETECTION STAGE (FIRST STAGE)



E0614

RESET POWER STAGE (SECOND STAGE)

NOTE: ORIENTATION SHOWN IS FOR TYPE OSE. ORIENTATION FOR TYPES 627-OSX, EZH-OSX, EZL-OSX AND EZR-OSX IS ROTATED 180°.

Figure 7. Mechanism Trip Stages

North America Only

Type OS2

To reset the Type OS2, close the upstream block valve. Open the front cover of the mechanism box.

Detection Stage (First Stage)

The reset pin with white dot is at the top center location of the mechanism box, see Figure 8. Push this pin away from the valve body. This action will lock in the detection stage (see step A in Figure 7).

Power Stage (Second Stage)

Note

The reset tool (key 3) is keyed and will only fit on the second stage releasing shaft in one orientation. Be sure the tool securely fits onto the shaft before turning.

To reset the power stage, use the square reset tool (key 3). Place the square end of the tool on the second stage releasing shaft at the center of the box and slowly rotate clockwise (see step B in Figure 7).

When movement is started on the stem, the internal bypass in sizes from NPS 1 through 6 / DN 25 through 150 will open and equalize the pressure on each side of the valve plug before the valve plug can be moved off the seat. For NPS 8 and 10 / DN 200 and 250, external bypass valve (key 97) should be opened.

CAUTION

Wait for the pressure on each side of the valve plug to equalize before proceeding to the following steps. Never use an extension with the reset tool when resetting the second stage. Failure to do so may result in equipment damage.

After the pressure has equalized on each side of the valve plug, continue turning the reset tool. This action will raise the valve plug, compress the closing spring and latch the second stage (power stage) mechanism. Replace the reset tool on its holder and replace the cover. Slowly open the upstream block valve.

Shutdown*

WARNING

To avoid personal injury or property damage due to explosion or damage to shutoff device, regulator or downstream components during shutdown, release downstream pressure to prevent an overpressure condition on the regulator diaphragm.

Installation arrangements may vary, but in any installation it is important that the valves be opened or closed slowly. The steps below apply to the typical installation.

1. Slowly close the downstream shutoff valve.
2. Slowly close the upstream shutoff valve.
3. Slowly open the vent valves downstream of the slam-shut valve.
4. Slowly open the vent valves upstream of the slam-shut valve.

Maintenance

Instructions are given for complete disassembly and assembly. Key numbers are referenced in Figure 12 for NPS 1 through 6 / DN 25 through 150 body sizes and Figure 13 for NPS 8 and 10 / DN 200 and 250 body sizes unless otherwise noted.

WARNING

Avoid personal injury or damage to property from sudden release of pressure or uncontrolled gas or other process fluid. Before disassembling, carefully relieve all pressures. Use gauges to monitor inlet and outlet pressures while releasing these pressures.

Avoid personal injury or damage to the equipment by using proper lifting equipment and techniques when handling this equipment.

Note

The seat ring on the Type OSE is pressed into the body and is not field removable.

Main Valve

Disassembly for NPS 1 through 6 / DN 25 through 150 Body Sizes (Refer to Figure 12)

The cover is held on by one screw which can be unscrewed manually or by using a socket (maximum recommended torque is 1.8 ft-lbs / 2.4 N•m).

1. Open the mechanism cover and replace the cover screw O-ring (key 16J) by removing the circlip.
2. Trip the mechanism by carefully turning the tripping plate (Pins D1 and D2) clockwise (refer to Figures 5 and 6).

*For further instructions on Types 627, EZR, EZH and EZL, refer to the corresponding instruction manual of these products.

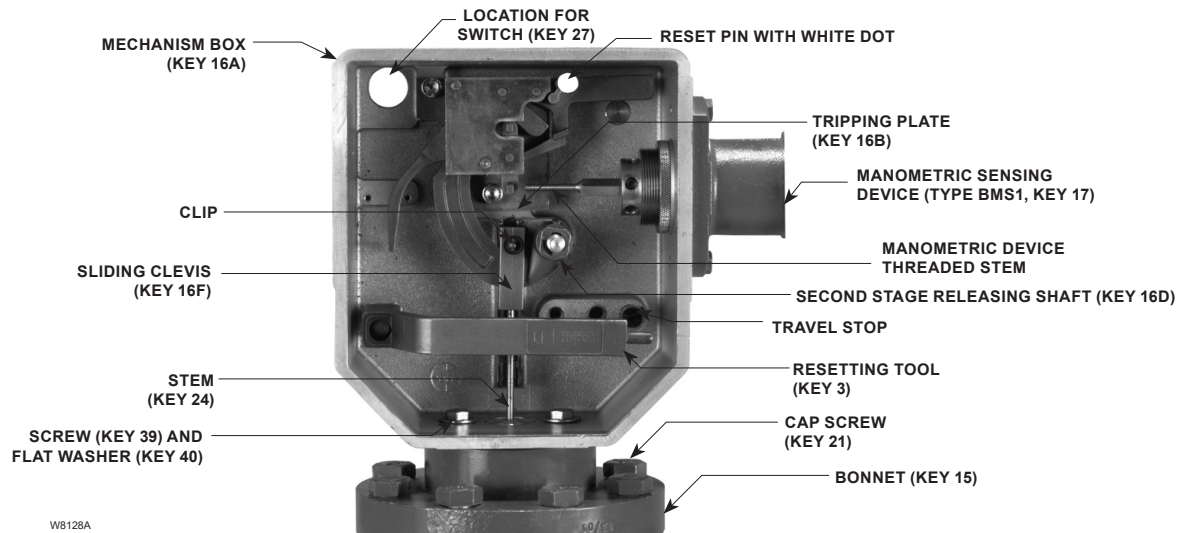


Figure 8. Type OS2 Internal Parts

3. Remove the travel stop (refer to Figure 8).
4. Remove the two cap screws (key 39) holding the mechanism box (key 16) to the bonnet (key 15). Disconnect the stem (key 24) from the sliding clevis (key 16F) and remove the mechanism box.
5. Remove the nuts (key 23, for NPS 4 and 6 / DN 100 and 150 only) or cap screws (key 21) holding the bonnet (key 15) to the body (key 1). Due to the force created by the main spring (key 12), take care when removing the bonnet.
6. The bonnet (key 15), valve plug (key 5H) (with equalizer bypass, key 5A in NPS 1 through 6 / DN 25 through 150 body sizes), main spring (key 12) and small stem bushing (key 24) will lift out of the body as a unit. Set the unit on a hard flat surface with the valve plug (key 5H) at the bottom and press down on the bonnet (key 15) to compress the main spring (key 12), allowing the stem to be unhooked from the coupling head.
7. Use a spanner wrench (a wrench is supplied with one of the replacement parts kits) to unscrew the equalizer bypass (key 5A) from the valve plug (key 5H). The NPS 1 / DN 25 body size equalizer bypass (key 5A) holds the plug O-ring (key 5J) to the valve plug (key 5H). On the NPS 2 and 3 / DN 50 and 80 body sizes, the equalizer bypass (key 5A) holds the plug disk (key 5N) and the plug O-ring (key 5J) to the valve plug (key 5H). The NPS 4 and 6 / DN 100 and 150 body sizes valve plug disk and valve plug are held together by six cap screws. On these body sizes, remove the cap screws and valve plug disk to replace the plug O-ring.

Note

The equalizer bypass (key 5A) is a common part between valve plug sizes from NPS 1 through 6 / DN 25 through 150 body sizes. The equalizer bypass (key 5A) is not serviceable and must be replaced as a unit.

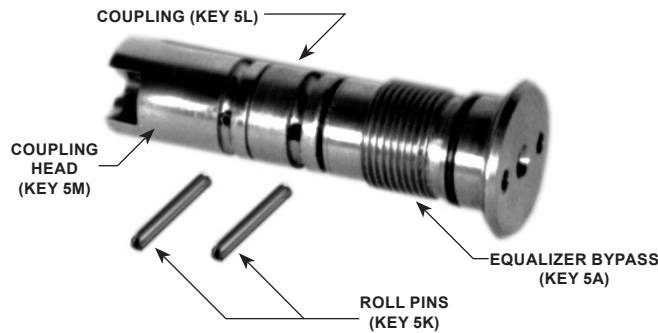
8. To remove the equalizer bypass (key 5A) from the coupling (key 5L) and coupling head (key 5M), drive out the roll Pin (key 5K) on the coupling.

Disassembly for NPS 8 and 10 / DN 200 and 250 Body Sizes (Refer to Figure 13)

1. Remove the mechanism box (BM) cover (key 96).
2. Remove the travel stop (see Figure 13).
3. Unscrew the nuts (keys 97 and 98).
4. Remove the resetting latch (key 100).
5. Remove the bolt (key 113) and the spacer (key 114).
6. Remove the cam (key 121) and yoke (key 108).
7. Unscrew the two screws (key 117).
8. Retain the square nut (key 53) situated at the extremity of the stem valve (key 20).
9. Unscrew the cap screws (key 21). Due to the force created by the main spring (key 12), take care when removing the bonnet.
10. Remove the O-ring (key 11).
11. For NPS 8 / DN 200, insert a spacer (key 114) between the cam (key 121) and square nut (key 53) or a stack washer (key 99) between the bolt (key 113) and square nut (key 53).
12. Remove the bonnet (key 15) / valve plug assembly (key 13).

Disassembly of the Valve Plug (if required) (Refer to Figure 13)

1. Remove the square nut (key 53).
2. Remove the small stem bushing (key 24).
3. Extract the bonnet (key 15) / valve cylinder (key 14).



W6853_1

Figure 9. Equalizer Bypass and Coupling Assembly for NPS 1 through 6 / DN 25 through 150 Body Sizes

Note

Normally, the bonnet (key 15) / valve cylinder (key 14) part cannot be dismantled.

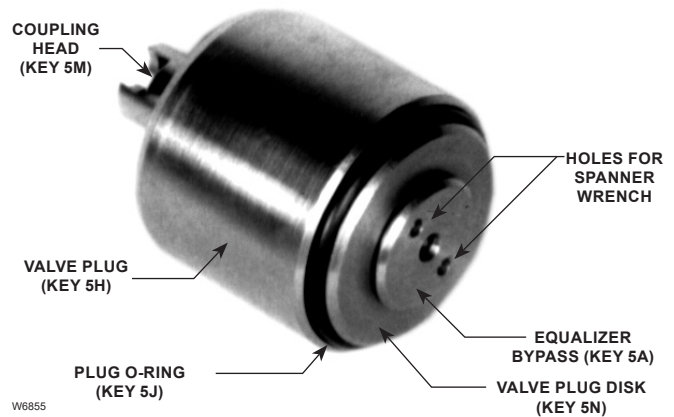
4. Remove the main spring (key 12).
5. Remove the screws (key 36) and fixing O-ring (key 34) while the pin (key 35) remains mounted on the valve plug body (key 13A).

Disassembly of the Valve Plug O-ring (if required) (Refer to Figure 13)

1. The valve plug body (key 13A) is threaded to the valve plug cylinder (key 13B), the O-ring (key 34) can be reached by unscrewing the valve plug assembly (keys 13A and 13B) using a bar of 800 and 4 screws [2 M8 on valve plug cylinder (key 13B) and 2 M10 on valve plug body (key 13A)].

Assembly for NPS 1 through 6 / DN 25 through 150 Body Sizes (Refer to Figure 12)

1. Attach a new equalizer bypass (key 5A) to the coupling (key 5) using a roll pin (key 5K).
2. Screw the equalizer bypass (key 5A) into the valve plug (key 5H) with the plug disk (key 5N) and a new plug O-ring (key 5J). Be careful not to nick or pinch the O-ring (key 5J) when tightening the equalizer bypass (key 5A). On the NPS 4 and 6 / DN 100 and 150 body sizes, attach the plug disk (key 5N) and a new plug O-ring (key 5J) to the valve plug (key 5H) using six cap screws.
3. Replace the valve piston ring (key 7) on the inside of the bonnet skirt.
4. Refer to Figures 12 and 15. Place a new O-ring (key 24B) on the small stem bushing (key 24). Set the valve plug assembly (key 5) on a hard flat surface. Set the main spring (key 12) in place on the valve



W6855

Figure 10. Valve Plug (Key 5) and Equalizer Bypass Assembly for NPS 1 through 6 / DN 25 through 150 Body Sizes

plug (key 5H). Place the bonnet (key 15) on the spring (key 12) and compress the spring by pressing down on the bonnet. Attach the stem (key 24) to the coupling head of the valve plug (key 5H) through the bonnet (key 15). Slowly release the bonnet (key 15) to allow the spring tension to seat the small stem bushing (key 24) onto the bonnet and carefully place the O-ring (key 24B).

5. Place the bonnet assembly (key 15) onto the body (key 1) using a new O-ring (key 10). Secure the bonnet (key 15) by tightening down the nuts (key 23, for NPS 4 and 6 / DN 100 and 150 only) or cap screws (key 21). Replace the external O-ring (key 11).
6. Place the mechanism box (key 16) onto the bonnet (key 15), hook the stem (key 24) to the sliding clevis (key 16F), and attach using two cap screws (key 39) and two flat washers (key 40).
7. Install the travel stop.

Note

The position of the travel stop (Figures 12 and 13) depends on the body size.

- NPS 1 and 2 / DN 25 and 50: Position B
- NPS 3, 4 and 6 / DN 80, 100 and 150: Position C
- NPS 8 / DN 200: Position B
- NPS 10 / DN 250: Position A

8. To reset, see Resetting the Trip Mechanism in the Adjustment section.

Assembly for NPS 8 and 10 / DN 200 and 250 Body Sizes (Refer to Figure 13)

1. Perform the operations described in Disassembly in reverse order.
2. Replace O-rings at each disassembly.

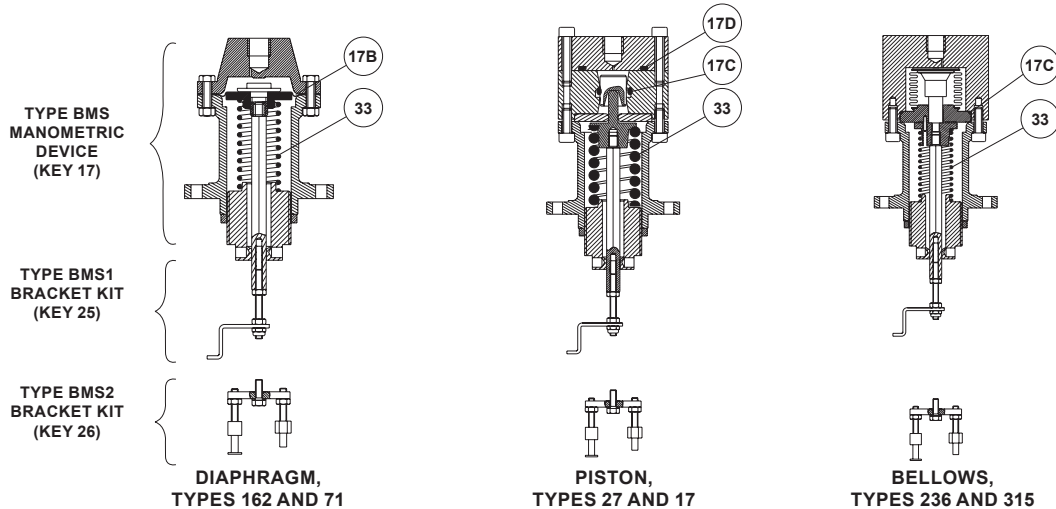


Figure 11. Manometric Sensing Device Types

3. Be careful when removing or replacing the valve plug assembly (key 13) to avoid damaging the piston ring (key 7).
 4. Lubricate screws before tightening (molybdenum graphite grease).
 5. Lightly lubricate O-rings (silicone grease).
 6. Replace the cover by tightening the screw manually or by using a socket (maximum recommended torque is 1.8 ft-lbs / 2.4 N•m).
- If the valve plug assembly (key 13) has been disassembled:
7. Lightly lubricate the valve plug O-ring (key 34) (silicone grease).
 8. Lubricate the thread of the valve plug cylinder (key 13B) (molybdenum graphite grease).
 9. Positioning the valve plug O-ring (key 34):
 - **For NPS 8 / DN 200 Body Size:** Screw the valve plug body (key 13A) partly to the valve plug cylinder (key 13B) and insert the O-ring (key 34) into the groove before tightening to reach metal/metal contact.
 - **For NPS 10 / DN 250 Body Size:** Place the O-ring (key 34) into the groove of the valve plug cylinder (key 13B), assemble and screw the valve plug body (key 13A) to reach metal/metal contact.
 10. Wipe the valve plug O-ring (key 34) after assembly.
 11. Lightly lubricate the stem valve (key 20) (silicone grease) on the small stem bushing (key 24).
 12. Check that the main spring (key 12) is correctly positioned.
 13. Positioning the O-ring (key 10):
 - **For NPS 8 / DN 200 Body Size:** Mount on connector part.

- **For NPS 10 / DN 250 Body Size:** Place in the bore of the body.

For the following procedures, key numbers are not shown in the assembly drawings for NPS 8 and 10 / DN 200 and 250 body sizes.

14. Lubricate the mechanism of the release relay (mechanism box face contact plus cam, spacer, bolt and resetting latch (keys 121, 114, 113 and 100) (molybdenum graphite grease).
15. Leave minimum operational space [rotation of the cam (key 121) / bolt (key 113)] between the locknut (key 98) and the resetting latch (key 100).
16. Lubricate the BMS spring (key 33) (molybdenum graphite grease).

Manometric Sensing Device (Type BMS1 or BMS2)

The Type BMS1 is the first manometric sensing device. The Type BMS2 is the second manometric sensing device.

Disassembly

1. Disconnect the pressure sensing line from the manometric sensing device (BMS, key 17).
2. If applicable, remove the BMS tripping hook from the adjustable stem of the BMS (see Figures 5 and 6).
3. Loosen and remove the hex head cap screws (key 38A) and O-ring (key 38B) at the mechanism box (BM, key 16)/manometric device (BMS, key 17) joint. (See Figure 13).

Type OS2

4. Carefully pull the BMS (key 17) away from the BM (key 16) followed by a rubber joint gasket (key 38C, Figure 13).
5. Inspect the rubber joint gasket (key 38C) for deterioration or damage and replace if necessary.
6. Loosen the adjustment locknut on the adjusting screw. Then unscrew and remove the adjusting screw.
7. Remove the BMS spring (key 33) from the spring case.

**For BMS Type 162 and 71 (Diaphragm, key 17)
(See Figure 12):**

8. Loosen the cap screws and nuts on the casing and remove the pressure sensing casing to reach the diaphragm assembly (key 17B).
9. If diaphragm replacement is desired, loosen the hex nut that holds the diaphragm assembly to the valve stem.

**For BMS Type 236 and 315 (Bellows, key 17)
(See Figure 12):**

8. Loosen the socket screws at the pressure sensing casing.
9. Remove the spring case from the pressure sensing casing and then remove the bellows (key 17).

**For BMS Type 27 and 17 (Piston, key 17)
(See Figure 12):**

8. Loosen the socket screws on the pressure sensing casing and remove the pressure sensing casing.
9. Loosen the socket screws on the spring case and remove the spring case away from the pressure sensing casing.
10. Slide the piston (key 17) out of the pressure sensing casing.

Assembly

Proceed in the reverse order of Disassembly.

Parts Ordering*

When corresponding with your local Sales Office about this equipment, always reference the equipment serial number. When ordering replacement parts, also be sure to include the complete 11-character part number from the following parts list. The NPS 2 / DN 50 Type 627-OSX utilizes only NPS 1 / DN 25 OS2 slamshut components.

Parts List

Key	Description	Part Number
	Parts kit (includes keys 5J, 7, 10 and 11)	
	NPS 1 / DN 25	FA197123X12
	NPS 2 / DN 50	FA197130X12
	NPS 3 / DN 80	FA197132X12
	NPS 4 / DN 100	FA197134X12
	NPS 6 / DN 150	FA197136X12
	NPS 8 / DN 200	FA197535X12
	NPS 10 / DN 250	FA197536X12
	Parts kit (includes keys 5A, 5J, 7, 10, 11 and a spanner wrench)	
	NPS 1 / DN 25	FA197124X12
	NPS 2 / DN 50	FA197131X12
	NPS 3 / DN 80	FA197133X12
	NPS 4 / DN 100	FA197135X12
	NPS 6 / DN 150	FA197137X12
	Replacement Bracket Kit for BMS	
	Type BMS1	FA181111T12
	Type BMS2	FA181112T12
1	Valve Body Assembly (For NPS 1 through 6 / DN 25 through 150 only)	
	Type OSE (E-Body)	
	WCC Steel body	
	NPS 1 / DN 25	
	NPT	T80543T0072
	CL150 RF	T80543T0012
	CL300 RF	T80543T0022
	CL600 RF	T80543T0032
	NPS 2 / DN 50	
	NPT	T80544T0072
	CL150 RF	T80544T0012
	CL300 RF	T80544T0022
	CL600 RF	T80544T0032
	NPS 3 / DN 80	
	CL150 RF	T80545T0012
	CL300 RF	T80545T0022
	CL600 RF	T80545T0032
	(For NPS 1 through 6 / DN 25 through 150 only) (Body, Seat ring and Seat O-ring)	
	Type OSE (E-Body)	
	WCC Steel body	
	NPS 4 / DN 100	
	CL150 RF	T80546T0012
	CL300 RF	T80546T0022
	CL600 RF	T80546T0032
	NPS 6 / DN 150	
	CL150 RF	T80547T0012
	CL300 RF	T80547T0022
	CL600 RF	T80547T0032
	Cast iron body	
	NPS 1 / DN 25	
	NPT	T80543T0042
	CL125 FF	T80543T0052
	NPS 2 / DN 50	
	NPT	T80544T0042
	CL125 FF	T80544T0052
	NPS 3 / DN 80	
	CL125 FF	T80545T0052
	NPS 4 / DN 100	
	CL125 FF	T80546T0052
	NPS 6 / DN 150	
	CL125 FF	T80547T0052

*For further instructions on Types 627, EZR, EZH and EZL, refer to the corresponding instruction manual of these products.

Key	Description	Part Number	Key	Description	Part Number
1	Valve Body Assembly (continued) (For NPS 1 through 6 / DN 25 through 150 only) (Body, Seat ring and Seat O-ring) (continued) Types EZHOSX, EZROX and EZLOSX (X-Body) LCC Steel body NPS 1 / DN 25 CL150 RF CL300 RF CL600 RF NPS 2 / DN 50 CL150 RF CL300 RF CL600 RF NPS 3 / DN 80 CL150 RF CL300 RF CL600 RF NPS 4 / DN 100 CL150 RF CL300 RF CL600 RF NPS 6 / DN 150 CL150 RF CL300 RF CL600 RF	T80548T0012 T80548T0022 T80548T0032 T80549T0012 T80549T0022 T80549T0032 T80550T0012 T80550T0022 T80550T0032 T80551T0012 T80551T0022 T80551T0032 T80552T0012 T80552T0022 T80552T0032	5J*	Plug O-ring NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	FA400257T12 FA400263T12 FA400258T12 FA400260T12 FA400261T12 FA400090X12 FA400091X12
			5K	Roll pin (2 required) NPS 1 through 6 / DN 25 through 150	FA405635T12
			5L	Coupling NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150	FA142208X12 FA142213X12 FA142219X12 FA142225X12 FA142231X12
			5M	Coupling Head NPS 1 through 6 / DN 25 through 150	FA142204X12
			5N	Valve Plug Disk NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150	----- FA142215X12 FA142221X12 FA142227X12 FA142233X12
1A	Valve Body (For NPS 8 and 10 / DN 200 and 250 only) Type EZH-OSX LCC Steel body NPS 8 / DN 200 CL150RF CL300RF CL600RF Type OSE (E-Body) LCC Steel body NPS 8 / DN 200 CL150 RF CL300 RF CL600 RF NPS 10 / DN 250 CL150 RF CL300 RF CL600 RF	ERAA43014A0 ERAA43012A0 ERAA36422A0 FA144718X12 FA144717X12 FA144716X12 FA144721X12 FA144720X12 FA144719X12	7*	Piston Ring (2 required) NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	FA401950T12 FA401951T12 FA401952T12 FA401953T12 FA401954T12 FA144908X12 FA144925X12
			10*	O-ring NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	19B2838X012 18B2124X012 18B8514X012 18B2140X012 19B0359X012 1P5585X0022 FA400093X12
			11*	O-ring, External, Bonnet NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	FA400009T12 FA400024T12 FA400259T12 FA400045T12 FA400262T12 FA400093X12 FA400017X12
1B	Seat ring (not shown) NPS 8 / DN 200 NPS 10 / DN 250	FA144794X12 FA144801X12	12	Main Spring Type OSE (E-Body) NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250 Type EZHOSX, EZROX, EZLOSX (X-Body) NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200	FA144205X12 FA144206X12 FA144208X12 FA144208X12 FA144208X12 FA144208X12 FA144208X12 FA139554X12 FA139554X12
1C	Seat O-ring (not shown) NPS 8 / DN 200 NPS 10 / DN 250	FA400046X12 FA400092X12			FA144205X12 FA144206X12 FA144208X12 FA144209X12 FA144210X12 ERAA45584A0
3	Resetting Tool NPS 1 through 6 / DN 25 through 150 NPS 8 and 10 / DN 200 and 250	FA242915T12 FA181258X12	13	Valve Assembly NPS 8 / DN 200 NPS 10 / DN 250	FA181259X12 FA181260X12
5	Plug and Bypass Assembly NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150	FA181114T12 FA181115T12 FA181116T12 FA181117T12 FA181118T12			
5A	Equalizer Bypass Assembly NPS 1 through 6 / DN 25 through 150	FA180977T12			
5H	Valve plug NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150	FA142206X12 FA142211X12 FA142217X12 FA142223X12 FA142229X12			

North America Only

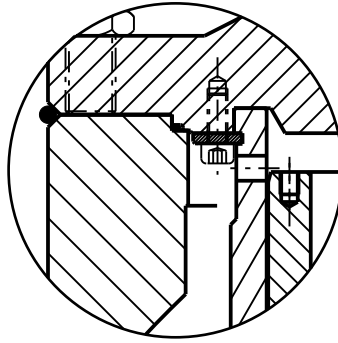
*Recommended spare part.

Type OS2

Key	Description	Part Number	Key	Description	Part Number
14	Cylinder, Guide NPS 8 / DN 200 NPS 10 / DN 250	FA144791X12 FA144798X12	20	Valve Stem NPS 8 / DN 200 NPS 10 / DN 250	FA144793X12 FA144800X12
15	Bonnet NPS 1 / DN 25 NPS 2 / DN 50 NPS 3 / DN 80 NPS 4 / DN 100 NPS 6 / DN 150 NPS 8 / DN 200 NPS 10 / DN 250	FA144510T12 FA144511T12 FA144512T12 FA144513T12 FA144514T12 FA144790X12 FA144797X12	21	Cap Screw NPS 1 / DN 25 (4 required) NPS 2 / DN 50 (8 required) NPS 3 / DN 80 (8 required) NPS 4 / DN 100 (8 required) NPS 6 / DN 150 (12 required) NPS 8 / DN 200 (8 required) NPS 10 / DN 250 (16 required)	1R281124052 1A453324052 1A454124052 1A440224052 1U513124052 FA402493X12 FA402493X12
16	Mechanism Box (BM) BM1 For NPS 1 through 6 / DN 25 through 150 For NPS 8 and 10 / DN 200 and 250 BM2 For NPS 1 through 6 / DN 25 through 150 For NPS 8 and 10 / DN 200 and 250	FA181067T12 FA181166X12 FA181068T12 FA181167X12	22	Eyebolt (2 required) NPS 4 and 6 / DN 100 and 150 NPS 8 and 10 / DN 200 and 250	FA403250T12 FA403252X12
16A	Box BM1 NPS 1 through 6 / DN 25 through 150 NPS 8 and 10 / DN 200 and 250 BM2 NPS 1 through 6 / DN 25 through 150 NPS 8 and 10 / DN 200 and 250	FA142924X12 FA144338X12 FA144071X12 FA144339X12	23	Nut (2 required) NPS 4 and 6 / DN 100 and 150 NPS 8 and 10 / DN 200 and 250	FA404154T12 FA404158X12
16B	Tripping Plate Assembly	FA181041X12	24	Small Stem Bushing Assembly NPS 1 through 6 / DN 25 through 150 NPS 8 and 10 / DN 200 and 250	FA181040X12 FA198426X12
16C	Lock Stem NPS 1 through 6 / DN 25 through 150	FA142920X12	24B	Bushing Assembly O-ring NPS 1 through 6 / DN 25 through 150	FA400514X12
16D	Second Stage Shaft NPS 1 through 6 / DN 25 through 150 NPS 8 and 10 / DN 200 and 250	FA181043X12 FA144845X12	25	Type BMS1 Bracket Kit	FA181111T12
16E	Snap Ring NPS 1 through 6 / DN 25 through 150	FA406128X12	26	Type BMS2 Bracket Kit	FA181112T12
16F	Sliding Clevis NPS 1 through 6 / DN 25 through 150 NPS 8 and 10 / DN 200 and 250	FA181042X12 FA144667X12	27	Trigger Switch, optional For NPS 1 to 6 / DN 25 to 150 only	FA196378X12
16G	Cover Gasket NPS 1 through 6 / DN 25 through 150	FA145430T12	28	Nameplate, Body	-----
16H	Cover Assembly NPS 1 through 6 / DN 25 through 150 NPS 8 and 10 / DN 200 and 250	FA181328T12 FA181168X12	29	Drive Screw (2 required) (not shown)	1A368228982
16J	Cover Screw O-ring NPS 1 through 6 / DN 25 through 150	FA406080T12	30	Pipe Plug, Mechanism Box (NPS 1 through 6 / DN 25 through 150 only) (not shown)	1A369224492
17	Manometric Device (BMS) Diaphragm Type 162 Type 71 Piston Type 27 Type 17 Bellows Type 236 Type 315	FA181105T12 FA181106T12 FA181107T12 FA181108T12 FA181109T12 FA181110T12	33	BMS Control Spring	See Table 2
17B*	Diaphragm BMS Type 162 BMS Type 71	FA137906X12 FA142549X32	35	Pin NPS 8 and 10 / DN 200 and 250	FA405634X12
17C*	O-ring BMS Type 27 BMS Type 17 BMS Type 236 and 315	FA400521X12 FA400527X12 FA400013X12	36	Screw NPS 8 / DN 200 (9 required) NPS 10 / DN 250 (11 required)	FA402638X12 FA402638X12
17D*	O-ring BMS Type 27 BMS Type 17	FA400527X12 FA400515X12	37*	Bonnet/BM Gasket For NPS 1 through 6 / DN 25 through 150 For NPS 8 and 10 / DN 200 and 250	FA142930T12 FA144671X12
			38A	Hex Head Cap Screw (2 required for BM1, 4 required for BM2)	FA402019X12
			38B	Washer (2 required for BM1, 4 required for BM2)	FA461150T12
			38C*	Joint Gasket (1 required for BM1, 2 required for BM2)	FA145431X12
			39	Screw (2 required) NPS 1 through 6 / DN 25 through 150 NPS 8 and 10 / DN 200 through 250	FA402036X12 FA402037X12
			40	Flat Washer (2 required)	FA405006X12
			53	Nut For NPS 8 and 10 / DN 200 and 250	FA144804X12
			98	Nut, Lock For NPS 8 and 10 / DN 200 and 250	FA404511X12
			99	Washer (4 required) For NPS 8 and 10 / DN 200 and 250	FA405006X12
			100	Resetting Latch For NPS 8 and 10 / DN 200 and 250	FA144849X12
			118	Washer, Sealing (2 required) For NPS 8 and 10 / DN 200 and 250	FA461150T12
			120	Joint Gasket For NPS 8 and 10 / DN 200 and 250	FA145431X12

*Recommended spare part.

North America Only



DETAIL OF NPS 10 / DN 250

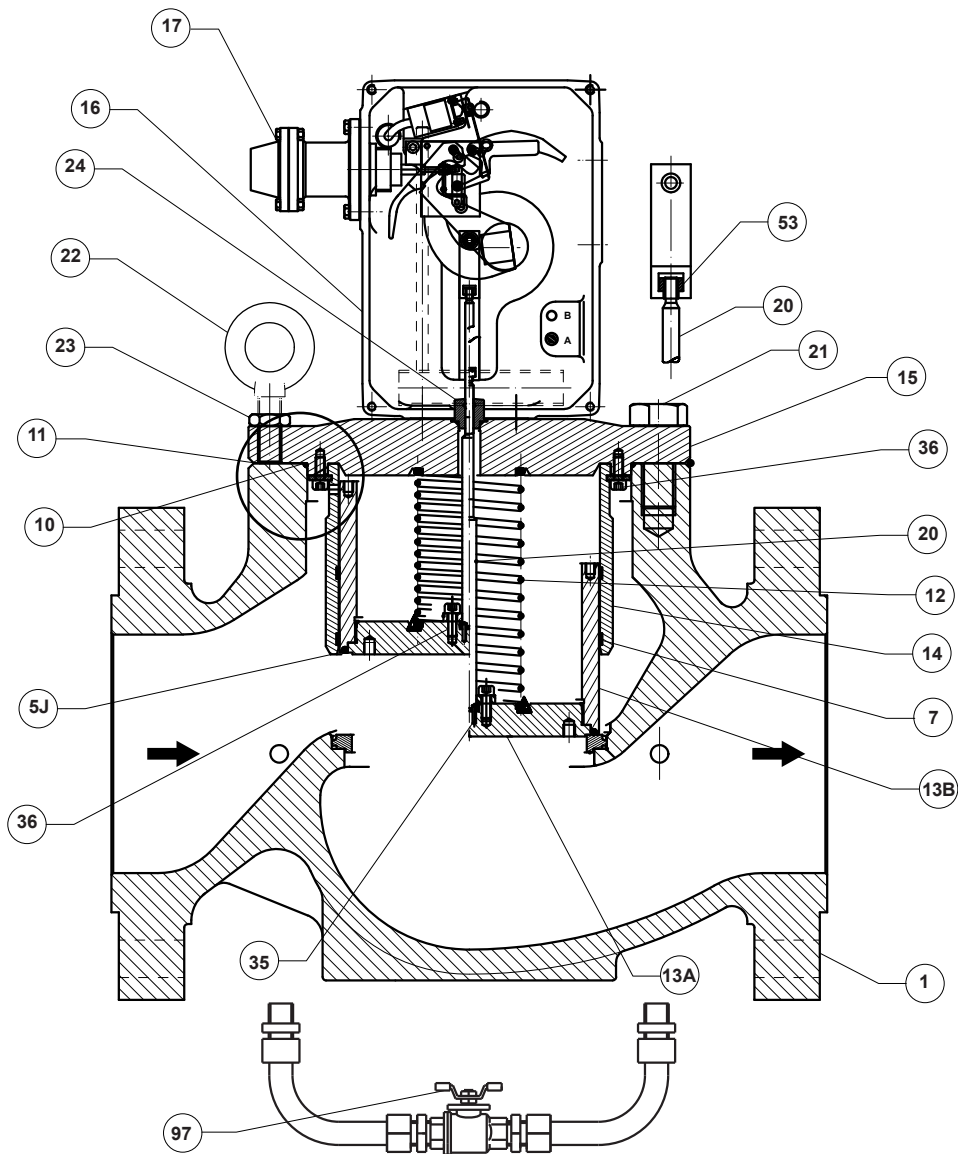


Figure 13. Type OS2 Slam-Shut Valve Assembly for NPS 8 and 10 / DN 200 and 250

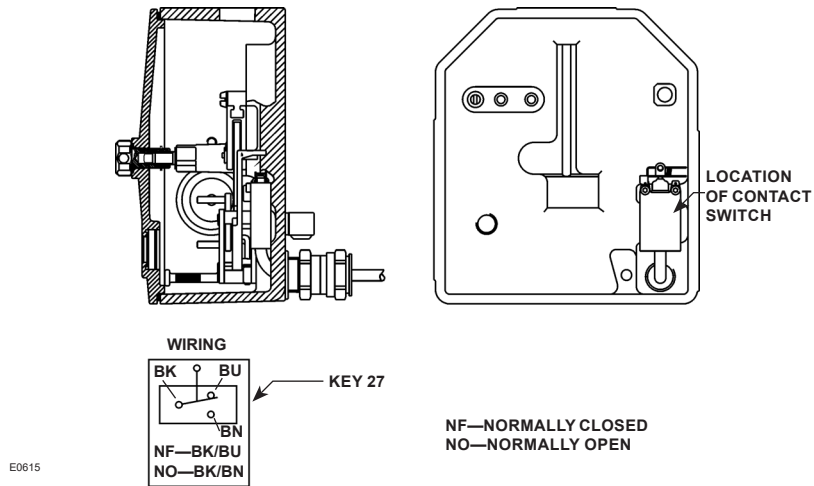


Figure 14. Optional Contact Limit Switch

Table 3. Optional Contact Limit Switch

C1 CONTACT VERSION—EXPLOSION PROOF CONNECTION WITH CABLE AND TIGHT-SHUT PACKING GLAND

	AC	DC
Maximum Current	7.0A	0.8A
Maximum Voltage	400V	250V
Protection	EEx-d IIC T6	
Tightness	IP 66	
Temperature	-20 to 160°F / -29 to 71°C	
Fastening	2 M3 screws	
Cable	3 wires (Black, Blue, Brown) H05VVF (0.118 x 0.3 in. ² / 3.0 x 7.6 mm ²) D (0.256 in. / 6.5 mm)	

OPTIONS

CONTACT VERSIONS	INSTALLMENT	TIGHTNESS	CONNECTION	MECHANICAL CONNECTIONS	ELECTRICAL CONNECTIONS			
					Common	NF	NO	Connection
C1	Explosion proof	IP 68	Explosion proof	9.84 ft / 3.0 m wire	Black	Blue	Brown	Wires

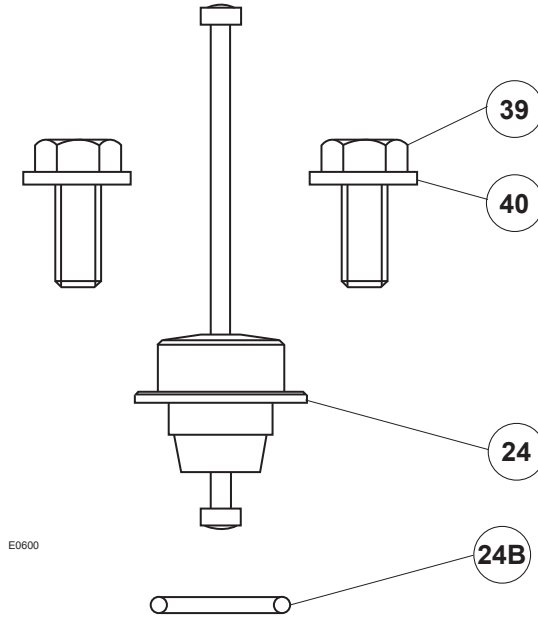


Figure 15. Small Stem Bushing Detail

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