

July 2012

Types S208 and S209 Pressure Reducing Regulators with Internal 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® regulators must be installed, operated, and maintained in accordance with federal, state, and local codes, rules and regulations, and Emerson Process Management Regulator Technologies, Inc. (Regulator Technologies) instructions.

If the regulator 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 regulator.

Introduction

Scope of the Manual

This instruction manual provides installation, adjustment, maintenance, and parts ordering information for Types S208, S208H, S208P, S208PK, S209, S209H, S209P, and S209PK gas service regulators with Type VSX-2 integral slam-shut device.

Description

Types S208 and S209 regulators are typically installed on industrial and commercial applications. Types S208 and S209 are similar in design to the Types S201 and S202 regulators. Type S209 units contain a token



Figure 1. Type S208K Pressure Reducing Regulator with Type VSX-2 Slam-Shut Device

internal relief to allow overpressure caused by thermal expansion to be released. The Types S208 and S209 include a Type VSX-2 integral slam-shut device. The Type VSX-2 is a shut-off device that provides over or over and underpressure protection by completely shutting off the flow of gas to the downstream system. The slam-shut device's actions are independent of the Types S208 and S209 regulators and of variations to inlet pressure. The Type VSX-2 has internal registration, except on the Type S208P or S209P where a downstream sensing line is required.

Specifications

The Specifications section lists the ratings, pressure ranges, and other specifications for all Types S208 and S209 regulators. The following information is stamped on the regulator nameplate at the factory: type number, manufacture date, spring range, orifice size, Type VSX-2 high and low trip pressures, maximum inlet pressure, maximum outlet operating pressure, and outlet pressure that may damage regulator parts.



Types S208 and S209

Specifications

Available Configurations

See Table 1

Body Sizes and End Connection Styles

See Table 2

Maximum Inlet Pressure (Body Rating)⁽¹⁾

150 psig / 10.3 bar

Maximum Operating Inlet Pressure to Obtain Optimum Performance by Orifice Size

See Table 3

Maximum Outlet Pressure (Casing)⁽¹⁾

15 psig / 1.0 bar

Maximum Operating Outlet Pressure To Avoid Internal Part Damage⁽²⁾

Light Diaphragm Plate: 2 psi / 0.14 bar above outlet pressure setting

Heavy Diaphragm Plate: 3 psi / 0.21 bar above outlet pressure setting

Outlet Pressure Ranges

See Table 4

Type VSX-2 Trip Pressure Ranges

See Table 5

Pressure Setting Adjustment

Adjusting Screw

Pressure Registration

See Table 1

Material Temperature Capabilities⁽¹⁾

Nitrile (NBR): -20 to 150°F / -29 to 66°C

Fluorocarbon (FKM): 0 to 200°F / -18 to 93°C
(Upper temperature limitation due to Nylon (PA) flappers)

Type VSX-2: -20 to 140°F / -29 to 60°C

Control and Sensing Line Connections (required on the "P" version only)

Types S208 and S209: 3/4 NPT

Type VSX-2: 1/4 NPT

Approximate Weight

30 pounds / 14 kg

1. The pressure/temperature limits in this Instruction Manual and any applicable standard limitation should not be exceeded.

Principle of Operation (Figure 2)

Types S208 and S209

When the downstream demand decreases, the pressure under the diaphragm increases. This pressure overcomes the regulator setting (which is set by a spring). Through the action of the pusher post assembly, the valve disk moves closer to the orifice and reduces gas flow. If demand downstream increases, pressure under the diaphragm decreases. Spring force pushes the pusher post assembly downward, the valve disk moves away from the orifice, and the gas flow increases.

The Type S209 regulators include a limited capacity internal relief valve for relief of thermal expansion. If the downstream pressure exceeds the regulator setting by 8 inches w.c. to 2 psig / 20 mbar to 0.14 bar, depending on the main spring used, the relief valve opens and excess gas is vented through the stabilizer vent in the upper spring case.

Type VSX-2 Slam-Shut Device

The Type VSX-2 slam-shut device on the Types S208 and S209 regulators is a fast acting shut-off valve which provides over or over and underpressure protection by completely shutting off the flow of gas to the downstream system. The shutoff module's actions are independent of the Types S208 and S209 regulators and variations to the inlet pressure. The Type VSX-2 has internal or external registration. External registration requires a downstream sensing line.

The shutoff disk is held in the open position (reset position) by a small ball holding the disk stem. If the pressure below the diaphragm increases (or decreases) reaching the Type VSX-2 setpoint, the diaphragm will travel upwards (or downwards) operating a level which in turn releases the ball.

Once the ball is released, the spring force on the stem will push the stem and disk to the closed position against the seat shutting off all gas flow. The manual reset has an internal bypass to equalize the reset pressure on either side on the shut-off disk.

Types S208 and S209

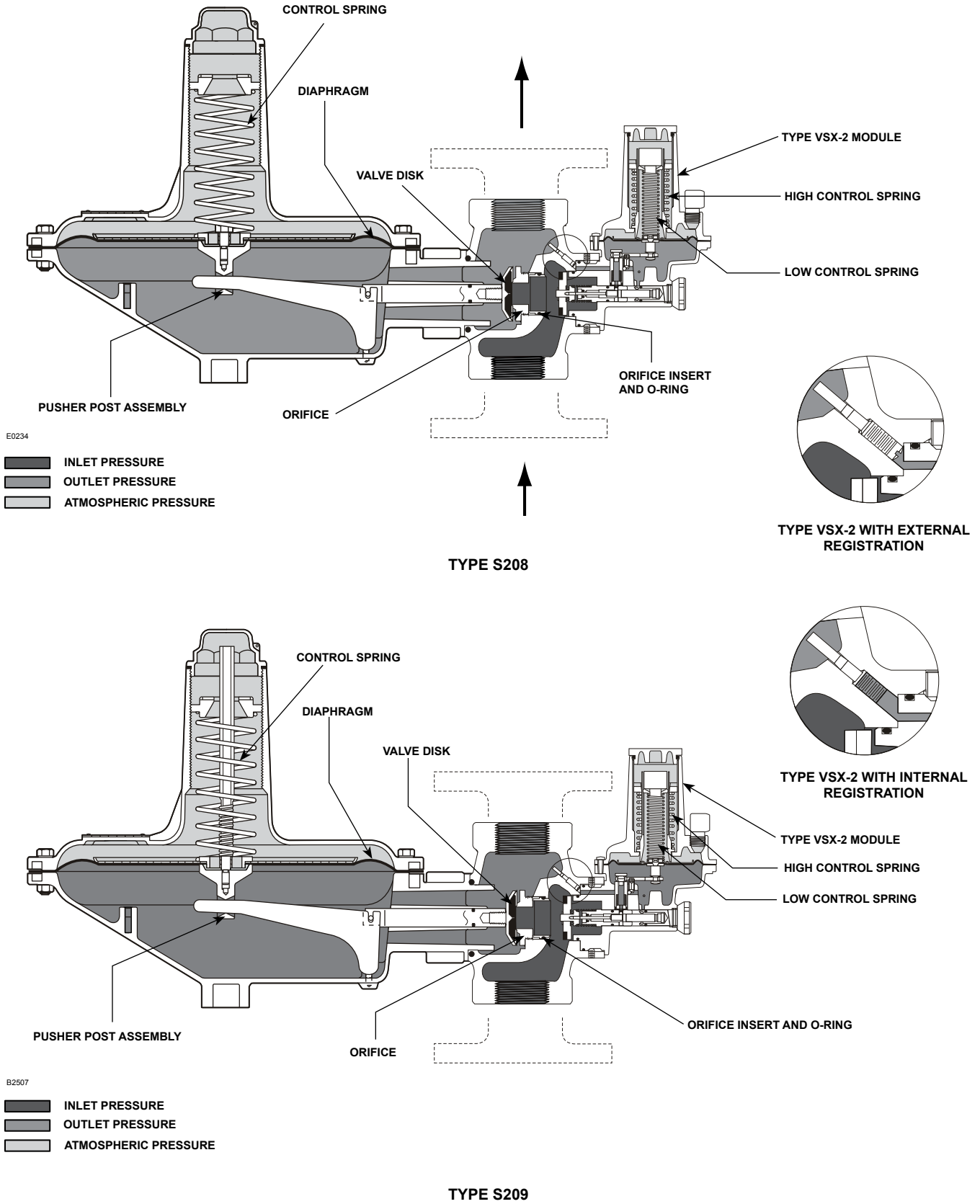


Figure 2. Operational Schematics

Types S208 and S209

Table 1. Available Configurations

CONSTRUCTION FEATURES	TYPE NUMBER							
	S208	S208H	S208K	S208P	S208PK	S209	S209H	S209P
Light diaphragm plate	X					X		
Heavy diaphragm plate		X	X		X		X	
Either light or heavy diaphragm plate depending on outlet pressure range				X				X
Internal registration	X	X	X			X	X	
External registration - O-ring stem seal and downstream control line connection				X	X			X
Internal relief - Token						X	X	X
Type VSX-2	X	X	X	X	X	X	X	X

Table 2. Body Sizes and End Connection Styles

BODY SIZE		END CONNECTION STYLE
NPS	DN	
1-1/4, 1-1/2, or 1-1/2 x 2	32, 40, or 40 x 50	NPT
2	50	NPT, CL125 FF flanged, CL250 RF flanged, or PN 10/16 RF flanged

Table 3. Orifice Sizes and Maximum Operating Inlet Pressures

ORIFICE SIZE		MAXIMUM OPERATING INLET PRESSURE		C _g	C _v	C ₁
Inches	mm	psig	bar			
1/4	6.4	125	8.6	53	1.51	35
3/8	9.5	125	8.6	110	3.14	
1/2	13	100	6.9	190	5.43	
3/4	19	60	4.1	415	11.9	
1	25	25	1.7	700	20	
1-3/16	30	13	0.90	910	26	

In order for the Underpressure Shutoff (UPS) of any slam shut to be triggered, the downstream pipe pressure must drop below the UPS setpoint. In the case of a downstream line break, numerous factors can prevent the downstream pipe pressure from decreasing below the slam-shut UPS setpoint. These factors include the distance of pipe to the break, the diameter of the pipe, size of the break, and the number of restrictions, such as valves, elbows and bends, downstream of the regulator and/or slam-shut device. Due to these factors additional protections should be installed to stop flow in the event of a line break.

downward to allow condensate to drain. This minimizes the possibility of freezing of water or other foreign material from entering the vent and interfering with proper operation.

Under enclosed conditions or indoors, escaping gas may accumulate and be an explosion hazard. In these cases, the vent should be piped away from the regulator to the outdoors.

If the regulator or slam-shut device is exposed to an overpressure condition, it should be inspected for any damages that may have occurred. Operation below these limits does not preclude the possibility of damage from external sources or from debris in the pipeline.

In the case of a downstream line break, numerous factors affect the capability to evacuate gas from the pipeline. These factors include the distance of pipe to the break, the diameter of the pipe, size of the break, and the number of restrictions, such as valves, elbows and bends, downstream of the regulator and/or slam-shut device. Due to these factors additional protections should be installed to stop flow in the event of a line break.

WARNING

Personal injury or system damage may result if this regulator is installed, without appropriate overpressure protection, where service conditions could exceed the limits given on the regulator nameplate. Regulator installations should be adequately protected from physical damage.

All vents should be kept open to permit free flow of gas to the atmosphere. Protect openings against entrance of rain, snow, insects, or any other debris that may plug the vent or vent line. On outdoor installations, point the spring case vent

Types S208 and S209

Table 4. Outlet Pressure Ranges

TYPES	SPRING NUMBER	OUTLET (CONTROL) PRESSURE RANGE		PILOT CONTROL SPRING					
		Inch w.c.	mbar	Part Number	Color Code	Free Length		Wire Diameter	
						Inches	cm	Inches	mm
S208, S209, S208P, and S209P	----	2 to 4.5 ⁽¹⁾	5 to 11 ⁽¹⁾	1D892527022	Brown Stripe	6.12	15.5	0.109	2.77
	1	3.5 to 6.5	9 to 16	1D892627022	Red	7.5	19.1	0.120	3.05
	2	5 to 9	12 to 22	1D892727012	Black	7.88	20.0	0.130	3.30
	3	8.5 to 18	21 to 45	1D893227032	Gray	7.5	19.1	0.156	3.96
S208H, S208P ⁽²⁾ , S209H, and S209P ⁽²⁾	4	14 to 30	35 to 75	1D893327032	Dark Green	7.25	18.4	0.182	4.62
	5	1 to 2 psig	0.07 to 0.14 bar	1H975827032	Dark Blue	7.38	18.7	0.225	5.72
	6	1.5 to 3.25 psig	0.10 to 0.22 bar	1H975927032	Orange	7.38	18.7	0.250	6.35
S208K and S208PK	7	2 to 5 psig	0.14 to 0.34 bar	1P615427142	Yellow	6.5	16.5	0.283	7.19
	8	2 to 5.5 psig	0.14 to 0.38 bar	0Y066427022	Green Stripe	6.00	15.2	0.363	9.22
	9	4 to 10 psig	0.28 to 0.69 bar	1H802427032	Unpainted	6.00	15.2	0.406	10.31

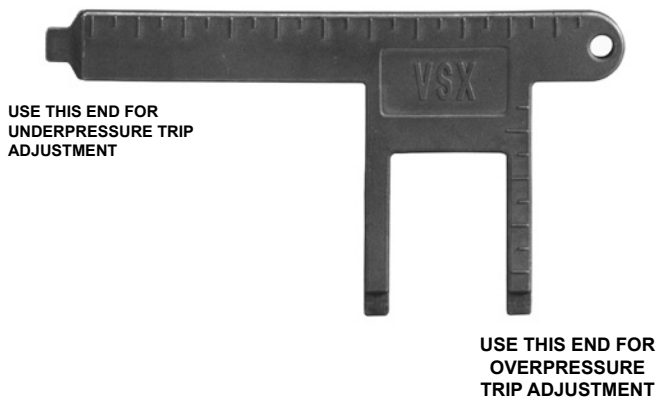
1. With regulator installed so control spring is on top of diaphragm. If installed so control spring is on bottom, lower end of outlet pressure range can be reduced by 1-inch w.c. / 2 mbar for regulator with light diaphragm plate or 2-inches w.c. / 5 mbar for regulator with heavy diaphragm plate.
2. Types S208P and S209P require heavy diaphragm plate for outlet pressures over 1 psig / 0.07 bar.

Table 5. Type VSX-2 High and Low Trip Pressure Ranges

SETPOINT RANGES	SLAM-SHUT REGISTRATION	FOR USE WITH MAIN VALVE SPRING NUMBER ^(1,2)	MINIMUM TO MAXIMUM TRIP PRESSURE		TYPE VSX-2 SPRING PART NUMBER	SPRING COLOR	SPRING FREE LENGTH		SPRING WIRE DIAMETER	
			Inch w.c.	mbar			Inches	mm	Inches	mm
Overpressure Shutoff	Internal or External	1, 2	12 to 25	30 to 62	T14162T0012	Black	3.15	80.0	0.067	1.70
		1, 2, 3, 4	20 to 52	50 to 129	T14163T0012	Brown	3.15	80.0	0.080	2.03
		3, 4, 5, 6	1.4 to 3.9 psig	0.10 to 0.27 bar	T14164T0012	Red	3.15	80.0	0.091	2.31
		5, 6, 7, 8, 9	3.8 to 8.7 psig	0.26 to 0.60 bar	T14165T0012	Orange	3.15	80.0	0.120	3.05
		9	5.8 to 16 psig	0.40 to 1.1 bar	T14166T0012	Pink	3.15	80.0	0.138	3.51
Underpressure Shutoff	External	2, 3	2 to 12	5 to 30	T14168T0012	White	3.15	80.0	0.043	1.09
		3, 4, 5, 6	4 to 30	10 to 75	T14169T0012	Blue	3.15	80.0	0.055	1.40
		5, 6, 7, 8	10 inches w.c. to 2.3 psig	25 mbar to 0.16 bar	T14170T0012	Silver	3.15	80.0	0.067	1.70
		7, 8, 9	1.5 to 10.8 psig	0.10 to 0.75 bar	T14171T0012	Olive	3.15	80.0	0.125	3.18
	Internal	2, 3, 4 ⁽³⁾	----	----	-----	----	----	----	----	----
		5, 6 ⁽⁴⁾	50% of regulator setpoint to 30	50% of regulator setpoint to 75	T14169T0012	Blue	3.15	80.0	0.055	1.40
		5, 6, 7, 8 ⁽⁴⁾	50% of regulator setpoint to 2.3 psig	50% of regulator setpoint to 0.16 bar	T14170T0012	Silver	3.15	80.0	0.067	1.70
		7, 8 ⁽⁴⁾	50% of regulator setpoint to 10.8 psig	50% of regulator setpoint to 0.75 bar	T14171T0012	Olive	3.15	80.0	0.125	3.18
	9 ⁽⁴⁾	70% of regulator setpoint to 10.8 psig	70% of regulator setpoint to 0.75 bar	T14171T0012	Olive	3.15	80.0	0.125	3.18	

1. See Table 4 for main valve spring number.
2. Other spring combinations are available, please contact your local Sales Office for additional information. Trip pressure that are 2 or 3 psig / 0.14 to 0.21 bar over set pressure may result in internal parts damage.
3. Regulator main valve spring numbers 2, 3, and 4 cannot be used with an internally registered Type VSX-2 to provide underpressure shutoff under flowing conditions. If protection against loss of inlet pressure is the only required function for the Type VSX-2 then an internally registered Type VSX-2 may be used with the same minimum trip pressures as an externally registered Type VSX-2.
4. 50% of regulator setpoint is the minimum allowable underpressure shutoff setting for an internally registered Type VSX-2 used with main valve spring numbers 5, 6, 7, and 8. 70% of regulator setpoint is the minimum allowable underpressure shutoff setting for an internally registered Type VSX-2 used with main valve spring number 9. If protection against loss of inlet pressure is the only required function for the Type VSX-2 then an internally registered Type VSX-2 may be used with the same minimum trip pressures as an externally registered Type VSX-2.

Types S208 and S209



W7874

TYPE VSX ADJUSTING TOOL



W7877

TYPE VSX TOOL BEING USED TO ADJUST A TYPE VSX-2

Figure 3. Type VSX Adjusting Tool

Before installing the regulator, check for damage which might have occurred in shipment. Also check for dirt or foreign matter that may have accumulated in the regulator body or in the pipeline. Apply pipe compound to the external threads of the pipeline and install the regulator so that flow is in the direction of the arrow cast on the body. The diaphragm casing assembly can be rotated to any position relative to the body. Loosen the two cap screws (not shown) in order to rotate the diaphragm casing assembly.

Do not install the regulator in a location where there can be excessive water accumulation, such as directly beneath a downspout.

The Types S208 and S209 regulators have 1 NPT screened vent openings in the spring case. If necessary to vent escaping gas away from the regulator, install a remote vent line in the spring case tapping.

Vent piping should be as short and direct as possible with a minimum number of bends and elbows. The remote vent line should have the largest practical diameter. Vent piping on regulators with internal relief (Type S209) must be large enough to vent all relief valve discharge to atmosphere without excessive backpressure and resulting excessive pressure in the regulator. The Type VSX-2 has 1/4 NPT vent opening.

Periodically check all vent openings to be sure that they are not plugged.

Type VSX-2 Installation

The Type VSX-2 may be shipped separately from the regulator. To install the Type VSX-2 on a regulator, place the new O-rings (keys 2 and 3, Figure 10) on the Type VSX-2 and slide the module into the regulator body (key 21, Figures 5 through 8). Secure the Type VSX-2 to the regulator body with the four set screws (key 4, Figure 10). The Type VSX-2 device may be oriented in any direction with respect to the sensor line connection.

Startup



Pressure gauges should always be used to monitor downstream pressure during startup. Procedures used in putting this regulator into operation must be planned accordingly if the downstream system is pressurized by another regulator or by a manual bypass.

If the downstream system is not pressurized by another regulator or manual bypass valve, use the following procedure to start up the regulator.

1. Check to see that all appliances are turned off.
2. The Type VSX-2 is shipped in the tripped position and will need to be reset. If the Type VSX-2 is a high trip only, it can be reset before starting the regulator. If the Type VSX-2 is a high and low trip, the regulator will have to be started and the downstream system pressurized before the Type VSX-2 can be reset. See the section for Type VSX-2 reset.
3. Slowly open the upsteam block valve.
4. Check all connections for leaks.
5. Light appliance pilots.

Adjustment

Types S208 and S209

The range of allowable pressure settings is stamped on the nameplate. If the required setting is not within this range, substitute the correct spring (as shown in Table 4). If the spring is changed, be sure to change the nameplate to indicate the new pressure range. If the regulator spring is changed the Type VSX-2 must be adjusted accordingly.

A pressure gauge should always be used to monitor downstream pressure while adjustments are being made.

1. Remove the closing cap (key 4, Figures 5 through 8).
2. To increase the outlet setting, turn the adjusting screw (key 3, Figures 5 through 8) clockwise. To decrease the outlet setting, turn the adjusting screw counterclockwise.
3. Replace the closing cap.

Type VSX-2 Trip Adjustment

Note

An adjustment tool is included with the Type VSX-2 (see Figure 3). Use only this tool to make adjustments to the Type VSX-2. To make adjustments, the overpressure trip spring is found under the outer adjusting screw and the underpressure trip spring is found under the inner adjusting screw.

Use the following procedure to adjust the Overpressure Trip Spring:

1. Use the Type VSX adjusting tool to adjust the overpressure trip spring to its maximum compression.
2. If present, adjust the underpressure spring (using the Type VSX adjusting tool) to its minimum compression.
3. Backpressure the unit with the desired trip pressure.
4. Use the Type VSX tool to reduce the overpressure trip spring compression until the Type VSX-2 trips.

Use the following procedure to adjust the Underpressure Trip Spring:

1. Use the Type VSX adjusting tool to adjust the underpressure trip spring to its minimum compression.
2. Backpressure the unit with the desired trip pressure.
3. Increase the underpressure trip spring compression (using the Type VSX adjusting tool) until the Type VSX-2 trips.

Shutdown

Installation arrangements may vary, but in any installation it is important that the valves be opened or closed slowly and that the outlet pressure be vented before venting inlet pressure to prevent damage caused by reverse pressurization of the regulator. The steps below apply to the typical installation as indicated.

1. Slowly close the upstream shut-off valve.
2. Slowly open the vent valves up and downstream of the regulator.

Type VSX-2 Reset

Note

The over and under trip pressure can only be reset if the Types S208 and S209 outlet pressure is between the over and under trip pressure.

Use the following procedure to reset the Type VSX-2:

1. Unscrew the brass knob to open the equalizing bypass.
2. Pull out on the knob until it stops. This resets the tripping mechanism.
3. Push in and tighten the knob.

Types S208 and S209

Maintenance

WARNING

To avoid personal injury or equipment damage, do not attempt any maintenance or disassembly without first isolating the regulator from system pressure and relieving all internal pressure as described in the Shutdown section.

Regulators that have been disassembled for repair must be tested for proper operation before being returned to service. Only parts manufactured by Regulator Technologies should be used for repairing Fisher® regulators. Relight pilot lights according to normal Startup procedures.

Due to normal wear or damage that may occur from external sources, this regulator should be inspected and maintained periodically. The frequency of inspection and replacement of parts depends upon the severity of service conditions or the requirements of local, state, and federal rules and regulations.

Types S208 and S209 Maintenance

The key numbers in the following sections refer to Figures 5 through 8.

Disassembly to Replace Diaphragm

1. Remove the closing cap (key 4). Turn the adjusting screw (key 3) counterclockwise to remove spring compression.
2. Remove the adjusting screw (key 3) and spring (key 2).
3. Remove the hex nuts (key 15) and cap screws (key 14). Separate the upper spring case (key 1) from the lower casing assembly (key 9).

Note

If disassembling a Type S209 regulator, lift the upper spring case straight up in order to avoid hitting the stem.

4. Slide the diaphragm and diaphragm head assembly (key 7) away from the body (key 21) to unhook the pusher post (key 8) from the lever (key 10). Lift off the diaphragm and diaphragm head assembly.

5. Unscrew the cap screw or stem (key 24) that fastens the lower spring seat (key 6) to the pusher post and separate the lower spring seat, diaphragm and diaphragm head assembly, and pusher post. For Type S209 regulators, the relief valve spring (key 25) and relief restriction (key 94) will also have to be removed.

CAUTION

Before tightening the spring case cap screws (key 14) in step 6, replace the spring (key 2) and adjusting screw (key 3). Turn the adjusting screw to about mid-position. This will stretch the oversized diaphragm to ensure slack in the assembled diaphragm. The slack created by this method is necessary for good regulation. Be sure the diaphragm does not fold over at the flange when reassembling.

6. Reassemble the spring case unit in the reverse order of the above steps. Before tightening the cap screw or stem into the pusher post, place the loosely assembled diaphragm assembly into position in the lower casing, being sure that the pusher post is hooked into the lever. Rotate the diaphragm so that the diaphragm and lower casing holes are aligned. Tighten the screw or stem.

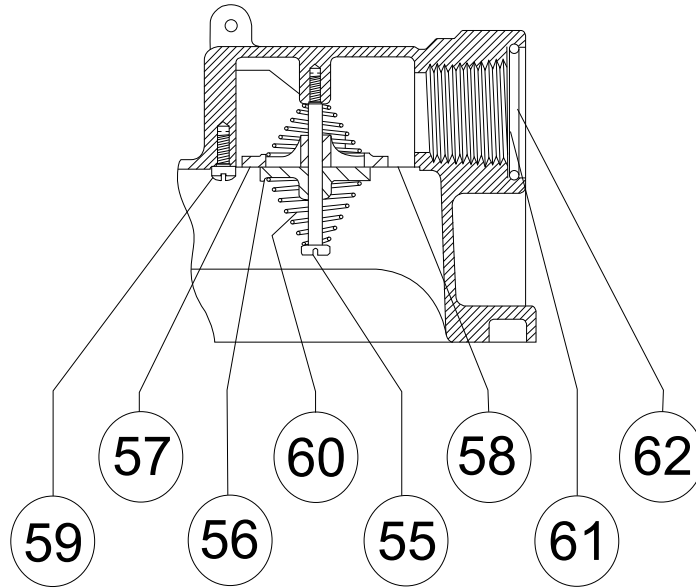
Disassembly to Replace Valve Disk and Orifice

1. Remove the bolts (key 18) that hold the lower spring casing (key 9) to the body (key 21). Separate the lower spring casing from the body.
2. Check the body O-ring (key 19) for wear.

Note

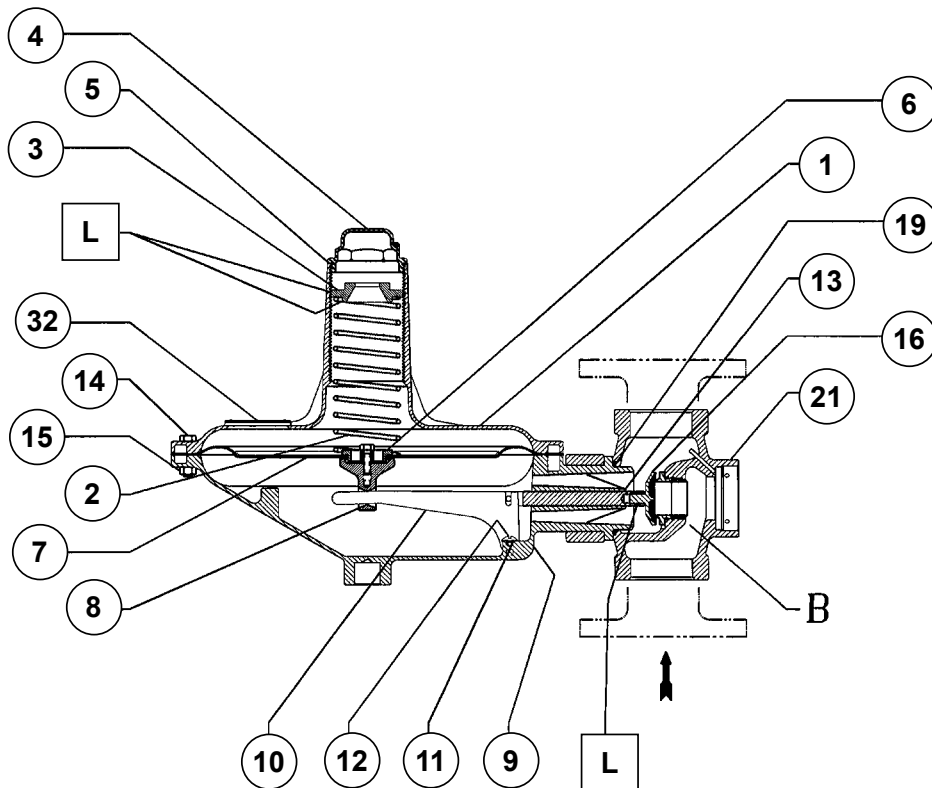
Replace used O-rings with new O-rings. Used or damaged O-rings can cause leaks.

3. Examine the valve disk holder and disk (key 16) for nicks, cuts, and other damage. Unscrew the disk holder assembly from the valve stem assembly (key 13) and replace it with a new part if necessary.
4. If the seating edge of the orifice is nicked or rough, remove the orifice (key 20), insert (key 121) and O-ring (key 122) from the body, Figure 9. Change to new parts when reassembling the regulator. If the orifice is being replaced with a different size orifice, change the nameplate to state the new size and maximum inlet pressure.
5. Reassemble the regulator in the reverse order of the above steps.



T80385_D

Figure 4. Two-Way Stabilizer Vent



T80385_D

□ APPLY LUBRICANT (L)

Figure 5. Types S208 and S208H Assembly

Types S208 and S209

Type VSX-2 Maintenance

The Type VSX-2 device (key 1, Figure 10) is designed to remove as a unit from the Types S208 and S209 body (key 21, Figures 5 through 8) and be replaced as a complete unit. The only replaceable parts in the Type VSX-2 module are the O-rings (keys 2 and 3, Figure 10) and the high and low pressure springs (keys 7 and 8, Figure 10). The high and low pressure springs may be adjusted or replaced without removing the slam-shut from the Type S208 or S209 body.

Parts Ordering

The type number, orifice size, spring range, and date of manufacture are stamped on the nameplate. Always provide this information in any correspondence with your local Sales Office regarding replacement parts or technical assistance. If construction changes are made in the field, be sure that the nameplate is also changed to reflect the most recent construction. When ordering a replacement part, be sure to include the complete eleven-character part number from the following parts list.

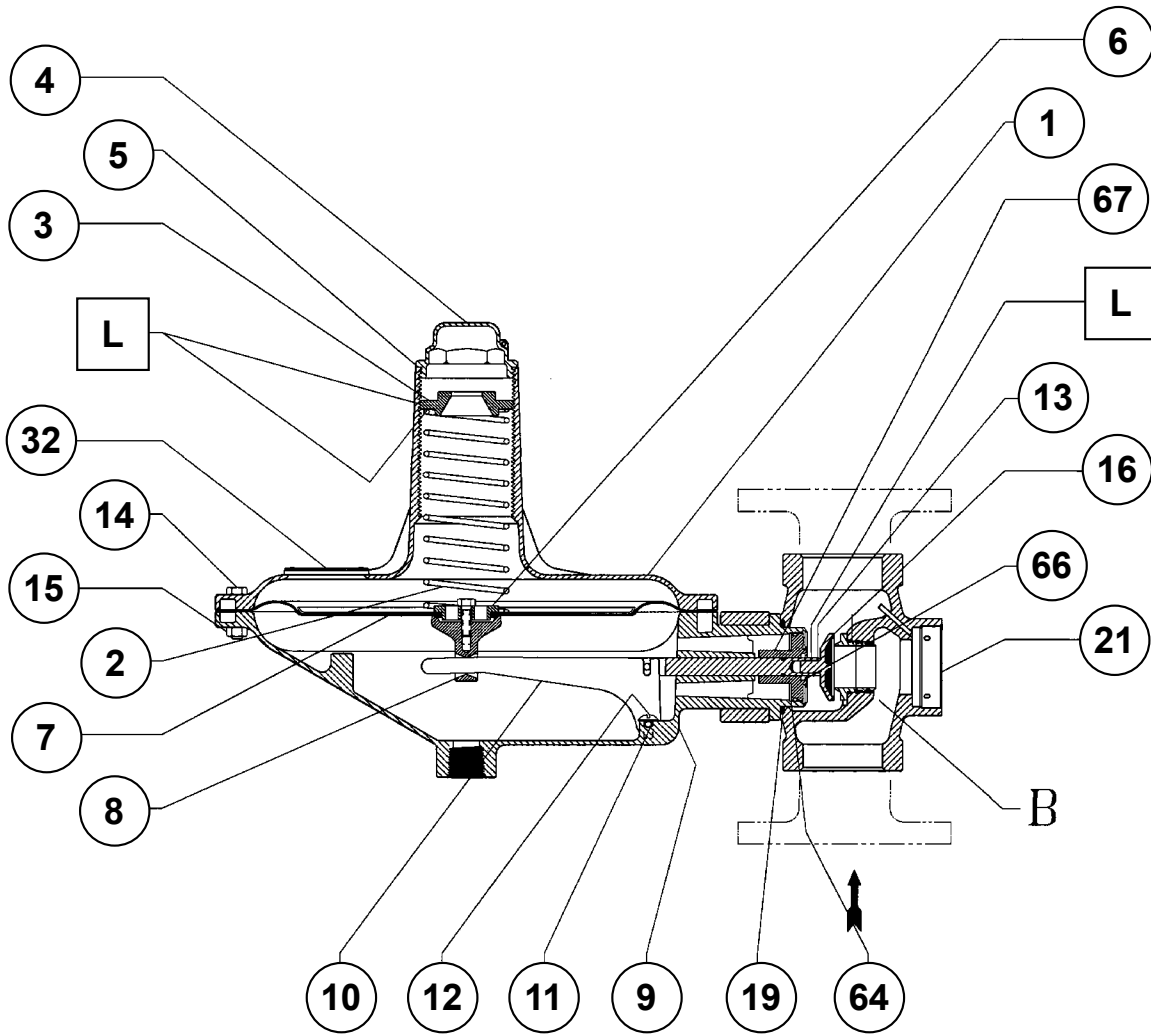
Parts List

Types S208 and S209 (Figures 4 through 9)

Key	Description	Part Number
1	Spring Case, Aluminum Standard With travel stop	4L142308032 1J718699022
2	Spring, Steel	see Table 4
3	Adjusting Screw, Aluminum	1L928608012
4	Closing Cap, Aluminum	1L928308012
5*	Closing Cap Gasket, Neoprene (CR)	1N446206992
6	Lower Spring Seat, Aluminum	1L928708012
7	Diaphragm and Head Assembly Standard Head Heavy Head	1L1544X0012 1L1545X0012
8	Pusher Post For All Types S208 For All Types S209	2H980608012 2H975208012
9	Lower Casing Assembly, Aluminum For All Types except Types S208K and S208PK For Types S208K and S208PK (includes 9A, 9B, and 9C)	1H9751X0012
	9A Lower Casing	T20915T0012
	9B Union Ring	2H9734T0012
	9C Spring Pin	1H975038992
10	Lever, Steel	1H974028992
11	Pin, 303 Stainless steel	1H972935032

Key	Description	Part Number
12	Machine Screw, Steel (2 required)	1B420428982
13	Valve Stem Assembly For Types S208, S208H, S208PK, S209, and S209H	1H9748000A2 1L1426000A2
14	Cap Screw, Steel (12 required)	1B136324052
15	Hex Nut, Steel (12 required)	1A309324122
16	Disk Holder For Natural Gas For Manufactured Gas and 5/8 inch / 16 mm orifice or larger	1P7349000A2 1J1680X0012
17	Diaphragm Head (Types S208K and S208PK)	1A347825022
18	Cap Screw (not shown), Plated steel (2 required)	T14254T0012
19*	O-ring, Nitrile (NBR)	T12587T0012
20	Orifice, Aluminum 1/4 inch / 6.4 mm 3/8 inch / 9.5 mm 1/2 inch / 13 mm 3/4 inch / 19 mm 1 inch / 25 mm 1-3/16 inch / 30 mm	T13833T0012 1H979309022 1H979409022 1H979509022 1H979609022 1H979709022
21	Body, Ductile Iron 1-1/2 NPT NPS 2 / DN 50 NPT CL125 FF flanged CL250 RF flanged PN 10/16 flanged	T40561T0012 T40562T0012 T80424T0012 T80425T0012 T80426T0012
24	Cap Screw (not for Type S209), Zinc-plated steel For Types S208 and S208P For Types S208H and S208P For Types S208K and S208PK Stem (for Types S209 and S209P only), Zinc-plated steel	1H975424272 1A667824052 1K427828982 1H969224272
25	Relief Valve Spring (for Type S209), Plated steel	1H976027012
32	Nameplate	-----
55	Flapper Stem, 302 Stainless steel	1H976335022
56	Lower Flapper, Nylon (PA)	1H976406992
57	Upper Flapper, Nylon (PA)	1H976506992
58	Orifice, 302 Stainless steel	T13609T0012
59	Self-tapping Screw, Steel (3 required)	1H976728982
60	Spring, 302 Stainless steel (2 required)	1H976837022
61	Screen, Monel®	1E564843122
62	Snap Ring, 302 Stainless steel	1E564937022
63	Retaining Ring (for Types S208K, S208P, and S209P)	1L142838992
64	O-ring (for Types S208K, S208P, and S209P)	1L142906992
65	O-ring	1E216306992
66	Wiper Ring, Nitrile (NBR)	1L143006992
67	Stem Adaptor (for Types S208K, S208P, and S209P)	1L143109012
94	Relief Restriction (for Type S209)	1U983936012
121	Insert	T14013T0012
122	O-ring	T1072606562
123	Pipe Plug, 1/4 NPT	1A767524662

*Recommended spare part.
Monel® is a mark owned by Special Metals Corporation.

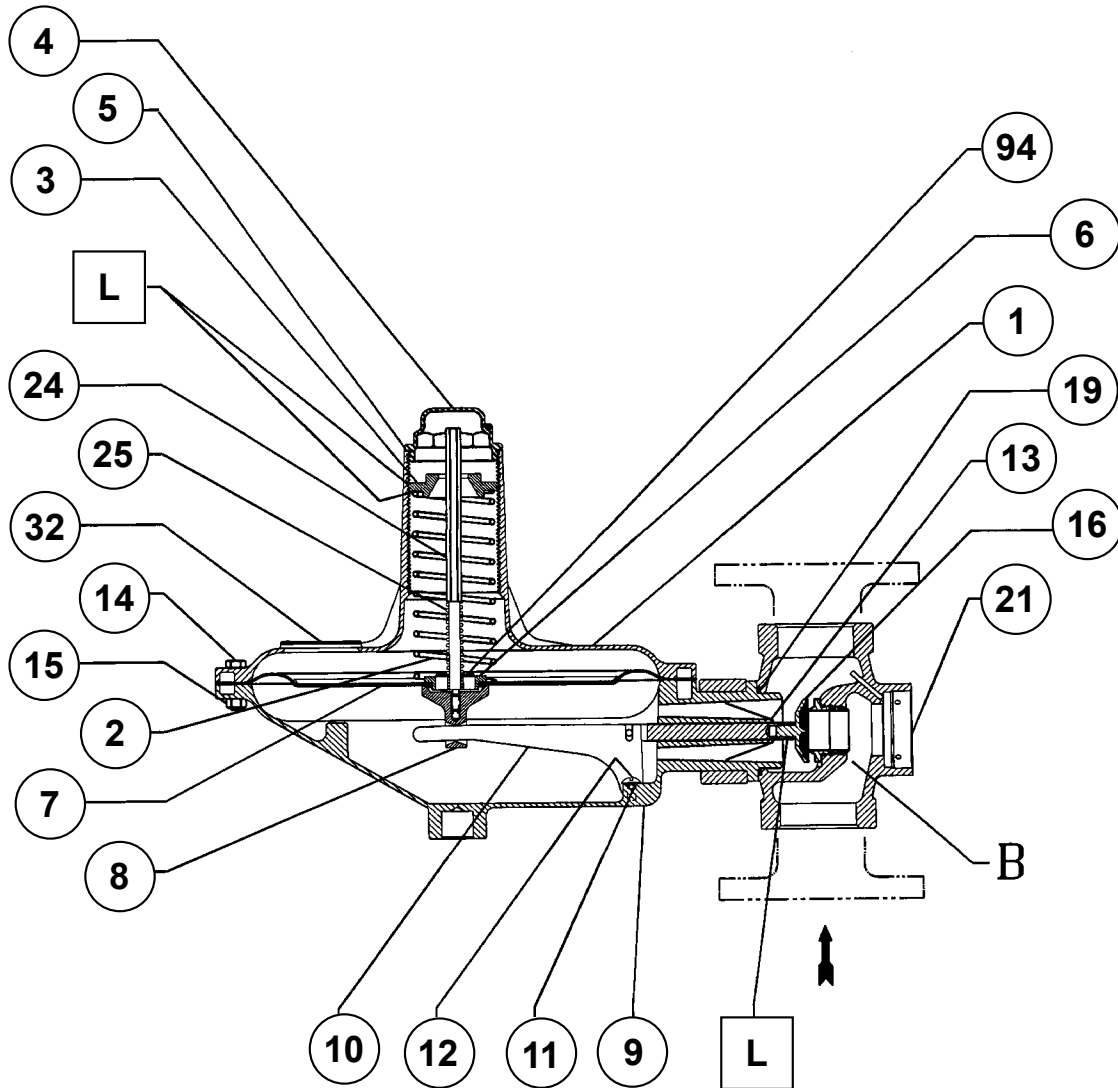


T80386_D

□ APPLY LUBRICANT (L)

Figure 6. Type S208P Assembly

Types S208 and S209

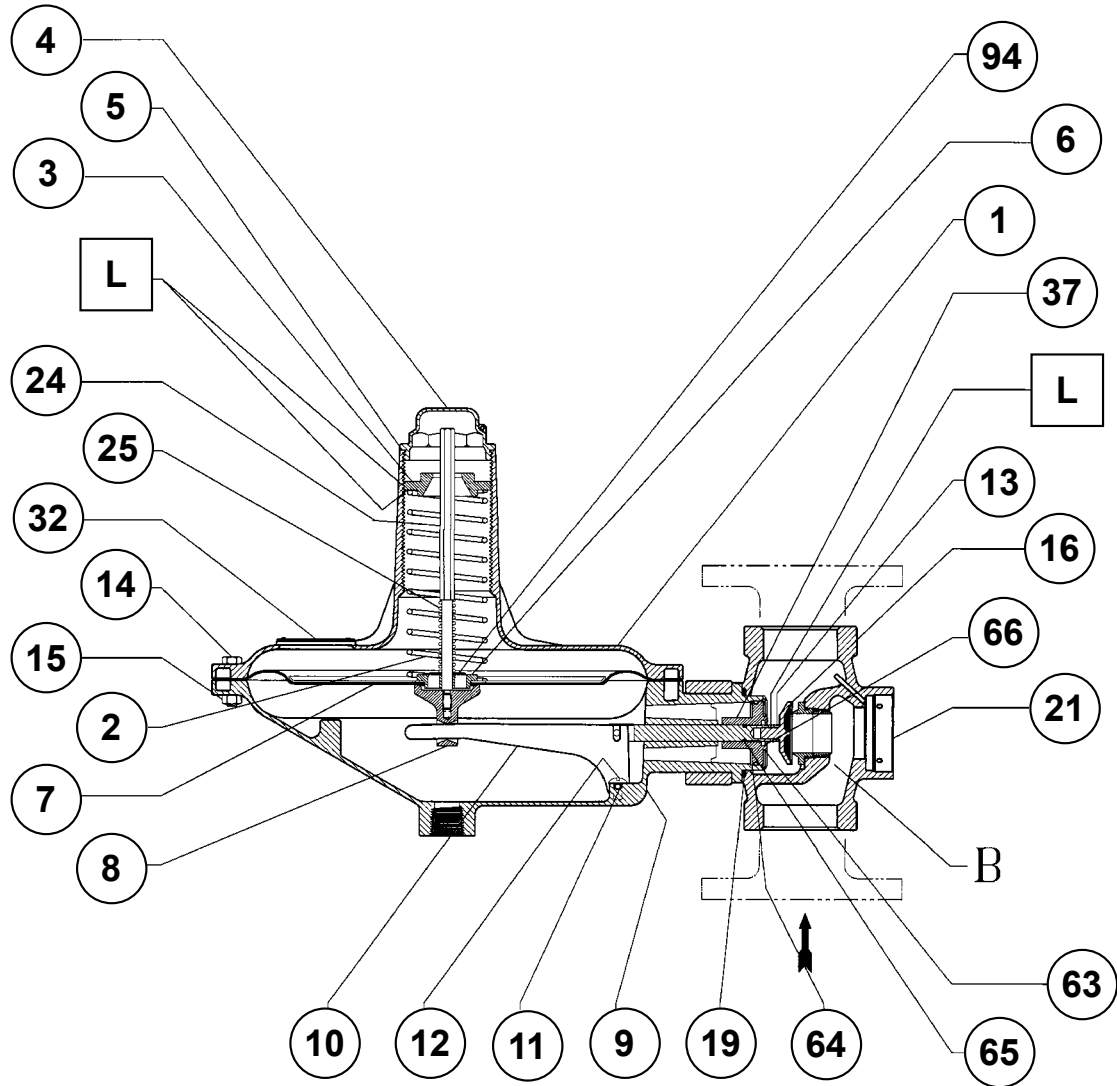


T80387_D

□ APPLY LUBRICANT (L)

NOTE: KEY 7 INCLUDES THE DIAPHRAGM (KEY 7A) AND THE DIAPHRAGM HEAD (KEY 7B)

Figure 7. Types S209 and S209H Assembly

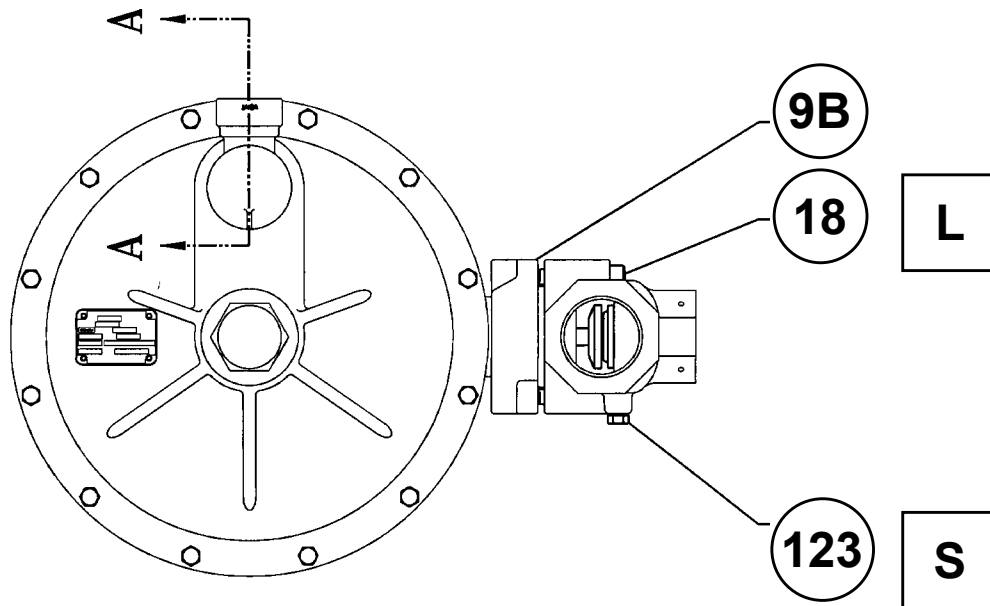


T80388_C

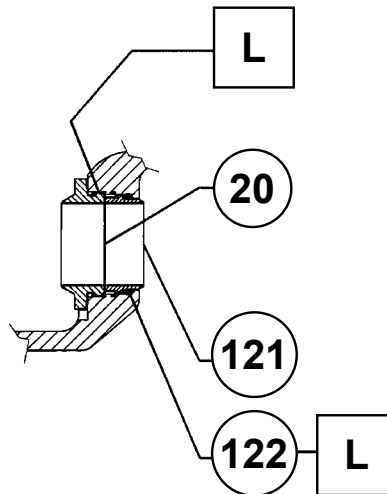
□ APPLY LUBRICANT (L)

Figure 8. Type S209P Assembly

Types S208 and S209



T80385_D

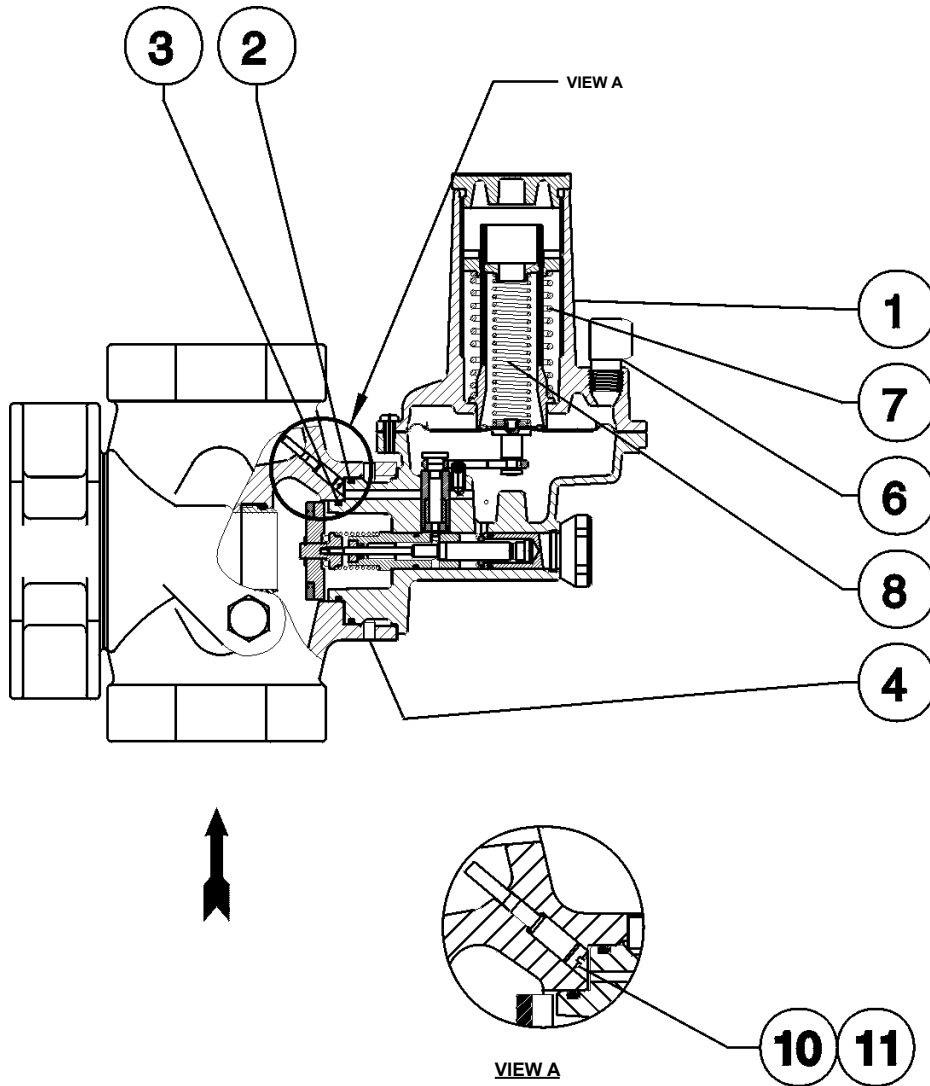


T80385_D

DETAIL B

□ APPLY LUBRICANT (L) SEALANT (S)

Figure 9. Typical External View and Orifice Detail



T80390_C

Figure 10. Type VSX-2 Assembly

Types S208 and S209

Type VSX-2 Slam-Shut Device (Figure 10)

Key	Description	Part Number
1	Type VSX-2 Module	FA196247X12
2	Upper O-ring	T13769T0012
3	Lower O-ring	T13772T0012
4	Set Screw (4 required)	1C629828992
6	Vent Assembly	27A5516X012
7	High pressure Control Spring, Zinc-plated steel	
	12 to 25 inches w.c. / 30 to 62 mbar, Black	T14162T0012
	20 to 52 inches w.c. / 50 to 129 mbar, Brown	T14163T0012
	1.4 to 3.9 psi / 0.10 to 0.27 bar, Red	T14164T0012
	3.8 to 8.7 psig / 0.26 to 0.60 bar, Orange	T14165T0012
	5.8 to 16 psig / 0.40 to 1.1 bar, Yellow	T14166T0012
8	Low pressure Control Spring, Zinc-plated steel	
	2 to 12 inches w.c. / 5 to 30 mbar, White	T14168T0012
	4 to 30 inches w.c. / 10 to 75 mbar, Blue	T14169T0012
	10 inches w.c. to 2.3 psig /	
	25 mbar to 0.16 bar, Silver	T14170T0012
	1.5 to 10.8 psig / 0.10 to 0.75 bar, Olive	T14171T0012
10	Machine Screw (for external control line), Steel	1H8162X0012
11	Gasket (for external control line)	T14191T0012
12	Adjustment Tool (see Figure 3)	FA142932X12
13	Pipe Plug (for external registration)	1A767524662

Industrial Regulators

Emerson Process Management Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75069-1872, USA
Tel: +1 800 558 5853
Outside U.S. +1 972 548 3574

Asia-Pacific
Shanghai 201206, China
Tel: +86 21 2892 9000

Europe
Bologna 40013, Italy
Tel: +39 051 419 0611

Middle East and Africa
Dubai, United Arab Emirates
Tel: +971 4811 8100

Natural Gas Technologies

Emerson Process Management Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75069-1872, USA
Tel: +1 800 558 5853
Outside U.S. +1 972 548 3574

Asia-Pacific
Singapore 128461, Singapore
Tel: +65 6770 8337

Europe
Bologna 40013, Italy
Tel: +39 051 419 0611
Chartres 28008, France
Tel: +33 2 37 33 47 00

TESCOM

Emerson Process Management Tescom Corporation

USA - Headquarters
Elk River, Minnesota 55330-2445, USA
Tels: +1 763 241 3238
+1 800 447 1250

Europe
Selmsdorf 23923, Germany
Tel: +49 38823 31 287

Asia-Pacific
Shanghai 201206, China
Tel: +86 21 2892 9499

For further information visit www.fisherregulators.com

The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are the property of their prospective owners. Fisher is a mark owned by Fisher Controls International LLC, a business of Emerson Process Management.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

Emerson Process Management does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Emerson Process Management product remains solely with the purchaser.