Type BM9 Slam-Shut Valve

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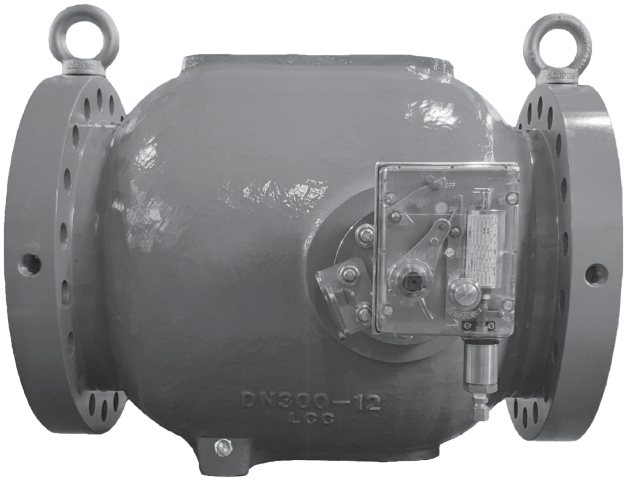


Figure 1. *Type BM9 Slam-Shut Valve*

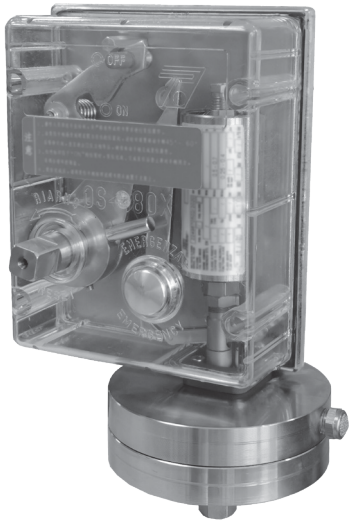


Figure 2. *OS9/80X-APA-R Slam-Shut Controller*

WARNING

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

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

If the slam-shut valve 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.

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. Call qualified personnel when installing, operating and maintaining the Type BM9 slam-shut valve.

Specifications

The Specifications section gives some general specifications for the Type BM9 slam-shut valve. The nameplates give detailed information for a particular slam-shut valve as built in the factory.

Body Sizes and End Connection Styles
DN 200 / NPS 8: CL300 RF and CL600 RF
DN 250 / NPS 10: CL300 RF and CL600 RF
DN 300 / NPS 12: CL300 RF and CL600 RF

Maximum Allowable Pressures(1)
CL300 RF: 51.7 barg / 750 psig
CL600 RF: 103 barg / 1500 psig

Inlet Operating Pressure Range (b_{Pu})(2)
CL300 RF: 51.7 barg / 750 psig
CL600 RF: 100 barg / 1450 psig(2)

Overpressure Set Ranges (W_{do})(1)
CL300 RF: 0.5 to 50 barg / 7.25 to 725 psig
CL600 RF: 0.5 to 90 barg / 7.25 to 1305 psig

Underpressure Set Ranges (W_{du})(1)
CL300 RF: 0.3 to 50 barg / 4.35 to 725 psig
CL600 RF: 0.3 to 80 barg / 4.35 to 1160 psig

Temperature Classes (TS)(2)
Class 1: -10 to 60°C / 14 to 140°F
Class 2: -20 to 60°C / -4 to 140°F

Working Temperature Capabilities(2)
Standard Version, Nitrile (NBR) or Fluorocarbon (FKM): -10 to 60°C / 14 to 140°F
Low Temperature Version, Nitrile (NBR): -20 to 60°C / -4 to 140°F

Flow Coefficients
See Table 1

Slam-Shut Controller

OS9/80X-R Series (a sub-family of OS/80X Series)
Pressure Connection: 1/4 NPT

Slam-Shut Controller Pressure Connection
1/4 NPT

Accuracy Class (AG)
Up to ± 1%

Response Time (ta)
≤ 1 second

Construction Materials
Body: LCC
Sleeve: Steel
O-ring: Nitrile (NBR) (standard) or Fluorocarbon (FKM) (optional)
Disk: Polytetrafluoroethylene (PTFE)
Controller: See Tables 2 and 3

Approximate Weights

CL300 RF
DN 200 / NPS 8: 313 kg / 690 lbs
DN 250 / NPS 10: 508 kg / 1120 lbs
DN 300 / NPS 12: 790 kg / 1742 lbs

CL600 RF
DN 200 / NPS 8: 351 kg / 774 lbs
DN 250 / NPS 10: 590 kg / 1301 lbs
DN 300 / NPS 12: 870 kg / 1918 lbs

Options
Body Drainage Hole and Plug
Proximity Switch for remote monitoring
Solenoid Valve for remote-controlled closure
Three-way Valve for setting control
Wireless Position Monitor

1. The pressure/temperature limits in this Instruction Manual and any applicable standard or code limitation should not be exceeded.
2. In accordance with EN14382 standard.

Table 1. *Type BM9 Flow Coefficients*

FLOW COEFFICIENT	DN 200 / NPS 8	DN 250 / NPS 10	DN 300 / NPS 12
C_g	37,890	61,200	83,087
C_1	30	32.5	31
C_v	1260	1883	2680
X_t	0.57	0.67	0.61
F_d	0.313	0.345	0.355
F_l	0.8	0.85	0.89

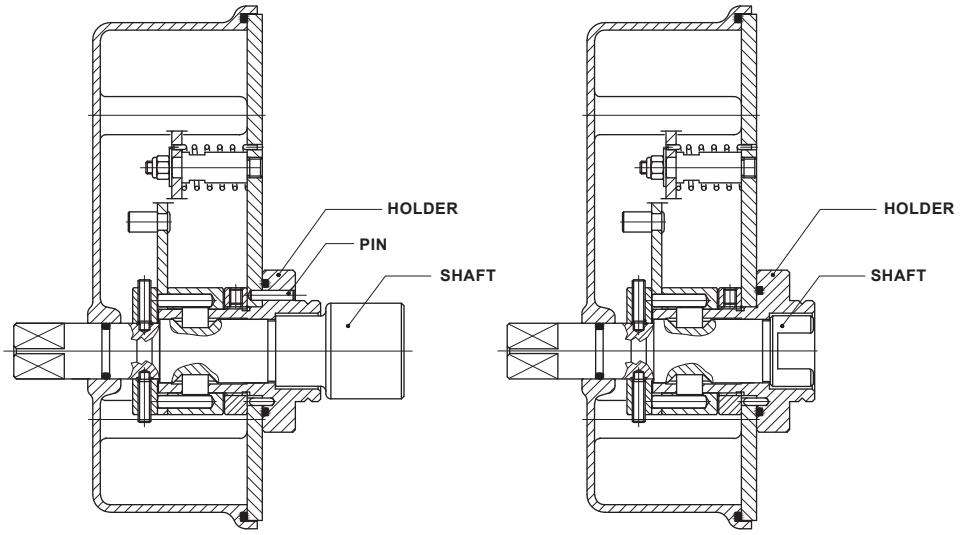
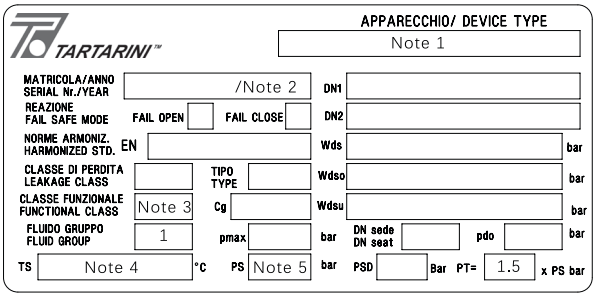


Figure 3. *Differences Between OS9 and OS Series*



Note 1: See “Specifications”
Note 2: Year of Manufacture
Note 3: Class A or Class B
Only valves with overpressure and underpressure settings can be classified in Class A.
Note 4: Class 1: -10 to 60°C / 14 to 140°F
Class 2: -20 to 60°C / -4 to 140°F
Note 5: CL300 RF PS: 51.7 bar / 750 psig
CL600 RF PS: 103 bar / 1500 psig

Figure 4. *Type BM9 Slam-Shut Valves Nameplate*

Introduction

Scope of the Manual

This manual provides instructions for installation, startup, maintenance and spare parts ordering for the Type BM9 slam-shut valve. This document also contains information for the OS9/80X-R Series slam-shut controller.

PED Categories and Fluid Group

According to EN 14382, only in integral strength Type and Class A configuration (when both over and under pressure protections are set up), this slam-shut valve can be classified like a safety accessory according to Pressure Equipment Directive (PED) 2014/68/EU.

The minimum PS between SSD valve and controller shall be the PS of the safety accessory to comply the provisions of EN 14382 about integral strength type.

This product in its Class A and integral strength configuration is a safety accessory for pressure equipment in PED categories on Table 4.

Built-in pressure accessories (e.g. controllers OS9/80X-R Series) conform to PED Article 4 section 3 and were designed and manufactured in accordance with sound engineering practice (SEP).

Per Article 4 section 3, these “SEP” products must not bear the CE marking.

ATEX Requirements

⚠ WARNING

If the provisions of EN 12186 and EN 12279, national regulations, or any specific manufacturer recommendations are not put into practice before installation and if purge by inert gas is not carried out before equipment’s start-up and shut-down operations, a potential external and internal explosive atmosphere can be present in equipment and gas pressure regulating, measuring stations or installations.

Table 2. *OS9/80X-R Series Spring-Loaded Slam-Shut Controller Pressure Rating*

TYPE	MAXIMUM ALLOWABLE PRESSURE		OVERPRESSURE SET RANGE, W_{do}				UNDERPRESSURE SET RANGE, W_{du}				BODY MATERIAL
			Minimum		Maximum		Minimum		Maximum		
	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	
OS9/80X-MPA-D-R	100	1450	0.5	7.25	5	72.5	0.3	4.35	4	58	Steel
OS9/80X-APA-D-R			2	29	10	145	0.3	4.35	7	102	
OS9/84X-R			5	72.5	41	595	4	58	16	232	Brass
OS9/88X-R			18	261	90	1305	8	116	70	1015	

Table 3. *OS9/80X-R Series Pilot-Loaded Slam-Shut Controller with Type PRX Pilot Pressure Rating*

TYPE	MAXIMUM ALLOWABLE PRESSURE		OVERPRESSURE SET RANGE, W_{do}				UNDERPRESSURE SET RANGE, W_{du}				BODY MATERIAL
			Minimum		Maximum		Minimum		Maximum		
	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	
OS9/80X-R-PN[1]	100	1450	0.5	7.25	40	580	0.5	7.25	40	580	Steel
OS9/84X-R-PN[2]			30	435	80	1160	30	435	80	1160	Brass

Notes:
1. Made of an OS9/80X-APA-D-R set at about 0.4 bar / 5.80 psig and PRX/182-PN pilots for overpressure and PRX/181-PN for underpressure.
2. Made of an OS9/84X-R set at about 20 bar / 290 psig and PRX-AP/182-PN pilots for overpressure and PRX-AP/181-PN for underpressure.

Table 4. *PED Category for Type BM9 Slam-Shut Valves*

PRODUCT SIZE	CATEGORY	FLUID GROUP
DN 200, 250 and 300 / NPS 8, 10 and 12	IV	1

If a presence of foreign material in the pipelines is foreseen and purge by inert gas is not carried out, the following procedure is recommended to avoid any possible external ignition source inside the equipment due to mechanical generated sparks:

- Drainage to safe area via drain lines of foreign materials, if any, by inflow of fuel gas with low velocity in the pipe-work (5 m/sec.)

In any case,

- Provisions of Directive 1999/92/EC and 89/655/EC shall be enforced by gas pressure regulating, measuring station or installation's end user.
- With a view to preventing and providing protection against explosions, technical and/or organizational measures appropriate to the nature of the operation shall be taken (e.g.: filling/exhausting of fuel gas of internal volume of the isolated part/entire installation with vent lines to safe area - 7.5.2 of EN 12186 and 7.4 of EN 12279; monitoring of settings with further exhaust of fuel gas to safe area; connection of isolated part/entire installation to downstream pipeline; ….).
- Provision in 9.3 of EN 12186 and 12279 shall be enforced by pressure regulating/measuring station/ installation's end user.
- External tightness test shall be carried out after each reassembly using testing pressure in accordance with national rules.
- Periodical check/maintenance for surveillance shall be carried out complying with national regulations, if any, and specific manufacturer recommendations.

Product Description

Type BM9 Slam-Shut Valve

Type BM9 slam-shut valves are axial flow type and are used in regulating, distribution and transmission stations of suitably filtered natural gas.

This product is designed to be used with fuel gases of 1st and 2nd family according to EN 437 and with other non-aggressive and non-fuel gases. For any other gases, other than natural gas, please contact your local Sales Office.

Use of gas pressure devices (safety shut-off devices – SSD slam-shut type) shall comply with EN 12186 and EN 12279.

Safety slam-shut valves manufactured by Emerson must use pressure accessories (e.g. controller or filters) manufactured or approved by Emerson. Emerson is not responsible for any possible inefficiency due to installation of pressure accessories not manufactured or approved by Emerson.

When pressure containing parts of safety slam-shut device (SSD) and controller have different maximum allowable pressures (PS), the SSD is the differential strength type.

OS9/80X-R Series Slam-Shut Controller

OS9/80X-R Series is designed for Type BM9 and its overpressure rating is up to 90 bar / 1305 psig.

Type BM9 slam-shut valve is operated by either spring-loaded controllers,

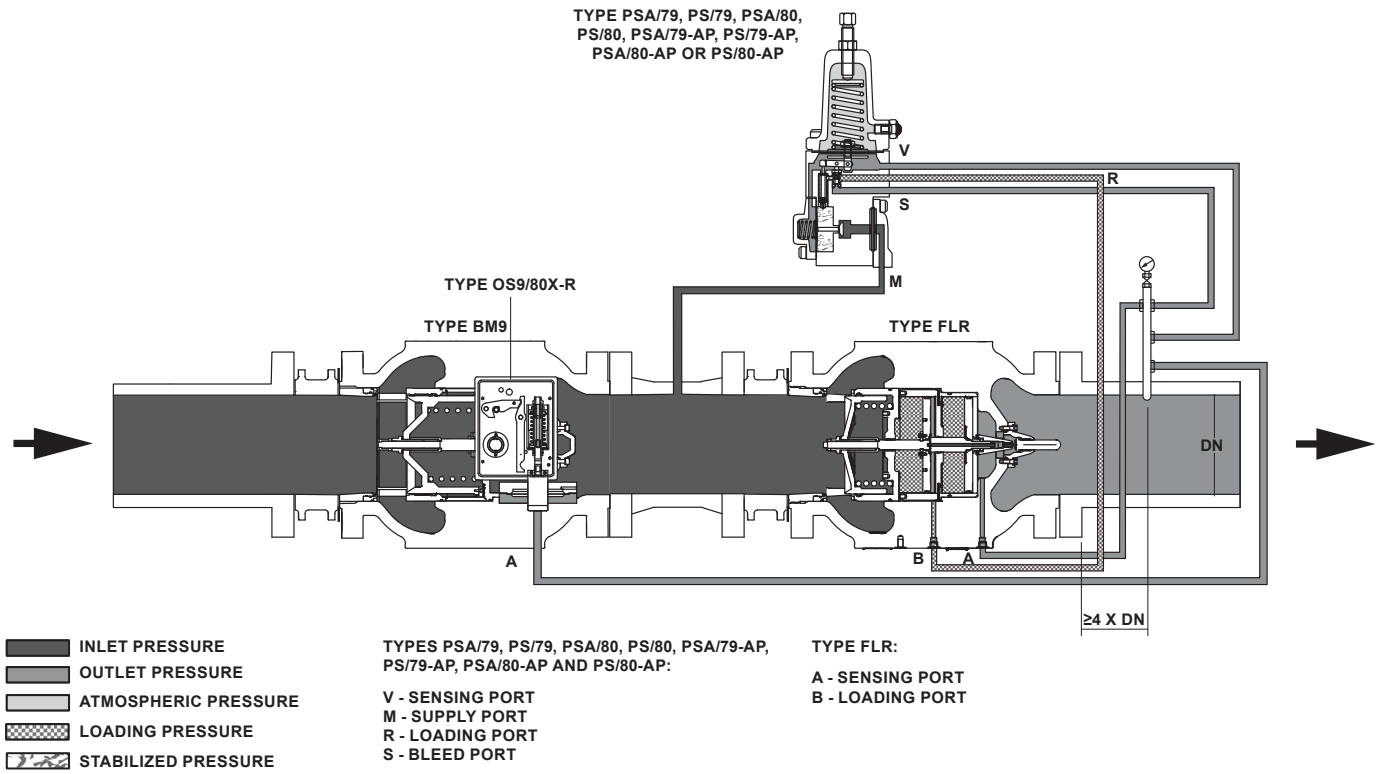


Figure 5. *Type BM9 and Type FLR Operational Schematic*

OS9/80X-R Series (see Tables 2, 7 and 8) or pilot-loaded controllers, OS9/80X-R-PN Series (see Tables 3, 7 and 8).

PRX/182-PN Series pilots are used for overpressure setting and PRX/181-PN Series pilots are used for underpressure setting with pilot-loaded controllers, OS9/80X-R-PN Series.

Pilot-loaded controllers are used when required reset differential pressures (ΔP_{wo} and ΔP_{wu}) are much lower than spring-loaded controller's reset differential pressures. See Tables 7 and 8 and Figure 12.

Pilot-loaded controllers also have better accuracy than spring-loaded controllers.

Principle of Operation

Type BM9 slam-shut valves are used to prevent overpressure, underpressure or both overpressure and underpressure in the system. This slam-shut valve is a combination of an axial flow valve and an OS9/80X Series slam-shut controller which keeps the slam-shut valve open.

Type BM9 has a shutter valve which slides axially. With this design, by-pass is not needed for it to open even with the presence of pressurized gas.

The slam-shut valve can only be opened manually by turning the eccentric shaft counterclockwise if the upstream and downstream pressures are equal.

When the control pressure is within the set value of the slam-shut controller, the controller prevents the rotation of the eccentric shaft and the slam-shut valve remains open.

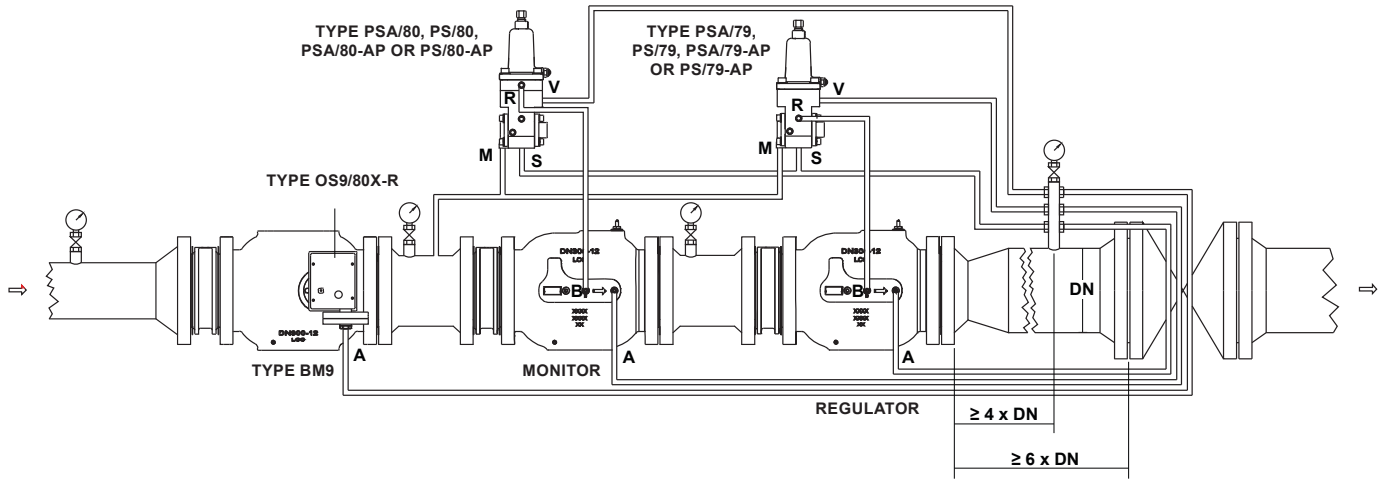
When the control pressure is above or below the set value, the slam-shut controller releases the eccentric shaft closing the slam-shut valve.

The slam-shut controller is provided with a manual release push-button to quickly close the slam-shut valve in case of emergency or during maintenance/ checking operations.

Type BM9 slam-shut valve can be used with pilot. Supply to pilot comes from the downstream of the slam-shut valve.

Note

The downstream regulator(s) must be rated for full inlet pressure of the system because the regulator(s) may see full inlet pressure when slam shut valve is fully open in normal operating conditions. Also, the outlet pressure rating of the pilots and any other components that are exposed to the intermediate pressure must be rated for full inlet pressure.



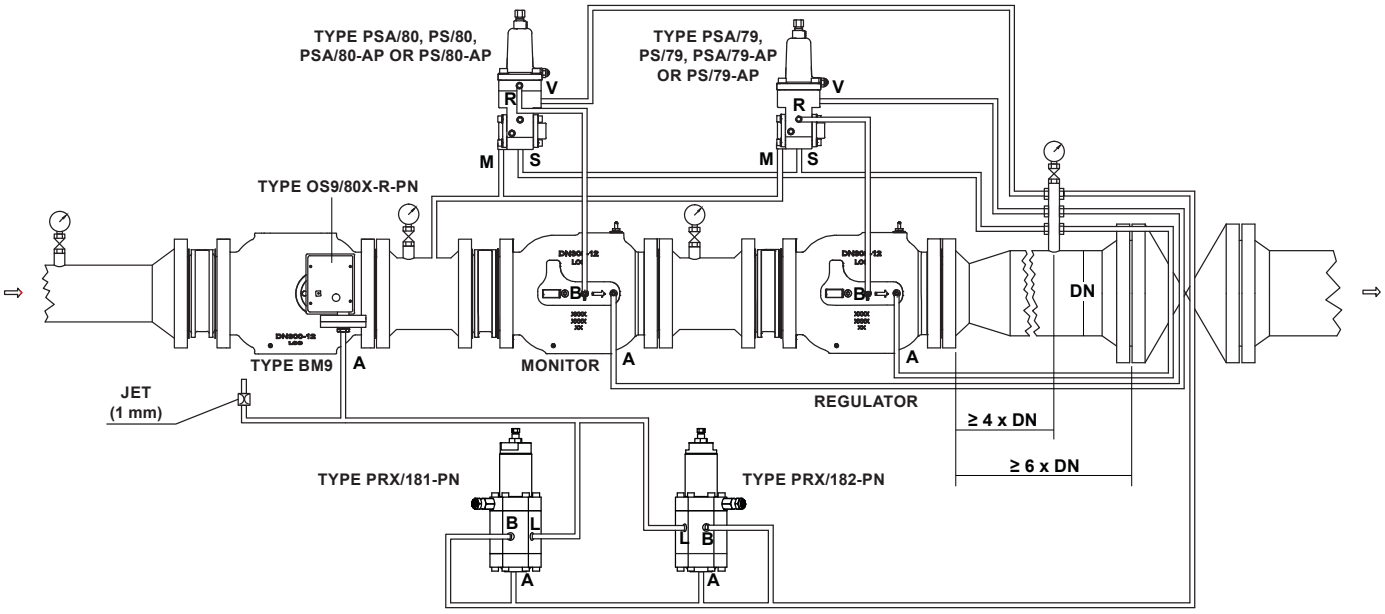
TYPES PSA/79, PS/79, PSA/80, PS/80, PSA/79-AP, PS/79-AP, PSA/80-AP AND PS/80-AP:

V - SENSING PORT
M - SUPPLY PORT
R - LOADING PORT
S - BLEED PORT

TYPE FLR:

A - SENSING PORT
B - LOADING PORT

SLAM-SHUT VALVE WITH TYPE OS9/80X-R CONTROLLER – INSTALLATION IN WIDE-OPEN MONITOR LINE



PRX SERIES:

B - SUPPLY PORT
L - LOADING PORT
A - SENSING PORT

TYPES PSA/79, PS/79, PSA/80, PS/80, PSA/79-AP, PS/79-AP, PSA/80-AP AND PS/80-AP:

V - SENSING PORT
M - SUPPLY PORT
R - LOADING PORT
S - BLEED PORT

TYPE FLR:

A - SENSING PORT
B - LOADING PORT

SLAM-SHUT VALVE WITH TYPE OS9/80X-R-PN CONTROLLER – OVERPRESSURE AND UNDERPRESSURE CONTROL IN WIDE-OPEN MONITOR SYSTEM

Figure 6. *Type BM9 Connection / Installation Schematics*

Transport and Handling

WARNING

Only qualified personnel in rigging may use lifting equipment to transport and handle this unit. If violated, personal injury and/or equipment damage may result.

Do not exceed the specification of lifting equipment and its accessories for transport and handling of this unit. If violated, personal injury and/or equipment damage may result.

Never stand, work or crawl under the load. The load could swing, pieces could drop or the load could fall or slip. Allow for this possibility by establishing a safe distance between yourself and the load, and never lift the load over others. If violated, personal injury and/or equipment damage may result.

CAUTION

Eyebolts are provided to aid in the transport and handling of this unit. When lifting this unit, use both the eyebolts.

The load should never be applied at more than 45 degree angles from the bolt center line. Refer to Figure 7 for proper orientation of lifting line and eyebolts.

Eyebolts are designed just for handling the weight of this unit. Do not attempt to lift more weight than that of this unit with these eyebolts.

Loads must be applied only in the plane of the lifting eyebolt. If the plane of the eyebolt is not aligned with the load, estimate the amount of unthreading necessary to properly align the eye. Remove the eyebolt and add shims to adjust the angle of the plane of the eye.

Weight on the lifting straps may cause them to unwind, which can cause a hanging load to rotate. Make sure the straps are not twisted before lifting, or if necessary use a tag line attached to one of the eyebolts, to which a person can grip and stabilize the weight during lifting.

Installation

WARNING

Personal injury or equipment damage, due to bursting of pressure-containing parts may result if this slam-shut valve is overpressured or is installed where service conditions could exceed the limits given in the Specification section and on the appropriate nameplate or where conditions exceed any rating of the adjacent piping or piping connections.

To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices to prevent service conditions from exceeding those limits. Also, be sure the installation is in compliance with all applicable codes and regulations.

Additionally, physical damage to the slam-shut valve could break the slam-shut controller off the main valve, causing personal injury and property damage due to bursting of pressure-containing parts. To avoid such injury and damage, install the slam-shut valve in a safe location.

Installation procedures performed by unqualified personnel may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Only a qualified person shall install or service the Type BM9 slam-shut valve.

When selecting Type OS9/80X-R-PN or Type OS9/84X-R-PN controller, the JET must direct to or be piped to safe area, shown in Figures 6, 15 and 16. If violated, serious injury may occur due to sudden release of extremely high pressure.

CAUTION

Eyebolts are installed to aid in the handling and installation of the slam-shut valve assembly only. Always utilize both eyebolts and do not attempt to lift more weight than the slam-shut valve with these eyebolts.

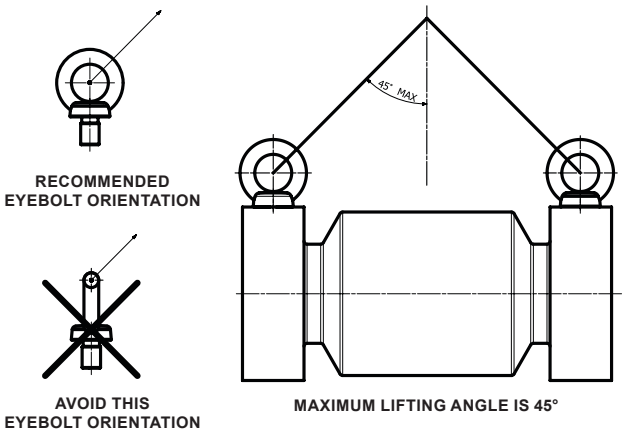


Figure 7. *Lifting Lugs: Illustration of Lateral Loading*

Before Installation:

- Unpack the slam-shut valve and remove the protective shipping covers from the end connections of the body.
- Check the slam-shut valve and make sure it has not been damaged or collected foreign material during shipping.
- Remove any debris or dirt in the tubing and the pipeline.
- Use suitable line gaskets and approved piping and bolting practices.
- Make sure gas flow through the slam-shut valve is in the same direction as the arrow on the body.
- Under enclosed conditions or indoors, escaping gas may accumulate and be an explosion hazard. In this case, the vent should be piped outdoors.
- For slam-shut valve and accessories with vents, the vent should be kept open to permit free flow of gas to the atmosphere. Protect openings against entrance of rain, snow, insects or any other foreign material that may plug the spring case vent or vent line.

Connect a downstream control line to a straight run of pipe 4 to 5 pipe diameters from the regulator outlet as shown in Figures 5 and 6. If such a distance is not practical, connect the control line away from elbows, swages, nipples or any area where abnormal flow velocities occur. See Figures 5 and 6.

Pilot-Loaded Controllers

WARNING

A pilot may vent some gas to the atmosphere. In hazardous or flammable gas service, vented gas may accumulate, causing personal injury, death or property damage due to fire or explosion. Install vent line(s) from the pilot(s) to a remote, safe location away from air intakes or any hazardous location. The end of the vent line or stack opening must be pointed down and protected against condensation or clogging.

CAUTION

To avoid freeze-up because of pressure drop and moisture in the gas, use anti-freeze practices, such as heating the supply gas or adding a de-icing agent to the supply gas.

Type BM9 slam-shut valve bleeds no gas to atmosphere during normal operation, thus making it suitable for installation in enclosed locations without elaborate venting system, if the bleed lines are connected to the downstream pipeline. Further, the pilot spring case vent shall be referenced to atmospheric pressure so that the pilot can be set.

The PRX pilots have a 1/4 NPT vent connection at the spring case and at the side of the body respectively.

To remotely vent the pilots:

1. Remove the screened vent and install obstruction-free tubing or piping into the 1/4 NPT vent tapping.
2. Install a screened vent cap onto the remote end of the vent pipe to provide protection on a remote vent.

Note

The piping or tubing should vent to a safe location, have as few elbows as possible and have a screened vent on its exhaust.

3. Install the pilot and any remote vent piping or tubing so that the vent is protected from condensation, freezing or any substance that could clog it.
4. Install a full flow hand valve, such as a full port ball valve, in the control line.

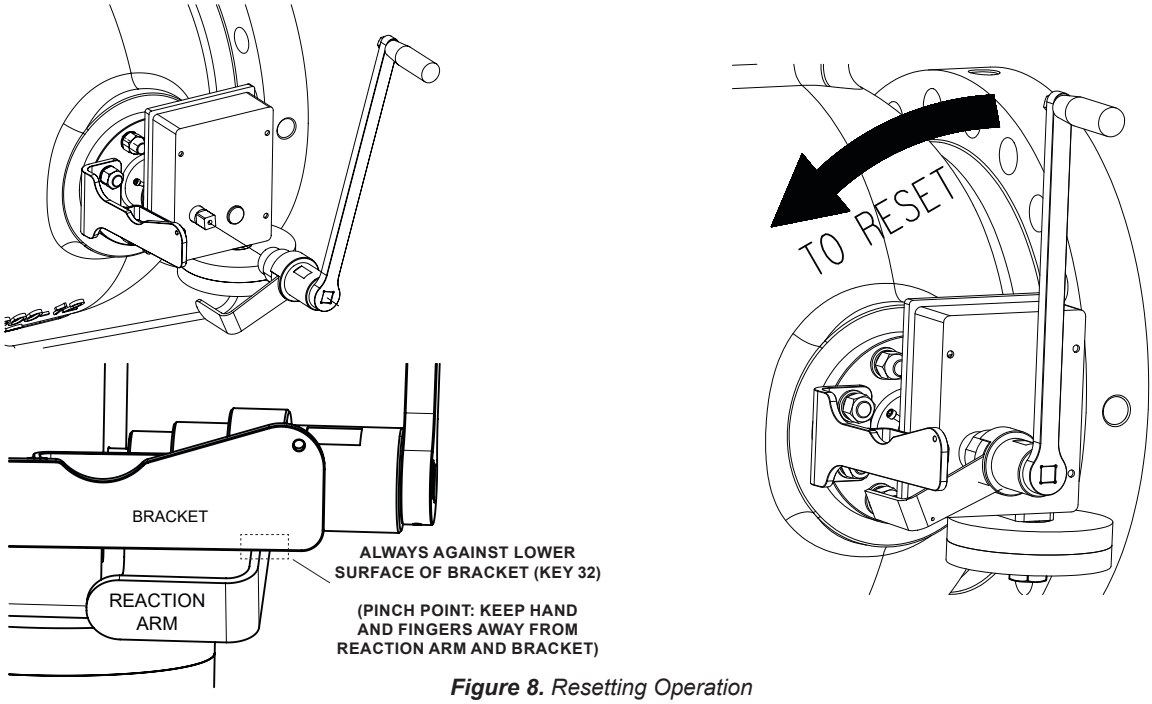


Figure 8. *Resetting Operation*

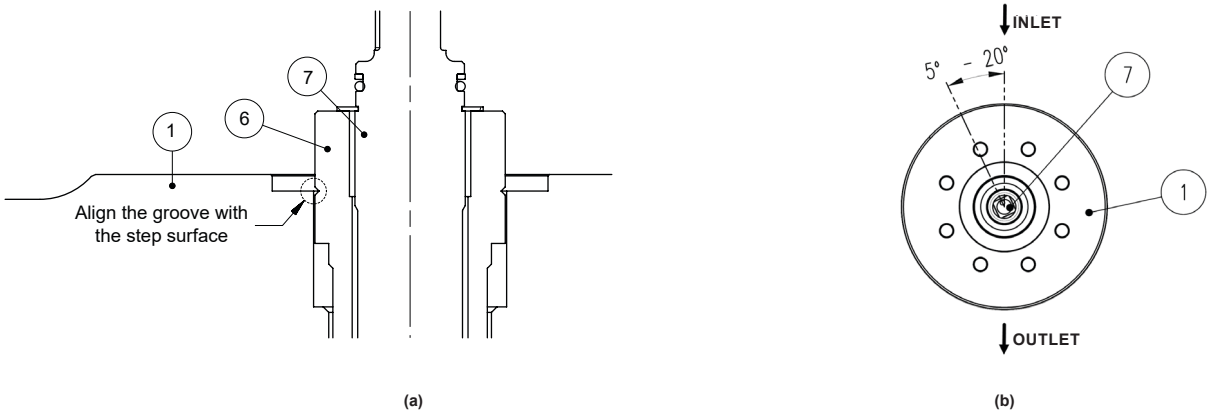


Figure 9. *Shaft Maintenance on Closed Position*

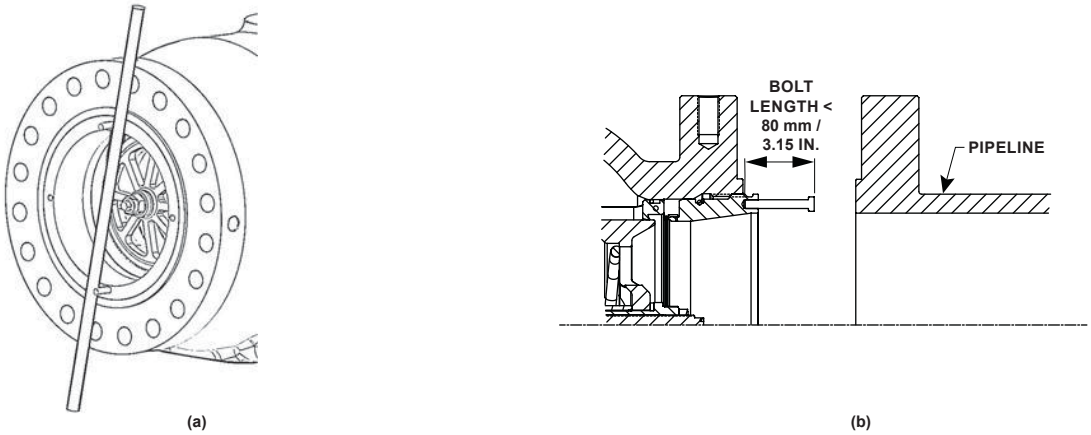


Figure 10. *Main Valve Disk Ring Replacement*

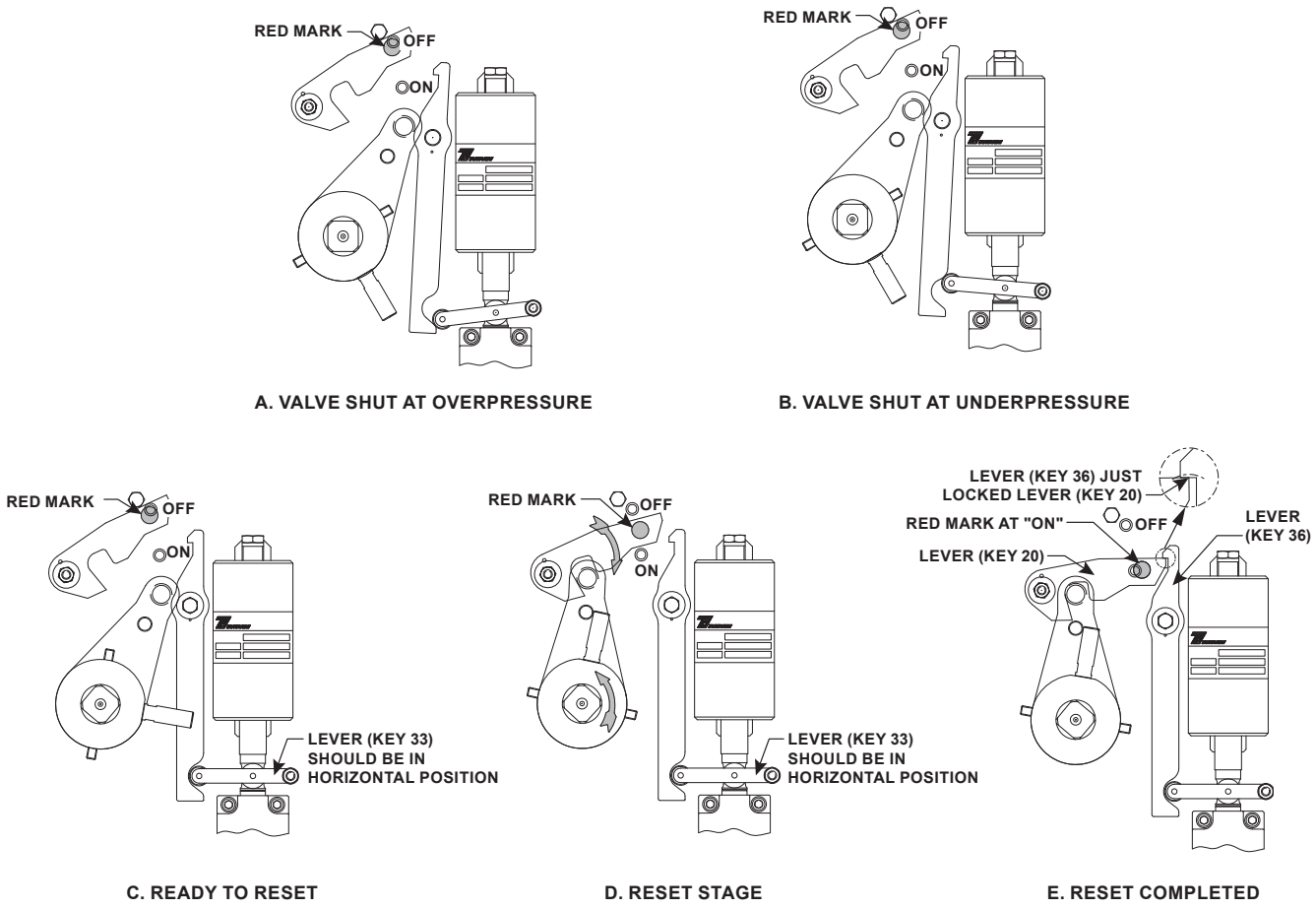


Figure 11. *OS9/80X-R Series Slam-Shut Controller Resetting Position*

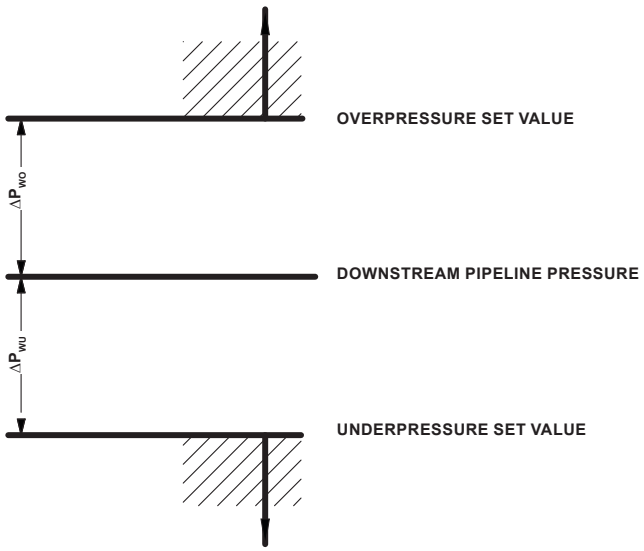


Figure 12. *OS9/80X-R Series Slam-Shut Controller Range Setting*

Table 5. *Torque Specifications*[1]

KEY	PART NAME	TORQUE					
		DN 200 / NPS 8		DN 250 / NPS 10		DN 300 / NPS 12	
		N•m	Ft-lbs	N•m	Ft-lbs	N•m	Ft-lbs
4	Bolt (End cap)	25 to 28	18 to 21	50 to 54	36.9 to 39.8	70 to 75	51.5 to 55.2
20	Locknut	22 to 25	16.2 to 18.4	22 to 25	16.2 to 18.4	22 to 25	16.2 to 18.4
	Hex Screw (Locknut)	Initial: 1.5 Final: 4.5	Initial: 1.1 Final: 3.3	Initial: 1.5 Final: 4.5	Initial: 1.1 Final: 3.3	Initial: 1.5 Final: 4.5	Initial: 1.1 Final: 3.3
21	Screw Rod	80 to 100	59.0 to 73.8	80 to 100	59.0 to 73.8	80 to 100	59.0 to 73.8
30	Nut	90 to 100	66.4 to 73.8	90 to 100	66.4 to 73.8	90 to 100	66.4 to 73.8
40	Screw (Ring, Clamping)	7 to 8	5 to 5.9	6.3 to 8	4.6 to 5.9	6.3 to 8	4.6 to 5.9
49	Bolt (Seal Ring)	- - - -	- - - -	- - - -	- - - -	4 to 6	3 to 4.4
50	Cam Roller	10 to 12	7.4 to 8.9	10 to 12	7.4 to 8.9	10 to 12	7.4 to 8.9
52	Screw (Bonnet)	2.5 to 2.9	1.8 to 2.1	2.5 to 2.9	1.8 to 2.1	2.5 to 2.9	1.8 to 2.1
62	Nut (Bonnet)	140 to 150	103.3 to 110.6	140 to 150	103.3 to 110.6	140 to 150	103.3 to 110.6
70	Nut	20 to 22	14.7 to 16.22	20 to 22	14.7 to 16.22	20 to 22	14.7 to 16.22
101	Lower Cover	40 to 50	29.5 to 36.8	40 to 50	29.5 to 36.8	40 to 50	29.5 to 36.8
105	Screw	3 to 5	2.5 to 3.7	3 to 5	2.5 to 3.7	3 to 5	2.5 to 3.7
114	Nut	30 to 40	22.1 to 29.5	30 to 40	22.1 to 29.5	30 to 40	22.1 to 29.5
115	Handle	20 to 30	17.8 to 22.1	20 to 30	17.8 to 22.1	20 to 30	17.8 to 22.1
33[2]	Type PRX Pilot Plug	NPT Thread[3][4]					
37	Main Valve Plug						
38[2]	Special Connection						
74	Main Valve Fitting Elbow						
74[2]	Controller Silencer						
75	Fitting Tee						
- - - -	End Connections						

1. Overtightening may be detrimental to the sealing function of the joint.
2. Optional parts according to customer requirement.
3. Joints should be tightened beyond the hand-tight engagement position.
4. Advancing the joint past hand-tight creates interference between external and internal thread flanks, produces a seal (with the use of a sealant), and helps prevent loosening of the joint.

Overpressure Protection

The recommended maximum allowable pressures are stamped on the slam-shut valve nameplate.

Upstream overpressure protection shall be provided if the inlet pressure is likely to go higher than the maximum operating inlet pressure (P_{umax}).

Downstream pressure after slam-shut valve's intervention shall stay within the allowable pressure range to avoid anomalous backpressures that can damage the slam-shut controller.

Downstream overpressure protection shall also be provided if the slam-shut valve outlet pressure is likely to go higher than the PS of the slam-shut controller (differential strength type).

Slam-shut valve operation below the maximum pressure limitations does not preclude the possibility of damage from external sources or debris in the line.

The slam-shut valve should be inspected for damage after any intervention.

Underpressure Protection

WARNING

In order for the Underpressure Shutoff (UPSO) of slam-shut valve to be triggered, the downstream pipe pressure must drop below the UPSO setpoint. In the case of a downstream line break, numerous factors can prevent the downstream pipe pressure from decreasing below the slam-shut valve's UPSO 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 valve. Due to these factors additional protections should be installed to stop flow in the event of a line break.

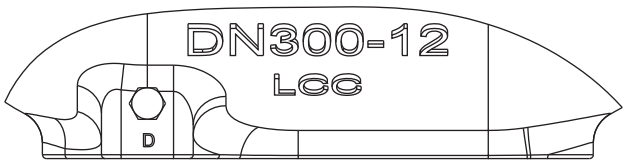


Figure 13. *Optional Drainage Hole and Plug*
(Do not remove plug while unit is pressurized.)

Slam-shut valve can also be used to shut off a gas system when system pressure falls below a set value which may occur due to various reasons such as severing of gas pipeline or drop in inlet pressure or flow.

If system pressure or flow drops too low, it may not meet the minimum operating pressure required for safe operation of downstream equipment such as burners due to which the gas may not get ignited. This may be result in gas build up and explosion.

For these reasons, underpressure protection is also considered in system design.

Startup and Adjustment

Pre-startup Considerations

CAUTION

Do not apply the reaction arm against slam-shut controller.

Make sure to remove handle from reset stem of controller after reset and hang it on the bracket (key 32).

Possible hand and finger pinch point between reaction arm and bracket. Reaction arm closes quickly and with extreme force. Keep hands and fingers away from reaction arm and bracket, as the reaction arm closes.

When red mark in controller gets to "ON", resetting has been completed. Further operation will damage the controller. Based on structural characteristics, the torque for resetting first increases then decreases with the increase of rotation of handle. The final torque is about 15 to 20 N•m / 11.1 to 14.7 lb-ft (the force is 43 to 57 N / 9.67 to 12.8 lbf) for all Type BM9 size when red mark is at "ON".

WARNING

The valve must be reset completely and forbid opening partly. Otherwise, that may affect the sealing performance and even cause injury because of the rebound of the resetting handle.

Before reset completed, lever (key 33) must be on the horizontal position, otherwise lever (key 36) will not be able to lock lever (key 20), and controller can not be reset.

Each slam-shut valve is factory-set for set pressure(s) specified on the order. If no setting was specified, it will be factory-set at the mid-range of the controller spring range. Before beginning the startup procedure in this section, make sure the following conditions are in effect:

- Block valves to isolate the slam-shut valve
- Vent valves are closed
- A bypass, if any, is in operation

In all cases, check the controller spring setting to make sure it is correct for the application.

1. The slam-shut valve is factory set at approximately the midpoint of the spring range or at the customer specified set pressure; however, a field adjustment may be required to obtain desired results.
2. Completely close the isolation valve or block valve located downstream of the regulator.
3. Slowly and slightly open the isolation valve or block valve upstream of the slam-shut valve.
4. Put the handle on reset stem of controller, apply the reaction arm securely against lower surface of the bracket. See Figure 8 for resetting operation.
5. From the position where the change of resistance force could be obviously felt, slowly turn the handle counterclockwise to the degree of 45° to 60° and wait until the inlet and outlet pressures are balanced lever (key 33) must be on horizontal position (indicates that the monitoring pressure of the Type BM9 at this time is equal to the normal working pressure, then continue to turn the handle until the red mark is at ON position to complete the reset operation (see Figure 11). The handle may need to be turned certain degrees: 445° for DN 200 / NPS 8, 455° for DN 250 / NPS 10 and 480° for DN 300 / NPS 12.
6. Slowly open the block valve upstream of the Type BM9 slam-shut valve completely, then slowly open the block valve downstream of the regulator.

Table 6. *Troubleshooting Type BM9 Slam-Shut Valve*

SYMPTOMS	CAUSE	ACTIONS
Slam-shut device does not remain set	The sensing line to port (A) of slam-shut controller is not connected properly	Check the sensing line connections (A)
	Downstream pressure coincides with the maximum or minimum slam-shut settings	Check slam-shut controller settings
	Damaged Diaphragm (key 62) on Type OS9/80X-R Lip seal (key 66) on Types OS9/84X-R and OS9/88X-R	Replace the diaphragm on Type OS9/80X-R Replace the lip seal on Types OS9/84X-R and OS9/88X-R
Sleeve does not seal properly	Worn seal gaskets	Check gaskets and replace if necessary
	Dirt deposit on sleeve	Check sleeve and clean / replace if necessary
	Shaft and Roller (keys 7 and 50) are damaged	Check shaft and roller and replace if necessary

Slam-Shut Controller Adjustment

To change spring-loaded slam-shut controller setpoints (overpressure and/or underpressure), remove the spring closing cap of the controller and turn the adjusting screw clockwise to increase outlet pressure or counterclockwise to decrease pressure.

To change pilot-loaded slam-shut controller setpoints (overpressure and/or underpressure), adjust the pilot setpoints. Refer to pilot's instruction manuals for details.

Monitor outlet pressure with a test gauge during the adjustment.

Range Setting

The reset differential indicates the minimum value to be considered with respect to downstream pipeline pressure set point for proper resetting of the controller. See Figure 12.

Example: Downstream pipeline pressure set point 15 bar / 218 psig.

Choose OS9/84X-R with blue spring for overpressure and red spring for underpressure, see Tables 7 and 8. The reset differential ΔPwo is 3.0 bar / 43.5 psig and ΔP_{wu} is 6.0 bar / 87.0 psig.

So, the overpressure set value should be 18 bar / 261 psig (15 bar + 3 bar = 18 bar or 218 psig + 43.5 psig = 261 psig) or higher, and underpressure set value should be 9 bar / 131 psig (15 bar - 6 bar = 9 bar or 218 psig - 87 psig = 131 psig) or lower.

Shutdown

WARNING

To avoid personal injury resulting from sudden release of pressure, isolate the slam-shut valve from all pressure before attempting disassembly and release trapped pressure from the equipment and pressure line.

CAUTION

In any installation, it is important to slowly open and close the valves and to vent the outlet pressure before venting the inlet pressure to prevent damage caused by reverse pressurization of the pilot or main valve.

1. Slowly close the valves in the following order:
   a. Inlet block valve
   b. Outlet block valve
   c. Control line valve(s), if used.
2. Open the vent valves to depressurize the system.

Maintenance

WARNING

To avoid personal injury resulting from sudden release of pressure, isolate the slam-shut valve from the system pressure and release trapped pressure from the equipment and pressure line before attempting maintenance operation.

Use proper lifting techniques, when lifting the body and spacer (keys 1 and 17).

The optional drainage plug at the bottom of the valve, shown in Figure 13, must not be removed unless the pressure in the valve is completely released. If violated, serious injury may occur due to sudden release of extremely high pressure.

The slam-shut valve parts are subject to normal wear and must be inspected periodically and replaced as necessary. The frequency of inspection and replacement depends on the severity of service conditions and on applicable federal, state and local codes and regulations. **Use Torque Specifications (Table 5) for proper torque values.**

Main Valve (See Figures 14, 15 and 16)

WARNING

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. Call qualified personnel when installing, operating and maintaining the unit.

CAUTION

Eyebolts are installed to aid in the handling and installation of the slam-shut valve assembly only. Do not attempt to lift more weight than the slam-shut valve with these eyebolts.

Do not use another type of eyebolt, slam-shut controller or pilot on this slam-shut valve. Only Emerson parts can be used to maintain the unit.

See Table 6 for troubleshooting and corrective action for Type BM9.

Disk Ring Maintenance (See Figure 14)

WARNING

When removing disk holder, ensure to handle with care to avoid dropping which may result in equipment damage or personal injury.

CAUTION

Before removing line bolting connecting the pipeline and body, ensure adequate support is provided to prevent body and/or spacer from dropping and damaging and/or deforming the piping and accessories.

1. Remove all piping bolts connecting to pipeline and body inlet flange.
2. Take out spacer (key 17).
3. Screw in two bolts or screws into two threaded holes on disk holder (key 18). Bolt dimensions are M12 for DN 300 / NPS 12, M10 for DN 250 / NPS 10 and M8 for DN 200 / NPS 8. Apply torque counterclockwise on both bolts to slowly back out the disk holder (key 18). Use a crowbar or wrench for ease of rotating.

Note

The bolts could be substituted with studs, screws or eyebolts. The recommended length should not exceed 80 mm / 3.15 in. The strength of the bolt should be equal to or greater than that of class 8.8 material. The thread engagement between bolt and threaded hole on disk holder should be at least 10 mm / 0.4 in.

4. When the disk holder (key 18) is completely unscrewed as shown in Figure 10 (a), remove the bolt from the disk holder (to avoid damaging the pipe flange) and then remove the disk holder from the valve body as shown in Figure 10 (b). Seat ring (key 47) will be taken out along with the disk holder.

Note

When maintaining Type BM9 online, if the seat ring (key 47) is not taken out along with the disk holder (key 18), please slowly reset about 60° and slowly closed. Then the Seat Ring (key 47) can be pushed out. In the process of resetting, do not put hands near the inlet to avoid injury.

5. For DN 300 / NPS 12, unscrew the six screws (key 49) from seal ring retainer (key 46), disassemble disk holder (key 18) and seal ring retainer (key 46), and replace the old disk (key 47) and O-ring (key 42).

   For DN 200 and 250 / NPS 8 and 10, separate the disk (key 47) and O-ring (key 42) from disk holder (key 18), and replace them.

6. Reinstall the seal ring retainer (key 46) to disk holder (key 18) in reverse order.

7. Reinstall the disk holder (key 18) and seal ring retainer (key 46) subassembly into the body (key 1). Apply anti-seize lubricant on the disk holder and body threads to lubricate. Screw in disk holder clockwise on body (key 1) until the top surface of disk holder is perfectly aligned with mating surface of body. Ensure that the surface of the disk holder is not projecting outside of body flange surface.

General Maintenance
(See Figures 14, 15 and 16)

CAUTION

Protect gasket surfaces on the body flanges and spacer from scratches and damage.

Make sure the larger ring of thrust ball bearing (key 53) connects with cam (key 55) for size DN 300 / NPS 12, otherwise more resistance may hinder smooth rotation. For size DN 200 / NPS 8 and DN 250 / NPS 10, the rings of thrust needle bearing (key 53) have the same size.

The hex head of stem (key 19) must be held firmly when screwing screw (key 21), otherwise parts may be damaged.

1. Remove the slam-shut valve from the pipeline. Use the eyebolts to lift it. Place the slam-shut valve on flat surface. Refer to Figure 7 for lifting instructions.
2. Loosen the screws (key 52) and dismount the slam-shut controller.
3. Loosen nuts (key 62) and remove bonnet (key 8). Replace O-rings (keys 11, 58 and 63) and anti-friction rings (key 59).
4. Take out disk holder (key 18) together with seal ring retainer (key 46) (if any). See “Disk Ring Maintenance” section for details.
5. If needed, place the slam-shut valve vertical on flat surface with inlet flange facing up. Take care to protect the gasket surfaces on body flanges from scratches and damage while carrying out this task.
6. Separate disk holder (key 18) and seal ring retainer (key 46). Replace disk (key 47) and O-rings (keys 42, 43 and 48).
7. Pull out shaft (key 7) to the position shown in Figure 9 to allow pull out of internal components.
8. Loosen 3 screws of locknut (key 20) then remove it, slowly loosen screw (key 21) to release spring (key 26). Remove sleeve (key 24) and cage (key 15). Replace O-ring (keys 44 and 45) and anti-friction rings (key 43), and for size DN 200 also need to replace seal retainer (key 78). Loosen screws (key 40) to remove ring (key 14). Replace O-ring (key 42).
9. Hold shaft (key 7) and remove retainer ring (key 57). Remove shaft and cam (key 55) from body (key 1). Separate shaft and wiper (key 51) from cam. Check bearing (key 53) and replace it if necessary.
10. Loosen bolts (key 4) to remove end cap (key 2), replace O-ring (key 3).
11. Check all moving parts, paying attention to plated surfaces.
12. Clean the parts for reuse. Replace worn out parts, if any.

Reassembly

Note

When the word “lubricate” is used in this document it is implied that the amount of lubricate used should be just enough to cover the surface of the part being lubricated. Using an excess amount of lubricant should be avoided unless otherwise stated.

Precautions for the use of anti-loose washer (keys 5 and 41): It is recommended the use of a lubricant. Lubricate the thread and the outer surface area of the anti-loose washer (the area in contact with the fastener) prior to installation.

Lubricate all seals with silicone-based grease. Be sure not to damage them while reassembling.

Reassemble in reverse order.

During reassembly, make sure that parts move smoothly with respect to one another without friction.

Note

The shaft (key 7) must be rotated 5° to 20° anti-clockwise referring the mark hole on shaft (key 7) for smooth assembly. See Figure 9.

1. Pull out bushing and shaft (keys 6 and 7) until the groove aligned with the step surface (see Figure 9) before inserting cage (key 15), stem (key 19) and sleeve (key 24) into body (key 1), for smooth assembly.
2. Reassemble shaft (key 7) into cam (key 55). Make sure the mark hole on the end face of shaft faces the pawl of cam roller (key 50).
3. Before reinstalling the slam-shut controller, make sure that the mark hole of shaft (key 7) is facing the inlet flange.

4. Make sure that the line connecting two centers of bonnet (key 8) used to mount controller is parallel to axis of body (key 1).
5. Check if the slam-shut sleeve (key 24) opens when shaft (key 7) is rotated counterclockwise.

Handle Unit Maintenance (See Figure 17)

Handle unit maintenance entails checking of O-ring (key 106) and the movement of gear train (key 103) and adapter (key 111). They should move freely with a minimum friction. If necessary, lubricate them with silicone-based grease.

Maintenance

1. Remove screw (key 105) and lever (key 116).
2. Loosen upper and lower cover (keys 101 and 102), remove washer (key 107) and adapter (key 111).
3. Remove gear train (key 103) and washer (key 107).
4. Remove connector (key 104) and O-ring (key 106).
5. Clean the parts for reuse. Check O-ring and washers (keys 106 and 107) for wear.
6. Replace worn out parts if any.

Reassembly

CAUTION

Ensure to uniformly tighten all screws and nuts to the recommended torque values. See Table 5 for torque requirements.

Reassemble in reverse order.

During reassembly, make sure that parts move smoothly with respect to one another without friction.

Slam-Shut Controller Maintenance (See Figures 18 and 19)

CAUTION

Slam-shut controller must be mounted upright as shown in Figure 15. If mounted any other way, the controller will not function properly.

Possible hand and finger pinch point between reaction arm and bracket. Reaction arm closes quickly and with extreme force. Keep hands and fingers away from reaction arm and bracket, as the reaction arm closes.

Periodical Checks

It is recommended to periodically check the efficiency of the slam-shut controller.

Cut-off Test

1. Cut-off the circuit by means of inlet and outlet block valves and disconnect the pressure sensing line to port A of the slam-shut controller. The slam-shut controller should cut-off at minimum pressure (only if so set).
2. Raise the pressure to normal operating level by using a small pump or other appropriate means to port A connection in the controller. Reset slam-shut controller if it was cut-off in step 1.
3. Simulate pressure increase until maximum pressure cutoff value is reached.
4. Connect the sensing line back to port A of the controller and set the circuit back to operating conditions by following the instructions described in the Startup section.

Valve-seal Check

1. Close downstream isolation valve.
2. Press the “EMERGENCY” button. This will cause the immediate closing of slam-shut valve.
3. Release the pressure in the line section between slam-shut valve and downstream isolation valve. The pressure should drop and eventually become zero. If pressure does not fall down to zero, it is a sign that the unit is not closing tight. Proceed with necessary maintenance as required.

OS9/80X-R Series Maintenance (See Figures 18 and 19)

WARNING

All maintenance procedures must be carried out only by qualified personnel. If necessary, contact our local Sales Office.

Maintenance procedures performed by unqualified personnel may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Call qualified personnel when maintaining the unit.

Before starting the maintenance, disconnect sensing line (connection at port A) and ensure that pressure in slam-shut controller is completely released.

Failure to follow these instructions could result in property damage and/or personal injury or death.

Slam-shut controller maintenance entails checking of the diaphragm on the Type OS9/80X-R (the piston Gaco flex on the Type OS9/84X-R) and the movement of the levers, i.e. they should move freely with a minimum of friction. If necessary, lubricate pins with silicone-based grease.

Replacing Diaphragm (OS9/80X-R Series only)

1. Remove screws (key 27) and cover (key 61).
2. Replace diaphragm (key 62).
3. To remount diaphragm, coat it with grease, set it in place around the edge of cover (key 61) and evenly tighten screws (key 27) to ensure proper sealing.

Replacing O-ring (Types OS9/84X-R and OS9/88X-R only)

1. Remove plug (key 61) and extract piston (key 68) from body (key 60).
2. Replace O-ring (key 67) and Gaco flex (key 66).
3. Reassemble in reverse order.

General Maintenance

1. Remove screws (key 40) and casing (key 47).
2. Remove dowels (key 12) and bushing (key 13).
3. Slide off stem (key 6), lever assembly (keys 17 and 2), rollers for Type OS9/80X-R (key 10), and shim ring (key 15). Clean the parts for reuse. Replace worn out parts if any.
4. Remove nuts (key 18), levers (keys 20 and 36) and springs (keys 37 and 21).
5. Remove nut (key 30), screw (key 29) and lever (key 33).
6. Remove minimum adjusting screw (key 49), maximum adjusting nut (key 50) and springs (keys 53 and 54).
7. Remove cover (key 61) on OS9/80X-R Series, or plug on Types OS9/84X-R and OS9/88X-R, and proceed as directed in replacing diaphragm/ O-ring section.
8. Remove nut (key 70) and locknut (key 69), then slide off stem unit (key 57).
9. Loosen screw (key 3), unscrew nut (key 9), remove balls holder (key 5) and check seals (keys 4 and 8) for wear.
10. Clean the parts for reuse. Replace worn out parts, if any.

Reassembly

CAUTION

The lever (key 33) is in proper position when it is exactly horizontal and in the center of the groove of lever (key 36).

Reassemble in reverse order.

During reassembly, make sure that parts move smoothly with respect to one another without friction.

Make sure to:

1. Narrow the gap between nuts (keys 30 and 18) so that levers (keys 33, 36, and 20) move freely without friction.
2. Register position of lever (key 33) by locking the nut (key 70) into place with locknut (key 69) before mounting minimum spring (key 54).
3. Remount lever assembly (keys 17 and 2), rollers for Type OS9/80X-R (key 10), keeping them in their seat with grease and stem (key 6), which is to be turned so the rollers enter their seats. The stem and lever assembly should now be tightly fitted together.
4. Remount bushing (key 13), make sure that the dowels are firmly set in the grooves of the stem (key 6).
5. Repeatedly check if pilot resets properly, then, remount minimum spring (key 54).
6. Always check controller setting.

Table 7. *Overpressure Shut-off Spring Ranges and Information*

CONTROLLER TYPE	SPRING RANGE		RESET DIFFERENTIAL		SPRING DIAMETER		SPRING LENGTH		PART NUMBER	MATERIAL	SPRING COLOR
	bar	psig	bar	psig	mm	In.	mm	In.			
OS9/80X-MPA-D-R	0.50 to 0.70	7.25 to 10.15	0.15	2.17	3.00	0.12	75.0	2.95	M0105140X12	Steel	Yellow
	0.70 to 2.50	10.15 to 36.25	0.30	4.35	4.00	0.16	75.0	2.95	M0197070X12	Steel	Blue
	2.50 to 5.00	36.25 to 72.51	0.50	7.25	5.00	0.20	75.0	2.95	M0197080X12	Steel	Red
OS9/80X-APA-D-R	2 to 4	29 to 58	0.40	5.80	4.00	0.16	75.0	2.95	M0197070X12	Steel	Blue
	4 to 10	58 to 145	1	14.50	5.00	0.20	75.0	2.95	M0197080X12	Steel	Red
OS9/84X-R	5.0 to 25	72 to 362	3	43.50	4.00	0.16	75.0	2.95	M0197070X12	Steel	Blue
	24 to 41	348 to 594	5	72.50	5.00	0.20	75.0	2.95	M0197080X12	Steel	Red
OS9/88X-R	18 to 50	261 to 725	8	116.00	3.00	0.12	75.0	2.95	M0105140X12	Steel	Yellow
	40 to 80	580 to 1160	12	174.00	4.00	0.16	75.0	2.95	M0197070X12	Steel	Blue
	70 to 90	1088 to 1305	15	217.50	5.00	0.20	75.0	2.95	M0197080X12	Steel	Red
OS9/80X-R-PN with PRX/182-PN	0.5 to 1.1	7.3 to 16	0.2	2.90	2.50	0.10	51	2.01	M0255250X12	Steel	White
	1 to 1.8	14.5 to 26	0.3	4.35	2.80	0.11	55	2.17	M0255240X12	Steel	Yellow
	1.6 to 3	23 to 44	0.3	4.35	3.20	0.13	55	2.17	M0255230X12	Steel	Green
	2.8 to 5.5	41 to 80	0.4	5.80	3.50	0.14	55	2.17	M0255180X12	Steel	Blue
	5 to 8.5	73 to 123	0.4	5.80	4.00	0.16	55	2.17	M0255220X12	Steel	Black
	8 to 14.5	116 to 210	0.5	7.25	4.50	0.18	55	2.17	M0255210X12	Steel	Silver
	14 to 23	203 to 334	0.6	8.70	5.50	0.22	51	2.01	M0255200X12	Steel	Gold
	22 to 30	319 to 435	0.6	8.70	6.00	0.24	51	2.01	M0255860X12	Steel	Aluminum
	29 to 42	421 to 609	0.6	8.70	6.50	0.26	50	1.97	M0255190X12	Steel	Red
OS9/84X-R-PN with PRX-AP/182-PN	30 to 80	435 to 1160	0.8	11.60	8.50	0.33	100	3.94	M0273790X12	Steel	Neutral

Table 8. *Underpressure Shut-off Spring Ranges and Information*

CONTROLLER TYPE	SPRING RANGE		RESET DIFFERENTIAL		SPRING DIAMETER		SPRING LENGTH		PART NUMBER	MATERIAL	SPRING COLOR
	bar	psig	bar	psig	mm	In.	mm	In.			
OS9/80X-MPA-D-R	0.3 to 0.40	4.35 to 5.80	0.15	2.17	1.75	0.07	60.0	2.36	M0174340X12	Steel	Yellow
	0.40 to 0.90	5.80 to 13.05	0.30	4.35	2.25	0.09	60.0	2.36	M0197060X12	Steel	Blue
	0.90 to 4	13.05 to 58.01	0.70	10.15	3.00	0.12	60.0	2.36	M0197820X12	Steel	Red
OS9/80X-APA-D-R	0.3 to 0.8	4.35 to 11.6	0.25	3.62	1.75	0.07	60.0	2.36	M0174340X12	Steel	Yellow
	0.8 to 2.0	11.6 to 29	0.50	7.25	2.25	0.09	60.0	2.36	M0197060X12	Steel	Blue
	2.0 to 7.0	29 to 101.52	1.50	21.7	3.00	0.12	60.0	2.36	M0197820X12	Steel	Red
OS9/84X-R	4.0 to 8.0	58.01 to 116.03	3	43.50	2.25	0.09	60.0	2.36	M0197060X12	Steel	Blue
	7.0 to 16	101.52 to 232.06	6	87.00	3.00	0.12	60.0	2.36	M0197820X12	Steel	Red
OS9/88X-R	8.0 to 30	116.03 to 435.11	8	116.00	1.75	0.07	60.0	2.36	M0174340X12	Steel	Yellow
	20 to 70	290.07 to 1015.26	15	217.50	2.25	0.09	60.0	2.36	M0197060X12	Steel	Blue
OS9/80X-R-PN with PRX/181-PN	0.5 to 1.1	7.3 to 16	0.3	4.35	2.50	0.10	51	2.01	M0255250X12	Steel	White
	1 to 1.8	14.5 to 26	0.4	5.80	2.80	0.11	55	2.17	M0255240X12	Steel	Yellow
	1.6 to 3	23 to 44	0.4	5.80	3.20	0.13	55	2.17	M0255230X12	Steel	Green
	2.8 to 5.5	41 to 80	0.6	8.70	3.50	0.14	55	2.17	M0255180X12	Steel	Blue
	5 to 8.5	73 to 123	0.6	8.70	4.00	0.16	55	2.17	M0255220X12	Steel	Black
	8 to 14.5	116 to 210	0.6	8.70	4.50	0.18	55	2.17	M0255210X12	Steel	Silver
	14 to 23	203 to 334	0.8	11.60	5.50	0.22	51	2.01	M0255200X12	Steel	Gold
	22 to 30	319 to 435	0.8	11.60	6.00	0.24	51	2.01	M0255860X12	Steel	Aluminum
	29 to 42	421 to 609	0.8	11.60	6.50	0.26	50	1.97	M0255190X12	Steel	Red
OS9/84X-R-PN with PRX-AP/181-PN	30 to 80	435 to 1160	1	14.50	8.50	0.33	100	3.94	M0273790X12	Steel	Neutral

Minimum and Maximum Setting

CAUTION

Whenever minimum or maximum pressure setting is not required, omit corresponding steps.

Possible hand and finger pinch point between reaction arm and bracket. Reaction arm closes quickly and with extreme force. Keep hands and fingers away from reaction arm and bracket, as the reaction arm closes.

1. Make sure that the lever (key 33) is in horizontal position when slam-shut controller is reset (see Figure 11). If necessary, use nut and locknut (keys 69 and 70) to adjust (see step 2, Reassembly section).
2. Use maximum adjusting nut (key 50) to completely load maximum pressure spring (key 53). Loosen minimum adjusting screw (key 49) to completely relieve minimum pressure spring (key 54).
3. Disconnect sensing line to port (A) of slam-shut controller.
4. Through the pressure control connection, use a small pump or other appropriate means to raise the pressure to normal operating level.
5. Reset slam-shut controller and reduce the pressure until it reaches minimum cutoff level.
6. Use minimum adjusting screw (key 49) to load spring (key 54) slowly until pilot is triggered.
7. Repeat steps 4 and 5 above, making any necessary adjustment in the setting.
8. Bring pressure back to normal values.
9. Reset controller and raise the pressure until it reaches maximum cutoff level.
10. Using maximum adjusting nut (key 50), slowly unload spring (key 53) until cutoff point is reached.
11. Repeat steps 8 and 9 above, making any adjustment necessary in the setting.

Parts Ordering

Contact your local Sales Office when ordering replacement parts. Repair kits containing all recommended spare parts are available.

The serial number, type number, spring range, the date of manufacture and other pertinent information are stamped on the nameplate. Always provide this information in any correspondence with your local Sales Office regarding replacement parts or technical assistance.

Spare Parts

Spare parts storage shall be done by proper procedures according to national standard/rules to avoid over aging or any damage.

Parts List

WARNING

Use only genuine Emerson replacement parts. Components that are not supplied by Emerson should not, under any circumstances, be used in any Emerson slam-shut valve, because they will void your warranty, might adversely affect the performance of the slam-shut valve and could give rise to personal injury and property damage.

Type BM9 Slam-Shut Valve DN 200 / NPS 8 Body Size

Key	Description	Part Number
	Parts Kit	
	Static and Dynamic (included are keys 3, 11, 25, 42, 43, 44, 45, 47, 51, 58, 59, 63, 78, 106 and 107)	
	Nitrile (NBR)	ERAA48400A0
	Fluorocarbon (FKM)	ERAA48401A0
	Dynamic (included are keys 25, 42, 43, 44, 47, 51, 58, 59 and 106)	
	Nitrile (NBR)	ERAA48402A0
	Fluorocarbon (FKM)	ERAA48403A0
1	Body, LCC steel	
	CL300 RF	
	With Drainage Hole	ERAA47144A1
	Without Drainage Hole	ERAA47145A1
	CL600 RF	
	With Drainage Hole	ERAA47142A1
	Without Drainage Hole	ERAA47143A1
2	End Cap, LCC steel	ERAA47160A0

- continued -

*Recommended Spare Parts

Type BM9 Slam-Shut Valve DN 200 / NPS 8 Body Size (continued)

Key	Description	Part Number
3*	O-ring	
	Nitrile (NBR)	ERAA43958A0
	Fluorocarbon (FKM)	ERAA43958A1
4	Bolt, steel (6 required)	JI1H6080020
5	Washer (6 required)	ERAA42959A1
6	Bushing, Stainless steel	ERAA47775A0
7	Shaft, steel	ERAA47776A0
8	Bonnet, steel	ERAA47777A0
9	Controller	- - - - - - - - - -
10	Label	- - - - - - - - - -
11	O-ring	ERAA43953A2
12	Barrel, steel	ERAA47778A0
13	Bushing, steel	ERAA47779A0
14	Ring, Stainless steel	ERAA47780A0
15	Cage, steel	ERAA47781A0
16	Gasket	
	CL300 RF	JI2B9650200
	CL600 RF	JI2B9611200
17	Spacer, steel	
	CL300 RF	ERAA43758A1
	CL600 RF	ERAA43759A1
18	Disk Holder, steel	
	CL300 RF	ERAA43744A1
	CL600 RF	ERAA43745A1
19	Stem, steel	ERAA47782A0
20	Locknut, steel	ERAA27830A0
21	Screw, steel	ERAA22999A0
22	Bearing	ERAA27834A0
23	Plug Retainer, steel	ERAA23452A0
24	Sleeve, steel	ERAA47783A0
25*	Ring	ERAA47784A0
26	Spring, steel	ERAA47785A0
27	Ring (Barrel)	ERAA43764A0
28	End Plate, steel	ERAA47786A0
29	Tab Washer, Stainless steel	ERAA47787A0
30	Nut, steel	JI1E2000M20
31	Eyebolt, steel	JG11000BM12
32	Bracket, steel	
	Standard Option	ERAA44093A0
	Wireless Transmitter	ERAA48399A0
33	Handle Unit	See Handle Unit section
34	Eyebolt, steel (2 required)	ERAA45560A0
35	Bushing	ERAA44787A0
36	Pin, Limit	ERAA44788A0
37	Plug, steel	ERAA03131A0
38	Bushing	ERAA47788A0
39	Cap Fixation, Stainless steel	ERAA47789A0
40	Screw, Stainless steel (12 required)	JI1H6050016
41	Washer (12 required)	ERAA47790A0
42*	O-ring (2 required)	
	Nitrile (NBR)	ERAA43959A0
	Fluorocarbon (FKM)	ERAA43959A1
43*	Backup Ring (2 required)	ERAA43742A0
44*	O-ring	
	Nitrile (NBR)	ERAA43952A0
	Fluorocarbon (FKM)	ERAA43952A1

Type BM9 Slam-Shut Valve DN 200 / NPS 8 Body Size (continued)

Key	Description	Part Number
45*	O-ring (2 required)	
	Nitrile (NBR)	ERAA43957A0
	Fluorocarbon (FKM)	ERAA43957A1
47*	Disk, PTFE	ERAA48872A0
50	Cam Roller	ERAA35456A0
51*	Wiper	ERAA47791A0
52	Screw, Stainless steel (3 required)	M0220650X12
53	Thrust Ball Bearing	ERAA47792A0
55	Cam, Stainless steel	ERAA47793A0
56	Bushing (2 required)	ERAA47794A0
57	Retainer Ring	ERAA47795A0
58*	O-ring	
	Nitrile (NBR)	ERAA47161A0
	Fluorocarbon (FKM)	ERAA47161A1
59*	Backup Ring, PTFE	ERAA47796A0
60	Pin (2 required)	M4500187X12
61	Stud (8 required)	JI1B8160055
62	Nut (8 required)	JI1E2000M16
63*	O-ring	
	Nitrile (NBR)	ERAA35462A0
	Fluorocarbon (FKM)	ERAA35462A1
64	Flow Arrow	- - - - - - - - - -
65	Drive Screw (4 required)	- - - - - - - - - -
66	Nameplate Sticker	- - - - - - - - - -
67	Nameplate Support	- - - - - - - - - -
70	Nut	- - - - - - - - - -
71	Washer	- - - - - - - - - -
73	Tee, Pipe (2 required)	- - - - - - - - - -
74	Fitting Elbow	
	Type PRX/182-PN or PRX/181-PN (2 required)	- - - - - - - - - -
	Types PRX/182-PN and PRX/181-PN (4 required)	- - - - - - - - - -
75	Fitting Tee	
	Type PRX/182-PN or PRX/181-PN (1 required)	- - - - - - - - - -
	Types PRX/182-PN and PRX/181-PN (2 required)	- - - - - - - - - -
76	Tube	- - - - - - - - - -
77	Bracket	ERAA46711A0
78	Seal Retainer	ERAA43763A0
79	Washer (8 required)	JI1J1000016
84	Spring Washer (8 required)	JI1J3000016

Type BM9 Slam-Shut Valve DN 250 / NPS 10 Body Size

Key	Description	Part Number
	Parts Kit	
	Static and Dynamic (included are keys 3, 11, 25, 42, 43, 44, 45, 47, 51, 58, 59, 63, 68, 69, 78, 106 and 107)	
	Nitrile (NBR)	ERAA48506A0
	Fluorocarbon (FKM)	ERAA48507A0
	Dynamic (included are keys 25, 42, 43, 44, 47, 51, 58, 59 and 106)	
	Nitrile (NBR)	ERAA48508A0
	Fluorocarbon (FKM)	ERAA48509A0
1	Body, LCC steel	
	CL300 RF	

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*Recommended Spare Parts

Type BM9 Slam-Shut Valve DN 250 / NPS 10 Body Size (continued)

Key	Description	Part Number
	With Drainage Hole	ERAA47134A1
	Without Drainage Hole	ERAA47135A1
	CL600 RF	
	With Drainage Hole	ERAA47132A1
	Without Drainage Hole	ERAA47133A1
2	End Cap, LCC steel	ERAA48380A0
3*	O-ring	
	Nitrile (NBR)	ERAA44420A0
	Fluorocarbon (FKM)	ERAA44420A1
4	Bolt, steel (6 required)	M5011046X12
5	Washer (6 required)	ERAA34047A1
6	Bushing, Stainless steel	ERAA48381A0
7	Shaft, steel	ERAA48473A0
8	Bonnet, steel	ERAA47777A0
9	Controller	- - - - - - - - - -
10	Label	- - - - - - - - - -
11	O-ring	ERAA43953A2
12	Barrel, steel	ERAA48382A0
13	Bushing, steel	ERAA48383A0
14	Ring, Stainless steel	ERAA48384A0
15	Cage, steel	ERAA50358A0
16	Gasket	
	CL300 RF	JI2B9650250
	CL600 RF	JI2B9611250
17	Spacer, steel	
	CL300 RF	ERAA44205A1
	CL600 RF	ERAA44204A1
18	Disk Holder, steel	
	CL300 RF	ERAA44175A1
	CL600 RF	ERAA44174A1
19	Stem, steel	ERAA48386A0
20	Locknut, steel	ERAA27830A0
21	Screw, steel	ERAA22999A0
22	Bearing	ERAA27834A0
23	Plug Retainer, steel	ERAA23452A0
24	Sleeve, steel	ERAA48387A0
25*	Ring	ERAA48388A0
26	Spring, steel	ERAA48389A0
27	Ring (Barrel)	ERAA44270A0
28	End Plate, steel	ERAA48390A0
29	Tab Washer, Stainless steel	ERAA47787A0
30	Nut, steel	JI1E2000M20
31	Eyebolt, steel	JG11000BM12
32	Bracket, steel	
	Standard Option	ERAA44093A0
	Wireless Transmitter	ERAA48399A0
33	Handle Unit	See Handle Unit section
34	Eyebolt, steel (2 required)	M5040007X12
35	Bushing	ERAA44787A0
36	Pin, Limit	ERAA44788A0
37	Plug, steel	1A369224492
38	Bushing	ERAA47788A0
39	Cap Fixation, Stainless steel	ERAA48391A0
40	Screw, Stainless steel (12 required)	ERAA34060A0
41	Washer (12 required)	ERAA34049A0
42*	O-ring (2 required)	
	Nitrile (NBR)	M6010140X12

*Recommended Spare Parts

Type BM9 Slam-Shut Valve DN 250 / NPS 10 Body Size (continued)

Key	Description	Part Number
	Fluorocarbon (FKM)	M6020117X12
43*	Backup Ring (2 required)	ERAA44222A0
44*	O-ring	
	Nitrile (NBR)	ERAA44418A0
	Fluorocarbon (FKM)	ERAA44418A1
45*	O-ring (2 required)	
	Nitrile (NBR)	ERAA44419A0
	Fluorocarbon (FKM)	ERAA44419A1
47*	Disk, PTFE	ERAA49113A0
50	Cam Roller	ERAA35456A0
51*	Wiper	ERAA47791A0
52	Screw, Stainless steel (3 required)	M0220650X12
53	Thrust Ball Bearing	ERAA47792A0
55	Cam, Stainless steel	ERAA48393A0
56	Bushing (2 required)	ERAA47794A0
57	Retainer Ring	ERAA47795A0
58*	O-ring	
	Nitrile (NBR)	ERAA47161A0
	Fluorocarbon (FKM)	ERAA47161A1
59*	Backup Ring, PTFE	ERAA47796A0
60	Pin (2 required)	M4500187X12
61	Stud (8 required)	JI1B8160055
62	Nut (8 required)	JI1E2000M16
63*	O-ring	
	Nitrile (NBR)	ERAA35462A0
	Fluorocarbon (FKM)	ERAA35462A1
64	Flow Arrow	- - - - - - - - - -
65	Drive Screw (4 required)	- - - - - - - - - -
66	Nameplate Sticker	- - - - - - - - - -
67	Nameplate Support	- - - - - - - - - -
68	O-ring	
	Nitrile (NBR)	ERAA44416A0
	Fluorocarbon (FKM)	ERAA44416A1
69	Seat Retainer	ERAA44238A0
70	Nut	- - - - - - - - - -
71	Washer	- - - - - - - - - -
73	Tee, Pipe (2 required)	- - - - - - - - - -
74	Fitting Elbow	
	Type PRX/182-PN or PRX/181-PN (2 required)	- - - - - - - - - -
	Types PRX/182-PN and PRX/181-PN (4 required)	- - - - - - - - - -
75	Fitting Tee	
	Type PRX/182-PN or PRX/181-PN (1 required)	- - - - - - - - - -
	Types PRX/182-PN and PRX/181-PN (2 required)	- - - - - - - - - -
76	Tube	- - - - - - - - - -
77	Bracket	ERAA46711A0
78	Seal Retainer	ERAA44239A0
79	Washer (8 required)	JI1J1000016
84	Spring Washer (8 required)	JI1J3000016

Type BM9 Slam-Shut Valve DN 300 / NPS 12 Body Size

Key	Description	Part Number
	Parts Kit	
	Static and Dynamic (included are keys 3, 11, 25, 42, 43, 44, 45, 47, 48, 51, 58, 59,	

- continued -

Type BM9 Slam-Shut Valve
DN 300 / NPS 12 Body Size (continued)

Key	Description	Part Number
	63, 106 and 107)	
	Nitrile (NBR)	ERAA36363A0
	Fluorocarbon (FKM)	ERAA36364A0
	Dynamic (included are keys 25, 42, 43, 44, 47, 51, 58, 59 and 106)	
	Nitrile (NBR)	ERAA36365A0
	Fluorocarbon (FKM)	ERAA36366A0
1	Body, LCC steel	
	CL300 RF	
	With Drainage Hole	ERAA46697A1
	Without Drainage Hole	ERAA47299A1
	CL600 RF	
	With Drainage Hole	ERAA46678A1
	Without Drainage Hole	ERAA47298A1
2	End Cap, LCC steel	ERAA22311A2
3*	O-ring	
	Nitrile (NBR)	ERAA27827A0
	Fluorocarbon (FKM)	ERAA27827A1
4	Bolt, steel (6 required)	M5011062X12
5	Washer (6 required)	ERAA34062A0
6	Bushing, Stainless steel	ERAA35444A0
7	Shaft, steel	ERAA35445A0
8	Bonnet, steel	ERAA35443A0
9	Controller	- - - - - - - - - -
10	Label	- - - - - - - - - -
11	O-ring	ERAA34045A2
12	Barrel, steel	ERAA35451A0
13	Bushing, steel	ERAA35437A0
14	Ring, Stainless steel	ERAA35465A0
15	Cage, steel	ERAA35340A0
16	Gasket	
	CL300 RF	JI2B9650300
	CL600 RF	JI2B9611300
17	Spacer, steel	
	CL300 RF	ERAA33152A1
	CL600 RF	ERAA22310A1
18	Disk Holder, steel	
	CL300 RF	ERAA32121A0
	CL600 RF	ERAA22303A0
19	Stem, steel	ERAA35450A0
20	Locknut, steel	ERAA27830A0
21	Screw, steel	ERAA22999A0
22	Bearing	ERAA27834A0
23	Plug Retainer, steel	ERAA23452A0
24	Sleeve, steel	ERAA35439A0
25*	Ring	ERAA35436A0
26	Spring, steel	ERAA35453A0
27	Ring (Barrel)	ERAA35440A0
28	End Plate, steel	ERAA35449A0
29	Tab Washer, Stainless steel	ERAA35448A0

Key	Description	Part Number
30	Nut, steel	JI1F2000M24
31	Eyebolt, steel	M5040004X12
32	Bracket, steel	
	Standard Option	ERAA44093A0
	Wireless Transmitter	ERAA48399A0
33	Handle Unit	See Handle Unit section
34	Eyebolt, steel (2 required)	
	CL300 RF	M5040007X12
	CL600 RF	ERCA00481A0
35	Bushing	ERAA44787A0
36	Pin, Limit	ERAA44788A0
37	Plug, steel	1A369224492
38	Bushing	ERAA35452A0
39	Cap Fixation, Stainless steel	ERAA35464A0
40	Screw, Stainless steel (12 required)	ERAA34060A0
41	Washer (12 required)	ERAA34049A0
42*	O-ring (2 required)	
	Nitrile (NBR)	ERAA27837A0
	Fluorocarbon (FKM)	ERAA27837A1
43*	Backup Ring (2 required)	ERAA35454A0
44*	O-ring	
	Nitrile (NBR)	ERAA27823A0
	Fluorocarbon (FKM)	ERAA27823A1
45*	O-ring (2 required)	
	Nitrile (NBR)	ERAA27821A0
	Fluorocarbon (FKM)	ERAA27821A1
46	Seal Ring Retainer	ERAA23318A0
47*	Disk, PTFE	ERAA22312A0
48*	O-ring	
	Nitrile (NBR)	ERAA31727A0
	Fluorocarbon (FKM)	ERAA31727A1
49	Screw, Stainless steel (6 required)	ERAA35520A1
50	Cam Roller	ERAA35456A0
51*	Wiper	ERAA35469A0
52	Screw, Stainless steel (3 required)	M0220650X12
53	Thrust Ball Bearing	ERAA35446A0
54	Parallel Key (2 required)	ERAA35455A0
55	Cam, Stainless steel	ERAA35447A0
56	Bushing (2 required)	ERAA35463A0
57	Retainer Ring	ERAA35460A0
58*	O-ring	
	Nitrile (NBR)	ERAA35457A0
	Fluorocarbon (FKM)	ERAA35457A1
59*	Backup Ring, PTFE	ERAA35458A0
60	Pin (2 required)	M4500187X12
61	Stud (8 required)	JI1B8160055
62	Nut (8 required)	JI1E2000M16

*Recommended Spare Parts

63*	O-ring	
	Nitrile (NBR)	ERAA35462A0
	Fluorocarbon (FKM)	ERAA35462A1
64	Flow Arrow	- - - - - - - - - -
65	Drive Screw (4 required)	- - - - - - - - - -
66	Nameplate Sticker	- - - - - - - - - -
67	Nameplate Support	- - - - - - - - - -
70	Nut	- - - - - - - - - -
71	Washer	- - - - - - - - - -
73	Tee, Pipe (2 required)	- - - - - - - - - -
74	Fitting Elbow	
	Type PRX/182-PN or PRX/181-PN (2 required)	- - - - - - - - - -
	Types PRX/182-PN and PRX/181-PN (4 required)	- - - - - - - - - -
75	Fitting Tee	
	Type PRX/182-PN or PRX/181-PN (1 required)	- - - - - - - - - -
	Types PRX/182-PN and PRX/181-PN (2 required)	- - - - - - - - - -
76	Tube	- - - - - - - - - -
77	Bracket	ERAA46711A0
79	Washer (8 required)	JI1J1000016
84	Spring Washer (8 required)	JI1J3000016

Handle Unit (See Figure 17)

Key	Description	Part Number
100	Cap	JJJJ56CXM11
101	Lower Cover	ERAA43890A0
102	Upper Cover	ERAA43876A0
103	Gear Train	ERAA43881A0
104	Connector, Steel	ERAA43872A0
105	Screw	ERAA43874A0
106*	O-ring	JI321265A21
107*	Washer (2 required)	ERAA43885A0
108	Bushing, Copper Alloy	ERAA43887A0
109	Spring, Steel	ERAA43888A0
110	Link	JJJJ56CX091
111	Adapter, Steel	ERAA43886A0
112	Ring, Stainless Steel	ERAA44137A0
113	Chain, Stainless Steel	ERAA44136A0
114	Nut, Stainless Steel	ERAA43893A0
115	Handle	ERAA43892A0
116	Lever, Stainless Steel	ERAA43871A0

Slam-Shut Controller (See Figures 18 and 19)

Key	Description	Part Number

Slam-Shut Controller (See Figures 18 and 19) (continued)

Key	Description	Part Number
1	Plate, Steel	
	Standard and Sour Gas	M0274390X12
	With 1 Proximity Switch	M0274390X12
	With 2 Proximity Switch	M0287280X12
2	Bushing, Copper Alloy	M0264650X12
3	Screw	M5021006X12
4*	Gasket, Copper	M0159590X12
5	Balls holder, Carbon steel	
	Reinforced, Right Orientation	M0264660X12
6	Stem, stainless steel	ERAA35442A0
7	Pin	M4500009X12
8*	O-ring	
	Nitrile (NBR)	M6010095X12
	Fluorocarbon (FKM)	M6020069X12
9	Nut, Copper Alloy	M0193640X12
10	Ball-Roller, Reinforced (2 required)	M4500764X12
11	Pin (2 required)	M4500222X12
12	Screw (2 required)	M5022002X12
13	Bushing, Copper Alloy	M0297990X12
14*	O-ring, Standard	JI321180019
15	Ring, Brass	M0193670X12
17	Lever, Steel	M0269940X12
18	Locknut (2 required)	M5006012X12
19	Washer (2 required)	M5001032X12
20	Lever, Steel	M0269710X12
21	Spring Winding direction - right, Steel	M0201060X12
22	Lever (2 required)	M0264700X12
24	Label	- - - - - - - - - -
26	Nut	
	Types OS9/80X-MPA-D-R, OS9/80X-APA-D-R, OS9/80X-R-PN, OS9/84X-R, OS9/84X-R-PN, and OS9/88X-R (1 required)	M5036001X12
27	Screw	
	Types OS9/80X-MPA-D-R (8 required), Types OS9/80X-APA-D-R and OS9/80X-R-PN (6 required)	M5011029X12
28	Pin, Steel	M0297980X12
29	Screw	M5023032X12
30	Locknut	M5006013X12
31	Washer	M5001002X12
32	Fulcrum, Carbon steel	M0269970X12
33	Plate, Copper Alloy	M0202250X12
34	Screw	

- continued -

*Recommended Spare Parts

Slam-Shut Controller
(See Figures 18 and 19) (continued)

Key	Description	Part Number
	Types OS9/80X-MPA-D-R, OS9/80X-APA-D-R and OS9/80X-R-PN (2 required)	M5011132X12
35	Cone, Standard only, Copper Alloy	M0193490X12
36	Lever, Steel	M0262570X12
37	Spring, Right orientation, Steel	
	All types of box except with 2 limit switch	M0193520X12
	With 2 limit switch box	M0193540X12
38	Plug	M4500377X12
39	Pin, Steel	M0193370X12
40	Screw (4 required)	
	Standard, left orientation aluminum box	M5011132X12
41	Indicator (Standard or With Proximity Switch only)	
	Stainless steel	M0267580X12
42	Knob (Standard or With Proximity Switch only)	
	Acrylonitrile butadiene styrene	M0240420X12
43	Button (Standard and Sour Gas only)	
	Copper-Aluminum Alloy	M0193480X12
44*	O-ring	M6010014X12
45	Spring (Standard and Sour Gas, for Casing without Button standard only)	M0169300X12
46	Cord, standard application	M4500228X12
46	Adhesive Tape, sour gas application	
	Types OS9/80X-R, OS9/84X-R and OS9/84X-R-PN	M4501525X12
	Type OS9/88X-R	M4500228X12
47	Casing, Right orientation	
	Standard and Sour Gas, Polycarbonate	M0193380X12
48	Screw (2 required)	M5011005X12
49	Screw, Copper Alloy	M0197120X12
50	Nut, Copper Alloy	M0197200X12
51	Tube, Carbon steel	M0193390X12
52	Washer, Copper Alloy	M0245750X12
53	Overpressure Spring	See Table 7
54	Underpressure Spring	See Table 8
55	Holder, Copper Alloy	M0197100X12
56	Ring	M4500221X12
57	Stem unit, Aluminum Alloy	M0267540X12
58	Spring, Stainless steel	M0261420X12
59	Stem, Aluminum Alloy	
	Types OS9/80X-APA-D-R and OS9/80X-R-PN	M0267490X12
	Type OS9/80X-MPA-D-R	M0267480X12
	Types OS9/84X-R, OS9/84X-R-PN and OS9/88X-R	M0267590X12
60	Upper cover	
	Types OS9/80X-APA-D-R and OS9/80X-R-PN	
	LF2, Carbon Steel	M0290150X12
	A105, Carbon Steel	M0211710X12
	Type OS9/80X-MPA-D-R	
	LF2, Carbon Steel	M0290140X12
	A105, Carbon Steel	M0211930X12
	Types OS9/84X-R and OS9/84X-R-PN	
	Brass	M0262610X12
	Carbon Steel	M0299410X12
	Type OS9/88X-R	
	Brass	M0267840X12
60	Body, Carbon steel	M0299380X12
61	Lower cover	
	Types OS9/80X-APA-D-R and OS9/80X-R-PN	
	LF2, Carbon Steel	M0290160X12
	A105, Carbon Steel	M0211720X12
	Type OS9/80X-MPA-D-R	
	LF2, Carbon Steel	M0290130X12
	A105, Carbon Steel	M0211920X12
	Types OS9/84X-R and OS9/84X-R-PN	
	Brass	M0262600X12
	Carbon Steel	M0299420X12
	Type OS9/88X-R	
	Brass	M0267830X12
61	Plug, Aluminum Alloy	M0299390X12
62*	Diaphragm (2 required)	
	Types OS9/80X-APA-D-R and OS9/80X-R-PN	
	Nitrile (NBR)	M0262770X12
	Fluorocarbon (FKM)	M0285060X12
	Type OS9/80X-MPA-D-R	
	Nitrile (NBR)	M0262780X12
	Fluorocarbon (FKM)	M0285070X12
	Type OS9/80X-BP-R	
	Nitrile (NBR)	M0262790X12
	Fluorocarbon (FKM)	M0285080X12
63	Screw, except Type OS9/80X-R Model BP (2 required)	M5011132X12
64	Block, except Type OS9/80X-R Model BP, Aluminum Alloy	M0198170X12
65*	O-ring	
	Nitrile (NBR)	M6010014X12
	Fluorocarbon (FKM)	M6020007X12
66*	Ring	
	Types OS9/84X-R and OS9/84X-R-PN	ERAA12494A0
	Type OS9/88X-R	M4501096X12
67*	O-ring	
	Nitrile (NBR)	M6010205X12

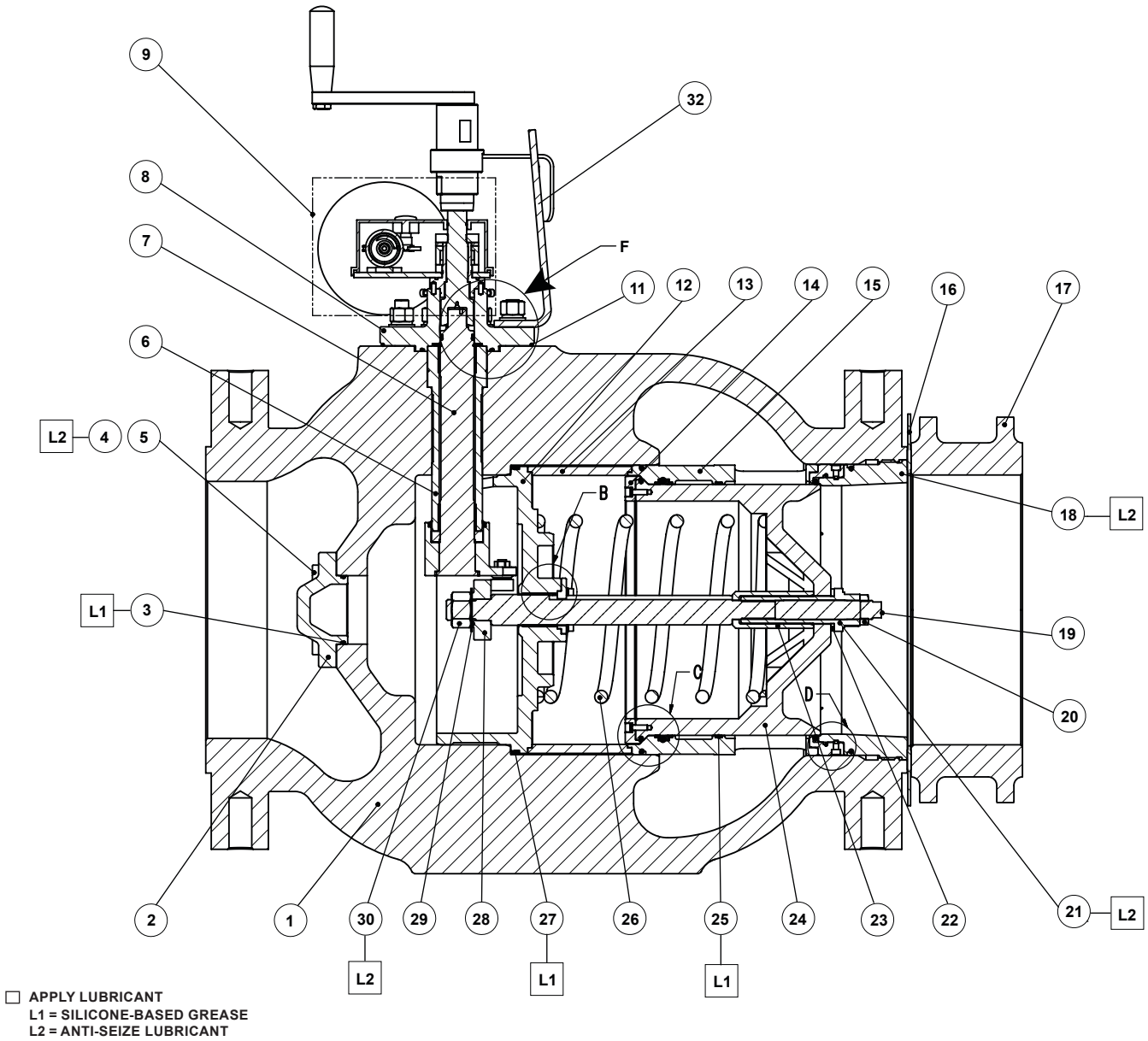


Figure 14. *Type BM9 Slam-Shut Valve*

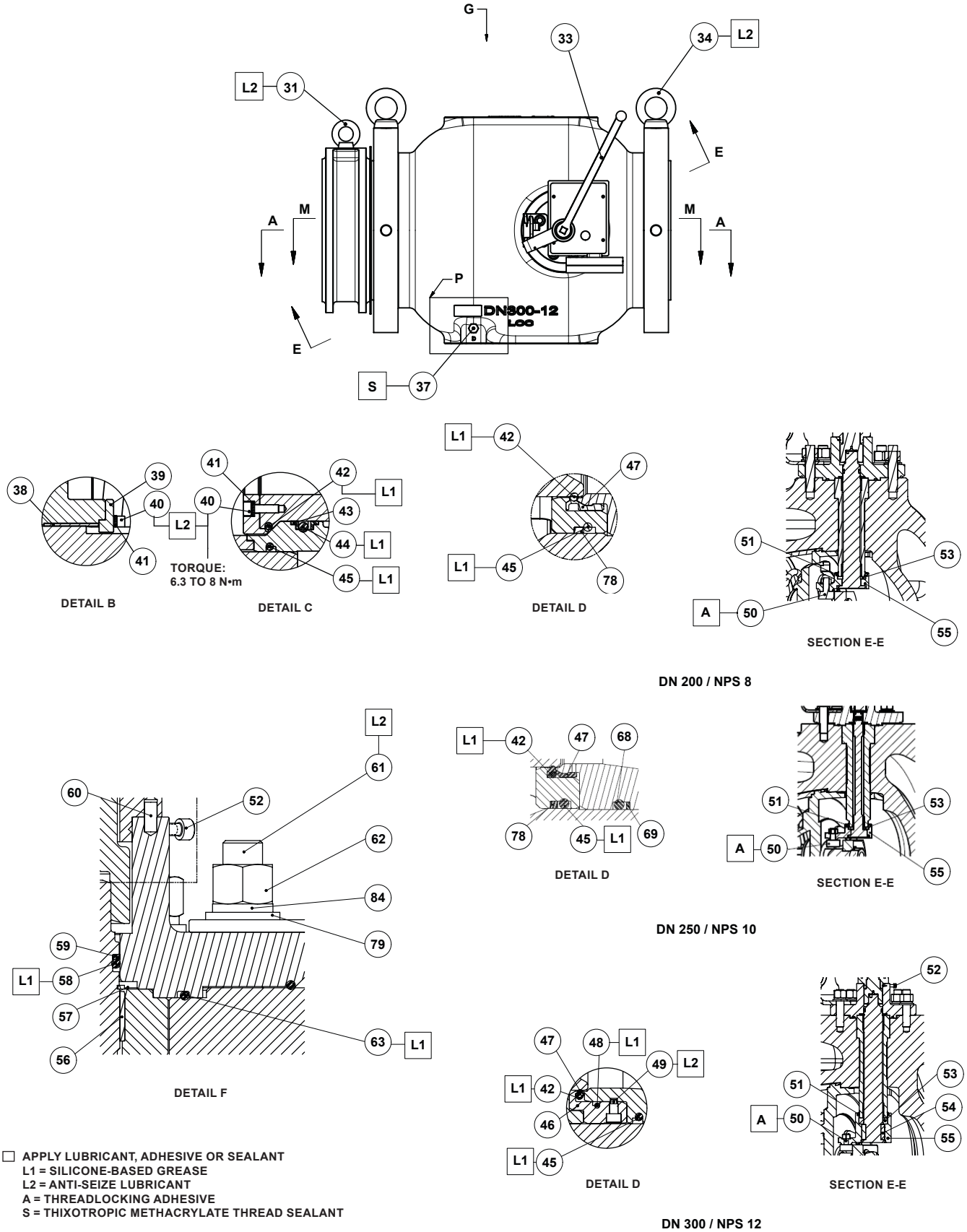
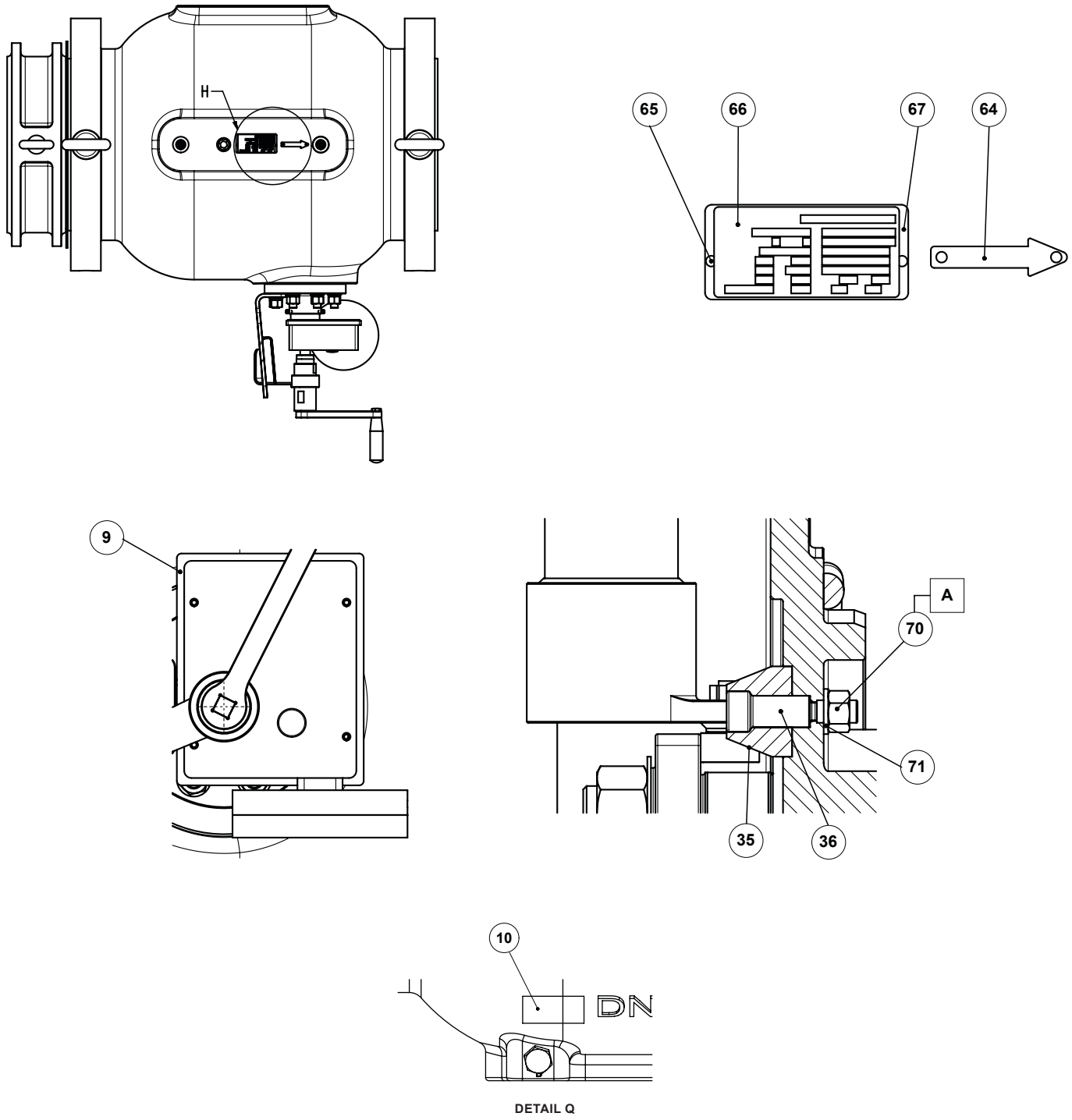
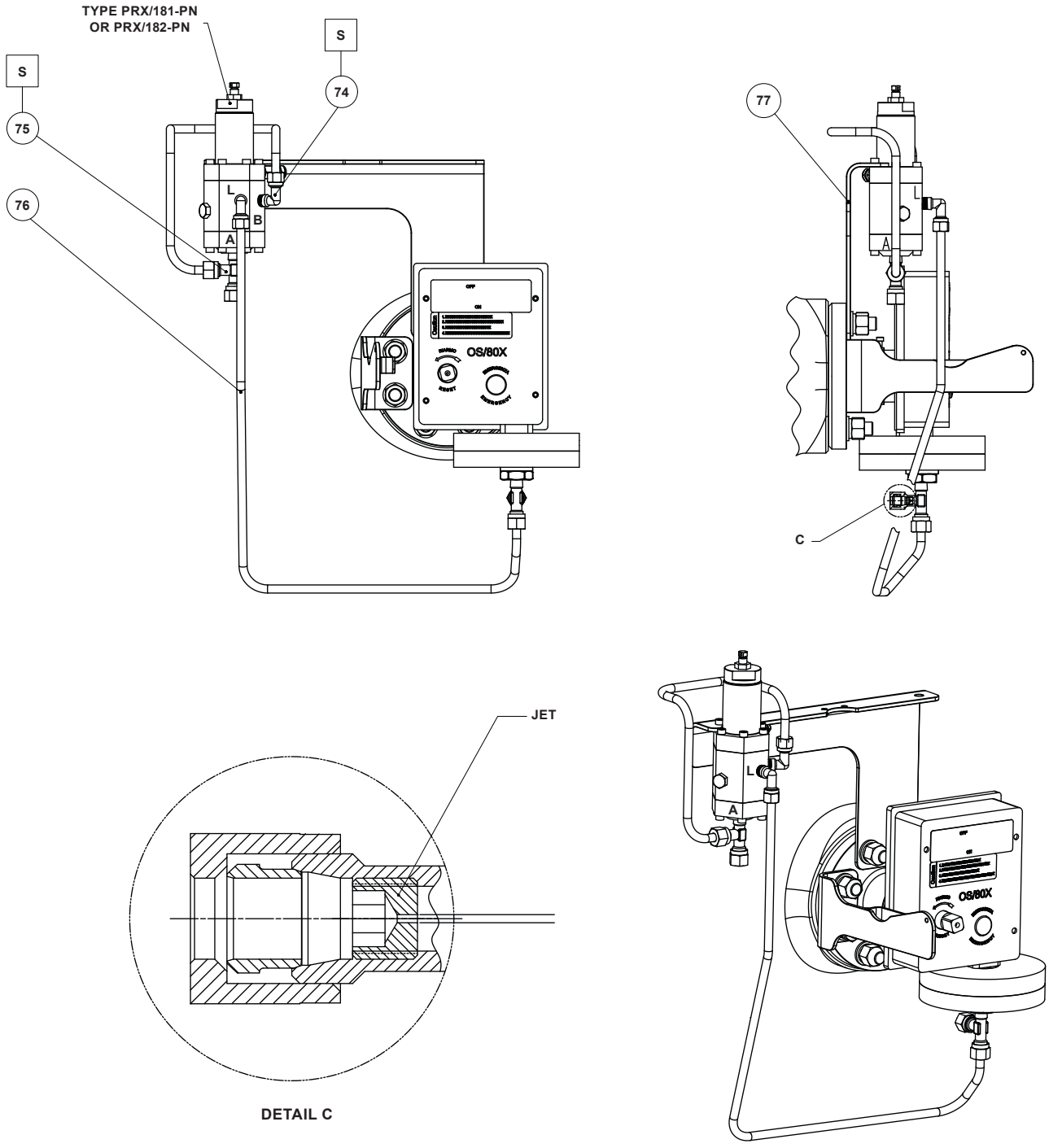


Figure 14. *Type BM9 Slam-Shut Valve (continued)*



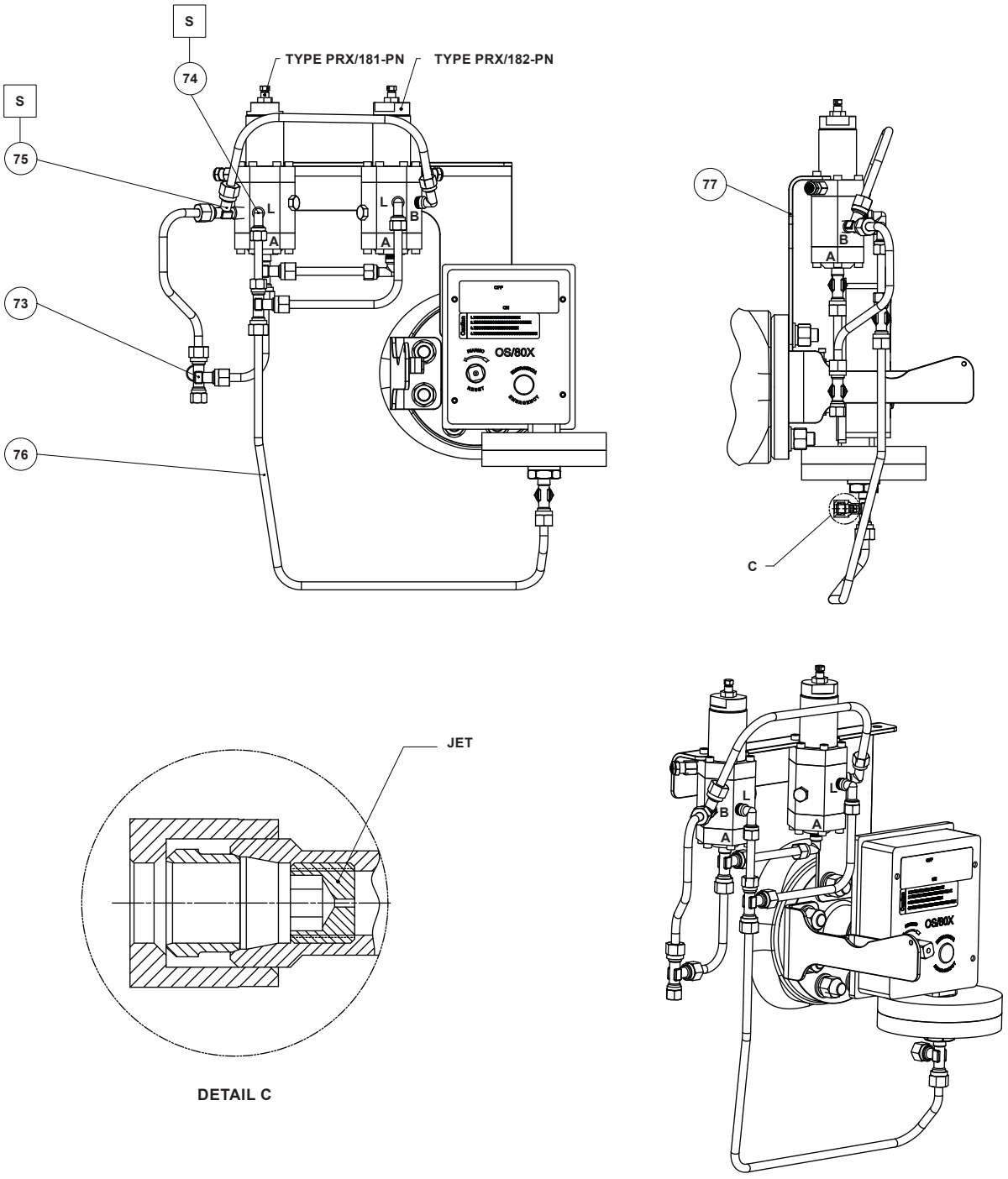
□ APPLY LUBRICANT, ADHESIVE OR SEALANT
A = THREADLOCKING ADHESIVE

Figure 14. *Type BM9 Slam-Shut Valve (continued)*



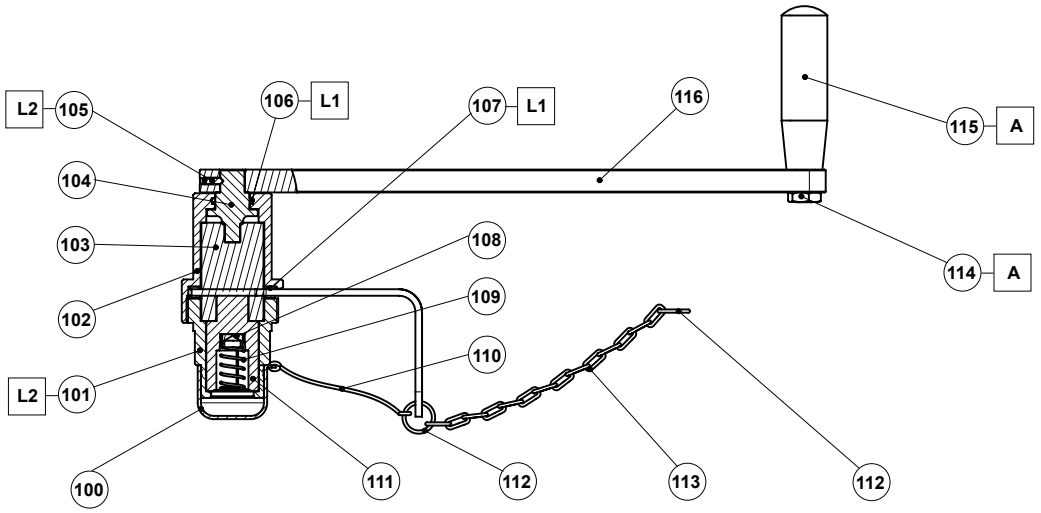
☐ APPLY SEALANT
S = THIXOTROPIC METHACRYLATE THREAD SEALANT

Figure 15. *Type BM9 Slam-Shut Valve with Type PRX/181-PN or PRX/182-PN*



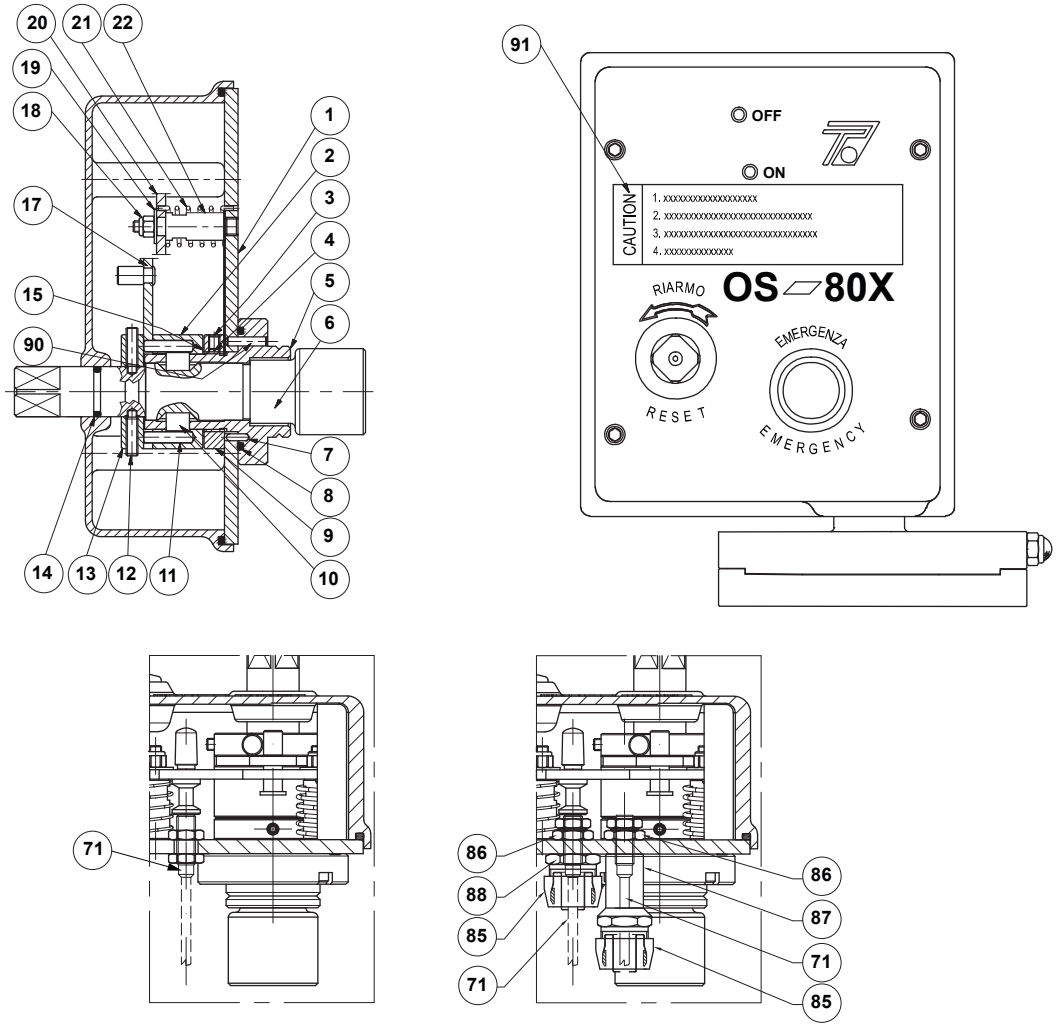
□ APPLY SEALANT
S = THIXOTROPIC METHACRYLATE THREAD SEALANT

Figure 16. *Type BM9 Slam-Shut Valve with Types PRX/181-PN and PRX/182-PN*



☐ APPLY LUBRICANT OR ADHESIVE
L1 = SILICONE-BASED GREASE
L2 = ANTI-SEIZE LUBRICANT
A = THREADLOCKING ADHESIVE

Figure 17. *Type BM9 Handle Unit*



DETAIL OF TYPE OS9/80X-R WITH PROXIMITY SWITCH

Figure 18. *Type OS9/80X-R Slam-Shut Controller (standard)*

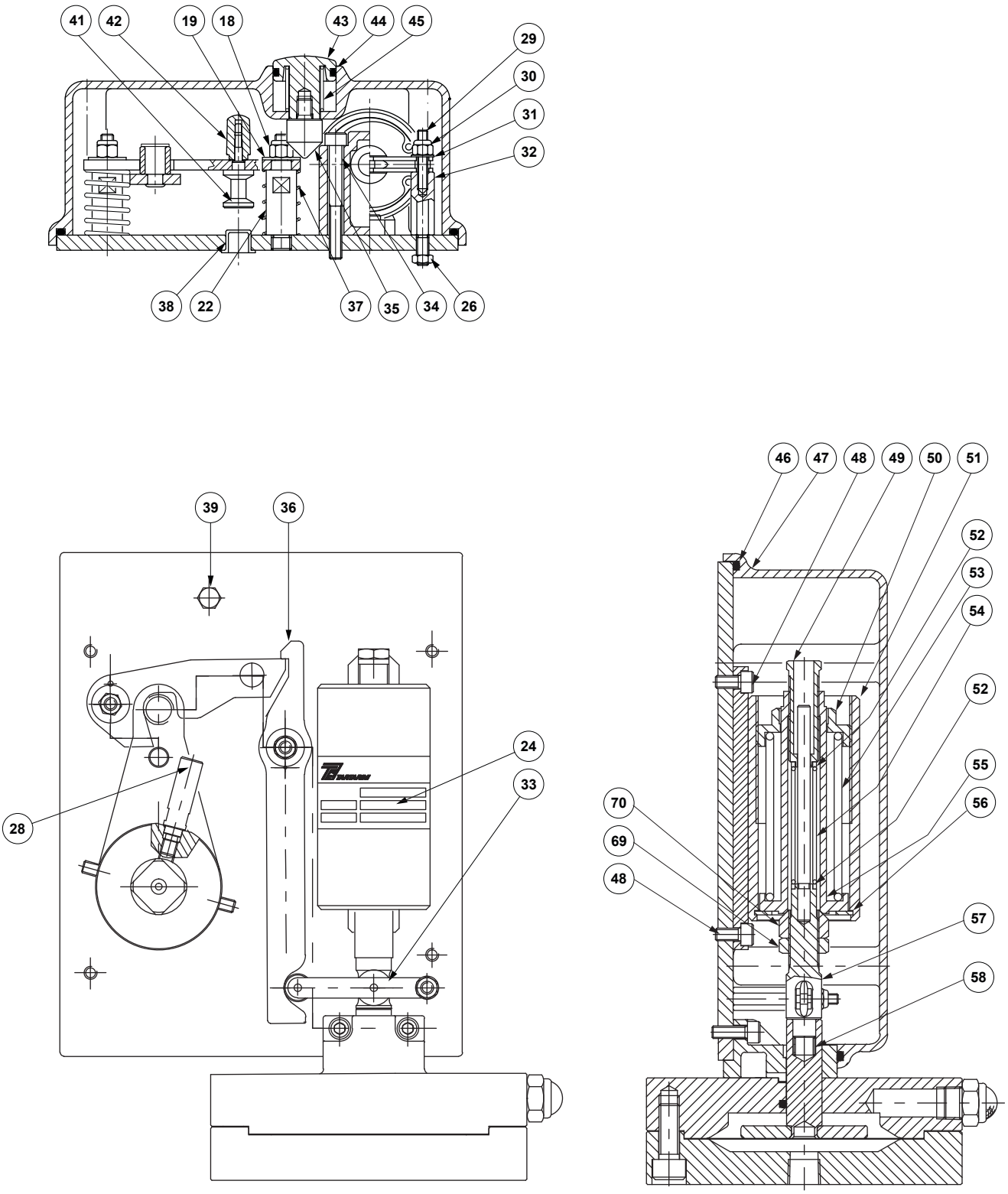


Figure 18. *Type OS9/80X-R Slam-Shut Controller (standard) (continued)*

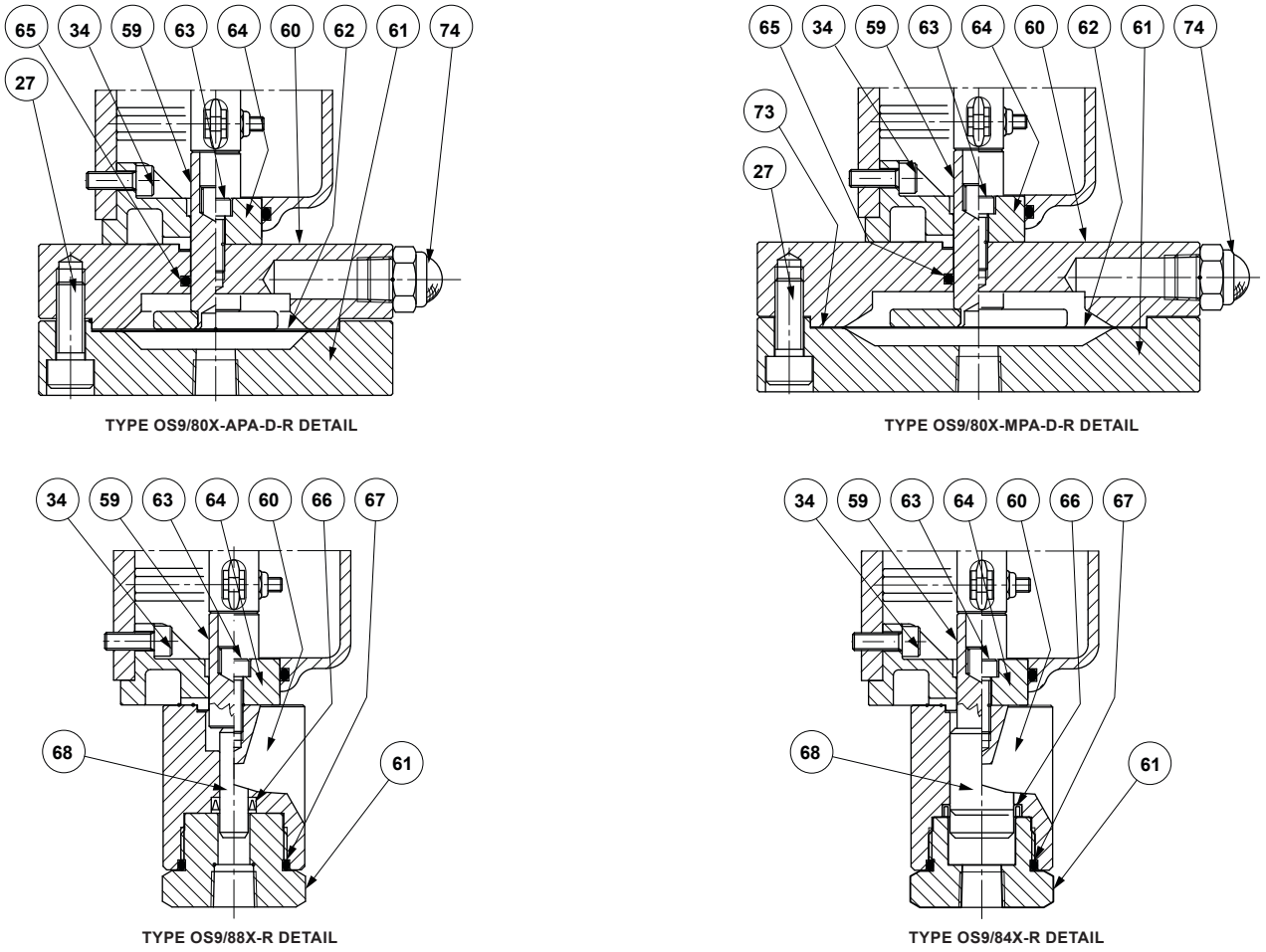


Figure 19. *Actuators Series of Slam-Shut Controller*

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