

BM5 Series Slam-Shut Valve

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INTRODUCTION

Scope of Manual

This manual provides instructions for installation, startup, maintenance and spare parts ordering for the BM5 Series slam-shut valves. It also contains information for the OS/80X Series slam-shut controller.

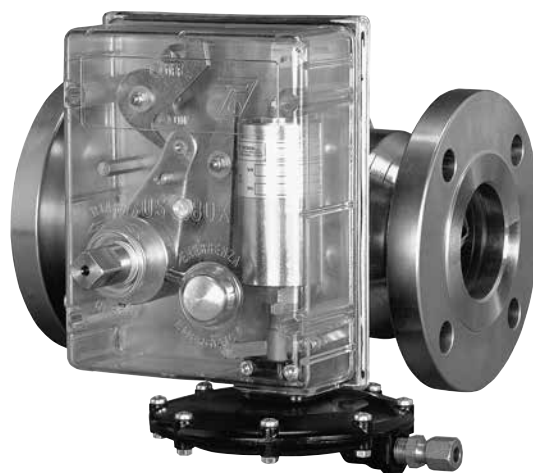


Figure 1. BM5 Series Slam-Shut Valve

Product Description

The BM5 Series slam-shut valves are axial flow type with a single seat and counterbalanced shutter and are used in regulating, distribution and transmission stations of suitably filtered natural gas.

This product has been 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 agent.

The standard gas pressure devices (safety shut-off devices - SSD slam-shut type) are those used in the assemblies dealt with into EN 12186 and EN 12279 and their use has to be under the provisions into ENs 12186 & 12279.

In the safety slam-shut valves manufactured by Emerson Process shall be used additional pressure accessories (e.g. controller or filters) manufactured and labeled by Emerson Process.

Emerson Process will be not responsible for any possible inefficiency due to installation of not own production additional pressure accessories.

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

BM5 Series

PED CATEGORIES AND FLUID GROUP

According to EN 14382, only in 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 PED.

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 configuration is a safety accessory for pressure equipment in the following Pressure Equipment Directive 97/23/EC categories.

Table 1. P.E.D. Category for BM5 Series Slam-Shut Valves

PRODUCT SIZE	CATEGORY	FLUID GROUP
DN 25-40-50-65-80-100-150	IV	1

Built-in pressure accessories (e.g. controllers OS/80, OS/80-X) conform to Pressure Equipment Directive (PED) 97/23/EC Article 3 section 3 and were designed and manufactured in accordance with sound engineering practice (SEP).

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

CHARACTERISTICS

Body Sizes and End Connection Styles

DN 25 - 40 - 50 - 65 - 80 - 100 - 150

PN 16-25 UNI/ DIN

ANSI 150 - 300 - 600 flanged



WARNING

Maximum Operating Inlet Pressure⁽¹⁾⁽²⁾

PN 16: 16 bar

PN 25: 25 bar

ANSI 150: 20 bar

ANSI 300: 50 bar

ANSI 600: 100 bar

Overpressure Set Range

0.03 to 80 bar

Underpressure Set Range

0.01 to 80 bar

Minimum/Maximum Allowable Temperature (TS)⁽¹⁾

See label.

Functional Features

Accuracy Class AG : ± 1%

Response Time t_a : ≤ 1 second

Temperature

Standard Version: Working -10° to 60°C

Low Temperature Version: Working -20° to 60°C

Materials

Body: Steel

Sleeve: Steel

O-ring: Nitrile (NBR) rubber or FKM

Pad: Nitrile (NBR) rubber or FKM

Pad holder: Steel

1. The pressure/temperature limits indicated in this instruction manual or any applicable standard or code limitation should not be exceeded.
2. At average ambient temperature.

LABELLING

TARTARINI BOLOGNA ITALY **CE** Notified body xxxxx APPARECCHIO TIPO / DEVICE TYPE Note 1

MATRICOLA / ANNO SERIAL Nr. / YEAR / Note 2 DN1

REAZIONE FAIL SAFE MODE FAIL OPEN FAIL CLOSE DN2

NORME ARMONIZ. HARMONIZED STD. EN Wds bar

CLASSE DI PERDITA LEAKAGE CLASS TIPO TYPE Wdso bar

CLASSE FUNZIONALE FUNCTIONAL CLASS Note 3 Cg Wdsu bar

FLUIDO GRUPPO FLUID GROUP 1 pmax bar DN seat DN sede pdo bar

TS Note 4 °C PS Note 5 bar PSD Bar PT= 1.5 x PS bar

Figure 2. Label for BM5 Series Slam-Shut Valves

Note 1: See “Characteristics”

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°/60°C
Class 2: -20°/60°C

Note 5: PN 16 PS: 16 bar
PN 25 PS: 25 bar
ANSI 150 PS: 20 bar
ANSI 300 PS: 50 bar
ANSI 600 PS: 100 bar

OVERPRESSURE PROTECTION

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

Upstream overpressure protection shall be provided if the inlet pressure is greater than the maximum operating inlet pressure ($p_{u,max}$) and than the maximum allowable pressure (PS, PSD).

Downstream side pressure after slam-shut valve's intervention shall stay within the actual maximum operating set-up range to avoid anomalous back pressures that can damage the slam-shut controller.

Downstream overpressure protection shall be also provided if the slam-shut valve outlet pressure can be greater 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.

TRANSPORT AND HANDLING

Established transport and handling procedures shall be followed to avoid any damage on the pressure containing parts by shocks or anomalous stresses.

Eyebolts are designed just for handling of equipment weight.

Built-up sensing lines and pressure accessories (e.g. slam-shut controller) shall to be protected by shocks or anomalous stresses

ATEX REQUIREMENTS



WARNING

If the provisions of EN 12186 & EN 12279, national regulations, if any, and 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 & gas pressure regulating/measuring stations/installations.

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

(5m/sec)

In any case,

- provisions of Directive 1999/92/EC and 89/655/EC shall be enforced by gas pressure regulating/measuring station/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 & 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 & 12279 shall be enforced by pressure regulating/measuring station/installation's end user
- external tightness test shall be carried out after each reassembly at installation site 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.

BM5 Series

SLAM-SHUT CONTROLLER

The BM5 Series slam-shut valves are equipped with the OS/80X or OS/80X-PN series slam-shut controller. The controllers are supplied in different models according to set ranges required. The BM5 DN 150 is equipped with a reinforced version OS/80X-R.

Table 2. Characteristics for Type OS/80X Spring Loaded Pneumatic Slam-Shut Controller

MODEL	SERVOMOTOR BODY RESISTANCE (bar)	OVERPRESSURE SET RANGE Wdo (bar)		UNDERPRESSURE SET RANGE Wdu (bar)		BODY MATERIAL
		Min.	Max.	Min.	Max.	
OS/80X-BP	5	0.03	2	0.01	0.6	Aluminium
OS/80X-BPA-D	20					
OS/80X-MPA-D	100	0.5	5	0.25	4	Steel
OS/80X-APA-D		2	10	0.3	7	
OS/84X		5	41	4	16	Brass
OS/88X		18	80	8	70	

N.B.: 1/4" NPT female threaded connections

Table 3. Characteristics for Type OS/80X Pneumatic Slam-Shut Controller with Type PRX Pilot

MODEL	SERVOMOTOR BODY RESISTANCE (bar)	OVERPRESSURE SET RANGE Wdo (bar)		UNDERPRESSURE SET RANGE Wdu (bar)		BODY MATERIAL
		Min.	Max.	Min.	Max.	
OS/80X-PN	100	0.5	40	0.5	40	Steel
OS/84X-PN	100	30	80	30	80	Brass

OS/80X-PN: Pressure range 0.5 to 40 bar
Appliance made of an OS/80X-APA-D set at about 0.4 bar and a variable number of PRX/182 pilots for overpressure and PRX/181 for underpressure, as many as necessary to control different points of the installation.

OS/84X-PN: Pressure range 30 to 80 bar
Appliance made of an OS/84X set at about 20 bar and a variable number of PRX-AP/182 pilots for overpressure and PRX-AP/181 for underpressure, as many as necessary to control different points of the installation.

N.B.: 1/4" NPT female threaded connections.



Figure 3. OS/80X-BP Slam-Shut Device

DIMENSIONS AND WEIGHTS

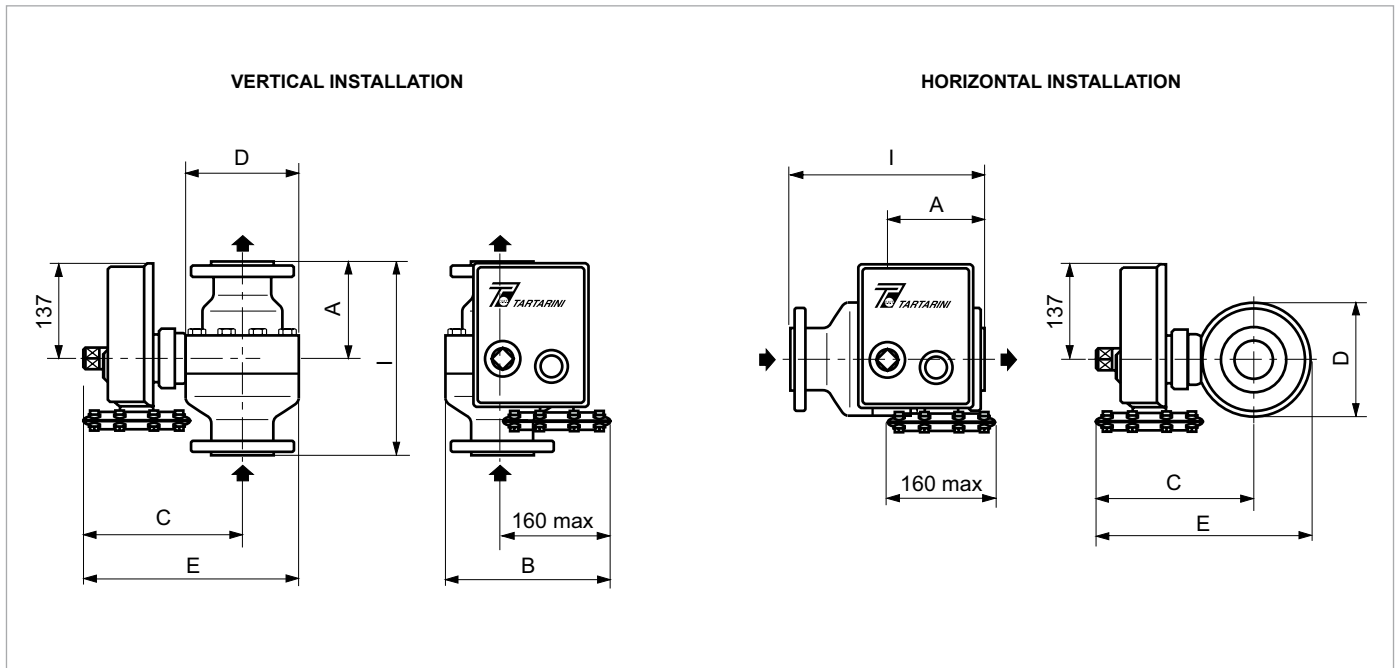


Figure 4. Type BM5 Series Dimensions

Table 4. Type BM5 Series Dimensions (mm)

TYPE	DN 25	DN 40	DN 50	DN 65	DN 80	DN 100	DN 150	
A	100	125	145	155	165	195	250	
B	220	235	245	255	275	295	365	
C	200	205	215	225	245	270	380	
D	125	155	165	190	230	275	410	
E	260	280	300	320	360	410	585	
PN 16	I	184	222	254	276	298.5	352.5	451
PN 25		184	-	254	-	298.5	352.5	451
ANSI 150		184	222	254	276	298.5	352.5	451
ANSI 300		197	235	266.5	292	317.5	368.5	473
ANSI 600		210	251	286	311	336.5	394	508

N.B. The C dimensions are indicative and refer to the models with larger dimensions.
The threaded opening for the connection of the control line is 1/4" NPT female.

Table 5. Type BM5 Series Weights (kg)

TYPE	DN 25	DN 40	DN 50	DN 65	DN 80	DN 100	DN 150
PN 16/25 - ANSI 150	15	21	26	38	54	83	170
ANSI 300/600	17	25	30	41	62	105	280

BM5 Series

OPERATION

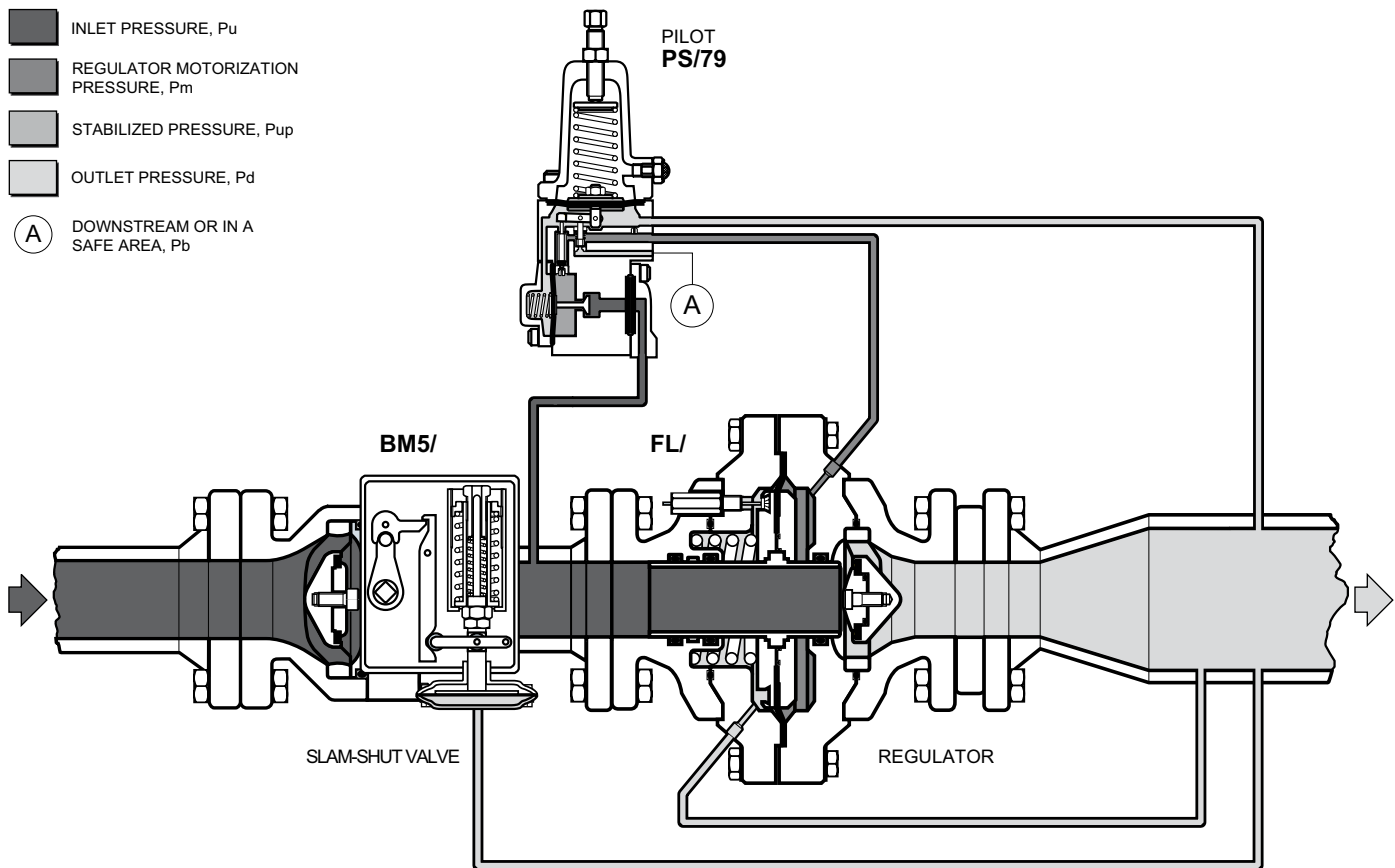


Figure 5. Type BM5 and FL Operational Schematic

Slam-shut Valve

BM5 series slam-shut valve is essentially made of an axial flow valve and a controller allowing to keep the valve open.

To keep the shutter open, the slam-shut controller series OS/80X or OS/80X-PN are used.

Both series are designed to operate on maximum and minimum, maximum only, or minimum only pressure.

The valve body features a shutter valve sliding axially and as a consequence no by-pass is needed for its opening even in the presence of pressurized gas.

The valve opening can be made only manually by turning the eccentric shaft counterclockwise.

The seal pad is not hit by the gas flow since it is protected by the pad holder and as a consequence is not affected by any possible dirt present in the gas.

When the controlled pressure is within set values of the slam-shut controller, this remains set and prevents the rotation of the eccentric shaft.

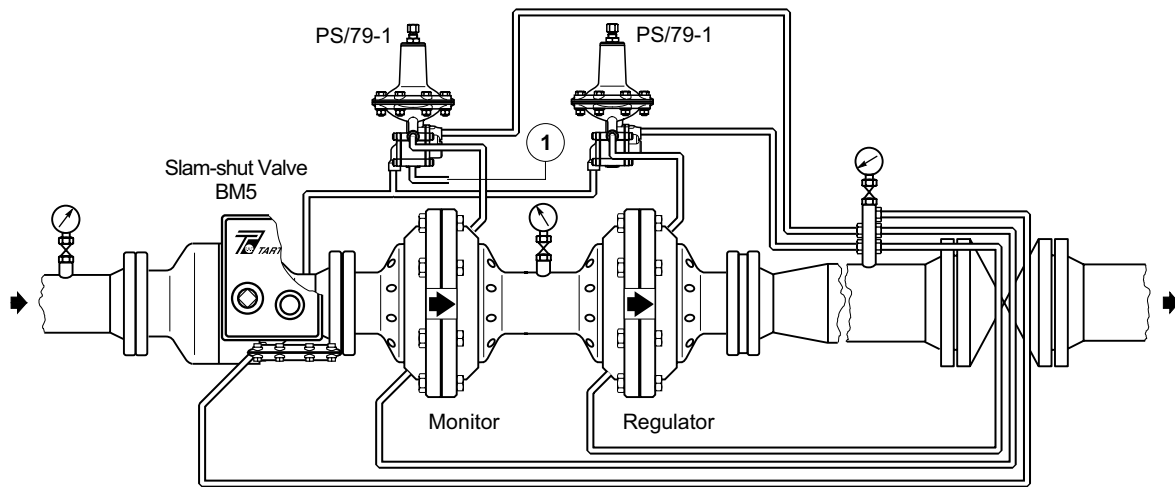
When this pressure varies beyond setting limits, the slam-shut controller releases the eccentric shaft and the valve is brought to its closing position following the spring thrust.

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.

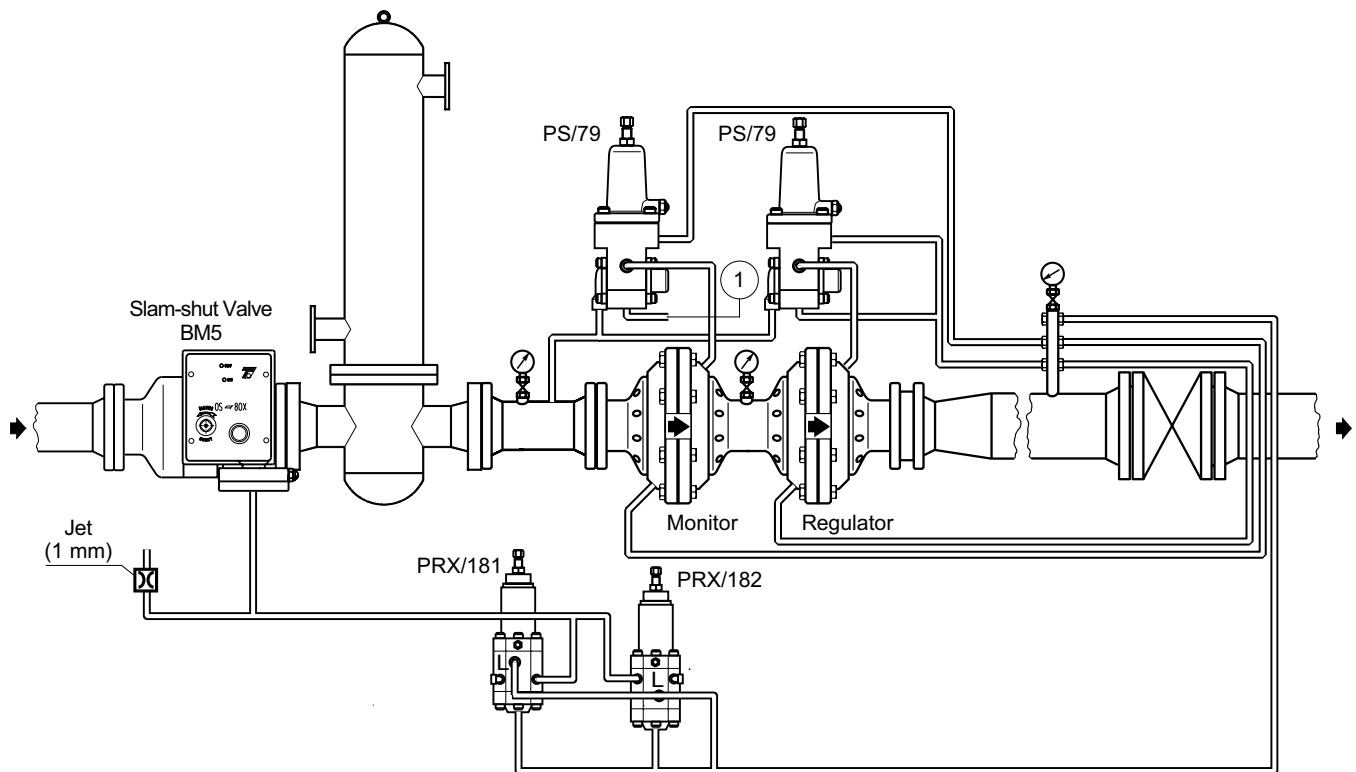
Should the valve be used with pilot-operated pressure regulators, the supply to pilots should be taken downstream of the slam-shut valve. For this purpose, BM5 valves feature a threaded hole to be used for supply to pilots; the hole is normally kept closed by a dowel.

The supply to pilots can be made through a standard joint or through the suitable stud supplied on request.

INSTALLATION



SLAM-SHUT VALVE WITH OS/80X CONTROLLER - INSTALLATION IN A LOW PRESSURE REGULATING LINE



SLAM-SHUT VALVE WITH OS/80X-PN CONTROLLER - OVERPRESSURE AND UNDERPRESSURE CONTROL DOWNSTREAM OF REGULATORS

LEGEND:

① DOWNSTREAM OR TO A SAFE AREA

NOTE: RECOMMENDED PIPING IS STAINLESS STEEL WITH 10 mm DIAMETER.

Figure 6. BM5 Series Connection/Installation Schematics

BM5 Series

INSTALLATION (CONTINUED)

- Ensure that the data found on the slam-shut valve label are compatible with usage requirements.
- Make sure that slam-shut controller is installed up-right.
- Ensure that the slam-shut valve is mounted in accordance with the direction of flow indicated by the arrow.
- Make the connection of the pressure control pipe (B), taking it off a straight section of the downstream pipe, if possible far from narrow sections, curves, or branches, to avoid variations in the release values of slam-shut device caused by turbulence.



WARNING

Only qualified personnel should install or service a slam-shut valve.

Slam-shut valve should be installed, operated, and maintained in accordance with international and applicable codes and regulations.

If the slam-shut valve vents fluid or a leak develops in the system, it indicates that servicing is required.

Failure to take the slam-shut valve out of service immediately may create a hazardous condition.

Personal injury, equipment damage, or leakage due to escaping fluid or 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 "Characteristics" section, or where conditions exceed any ratings of the adjacent piping or piping connections.

To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices (as required by the appropriate code, regulation, or standard) to prevent service conditions from exceeding limits.

Additionally, physical damage to the slam-shut valve could result in personal injury and property damage due to escaping fluid.

To avoid such injury and damage, install the slam-shut valve in a safe location.

Before installation, check shall be done if service conditions are consistent with use

limitations and if its slam-shut device set-up is in accordance with service conditions of protected equipment.

All means for venting have to be provided in the assemblies where the pressure equipment are installed (ENs 12186 & 12279).

All means for draining have to be provided in the equipment installed before the slam-shut valve (ENs 12186 & 12279).

Further the ENs 12186 & 12279, where this product is used:

- Provide the cathodic protection and electrical isolation to avoid any corrosion
- In accordance with clause 7.3/7.2 of aforesaid standards, the gas shall be cleaned by proper filters/separators/scrubbers to avoid any technical & reasonable hazard of erosion or abrasion for pressure containing parts

Slam-shut valve shall be installed in non-seismic area and hasn't to undergo fire and thunderbolt action.

Clean out all pipelines before installation of the slam-shut valve and check to be sure the slam-shut valve has not been damaged or has collected foreign material during shipping.

Use suitable line gaskets and approved piping and bolting practices.

Installation must to be done avoiding anomalous stresses on the body and using suitable joint means (bolts, flanges, ...) according equipment dimensions and service conditions.

Install the slam-shut valve in any position desired, unless otherwise specified, but be sure flow through the body is in the direction indicated by the arrow on the body.

User has to check and carry out any protection suitable for assembly's specific environment.

For outdoor installations, the slam-shut valve should be located away from vehicular traffic and positioned so that water, ice, and other foreign materials cannot enter into the pilot mechanism.

Avoid placing the slam-shut valve beneath eaves or downspouts, and be sure it is above the probable snow level.

STARTUP

The built-in slam-shut controller is factory set at approximately the midpoint of the spring range or the pressure requested, so an initial adjustment may be required to obtain desired results.

- a. Open the valve located downstream of the regulator a small amount so as to allow a minimum gas flow.
- b. Slowly open the shut-off valve upstream of the slam-shut valve a small amount.
- c. Turn the reset stem slowly counterclockwise using the appropriate lever unit. This causes the inlet pressure to be conveyed to the outlet side of the slam-shut valve, i.e. downstream of the regulator
- d. Wait a few second for the pressure to stabilize.
- e. Repeat the operation described in point c) above, making sure that levers of slam-shut controller keep the valve open.
- f. First slowly open the valve upstream of the BM5/ completely, then slowly open the valve downstream of the regulator.

SLAM-SHUT CONTROLLER ADJUSTEMENT

To change the slam-shut controller setpoints (overpressure and/or underpressure), remove the spring closing cap of the controller and turn the adjusting screws clockwise to increase outlet pressure or counterclockwise to decrease pressure. Monitor outlet pressure with a test gauge during the adjustment.

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. In case of disassembly of main pressure retaining parts for checks and maintenance procedures, external and internal tightness tests have to be done according to applicable codes.

MAINTENANCE (SEE FIGURE 7)



WARNING

All maintenance procedures must be carried out only by qualified personnel.

If necessary, contact our technical support representatives or our authorized dealers.

The valve and it's pressure accessories are subject to normal wear and must be inspected periodically and replaced if necessary.

The frequency of inspection/checks and replacement depends upon the severity of service conditions and according to applicable National or Industry codes, standards and regulations/recommendations.

In accordance with applicable National or Industry codes, standards and regulations/recommendations, all hazards covered by specific tests after final assembling before applying the CE marking, shall be covered also after every subsequent reassembly at installation site, in order to ensure that the equipment will be safe throughout its intended life.

Before proceeding with any maintenance work, shutoff the gas upstream and downstream from the valve, also ensure that there is no gas under pressure inside the body by loosening the upstream and downstream connections.

Upon completion, check for leaks using suds.

General Maintenance

- a. Disconnect all fittings, remove slam-shut valve from the line and place it in upward vertical position.
- b. Mark the position of the outlet flanges (key 116) and inlet flange (key 100), to keep the correct alignment during the following reassembly phase.
- c. Loosen the special screws (key 133) and dismount the slam-shut controller.
- d. Loosen screws (key 135) and remove hub (key 124). Remove seeger (key 122) and dismount parts. Replace O-Rings (key 120, 125 and 126 (for DN150 also key 130)) and anti-friction rings (key 119). Check bearing (key 128 (for DN150 also key 131)) and replace it if is necessary.
- e. Slowly loosen nuts (key 112) to slowly release spring (key 114).
- f. Remove sleeve (key 117), disk (key 110) and pad holder (key 101), loosen screw (key 104) and replace pad unit (key 102). Replace O-Ring (key 107), for DN 65 to DN 150 sizes replace also (key 129).
- g. Replace O-Ring (key 115).
- h. Check all moving parts, paying special attention to nickel plated surfaces. Replace any that are worn or damaged.
- i. Clean all stripped-down parts with petrol and dry with compressed air.

Reassembly

Lubricate all seals with MOLYKOTE 55 M, being very careful not to damage them when reassembling.

Reassemble the parts by reversing the above steps.

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As you proceed, make sure that parts move freely and without friction.

In addition:

- a. Complete reassembly and make sure to tighten all screws uniformly.
- b. When reassembling the hub (key 124), make sure that the pawl of shaft unit (key 121) is facing the inlet flange (key 100).
- c. Check that slam-shut sleeve (key 117) opens when shaft unit (key 121) is rotated counterclockwise.
- d. Before reassembling the slam-shut controller, make sure that the pawl of shaft unit (key 121) is against the sleeve (key 117). Upon completion of the assembling procedure, check that slam-shut actuator has been correctly mounted.
- e. After the reassembly completion, check the proper functioning of all parts. Check the valve with soapy water, making sure there are no leaks.
- f. Remount regulator on the line and reestablish all connections.

SLAM-SHUT CONTROLLER MAINTENANCE (SEE FIGURE 8)

Installation

- a. Install the slam-shut controller in a covered area and protect it against weather agents.
- b. Check that data on the plate are compatible with actual working conditions.
- c. Make sure slam-shut controller is installed upright, i.e. screw (key 49) on top.



CAUTION

Mounting in any other way will jeopardize controller's performance.

- d. Carry out the connection of gas outlet (A). It must be derived from the pressure control piping, in a straight tract, possibly far away from restrictions, curves or derivations, in order to avoid turbulence that can alter the trip pressure setpoints.

Startup

- a. Using lever, activate slam-shut by turning reset stem (key 6) in the direction shown by the arrow.
- b. Wait until the pressure being controlled stabilizes and then slowly release lever.
- c. Now repeat this procedure, make sure that levers keep slam-shut controller properly set and that lever (key 33) is in horizontal position.

Periodical Checks

It is recommended that slam-shut controller be efficiency checked periodically.

Cut-off Test

- a. Cut-off the circuit by means of inlet and outlet valves and disconnect the pressure control pipe (A). The slam-shut controller should cut-off at minimum pressure (only if so set).
- b. Through the pressure control connection, use a small pump or other appropriate means, to raise the pressure to normal operating level. Reset slam-shut controller after cut-off in step a.
- c. Simulate pressure increase until maximum pressure cutoff value is reached.
- d. Connect the pressure control slam-shut controller (A) and set the circuit back to operating conditions by following the instructions described in the Startup section.

Valve-seal Check

- a. Slowly close the valve located downstream.
- b. Press the "EMERGENCY" button. This will cause the immediate closing of slam-shut controller.
- c. Loosen a connector in the downstream line of the slam-shut valve or of the regulator. Check the connector with soap and water, making sure there are no leaks; make any necessary repairs otherwise.

Maintenance

Routine slam-shut controller maintenance entails simply periodic checking of the diaphragm on the Type OS/80X (the piston Gaco flex on the Type OS/84X) and the movement of the levers, i.e. they should move freely with a minimum of friction. If necessary, lubricate pins with "Molykote 55 M".



WARNING

For a successful job it is indispensable to use qualified personnel, possibly calling on our Technical Support Representatives. Before starting maintenance, disconnect impulse connection (A) to make sure there is no gas under pressure in the slam-shut controller. When maintenance operations are finished check the tightness with suds.

Replacing Diaphragm (OS/80X Series only)

- a. Remove screws (key 27) and cover (key 61).
- b. Replace diaphragm (key 62).
- c. 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 (Type OS/84X and OS/88X only)

- a. Remove plug (key 61) and extract piston (key 68) from body (key 60).
- b. Replace O-ring (key 67) and gaco flex (key 66).
- c. Reassemble by reversing the above procedures.

General Maintenance

- a. Remove screws (key 40) and casing (key 47).
- b. Remove dowels (key 12) and bushing (key 13).
- c. Slide off stem (key 6), lever assembly (key 17 and 2), balls (key 10) or rollers for type OS/80X-R, and shim ring (key 15). Wash parts, replace any if worn.
- d. Remove nuts (key 18), levers (key 20 and 36) and springs (key 37 and 21).
- e. Remove nut (key 30), screw (key 29) and lever (key 33).
- f. Remove minimum adjusting screw (key 49), maximum adjusting nut (key 50) and springs (key 53 and 54).
- g. Remove cover (key 61) on OS/80X Series, or plug on types OS/84X and OS/88X, and proceed as directed in replacing diaphragm/O-ring section.
- h. Remove nut (key 70) and locknut (key 69), then slide off stem unit (key 57).
- i. Loosen screw (key 3), unscrew nut (key 9), remove balls holder (key 5) and check seals (key 4 and 8) for wear.
- J. Clean all parts with petrol, replace any if worn.

Reassembly

Reassemble all parts by reversing the steps in the general maintenance section.

As you proceed, make sure all parts move freely without friction. If necessary, lubricate them with Molykote 55 M.

Make sure to:

- a. Narrow the gap between nuts (key 30 and 18) so that levers (key 33, 36, and 20) have minimum play yet move freely without friction.
- b. Before mounting minimum spring (key 54), register position of lever (key 33) by means of nut (key 70), locking it into place with locknut (key 69).

- c. Now remount lever assembly (key 17 and 2), balls (key 10) or rollers for type OS/80X-R, keeping them in their seat with grease, and stem (key 6), which is to be turned so the balls/rollers enter their seats. The stem and lever assembly should now be tightly fitted together.
- d. Remount bushing (key 13), make sure that the dowels are firmly set in the grooves of the stem (key 6).
- e. Repeatedly check if pilot resets properly and, lastly, remount minimum spring (key 54).
- f. Always check controller setting.

Minimum and Maximum Setting

- a. Make sure that the lever (key 33) is in horizontal position when slam-shut controller is reset. If necessary, use nut and locknut (key 69 and 70) to adjust (see step b, Reassembly section).
- b. 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).
- c. Disconnect pressure control pipe (A).
- d. Through the pressure control connection, use a small pump or other appropriate means to raise the pressure to normal operating level.
- e. Reset slam-shut controller and reduce the pressure until it reaches minimum cutoff level.
- f. Use minimum adjusting screw (key 49) to load spring (key 54) slowly until pilot is triggered.
- g. Repeat procedures (d) and (e) above, making any necessary adjustment in the setting.
- h. Bring pressure back to normal values.
- i. Reset controller and raise the pressure until it reaches maximum cutoff level.
- j. Using maximum adjusting nut (key 50), slowly unload spring (key 53) until cut-off point is reached.
- k. Repeat procedures (h) and (i) above, making any adjustment necessary in the setting.



CAUTION

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



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).

SPARE PARTS

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

BM5 Series

TROUBLESHOOTING

Table 6. Troubleshooting for BM5 Series Slam-Shut Valve

SYMPTOMS	CAUSE	ACTIONS
Slam-shut device does not remain set	The actuator impulse intake (A) is not connected properly	Check connections (A)
	Downstream pressure coincides with the maximum or minimum slam-shut settings	Check slam-shut settings
	Diaphragm (62) is damaged (Gaco flex (66) on types OS/84X, OS/88X)	Replace the diaphragm
Sleeve does not seal properly	Worn seal gaskets	Check gaskets
	Dirt deposit on sleeve	Check sleeve
	Shaft unit (121) damaged	Check shaft unit

PARTS LISTS

BM5 Series Slam-Shut Valve (See Figure 7)

Key	Description	Key	Description
100	Inlet flange	121	Shaft unit
101	Pad holder	122	Seeger ring
102*	Pad unit	123	Pin
103	Pad retainer	124	Hub
104	Screw	125*	O-ring
105	Label	126*	O-ring
106	Rivet	127	Disk
107*	O-ring	128	Bearing
108	Label support	129*	O-ring
109	Label	130*	O-ring
110	Disk	131	Bearing
111	Washer	132	Spacer
112	Nut	133	Special screw
113	Stud bolt	134	Bushing
114	Spring	135	Screw
115*	O-ring	136	Eyebolt
116	Outlet flange	137	Lever unit
117	Sleeve		
118	Screw		
119*	Anti-friction ring		
120*	O-ring		

OS/80X Series Slam-Shut Controller (See Figure 8)

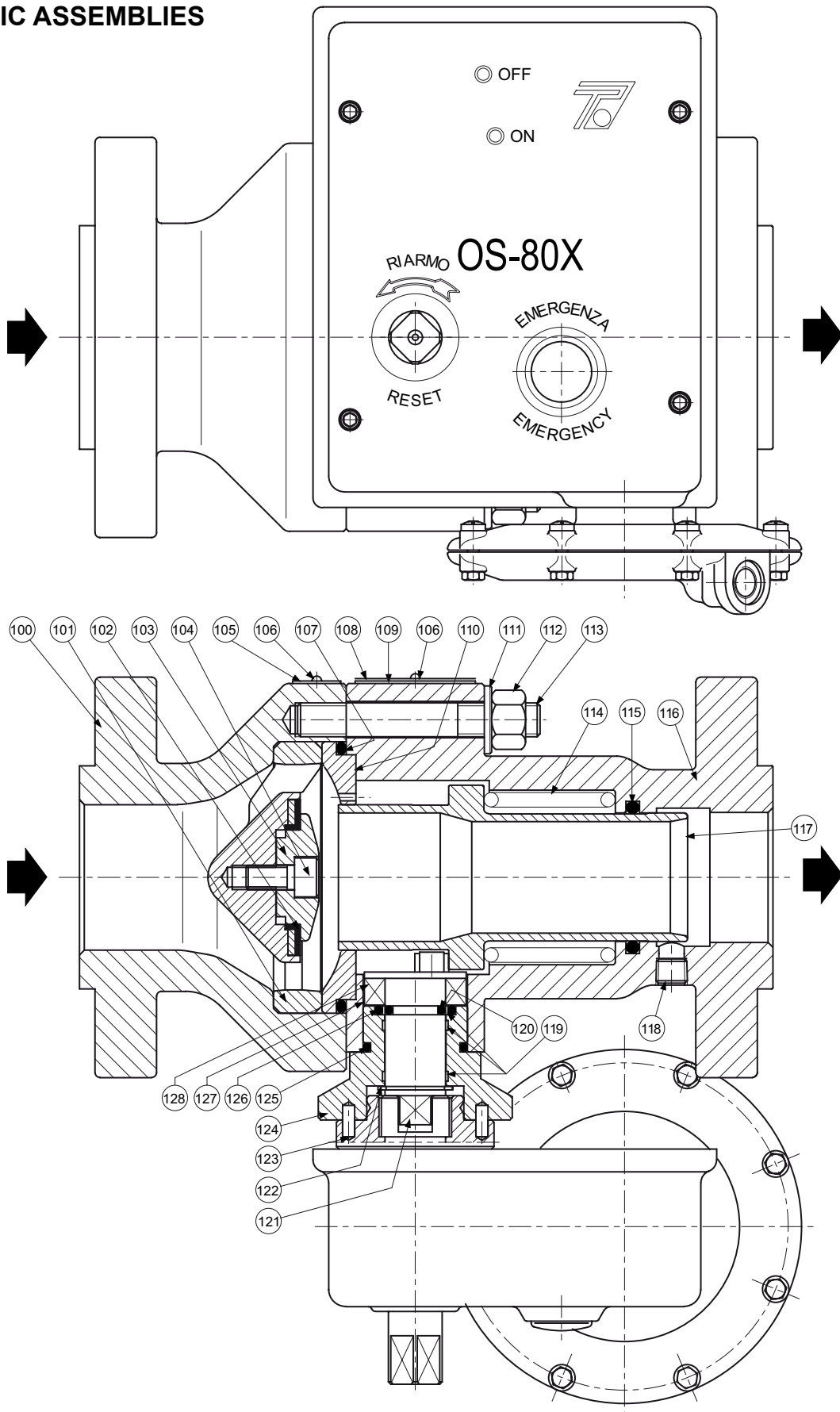
Key	Description	Key	Description
1	Plate	47	Casing
2	Releasing bushing	48	Screw
3	Screw	49	Minimum pressure adjusting screw
4*	Gasket	50	Maximum pressure adjusting nut
5	Balls holder	51	Pipe assembly
6	Stem	52	Washer
7	Roller	53	Spring
8*	O-ring	54	Spring
9	Reloading nut	55	Lower spring holder unit
10	Ball (Roller for type OS/80X-R)	56	Seeger ring
11	Roller	57	Stem unit
12	Dowels	58	Spring
13	Reloading bushing	59	Plate holding stem unit
14*	O-ring	60	Top cover (Body for type OS/84X and OS/88X)
15	Ring	61	Lower cover (Plug for type OS/84X and OS/88X)
17	Reloading lever unit	62*	Diaphragm
18	Self-locking nut	63	Screw
19	Washer	64	Block
20	Return lever	65*	O-ring
21	Spring	66*	Gaco flex
22	Fulcrum	67*	O-ring
24	Label	68	Piston
26	Nut	69	Locknut
27	Screw	70	Nut
28	Reloading pin	71	Microswitch
29	Screw	73*	Gasket (only for BP, BPA-D, MPA-D)
30	Self-locking nut	74	Filter
31	Washer		
32	Plate fulcrum		
33	Lever		
34	Screw		
35	Cone		
36	Releasing lever		
37	Spring		
38	Plug		
39	Locking pin		
40	Screw		
41	Indicator pin		
42	On-Off indicator		
43	Button		
44*	O-ring		
45	Spring		
46	Gasket		

Rubber parts marked with (*) are supplied in the "spare parts kit", recommended as stock.

To order the kit it is necessary to communicate to us the type of the slam-shut valve or slam-shut controller and its serial number.

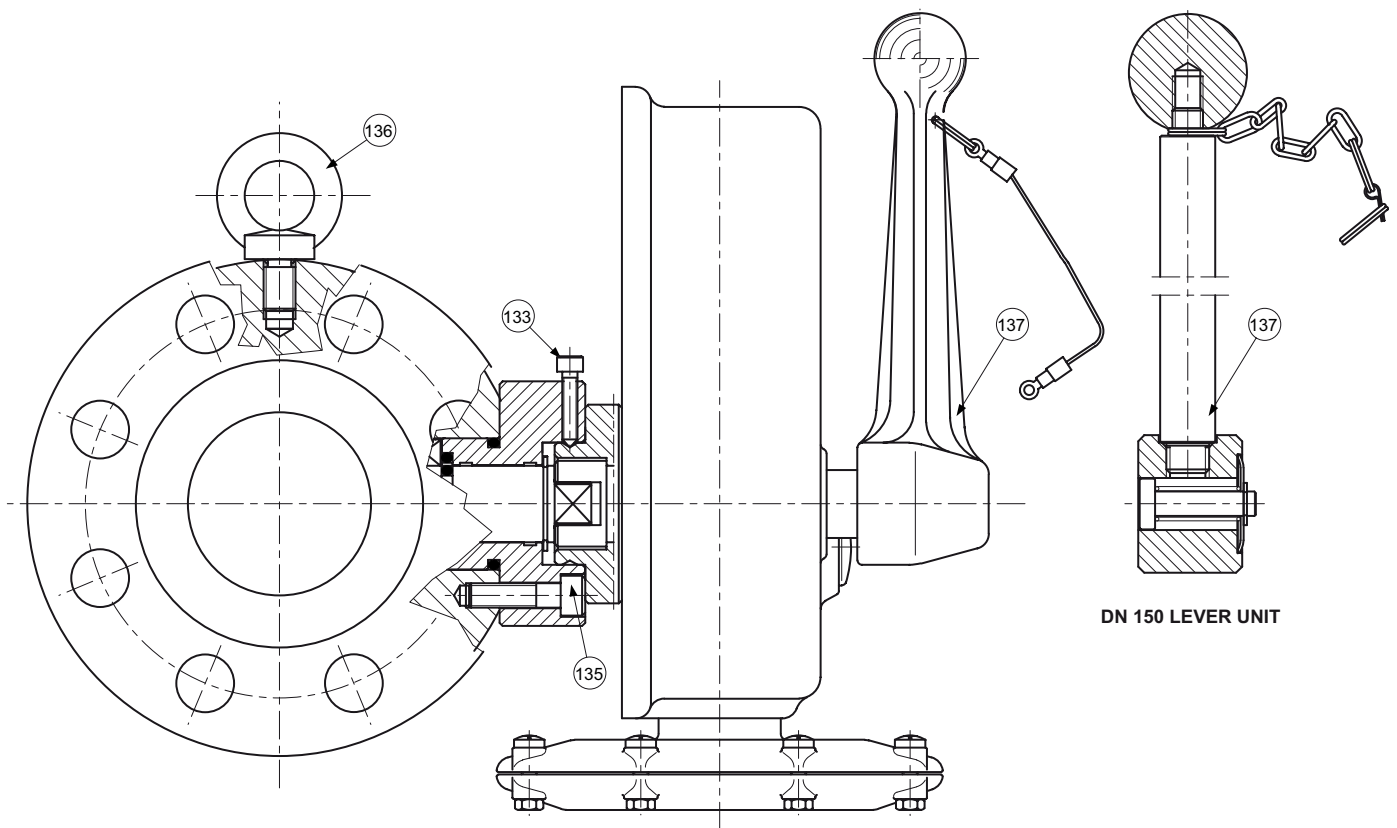
BM5 Series

SCHEMATIC ASSEMBLIES



LM/1499

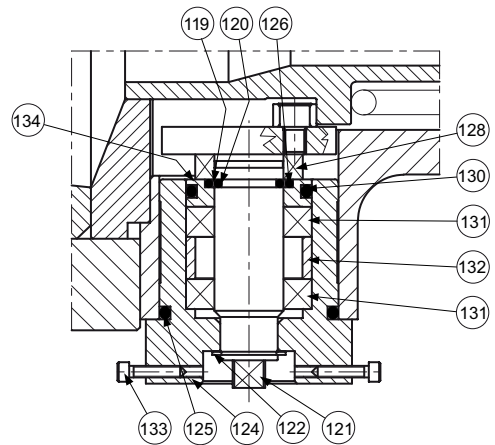
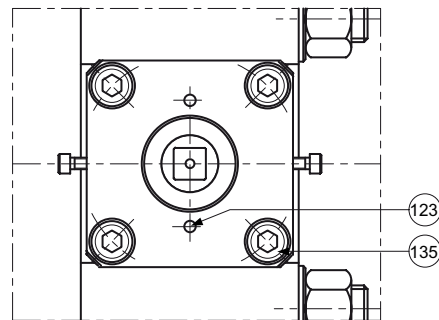
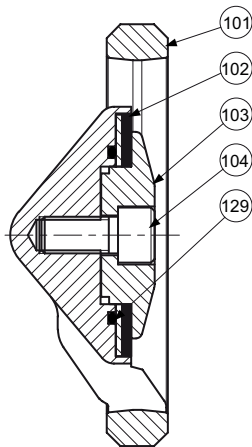
Figure 7. BM5 Series Slam-Shut Valve



DN 150 LEVER UNIT

DN 150 RE-OPENING HUB

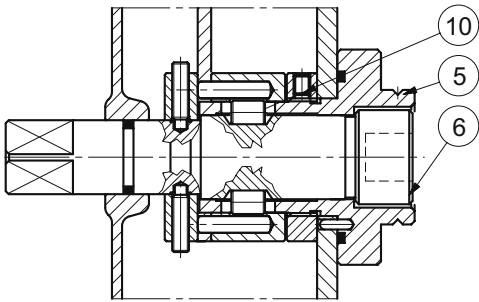
PAD HOLDER
DN 65 TO DN 150



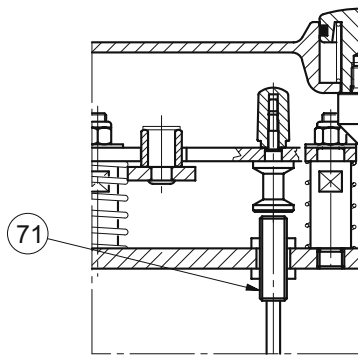
LM/1499

Figure 7. BM5 Series Slam-Shut Valve (continued)

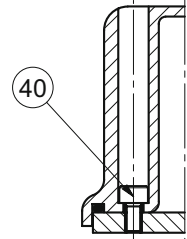
BM5 Series



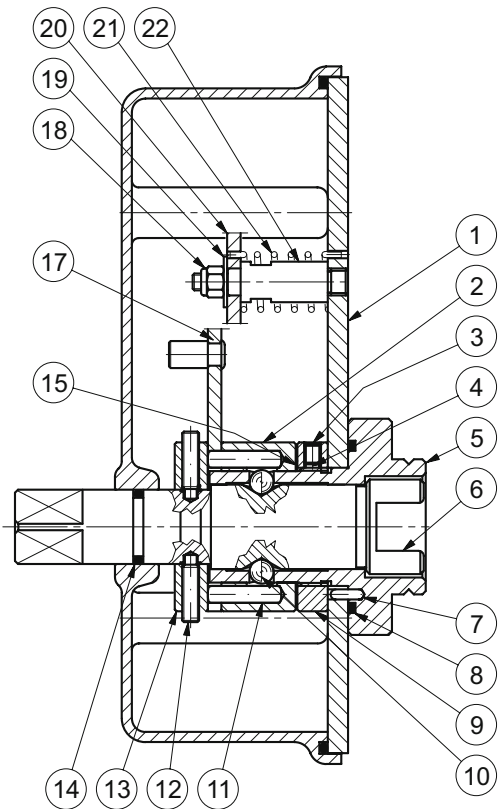
DETAIL OF TYPE OS/80X-R
REINFORCED FOR BM5 DN 150



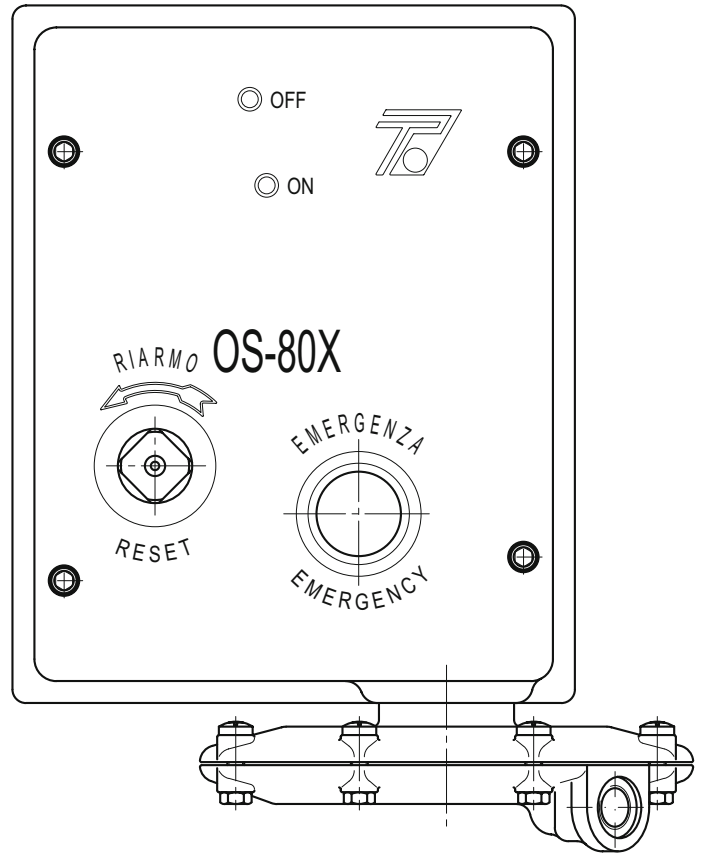
DETAIL OF TYPE OS/80X WITH
MICROSWITCH



SECTION D-D

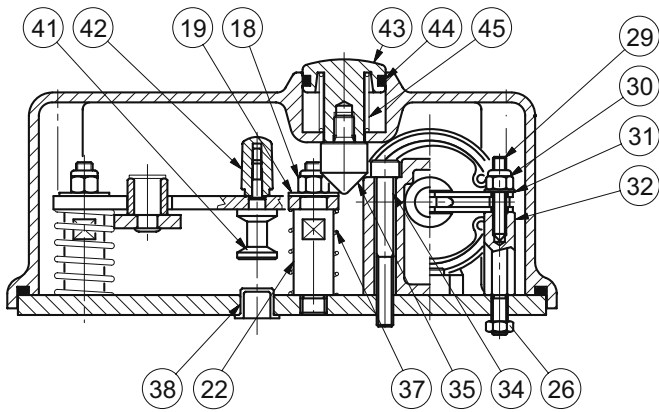


SECTION C-C

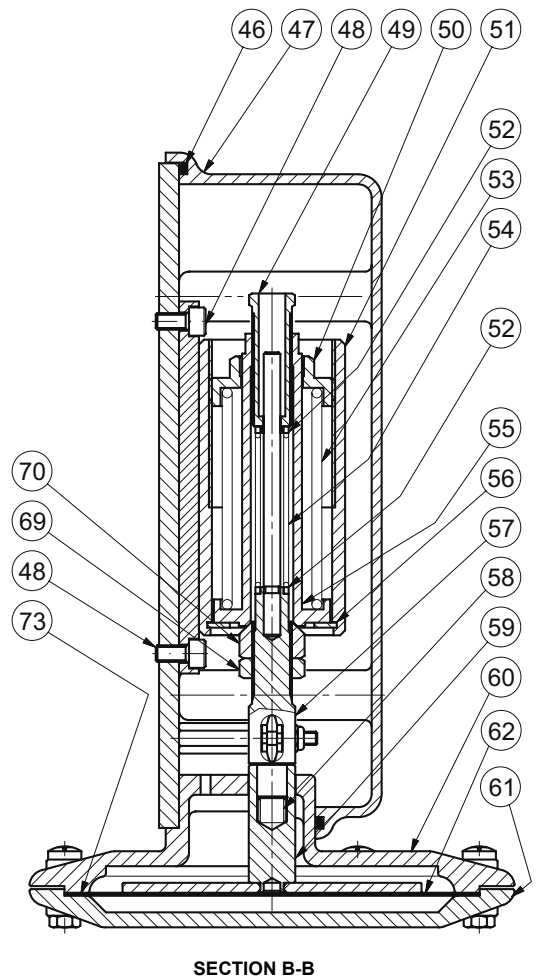
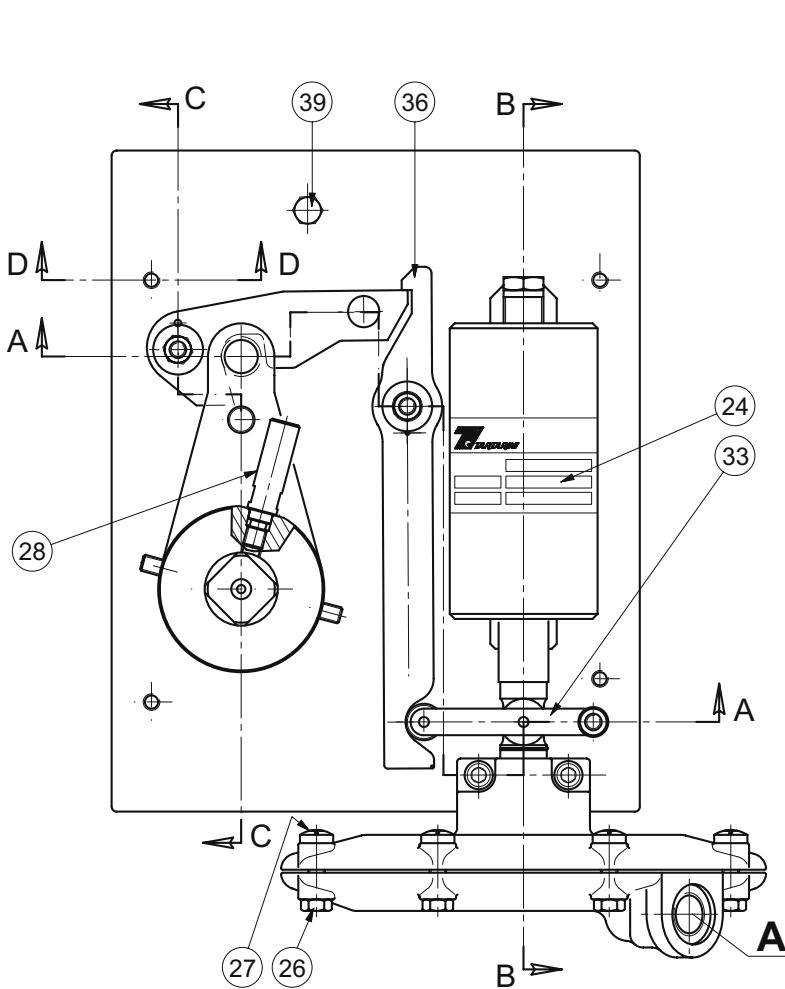


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Figure 8. OS/80X Slam-Shut Controller (Standard Version)



SECTION A-A

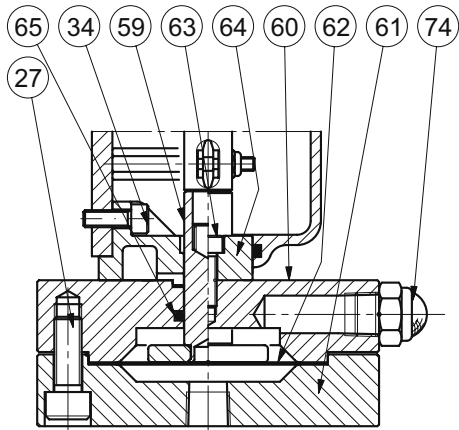


SECTION B-B

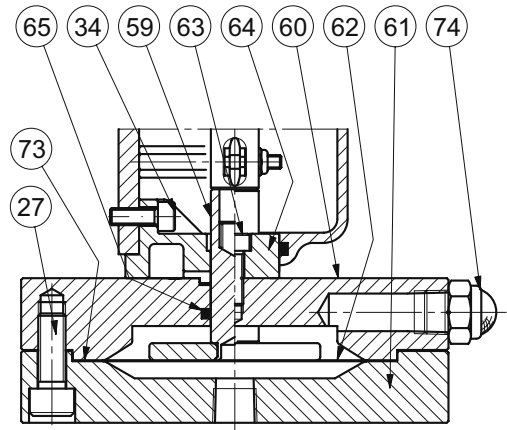
LM/1389

Figure 8. OS/80X Slam-Shut Controller (Standard Version) (continued)

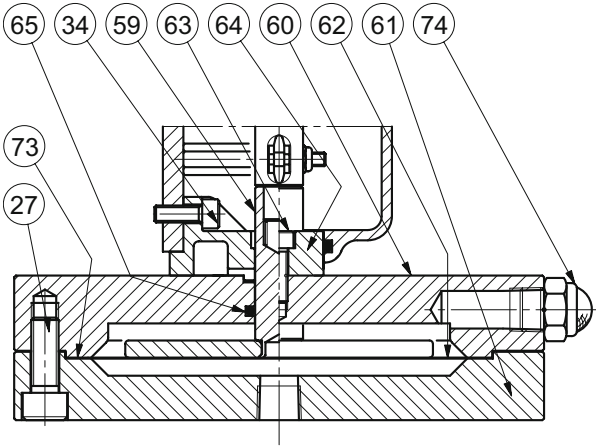
BM5 Series



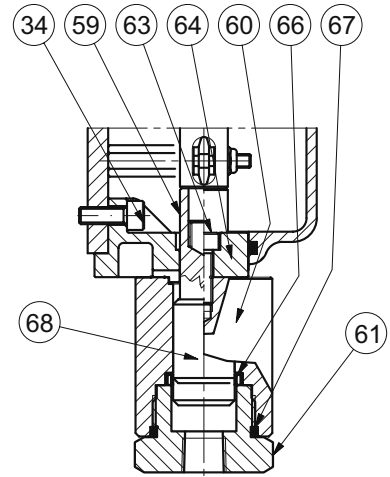
TYPE OS/80X-APA-D DETAIL



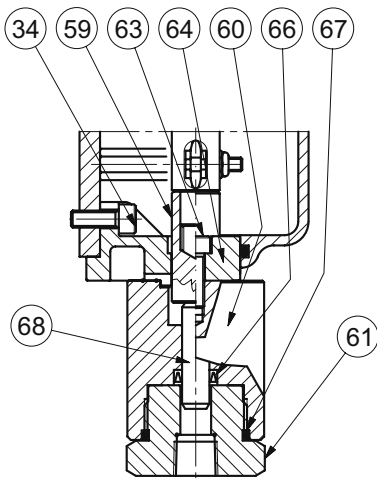
TYPE OS/80X-MPA-D DETAIL



TYPE OS/80X-BPA-D DETAIL



TYPE OS/84X DETAIL



TYPE OS/88X DETAIL

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Figure 8. OS/80X Slam-Shut Controller (Standard Version) (continued)

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