

Slam-Shut Valve

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INTRODUCTION

Scope of Manual

This manual provides installation, start-up, maintenance, and parts ordering information for the Type OSE LS Slam-Shut Valve.

Information on other equipment used with this slam-shut valve is found in separate manuals.

Product Description

The OSE LS function is to protect transmission and distribution networks or pipe lines supplying industries and commercial businesses.

It permits the gas flow to be cut off rapidly and totally in the case of under or over regulator pressure

The OSE LS exists in DN 200 (8") and DN 250 (10") and completes the range covered by the OSE (DN 25 (1") to DN 150 (6")).

The OSE LS consists of:

- A body with a removable orifice, enclosed by a connecting part
- A valve plug tightshut by an O-ring
- An external manual bypass
- A release relay type OSD2 including:
 - A mechanism box (BM)
 - A safety manometric box (BMS) to be connected on the outlet side of the pressure regulator.



Figure 1. Type OSE LS Slam-Shut Valve

CHARACTERISTICS

Material

Body	Steel
Connecting part	Steel
Orifice	Stainless steel
Valve plug	Stainless steel
O-rings	Nitrile

Connections

Inlet/Outlet	ISO PN 100 B (ANSI 600 RF) ISO PN 50 B (ANSI 300 RF) ISO PN 20 B (ANSI 150 RF) Other connections available (contact factory) ISO PN 16B, 25B, 40B
Impulse (IS)	1/4" NPT threaded
Mechanism box vent (E)	1/4" NPT threaded
Impulse diameter	Tube interior Ø 8/10 mm
Safety contact	See NTAOS2

The **OSE LS** is in conformity with the Pressure Equipment Directive PED 97/23/EC and is classified under category IV.

Table 1. Technical Characteristics of the Type OSE LS Slam-Shut Valve

OPERATING PRESSURE		
Body, valve plug	PS	100 bar max
ssociated BMS ⁽¹⁾ according to size	PSD	10 to 100 bar
Maximum Inlet Pressure	Pumax	100 bar
Type	DS	Differential strength ⁽²⁾
OPERATING TEMPERATURE ⁽³⁾	TS	- 20 / 60 °C - 30 / 71 °C

SLAM-SHUT		
Sizes available	DN	200, 250
Norm	EN 14382	
Operating class	A or B (see label, figure 2)	

Accuracy	AG	2,5 - 5 (Piston)
Setpoint range	Wdu-Wdo	0.010 to 100 bar
Response time	ta	< 1 s
Max Differential (valve closed)	ΔP max	100 bar
Max Differential (valve open)	ΔP max	See table 2
Rearming	Manually after rectification of fault	
Position indicator	On mechanism box	
FLUID		
Group 1 and 2 according to PED 97/23/CE, 1st and 2nd family gas according to EN 437, or other gases (compressed air, nitrogen).		
The gas must be noncorrosive, clean (filtration on inlet side necessary) and dry		

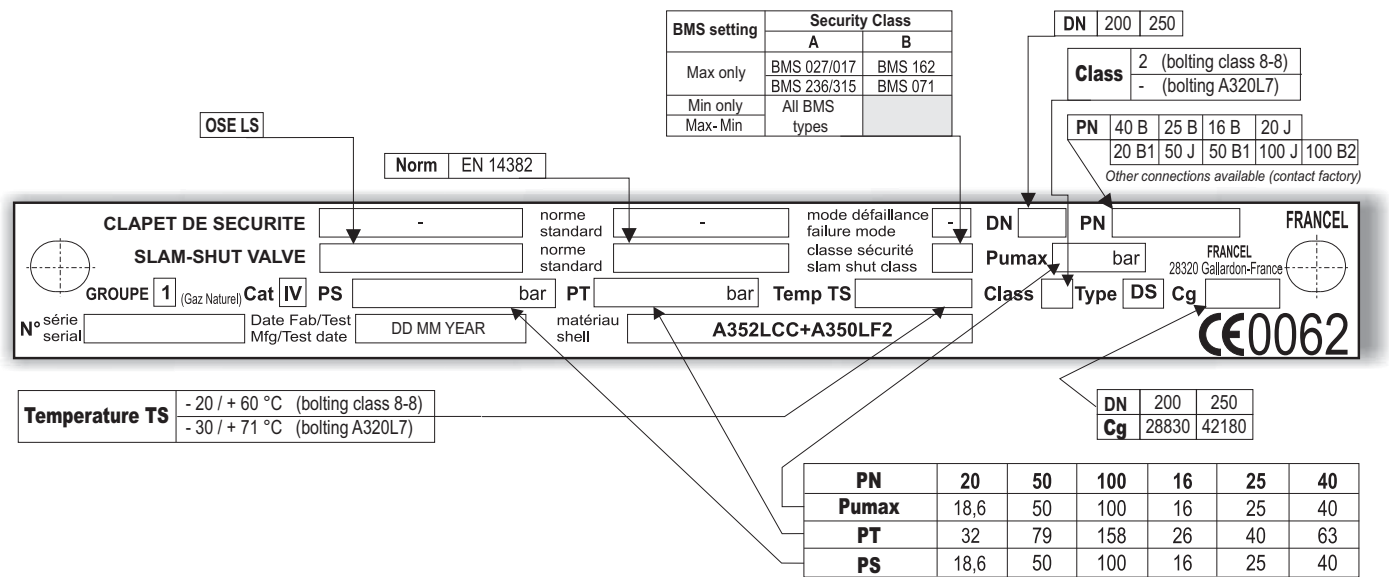
(1) BMS : Safety manometric box
(2) Differential strength (depending on BMS chosen)
(3) Temperature depending on bolting material (see label)

Table 2. Flow Coefficient, ΔP max, Relay travel

DN	200	250	Bypass
Cg	28830	42180	133
C1	34,6	35,5	32,8
ΔP max (bar)	8,2	4,6	
Relay travel (mm)	70	82	

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LABELLING



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Figure 2. Label for Type OSE LS Slam-Shut Valve

DIMENSIONS AND WEIGHTS

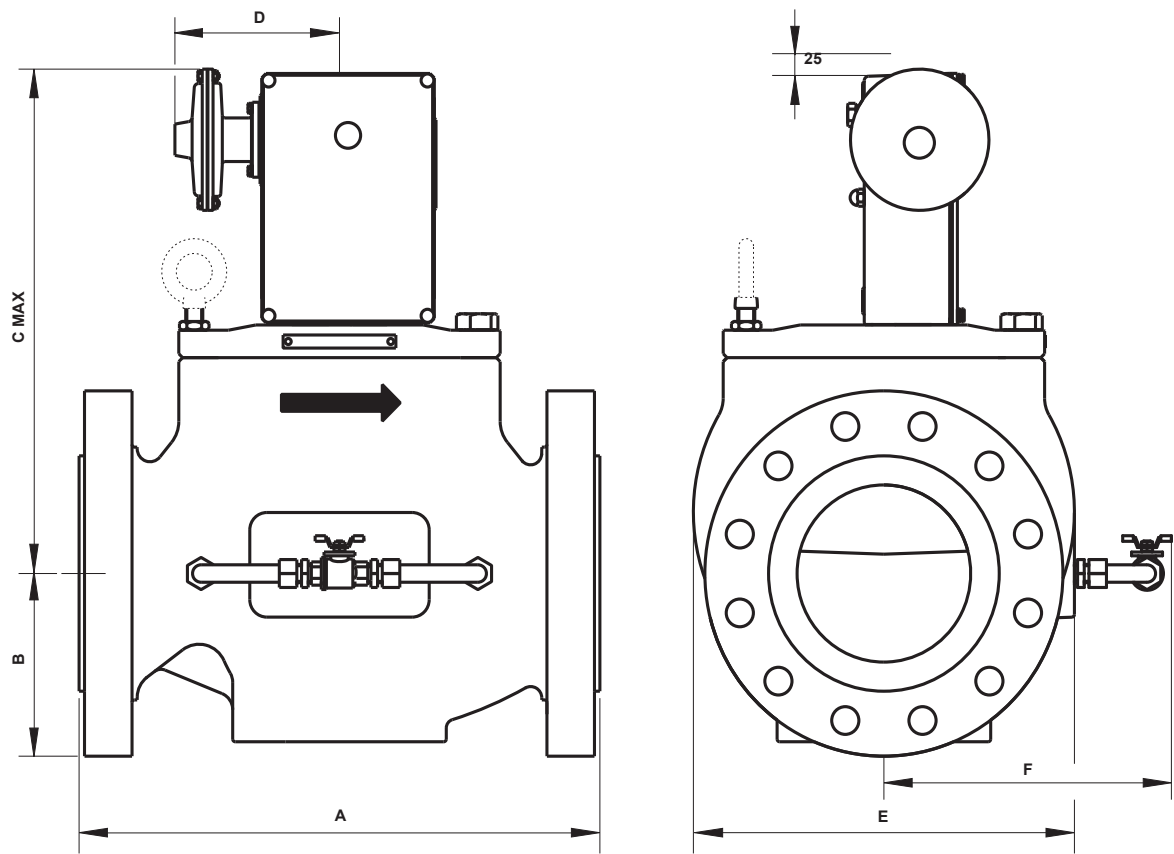


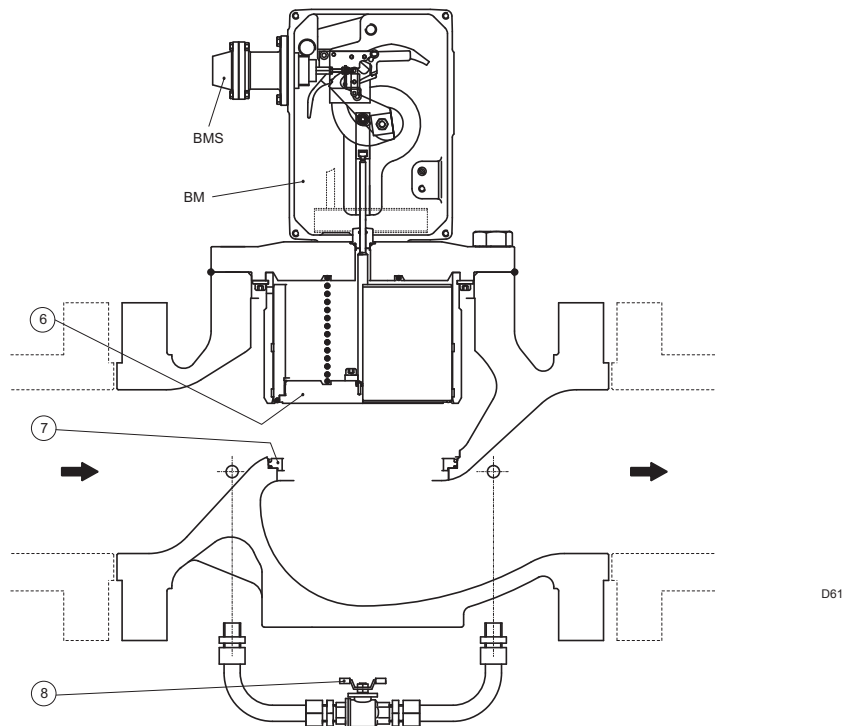
Figure 3. Type OSE LS Slam-Shut Valve Dimensions

Table 3. Type OSE LS Slam-Shut Valve Dimensions and Weights

DN	PN (B)	ANSI (RF)	DIMENSIONS						WEIGHT (kg)	
			A	B	C max	D	E	F		
200	20	150	543	171,5	579	220	446	336	294	
	50	300	568	190,5					321	
	100	600	610	209,5					356	
250	20	150	673	203	667		220	498	363	469
	50	300	708	222						504
	100	600	752	254						577

Other PN16/25/40: contact factory

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Safety contact : see NTAOS2.

Figure 4. Type OSE LS - Principle of Operation

OPERATION

The pressure of the zone to be protected (generally the pipe line on the outlet side of the pressure regulator and situated after the slam shut valve) activates the safety manometric box (BMS).

If the pressure rises above the release set point the release relay frees the valve plug (key 6).

Due to the weight of the valve plug, the closing spring and the fluid (attempting to close), the valve plug will sit into the orifice (key 7).

The gas flow is obstructed until the mechanism box is manually rearmed.

To reopen the valve plug an equal pressure balance on inlet and outlet sides is required.

Rearming is possible after bypassing is performed using the bypass valve (key 8).

The bypass valve should be closed after pressure balance is obtained.

The slam shut valve is installed on the inlet side of the regulator, on the horizontal pipeline. The mechanism box should be situated on top (see above schematic).

Installation according to EN12186 is recommended.

Install according to direction of the fluid flow (see arrow).

When assembling with adjacent elements, care must be taken not to create pressure force on the body and the assembling elements (bolts, O-rings, flanges) should be compatible with the geometry and working conditions of the equipment.

If the case arises a support must be used to avoid pressure force on the body (a support can be installed under the flanges).

Connect the safety manometric box (IS) to the impulse at 4D on the outlet pipe.

It is recommended to install an isolation valve (R1) and an atmospheric valve (R2), which can be useful for tripping and verifications.

No modification should be made to the structure of the equipment (drilling, grinding, soldering ...).

Verify that the inlet side is protected by an appropriate device(s) to avoid exceeding the limits of utilization (PS, TS).

INSTALLATION



WARNING

All interventions on the equipment should only be performed by qualified and trained personnel.

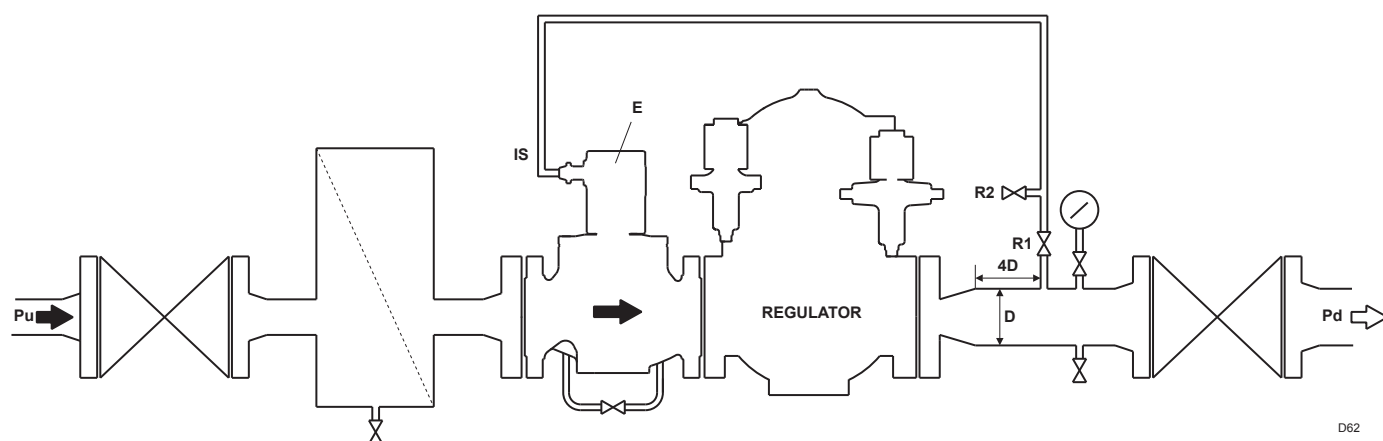


Figure 5. Type OSE LS - Installation

Verify that the limits of utilization correspond to the appropriate operating conditions.

Verify that the safety manometric box (BMS) and spring correspond to the appropriate operating conditions on the outlet side of the regulator.

The equipment should not receive any type of shock, especially the release relay.

The user should verify or carry out a protection adapted to the environment.

Fire, seismic and lightning are not taken into consideration for standard regulators. If required, a special product selection and/or specific calculations may be supplied according to specific requirements.

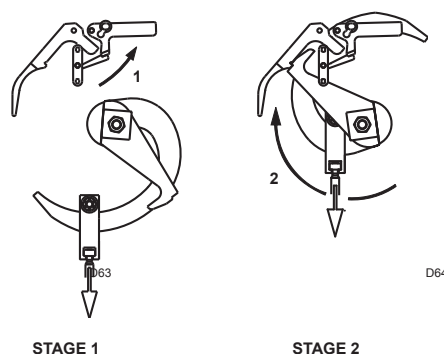
- Impulse atmospheric valve
→ Open

Setpoint Verification

Using the atmospheric valve, inject a pressure equal to the pressure foreseen for the regulator

- 1st release relay stage
→ Set (Stage 1)
- Slam shut valve
→ Open (Stage 2)
→ Progressively increase the pressure to reach tripping
→ Adjust setting if necessary (NTAOS2)

Note the set point value on the equipment or mark it in a commissioning document.



STAGE 1

STAGE 2

Figure 6. Setpoint Verification

COMMISSIONING



WARNING

All interventions on the equipment should only be performed by qualified and trained personnel.

Preliminary Verifications

Start-up positions

- Inlet and outlet valves
→ Closed

Verify absence of pressure between inlet and outlet valves

- Slam shut valve plug
→ Closed
- Slam shut bypass
→ Closed
- Impulse isolation valve
→ Closed

Positions before Commissioning

- Impulse isolation valve
→ Open
- Impulse atmospheric valve
→ Closed
- Slam shut valve plug
→ Closed

The equipment is ready for commissioning

Commissioning (max. only or max. and min.)

- Inlet valve
→ Open slowly
- Slam shut bypass
→ Open slowly
- Regulator
→ Put into operation (see corresponding manual)
- 1st release relay stage
→ Set (Stage 1)
- Slam shut valve plug
→ Open (Stage 2)
- Slam shut bypass
→ Closed
- Outlet valve
→ Open slowly

The equipment is commissioned

After checking and commissioning the release relay it is recommended to seal it

MAINTENANCE

Service Check

Recommended frequency:

- Twice yearly minimum

Verification:

- Tripping and tripping value
- Slam shut valve plug tightness

Departure positions

- Inlet valve → Open
- Outlet valve → Open
- Slam shut valve plug → Open
- Regulator → In operation

Inlet and outlet sides of the regulator under pressure

Tripping verification:

- Inlet valve → Closed
- Outlet valve → Closed
- Regulator Increase set point to reach tripping (without exceeding the outlet limits)

Table 4. Recommended Tools

Key	Dimension	Spanner	Torque (N.m)
10	M8	13 mm	15
13	1"1/8-8x70 mm	1 11/6"	400
19	M8	6 six-sided wrench	15

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Disassembly

Recommended frequency:

- Every 4 to 6 years (or less depending on operating conditions)

Verification:

- Condition of O-rings, diaphragm, lubrication

Replacement:

- O-rings, diaphragm

Tools:

- Spanners 10, 13, 6 six-sided wrench
- Spanner (see table 4)
- M8 and M10 screws + disassembly tool (approx. length 800) (valve plug disassembly)
- Valve plug closed
- Inlet and outlet valves closed
- Bleed off outlet pressure
- Bleed off inlet pressure
- Unscrew the impulse connection IS
- Remove the BM cover (key 1)
- Remove the travel stop (key 2)
- Unscrew the nuts (keys 3 and 4)
- Remove the resetting part (key 5)
- Remove the bolt (key 6) and the spacer (key 7)
- Remove the cam (key 8) and yoke (key 9)
- Unscrew the two screws (key 10)
- Remove the BM and flat joint
- Retain the square nut (key 11) situated at the extremity of the valve angle (key 12)
- Unscrew the screws (key 13)
- Remove the O-ring (key 2)
- DN 200 only: insert a spacer D15 min. - 7.5 x 20 or stack washers of 8 and 6 beneath the square nut (key 11)
- Remove the connector assembly (key 14) / valve plug (keys 15 and 16)

Disassembly of the valve plug (if required)

- Remove the square nut (key 11)
- Remove the packing gland (key 17)
- Extract the connector assembly (key 14) / valve cylinder

Note

Normally this part cannot be dismantled (screw CHc 27 fixed with loctite thread locking adhesive)

- Remove the spring (key 18)
- Remove the screws (key 19) and fixing ring (key 20) (pin (key 21) remains mounted on (key 15))

Disassembly of the valve plug O-ring (if required)

- The valve plug body (key 15) is screwed in the valve plug cylinder (key 16), the O-ring (key 22) is reached by

unscrewing the above using a bar of 800 and four screws (two M8 on cylinder (key 16) and two M10 on valve plug body (key 15))

The removal of the orifice (key 28) (not recommended) requires a special extraction tool

Reassembly

- Perform the above operations in reverse order (respect tightening torques)
- Replace O-rings at each disassembly
- Precaution should be taken when removing or replacing the valve plug to avoid damaging the segments (key 26)
- Lubricate screws before tightening (molybdenum graphite grease)
- Lightly lubricate O-rings (silicone grease)

If the valve plug assembly (key 15/16) has been disassembled:

- Lightly lubricate the valve plug O-ring (key 22) (silicone grease)
- Lubricate the thread of the valve plug cylinder (key 16) (molybdenum graphite grease)
- Positioning the valve plug O-ring (key 22):
DN 200: Screw the valve plug body (key 15) partly in the valve plug cylinder (key 16) and insert the O-ring (key 22) into the groove before tightening to reach metal/metal contact
DN 250: Place the O-ring (key 22) into the groove of the valve plug cylinder (key 16), assemble and screw the valve plug body to reach metal/metal contact
- Wipe the valve plug O-ring (key 22) after assembly
- Lightly lubricate the valve plug shaft (key 12) (silicone grease) on the packing gland travel
- Check that the spring (key 18) is correctly positioned
- Positioning the O-ring (key 25) :
DN 200 Mount on connector part
DN 250 Place in the bore of the body

The reassembly of a new orifice (key 28) requires a special tool

- Lubricate the mechanism of the release relay (BM face contact + keys 8, 7, 6, 5) (molybdenum graphite grease)
- Leave minimum operational space (rotation of the cam/bolt) between the locked nut and the resetting part
- Lubricate the BMS spring (molybdenum graphite grease)

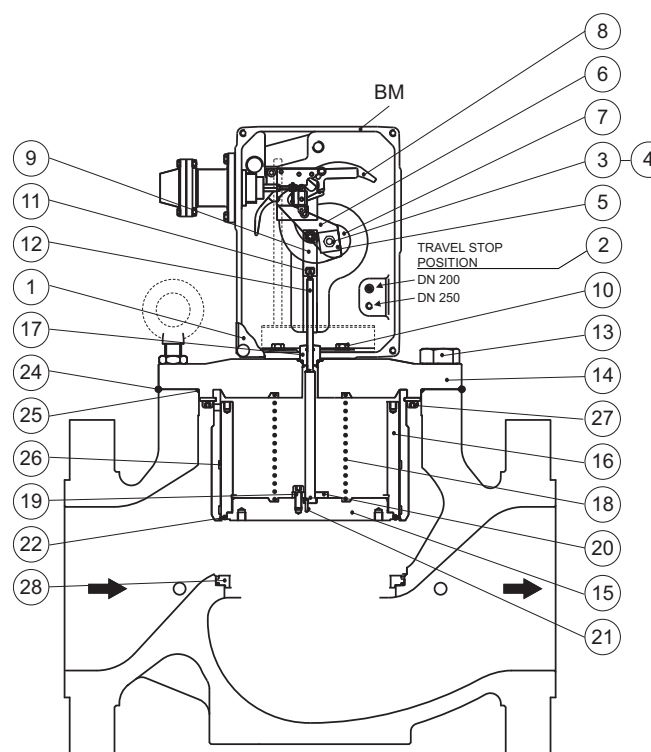


Figure 7. Type OSE LS - Commissioning Schematic

Table 5. Troubleshooting for Type OSE LS Slam-Shut Valve

SYMPTOMS	CAUSE	ACTIONS
If the valve will not close	Operating fault	Check the release relay Check the valve plug or contact after-sales
If the valve closes	Operating correctly	Observe the evolution of the outlet pressure (check tightness)
If the outlet pressure in the slam shut is decreases	External leak	Locate and seal the leak or contact after-sales
If the outlet pressure in the slam shut is constant		Bleed off the outlet side of the regulator Observe the evolution of the outlet pressure (check tightness)
If the outlet pressure increases	Internal leak	Check the slam shut valve plug Check the orifice Check the bypass or contact after-sales

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SPARE PARTS

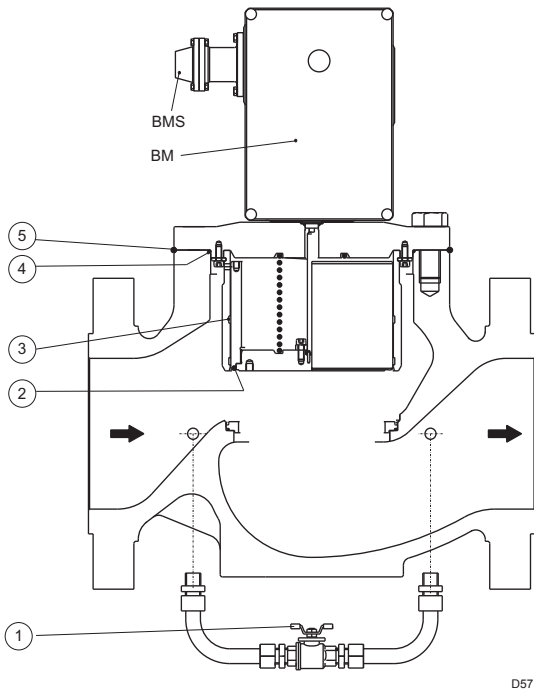


Figure 8. Type OSE LS Spare Parts

Table 6. Type OSE LS Spare Parts

Key	Description	DN 200	DN 250
1	Bypass valve	450 759	
2	Valve plug O-ring	400 090	400 091
3	Segments	197 533	197 534
4	O-ring	1P5585X0022	400 093

Key	Description	DN 200	DN 250
5	O-ring	400 093	400 017
Packing gland « Kit »		198 426	
Set of O-rings*		197 535	197 536
Release Relay Type OSD2		See NTAOSD2 manual	

(*) Set of O-rings and segments including O-ring key nos 2, 3, 4, 5

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Natural Gas Technologies

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