ELSTER Jeavons

Maintenance & Commissioning Literature for

S200

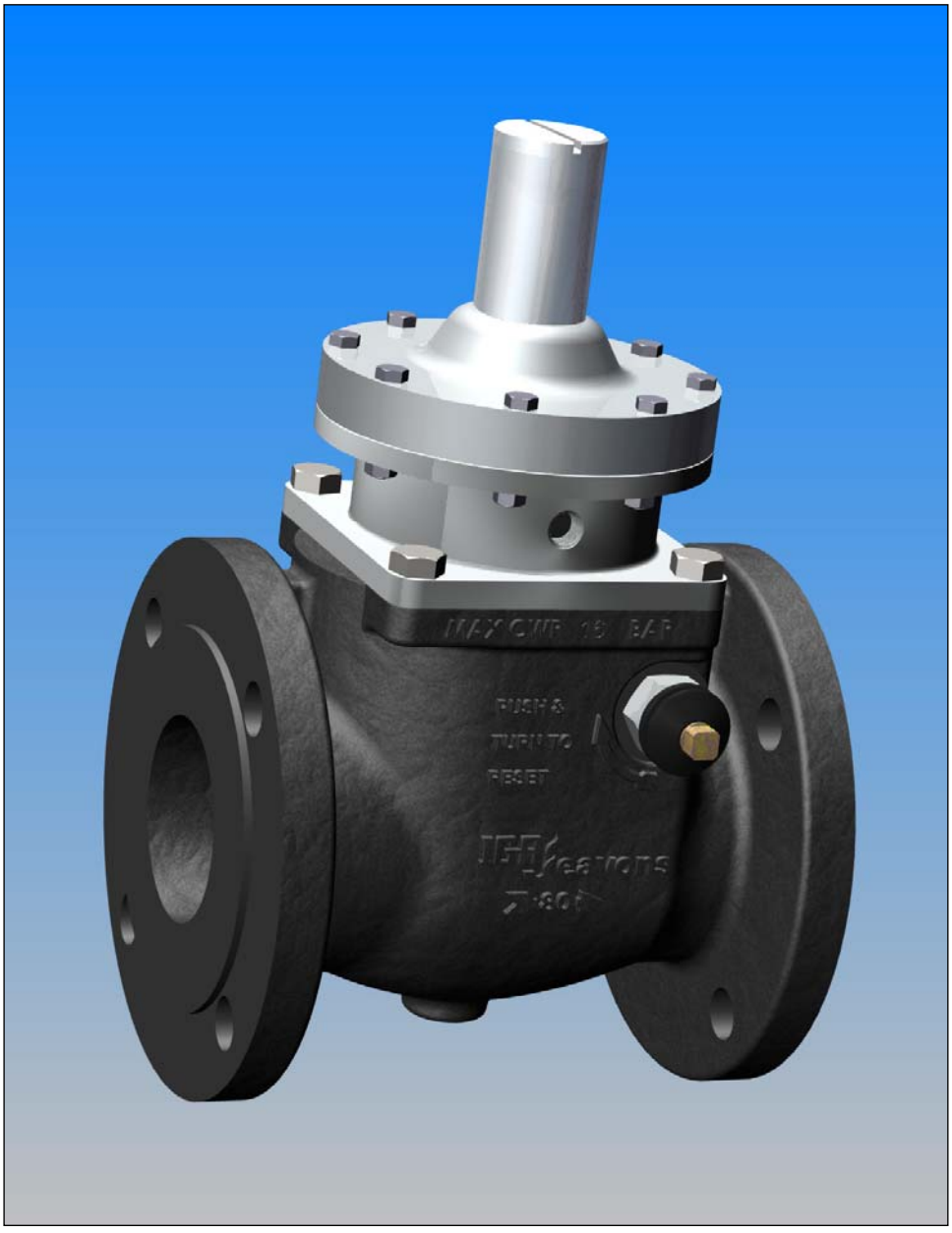
OPSS/UPSS Slam Shut Valves

CONTENTS

June 2005

SERIES 200 SLAM SHUT VALVE
SIZES 50mm, 80mm and 100mm

COMMISSIONING AND MAINTENANCE INSTRUCTIONS



Available in Low and High Pressure Versions.

INSTALLATION, OPERATION AND MAINTENANCE

INSTALLATION INSTRUCTIONS (fig 1)

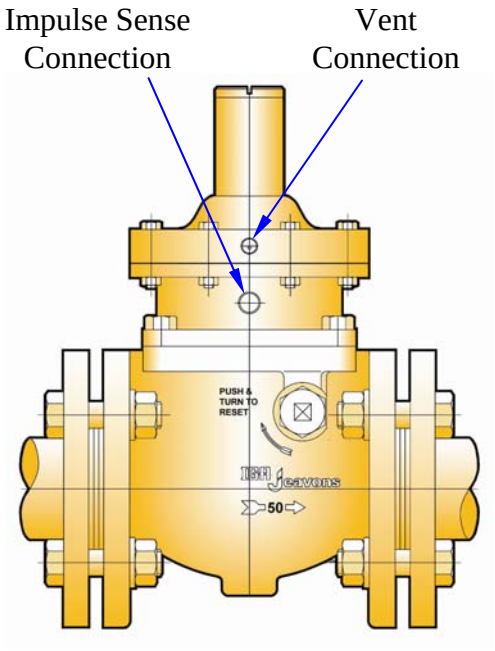


Fig. 1

1. The unit should not be installed in a corrosive environment.
2. The ambient temperature (surface temperature) should be within the limits stated on the slam shut valve catalogue.
3. Check the maximum allowable pressure on the slam shut valve nameplate against the installation specification. Remove protective discs from flanges on inlet and outlet ports.
4. Ensure installation pipework is thoroughly clean.
5. The direction of gas flow must be the same as the arrows on the slam shut body.
6. Install the slam shut valve into the pipework, using gaskets and bolting approved to National Standards.
7. Connect impulse line to sense chamber tapping, using jointing compound approved to National Standards.
8. Vent line can be installed as below if required: Remove vent protective screen and connect vent pipe line to top cover, using jointing compound approved to National Standards.
   Lead pipe to atmosphere in accordance with National Standards.
   Ensure no water can penetrate pipe termination point.

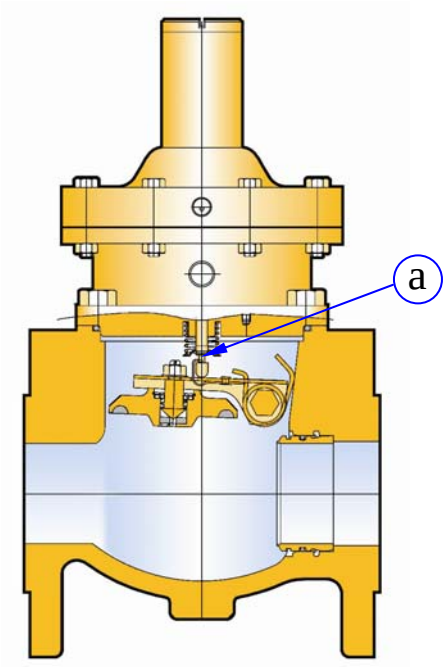


Fig. 2

VALVE OPERATION (Fig 2)

As the sense pressure rises to the desired trip point, it acts against the pressure sensing diaphragm and pressure setting spring.
A bearing cage is lifted, allowing ball bearings to move radially outwards against the bearing cage taper, to a point where the shoulder diameter on the spring loaded shaft, is free to pass through the bearings (TRIP POINT).
As the shaft moves through the bearings, it releases the spring clip (a) thereby allowing the valve seat assembly to operate in the closed position.

SETTING THE TRIP PRESSURES (Fig 3)

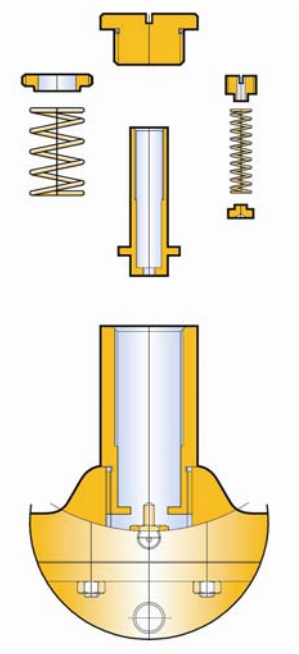


Fig. 3

1. Ensure valve is depressurised.
2. Remove top cap.
3. Using a flat blade screwdriver turn the outer OPSS adjusting bush clockwise (+) to increase loading on OPSS spring to maximum.
4. Screw inner UPSS adjusting bush anti-clockwise to reduce loading on UPSS spring, making sure that adjusting bush does not protrude from bushing guide.
5. Introduce desired OPSS set pressure at pressure sense point.
6. Re-arm valve (see below).
7. Wind OPSS adjusting bush anti-clockwise nut half a turn at a time until valve trips.
8. Remove pressure, reset valve (see below).
9. Slowly introduce pressure at sense point, and check that OPSS trips at desired pressure. Adjust as necessary.

NOTE: OPSS is now set.

10. Introduce desired UPSS set pressure at pressure sense point.
11. Re-arm valve (see below).
12. Wind UPSS adjusting bush clockwise half a turn at a time until valve trips.
13. Increase pressure to between OPSS and UPSS settings and reset valve (see below).
14. Slowly reduce pressure at sense point, and check that UPSS trips at desired pressure. Adjust as necessary.

NOTE: UPSS is now set.

15. Refit top cap.
16. NOTE; if correct trip pressure is not obtainable, choose correct spring from tables on page 13, substitute for springs fitted and go back to instruction 3 above.

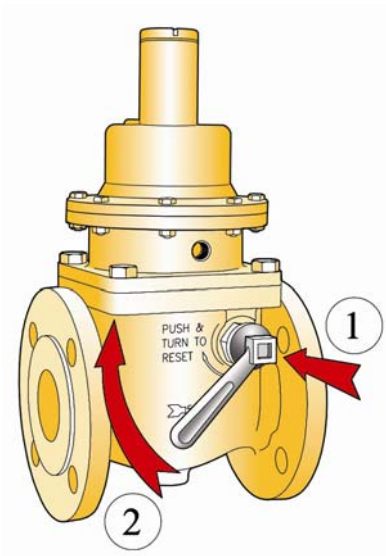


Fig. 4

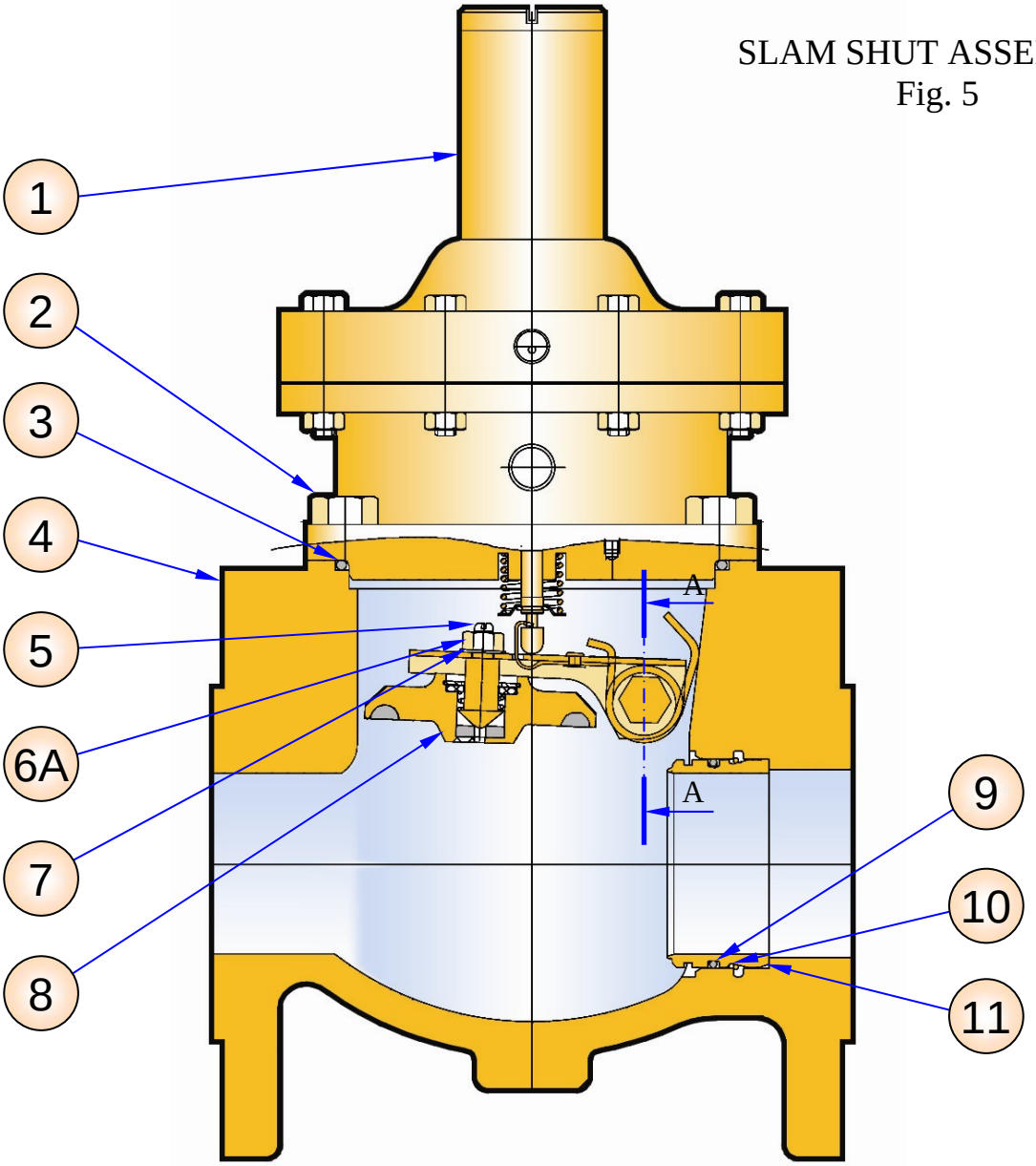
RE-ARMING THE VALVE (Fig 4)

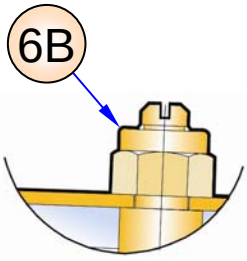
Re-arming of the valve is carried out manually. Prior to re-arming, the cause of operation should first be ascertained and rectified. The valve must be isolated and downstream pressure vented. In order to operate the correct procedure must be followed.

The reset shaft requires to be pushed and rotated (1) until it is felt to engage the latching assembly. Further rotation using light pressure causes the automatic equalizing valve to operate.

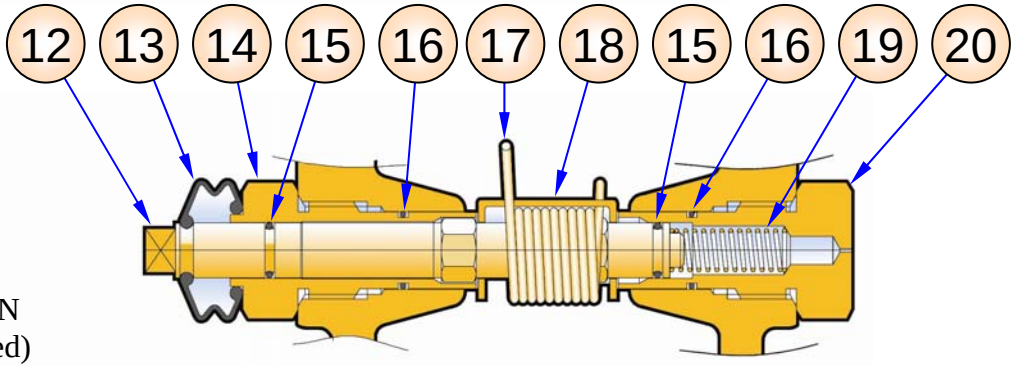
Do not attempt to force the valve open. Once pressure has equalised the valve seat assembly will be felt to lift from the seat allowing the reset shaft to be easily rotated (2) to the latching position.

SLAM SHUT ASSEMBLY
Fig. 5



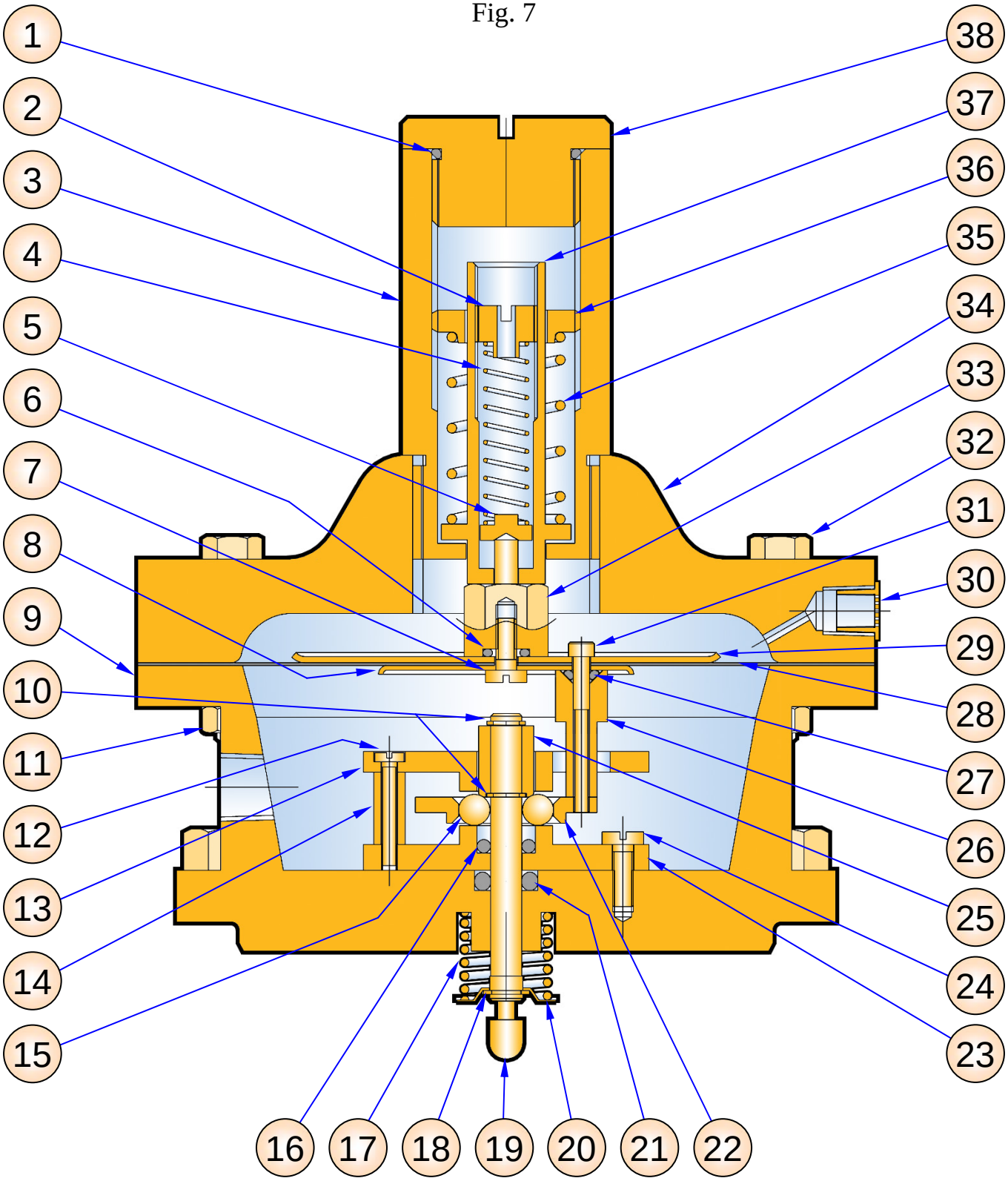


ALTERNATIVE VERSION
(Washer Item 7 Not Required)

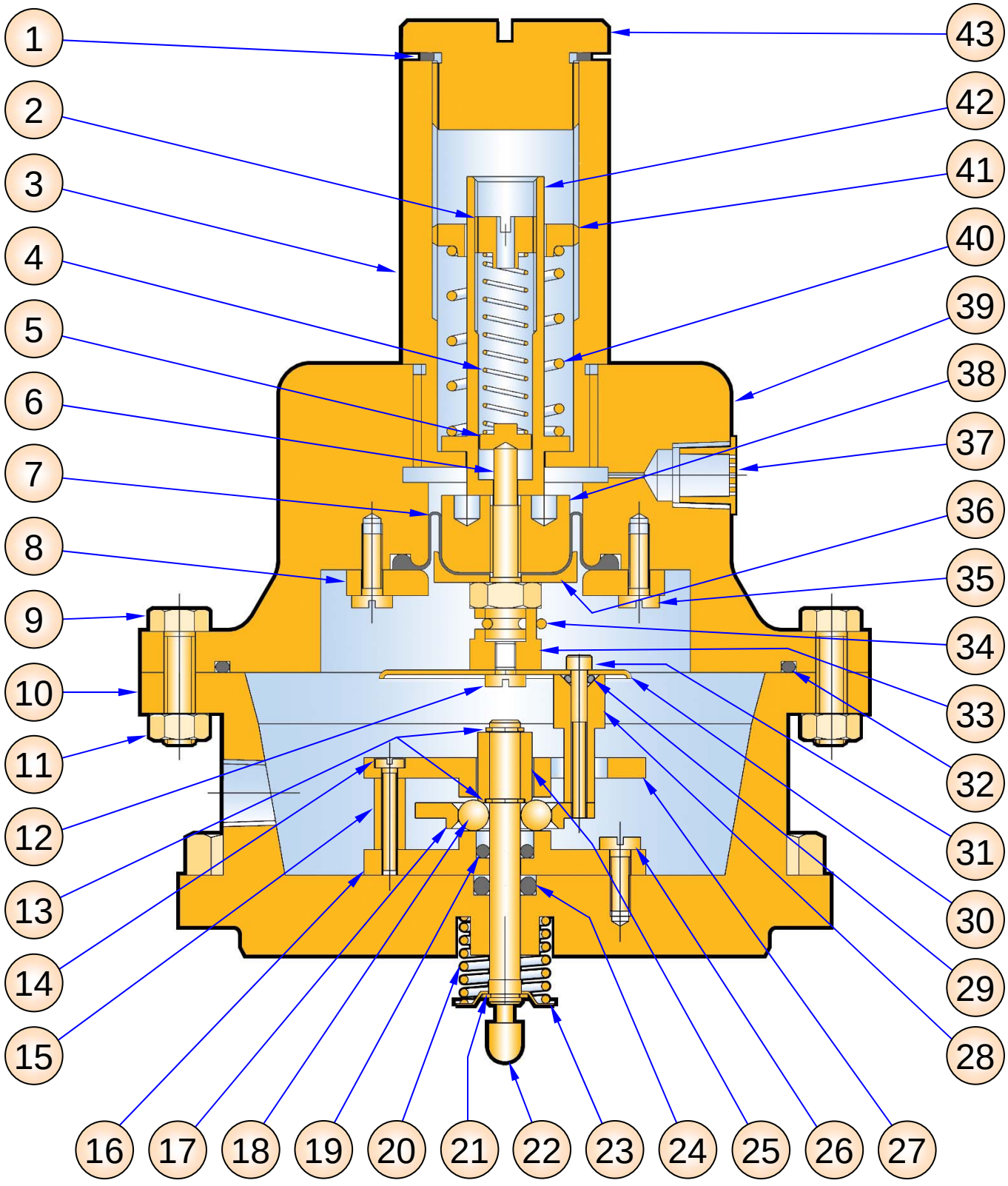


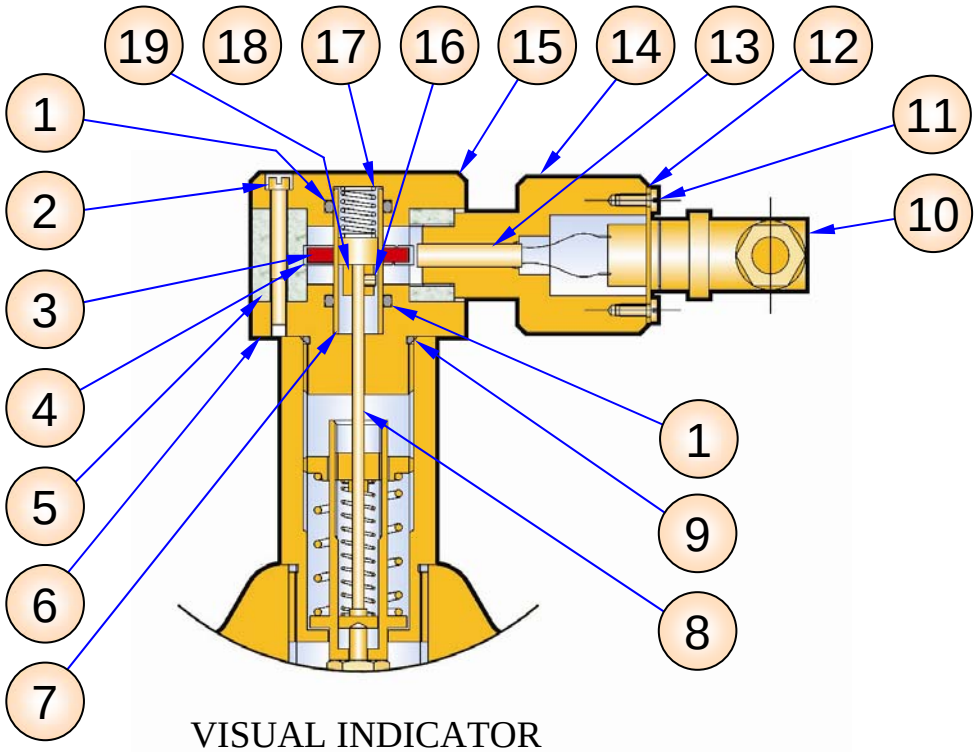
SECTION A-A Fig. 6

LOW PRESSURE HEAD ASSEMBLY
Fig. 7

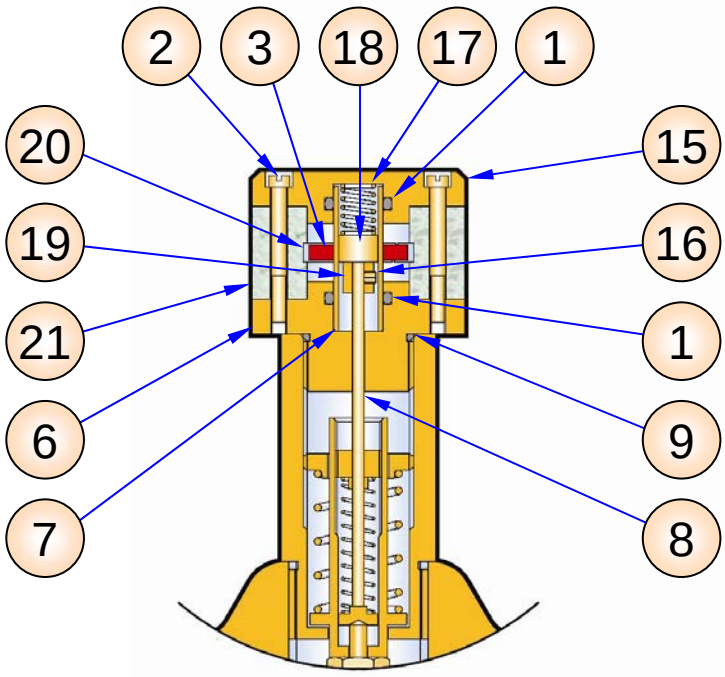


HIGH PRESSURE HEAD ASSEMBLY
Fig. 8





VISUAL INDICATOR
WITH MICRO SWITCH
Fig. 9



VISUAL INDICATOR
Fig. 10

PARTS LIST 1

For Slam Shut Assembly and Section 'A-A' see Figs. 5 & 6

ITEM No.	DESCRIPTION	PART No.	No. Off	SIZE (mm)
1	OPSS/UPSS ASSEMBLY LP	S2HL09	1	50,80
	OPSS/UPSS ASSEMBLY LP	S2HL12	1	100
	OPSS/UPSS ASSEMBLY HP	S2HH09	1	50,80
	OPSS/UPSS ASSEMBLY HP	S2HH12	1	100
2	HEXAGON HEAD SCREW M10 x 25 ZINC PLT	JSA1025HHNZG	4	50,80,100
3	'O'RING	JOBS243	✶ 1	50,80
	'O'RING	JOBS247	✶ 1	100
4	BODY ASME 150 RAISED FACE	J10009-040I01	1	50
	BODY ASME 150 FLAT FACE	J10009-040I02	1	50
	BODY NP16	J10009-017C01	1	50
	BODY NP25	J10009-017T01	1	50
	BODY ASME 150 RAISED FACE	J10011-001I01	1	80
	BODY ASME 150 FLAT FACE	J10011-001I02	1	80
	BODY NP16	J10011-001C01	1	80
	BODY NP25	J10011-001T01	1	80
	BODY ASME 150 RAISED FACE	J10012-001I01	1	100
	BODY ASME 150 FLAT FACE	J10012-001I02	1	100
	BODY NP16	J10012-001C01	1	100
	BODY NP25	J10012-001T01	1	100
5	STEM (Including Item 8)			
6A	NUT M6 (Normal Nut)	JNA6FSD	1	50,80,100
6B	NUT M6 (Lock Nut)	JNA6PZ	1	50,80,100
7	WASHER	JWM6ETLS	1	50,80,100
8	VALVE DISC ASSEMBLY	S1VC09	✶ 1	50
	VALVE DISC ASSEMBLY	S1VC11	✶ 1	80
	VALVE DISC ASSEMBLY	S1VC12	✶ 1	100
9	'O'RING	JOBS138	✶ 1	50
	'O'RING	JO200152-4475	✶ 1	80
	'O'RING	JOBS243	✶ 1	100
10	RETAINER RING	J10009-031	1	50
	RETAINER RING	J10011-004	1	80
	RETAINER RING	J10012-004	1	100
11	SEAT RING	J10009-010	1	50
	SEAT RING	J10011-002	1	80
	SEAT RING	J10012-002	1	100
12	SHAFT	J10009-028	1	50,80,100
13	GAITER V6-438	I544199	1	50,80,100

NOTE: Items marked ✶ in parts lists are contained in spares kits (see Page 13).

PARTS LIST 1 CONT

For Slam Shut Assembly and Section 'A-A' see Figs. 5 & 6

ITEM No.	DESCRIPTION	PART No.	No. Off	SIZE (mm)
14	RESET SHAFT BUSH	J10009-029	1	50,80,100
15	'O'RING	JOBS012	✶ 2	50,80,100
16	'O'RING	JOBS015	✶ 2	50,80,100
17	CLOSING SPRING	J10009-030	1	50,80
	CLOSING SPRING	J10012-005	1	100
18	LEVER ASSEMBLY	S1LC09	1	50
	LEVER ASSEMBLY	S1LC11	1	80
	LEVER ASSEMBLY	S1LC12	1	100
19	SPRING	J10009-005	1	50,80,100
20	SPRING RESET SHAFT BUSH	J10009-023	1	50,80,100

PARTS LIST 2

For Low Pressure OPSS / UPSS Assembly Fig. 7

ITEM No.	DESCRIPTION	PART No.	No. Off	SIZE (mm)
1	'O'RING SEAL (TOP CAP)	JOBS120	✶ 1	50,80,100
2	SPRING ADJUSTING BUSH (UPSS)	J10009-047	1	50,80,100
3	SPRING HOUSING BUSH	J10009-048	1	50,80,100
4	UPSS LOADING SPRING	SEE TABLE	1	50,80,100
5	UPSS BOTTOM GUIDE	J10009-049	1	50,80,100
6	'O'RING SEAL	JOBS009	✶ 1	50,80,100
7	CHEESE HEAD SCREW M4 x 10 ZINC PLATED	JSA410ICNZ	1	50,80,100
8	BOTTOM DIAPHRAGM PLATE	J10009-050	1	50,80,100
9	ADAPTOR BODY Rp¼	J10009-051B01	1	50,80
	ADAPTOR BODY ¼" NPT	J10009-051F01	1	50,80
	ADAPTOR BODY Rp¼	J10012-006B01	1	100
	ADAPTOR BODY ¼" NPT	J10012-006B01	1	100
10	CIRCLIP	JCIR1800-60	✶ 2	50,80,100
11	NUT (Normal) M6 ZINC PLATED	JNA6FZD	8	50,80,100
12	CHEESE HEAD SCREW M3 x 20 ZINC PLATED	JSA320ICNZ	3	50,80,100
13	UPPER DISC	J10009-052	1	50,80,100
14	UPPER DISC SPACER	J10009-053	3	50,80,100
15	STEEL BALL 6.0mm DIA.	JBALL6	6	50,80,100
16	'O'RING SEAL	JOBS108	✶ 1	50,80,100
17	ACTUATING SPRING	J10009-004	1	50,80,100

NOTE: Items marked ✶ in parts lists are contained in spares kits (see Page 13).

PARTS LIST 2 CONT

For Low Pressure OPSS / UPSS Assembly Fig. 7

ITEM No.	DESCRIPTION	PART No.	No. Off	SIZE (mm)
18	SPRING RETAINING CIRCLIP	JCIR1800-25B	✶ 1	50,80,100
19	SHAFT	J10009-054	1	50,80,100
20	SPRING RETAINING WASHER	I544145	1	50,80,100
21	'O'RING SEAL	JOBS202	✶ 1	50,80,100
22	BALL DISC	J10009-055	1	50,80,100
23	LOWER DISC	J10009-056	1	50,80,100
24	CHEESE HEAD SCREW M4 x 12 ZINC PLATED	JSA412ICNZ	3	50,80,100
25	COLLAR	J10009-057	1	50,80,100
26	SPACER	J10009-058	3	50,80,100
27	'O'RING SEAL	JORM0031-16	✶ 3	50,80,100
28	DIAPHRAGM	I544235	✶ 1	50,80,100
29	TOP DIAPHRAGM PLATE	I544935	1	50,80,100
30	VENT SCREEN	J12506-277	1	50,80,100
31	SOCKET CAP BOLT M3 x 30 ZINC PLATED	JBA330SANZI	3	50,80,100
32	HEX HEAD SCREW M6 x 35 ZINC PLATED	JSA635HHNZG	8	50,80,100
33	DIAPHRAGM STEM (LOW PRESSURE)	J10009-061	1	50,80,100
34	TOP COVER (LOW PRESSURE) Rp1/8	J10009-062	1	50,80,100
35	OPSS LOADING SPRING	SEE TABLE	1	50,80,100
36	SPRING ADJUSTING BUSH (OPSS)	I513121	1	50,80,100
37	BOTTOM SPRING HOLDER	J10009-063	1	50,80,100
38	TOP CAP	J10009-064	1	50,80,100

NOTE: Items marked ✶ in parts lists are contained in spares kits (see Page 13).

PARTS LIST 3

For High Pressure OPSS / UPSS Assembly Fig. 8

ITEM No.	DESCRIPTION	PART No.	No. Off	SIZE (mm)
1	TOP CAP GASKET	J10009-006	✶ 1	50,80,100
2	SPRING ADJUSTING BUSH (UPSS)	J10009-047	1	50,80,100
3	SPRING HOUSING BUSH	J10009-048	1	50,80,100
4	UPSS LOADING SPRING	SEE TABLE	1	50,80,100
5	UPSS BOTTOM GUIDE	J10009-049	1	50,80,100
6	DIAPHRAGM STEM HP	J10009-065	1	50,80,100
7	DIAPHRAGM	J10009-066 / I544934	✶ 1	50,80,100
8	LOCKING PLATE	J10009-067	1	50,80,100
9	HEX HEAD SCREW M6 x 22 ZINC PLATED	JSA622HHNZG	8	50,80,100
10	ADAPTOR BODY Rp¼	J10009-051B01	1	50,80
	ADAPTOR BODY ¼" NPT	J10009-051F01	1	50,80
	ADAPTOR BODY Rp¼	J10012-006B01	1	100
	ADAPTOR BODY ¼" NPT	J10012-006F01	1	100
11	NUT (Normal) M6 ZINC PLATED	JNA6FZD	8	50,80,100
12	CHEESE HEAD SCREW M4 x 6 ZINC PLATED	JSA46ICNZ	1	50,80,100
13	CIRCLIP	JCIR1800-60	✶ 2	50,80,100
14	CHEESE HEAD SCREW M3 x 20 ZINC PLATED	JSA320ICNZ	3	50,80,100
15	UPPER DISC SPACER	J10009-053	3	50,80,100
16	LOWER DISC	J10009-056	1	50,80,100
17	BALL DISC	J10009-055	1	50,80,100
18	STEEL BALL 6.0mm DIA.	JBALL6	6	50,80,100
19	'O'RING SEAL	JOBS108	✶ 1	50,80,100
20	ACUATING SPRING	J10009-004	1	50,80,100
21	SPRING RETAINING CIRCLIP	JCIR1800-25B	1	50,80,100
22	SHAFT	J10009-054	1	50,80,100
23	SPRING RETAINING WASHER	I544145	1	50,80,100
24	'O'RING SEAL	JOBS202	✶ 1	50,80,100
25	COLLAR	J10009-057	1	50,80,100
26	CHEESE HEAD SCREW M4 x 12 ZINC PLATED	JSA412ICNZ	3	50,80,100
27	UPPER DISC	J10009-052	1	50,80,100
28	SPACER	J10009-058	3	50,80,100
29	'O'RING SEAL	JORM0031-16	✶ 3	50,80,100
30	DIAPHRAGM PLATE	J10009-050	1	50,80,100
31	SOCKET CAP BOLT M3 x 30 ZINC PLATED	JBA330SANZI	3	50,80,100
32	'O'RING SEAL	JOBS156	✶ 1	50,80,100
33	STEM NUT	J10009-068	1	50,80,100
34	RETAINING PIN 2mm DIA	JRP01	1	50,80,100

NOTE: Items marked ✶ in parts lists are contained in spares kits (see Page 13).

PARTS LIST 3 CONT

For High Pressure OPSS / UPSS Assembly Fig. 8

ITEM No.	DESCRIPTION	PART No.	No. Off	SIZE (mm)
35	CHEESE HEAD SCREW M4 x 12 ZINC PLATED	JSA412ICNZ	4	50,80,100
36	LOWER DIAPHRAGM CUP	J10009-069	1	50,80,100
37	VENT SCREEN	J112506070	1	50,80,100
38	UPPER DIAPHRAGM CUP	J10009-070	1	50,80,100
39	TOP COVER (HIGH PRESSURE) Rc1/4	J10009-071A01	1	50,80,100
	TOP COVER (HIGH PRESSURE) ¼" NPT	J10009-071F01	1	50,80,100
40	OPSS LOADING SPRING	SEE TABLE	1	50,80,100
41	SPRING ADJUSTING BUSH (OPSS)	I513121	1	50,80,100
42	BOTTOM SPRING HOLDER	J10009-063	1	50,80,100
43	TOP CAP	J10009-064	1	50,80,100

NOTE: Items marked ✷ in parts lists are contained in spares kits (see Page 13).

PARTS LIST 4

For Visual Indicator and Micro Switch Assembly Figs. 9 & 10

ITEM No.	DESCRIPTION	PART No.	No. Off	SIZE (mm)
1	'O'RING SEAL	JOBS112	2	50,80,100
2	CHEESE HEAD SCREW M4 x 35	JSA435ICNS	4	50,80,100
3	RING MAGNET	I544265	1	50,80,100
4	OBSCURING RING (MICRO SWITCH)	I544267A	1	50,80,100
5	SPY GLASS (MICRO SWITCH)	I544267B	1	50,80,100
6	INDICATOR BOTTOM PLATE	I544261	1	50,80,100
7	MAGNET GUIDE TUBE	I544264	1	50,80,100
8	SHAFT (SHAFT ASSEMBLY)	I544270A	1	50,80,100
9	'O'RING SEAL (LP UNIT ONLY)	JOBS120	1	50,80,100
	TOP CAP GASKET (HP UNIT ONLY)	I560021	1	50,80,100
10	MALE CABLE CONNECTOR	I544274	1	50,80,100
11	CHEESE HEAD SCREW M3 x 6	I577019	4	50,80,100
12	MOUNTING PLATE	I577013	1	50,80,100
13	SENSOR	I577015	1	50,80,100
14	SENSOR MOUNTING BUSH	I544268	1	50,80,100
15	INDICATOR TOP PLATE	I544262	1	50,80,100
16	SOCKET SET SCREW M3 (SHAFT ASSEMBLY)	I544270B	1	50,80,100
17	INDICATOR RETURN SPRING	I544271	1	50,80,100
18	MAGNET 10mm DIA. (SHAFT ASSEMBLY)	I544270C	1	50,80,100
19	LOCATING BUSH (SHAFT ASSEMBLY)	I544270D	1	50,80,100
20	OBSCURING RING (NO MICRO SWITCH)	I544263A	1	50,80,100
21	SPY GLASS (NO MICRO SWITCH)	I544263B	1	50,80,100

SPRING TABLE

LOW PRESSURE UNITS

OPSS SPRINGS (ALL SIZES)

mBar	”wg	PART No.	COLOUR CODE
24 – 40	9.6 – 16.0	J10009-011	-
35 – 70	14.0 – 28.1	J10009-012	LIGHT BLUE
70 - 140	28.1 – 56.2	J10009-013	RED / BROWN
140 - 210	56.2 – 84.3	J10009-014	PURPLE
210 - 350	84.3 – 140.5	J10009-015	ORANGE – YELLOW
350 - 700	140.5 – 280.0	J10009-016	ORANGE – DARK GREEN

UPSS SPRINGS (ALL SIZES)

mBar	”wg	PART No.	COLOUR CODE
5 - 15	2.0 – 6.0	J10009-042	WHITE / BLACK
10 - 50	4.0 – 20.0	J10009-043	WHITE / ORANGE
40 - 120	16.0 – 48.1	J10009-044	WHITE / RED
90 - 250	36.1 – 100.3	J10009-045	WHITE / LIGHT BLUE

HIGH PRESSURE UNITS

OPSS SPRINGS (ALL SIZES)

Bar	PSIG	PART No.	COLOUR CODE
0.7 – 1.4	10.1 – 20.3	J10009-013	RED / BROWN
1.4 – 2.1	20.3 – 30.5	J10009-014	PURPLE
2.1 – 3.5	30.5 – 50.7	J10009-015	ORANGE – YELLOW
3.5 – 7.0	50.7 – 101.5	J10009-016	ORANGE – DARK GREEN
4.0 – 8.0	58.0 – 116.0	J10009-046	ORANGE - PURPLE

UPSS SPRINGS (ALL SIZES)

mBar	”wg	PART No.	COLOUR CODE
50 - 150	20.0 – 60.0	J10009-042	WHITE / BLACK
100 - 500	40.1 – 200.7	J10009-043	WHITE / ORANGE
400 - 1200	160.5 – 481.7	J10009-044	WHITE / RED
900 - 2500	361.3 – 1003.6	J10009-045	WHITE / LIGHT BLUE

SPARES KITS

PART No.	DESCRIPTION
SK209-01	50mm LOW PRESSURE
SK209-02	50mm HIGH PRESSURE
SK211-01	80mm LOW PRESSURE
SK211-02	80mm HIGH PRESSURE
SK212-01	100mm LOW PRESSURE
SK212-02	100mm HIGH PRESSURE

MAINTENANCE

Drawing Reference: Fig. 5, Fig. 6
Parts List Reference: Table 1

NOTE: Numbers in brackets identify items on drawings

Dismantling Procedure for Slam Shut Assembly:

Removal of OPSS /UPSS assembly from Slam-Shut Body:

1. Ensure all valves are closed, and line is fully vented to the atmosphere.
2. Remove impulse line to OPSS / UPSS assembly (1) and mark position of OPSS /UPSS assembly relative to slam-shut body (4).
3. Remove 4 screws (2) holding OPSS / UPSS assembly (1) to the slam-shut body (4). If the slam-shut is closed, the OPSS /UPSS assembly can be lifted out vertically. If the slam-shut is open, then raise OPSS / UPSS assembly at outlet side and slide towards outlet, this will release the latch closing the slam shut and allowing the OPSS / UPSS assembly to be lifted clear of the slam shut body.

Dismantling of Slam-Shut Body:

1. Remove "O" ring (3) from slam-shut body (4).
2. Carefully using pliers, disengage closing spring (17) by pulling tail of spring into locking slot on lever assembly (18). Valve disc assembly (8) and lever assembly (18) will now be free to swing, without resistance from closing spring (17).
3. Remove gaiter (13) from shaft (12), then unscrew reset bush (14) from slam-shut body (4)
4. Whilst holding valve disc assembly (8) with lever assembly (18) withdraw shaft (12) from slam-shut body (4). (a slight rotation may be required to remove shaft from lever assembly).
5. The valve disc assembly (8) with lever assembly (18) can now be lifted clear of the slam-shut body (4).

WARNING: Do not disengage spring (17) from the slot in the lever assembly (18).

6. Unscrew reset bush (20) from slam shut body (4), remove spring (19) from inside reset bush (20).
7. The face of seat ring (11) can now be inspected for evidence of damage.
8. If seat ring (11) is damaged remove as follows: Place a screwdriver in seat ring slot, and using the screwdriver as a lever, slide seat ring towards inlet, repositioning screwdriver as far round both sides of seat ring as possible, to ensure seat ring (11) slides out square to slam-shut body (4). (Note: seat ring (11) is a push fit into slam-shut body (4), and is held in place by a seat ring retainer (10) and is sealed by "O" ring (9).
9. "O" ring (9) and seat ring retainer (10) can now be removed from slam-shut body (4).
10. Unscrew valve stem nut (6A) or (6B) (whilst using screwdriver to prevent valve stem (5) from rotating), Remove washer (7) if fitted from under valve stem nut (6). Valve disc assembly (8) can now be removed from lever assembly (18).
11. Remove "O" rings (15) and (16) from shaft (12) and bushes (14) and (20).

Discard all "O" rings, valve disc assembly (8) and replace with new parts from spares kit.

To maintain OPSS / UPSS see separate instructions later.

MAINTENANCE

Rebuilding Procedure for Slam-Shut Assembly:

Rebuilding of slam-shut body:

It is recommended that all "O" rings be lightly greased, before assembly using Dow Corning Molycote 55M

1. Replace seat retaining ring (10) into slot in slam-shut body (4).
2. Refit "O" ring (9) onto seat ring (11) middle groove and lightly lubricate with silicon grease.
3. Fit seat ring (11) into slam-shut body (4) with the chamfer on the inside of the seat ring (11) to be facing inwards. Care should be taken not to damage seating face.
4. If removed fit closing spring (17) into lever assembly (18), (using pliers) the short leg of the spring fits into the hole in the lever assembly, the long leg of the spring fits into the slot in the lever assembly.

NOTE: The reset shaft assembly is universal handed, and can be refitted from either side of the slam shut valve.

5. Attach the seat disc assembly (8) to the lever assembly (18) by fitting stem (5) of valve disc assembly through hole in lever assembly (18), and securing in position using washer (7) if fitted and nut (6A) or (6B). If self locking nut (6B) is used, do not fit washer (7).
6. Fit "O" ring (16) into groove in reset shaft bush (14).
7. Fit "O" ring (16) into groove in spring reset shaft bush (20).
8. Place spring (19) into spring reset shaft bush (20) then screw reset shaft into slam-shut body (4). On the opposite side to re-cocking.
9. Refit 2 "O" rings (15) into grooves in shaft (12), lightly lubricate shaft and "O" rings.
10. Holding seat disc assembly (8) with lever assembly (18) in slam-shut body (4), insert shaft (12) through lever assembly, so that spigot on the end of the shaft locates into the spring (19), which is held in the slam-shut body by the reset shaft bush (20). (A slight rotation of the shaft (12) may be required to ensure the hexagon section of the shaft passes through the lever assembly).
11. Whilst pushing the shaft (12) in to the slam-shut body (4), place the reset shaft bush (14) over the end of shaft (12), and screw into the slam-shut body (4).
12. Refit shaft cover (13) onto shaft (12).
13. Check that valve disc assembly (8) with lever assembly (18) is free to swing.
14. CAREFULLY (using pliers) release spring tail out of slot in the lever assembly (18) (see label on lever assembly for direction to release spring).
15. Using a 9/16" Spanner or reset tool on reset shaft (12), check the operation of assembly by pressing shaft towards the slam-shut body (4), and rotating clockwise. A slight rotation may be required to locate shaft hexagon in lever assembly. Slam-shut should freely open and close when pressure on reset shaft is released.
16. Lightly lubricate "O" ring (3) and fit into groove in slam-shut body (4).
17. Once OPSS / UPSS assembly (1) has been assembled in TRIPPED position, (see section for OPSS / UPSS assembly procedure) place OPSS / UPSS assembly (1) on top of slam-shut body (4). Check (see fig 5) orientation of OPSS / UPSS assembly (1) to slam-shut body (4). Or replace using alignment marking taken on dismantling.
18. Secure OPSS / UPSS assembly (1) to slam-shut body (4) using 4 screws (2).
19. Recommission unit as described in commissioning instructions.

MAINTENANCE

Drawing Reference: Fig 7

Parts List Reference: Table 2

NOTE: Numbers in brackets identify items in drawings

Dismantling Procedure for Low Pressure OPSS / UPSS Assembly:

If micro switch or visual indicator are fitted refer to page 24.

1. Unscrew top cap (38) together with "O" ring (1) from spring housing bush (3).
2. Remove "O" ring (1) from top cap (38).
3. Unscrew and remove OPSS adjusting bush (36), take out OPSS loading spring (35) and bottom spring holder (37).
4. Take UPSS adjusting bush (2) from bottom spring holder (37) and withdraw UPSS loading spring (4) and UPSS bottom guide (5).
5. Make note of the position of the vent in the top cover (34), relative to the horizontal tapped hole in the adaptor body (9).
6. Remove 8 screws (32) holding top cover (34) onto the adaptor body (9), then lift off top cover (34).
7. Unscrew 3 cap head bolts (31) and lift off diaphragm assembly from adaptor body (9), taking care that all 6 balls (15) fall into adaptor body (9).
8. Remove all 6 balls (15) from adaptor body (9).
9. Take 3 spacers (26) and “O” rings (27) from diaphragm assembly.
10. Unscrew Cheese head screw (7) and separate diaphragm assembly components – top diaphragm plate (29), diaphragm (28), bottom diaphragm plate (8) and L.P. diaphragm stem (33), removing “O” ring (6).
11. Undo and remove 3 cheese head screws (12) and lift off upper disc (13) and 3 upper disc spacers (14).
12. Take off ball disc (22).
13. Place adaptor body (9) in vice fitted with soft jaws, with shut off spring (17) facing downward. Take care not to over tighten which could result in damage it the body.
14. Compress shut off spring (17) by pushing shaft (19) upwards. Using fine pointed pliers remove upper circlip (10), take off collar (25) and remove lower circlip (10). As circlips are small care must be taken so that they are not misplaced.
15. Shut off spring (17), retainer (20) and shaft (19) can now be withdrawn from adaptor body (9).
16. Remove adaptor body (9) from vice, remove “O” ring (16).
17. Remove 3 cheese head screws (24) and take off lower disc (23).
18. Take out “O” ring (21) from adaptor body (9).
19. It is not necessary to remove retainer (20) and circlip (18) from shaft (19) unless damaged.

Discard "O" rings and diaphragm (28) and replace with new parts from spares kit.

MAINTENANCE

Rebuilding Procedure for Low Pressure OPSS / UPSS Assembly:

It is recommended that all "O" rings be lightly greased before assembly, using Dow Corning Molycote 55M

1. Fit "O" ring (21) into adaptor body (9), taking care not to damage it whilst fitting (use only blunt nose tools if needed).
2. Secure lower disc (23) using 3 cheese head screws (24) onto adaptor body (9).
3. Fit shock absorber "O" ring (16) into recess in lower disc (23).
4. Place adaptor body assembly (9) in vice, fitted with soft jaws, with underside facing upwards. Take care not to over tighten which could result in damage to the body.
5. If previously removed, refit circlip (18), retainer (20) and shut off spring (17) over rounded end of shaft (19).
6. Lightly lubricate shaft (19) with silicon grease, push square end through adaptor body (9) and lower disc (23).
7. To enable shut off spring (17) to be compressed for refitting of circlip (10), it may be necessary to place packing below the shaft (19) in the vice. Using suitable tool, add circlip (10) into the groove on shaft (19) nearest to adaptor body (9), so spring (17) and spring retaining washer (20) are held in position.
8. Remove adaptor body assembly (9) from vice, then invert and reclamp in vice. Place collar (25) over shaft (19) with counter bore of collar facing adaptor body (9), retain collar (25) in position on shaft (19), by fitting circlip (10) using tool, into remaining groove on shaft (19).
9. Place “O” ring (6) into recess in L.P. diaphragm stem (33).
10. Pass screw (7) through bottom diaphragm plate (8), diaphragm (28) and top diaphragm plate (29) ensuring that lips of plates face away from diaphragm and that radial holes in plates and diaphragm line up.
11. Fasten screw (7) into L.P. diaphragm stem (33) and tighten.
12. Insert 3 cap head bolts (31) through holes in upper diaphragm plate (29).
13. Add 3 “O” rings (27) and 3 spacers (26) with hexagonal end towards diaphragm, over screws (31) and restrain with a small amount of silicon grease.
14. Lift shaft (19) as high as possible by compressing shut off spring (17) and hold in position.
15. Apply grease to 6 balls (15), locate balls around shaft (19) on top face of lower disc (23), grease will hold the balls in position.
16. Place ball disc (22) with lip facing downward, over ring of balls and restrain with silicon grease. Threaded holes should be roughly aligned with screw heads in lower disc (23).
17. Stand 3 upper disc spacers (14) over threaded holes in lower disc (23).
18. Position upper disc (13) onto upper disc spacers (14) with lip facing downward and secure using 3 cheese head screws (12) taking care not to disturb balls (15) or ball disc (22).
19. Carefully introduce diaphragm assembly (28) by lowering spacers (26) through holes in upper disc (13) until 3 cap head bolts (31) can be fastened to ball disc (22). Ensure that holes around edge of diaphragm (28) line up with holes in adaptor body (9).
20. Release compression on shut off spring (17).
21. Place L.P. top cover (34) onto adaptor body assembly (9). Ensure holes in diaphragm (28), adaptor body (9) and L.P. top cover (34) line up. Clamp L.P. top cover (34) onto adaptor body assembly (9), using 8 hexagon head screws (32) and 8 nuts (11).

NOTE: The position of the vent in the L.P. top cover (34), relative to the tapped hole in the side of the adaptor body (9) should be as noted during dismantling.

MAINTENANCE

Rebuilding Procedure for Low Pressure OPSS / UPSS Assembly (Continued):

22. Drop UPSS bottom guide (5) into bottom spring holder (37) with spigot upward.
23. Replace UPSS loading spring (4) ensuring location on spigot of UPSS bottom guide (5).
24. Introduce UPSS spring adjusting bush (2) into bottom spring holder (37) with spigot facing downwards, and screw down about 5mm from top surface.
25. Lower bottom spring holder assembly (37) into spring housing bush (3) and locate onto post of diaphragm stem (33).
26. Put OPSS loading spring (35) into spring housing bush (3) and over bottom spring holder assembly (37).
27. Thread OPSS spring adjusting bush (36) into spring housing bush (3) and screw down about 20mm from top surface.
28. Add “O” ring (1) to top cap (38) and replace cap to spring housing bush (3).
29. If removed add screen vent (30) into vent of top cover (34).

MAINTENANCE

Drawing Reference: Fig 8

Parts List Reference: Table 3

NOTE: Numbers in brackets identify items in drawings

Dismantling Procedure for High Pressure OPSS / UPSS Assembly:

If micro switch or visual indicator are fitted refer to page 24.

1. Unscrew top cap (43) together with gasket (1) from spring housing bush (3).
2. Remove gasket (1) from top cap (43).
3. Unscrew and remove OPSS adjusting bush (41), take out OPSS loading spring (40) and bottom spring holder (42).
4. Take UPSS adjusting bush (2) from bottom spring holder (42) and withdraw UPSS loading spring (4) and UPSS bottom guide (5).
5. Make note of the position of the vent in the top cover (39), relative to the horizontal tapped hole in the adaptor body (10).
6. Remove 8 hex head screws (9) and nuts (11) holding top cover (39) onto the adaptor body (10).
7. Withdraw retaining pin (34) and lift off top cover (39).
8. Unscrew 3 cap head bolts (31) and lift off diaphragm assembly from adaptor body (10), taking care that all 6 balls (18) fall into adaptor body (10).
9. Remove all 6 balls (18) from adaptor body (10).
10. Take 3 spacers (28) and “O” rings (29) from diaphragm plate (30).
11. Unscrew 4 cheese head screws (35) and remove collar (8) and diaphragm assembly (7).
12. Separate diaphragm assembly components – upper diaphragm cup (38), diaphragm (7), lower diaphragm cup (36) and H.P. diaphragm stem (6).
13. Undo and remove 3 cheese head screws (14) and lift off upper disc (27) and 3 upper disc spacers (15).
14. Take off ball disc (17).
15. Place adaptor body (10) in vice fitted with soft jaws, with shut off spring (20) facing downward. Take care not to over tighten which could result in damage it the body.
16. Compress shut off spring (20) by pushing shaft (22) upwards. Using fine pointed pliers remove upper circlip (13), take off collar (25) and remove lower circlip (13). As circlips are small care must be taken so that they are not misplaced.
17. Shut off spring (20), retainer (23) and shaft (22) can now be withdrawn from adaptor body (10).
18. Remove adaptor body (10) from vice, remove “O” ring (19).
19. Remove 3 cheese head screws (26) and take off lower disc (16).
20. Take out “O” ring (24) from adaptor body (10).
21. It is not necessary to remove retainer (23) and circlip (21) from shaft (22) unless damaged.

Discard "O" rings and diaphragm (7) and replace with new parts from spares kit.

MAINTENANCE

Rebuilding Procedure for High Pressure OPSS / UPSS Assembly:

It is recommended that all "O" rings be lightly greased before assembly, using Dow Corning Molycote 55M

1. Fit "O" ring (24) into adaptor body (10), taking care not to damage it whilst fitting (use only blunt nose tools if needed).
2. Secure lower disc (16) using 3 cheese head screws (26) onto adaptor body (10).
3. Fit shock absorber "O" ring (19) into recess in lower disc (16).
4. Place adaptor body assembly (10) in vice, fitted with soft jaws, with underside facing upwards. Take care not to over tighten which could result in damage to the body.
5. If previously removed, refit circlip (21), retainer (23) and spring (20) over rounded end of shaft (22).
6. Lightly cover shaft (22) with silicon grease, push square end through adaptor body (10) and lower disc (16).
7. To enable shut off spring (20) to be compressed for refitting of circlip (13), it may be necessary to place packing below the shaft (22) in the vice. Using suitable tool, add circlip (13) into the groove on shaft (22) nearest to adaptor body (10), so spring (22) and spring retaining washer (23) are held in position.
8. Remove adaptor body assembly (10) from vice, then invert and reclamp in vice. Place collar (25) over shaft (22) with counter bore of collar facing adaptor body (10), retain collar (25) in position on shaft (22), by fitting circlip (13) using tool, into remaining groove on shaft (22).
9. Pass screw (12) through bottom diaphragm plate (30), from concave side, and into stem nut (33) and tighten.
10. Insert 3 cap head bolts (31) through holes in diaphragm plate (29).
11. Add 3 “O” rings (29) and 3 spacers (28) with hexagonal end towards diaphragm plate, over screws (31) and restrain with a small amount of silicon grease.
12. Lift shaft (22) as high as possible by compressing shut off spring (20) and hold in position.
13. Apply grease to 6 balls (18), locate balls around shaft (22) on top face of lower disc (16), grease will hold the balls in position.
14. Place ball disc (17) with lip facing downward, over ring of balls and restrain with silicon grease. Threaded holes should be roughly aligned with screw heads in lower disc (16).
15. Stand 3 upper disc spacers (15) over threaded holes in lower disc (16).
16. Position upper disc (27) onto upper disc spacers (15) with lip facing downward and secure using 3 cheese head screws (14) taking care not to disturb balls (18) or ball disc (27).
17. Carefully introduce diaphragm plate assembly (30) by lowering spacers (28) through holes in upper disc (27) until 3 screws (31) can be fastened to ball disc (27).
18. Release compression on shut off spring (20).
19. Pass H.P. diaphragm (6) stem through lower diaphragm cup (36), H.P. diaphragm (7), keeping diaphragm bead facing away from screw head, and screw into rounded end of upper diaphragm cup (38).
20. Invert H.P. top cover (39) and position diaphragm assembly (7) with diaphragm bead in groove in H.P. top cover (39).
21. Secure with collar (8), ensuring that rounded side of inner hole is against diaphragm (7), and 4 cheese head screws (35).
22. Hold H.P. top cover assembly (39) over adaptor body (10) and extend diaphragm plate assembly (29) upwards and diaphragm assembly (7) downwards, until they can be joined using retaining pin (34).
23. Lower H.P. top cover (39) onto adaptor body assembly (10). Ensure holes in adaptor body (10) and top cover (39) line up. Clamp H.P. top cover (39) onto adaptor body assembly (10), using 8 hexagon head screws (9) and 8 nuts (11).

NOTE: The position of the vent in the H.P. top cover (39), relative to the tapped hole in the side of the adaptor body (9) should be as noted during dismantling.

MAINTENANCE

Rebuilding Procedure for High Pressure OPSS / UPSS Assembly (Continued):

24. Drop UPSS bottom guide (5) into bottom spring holder (42) with spigot upward.
25. Replace UPSS loading spring (4) ensuring location on spigot of UPSS bottom guide (5).
26. Introduce UPSS spring adjusting bush (2) into bottom spring holder (42) with spigot facing downwards, and screw down about 5mm from top surface.
27. Lower bottom spring holder assembly (42) into spring housing bush (3) and locate onto post of H.P. diaphragm stem (6).
28. Put OPSS loading spring (40) into spring housing bush (3) and over bottom spring holder assembly (42).
29. Thread OPSS spring adjusting bush (41) into spring housing bush (3) and screw down about 20mm from top surface.
30. Add gasket (1) to top cap (43) and replace cap to spring housing bush (3).
31. If removed add screen vent (37) into vent of H.P. top cover (39).

MAINTENANCE

Drawing Reference: Fig 9

Parts List Reference: Table 4

NOTE: Numbers in brackets identify items in drawings

Dismantling Procedure for Micro Switch Assembly:

1. Disconnect electrical wires from male cable connector (10), noting colour coding.
2. Unless damaged there is no need to dismantle sensor mounting bush assembly (14) – go to instruction (5).
3. Unscrew 4 cheese head screws (11) and remove mounting plate (12) and male cable connector (10).
4. Carefully withdraw micro switch sensor (13) taking care not to damage connecting wires.
5. Undo and remove indicator assembly from spring housing bush.
6. Take off “O” ring seal (9) or HP gasket.
7. Remove 4 cheese head screws (2) and lift off indicator top plate (15).
8. Take “O” ring seal (1) from groove in indicator top plate (15).
9. Lift out indicator return spring (17).
10. Remove spy glass (5).
11. Take off ring magnet (3) and withdraw magnet guide tube (7).
12. Lift out shaft assembly (8) – do not dismantle further.
13. Take “O” ring seal (1) from groove in indicator bottom plate (6).

Rebuilding Procedure for Micro Switch Assembly:

1. Carefully insert “O” ring seal (1) into grove in indicator bottom plate (6).
2. Push magnet guide tube (7) into indicator bottom plate (6).
3. Insert shaft assembly (8) into indicator bottom plate (6).
4. Drop ring magnet (3) over magnet guide tube (7).
5. Position spy glass (5) onto indicator bottom plate (6), aligning radial holes.
6. Replace indicator return spring (17) into magnet guide tube (7).
7. Carefully insert “O” ring seal (1) into grove in indicator top plate (15).
8. Lower indicator top plate (15) onto magnet guide tube (7) and spy glass (5), aligning radial holes.
9. Replace 4 cheese head screws (2) to secure assembly.
10. If previously dismantled replace sensor (13) into sensor mounting bush (14), followed by male cable connector (10) and secure using mounting plate (12) and 4 cheese head screws (11).
11. Screw sensor mounting bush (14) into spy glass (5) taking care not to over tighten.
12. Replace “O” ring (9) or HP gasket on underside of indicator bottom plate (6).
13. Carefully lower shaft (8) through hole in UPSS spring adjusting bush. Screw assembly into spring housing bush.
14. Reconnect electrical wiring.

MAINTENANCE

Drawing Reference: Fig 10
Parts List Reference: Table 4

NOTE: Numbers in brackets identify items in drawings

Dismantling Procedure for Visual Indicator Assembly:

1. Undo and remove indicator assembly from spring housing bush.
2. Take off “O” ring seal (9) or HP gasket.
3. Remove 4 cheese head screws (2) and lift off indicator top plate (15).
4. Take “O” ring seal (1) from groove in indicator top plate (15).
5. Lift out indicator return spring (17).
6. Remove spy glass (21).
7. Take off ring magnet (3) and withdraw magnet guide tube (7).
8. Lift out shaft assembly (8) – do not dismantle further.
9. Take “O” ring seal (1) from groove in indicator bottom plate (6).

Rebuilding Procedure for Visual Indicator Assembly:

1. Carefully insert “O” ring seal (1) into grove in indicator bottom plate (6).
2. Push magnet guide tube (7) into indicator bottom plate (6).
3. Insert shaft assembly (8) into indicator bottom plate (6).
4. Drop ring magnet (3) over magnet guide tube (7).
5. Position spy glass (21) onto indicator bottom plate (6), aligning radial holes.
6. Replace indicator return spring (17) into magnet guide tube (7).
7. Carefully insert “O” ring seal (1) into grove in indicator top plate (15).
8. Lower indicator top plate (15) onto magnet guide tube (7) and spy glass (21), aligning radial holes.
9. Replace 4 cheese head screws (2) to secure assembly.
10. Replace “O” ring (9) or HP gasket on underside of indicator bottom plate (6).
11. Carefully lower shaft (8) through hole in UPSS spring adjusting bush. Screw assembly into spring housing bush.

Elster Jeavons is committed to a programme of continuous quality enhancement. All equipment designed and manufactured by Elster Jeavons benefits from the company's quality assurance standards, which are approved to ISO9001 (BS5750 Part 1).
Elster Jeavons has a programme of continuous product development and improvement and in consequence the information in this leaflet may be subject to change or modification without notice.

ELSTER Instromet

ELSTER JEAVONS Ltd.
Lower Church Lane, Tipton
West Midlands DY4 7PH England

Tel: +44 (0)121 557 3911
Fax: +44 (0)121 520 9556
Email: info@jeavonsltd.co.uk