



technical S.r.l.

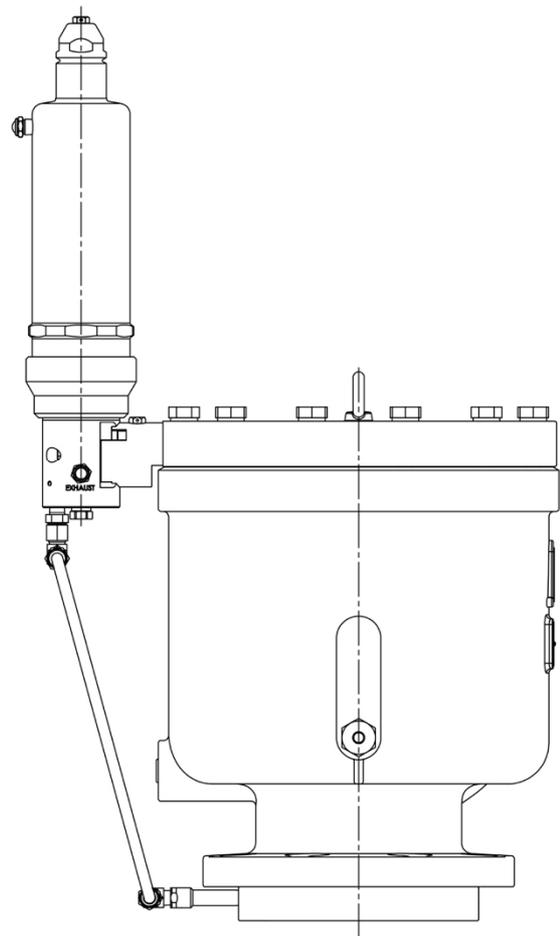
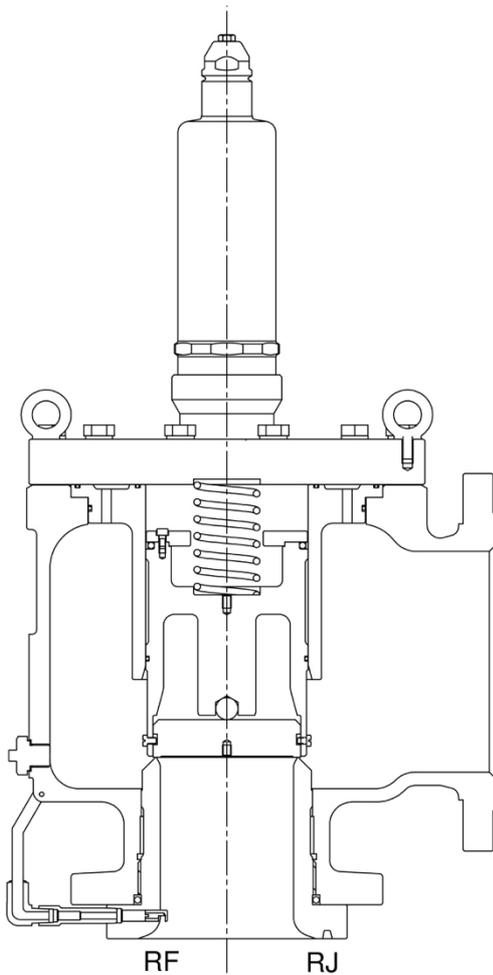
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PILOT OPERATED SAFETY VALVE

30000 SERIES

***PROPORTIONAL
PISTON TYPE***

***USE AND
MAINTENANCE
MANUAL***



VALVES FOR GASES, VAPOURS AND LIQUIDS.

Features

- PED and EAC compliant;
- limited overpressure;
- 10-20% blowdown;
- spring adjustment as shown in the setting range of the pilot;
- gases and vapours discharge coefficient $k = 0.94$;
- liquids discharge coefficient $k = 0.6$;
- connections: ANSI, UNI, DIN, AFNOR etc.

Accessories

- test gag;
- backflow preventer;
- soft seat.

30000 SERIES PILOT OPERATED SAFETY VALVES

The **30000 P Series** pilot operated safety valves are comparable to the conventional valves of the same series, and retain the same orifices, discharge profiles and operational efficiency (discharge coefficient $k = 0.94$). They are designed and manufactured by **Technical s.r.l.** in accordance with the **API 526** regulations on pilot operated valves; and are full nozzle, total lift, flat seat valves.

The body is cast, the nozzle, the disc-holder and the cylinder are cast or made from bar stock while the bonnet and other parts subject to line pressure are made from bar stock or forged.

1. INSTALLATION

Before installing the valve in the system make sure that:

- the fluid in the line is listed in the construction declaration or is compatible with the materials the valve is made of;
- the piping to the valve inlet is clean, without impurities, slag etc. and remove them if present;
- the inlet and discharge piping are sized so as to minimise loss of pressure.

Installation of the valve in the system must be done by tightening the bolts in a cross pattern and uniformly.

Once the valve has been installed in the system make sure that:

- the discharge is not placed in such a way as to be dangerous for people or for the equipment;
- the discharge is properly conveyed.

1.1 SET UP

Before shipment all pressure-bearing components of the safety valves are hydrostatically tested and adjusted to the trip pressure specified by the Customer. Therefore, no on-site adjustment should be needed.

The maximum calibration deviation is less than 3% for pressure up to 21 bar, with a minimum of 0.2 bar; it is less than 0.7 bar for pressure up to 70 bar; and less than 1% for pressure over 70 bar.

The blowdown is fixed and proportional to the set pressure.

Should it be necessary to modify the set pressure, proceed as follows:

1.1.1 Set pressure adjustment (figure 1)

To properly adjust the valve's set pressure:

- remove the cap (28);
- loosen the locknut (26);
- turn the adjusting screw (27) clockwise to increase the set pressure;
- turn the adjusting screw (27) counter-clockwise to decrease it.

The adjustment range of the spring is $\pm 5\%$; for extended ranges contact our Technical Office.

Once the setting is adjusted, tighten the locknut (26) and put the cap back in place (28) on the valve.

2. DISASSEMBLY

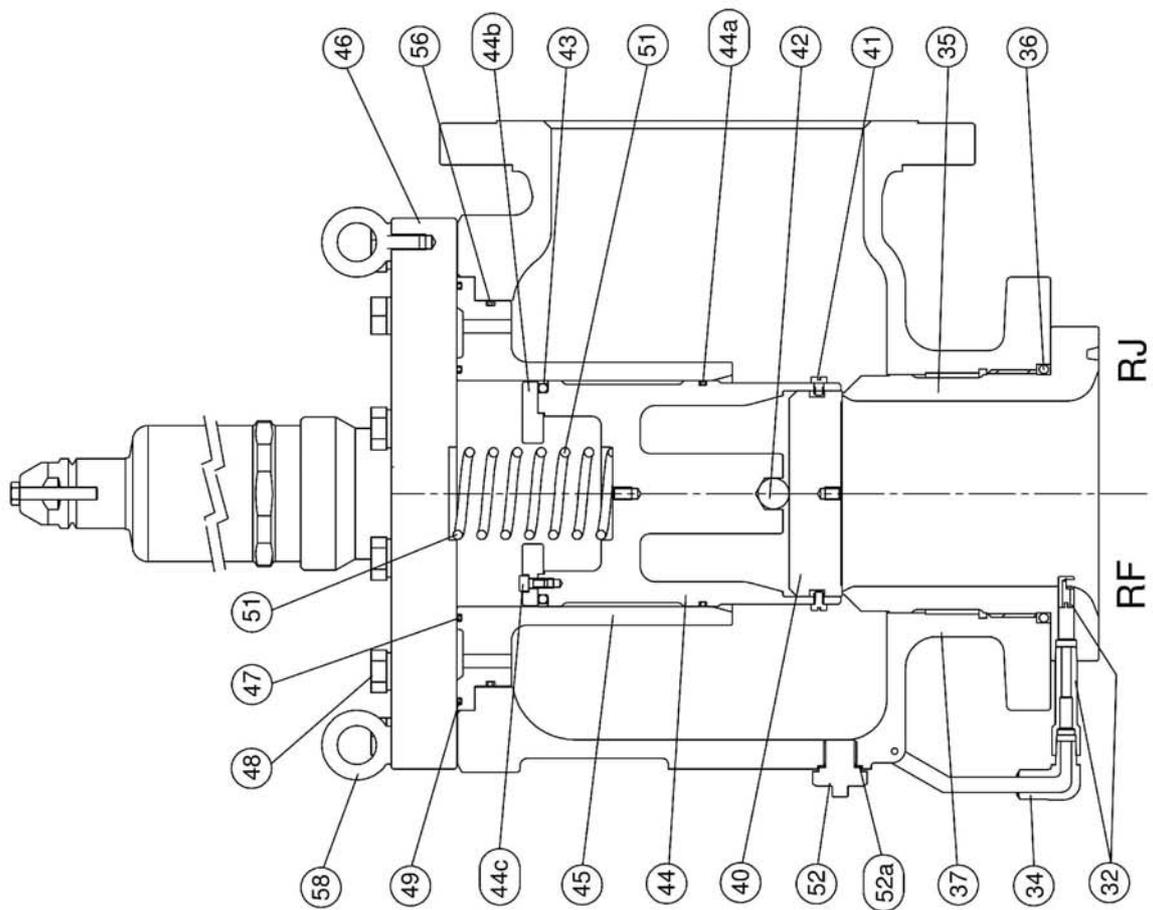
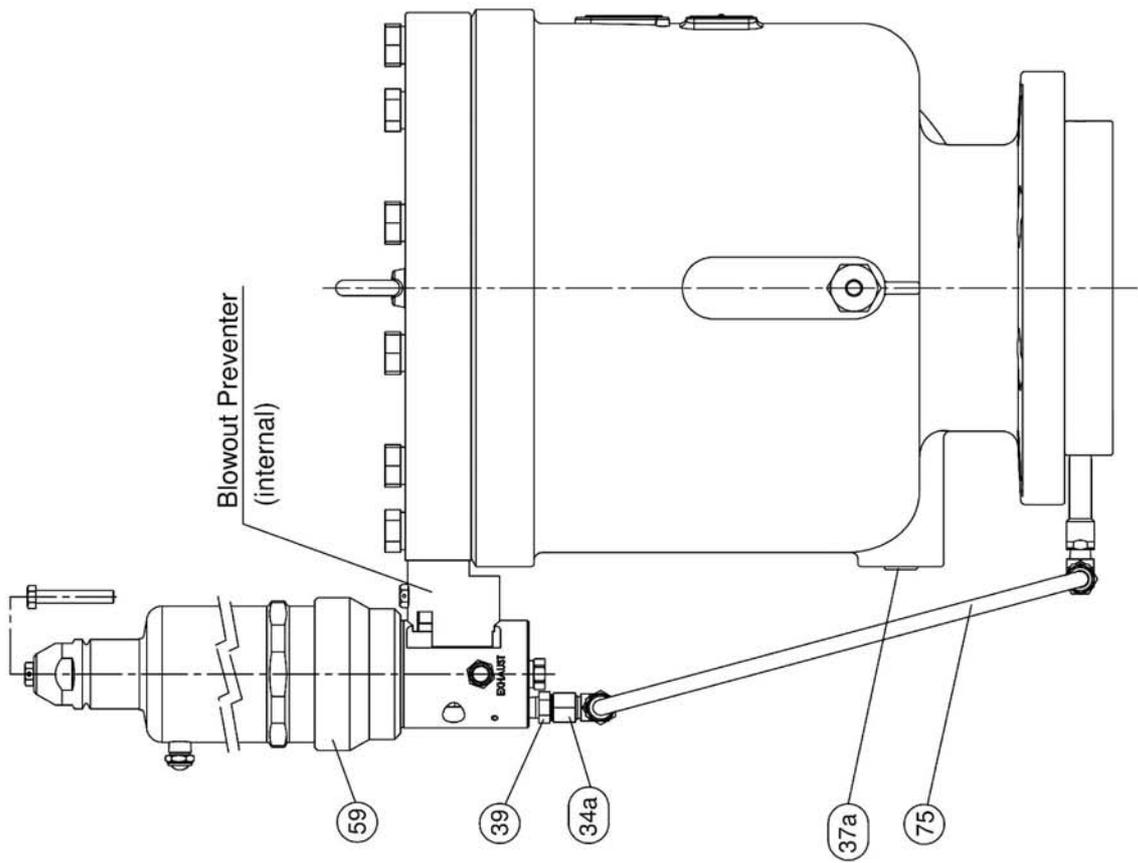
2.1 PILOT OPERATED VALVE WITHOUT ACCESSORIES

To disassemble the pilot operated valve, carry out the following operations, in sequence:

ATTENTION: before disassembling the valve make sure that the system on which it is mounted is not under pressure and that no pressure remains inside the valve itself.

Remove the valve from the system.

ATTENTION: Before disassembling the valve, slowly loosen the fittings in order to let out any pressure that may have accumulated in it or in the pilot, and then proceed as follows:



2.1.1 VALVE

- *loosen the fittings and remove the pipes (75);*
- *unscrew the screws (62) and remove the pilot from the backflow body (65);*
- *unscrew the screws (109) and remove the backflow preventer from the bonnet (46);*
- *unscrew the screws (48) and remove the bonnet (46) from the valve body (37);*
- *remove the eyebolts (58) from the bonnet (46);*
- *remove the spring (51);*
- *remove the guide (45) along with the disc holder (44), the disc (40) and the ball (42);*
- *separate the disc-holder unit (44), and the gaskets (47) (49) (56) from the guide (45);*
- *loosen the screws (41) and separate the disc (40) and the ball (42) from the disc-holder (44);*
- *unscrew the screws (44c) and remove the flange (44b), the gaskets (43) (44a) from the disc-holder (44);*
- *remove the plug (37a), the screw and the gasket (52) from the valve body (37);*
- *unscrew the nozzle (35) from the valve body (37);*
- *remove the gasket (36), the fitting (34), the extension and the ejector (32) from the nozzle (35);*
- *remove the gasket from the extension (32).*

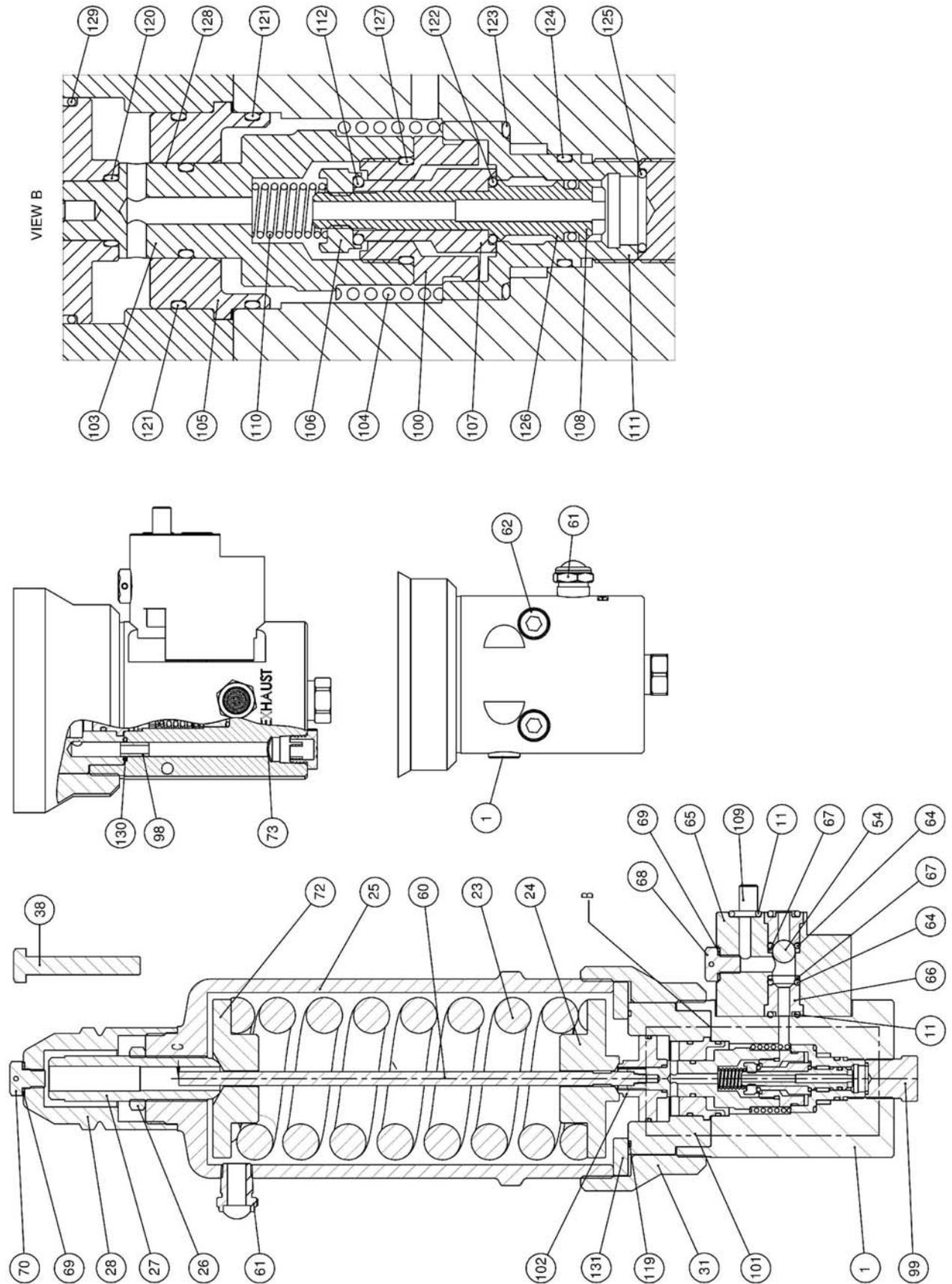
2.1.2 BACKFLOW PREVENTER

- *remove the gaskets (11), the seats (66), the gaskets (64), the ball (54) and the bushings (67);*
- *unscrew the plug (68) and remove the gasket (69).*

2.1.3 PISTON PILOT TYPES "A" AND "B"

- *remove the cap (28) and separate the plug (70);*
- *loosen the locknut (26);*
- *rotate the adjustment screw (27) counter-clockwise to fully discharge the spring (23);*
- *remove the bonnet (25) from the lower base (31);*
- *separate the adjusting screw (27) and the locknut (26) from the bonnet (25);*
- *remove the spring guides (72), the spring (23), the spring guide (24) with the stem (60), the spacer (131) and the gasket (119);*
- *unscrew the stem (60) from the spring guide (24);*
- *remove the lower base (31) from the pilot body (1);*
- *extract from the pilot body (1) the group made up of cylinder (101), guide (105), piston (102), nut (113), spindle (103), nozzle (100), nut (106), spacer (107), disc (108) and spring (110);*
- *remove the nozzle (98) from the pilot body (1);*
- *unscrew the nut (113) and the piston (102) from the spindle (103) and remove the seals (120) (129);*
- *separate the cylinder (101) from the guide (105);*
- *separate the guide (105) from the spindle (103) and remove the gaskets (121) (128);*
- *unscrew the nozzle (100) from the spindle (103) and remove the gasket (127);*
- *remove the spring (110);*
- *using milling, unscrew the nut (106) from the disc (108) and remove the gasket (112);*
- *separate the nozzle (100) from the spacer (107);*
- *separate the spacer (107) from the disc (108) and remove the gaskets (122) (126);*
- *pull out the spring (104);*
- *remove the fitting (34a) and the adapter (39) from the pilot body (1);*
- *remove the plug (99) and the gasket (125) from the pilot body (1);*
- *unscrew the nozzle (111) until it pulls loose from the pilot body (1) and remove the gaskets (123) (124);*
- *remove the filter (61), the cap (118) and the filter net (73).*

TYPE "A"- PROPORTIONAL PILOT 4.51 - 18.7 bar



2.1.4 PISTON PILOT TYPE "C"

- remove the cap (28);
- loosen the locknut (26);
- rotate the adjustment screw (27) counter-clockwise to fully discharge the spring (23);
- remove the bonnet (25) from the body (1);
- separate the adjusting screw (27) and the locknut (26) from the bonnet (25);
- remove the spring guide (72), the spring (23), the spring guide (24) with the stem (60);
- separate the stem (60) from the spring guide (24);
- unscrew the nut (113) from the spindle (21);
- remove the spacer (114), the piston (115), the gaskets (116) (117), the bushing (85) and the gasket (117);
- unscrew the connection (96) from the pilot body (1) and remove the gasket (93) and the net (73);
- remove the gasket (92), the seat (91), the gasket (94) and the group made up of shutter (97), spacer (95), nut (86), seat (90), spindle (21) and spring (84);
- unscrew the spindle (21) from the seat (90) and remove the spring (84) and the gasket (88);
- using milling unscrew the nut (86) from the shutter (97) and remove the gasket (87), the seat (90), the spacer (95) and the seals (89) (87);
- remove the plug (118) and the filter (61).

3. ASSEMBLY

3.1 VALVE WITHOUT ACCESSORIES

For assembly, carry out the same operations of paragraph 2.1), but in reverse order.

ATTENTION: **mount the gaskets on the components in advance and lubricate them with a silicone lubricant.**

4. MAINTENANCE

The safety valve requires simple but careful maintenance (**SEE MAINTENANCE PLAN**) and if necessary, perform the operations listed in paragraph **2**) for disassembly, and **3**) for assembly. The valve's set pressure should be adjusted using a fluid that has the same state of the fluid to be used in operation.

If the gasket seat is damaged, it must be lapped again by specialized personnel.

Should problems arise in the valve, check the **TROUBLESHOOTING TABLE** for suggestions on how to solve the problem.

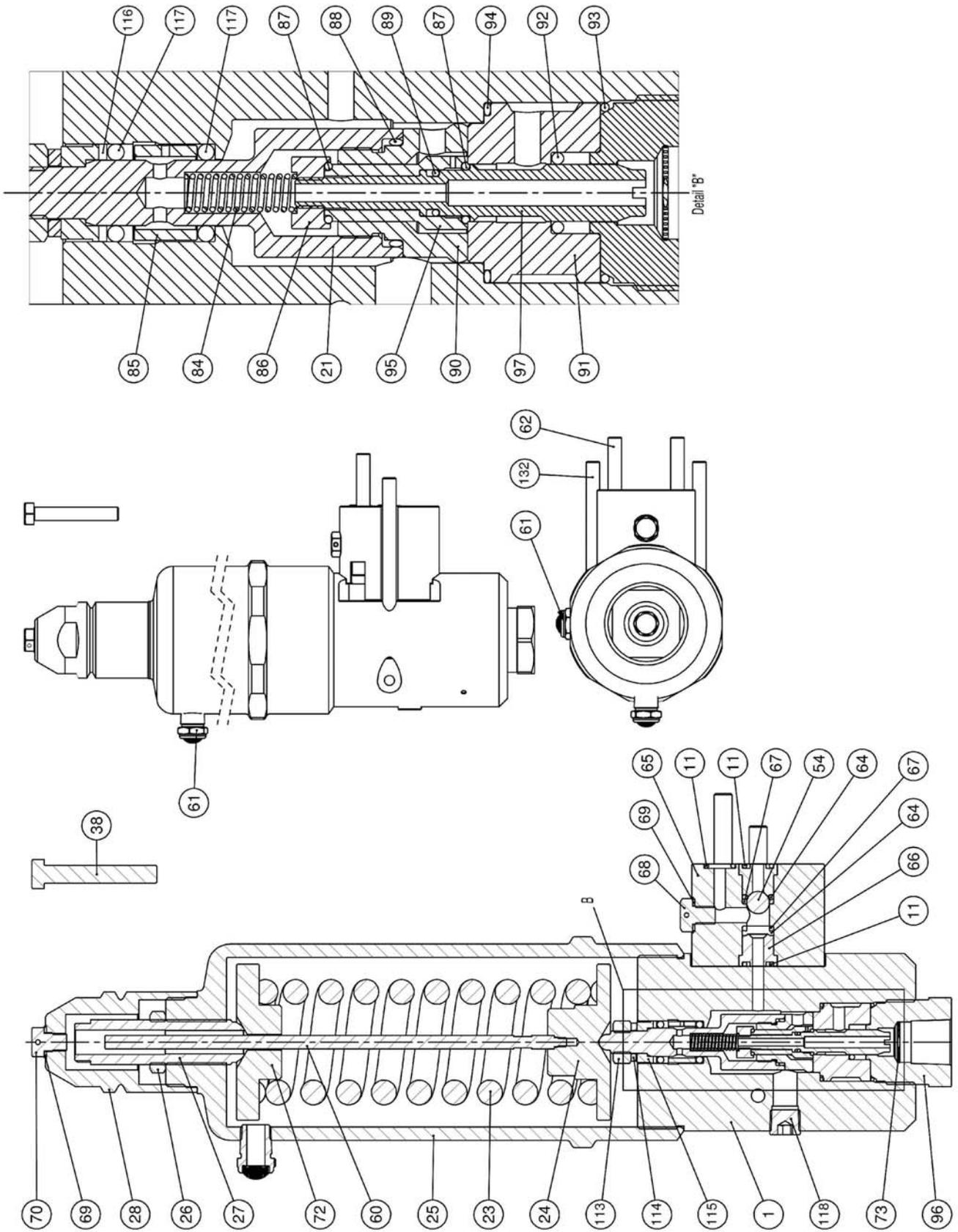
If the problem is not addressed in the table, contact our Service Department.

WARNING

- **The pilot operated safety valves should not be subject to shock or stress that could adversely affect their operation.**
- **High loads on the pilot spring can damage the valve.**
- **The safety valves must be used solely and exclusively for the fluid stated on the construction declaration or others compatible with the materials the valve is made of.**
- **According to Italian regulations, the safety valve must be overhauled within two years from installation if used for hazardous fluids (Group 1) and within three years if used for other fluids (Group 2) independently from the number of operations performed by the valve; if specific local laws exist, comply with them.**

If no regulations exist, follow the guidance given in ORDINARY MAINTENANCE PLAN table.

TYPE "C"- PROPORTIONAL PILOT 95.1 - 413 bar



ORDINARY MAINTENANCE PLAN

While in the system, inspect the tightness of the seat and of the disc	Every valve opening or every 6-months of operation.
Check tightness towards the outside of the system for counter-pressure.	Every 30 days.
Check tightness towards the outside of the pilot, the pipes, the manifolds and the accessories.	Every 6 months.
Check the system's paint condition.	Every 6 months.
Ordinary maintenance of the valve installed in the system, including the tightness check and the visual inspection of moving components.	Every 12-months of operation.
General maintenance of the valve, removed from the system and including disassembly, inspection of the gasket seat and of the disc, and if required, lapping the seat and the disc, replacing the gaskets, repainting the valve and bench testing.	Every time the seats are damaged during opening or every 24-months of operation (Group 1) every 36-months of operation (Group 2)

TROUBLESHOOTING TABLE

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Fluid leakage on the line	Seat wear and tear	Replace or overhaul nozzle
	Disc wear and tear	Replace or overhaul disc
	Damaged seat and disc	Overhaul nozzle and disc
	Foreign matter between seat and disc	Clean and overhaul nozzle and disc
	Use with a fluid different from the one stated in the purchase order	Overhaul nozzle and disc
Leakage of fluid on the line or of external back pressure	Damaged valve gaskets	Replace gaskets
	Valve body-bonnet damage	Overhaul or replace valve
	Fittings loosening	Inspect and tighten fittings
Opening at a pressure different from valve setting	Leak in pilot circuit	Inspect and fix pilot circuit
	Pilot spring failure	Replace spring and check compatibility of spring material with the fluid
	Pilot cap slipped backwards	Recalibrate the pilot and tighten the locknut
Prolonged series of quick opening and closing of the valve	Strong pressure loss in the inlet piping	Check the inlet piping length
	Pulsating discharge flow	Check system calibration
	Oversized valve	Replace the valve with one that is properly sized

<i>ITEM</i>	<i>DESCRIPTION</i>	<i>ITEM</i>	<i>DESCRIPTION</i>
1	PILOT BODY	72	SPRING GUIDE
11	GASKET	73	FILTER
21	SPINDLE	84	SPRING
23	SPRING	85	BUSHING
24	SPRING GUIDE	86	NUT
25	BONNET	87	GASKET
26	LOCKNUT	88	GASKET
27	ADJUSTING SCREW	89	GASKET
28	CAP	90	SEAT
31	LOWER BASE	91	SEAT
32	EJECTOR EXTENSION GASKET	92	GASKET
34	ELBOW	93	GASKET
34a	ELBOW	94	GASKET
35	NOZZLE	95	SPACER
36	GASKET	96	CONNECTION
37	VALVE BODY	97	SHUTTER
37a	PLUG	98	NOZZLE
38	SCREW	99	PLUG
39	ADAPTER	100	NOZZLE
40	DISC	101	CYLINDER
41	SCREW	102	PISTON
42	BALL	103	SPINDLE
43	GASKET	104	SPRING
44	DISC-HOLDER	105	GUIDE
44a	GASKET	106	NUT
44b	FLANGE	107	SPACER
44c	SCREW	108	DISC
45	GUIDE	109	SCREW
46	BONNET	110	SPRING
47	GASKET	111	NOZZLE
48	SCREW	112	GASKET
49	GASKET	113	NUT
51	SPRING	114	SPACER
52	SCREW GASKET	115	PISTON
53	PIPE	116	GASKET
54	BALL	117	GASKET
56	GASKET	118	PLUG
58	EYEBOLT	119	GASKET
59	PILOT	120	GASKET
60	STEM	121	GASKET
61	FILTER	122	GASKET
62	SCREW	123	GASKET
64	GASKET	124	GASKET
65	BACKFLOW BODY	125	GASKET
66	SEAT	126	GASKET
67	BUSHING	127	GASKET
68	PLUG	128	GASKET
69	GASKET	129	GASKET
70	PLUG	130	GASKET
		131	SPACER
		132	SCREW

