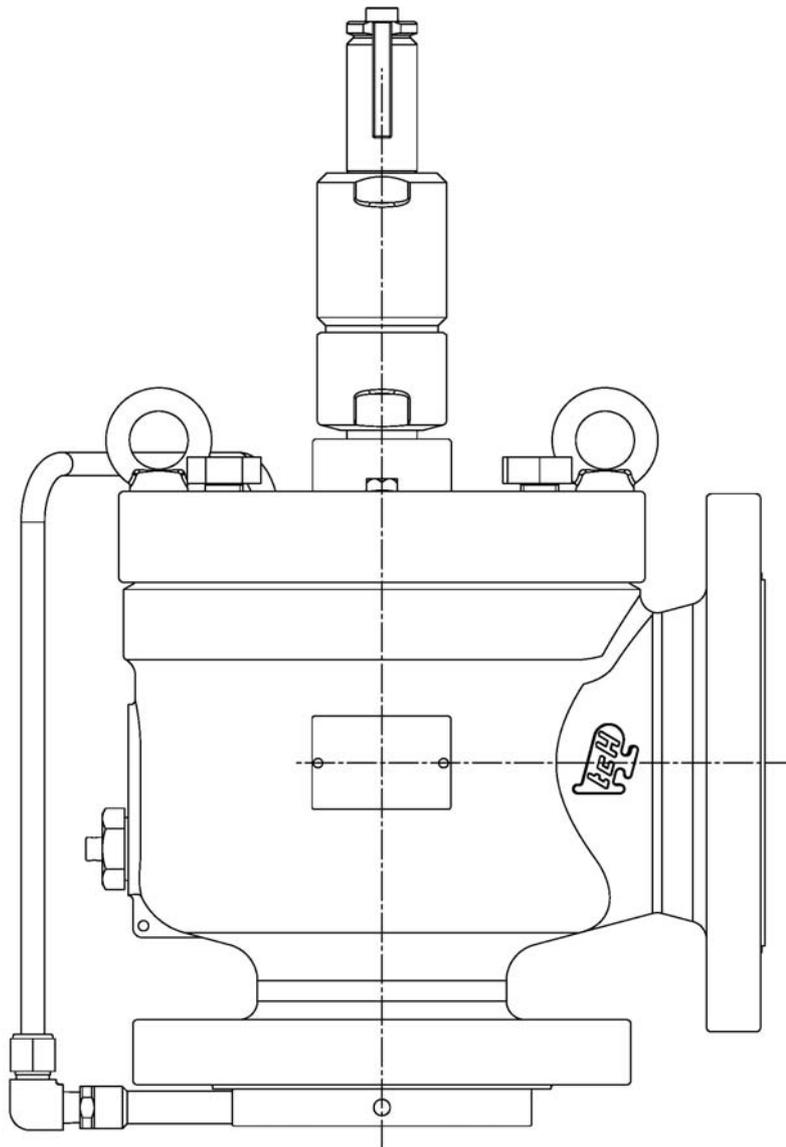


PILOT OPERATED SAFETY VALVES

30000P SERIES ON/OFF TYPE

USE AND MAINTENANCE MANUAL



PRESSURE RELIEF VALVES FOR GASES, VAPORS AND LIQUIDS

Characteristics

- PED Approval;
- zero overpressure;
- 5-20% blowdown pressure;
- spring adjustment as shown in the adjustment fields of the pilot;
- gases and vapors discharge coefficient $k = 0.94$;
- liquids discharge coefficient $k = 0.6$;
- connection: ANSI, UNI, DIN, AFNOR etc.

Accessories

- test gag;
- counter flow prevention device;
- soft seat.

PILOT OPERATED SAFETY VALVES 3000P SERIES

The **3000 P Series** pilot operated safety valves are derived from 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 of the full nozzle, total lift, flat seat type.

The body is cast, the nozzle is made from casting or bar stock and the bonnet, the cap and other parts subject to line pressure are made from bar stock or casting.

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 construction materials;
- the piping to the valve inlet is clean, without contamination, slag etc. and remove them if present;
- the inlet and discharge piping are sized so as to determine the minimum possible 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 the safety valves are hydrostatically tested and calibrated at the pressure required by the Customer. Therefore, on site adjustment should not 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 up to 70 bar; and less than 1% for pressure over 70 bar.

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

1.1.1 set pressure adjustment

To adjust the valve set pressure:

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

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

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

1.1.2 adjusting blowdown pressure

To adjust the valve blowdown pressure:

- loosen the locknut (13);
- turn the blowdown adjustment screw (12) clockwise to decrease the blowdown pressure;
- turn the blowdown adjustment screw (12) counterclockwise to increase the blowdown pressure.

CAUTION: adjustment occurs within $\pm 1/4$ of a turn.

2. DISASSEMBLY

2.1 PILOT OPERATED VALVE

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

CAUTION: 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;

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 MAIN VALVE

- loosen the fitting and remove the pipes;
- unscrew the screws (62) and remove the pilot from the bonnet (46);
- unscrew the screws (48) and remove the bonnet (46) from the valve body (37);
- remove the spring (51);
- remove the guide (45) along with the disc holder (44), the disc (40) and ball (42);
- separate the disc (40), the ball (42) and the screw (41), from the disc holder (44) after they have been removed from the guide (45);
- remove the plug (52) from the valve body (37);
- unscrew the nozzle (35) from the valve body (37) and remove the elbow fitting (34), sensing tube and the ejector (32);
- retrieve all gaskets (36) (52) (43) (44a) (47) (49) (56) from the components.

ITEM	DESCRIPTION	DRAWING
32	SENSING TUBE EIECTOR	
34	ELBOW CONNECTOR	
35	NOZZLE	
36	GASKET	
37	BODY VALVE	
40	DISC	
41	SCREW	
42	BALL	
43	GASKET DISC HOLDER	
44	DISC HOLDER	
44a	DISC HOLDER GASKET	
44b	DISC HOLDER FLANGE	
44c	DISC HOLDER SCREW	
45	GUIDE	
46	BONNET	
47	GASKET	
48	SCREW + WASHER	
49	GASKET	
51	SPRING	
52	SCREW GASKET	
53	PIPE	
56	GASKET	
58	EYEBOLT	
59	PILOT	

2.1.2 PILOT ON/OFF

- remove the external o-rings (11) from the backflow body (65);
- remove the bush (66) the o-rings (64) the ball (54) and the seat bush (67);
- remove the backflow body (65) from the body pilot (1);
- remove the o-rings (11) the bush (66) the o-rings (64) and the seat bush (67);
- remove the screw (68) and the gasket (69);
- remove the cap (28);
- loosen the locknut (26);
- rotate the adjustment screw (27) to fully discharge the spring (23);
- remove the bonnet (25) and the gasket (74) from the lower base (31);
- remove the upper spring guide (72) spring (23) and the lower spring guide (24);
- remove the lower base (31) from the pilot body (1);
- extract sequentially from the pilot body (1) the guide (2), the spindle (21), the seat guide (3), the seat (18) and the spacer (5) in addition to the gaskets (20) (19) (4);
- remove the filter (61) from the body (37);
- remove the ring nut (14) along with the blowdown adjustment screw (12), and the locknut (13);
- separate the locknut (13), the blowdown adjustment screw (12), from the ring nut (14);
- separate the seat (6), the shutter (16) and the piston (8) from the blowdown adjustment screw (12);
- retrieve the gaskets (7) (17) (57) (63).

ITEM	DESCRIPTION	DRAWING
1	PILOT BODY	
2	GUIDE	
3	SEAT GUIDE	
4	GASKET	
5	SPACER	
6	SEAT GUIDE	
7	GASKET	
8	PISTON	
11	GASKET	
12	BLOWDOWN SCREW	
13	LOCK NUT	
14	RING NUT	
16	SHUTTER	
17	GASKET	
18	SEAT GUIDE	
19	GASKET	
20	GASKET	
21	SPINDLE	
23	SPRING	
24	SPRING GUIDE	
25	BONNET	
26	LOCK NUT	
27	ADJUSTING SCREW	
28	CAP	
31	BONNET BASE	
38	TEST GAG	
54	BALL BLOW OUT PREVENTER	
57	GASKET	
60	STEM	
61	STRAINER	
62	SCREW	
63	GASKET	
64	GASKET	
65	BACKFLOW BODY	
66	BUSH	
67	SEAT BUSH	
68	PLUG	
69	GASKET	
70	SCREW	
72	UPPER SPRING GUIDE	
73	INLET FILTER	
74	GASKET	

3. ASSEMBLING

3.1 VALVE WITHOUT ACCESSORIES

To assemble the valve, carry out the same operations of paragraph 2.1), but in reverse order.

CAUTION: mount the seals on the components in advance and lubricate them with a silicone lubricant;

4. MAINTENANCE

The Pilot Operated 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.

If the seat is damaged, a lapping is required: this must be done by skilled workers.

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 spring can damage the valve.
- The safety valves must be used only for the uses stated in the construction declaration.
- The safety valve must be overhauled within two years from installation if used for dangerous fluids (Group 1) and within three years for other fluids (Group 2) independently from the number of operations performed by the valve.

ORDINARY MAINTENANCE PLAN

Check the seat and disc tightness while in the system	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.
Inspect the paint condition while in the system.	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 including disassembly inspection of seat and of the disc, and if required, performing disc and seat lapping, replacement of gaskets, repainting and bench test.	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
External back pressure fluid leakage.	Damaged valve gaskets	Replace gaskets
	Damaged valve body-bonnet	Overhaul or replace valve
	Fittings loosening	Inspect and tighten fittings
Opening at a pressure different from valve calibration	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

