Pressure regulating valve (Unloader)

At gun closure, the waterflow is discharged in bypass reducing the pressure in the system upstream of the valve.

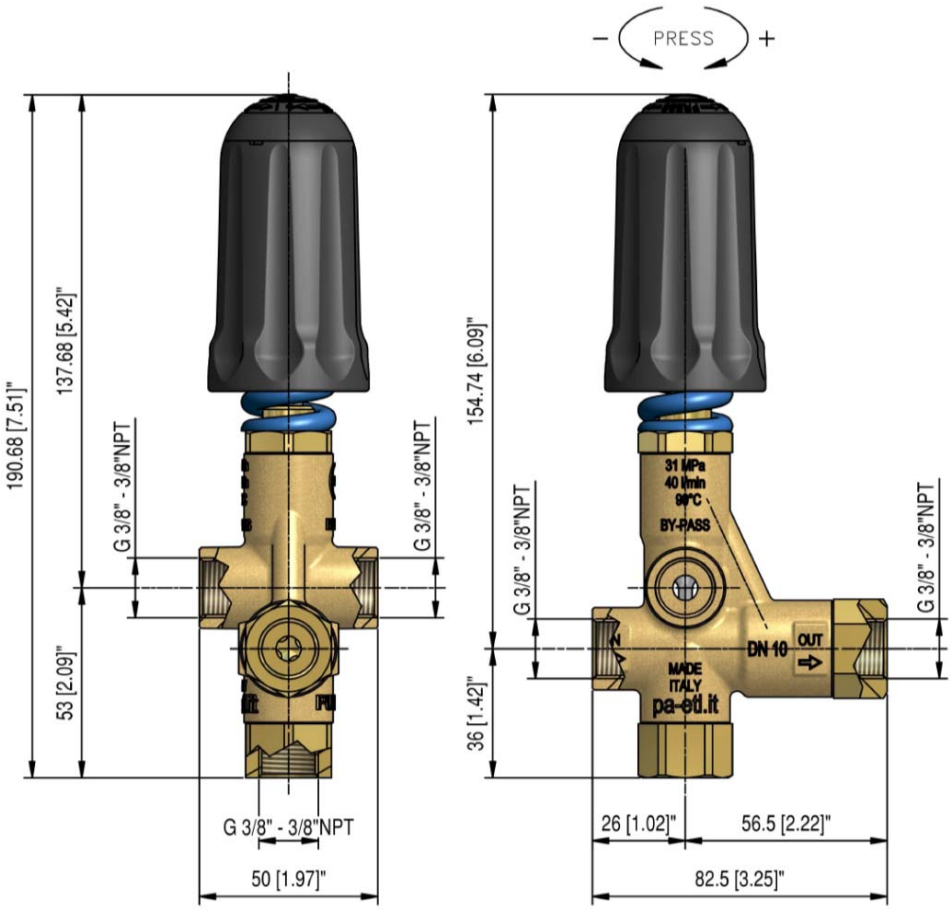
1) The valve has been designed for a continuous use with water at a temperature of **60℃ (140℉)** . It can work for short periods with water at the maximum temperature of **90℃ (195℉)** .

2) When the valve is in bypass mode, this is the decrease of pressure that has to occur in the circuit downstream of the valve, in order that the valve can restore the working pressure in the system. The indicated figure is expressed as a percentage of the pressure setting (working pressure).

3) If the valve is fed through the lower inlet port, the maximum flow rate is 20 l/min.

At gun closure, a pressure increase occurs in the circuit downstream of the valve. This pressure increase is used to activate the valve and discharge all the flow in bypass. The value of the pressure increase cannot be calculated. It depends on the correct setting of the valve (see PRESSURE ADJUSTMENT/SETTING) and on the layout of the system: flow rate, working pressure, length and characteristic of the tubes, closing time of the gun.

DIMENSIONAL DRAWING



PRESSURE REGULATING VALVE

DESCRIPTION
The valve has two inlet ports with Bsp 3/8" F thread (3/8"NPT F) . If the valve is fed through the lower inlet port, the maximum flow rate is 20 l/min (5.3 USGpm).
The valve has an outlet port with Bsp 3/8" F thread (3/8"NPT F) .
The valve has also two bypass ports with Bsp 3/8" F thread (3/8"NPT F) .
The valve is available in two different versions: with and without the plastic adjustment Knob.

SELECTION
This product is intended to be incorporated on a finished machine. This product is to be utilized with clean fresh water, even slightly additivated with normal detergents. For use involving different or corrosive liquids, contact the PA Technical department. Appropriate filtration should be installed when using impure liquids. Choose the valve in line with the working data of the machine where to be installed (permissible pressure, maximum flow rate and rated temperature of the system). In any case, the pressure of the machine must not exceed the permissible pressure imprinted on the valve.

OPERATION
The valve regulates the pressure of the system by altering the flow discharged by the bypass. The adjustment is carried out by changing, by means of a piston, the position of a ball that partially shuts the bypass opening. At gun closure, a check valve closes and isolates the part of the circuit downstream of the valve: the pressure increase that remains trapped is used to activate the complete opening of bypass. All the flow supplied by the pump is therefore discharged at low pressure through the bypass and the pump works at low pressure.

It is recommended to use a nozzle with a size that, at gun opened, allows to discharge from the valve bypass at least 5% of the flow supplied by the pump in order to obtain a constant pressure value, and an easy adjustment and to avoid troublesome pressure spikes at gun closure.
If the nozze wears out, the working pressure decreases. To reset the pressure back to work level, it is necessary to replace the worn out nozzle. When a new nozzle is fitted, re-setting of the system to its original working pressure is necessary.

PRESSURE ADJUSTMENT/CALIBRATION
The desired working pressure must be adjusted with the system running and the gun opened. Adjust the pressure by screwing or unscrewing the adjustment screw/knob. The operation is easier if the correct nozzle has been chosen. When screwing the screw/knob a consequent pressure increase must be matched. If, before reaching the desired pressure, there is no pressure increase when screwing the screw/knob, do not insist but check the correct ratio nozzle/flow rate – pressure and, if necessary, fit a nozzle with an inferior size. With the knob version it is possible to set up the minimum working pressure with the provided locknut (pos.22).
ATTENTION: The nut in position 26 is a mechanical security device that limits the maximum pressure; it must absolutely not be removed.

PROBLEMS AND SOLUTIONS

PROBLEMS	PROBABLE CAUSES	SOLUTIONS
Frequent valve recycles	Damaged check valve O-ring Leaking connections Restricted bypass or too small diameter of the bypass hose	Replace Check or renew Clean or adapt passage diameter
Valve does not reach pressure	Piston O-rings worn out Material between seat and shutter Seat worn out Nozzle worn out Incorrect choice of nozzle	Replace Clean the seat Replace Replace Fit nozzle with lower size
High pressure peaks at gun closure	There is not a min of 5% of total flow discharged in bypass Excessive flow in bypass Adjustment with spring totally compressed	Reset correctly Change type of valve or adjust passages Loosen adjustment screw/knob and eventually fit nozzle with lower size
Valve does not discharge at low pressure at gun closure	Jammed check valve Material matter on check valve	Clean or replace Clean

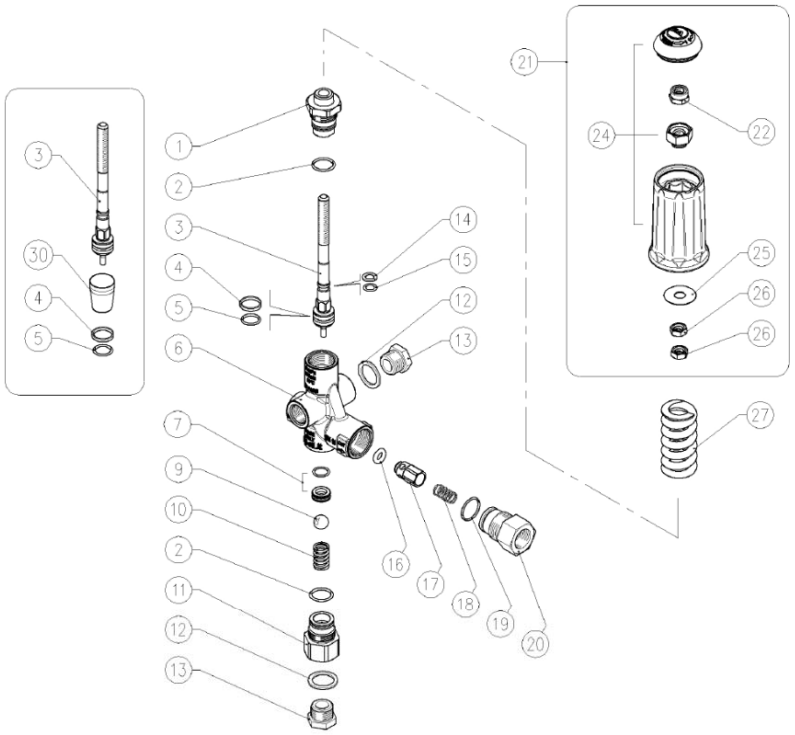
MAINTENANCE
STANDARD: every 400 working hours, control and lubricate the seals with water resistant grease.

SPECIAL: every 800 working hours, control the wear of the seals and internal parts and if necessary, replace with original PA parts taking care, during installation, to lubricate with water resistant grease.

Maintenance has to be carried out by Specialized Technicians.

The Manufacturer is not to be considered responsible for damage as a result from incorrect fitting and maintenance.

PRESSURE REGULATING VALVE ADDITIONAL PARTS INFO



Pos.	P/N	Description	Q.ty	K1	K2	K3	K4	
1	60.0146.31	Piston holder, brass	1					5
2	10.3064.01	O-ring, 1,78x14 mm Ni 85	2	•				10
3	60.0145.51	Puls.4 piston, Sst.	1					5
4	10.4058.00	Back-up ring, opn. 14x16x2 mm	1	•				10
5	10.3058.01	O-ring, 1,78x10,82 mm	1	•				10
6	60.0141.35	Housing -Pulsar 4- 3/8 Bsp F brass (1,2)	1					1
6	60.0136.35	Housing -Pulsar 4- 3/8 Npt F brass (3,4)	1					1
7	60.0259.20	Seat, 8mm + O-ring, 1,78mm	1	•				10
9	14.7461.00	Ball, 13/32" Sst.	1	•				10
10	60.0410.51	Spring, 1,6x11,5x20 mm Sst.	1					5
11	60.0142.31	Suction coupl., 3/8F Bsp brass (1,2)	1					10
11	60.0137.31	Suction coupl., 3/8F Npt brass (3,4)	1					10
12	14.4042.00	Washer, 16,7x22x1,5 mm alu. (1,2)	2					25
13	60.0028.31	Plug,brass 3/8 Bsp,hex.19 (1,2)	2					25
13	60.0025.31	Grub screw, brass 3/8M Npt (3,4)	2					10
14	10.4006.01	Back-up ring, opn. 6,2x9x1,2 mm	1	•				10

Pos.	P/N	Description	Q.ty	K1	K2	K3	K4	
15	10.3051.01	O-ring, 1,78x6,07 mm	1	•				10
16	10.3213.00	O-ring, 3x6 mm	1	•				10
17	60.0052.99	Shutter pin, brass+o-ring 3x6 mm	1					10
18	60.0053.51	Spring, 0,7x9x20 mm Sst.	1					10
19	10.3066.01	O-ring, 1,78x15,6 mm Ni 85	1	•				10
20	60.1811.31	Shutter coupl., 3/8F Bsp brass (1,2)	1					3
20	60.1817.31	3/8Npt F nipple (3,4)	1					3
21	60.0149.24	Knob Kit -Pulsar4, 6x1pcs.	1					1
22	11.4589.10	Hex. locknut, M8	1					10
24	60.0148.24	Knob + Plug -Pulsar4	1					5
25	14.3720.40	Washer, 9,2x24x0,5 mm	1					10
26	11.4573.31	Hex. nut, M8, brass	2					10
27	60.0012.61	Spring, 5x25x50 mm white (1,3)	1					5
27	60.0033.61	Spring, 5,7x26x53 mm blue (2,4)	1					5
30	10.4409.00	Seal frame >Pulsar/zero (2,4) **	1					1

** On request

Kit	P/N	Description	
K1	60.0131.24	Spares kit -Pulsar 4, 9(10)x1pcs.	1

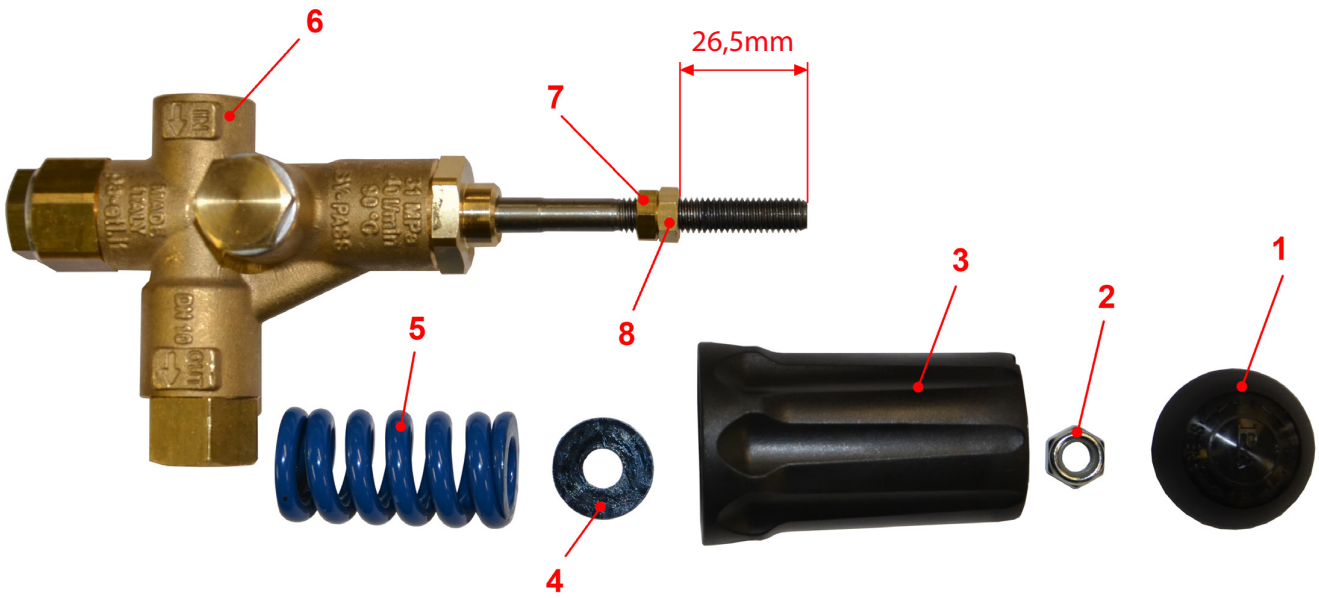
RAVO PN's:

Pressure regulating valve, complete	PN: 4180452
Knob + plug, position 24	PN: 4180453
Kit K1, spare kit	PN: 4180454

PRESSURE REGULATING VALVE ADJUSTMENT INFO

NOTE:
WHEN INSTALLING A NEW PRESSURE REGULATING VALVE ALLWAYS CHECK AND ADJUST THE VALVE SETTING TO 150 BAR.

Adjustment pressure regulator valve to 150 bar.



- Remove the cap (1) from the pressure regulator knob (3).
- Remove the self-locking nut (2).
- Remove the regulator knob (3), washer (4) and spring (5).
- Adjust the nut (8) so that the distance between the top of the nut (8) and the top of the wire-end is 26,5mm.
- Use the nut (7) to lock the nut (8) in place to the adjusted value of 26,5mm.
- Install the spring (5), washer (4) and regulator knob (3) to the pressure regulator (6).
- Install the self-locking nut (2). Make sure the nut (2) is hand tightened.
- Install the cap (1).