



## P.A. - S.r.l. - EQUIPAGGIAMENTI TECNICI DEL LAVAGGIO

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GRUPPO BANCO POPOLARE DI VERONA E NOVARA SWIFT VRBPIT2V492



# VB 80 150/280 – Unloader Valve (discharging)

Technical manual: **E 213**

Pressure regulating unloader valve equipped with double connection for inlet port.

Possibility of different pressure settings by a choice of 2 spring models.

At gun shut off, the water flow is bypassed at reduced pressure.

DN 10



- **60.0400.00** G1/2 F white spring
- **60.0400.05** 1/2Npt F white spring
- **60.0400.08** G1/2 F OR EPDM white spring
- **60.0400.60** G1/2 F blue spring
- **60.0400.61** G1/2 F blue spring w/handwheel
- **60.0400.64** G1/2 F with gauge port
- **60.0400.65** 1/2Npt F blue spring

- Sturdy construction in steel and brass
- Return action of the piston by means of a powerful spring, for confident working and a reliable pressure adjustment.
- Multiple connections for easy installation
- Hexagonal shaped check valve to avoid jamming.
- Version with manual pressure adjustment simplified by a hand wheel.
- Version with gauge port.

### Technical specifications

Max. flow rate: 80 l/min.(1) Max temperature: 90°C (2)

| Part Number | Rated pressure | Permissible pressure | Minimum adjustable pressure | (3)Trapped pressure at circuit closure | (4)Pressure drop to reset bypass | Inlet Outlet Bypass | Weight |
|-------------|----------------|----------------------|-----------------------------|--|----------------------------------|---------------------|--------|
|             | bar - MPa      | bar - MPa            | bar - MPa                   | %                                      | %                                |                     |        |
| 60.0400.00  | 150 - 15       | 170 - 17             | 15 - 1.5                    | 9%                                     | 24%                              | G1/2 F              | 1240   |
| 60.0400.05  | 150 - 15       | 170 - 17             | 15 - 1.5                    | 9%                                     | 24%                              | 1/2Npt F            | 1240   |
| 60.0400.08  | 150 - 15       | 170 - 17             | 15 - 1.5                    | 9%                                     | 24%                              | G1/2 F              | 1240   |
| 60.0400.60  | 280 - 28       | 310 - 31             | 28 - 2.8                    | 8%                                     | 26%                              | G1/2 F              | 1270   |
| 60.0400.61  | 280 - 28       | 310 - 31             | 28 - 2.8                    | 8%                                     | 26%                              | G1/2 F              | 1310   |
| 60.0400.64  | 280 - 28       | 310 - 31             | 28 - 2.8                    | 8%                                     | 26%                              | G1/2 F              | 1330   |
| 60.0400.65  | 280 - 28       | 310 - 31             | 28 - 2.8                    | 8%                                     | 26%                              | 1/2Npt F            | 1270   |

(1) Max.flow rate: 30 l/min if fed by lower fitting.

(2) The valve has been designed for a continuous use at a water temperature of 60°C. It can resist for short periods at a maximum temperature of 90°C.

(3) This is the maximum pressure increase implemented in the circuit for the intervention of the valve and to bring all the fluid in bypass (percentage figures of the pressure set up)

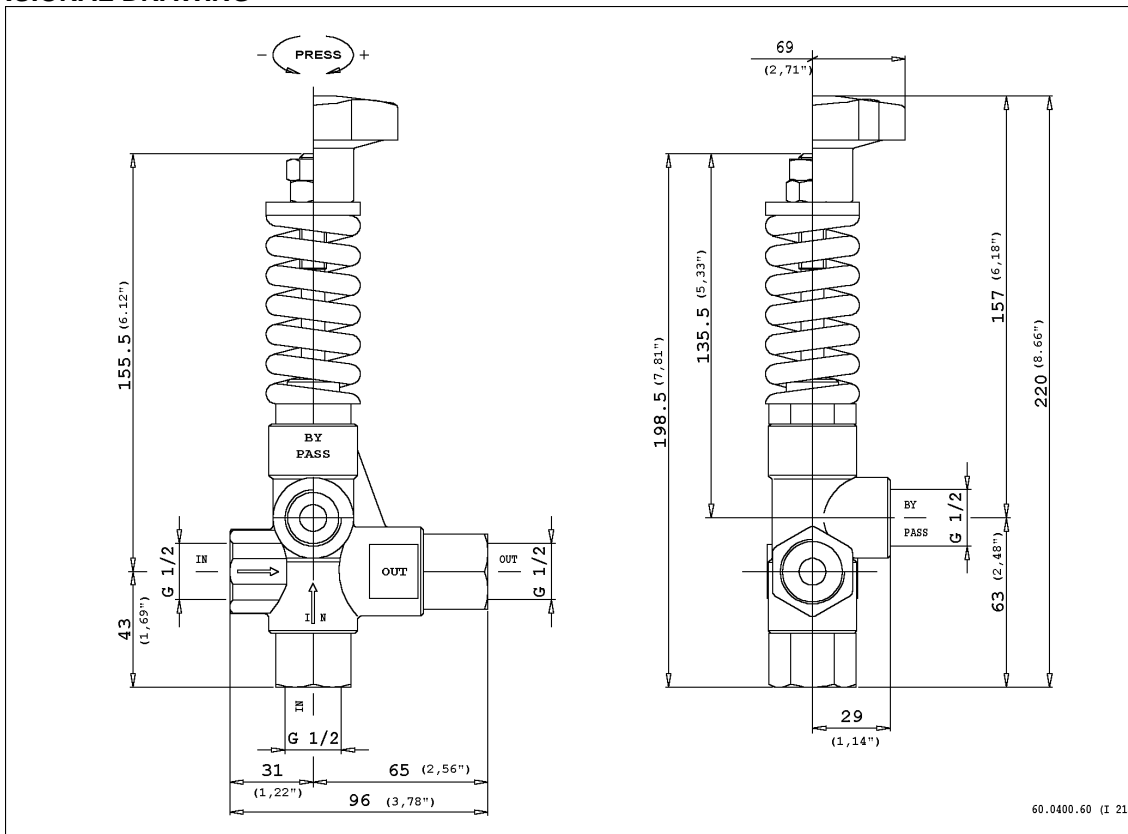
(4) This is the pressure reduction necessary in comparison to the set up, in order that the valve brings back pressure in the circuit. (percentage figures of the pressure set up)

**Instruction manual, maintenance, installation, spare parts.**

For a correct utilization, follow the directions of this manual

**Re-print them on the Use and Maintenance booklet of the machine.**

n. 12.9213.00

**DIMENSIONAL DRAWING****INSTRUCTIONS****SELECTION**

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 unclean liquids. Choose the valve in line with the data of nominal running (system rated pressure, max flow and max temperature). **In any case, the pressure of the machine should not exceed the permissible pressure rate imprinted on the valve.** The feeding from the lower fitting is possible with a reduced flow rate (see point 1)

**INSTALLATION**

This accessory, on a system that produces hot water, must be fitted in **front of the heat generator**. This product is bound to be incorporated on a finished machine. On a system that generates hot water, anticipate the fitting of accessories that limit the accidental increase of fluid temperature.

**Always install a safety valve that protects the pressurized inlet channel.**

Choose a correct nozzle size, which allows a regular discharge on bypass, at least 5% of the total flow of the system in order to achieve a constant pressure value and avoid troublesome pressure spikes at closure. If the nozzle wears out, the pressure drops. On installation of a new nozzle, re-adjust the system to the original pressure setting. The use of the white spring (150 bar – 15 MPa), is advisable in presence of low pressure, to decrease during lance aperture, motor strain caused by overpressure necessary to obtain bypass condition.

**OPERATIONS**

The valve regulates the max pressure of the system through a piston, which acts on a ball correctly positioned, that closes the bypass opening. A check valve cuts out the delivery section, the pressure of which controls the drive of the piston. Each regulation should be made when the system is operational and the nozzle open.

After adjusting the valve to the set pressure, tighten the nut (pos.24\*) and mark it with a drop of paint in order to emphasize any possible tampering.

**ATTENTION: The nut (pos 24\* nr 1pz) must never be removed otherwise a mechanical safety feature that limits the max pressure will lack, avoiding serious damage to persons and machine.**

**DISCHARGE SYSTEM AND WATER ADDUCTION**

The bypass line should be returned into a tank with deflectors. By using a direct pump recycle, with elevated pressure intake, it is necessary to install a pressure reducer in order to have an even flow supply and to protect the circuit intake.

When the system is opened and closed frequently, it is recommended to install a thermal protector valve (VT3 or VT6) in order to eliminate excessive temperature build-up.

For the pump return line, it is advisable to fit a hose at least 250mm in length.

## PROBLEMS AND SOLUTIONS

| PROBLEMS                                 | PROBABLE CAUSES   | SOLUTIONS   |
|--|---|---|
| Frequent unloader recycles               | Damaged check valve O ring<br>Leaking connections<br>Restricted bypass  | Replace<br>Check and renew<br>Clean or adapt                                      |
| Unloader does not reach pressure         | Unloader not properly sized<br>Piston O rings worn out<br>Material matter between seat and shutter<br>Worn out nozzle | Change spring or type of valve<br>Replace<br>Clean the seat<br>Replace            |
| Pressure peaks                           | There is not a min of 5% of total flow in bypass<br>Excessive flow in bypass<br>Spring totally compressed             | Reset<br>Change type of valve or adjust passages<br>Loosen knob and change nozzle |
| Unloader does not bypass at low pressure | Jammed check valve<br>Check valve O ring worn out<br>Material matter on check valve                                   | Clean or replace<br>Replace<br>Clean  |

## REGULATIONS : *see norm manual*

**The accessory hereby described bears the CE marking in accordance with the Norms and Directives applied on the Declaration of conformity.**

For a correct utilization, follow the directions described in this manual and re-print them on the Use and maintenance manual of the machine.

Make sure that you are given **the Original Conformity Declaration** for the accessory chosen. The present manual is valid for all unloader valves named **VB 80 150/280**.

## **MAINTENANCE**

Maintenance has to be carried out by **Specialized Technicians**.

**STANDARD:** every 400 working hours (circa 10,000 cycles), check and lubricate the seals with water resistant grease.

**SPECIAL:** every 800 working hours( circa 20,000 cycles), control the wear of the seals and internal parts and if necessary, replace with original PA parts taking care during installation and to lubricate with water resistant grease.

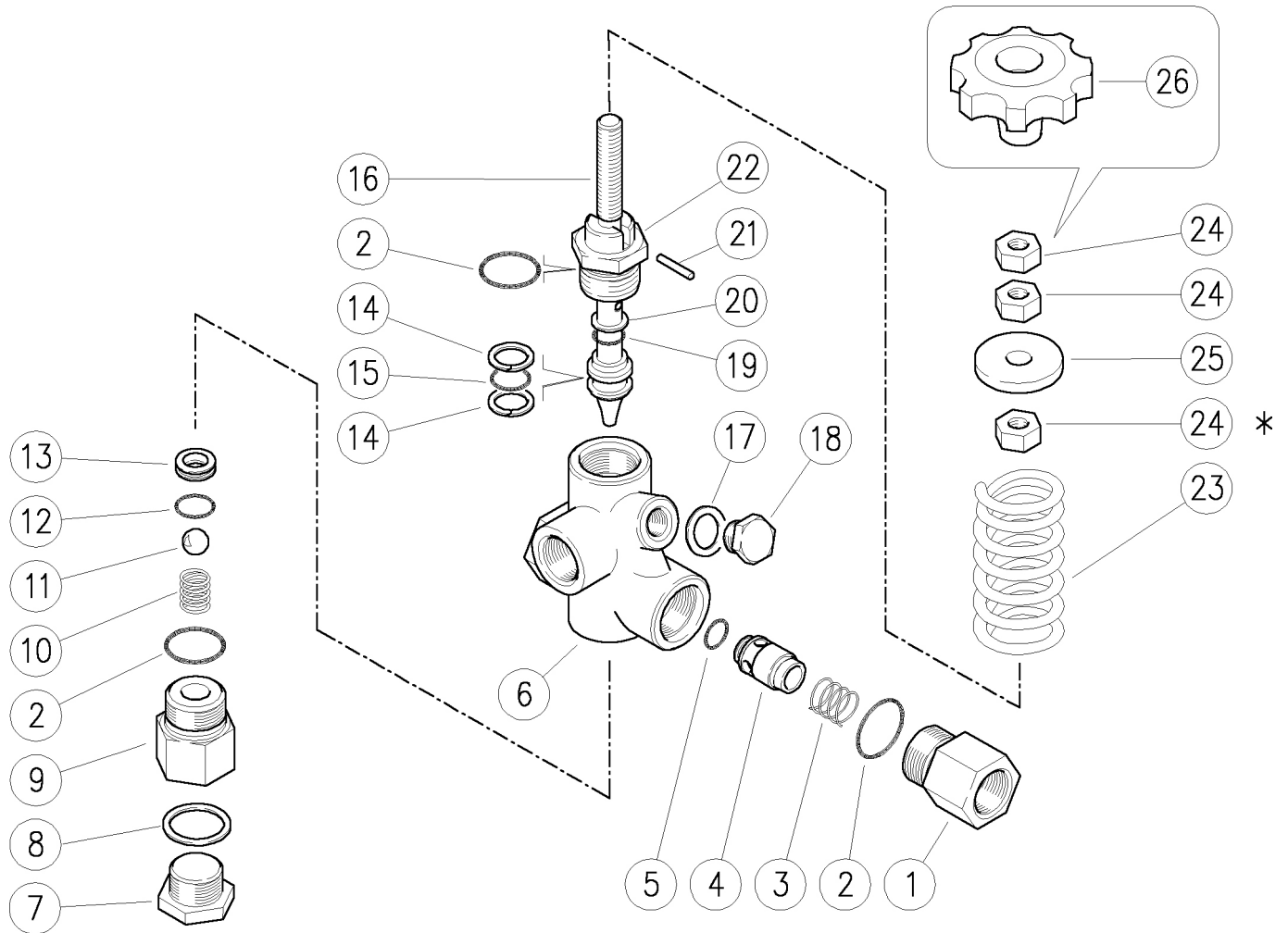
**ATTENTION:** reassemble the valve in the correct manner paying special attention to the Nut (pos 24\*) by fastening it with a drop of strong glue.

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

Technical data, descriptions and illustrations are indicative and liable to modification without notice.

60.0400.00 VB80/150 unload. 1/2F Bsp  
 60.0400.05 VB80/150 unload. 1/2F Npt  
 60.0400.08 VB80/150 unload. 1/2F Bsp +EPDM seals  
 60.0400.60 VB80/280 unload. 1/2F Bsp

60.0400.61 VB80/280 unload. 1/2F Bsp +hand wheel  
 60.0400.64 VB80/280 unload. 1/2F Bsp + gaug.inl 1/4  
 60.0400.65 VB80/280 unload. 1/2F Npt



| Pos. | P/N        | Description                                | Q.ty | K1 | K2 | K3 | K4 |    |
|------|------------|--|------|----|----|----|----|----|
| 1    | 60.0402.31 | Shutter coupl., 1/2F Bsp brass             | 1    |    |    |    |    | 5  |
| 1    | 60.0442.31 | Delivery coupl., 1/2"Npt brass (1)         | 1    |    |    |    |    | 3  |
| 2    | 10.3072.01 | O-ring, 1,78x20,35 mm Ni 85                | 3    | •  | •  |    |    | 10 |
| 2    | 10.3072.18 | O-ring, 1,78x20,35 mm EPDM (2)             | 3    |    |    |    |    | 5  |
| 3    | 60.0409.51 | Spring, 0,8x15,4x13 mm Sst.                | 1    |    |    |    |    | 5  |
| 4    | 60.0403.31 | Shutter pin, brass                         | 1    |    |    |    |    | 5  |
| 5    | 10.3292.00 | O-ring, 4x8 mm                             | 1    | •  | •  |    |    | 10 |
| 5    | 10.3292.10 | O-ring, 4x8 mm Vi 70 (2)                   | 1    |    |    |    |    | 10 |
| 6    | 60.0426.35 | Housing -VB80, 1/2F Bsp brass              | 1    |    |    |    |    | 3  |
| 6    | 60.0427.35 | Housing -VB80, 1/2F Npt brass (1)          | 1    |    |    |    |    | 3  |
| 6    | 60.0420.35 | Housing -VB80, 1/2F Bsp-1/4F Bsp brass (3) | 1    |    |    |    |    | 3  |
| 7    | 60.0413.31 | Plug,brass 1/2 Bsp, hex.27                 | 1    |    |    |    |    | 10 |
| 7    | 60.0444.31 | Grub screw, brass 1/2 Npt (1)              | 1    |    |    |    |    | 10 |
| 8    | 14.4290.00 | Washer, 22x27x1,5 mm alu.                  | 1    |    |    |    |    | 10 |
| 9    | 60.0405.31 | Suction coupl., 1/2F Bsp brass             | 1    |    |    |    |    | 3  |
| 9    | 60.0443.31 | Suction coupl., 1/2"Npt brass (1)          | 1    |    |    |    |    | 3  |
| 10   | 60.0410.51 | Spring, 1,6x11,5x20 mm Sst.                | 1    |    |    |    |    | 5  |
| 11   | 14.7461.00 | Ball, 13/32" Sst.                          | 1    | •  | •  |    |    | 10 |
| 12   | 10.3060.01 | O-ring, 1,78x12,42 mm Ni 85                | 1    | •  | •  |    |    | 10 |

| Pos. | P/N        | Description                       | Q.ty | K1 | K2 | K3 | K4 |    |
|------|------------|-----------------------------------|------|----|----|----|----|----|
| 12   | 10.3060.18 | O-ring, 1,78x12,42 mm EPDM (2)    | 1    |    |    |    |    | 5  |
| 13   | 60.0408.51 | Seat, 8,5x15,9x4,5 mm Sst.        | 1    | •  | •  |    |    | 5  |
| 14   | 10.4014.00 | Back-up ring, opn. 18x13,5x1,2 mm | 2    | •  | •  |    |    | 10 |
| 15   | 10.3178.00 | O-ring, 2,62x13,1 mm              | 1    | •  | •  |    |    | 10 |
| 15   | 10.3178.18 | O-ring, 2,62x13,1 mm EPDM (2)     | 1    |    |    |    |    | 5  |
| 16   | 60.0407.51 | Piston, M10 Sst.                  | 1    |    |    |    |    | 5  |
| 17   | 14.3912.00 | Washer, 14x20x1,5 mm alu. (3)     | 1    |    |    |    |    | 10 |
| 18   | 28.0013.31 | Plug, brass 1/4 Bsp (3)           | 1    |    |    |    |    | 25 |
| 19   | 10.3174.00 | O-ring, 2,62x9,93 mm              | 1    | •  | •  |    |    | 10 |
| 19   | 10.3174.18 | O-ring, 2,62x9,93 mm EPDM (2)     | 1    |    |    |    |    | 5  |
| 20   | 10.4015.00 | Back-up ring, 10x14,5x1,2 mm      | 1    | •  | •  |    |    | 10 |
| 21   | 15.1032.00 | Roll pin, 3x18 mm Sst.            | 1    |    |    |    |    | 10 |
| 22   | 60.0404.31 | Piston holder, brass              | 1    |    |    |    |    | 3  |
| 23   | 60.0412.61 | Spring, 7,5x35x70 mm blue         | 1    |    |    |    |    | 10 |
| 23   | 60.0411.61 | Spring, 6,5x33x70 mm white (4)    | 1    |    |    |    |    | 3  |
| 24   | 11.4629.00 | Hex. nut, M10                     | 3    |    |    |    |    | 10 |
| 25   | 60.0406.31 | Spring holding washer, brass      | 1    |    |    |    |    | 10 |
| 26   | 12.8310.00 | Handwheel, M 10 F (5)             | 1    |    |    |    |    | 5  |

| Kit | P/N        | Description                       |   |
|-----|------------|-----------------------------------|---|
| K1  | 60.0415.24 | Spares kit -VB80, 9x1pcs.         | 1 |
| K2  | 60.0414.24 | Spares kit -VB80/150-200, 9x5pcs. | 1 |

(1) 60.0400.05/65 (2) 60.0400.08 (3) 60.0400.64 (4) 60.0400.00/05 (5) 60.0400.61