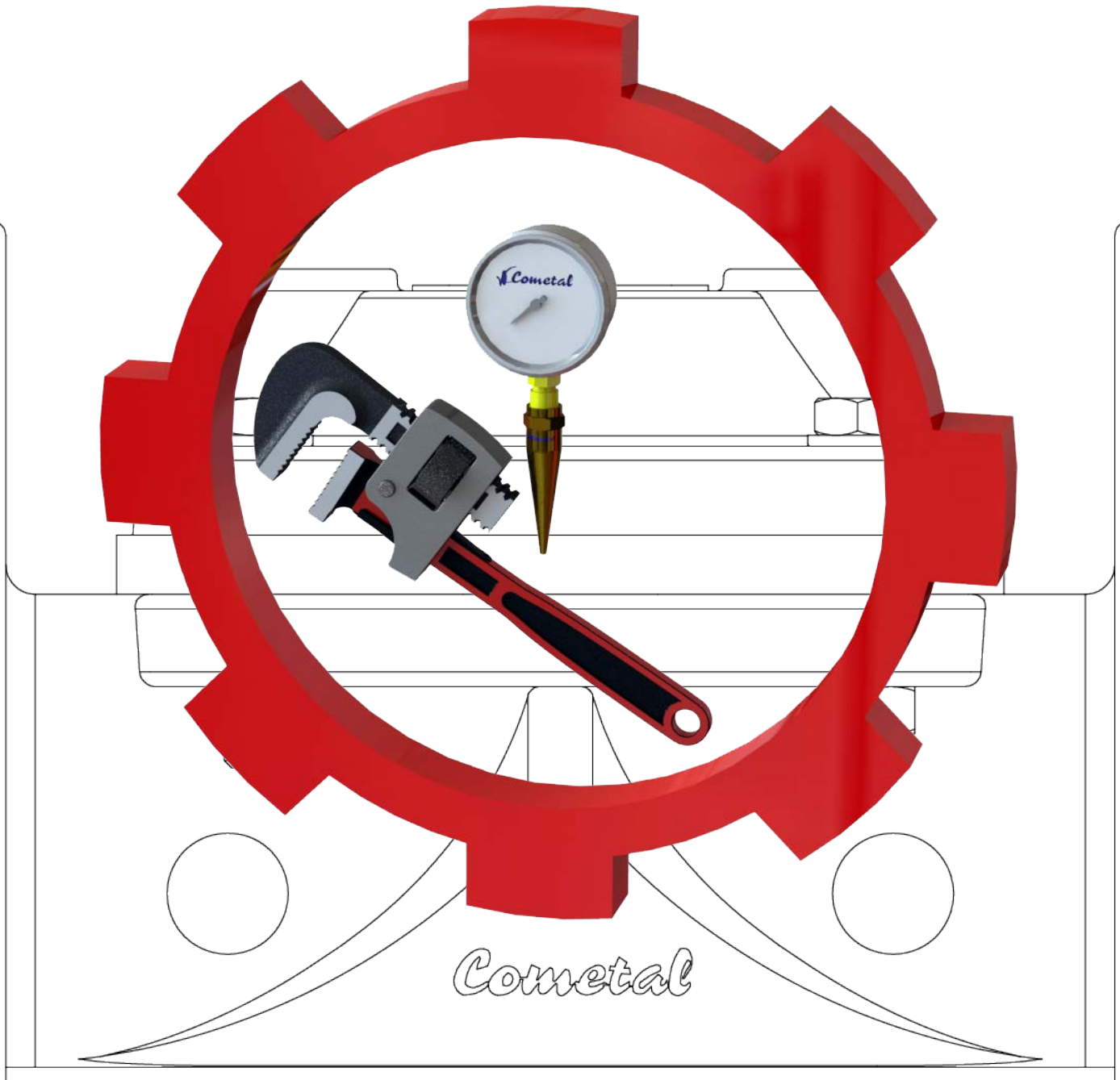
Cometal®
ALTA TECNOLOGÍA PARA AGUA

INSTALLATION, OPERATION AND MAINTENANCE OF HYDRAULIC VALVES



EDITION 2022

In the installation, commissioning and maintenance of the hydraulic valve and its accessories, the possible problems that may arise must be taken into account, understanding the suitability of each element and evaluating the causes to act accordingly. It is advisable to consult the technical specifications of each product, to ensure that it works optimally for a long service life.

GENERAL CONSIDERATIONS

• VALVE SELECTION

- **Dimensión**: diámetro nominal.
- **Dimension:** nominal diameter.
- **Flow:** load losses (1-3 mca).
- **Pressure:** minimum activation pressure and nominal pressure.
- **Connection:** flange, thread or groove.

• VALVE FUNCTION

- Opening-closing.
- Pressure reducing.
- Pressure sustaining.
- Flow control.
- Security: relief, wave anticipator, level control.
- Automatic filters.

• VALVE COMMAND

- **Manual** (three way tap).
- **Electric** (solenoid).
- **Remote** (hydraulic micropipe or electrical wire).

• INTEGRATION OF THE VALVE IN THE NETWORK

- Water quality.
- Interaction with other network elements: pumps, pipes, filters, meters, emitters, remote control, etc.
- The installation of measuring equipment, such as pressure gauges and watermeters, is recommended to have information on each situation.

• INSTALATION

- Place the valve in the proper flow direction.
- Use connectors compatible with the valve, following current regulations.
- **Flanges:** ISO-UNE-BS connection; ASME-ANSI; ACE. Use of flat gasket to achieve tightness and tighten the screws in a balanced way, crosswise.
- **Threads:** BSP, NPT connection; Use of teflon tape to achieve tightness.
- **Grooves:** correctly place the gasket and tighten the collar in a balanced way.

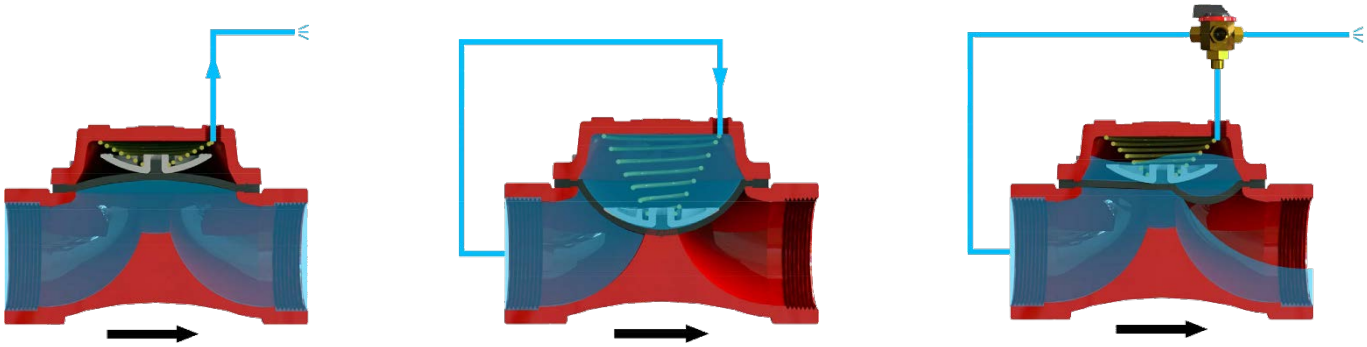
• MECHANICAL STRENGTH

- Overpressures: nominal pressure and maximum admissible pressure.
- Knocks, mishandling of threads, flanges, etc..
- Ice action: drainage of the network elements in winter stop.

• TIGHTNESS

- Tightening torque (torque wrench).
- Incorrect sealing in connections (threads, flanges, etc).
- Breakage of elements or microtubes.

• WORKING SCHEME



✓ The valve does not open:

- The force in the control chamber is greater than in driving.
- Pressure in the network less than the minimum activation pressure.
- Incorrect connection of the different elements: three-way valve, solenoid, pilots, VAR, filter, microtube, etc..
- Insufficient hydraulic or electrical signal.
- Leaks or obstructions of the different elements.

✓ The valve does not close:

- The force in the control chamber is less than in driving.
- Incorrect connection of the different elements: three-way valve, solenoid, pilots, VAR, filter, microtube, etc.
- Leaks or obstructions of the different elements
- Insufficient hydraulic or electrical signal.
- Obstruction in the membrane seat.
- Broken or deformed membrane.

✓ Other aspects:

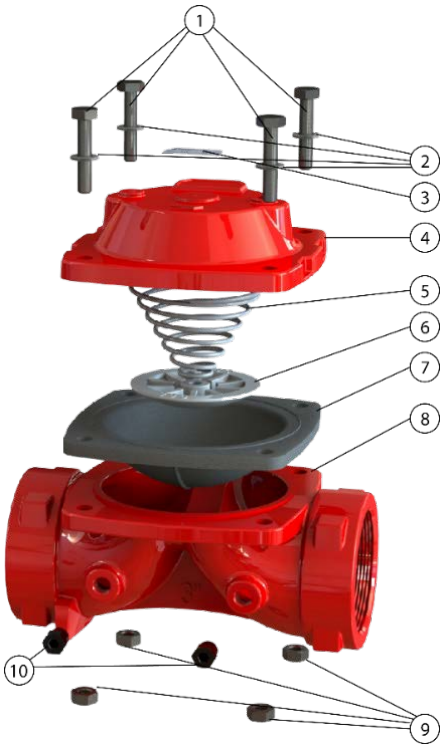
- Cavitation: high differential pressure - excessive flow. Noise and vibrations.
- Opening and closing times:

Fast reaction time: passage section to large control chamber.
Slow reaction time: passage section to small control chamber.

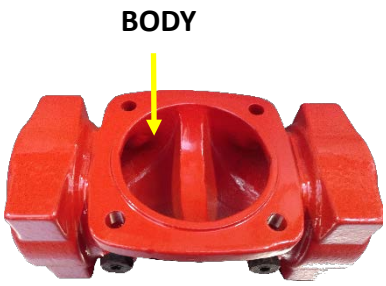
- Terrain topography. Consider the water column: 10 mca = 1 bar = 1 Kg/cm2.

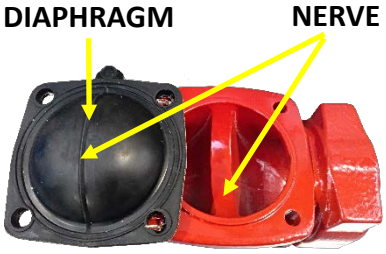
CHANGE OR REPLACEMENT OF VALVE ELEMENTS

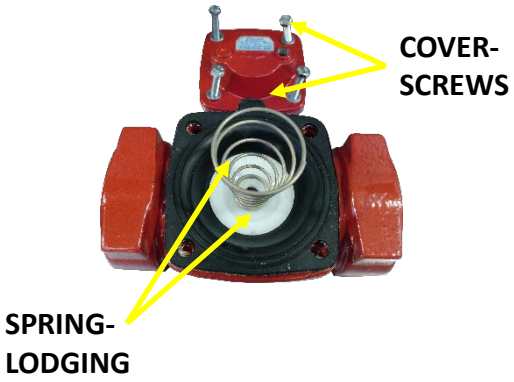
Any part of the valve can be replaced quickly and easily. For this it is necessary to depressurize the network to avoid accidents.



ITEM	*DENOMINATION*
1	*BOLT*
2	*WASHER*
3	*IDENTIFICATION PLATE*
4	*COVER*
5	*SPRING*
6	*LODGING*
7	*DIAPHRAGM*
8	*BODY*
9	*SCREW*
10	*PLUG*







✓ **Valve tightening torque (torque wrench) - Nm.**

	CAST IRON VALVES					NYLON VALVES	
PN	1”-1 ½” P	1 ½”G-2”-2 ½”-3”	DN80-100-125	DN150	DN200-250	1”-1 ½”-2”-2 ½”-3”	4”
6-16	10	15	30	70	90		
10						10	20

COMMON SITUATIONS AND PROBLEMS IN PILOTS AND ACCESSORIES

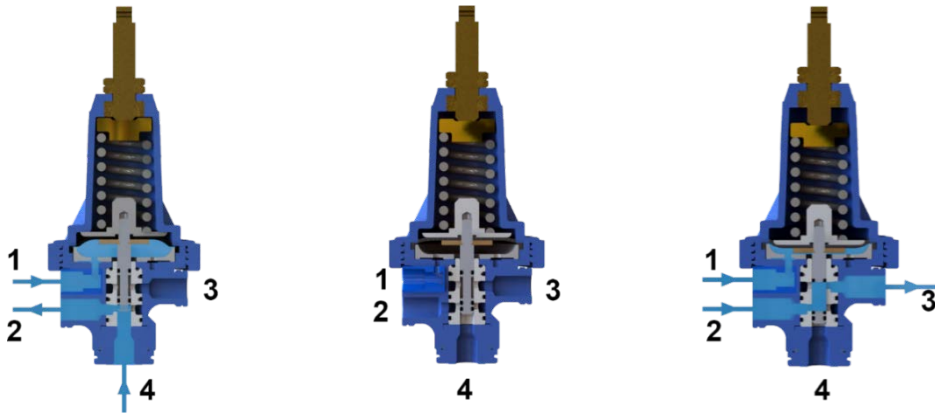
• MECHANICAL RESISTANCE AND SEALING

- Cap and / or body breakage.
- Tear or tear of membrane, o-rings or teflon housing.

• WORKING SCHEME

- Pressure: Reduced downstream. Sustained upstream. Pilot spring range.
- Flow: Valve sizing. Orifice plate.
- Connections in hydraulic circuit.

PRAL®: PRESSURE REGULATING PILOT



✓ Pressure reducer:

- The valve reduces the downstream pressure and keeps it constant ± 10%
- Recommended pressure reduction in 3: 1 ratio (upstream-downstream).
- Choice of pilot spring: regulated pressure range.
- Valve sizing: depending on the required flow and pressure drops (2-5 mca).
- Oversized valve: the required flow is below the minimum flow in the regulation curve: the downstream pressure oscillates and does not stabilize.
- Under-sized valve: the required flow is above the maximum flow in the regulation curve: high water speed - cavitation.

✓ Pressure sustainer:

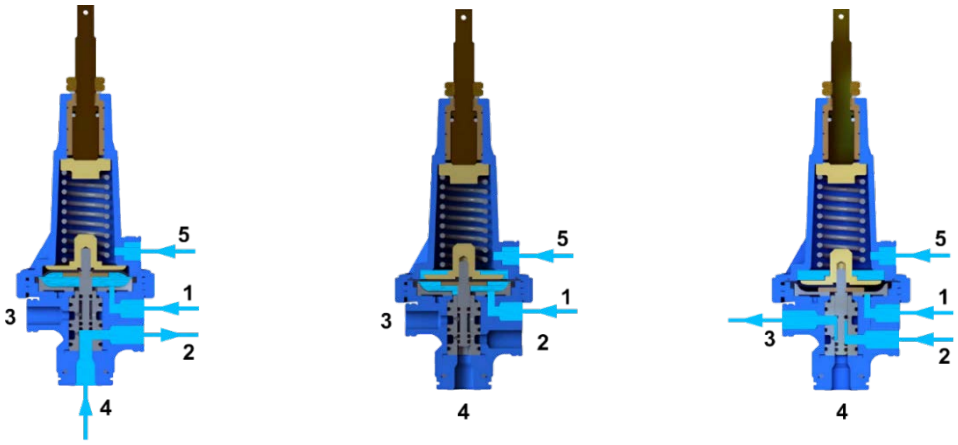
- The valve maintains the upstream pressure and maintains it constant ± 10%.
- Choice of pilot spring: regulated pressure range.
- Valve sizing: depending on the required flow and pressure drops (2-5 mca).

✓ Other aspects:

- The valve opens and relieves the pressure in the main line..
- Valve Sizing - Relief valve size is recommended to be 2/3 the size of the main line.

COMMON SITUATIONS AND PROBLEMS IN PILOTS AND ACCESSORIES

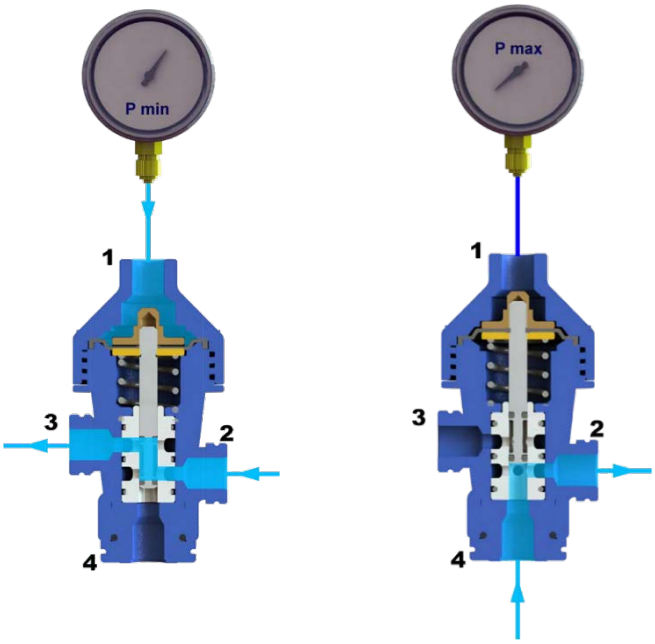
KATAL®: FLOW CONTROL PILOT



✓ **Flow limiter:**

- The valve limits a single flow rate for the differential pressure of the orifice plate positioned upstream of the valve.
- Valve sizing: depending on the demanded flow and the pressure losses of the valve + orifice plate assembly (2-5 mca).
- Plate hole dimensioning: depending on the pressure drops of the flow to be limited (2 mca).

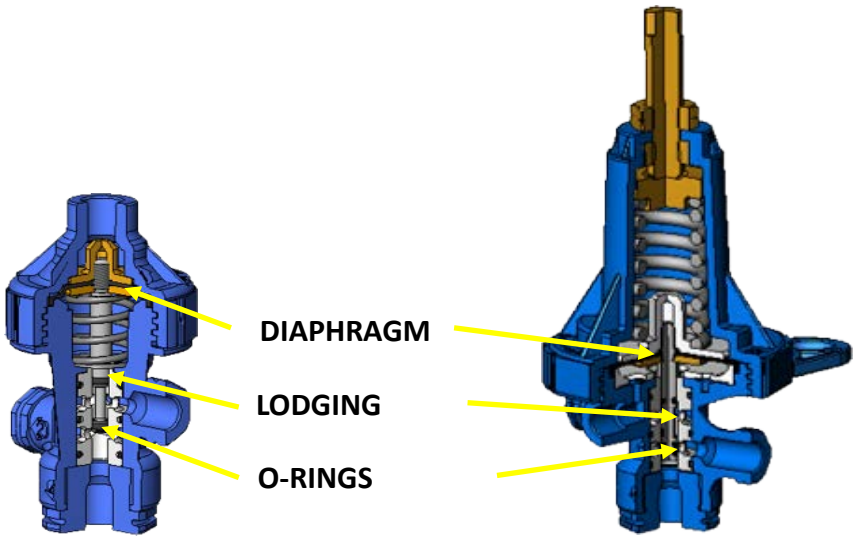
VAR®: FAST ACTION VALVE



- Choice of spring: minimum activation pressure and maximum resting pressure.
- Antitopographic valve. Consider the water column: 10 mca = 1 bar = 1 Kg/cm2.
- Hydraulic signal switch and amplifier.

CHANGE OR REPLACEMENT OF PILOT ELEMENTS

It is possible to replace any element of the pilots quickly and easily. For this it is necessary to disconnect them from the circuit.



COMMON SITUATIONS AND PROBLEMS IN PILOTS AND ACCESSORIES

REATON® /REAPLAS®: THREE WAY TAP

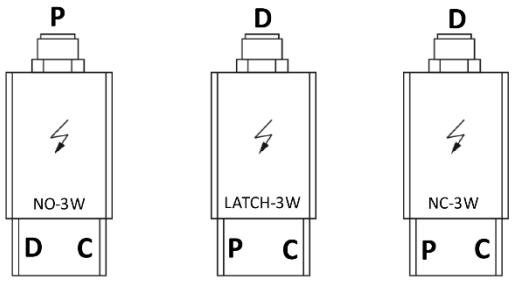
- Body or connectors break.
- Breakage or wear of the O-ring or teflon housing.
- Incorrect sealing of connectors.
- Obstructions.

STRAINER

- The intake filter is essential to avoid blockages in the hydraulic circuit.
- Regular cleaning is recommended.

SOLENOID

- Normally open / normally closed / pulsed (latch).
- Direct / alternating current.
- Voltage.
- Power.
- Nominal pressure.
- Inside diameter.
- Connections.



P= Pressure **C=** Chamber **D=** Drainage