



## Booster pump automatic control valve Mod. XLC 390/490

The CSA Model XLC 390/490 is a globe pattern hydraulically operated automatic control valve, active check valve, that isolates the pump from the system during pump starting and stopping to prevent and avoid surges and water hammer events. The valve opens and closes in response to signals applied to the solenoid on the circuit where a needle valve will adjust the response time for an accurate and smooth regulation. Equipped with a limit switch activated by the position indicator's movement, made in ductile cast iron and stainless steel, the valve is designed to reduced head loss, throttling noise and cavitation damage.

### Applications

- At the pumps to enable start and stop cycles avoiding surges and water hammer.
- To prevent water hammer during pump switching in batteries and parallel operation.
- To ensure an accurate and surge free check prevention system.

### Accessories

- Pressure measurement kit.
- Self-flushing and high capacity filter.

### Note to the engineer

- CSA anti-cavitation low flow stability plugs are recommended to provide an accurate regulation in case of low flow conditions.
- Recommended flow rate and operating conditions on the XLC series engineering.
- The duration of impulses sent to the solenoid is important and changes with valve size and operating pressure.

### Additional features

- XLC 491 booster pump pressure reducing valve.
- XLC 492 booster pump pressure sustaining control valve.
- XLC 493 booster pump with flow control valve.

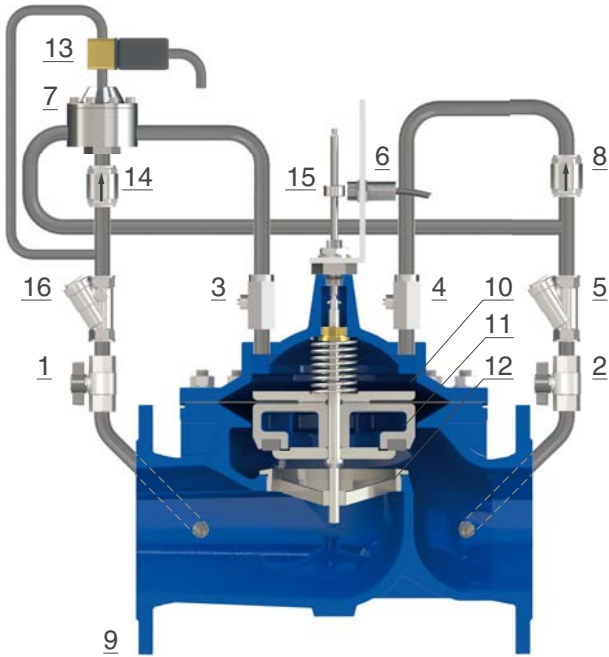
### Working conditions

- Fluid: treated water.
- Minimum operating pressure: 0,7 bar.
- Maximum operating pressure: 16 bar.  
Higher on request.
- Maximum temperature: 70°C.

### Solenoid electrical data

- Voltages: 24 V DC, 24 V/50 Hz, 230 V/50 Hz.  
Other voltages on request.
- Power consumption: inrush AC (VA) 24, hold AC (VA) 17 (8 W), DC hot/cold coil 8/9 W.

## Operating principle (for DN 150-600)



When pumps are turned off the valve (9) is closed and the solenoid (13) is de-energized. When the pump starts, the solenoid (13) is energized and the control chamber (10) is put in communication with the downstream pressure thanks to the hydraulic accelerator (7), thus pushing the obturator (11) upwards to generate a gradual increase of the flow rate. The needle valve (3) ensures the regulation of the opening and closing speed, to avoid sudden variations in pressure. When shut down is required, the pump is kept running while the solenoid (13) is de-energized diverting, through the flow accelerator (7), the upstream pressure towards the control chamber (10) with gradual closing of the obturator (11) onto the seat (12). Once the indication rod (15) has reached a pre-determined position (adjustable, usually the 20% of the valve stroke), the limit switch (6) will send a signal for the pump to close. In case of power failure, the backflow through the main valve (9) is prevented thanks to the check valve (8) allowing the downstream pressure back to the control chamber (10) minimizing surges.

## Installation layout

The picture below shows the recommended installation layout of CSA XLC 390/490 (1) as an effective surge prevention system and protection device for water pumping stations, in combination with CSA pressure relief valves XLC model 420-R (2) or surge anticipating XLC model 421. Anti-slam combination air valves are recommended upstream (3) and downstream of the booster pump control as well as sectioning devices and bypass required for the proper maintenance.

