BOSS™ 217 Pressure Reducing Valve Installation & Operation Manual

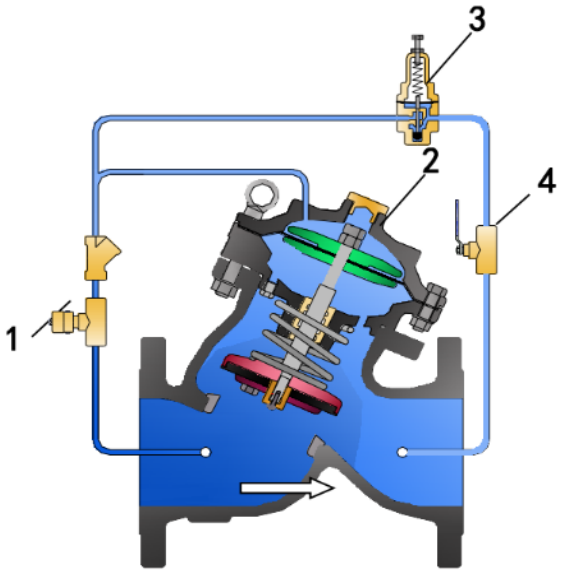
Product Information

The BOSS™ 217 Pressure Reducing Valve is a diaphragm type of hydraulic control valve operating by the hydraulic pressure within the piping system.
The function of the valve is to reduce the high pressure in a system to a lower predetermined pressure. Fitting the valve will also provide pressure stability by reducing pressure fluctuations and maintaining the pre-set pressure.

Suitable for use in Commercial and Industrial Potable Water Systems

Operating Principles

The BOSS™ 217 Pressure Reducing valve is equipped with a pressure reducing pilot valve, a needle valve, a micro strainer, and a ball valve.

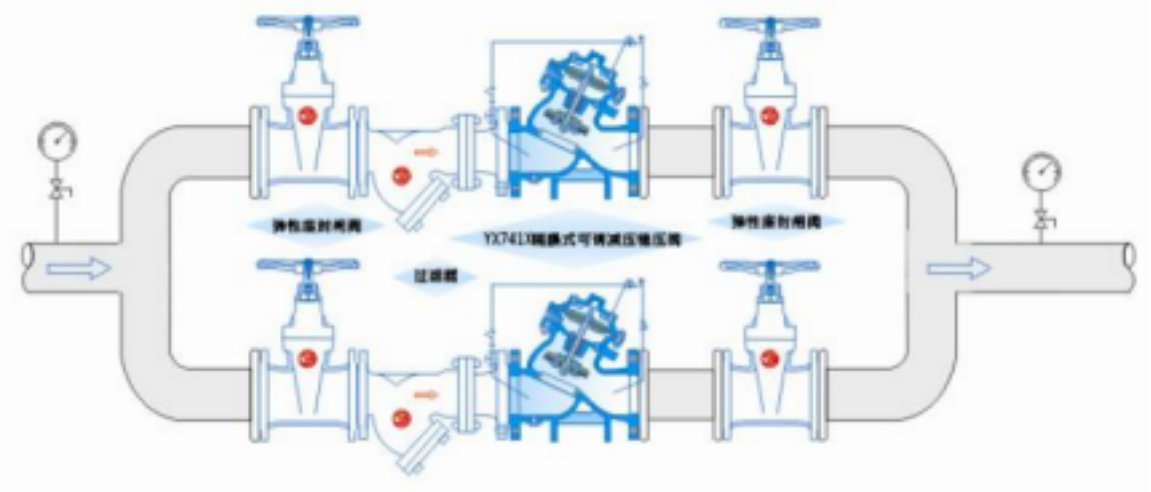


1. Needle Valve and Filter
2. Upper Cavity Chamber
3. Pilot Valve (for setting outlet pressure)
4. Isolation Valve

Under normal operating conditions, water flows continuously from the inlet opening to the upper cavity chamber (2) of the valve via the needle valve (1); whenever the pressure before the pilot valve (3) is lower than its pre-set value, the pilot valve remains completely open, and the upper cavity chamber of the valve cannot accumulate pressure. In this circumstance, the valve's disc will be open allowing the water pressure from the inlet opening to enable water flow. When the pressure drops, the pressure-reducing pilot valve gradually closes.

The throttle orifice that connects the lower cavity to the outlet of the valve ensures the valve's output is smooth and consistent. The ball valve (4) regulates the output water flow rate from the top cavity chamber, which helps to stabilize the basic valve's operation and should remain fully open. The ball valve can be closed in an emergency to shut off the Pressure Reducing Valve Outlet.

Typical installation illustration



Basic Parameters

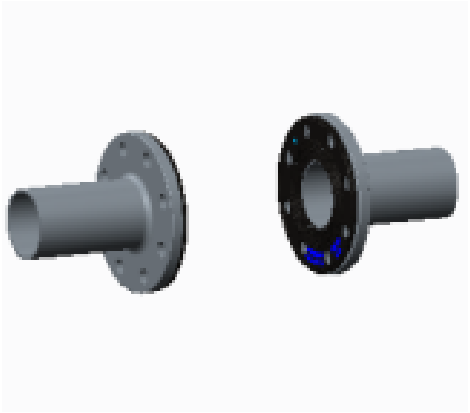
	Symbol	Nominal pressure
Max. Inlet pressure	P1max	16 Bar
Min. Inlet pressure	P1min	P2max + 0.2
Max. Outlet pressure	P2max	8 Bar
Min. Outlet pressure	P2min	0.05 Bar
Characteristics of flow deviation	ΔP2Q	10%
Pressure characteristic deviation	ΔP2p	5%
Min. pressure deviation	ΔPmin	2 Bar
Adjustable Range		2 - 8 Bar

Fault Finding and Actions

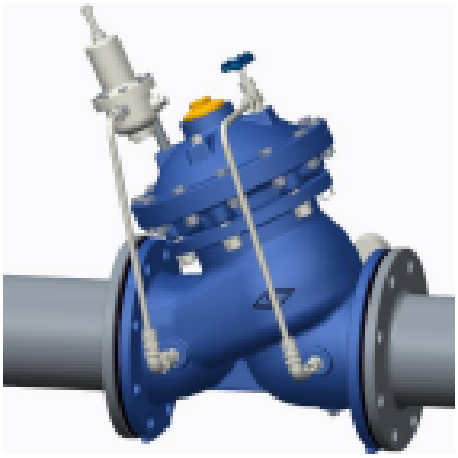
Common Problems	Proposed Solutions
Outlet pressure is similar to inlet pressure, no pressure reduction.	a. Check for any debris on the sealing surface of the main valve or pilot valve. b. Check if there is any damage on the sealing surface of the main valve or pilot valve. c. Check if any damage or fatigue on the spring of the main valve or pilot valve. d. Check for any damage or fatigue on the diaphragm of the main valve or pilot valve. e. Check if there is any corrosion or blocking on the stem of the main valve or pilot valve.
Strong vibration and noise.	a. Close the needle valve before the main valve and open 1/4 turns slowly. Open the hex screw on the top of the bonnet, release air. Adjusting the needle valve on inlet conduit slowly until there is no vibration. b. Check the Sizing Calculations and the selected Valve installed for compatibility
Pressure after the valve is not stable.	a. Check if the pressure is fluctuating strongly on the inlet to the valve. Try to keep it within a small range. b. Check if required flow is not too different from actual flow, check capacity of valve installed, if necessary select a new valve.

Installation Procedure

1. Reserve a suitable pipe end distance. The piping should be natural, and the position should not be hard to pull, so as to avoid prestressing



2. Place the valve in the middle of the pipe and align with one end of the pipe. Ensure Pipe flange hole is aligned with the valve flange hole.



3. Place the gasket in the middle of the pipe between the valve and the alignment end, and install the bolts, nuts and gaskets of the corresponding specifications prepared in advance on the flange holes.

4. Cross balance to tighten all nuts. To use a wrench that matches the nut, be careful not to exceed the specified torque when tightening with a hydraulic or pneumatic tool. The flanges should be tightened to avoid uneven force. They should be tightened in the order of symmetry and cross direction. After the flange is installed, make sure that all bolts and nuts are tightly tightened.

5. Place the gasket between the valve and the other end of the pipe, and install the bolt of the corresponding specification prepared in advance on the flange hole.

6. Repeat steps 3 and 4 to complete the installation.

7. Install a filter before the valve and install an isolation valve before and after the main valve and Filter to allow for servicing and cleaning

Installation Precautions

1. Ensure the pipe fittings of the valve are complete and undamaged.

2. Check the valve nameplate ensuring you have the correct valve size and pressure range required for installation.

3. Thoroughly clean the flange faces and ensure the pipeline is clean before installing the valve to ensure that there are no stones, welding slag and other debris in the pipeline.

4. The best way to install the valve is to install it horizontally on the pipe ensuring the direction of flow is correct using the arrow on the side of the
   Valve.

The valve can be installed in the vertical pipework, allowing water flow from the bottom in an upward direction. Additionally, it can be horizontally oriented, rotated 90 degrees from its upright position

5. Install a filter before the valve and install an isolation valve before and after the main valve and Filter to allow for servicing and cleaning.

6. The valve should be installed so that the direction of water flow is installed in the direction of the arrow shown on the main valve body.

7. The transit protection caps at both ends of the valve should be removed just before Installation to prevent debris from entering the valve cavity.

8. After the valve is installed on the pipeline, the fixing flange bolts are tightened, and the conduits and conduit interfaces of the valve should be Inspected, there should be no damage, distortion, looseness, etc.;

9. During the valve installation process, pay attention to protect the external piping to avoid bumping and deformation. Do NOT use the valves and connecting pipework to handle the valve.

Commissioning

N.B The set pressure can only be adjusted from low level to high level so take care in making small adjustments on the pilot valve during the setting procedure below.

1. All Pressure Reducing Valves have been subject to Factory Set 4.5Bar Pre-Commissioning tests before delivery. Further Commissioning is also required to suit Site Conditions and Pressure Requirements.

2. Adjustable outlet pressure range 2 to 8 Barg (Subject to inlet pressure)

3. Ensure the ball valve is in the fully open position.

4. After the system pressure becomes stable, tighten the adjusting screw of the pilot valve in a clockwise direction slowly, observing the downstream pressure gauge. When the outlet pressure increases to the required pressure then tighten the locknut under the adjusting screw to set.

5. If you go beyond the required set pressure during setting, then turn the adjusting screw on the pilot valve anticlockwise until fully open and then action from point 1 again until the required pressure is achieved and tighten the locknut under the adjusting screw to set.