



ABN 71098869160

HPE PRODUCT INFORMATION

PRODUCT PART NUMBER: WVH / WVL

DESCRIPTION: EXTERNAL PRESSURE RATIO VALVES

PURPOSE

The External Ratio Valve reduces a high inlet pressure to the valve to a low downstream pressure according to a fixed ratio with optional ratio trim to compensate for line pressure losses.



DESCRIPTION

Unlike standard ratio valves, the ratio is independent of the flow conditions inside the valve, and depends only on the ratio of the areas of the internal control piston in the poppet to the external sensing piston. The ratio of reduction is constant at all flow rates from the minimum flow required for control up to the maximum capacity of the valve.

Pressure ratios from 1.5:1 up to 6:1 can be provided in the same valve bodies by changing only the size of the external control piston, seal and seal holder. The valve can be configured in different ways—see CONTROL OPTIONS further on.

FEATURES

- The valve offers stable control over the full range of operation from 0 to 100% flow capacity. The valves are full bore unless otherwise required. They do not “hunt”.
- The pressure ratio is tamperproof from an operational point of view, but can be changed by selecting the size of the external control piston, seals and seal holders.
- The main valve poppet and seat are of our proven labyrinth grooved type that has proven to be best in “wire drawing”, cavitation and dirt resistance.
- The ratio will remain within $\pm 7\%$ erosion at all flows. The valves work well at differential pressures of up to 15 MPa but increasing pressure decreases life.
- The internal parts are all of corrosion resistant materials.
- The seals are proven to the best design that stands up to dynamic water sealing.
- Flanges are available in all standard configurations. The flanges selected limit operating pressure.
- Cast steel bodies.
- The valves are maintained in line requiring access from one side only. All the wear parts are changed in one operation.
- The wear parts are designed to the standard of the other HPE ranges of high-pressure water control valves that have proven superior durability.
- The valve trim design ensures minimum noise and cavitation.
- The valve cannot fail suddenly. Any signs of wear or gradual giving warning and sufficient time to plan a service.

CONTROL OPTIONS

- The External Ratio Trim consists of a “friction free” pilot regulator fitted with a ceramic poppet and seat, which can trim or fine-tune the downstream pressure setting.
- A pilot tube type flow sensor can be used to limit the maximum flow rate.
- Multiple valves connected in series can offer partial redundancy. Should one of the series fail, the primary valve will do the full control.
- Dissipators can be installed in the line to limit excess run-away flow conditions and to share the energy dissipating capacity of the system thereby extending the life of the valve without affecting the control ratio. This also limits noise and cavitation.
- Hand wheels can be incorporated in the control assembly so that the valve can be manually opened or closed.
- Stroke limiting spacers can be installed to limit the maximum flow or set in an intermediate position to limit flow.
- Over pressure shut down can be incorporated in the valve control together with hydro-timers that ensure the valve will only shut down if the excess pressure is sustained for the specified period.
- Closing rates can be controlled.

INSTALLATION

1. Mount the external ratio valve in the correct flow direction.
2. Connect a pressure gauge upstream and downstream of the valve.
3. Connect the new ratio valve control hose to the downstream of the second ratio valve or to the inlet of the outlet isolation valve. The hose must be connected to the body gauge ports. No isolation valve should be installed in this hose. There is a needle valve directly on the control cylinder leave it fully open when the system is commissioned.
4. Before running the system the needle valve must be turned halfway closed.
5. Bleed the air from the top pilot control chamber.
6. Open the supply valve to the station a fraction whilst the vent valves on the valve bodies are opened. This is the priming procedure.
7. Allow sufficient water through the pilot system to flow out of the control cylinder and then bolt up the control cylinder to seal off tightly. Whenever the system has been drained this procedure must be followed until adequate venting systems has been supplied to that control cylinder.
8. Air in that cylinder causes surging inside the valve and that is not good.

Starting the System

1. Open the downstream valve 4 turns.
2. Leave the needle valve in the full open condition.
3. Open the upstream control valve slowly. If it is an SIV, then keep the trigger depressed until the pressure on the system has increased to the desired set downstream pressures.
4. Once flow has been established and pressures are stabilized, close the downstream valve until the SIV sets fully open.
5. Open the SIV completely.
6. Open the downstream valve gradually and see that the line pressure is maintained properly.
7. Close the throttle valve to stop any surging that may occur.

TECHNICAL SPECIFICATIONS

The valve control mechanism is dictated by the ratio required.

Model WVH Ratio Range 5,2:1 to 10:1.

Model WVL Ratio Range 1,6 to 5:1.

For ratios of 1,04:1 to 1,8:1, refer to HPE Pressure Trim Valves.

The valve is designed to ANSI B16.34.

The valve body is rated to 25 MPa (ANSI Class 1500), but the valve pressure rating is limited by the flanges fitted.

For fatigue life up to 10 million cycles, the valve body pressure rating is reduced to 14 MPa.

Valve size (NB in mm)	80	100	150	200	250	300
Minimum Pressure (MPa)	2,5	2,5	2,5	2,5	3	5
Minimum differential pressure for control (l/s)	1.6	1.6	1.6	1.6	1.6	1.6
Minimum flow at which valve will control (l/s)	1.5	1.5	2.0	2.0	2.5	3.0
Working flow (l/s)--Note 1	35	60	100	150	220	255
Face-to-face HPE hubs (mm)	365	430	510	690	880	1100

Note 1—This flow is the recommended design flow rate for general reticulation. Higher flow rates higher than those above are possible, but careful consideration must be made to avoid cavitation. Consult HPE. HPE reserves the right to change these specifications without notice in the interest of improving its products.

Ratio valves generally require a small flow (a few percent of the maximum flow) to control pressure and are generally not tight shut-off valves. For this reason a pressure relief valve is always required to protect low-pressure piping downstream.

Materials of construction

Valve body	Cast steel--ASTM A216 grade WCC
Flanges	Wrought carbon steel--AISI A105 or as specified
Hubs	As per body
Seals	Ultra-high molecular weight polyethylene polymer
O-rings	Nitrile—70 Shore hardness
Spindle guides	Bronze--ASTM B505C83600
Guide pin etc	AISI 304
Seats & poppets	AISI 431 hardened & ground

Corrosion protection & finishes

Externally painted	Standard
Alternative coatings	Available to suit client requirements