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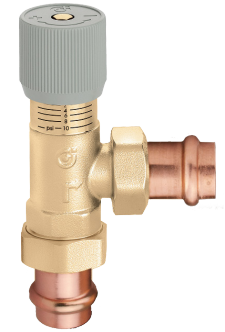
38482.05

Adjustable differential pressure by-pass valve with graduated scale

519 Series



Function

The differential pressure by-pass valve is used in systems with a fixed speed circulating pump supplying several zones controlled by two way zone valves. This valve ensures that the head pressure of the pump is proportional to the number of two way valves being closed. It will bypass the differential pressure created by the pump as the zone valves close, thus eliminating water hammer noise.

Product range

Code 519502A	By-pass with flow up to 9 gpm. Size 3/4" MNPT union inlet x 3/4" MNPT union outlet
Code 519566A	By-pass with flow up to 9 gpm. Size 3/4" press union inlet x 3/4" press union outlet
Code 519599A	By-pass with flow up to 9 gpm. Size 3/4" Sweat union inlet x 3/4" Sweat union outlet
Code 519600A	By-pass with flow up to 40 gpm Size 1" FNPT inlet x 1" MNPT union outlet
Code 519609A	By-pass with flow up to 40 gpm Size 1" Female NPT x 1" sweat outlet
Code 519700A	By-pass with flow up to 45 gpm Size 1 1/4" FNPT inlet x 1 1/4" MNPT union outlet
Code 519709A	By-pass with flow up to 45 gpm Size 1 1/4" FNPT inlet x 1 1/4" Sweat union outlet

Technical characteristics

Materials

Body:	brass
Valve plug:	brass
Valve plug gasket:	peroxide-cured EPDM
O-Ring seals:	peroxide-cured EPDM
Union seals:	asbestos free NBR
Control knob:	ABS
Spring:	stainless steel

Performance

Suitable fluids:	water, glycol solutions
Max percentage of glycol:	30%
Temperature range:	32–230°F (0–110°C)
Maximum working pressure:	150 psi (10 bar)
Flow rates:	3/4" flow up to 9 gpm 1" flow up to 40 gpm 1 1/4" flow up to 45 gpm
Setting range:	1 - 6 m w.g. (2 - 10 psi)

These items are designed for use in closed hydronic systems. Do not use in plumbing applications. These items do not meet the low-lead plumbing standards of U.S. and Canada.

SAFETY INSTRUCTION

This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.**

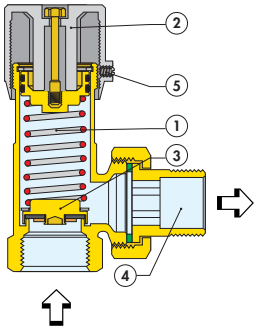
WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

CAUTION: All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of systems in accordance with all applicable codes and ordinances.

CAUTION: Over-tightening and breakage can occur with the use of Teflon® pipe joint compounds. Teflon® provides lubricity so that care must be exercised not to over-tighten joints. Failure to follow these instructions could result in property damage and /or personal injury.

WARNING: System fluids are under pressure or temperature can be hazardous. Be sure the pressure has been reduced to zero and the system temperature is below 100°F (38°C). Failure to follow these instructions could result in property damage and/or personal injury.

Operating principle

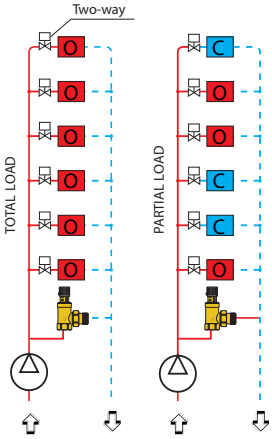


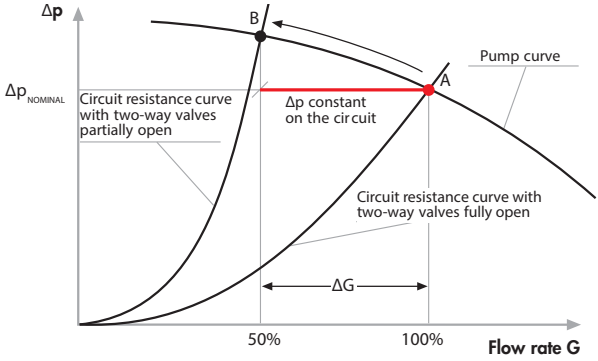
When the spring (1) compression is adjusted using the control knob (2), the force balance acting on the valve plug (3) changes, thus modifying the threshold pressure value of the valve. The valve plug opens, activating the by-pass circuit, only when it is subjected to a differential pressure sufficient to generate a thrust greater than the thrust exerted by the spring. This allows the flow discharge through the outlet (4), limiting the difference in pressure between the two points in the system where the valve is fitted.

The job of the differential pressure by-pass valve is to maintain the pump operating point as close as possible to its nominal value (point A on the graph shown below). If the by-pass valve is not used, when the flow rate in the circuit decreases due to partial closure of the two-way zone valves, the head loss in the circuit increases, point B.
The by-pass valve, set to the nominal head value of the pump, limits the increase in pressure, by-passing the flow rate ΔG. This behavior is guaranteed at any closing condition of the system two-way zone valves. In fact, once the position of the valve control knob has been established, the threshold pressure value is more or less constant as the discharge flow rate varies (see hydraulic characteristic diagrams).
A proper valve sizing must guarantee a sufficient flow rate by-pass to keep the pump at its nominal operating point in all system operating conditions, for example when the first zone valves are closed.

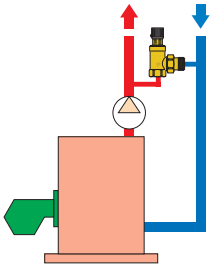
System operation

O = open
C = close





Installation

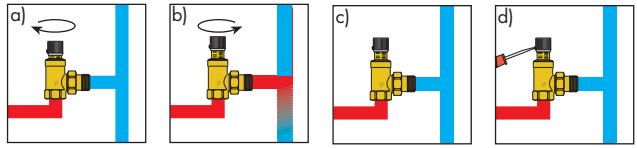


The differential pressure by-pass valve can be fitted in any position, respecting the flow direction indicated by the arrow on the valve body.
In systems with a traditional boiler it is normally fitted between the system flow and return ends, which allows the control of the pressure and the passage of a minimum flow through the heat generator.
In systems with a condensation boiler, it is preferable to fit the by-pass directly between the upstream and downstream sections of the pump, as this allows a higher ΔT in the circuit, with lower return temperatures and therefore better operation of the system.
In the event of high by-pass flow rate levels, it is recommended to fit the valve between the flow and return ends of each column, rather than fitting a number of valves in parallel at the central boiler.

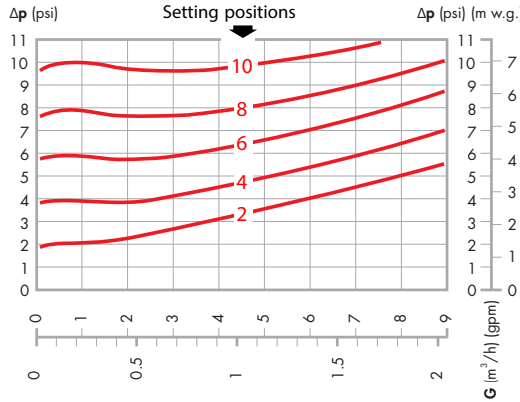
Adjustment

To regulate the valve, turn the knob to the required value on the graduated scale: the values correspond to the differential pressure in psi or meters w.g. to open the by-pass.
For a quick setup adjustment of the differential pressure by-pass valve, use the following manual method. As an example, a hydronic system with several zone valves: the system must be operating, the zone valves must be fully open and the by-pass valve must be set to the maximum value (a) (clockwise). Gradually open the differential pressure by-pass valve using the control knob (counterclockwise).

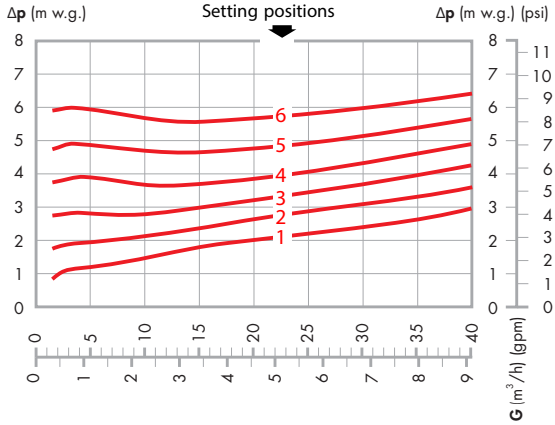
Use a thermometer, or simply your hand, to check that the hot water is flowing into the by-pass circuit (b). As soon as a rise in the temperature is noted, turn control knob (clockwise) one half turn closed so hot water stops flowing into the by-pass (c). Lock the knob in this position (d) with the locking screw.



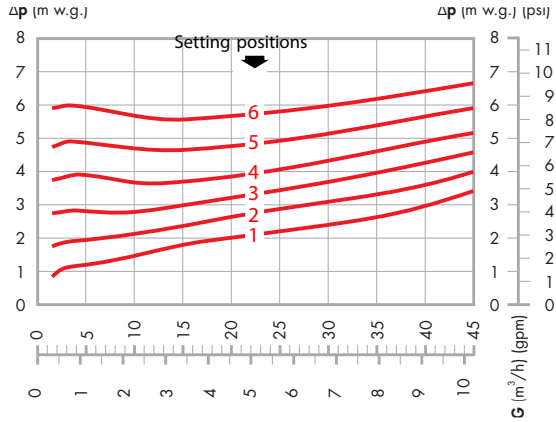
Hydraulic characteristics code 519502A, 519566A 519599A (3/4")



code 519600A - 519609A (1")



code 519700A - 519709A (1 1/4")



CAUTION: If the by-pass valve is not installed, commissioned and maintained properly, according to the instructions contained in this manual, it may not operate correctly and may endanger the user.

CAUTION: Make sure that all the connecting pipework is water tight.

Service Instructions

There is no service required for the differential by-pass valves.

Leave this manual for the user.

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