519 Ecopas

differential bypass valves

WRAS APPROVED PRODUCT

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519 Ecopas differential bypass valve

Application

The valve is installed in the bypass between the flow and return pipes and opens on rising differential pressure to allow flow through the bypass. This maintains the differential pressure between the flow and return pipes at the predetermined set value.

Differential bypass valves are used in systems with variable flowrates.

Radiator circuits utilising thermostatic radiator valves or heating systems incorporating 2-port control valves are typical applications.

Differential bypass valves can be used in both constant and variable volume systems to prevent the differential pressure from rising, which can seriously affect the performance of the 2-port control valves.

Design

The 519 differential bypass valves use a stainless steel compression spring to exert a pre-determined force onto the disc.

The force is adjustable by turning the control knob to set the required differential pressure between 1 to 6 m head which corresponds to 10 to 60 kPa. The setting is then locked using the locking screw on the side of the control knob to prevent unauthorised adjustment.

The 519500 and 519700 valves have a threaded female inlet and a threaded male union outlet.

The 519002GLW valve for use with copper tube has compression ends complying with BS EN 1252-2* and has been independently tested to meet British Gas specifications.

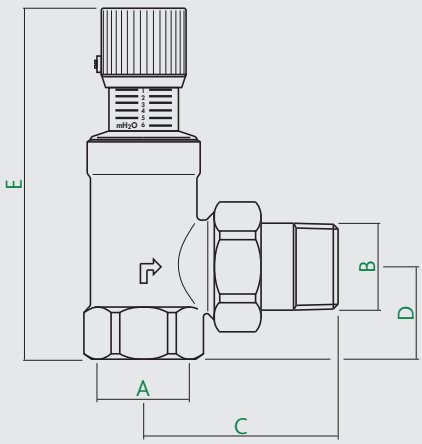
Construction Details

Component	Material	Grade
Body	Brass	BS EN 12165 CW617N
Disc	Brass	BS EN 12164 CW614N
Disc facing	EPDM	
'O' rings	EPDM	
Union joint gasket	Asbestos free NBR	
Control knob	ABS polymer	
Spring	Stainless steel	

Product	Size	Inlet	Outlet
C-519002GLW	22	compression	compression
519500	¾"	screwed female	screwed male union
519700	1¼"	screwed female	screwed male union
519504	¾"	screwed female	screwed male union

* Use with R250 (half hard) copper tube

Dimensions



Prod Code	A	B	C	D	E	kg
519002GLW	Ø22	Ø22	38	36	113	0.45
519500	G¾	G¾B	59	26	104	0.45
519700	G1¼	G1¼B	89	41	158	1.19
519504	G¾	G¾B	59	26	104	0.45

Technical Data

Medium:		water glycol solution
Max. percentage of glycol:		30%
Temperature range:		0 to 110˚C
Max. working pressure:		10 bar
Setting range:	Other codes	1 to 6m head 10 to 60 kPa
	Code 519504	10 to 40m head 100 to 400 kPa

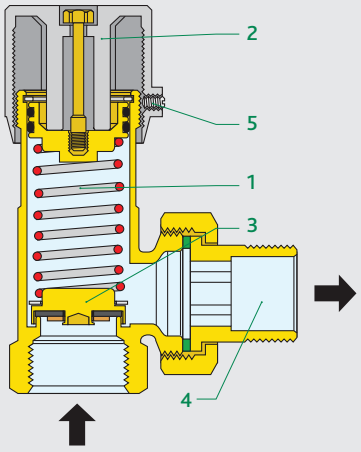
WRAS approved products

Operating principle

When the spring (1) compression is adjusted using the control knob (2), the force acting on the obturator (3) changes, thus modifying the trigger pressure value of the valve.

The obturator 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 opposing 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.



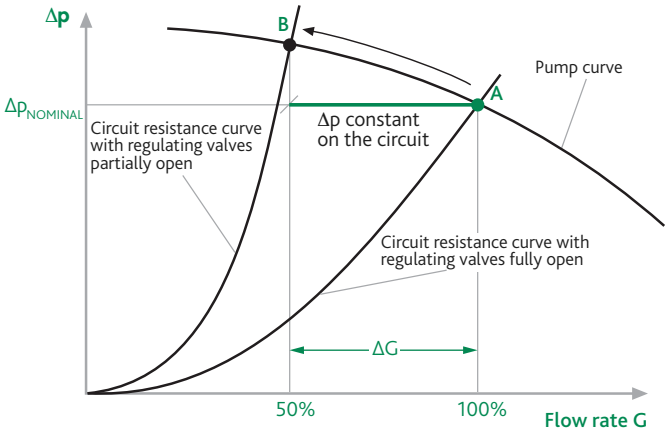
System operation

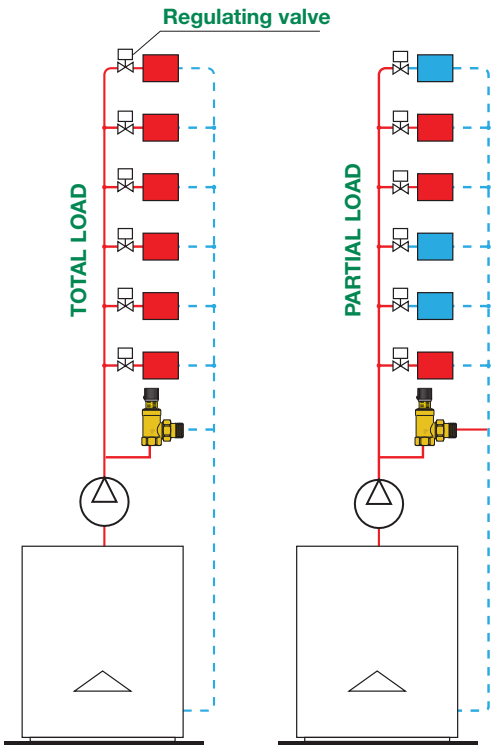
The purpose of the by-pass valve is to maintain the pump operating point as close as possible to its nominal value (point A on the graph shown below). If a by-pass valve is not used, when the flow rate in the circuit decreases due to partial closure of the two-way valves, the head loss in the circuit increases, point B.

The by-pass valve when set to the nominal head value of the pump limits the pressure increase, by-passing the flow rate ΔG.

Once the position of the valve control knob has been established, the set pressure value is more or less constant as the discharge flow rate varies (see hydraulic characteristic diagrams).

Correct valve sizing guarantees a sufficient flow rate to by-pass to keep the pump at its nominal operating point in all system operating conditions, for example when the first thermostatic valves are closed.





Setting

To regulate the valve, turn the knob to the required value on the graduated scale: the values correspond to the differential pressure in metres w.g. to open the by-pass.

When the set pressure in unknown it is possible to use the following practical method, which can be applied to the system in an apartment fitted with thermostatic valves.

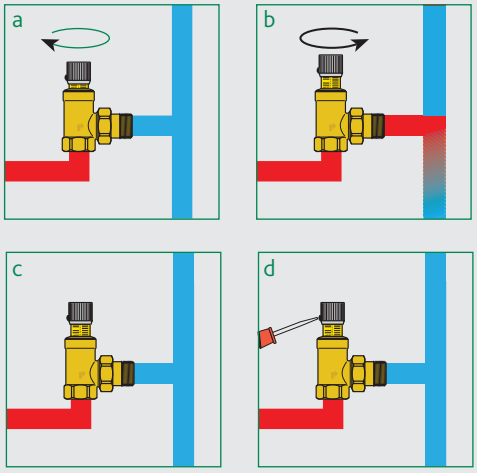
The system must be operating, the regulating valves must be fully open and the by-pass valve must be set to the maximum value (a).

Close approximately the 30% of the thermostatic regulating valve in the system.

Gradually open the by-pass valve using the control knob and using a thermometer, or simply your hand, check that hot water is flowing into the by-pass circuit (b).

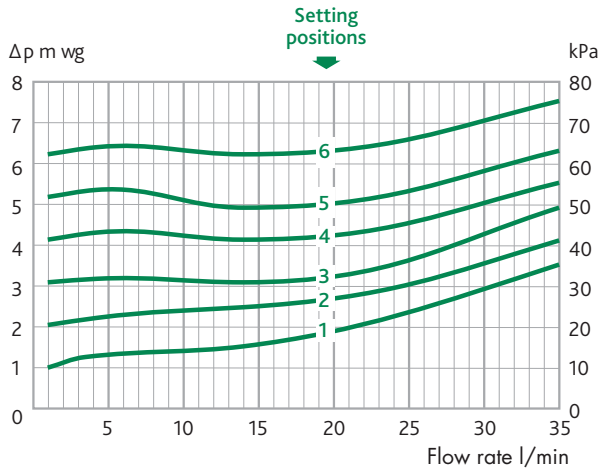
As soon as a rise in the temperature is noted, open the thermostat valves again and check that the hot water stops flowing into the by-pass (c).

Lock the knob in this position (d) with the fixing screw (5).

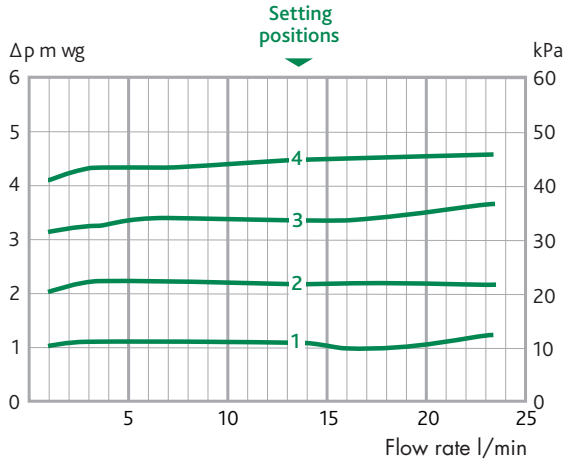


519 Ecopas differential bypass valve

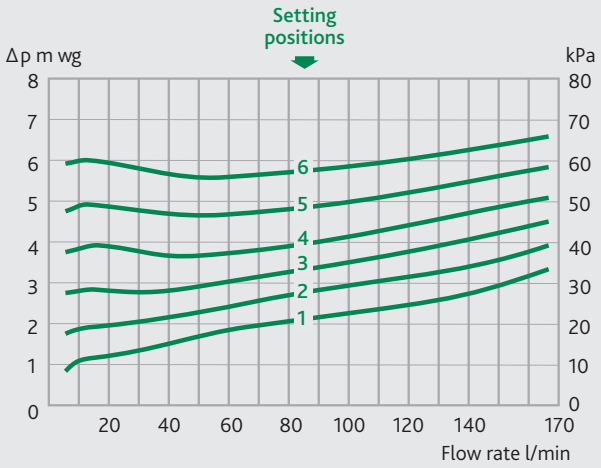
Hydraulic Characteristics
Product Code - 519500 (¾")



Product Code - 519504 (¾")



Hydraulic Characteristics
Product Code - 519700 (1¼")



Installation

The differential 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 pipes, which allows the control of the pressure and the passage of a minimum flow through the boiler.

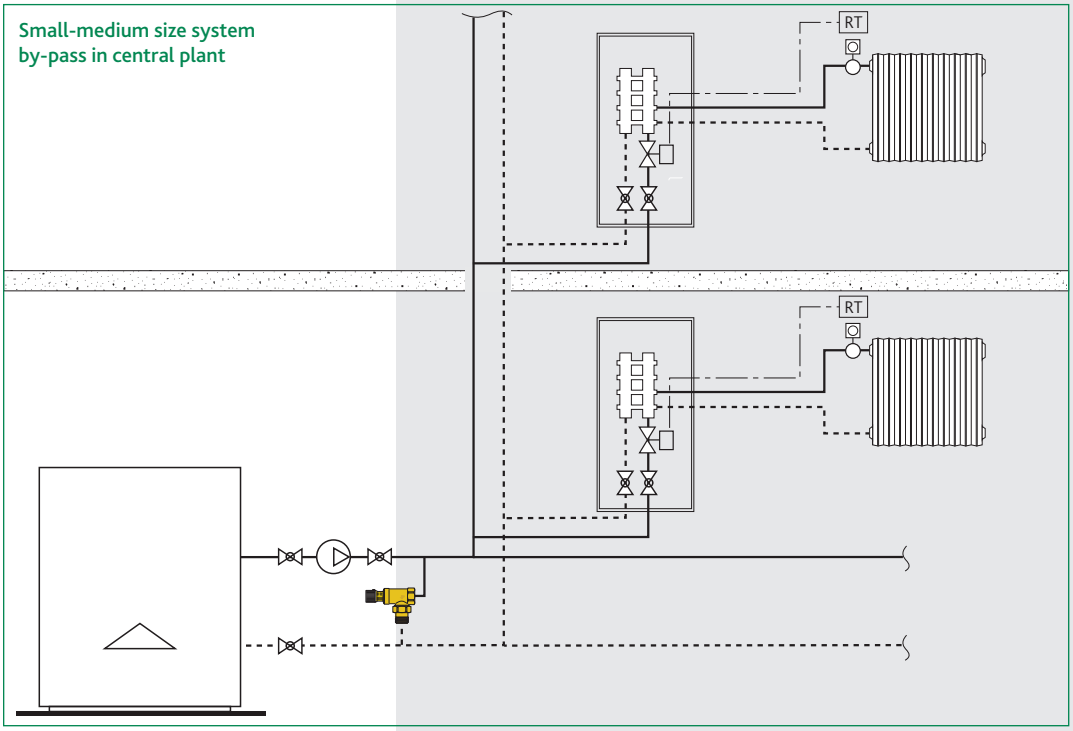
In systems with a condensing boiler, it is preferable to fit the by-pass directly between the upstream and downstream sections of the pump, as this allows a higher ΔT in the circuit, with lower return temperatures and therefore better operation of the system.

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.

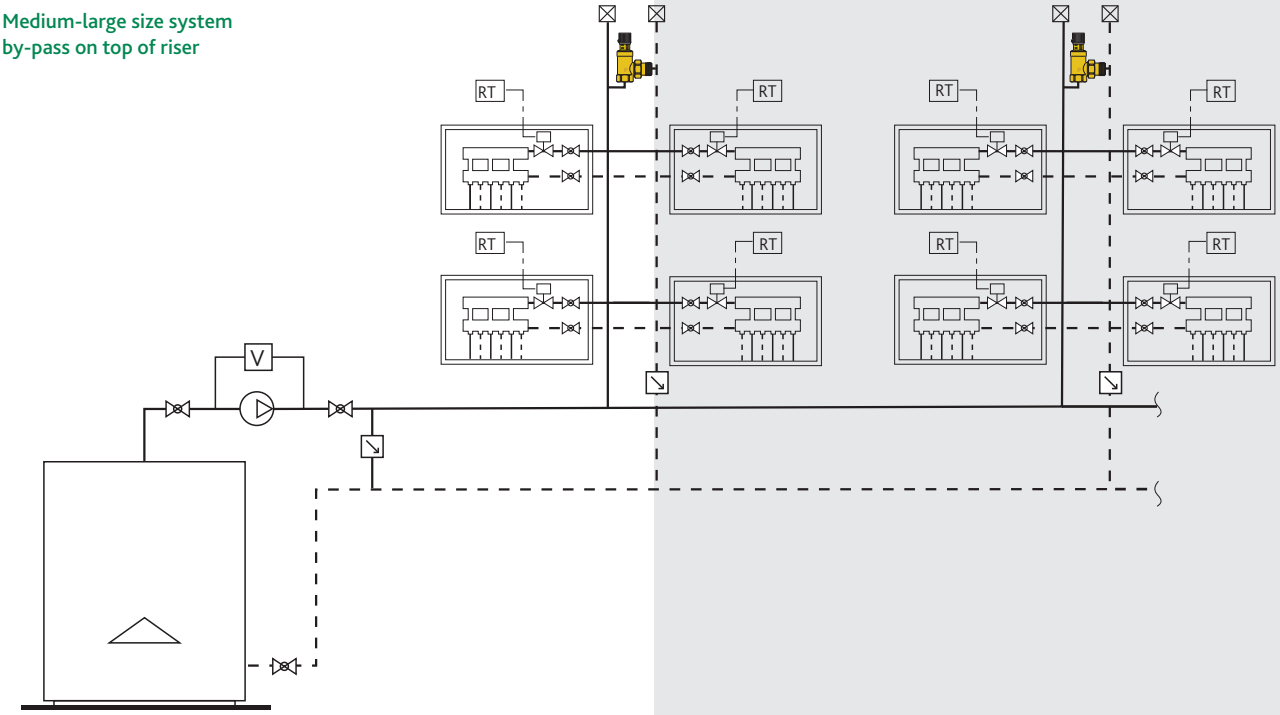
Typical applications

- Shut-off valve
- Pump
- RT Room thermostat
- Check valve
- Insulated manifold
- Two way zone valve
- Autoflow
- Thermostatic valve
- Automatic air vent

Small-medium size system by-pass in central plant



Medium-large size system by-pass on top of riser



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AL 299 14-03-25

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