

# Differential by-pass valve

## art. AC 665 - AC 666 - AC 667 - AC 668



A by-pass valve is an overpressure valve which prevents that the differential pressure between two points in a circuit exceeds a certain limit. It features a plug which, under normal operating conditions, is maintained closed by a spring. When a pressure increase generates on the plug surface a greater force than the spring equilibrating one, the plug opens and relieves the overpressure by allowing water to flow through the by-pass circuit. By-pass valves are required in all hydronic systems with local 2-way valves, or heating elements equipped with adjustment valves that, under certain conditions, cut-off the circuit completely. The valve provides enough recirculation to avoid pump operation far from design conditions: this helps preventing balance losses in parallel circuit branches, or annoying noise problems induced by increasing fluid velocities through the regulating devices. Available versions: AC 665 and AC 666 with manifolds connections; AC 667 with pipe unions, with or without thermometer; AC 668 with pipe unions and accessories.

### ■ TECHNICAL FEATURES

Adjustment range: 0.2÷0.6 bar  
 Max operating pressure: 10 bar  
 Max operating temperature: 120 °C  
 Thermometer range: 0÷80 °C

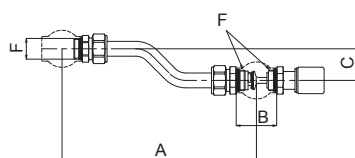
### ■ MATERIALS

Brass parts: CW617N  
 Seal parts and o-rings: peroxide EPDM  
 Spring: AISI 302  
 Knob cover: PP-H  
 Elastic rings: AISI 316L  
 Pipe: nickel-plated half-hard copper

### ■ DIMENSIONS

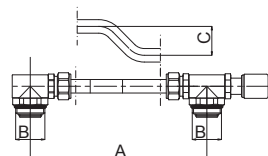
In article code: L = 250 mm interaxis; G = with turning nut; T = with thermometer

### Differential by-pass valve



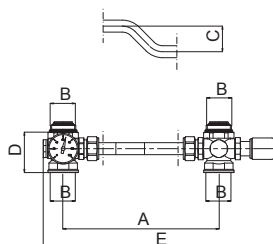
ART.	COD.	A	B	C	F
AC 665	500064	200	41	32	1/2"
AC 665L	500064L	250	41	32	1/2"

## Differential by-pass valve with manifold connections



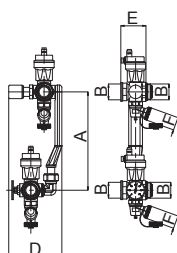
ART.	COD.	A	B	C	D
AC 666	500126	200	1"	32	34.5
AC 666L	500126L	250	1"	32	34.5

## Differential by-pass valve with pipe unions



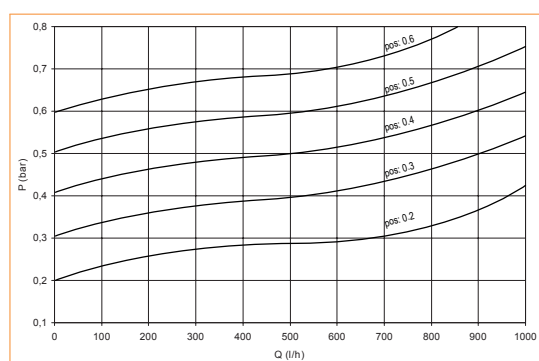
ART.	COD.	A	B	C	D	E
AC 667T	501263	200	1"	32	53	297
AC 667	500127	200	1"	32	53	297
AC 667TL	501263L	250	1"	32	53	347
AC 667L	500127L	250	1"	32	53	347
AC 667TG	501263G	200	1"	32	56	297
AC 667G	500127G	200	1"	32	56	297
AC 667TLG	501263LG	250	1"	32	56	347
AC 667LG	500127LG	250	1"	32	56	347

## Differential by-pass valve with pipe unions and accessories



ART.	COD.	A	B	D	E	F
AC 668	500128	200	1"	106	53	3/4"
AC 668L	500128L	250	1"	106	53	3/4"
AC 668G	500128G	200	1"	106	56	3/4"
AC 668LG	500128LG	250	1"	106	56	3/4"

## HYDRAULIC FEATURES



Hydraulic features of by-pass valves in different adjusting positions (0.2÷0.6 bar).

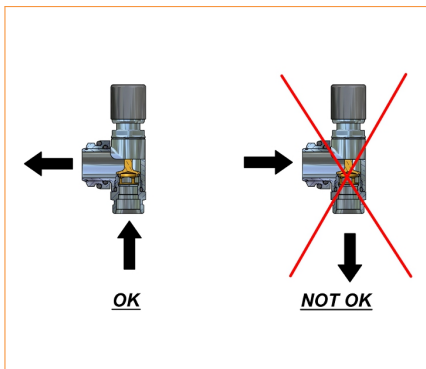
## OPERATING INSTRUCTIONS

For by-pass valves to work properly, it is essential that their connections to distribution manifolds is performed according to the flow direction specified in Fig.1a.

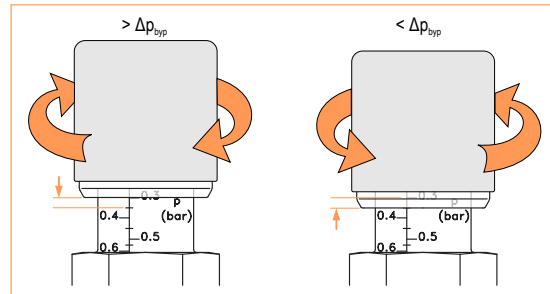
The valve can be adjusted between 0.2 and 0.6 bar. Turn the knob until its edge matches the value reported on the graduated scale: clockwise for a higher opening differential pressure  $\Delta p_{byp}$ , or anticlockwise for a lower value.

The opening differential pressure is referred to the two points between which the by-pass valve is installed. Therefore, it is suggested that the opening differential pressure value imposed is 1.1 times higher than the pressure head provided by the

circulator pump.



(a) Flow direction through by-pass valve.



(b) Adjustment of by-pass differential pressure,  $\Delta p_{byp}$ .

**Fig. 1:** Indications for by-pass valve installation.

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