

## Fixed Orifice Balancing Valve

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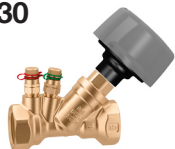
## 130 Series

### Function

Balancing valves are hydraulic devices that can precisely control the flow rate of the fluid that supplies a system's emitters. Hydraulic circuits must be correctly balanced to ensure that the system operates at the design conditions and provides a high level of heat comfort with low energy consumption.

For the 130 series valves, the flow rate is measured by a Venturi port designed into the body of the valve. This guarantees accurate setting as well as ease of use during calibration.

### Product Range 130



130400A 1/2" NPT Female  
130500A 3/4" NPT Female  
130600A 1" NPT Female  
130700A 1 1/4" NPT Female  
130800A 1 1/2" NPT Female  
130900A 2" NPT Female

### Technical Specifications

Material:	Body:	DZR low-lead brass
	Bonnet:	DZR low-lead brass
	Control stem:	DZR low-lead brass
	Valve plug:	stainless steel
	Seal seat:	brass
	Hydraulic seals:	EPDM
	Stem guide bearing:	PTFE
	Knob:	PA6G30
	Pressure test ports:	DZR low-lead brass body, EPDM seal elements
	NSF/ANSI 372-2011, Drinking Water System Components-Lead Content Reduction of Lead in Drinking Water Act, California Health and Safety Code 116875 S.3874, Reduction in Drinking Water Act, certified by ICC-ES, file PMG-1360.	



### Performance

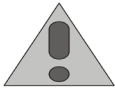
Suitable fluids:	Water and glycol solutions
Max. percentage of glycol:	50%
Maximum working pressure:	232 psi (16 bar)
Working temperature range:	-4 - 250°F (-20 - 120°C)
Accuracy:	±10%
Number of adjustment turns:	6

Connections:	
Main:	1/2"-2" NPT female
Valve body pressure test ports:	1/4" NPT female

### Technical specifications of insulation

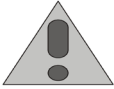
Material:	closed cell expanded PE-X
Thickness:	1/2 inch (15 mm)
Density:	- inner part: 1.9 lb/ft <sup>3</sup> (30 kg/m <sup>3</sup> ) - outer part: 5.0 lb/ft <sup>3</sup> (80 kg/m <sup>3</sup> )
Thermal conductivity (ISO 2581):	- at 32°F (0°C): 0.263 BTU-in/hr-ft <sup>2</sup> -°F (0.038 W/(m·K)) - at 104°F (40°C): 0.312 BTU-in/hr-ft <sup>2</sup> -°F (0.045 W/(m·K))

Coefficient of resistance to the diffusion of water vapour (DIN 52615):	>1,300
Temperature range:	32 - 212°F (0 - 100°C)
Reaction to fire (DIN 4102):	Class B2



## 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.**



**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.



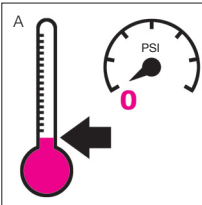
**CAUTION:** Over-tightening and breakage can occur with the use of Teflon® pipe joint compounds. Teflon® provides lubricity so that care must be exercised not to over-tighten joints. Failure to follow these instructions could result in property damage and /or personal injury.



**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.

Caleffi shall not be liable for damages resulting from stress corrosion, misapplication or misuse of its products.

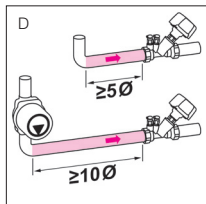
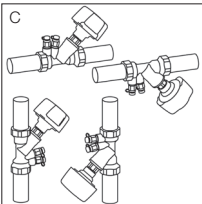
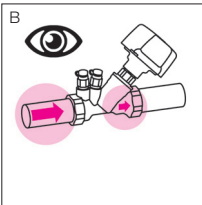
## Installation



Assembly and disassembly of the valves should always be conducted while the system is cold and not pressurized (fig. A).

Install according to the flow direction indicated by the arrow on the valve body (fig. B-C).

In order to ensure measuring accuracy, the balancing valve must be installed by keeping an upstream straight section of at least five diameters, increased to at least ten diameters if the nearest device upstream is a pump (fig. D).



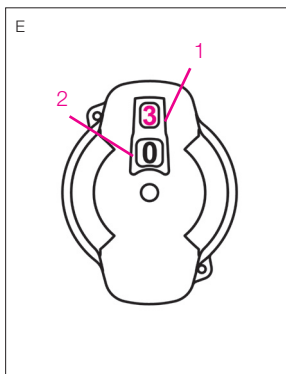
## Operating Principle

The opening position is indicated by two numbered indicators (fig. E):

- The turn indicator (1) shows a flow rate scale from 0 to 6 (0 closure, 5 maximum flow rate, 6 completely wide open flow) in red.

Turning the knob manually through 360° causes the indicator to click by one unit.

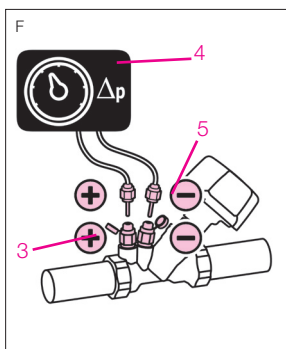
- The micrometric control indicator (2) shows numbers in black from 0 to 9. Each change in this number represents 1/10 of an opening/closing turn of the valve with respect to the turn indicator (1).



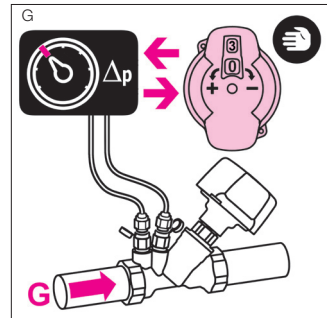
## Use of the balancing valve: setting the flow rate (fig F-G)

NOTE: the indications + and – on the drawings refer respectively to the pressure test ports upstream and downstream of the Venturi port inside the valve.

For the connection of the pressure test ports of the valve (3) with a differential pressure measuring device (4), use a pair of fittings with fast-plug syringe (5) (Caleffi 100 series) (fig. F).



- a) As the thermal fluid passes, measure the  $\Delta p$  of the valve many suitable differential pressure measuring device (fig. G);
- b) Using the "Hydraulic characteristics" sheet (sheet code 18169 supplied in the pack), find the flow rate value that is passing through the valve, consulting the Venturi diagram "Δp-flow rates" corresponding to the size of the valve used.
- c) Turn the knob and repeat steps a) and b) until you reach the desired value.



Correction for liquids of different densities

If using liquids with a density different from water at 70°F (20°C)  $\rho \approx 62.4 \text{ lb/ft}^3 (\approx 1 \text{ kg/dm}^3)$ , correct the value of the measured head loss  $\Delta p$  using the following formula:

$$\Delta p^1 = \Delta p \cdot \frac{\rho}{\rho_{\text{water}}}$$

where:

$\Delta p^1$  = reference head loss in (psid(kPa))

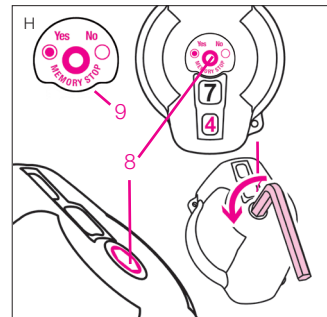
$\Delta p$  = measured head loss in (psid(kPa))

$\rho$  = fluid density in lb/ft<sup>3</sup> (kg/dm<sup>3</sup>)

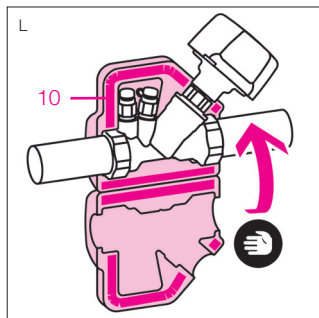
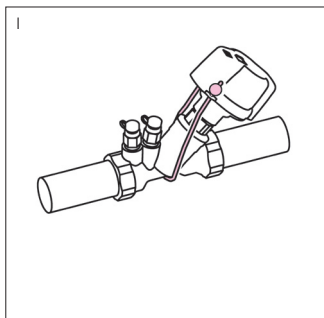
### Memory Stop on the balancing valve

After balancing the flow rate, insert a 2.5 mm hexagonal spanner in the hole (7), turn counter-clockwise until the red indicator (8), initially not visible, is aligned with the top edge of the knob, without forcing it. This operation allows you to close the valve and open it again until the set value is reached (fig. H ).

NOTE: the sticker (9) on the top of the knob indicates: "Yes"=Memory stop on; "No"=Memory stop off.



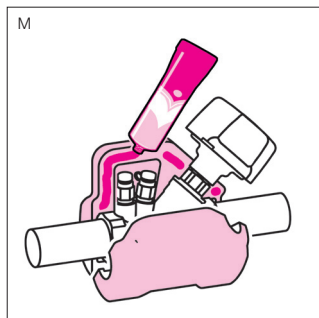
## Locking/sealing the setting position (fig. I)



## Installing Insulation

Apply the insulation and close with the Velcro (10) already installed (fig. L).

For installations with chilled water, seal with suitable adhesive (fig. M).



## Maintenance

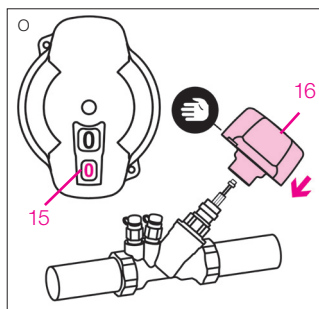
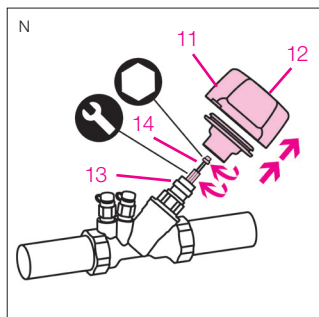
If broken, the knob of the valve can be replaced.

- Extract from the adjusting knob assembly the two parts (11) and (12) that make up the knob.

Fully turn the valve stem (13) clockwise with a 7 mm hexagonal spanner and fully turn the Memory stop indicator (14) clockwise, without forcing it, using a 2.5 mm hexagonal spanner (fig. N).

- Prepare the spare knob in control position 0-0 (15).

Manually insert the knob (16) in the adjusting knob assembly, until it automatically locks (fig. O).





**CAUTION:** If the balancing valve valve is not installed, commissioned and intained properly, according to the instructions contained in this nual, it may not operate correctly and may endanger the user.



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



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