CALEFFI Hydronic Solutions

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## Balancing valve for hydraulic systems

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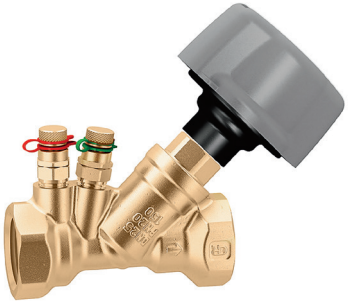
## 130 AUS series

# Installation, commissioning and servicing instructions

### Function

Balancing valves are hydraulic devices used for accurately regulating the flow rate of the thermal medium supplying the terminal emitters of a system.
Correct balancing of the hydraulic circuits is essential to guarantee system operation according to design specifications, high thermal comfort and low energy consumption.
On 130 series threaded valves, the flow rate is measured with a Venturi device, housed inside the valve body. This devices guarantees balancing accuracy and is extremely practical to use during setting.

### Product range



**130**400 AUS DN 15 (*1/2"*)
**130**500 AUS DN 20 (*3/4"*)
**130**600 AUS DN 25 (*1"*)
**130**700 AUS DN 32 (*1 1/4"*)
**130**800 AUS DN 40 (*1 1/2"*)
**130**900 AUS DN 50 (*2"*)

**Lead Free**
**WMTS-012**
**WMK27118**

### Technical specifications

**Materials**

| | |
|---|---|
| Body: | LOW LEAD dezincification resistant alloy CW511L-M |
| Cover: | LOW LEAD dezincification resistant alloy CW511L-M |
| Control Stem: | LOW LEAD dezincification resistant alloy EN 12165 CW724R |
| Obturator: | LOW LEAD dezincification resistant alloy EN 12165 CW724R |
| Hydraulic seals: | EPDM |
| Adjustment knob: | PA6G30 |
| Pressure test ports: | EN 12165 CW724R with EPDM seal elements |

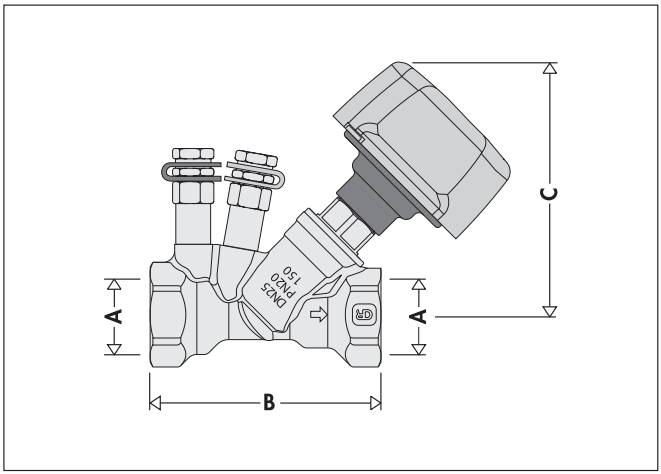
| | |
|---|---|
| **Connections** | 1/2" - 2" F (EN 10226-1) |
| pressure test ports: | 1/4" NPT Female |

**Performance**

| | |
|---|---|
| Medium: | water and non-hazardous glycol solutions |
| Max. working pressure: | 1600 kPa |
| Working temperature range: | -20–120 °C |
| Max. percentage of glycol: | 50 % |
| Accuracy: | ±10 % |

*This product is in compliance with the lead free requirements of the clause A5G4 of National Construction Code (NCC) 2022 Volume Three – Plumbing Code of Australia*

## Dimensions

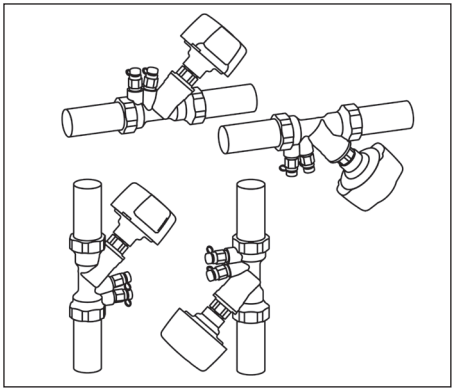



| Code | A | B | C | kg |
|---|---|---|---|---|
| **130**400 AUS | 1/2″ | 84 | 117 | 0,53 |
| **130**500 AUS | 3/4″ | 90 | 121 | 0,56 |
| **130**600 AUS | 1″ | 108 | 129 | 0,72 |
| **130**700 AUS | 1 1/4″ | 124 | 138 | 0,93 |
| **130**800 AUS | 1 1/2″ | 135 | 150 | 1,22 |
| **130**900 AUS | 2″ | 164 | 168 | 1,94 |

## Installation

Installation of the balancing valve has to be performed by an authorised plumber in accordance with AS/NZS 3500 and local legislation. Before fitting the balancing valve, the pipes must be flushed to ensure that impurities will not reduce its performance. We recommend always installing strainers of sufficient capacity at the inlet from the water mains. System flushing, cleaning and disinfection of the pipework to which the valve is installed shall be performed by suitably qualified persons in accordance with the system component manufacturer's instructions, AS/NZS 3500 along with any other applicable local authority requirements. Exceeding the maximum stated chemical concentrations and/or duration of exposure may negatively impact on the performance of the system and/or components installed. Chemical dosed products must be chemically compatible with materials used for the construction of the balancing valve, specified in its technical documentation.

The balancing valve can be fitted in any position, vertical or horizontal, by respecting the flow direction indicated by the arrow on the valve body. The balancing valve must be installed according to the diagrams given in the related manual. It must be installed in such a way as to allow free access to the device, for checking operation and maintenance; it is advisable to install isolating valves.



## Operation

Regulation is performed using a knob that governs the movement of an obturator, to regulate the flow of the medium. The flow rate is controlled according to the Δp value, which is measured with two piezometric connections suitably positioned on the valve.

## Using and setting the balancing valve

The balancing valve is used considering the fluid dynamic characteristics produced by the relationship between the head loss, flow rate and adjustment position of the obturator control knob.

**Pre-adjustment**
Knowing the value of the pressure drop Δp that needs to be created by the valve with a certain flow rate G, you can obtain the adjustment position number for the knob (PRESETTING). To make this choice you can use the characteristic diagram for each valve size. Or, analytically, you can calculate the corresponding Kv by applying the formula:

$$Kv = \frac{G}{\sqrt{\Delta p}}$$

where: G = flow rate in $m^3/h$
Δp = pressure drop in bar
(1 bar = 100 kPa, 10.000 mm w.g.)
Kv = flow rate in $m^3/h$ through the valve, which corresponds to a pressure drop of 1 bar

and you compare the value obtained with the typical values for each valve size.
It is recommended to choose the valve size so it is pre-set on a medium opening position in order to have room for both opening and closing.

**Flow rate measurement**
Connect a differential pressure measuring station to the valve's Venturi device pressure test ports. Reading the Δp on the measuring device, you can refer to the characteristic Venturi diagram for the valve being used to obtain the flow rate G.
Or, analytically, you can calculate the flow rate by applying the equation:

$$G = Kv_{Venturi} \times \sqrt{\Delta p_{Venturi}}$$

**Note:** The diagram used in this phase is not the one used for pre-adjustment as it refers to the characteristics of $\Delta p_{Venturi}$-Flow rate of the Venturi device located upstream from the valve, and not those of the entire valve (including the obturator), which instead are indicated in the diagrams used for pre-adjustment.

**Manual flow rate adjustment**
To manually set the flow rate through the valve, adjust the position of the knob until the differential pressure, indicated by the measurement device, corresponds to the desired flow rate on the characteristic Venturi diagram of the valve that you are using.
Or analytically calculate the head loss of the Venturi device by applying the equation:

$$\Delta pVenturi = \frac{G^2}{Kv_{Venturi}^2}$$

Then turn the adjustment knob to reach the value of Δp calculated theoretically with the formula (1.3) indicated above.

**Note:** The diagram used in this phase is not the one used for pre-adjustment as it refers to the characteristics of $\Delta p_{Venturi}$ - Flow rate of the Venturi device inserted in the valve, and not those of the entire valve (including the obturator), which instead are indicated in the diagrams used for pre-adjustment.

Correction for liquids with different densities
The following notes apply to liquids with viscosity ≤ 3 °E (water and glycol mixtures, for example). If using liquids with densities other than that of water at 20 °C ($\rho$ = 1 kg/dm$^3$), the measured pressure drop Δp may be corrected using the formula:

$$\Delta p' = \Delta p/\rho'$$

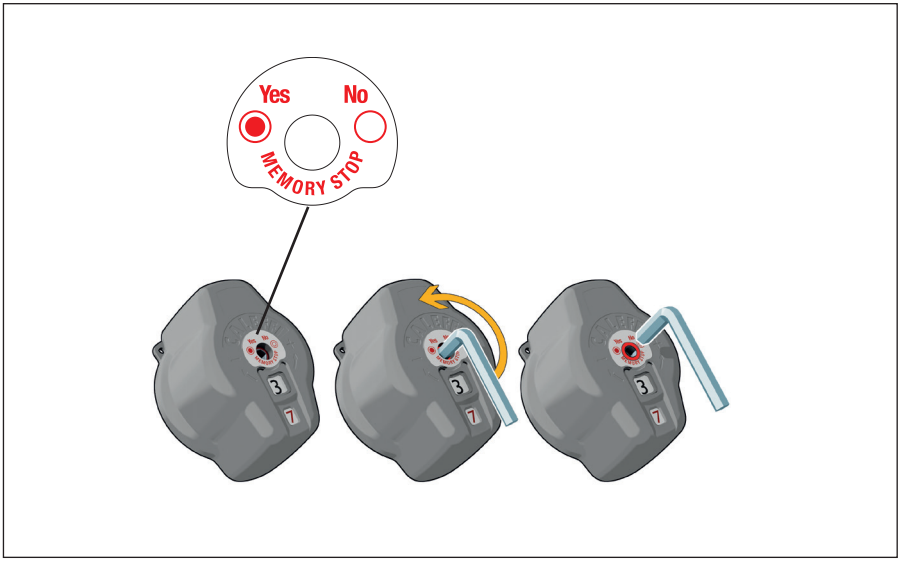
where: $\Delta p'$ = reference pressure drop
$\Delta p$ = measured pressure drop
$\rho'$ = liquid density in kg/dm$^3$

The value Δp' is used when pre-adjusting or measuring the flow rate using the diagrams or the formulas.

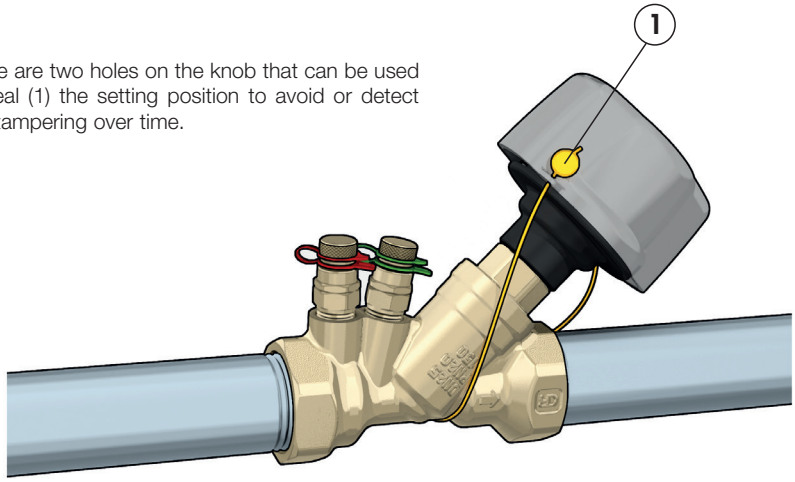
**Memory stop/Sealing locking**

The valves are equipped with an adjustment position memory system that, after full closure which can be necessary for various reasons, allows easy re-opening at the initial position.

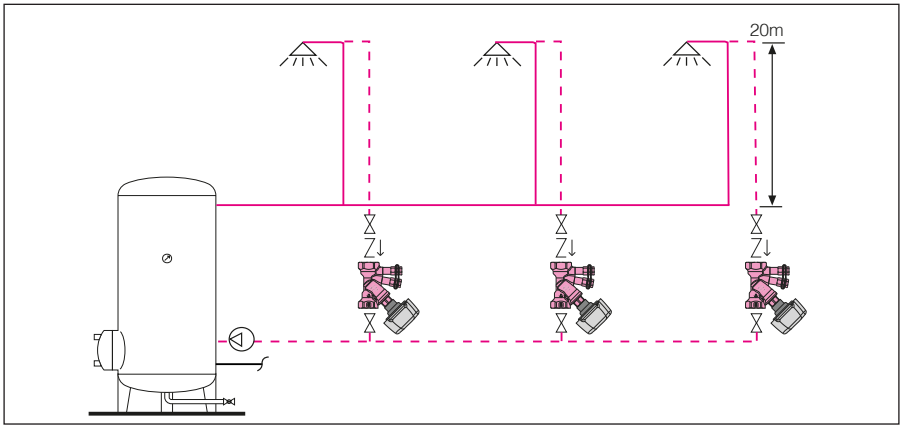
Insert a 2,5 mm hexagonal spanner in the hole, turn counter-clockwise until the red indicator, initially not visible, is aligned with the top edge of the knob, without forcing it.

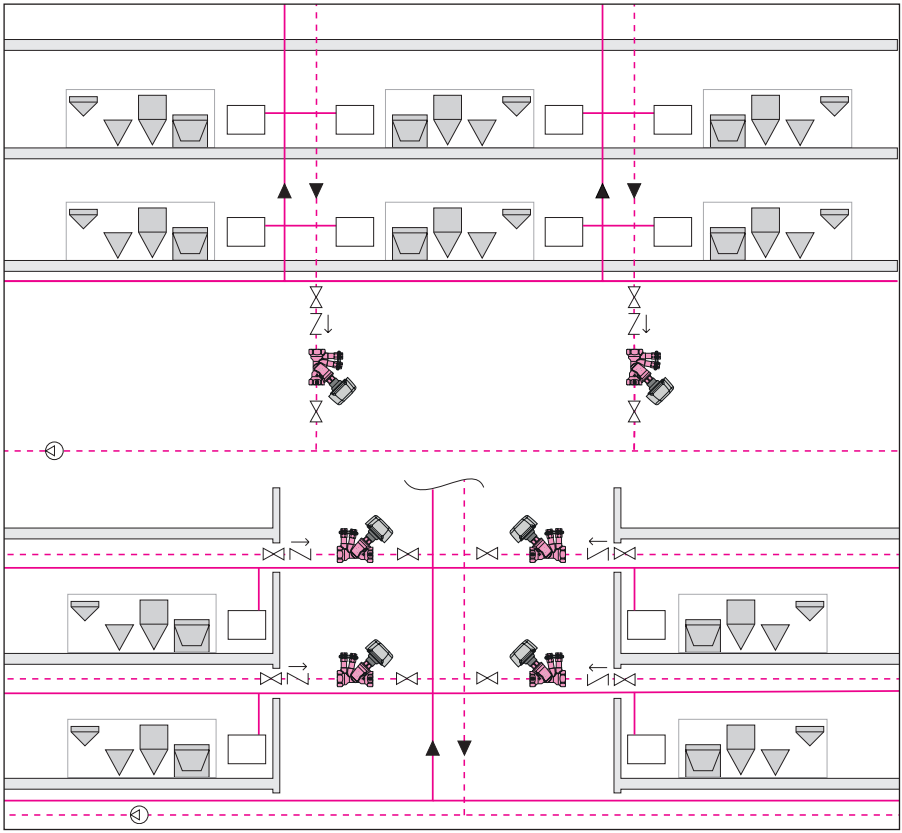



There are two holes on the knob that can be used to seal (1) the setting position to avoid or detect any tampering over time.



## Application diagrams



**Safety**

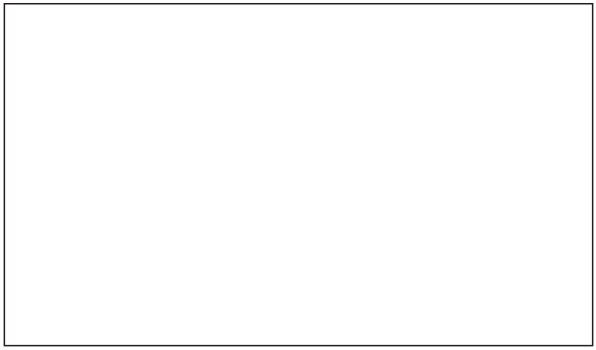
If the thermostatic regulator is not installed, commissioned and maintained properly in accordance with the instructions contained in this manual, it may not operate correctly, and may cause damage to objects and/or persons.

Make sure that all the connections are water-tight.

When installing the thermostatic regulator, make sure not to over-tighten the connections to the valve, as, over time, a failure can occur with subsequent water leakage causing damage.

In the case of highly aggressive water, arrangements must be made to treat the water before it enters the thermostatic regulator valve, in accordance with current legislation. Otherwise, the thermostatic regulator may be damaged and not function correctly.

**Leave this manual for the user**



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