

Balancing valve with flow meter

132 series



01149/08 GB



BSI EN ISO 9001:2000
Cert. n° FM 21654



UNI EN ISO 9001:2000
Cert. n° 0003



Function

The balancing valve is a hydraulic device that accurately regulates the flow rate of heating medium supplied to system terminals.

A correct balancing of hydraulic systems is essential to guarantee the system operation according to its design specifications, high thermal comfort and low energy consumption.

This particular series of valves is equipped with a flow meter for a direct reading of the regulated flow rate. The flow meter, housed in a by-pass circuit on the valve body and that can be shut off during normal functioning, allows a fast and easy balancing of circuits without the need for differential pressure gauges or diagrams.

The balancing valve is equipped with a hot pre-formed shell insulation to ensure a perfect thermal performance in case of use both with hot and chilled water.

Patent application No. MI2007A000703.

Product range

132 series Balancing valve with flow meter sizes 1/2", 3/4", 1", 1 1/4", 1 1/2" and 2"

Technical specifications

Materials

Valve

Body: brass EN 12165 CW617N
Ball: brass EN 12164 CW614N
Ball control stem: brass EN 12164 CW614N, chrome plated
Ball seal seat: PTFE
Control stem guide: PSU
Seals: EPDM

Flow meter

Body: brass EN 12165 CW617N
Headwork: brass EN 12164 CW614N
Obturator stem: brass EN 12164 CW614N, chrome plated
Springs: stainless steel
Seals: EPDM
Flow meter float: PSU
Indicator cover: PSU

Performance

Medium: water, glycol solutions
Max. percentage of glycol: 50%
Max. working pressure: 10 bar
Working temperature range: -10–110°C
Flow rate range unit of measurement: l/min
Accuracy: ±10%
Control stem angle of rotation: 90°
Operating wrench: 1/2"–1 1/4": 9 mm
1 1/2" and 2": 12 mm
Threaded connections: 1/2"–2" F

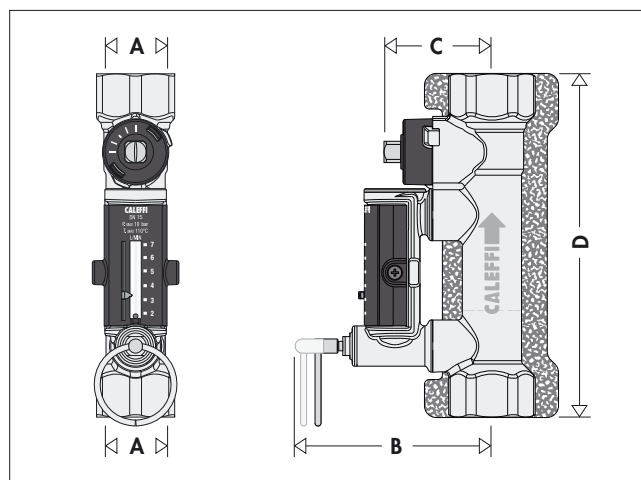
Insulation

Material: closed cell expanded PE-X
Thickness: 10 mm
Density: - inner part: 30 kg/m³
- outer part: 50 kg/m³
Thermal conductivity (DIN 52612): - at 0°C: 0,038 W/(m·K)
- at 40°C: 0,045 W/(m·K)
Coefficient of resistance to water vapour (DIN 52615): > 1.300
Working temperature range: 0–100°C
Reaction to fire (DIN 4102): class B2

Flow rate ranges

Code	132402	132512	132522	132602	132702	132802	132902
Size	1/2"	3/4"	3/4"	1"	1 1/4"	1 1/2"	2"
Flow rates (l/min)	2–7	5–13	7–28	10–40	20–70	30–120	50–200

Dimensions

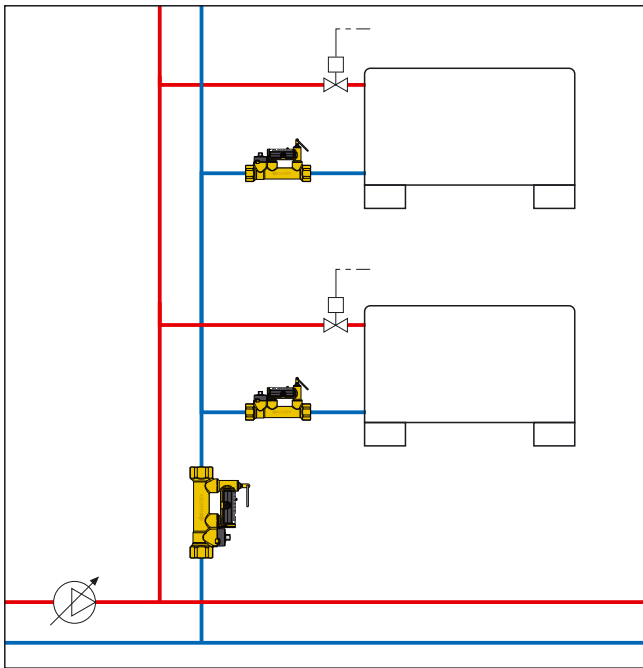


Code	A	B	C	D	Weight (kg)
132402	1/2"	83,5	45,5	145	0,80
132512	3/4"	83,5	45,5	145	0,74
132522	3/4"	83,5	45,5	145	0,74
132602	1"	85	47	158	0,96
132702	1 1/4"	88	50	163,5	1,19
132802	1 1/2"	91	56,5	171	1,47
132902	2"	96,5	62	177	2,00

Advantages of balanced circuits

Balanced circuits have the following principal benefits:

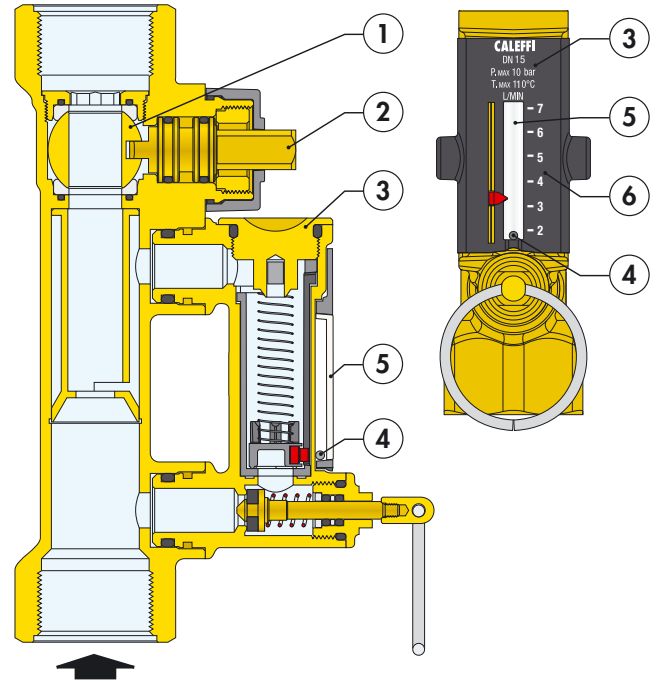
1. The system terminals operate correctly in heating, cooling and dehumidification without waste of energy and provide a better comfort.
2. The pumps run in their zone of highest efficiency, thus reducing the risk of overheating and excessive wear.
3. Too high medium speeds, which can result in noise and abrasion, are avoided.
4. The differential pressures acting on the regulation valves are limited in value, thus preventing faulty operation.



Operating principle

The balancing valve is an hydraulic device that allows to regulate the medium flow rate passing through.

The regulating action is made by a ball obturator (1), operated by a control stem (2). The flow rate is controlled by means of a flow meter (3) housed in a by-pass circuit, on the valve body, that can be shut off during normal functioning. The flow rate value is indicated by a metal sphere (4), sliding within a transparent guide (5), marked alongside by a graduated scale (6).



Construction details

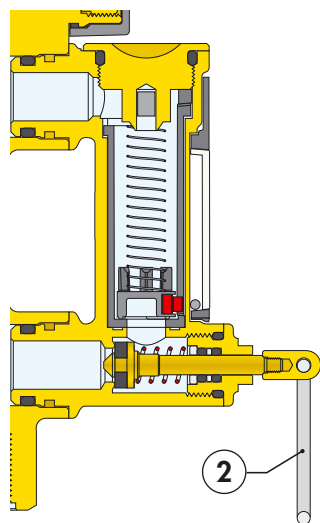
Flow meter

The flow rate value is displayed directly by a flow meter housed in a by-pass circuit on the valve body, automatically shut-off during normal functioning.

The use of a flow meter greatly simplifies the process of system balancing, since the flow rate can be measured and controlled at any time and there is no need for differential pressure gauges or reference charts.

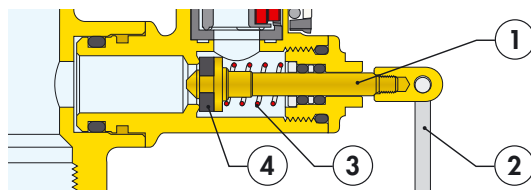
The provision of a flow meter also means that it is not anymore necessary to calculate valve settings at the system design stage.

The advantages of this solution can be explained as significant time and cost saving, because the traditional balancing device presetting, performed by qualified technicians, is a long and difficult procedure.



Flow meter obturator

The obturator (1) opens and shuts the circuit between the flow meter and the valve. The obturator can be easily opened by pulling the ring (2), and is closed automatically, after completion of the procedure, by the internal spring (3). The spring and the EPDM seal (4) guarantee over time a perfect circuit closure during normal functioning.



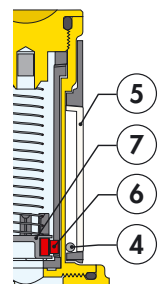
The operating ring (2) is made of a material with low thermal conductivity to avoid burns if the flow meter is opened while hot medium is passing through the valve.

Ball/magnet indicator

The ball (4) that indicates the flow rate value is not in direct contact with the thermal medium passing through the flow meter.

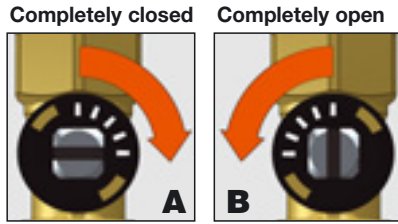
Thanks to an effective and innovative measuring system, the ball slides up and down in a cylinder (5) that is actually separate from the body of the flow meter. The ball is moved by a magnet (6) fixed to a float (7).

This means that the flow rate indication system remains perfectly clean and provides reliable readings over time.



Complete closing and opening of the valve

The valve can be completely closed and opened. A slot on the obturator stem indicates the status of the valve. When the control stem is turned fully clockwise and the slot lies perpendicular to the axis of the valve, the valve is fully closed (A). When the control stem is turned fully anti-clockwise and the slot lies parallel to the axis of the valve, the valve is fully open (B).

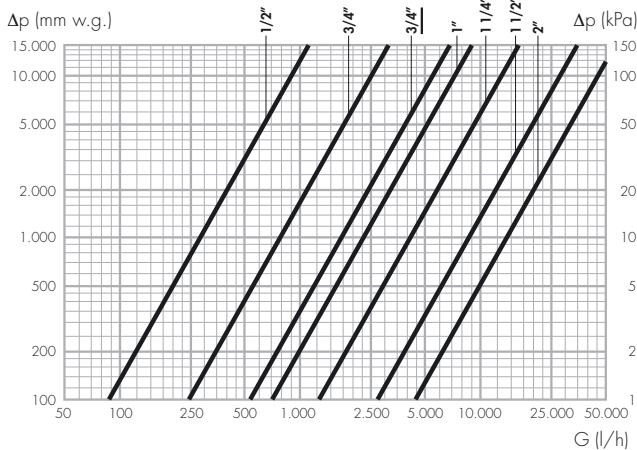


Insulation

The 132 series balancing valve is supplied complete with hot pre-formed insulation. This system ensures not only perfect thermal insulation, but also tightness to water vapour from the environment towards the inside. For these reasons, this type of insulation can also be used in chilled water circuits as it prevents condensation forming on the surface of the valve body.



Hydraulic characteristics



Code	132402	132512	132522	132602	132702	132802	132902
Size	1/2"	3/4"	3/4"	1"	1 1/4"	1 1/2"	2"
Flow rates (l/min)	2-7	5-13	7-28	10-40	20-70	30-120	50-200
Kv (m³/h)	0,9	2,5	5,4	7,2	13,1	27,8	46,4

Kv valves fully open

Correction for liquids with different densities

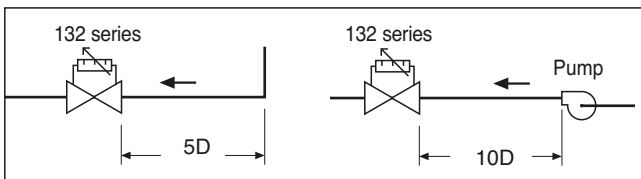
For fluids with a viscosity $\leq 3^{\circ}\text{E}$, e.g. water/glycol solutions with density different with respect to the water at 20°C ($\rho = 1 \text{ kg/dm}^3$), to which the upper diagram refers, it should be considered that:

- pressure drop (for sizing the pump) is determined by:

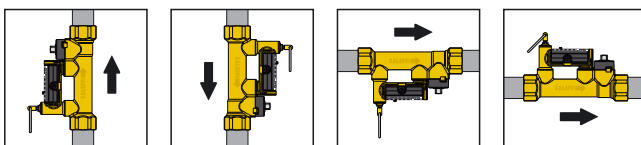
$$\Delta p_{\text{actual}} = \Delta p_{\text{reference}} \times \rho_{\text{glycol solution}}$$
- variation in flow rate measurement remains within the specified accuracy ($\pm 10\%$) for glycol percentages up to 50%.

Installation

Install the balancing valve in such a way to ensure free access to the flow meter obturator, control stem and flow rate indicator. We recommend to install straight sections of pipe as shown in the illustration below to ensure accurate flow measurement.



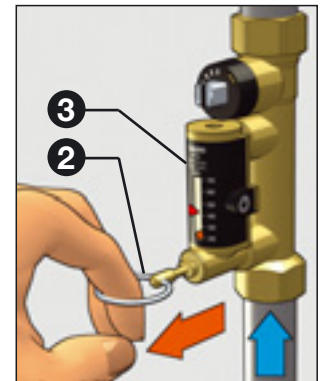
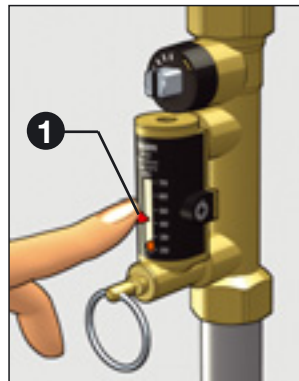
The valve can be installed in any position by respecting the flow direction shown on the valve body. The valve can be installed either horizontally or vertically.



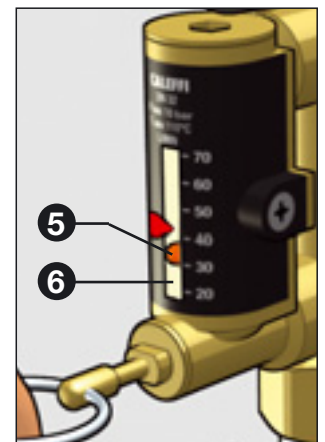
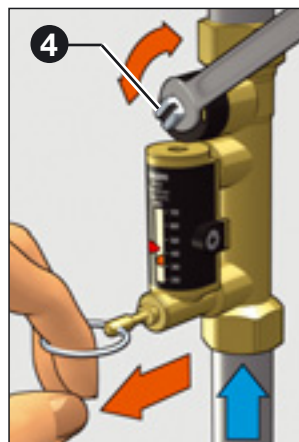
Flow rate adjustment

The flow rate is adjusted by carrying out the following operations:

- With the aid of the indicator (1), mark the reference flow rate at which the valve has to be set.
- Use the ring (2) to open the obturator that shuts off the flow of medium in the flow meter (3) under normal operating conditions.



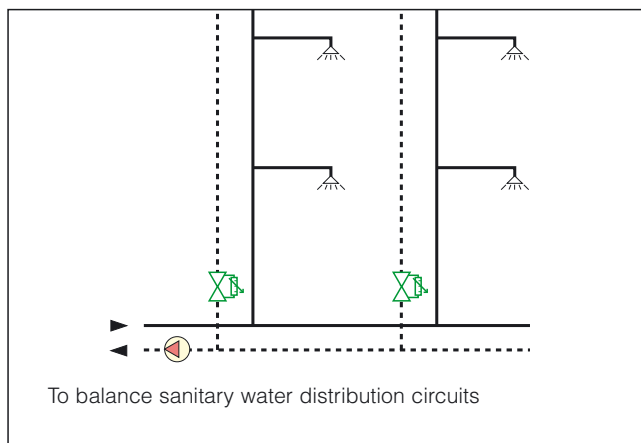
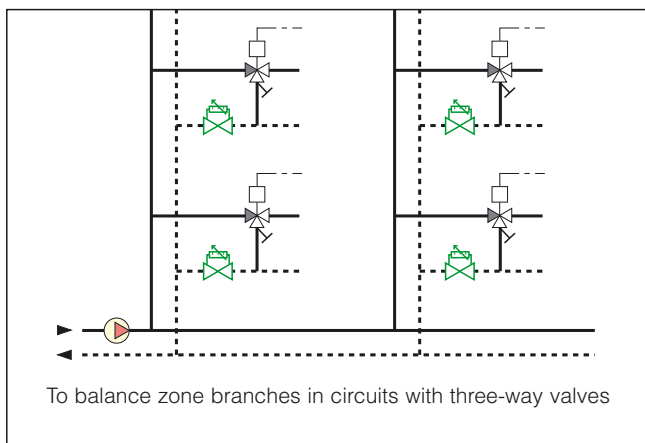
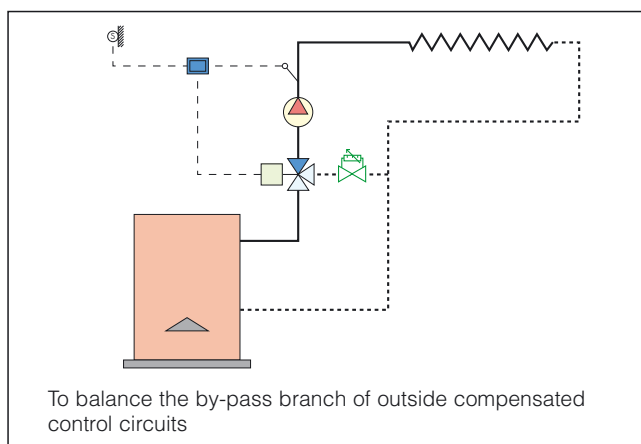
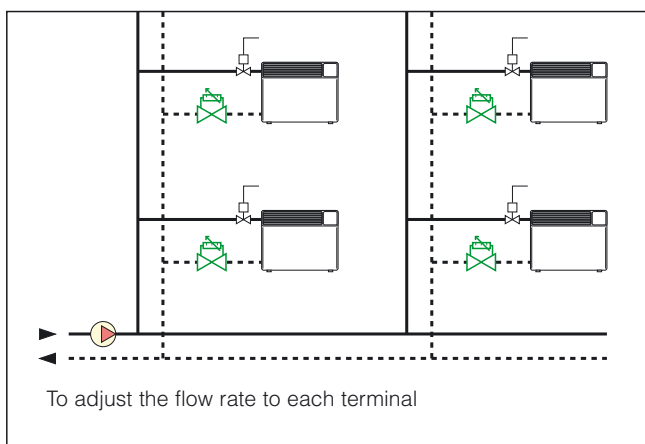
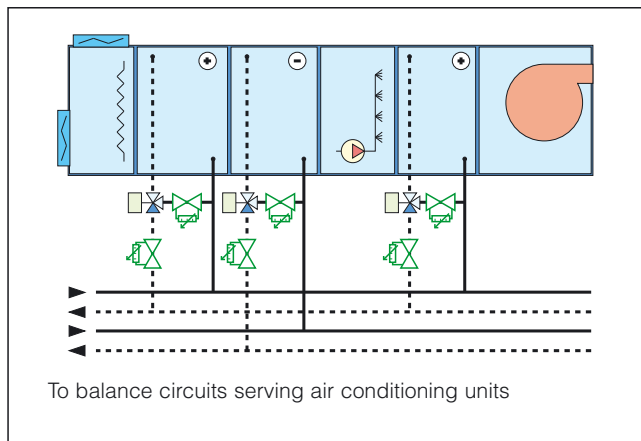
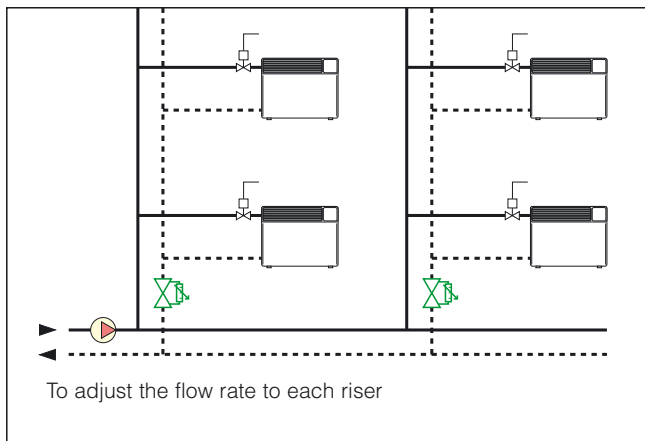
- Keeping the obturator open, apply a wrench on the control stem of the valve (4) to adjust the flow rate. It is indicated by a metal ball (5) that runs inside a transparent guide (6) marked by a graduated scale in l/min.



- After completing the balancing, release the ring of the flow meter obturator that, thanks to an internal spring, will automatically go back into the closed position.

Application diagrams

The balancing valve with the flow meter should preferably be installed on the circuit return pipe.



SPECIFICATION SUMMARIES

132 series

Balancing valve with flow meter. Threaded connections 1/2" (from 1/2" to 2") F x F. Brass body. Brass ball. Brass ball control stem, chrome plated. PTFE ball seal seat. PSU control stem guide. Brass flow meter body and headwork. Brass flow meter obturator control stem, chrome plated. Stainless steel flow meter springs. PSU flow meter float and indicator cover. EPDM seals. With pre-formed shell insulation in expanded closed cell PE-X. Medium water and glycol solutions. Maximum percentage of glycol 50%. Maximum working pressure 10 bar. Working temperature range -10-110°C. Flow rate range unit of measurement l/min. Accuracy ± 10%. Control stem angle of rotation 90°.

We reserve the right to make changes and improvements to the products and related data in this publication, at any time and without prior notice.



CALEFFI S.P.A. · I · 28010 FONTANETO D'AGOGNA (NO) · S.R. 229, N.25 · TEL. +39 0322 8491 R.A. · FAX +39 0322 863723

· www.caleffi.com · info@caleffi.com ·

© Copyright 2008 Caleffi