Balancing valve with flow meter

112 series

01235/13 GB

Function

The balancing valve allows to regulate the flow rate of the thermal medium circulating in geothermal systems.
This particular series of valves is equipped with a flow meter for a direct reading of the regulated flow rate. The flow meter is housed in a by-pass circuit on the valve body and can be shut off during normal functioning, allowing fast and easy balancing of circuits without the need for differential pressure gauges or diagrams.
The hot pre-formed shell insulation guarantees perfect thermal insulation.

The 112 series shut-off valve can only be coupled to the 110 series geothermal manifold.

Product range

112 series	Balancing valve with flow meter	sizes DN 25 (Ø 25), DN 32 (Ø 32), DN 34 (Ø 34), DN 40 (Ø 40)
112..2 series	Balancing valve with ball valve	sizes DN 25 (Ø 25), DN 32 (Ø 32)
Code 112001/3		Insulation for balancing valves

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:	NBR-FASIT 50-EPDM

Flow meter

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

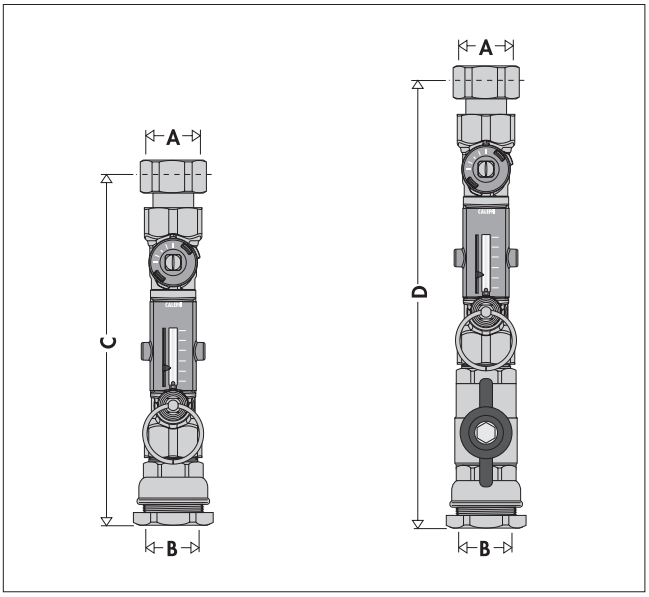
Performance

Medium:	water, glycol solutions, saline solutions
Max. percentage of glycol:	50%
Max. working pressure:	10 bar
Working temperature range:	-10–40°C
Ambient temperature range:	-20–60°C
Flow rate scale unit of measurement:	m^3/h
Flow rate range (m^3/h):	0,3–1,2
Accuracy:	±10%
Control stem angle of rotation:	90°
Operating wrench:	hexagonal 9 mm
Connections:	
- to manifold:	with captive nut 42 p.2,5 TR
- to pipe:	Ø 25, Ø 32, Ø 40

Insulation

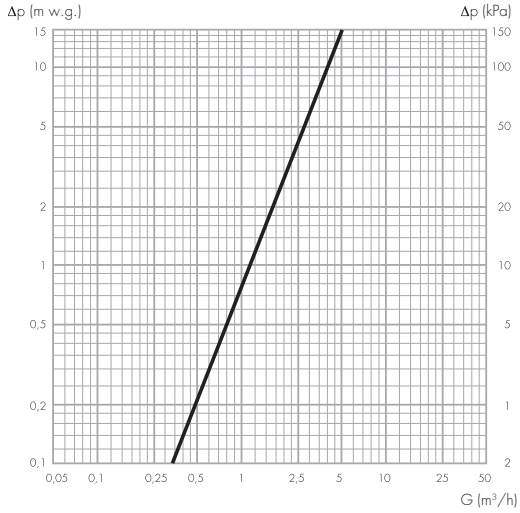
Material:		closed cell expanded PE-X
Thickness:		10 mm
Density:	- inner part:	30 kg/m^3
	- outer part:	80 kg/m^3
Thermal conductivity (DIN 52612):	- at 0°C:	0,038 W/(m·K)
	- at 40°C:	0,045 W/(m·K)
Coefficient of resistance to water vapour (DIN 52615):		> 1300
Working temperature range:		0–100°C
Reaction to fire (DIN 4102):		class B2

Dimensions



Code	A	B	C	D	Mass (kg)
112621	42 p.2,5 TR	Ø 25	225	–	1,70
112631	42 p.2,5 TR	Ø 32	225	–	1,62
112634	42 p.2,5 TR	Ø 34	233	–	1,70
112641	42 p.2,5 TR	Ø 40	233	–	1,76
112622	42 p.2,5 TR	Ø 25	–	292	2,04
112632	42 p.2,5 TR	Ø 32	–	292	2,05

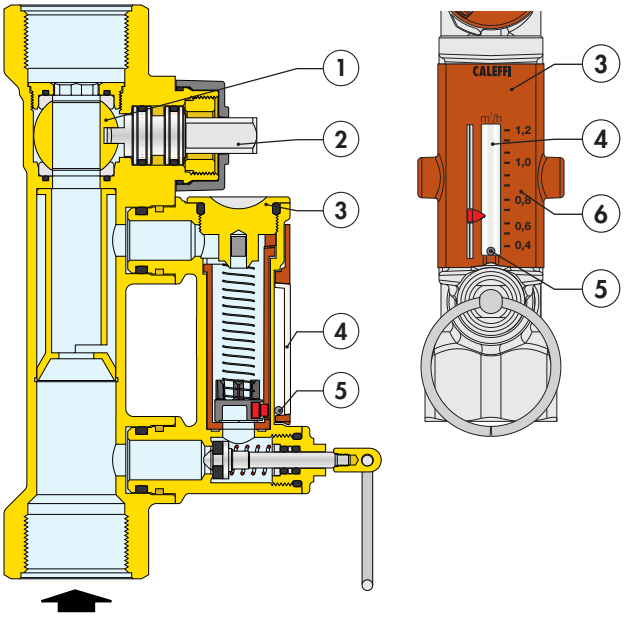
Hydraulic characteristics



Code	112621	112631	112634	112641	112622	112632
Size	DN 25	DN 32	DN 34	DN 40	DN 25	DN 32
Flow rate (m³/h)	0,3–1,2	0,3–1,2	0,3–1,2	0,3–1,2	0,3–1,2	0,3–1,2
Kv (m³/h)	3,5	3,5	3,5	3,5	3,5	3,5

Operating principle

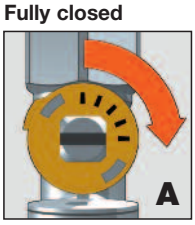
The balancing valve is an hydraulic device that allows to regulate the medium flow rate passing through.
The regulating action is made by a ball obturator (1), operated by a control stem (2). The flow rate is controlled by means of a flow meter (3) housed in a by-pass circuit, on the valve body, that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



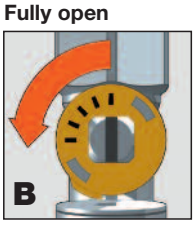
Complete closing and opening of the valve

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 fully turned 90° clockwise and the slot lies perpendicular to the axis of the valve, the valve is fully closed (A).
When the control stem is fully turned 90° anti-clockwise and the slot lies parallel to the axis of the valve, the valve is fully open (B).

Fully closed



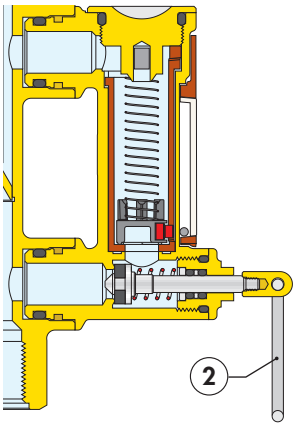
Fully open



Construction details

Flow meter for flow rate measurement

The flow rate measurement is provided directly by a flow meter, housed in a by-pass circuit on the valve body, which can be automatically excluded during normal function.

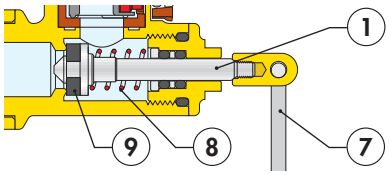


By using the flow meter, flow balancing operations can be simplified since the flow rate value can be read and checked second by second without having to use differential pressure gauges and reference graphs.

Furthermore, this makes no longer necessary to calculate valve presetting at the system design stage.
The benefits of this solution translate into significant time and cost savings, given that the calibration of conventional balancing devices, performed by qualified technicians, is a complex and expensive procedure.

Flow meter obturator

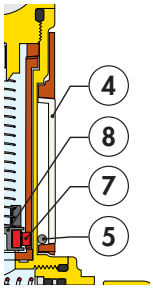
The obturator (1), which connects the flow meter to the valve, can be easily opened by pulling the ring (7) and is closed automatically, after completion of the procedure, by the internal spring (8). The spring and the EPDM seal (9) guarantee over time a perfect circuit closure during normal functioning.



The operating ring (7) 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.

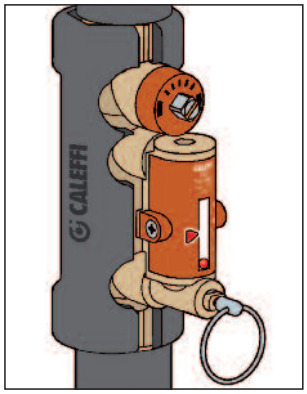
Ball/magnet indicator

The ball (5) 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 (4) that is actually separate from the body of the flow meter. The ball is moved by a magnet (7) fixed to a float (8).
This means that the flow rate indication system remains perfectly clean and provides reliable readings over time.



Insulation

The balancing valve can be coupled to the insulation (112 series).
This closed cell expanded PE-X insulation provides perfect thermal insulation, which is particularly useful for limiting heat loss from geothermal installations.
To make it easier to read the flow rate and carry out maintenance on the balancing valve, the insulation features a velcro opening thus avoiding the usual glueing.

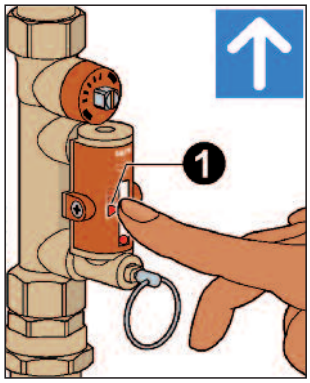


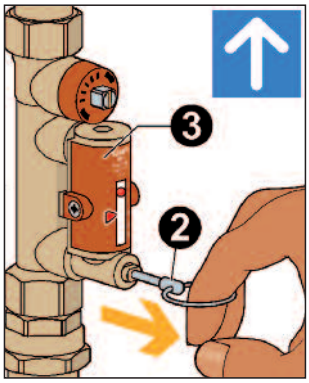
Flow rate adjustment

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

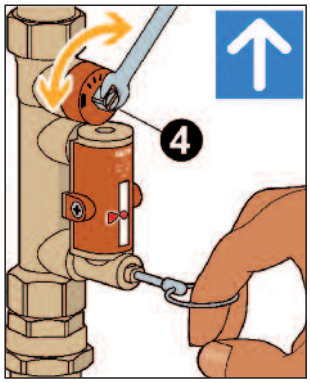
1) With the aid of the indicator (1), mark the reference flow rate at which the valve has to be set.

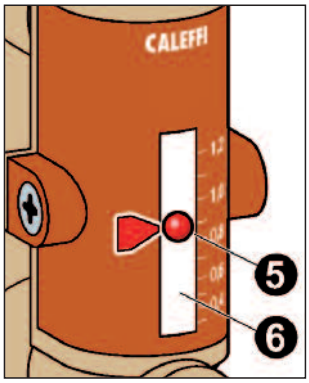
2) Use the ring (2) to open the obturator that shuts off flow of the medium in the flow meter (3) under normal operating conditions.





3) Keeping the obturator open, use a 9 mm hexagonal wrench on the valve control stem (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 m^3/h alongside it.





4) After completing the balancing, release the ring of the flow meter obturator (2) that, thanks to an internal spring, will automatically go back into the closed position.

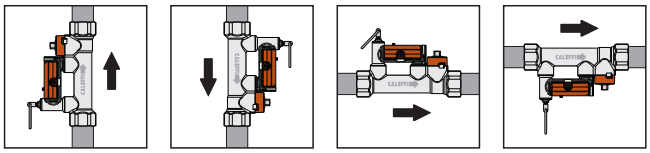
When using water/glycol solutions with density different with respect to the water, variation in flow rate measurement remain within the specified accuracy (± 10%) for glycol percentages of up to 50%.

Flow rate shut-off

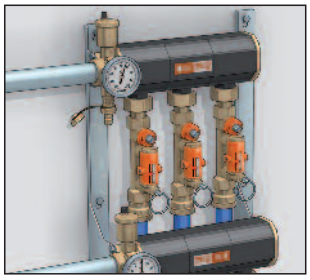
The 112..2 series valve is complete with a ball valve and was designed to allow system maintenance to be carried out without loosing the setting of the balancing valve.
In fact, in some cases, it may be useful to split the circuit into sections using the ball valve instead of the balancing valve regulation ball.
Like the 112 series, this version also has a nut at the top to connect to the geothermal manifold and the fitting for connection to the polyethylene pipe at the bottom.

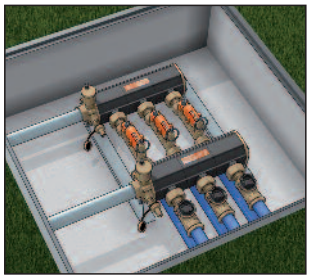
Installation

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.



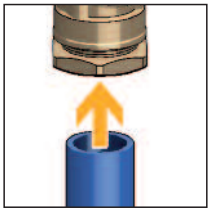
The versatility of the balancing valve means the geothermal manifold can be installed both vertically (wall mounted) and horizontally (in an outdoor well for example).

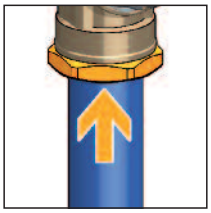




Circuit branching

The geothermal circuit pipe is connected directly to the balancing valve by means of a fitting for polyethlylene pipe, easy to fit. The pipe is fully inserted with the nut loosened, then the nut is retightened.





SPECIFICATION SUMMARY

112 series
Balancing valve with flow meter. Manifold connection with 42 p.2,5 mm trapezoidal thread captive nut and fitting for Ø 25, Ø 32, Ø 34, Ø 40 polyethylene pipe. Brass body. Brass ball. Brass ball control stem, chrome plated. PTFE ball seal seat. PSU control stem guide. Brass flow meter body and headwork. Stainless steel flow meter obturator stem. Stainless steel flow meter springs. PSU flow meter float and indicator cover. EPDM seals. Medium water, glycol solutions and saline solutions. Maximum percentage of glycol 50%. Maximum working pressure 10 bar. Working temperature range -10–40°C. Ambient temperature range -20–60°C. Flow rate scale unit of measurement in m^3/h. Accuracy ±10%. Control stem angle of rotation 90°.

Code 112001/3
Insulation for balancing valves. For Ø 25, Ø 32 (112001), Ø 34, Ø 40 (112003). Closed cell expanded PE-X material. Thickness 10 mm. Density of inner part 30 kg/m^3, outer part 80 kg/m^3. 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) > 1300. Working temperature range 0–100°C. Reaction to fire (DIN 4102) class B2.

Series 112...2
Balancing valve with flow meter complete with ball valve. Manifold connection with 42 p.2,5 mm trapezoidal thread captive nut and fitting for Ø 25, Ø 32, Ø 40 polyethylene pipe. Brass body. Brass ball. Brass ball control stem, chrome plated. PTFE ball seal seat. PSU control stem guide. Brass flow meter body and headwork. Stainless steel flow meter obturator stem. Stainless steel flow meter springs. PSU flow meter float and indicator cover. EPDM seals. Medium water, glycol solutions and saline solutions. Maximum percentage of glycol 50%. Maximum working pressure 10 bar. Working temperature range -10–40°C. Ambient temperature range -20–60°C. Flow rate scale unit of measurement in m^3/h. Accuracy ±10%. Control stem angle of rotation 90°.

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