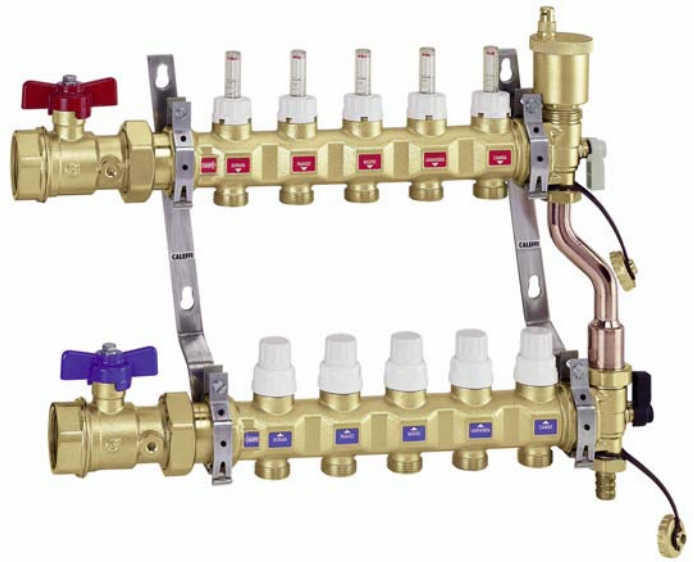
Pre-assembled distribution manifold for radiant panel systems

668...S1 series

01144/11 GB
Replaces 01144/07 GB



Function

The distribution manifold for radiant panel systems is used to optimally distribute the thermal medium in underfloor heating system circuits, in order to improve the control of the panel thermal emission.

They are offered in a pre-assembled version comprehensive of: flow meters to regulate and check the flow rate on the flow manifold; manual circuit shut-off valves fitted for thermo-electric actuator on the return manifold; end fittings complete with automatic air vent and multi-position valves with system fill/drain cocks; differential by-pass kit to keep the head balanced as the flow rate varies; pair of shut-off ball valves and brackets for box or wall mounting.

Reference documentation

- Tech. Broch. 01041 Automatic flow rate regulators with cartridge in steel, 120 - 125 - 103 series
- Tech. Broch. 01042 Thermo-electric actuator, 6561 series
- Tech. Broch. 01142 Thermo-electric actuator with manual opening and position indicator, 6563 series
- Tech. Broch. 01054 Automatic air vents MINICAL® - VALCAL® 5020 - 5021 - 5022 series

Product range

6686...S1 series Pre-assembled distribution manifold for radiant panel systems _____ size 1”
6687...S1 series Pre-assembled distribution manifold for radiant panel systems _____ size 1 1/4”

Technical specifications

Materials

Flow manifold

Body:	brass EN 1982 CB753S
Flow rate balancing valve	
Headwork:	brass EN 12164 CW614N
Obturator:	brass EN 12164 CW614N
Flow meter body:	PSU
Spring:	stainless steel
Hydraulic seals:	EPDM
Adjustment locking cover:	ABS

Return manifold

Body:	brass EN 1982 CB753S
Shut-off valve	
Headwork:	brass EN 1982 CB753S
Obturator stem:	stainless steel
Obturator:	EPDM
Springs:	stainless steel
Seals:	EPDM
Knob:	ABS

Shut-off ball valves

Body:	brass EN 12165 CW617N
Ball:	brass EN 12164 CW614N, chrome plated
Knob:	aluminium EN AB 46100

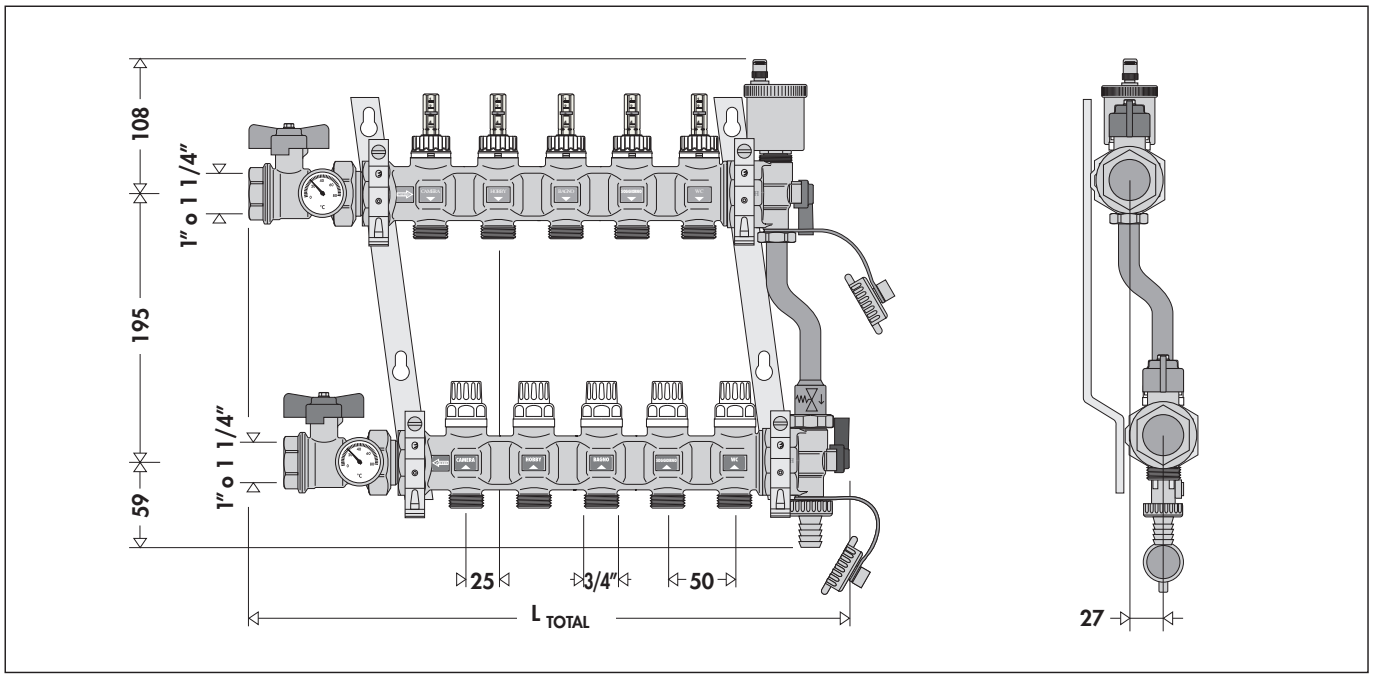
End fitting

Body:	brass EN 12165 CW617N
Air vent	
Obturator stem:	brass EN 12164 CW614N
Spring:	stainless steel
Seals:	EPDM
Float:	PP
Multi-position valve	
Ball:	brass EN 12165 CW617N
Control lever:	PA66GF
Hose connection:	brass EN 12164 CW614N

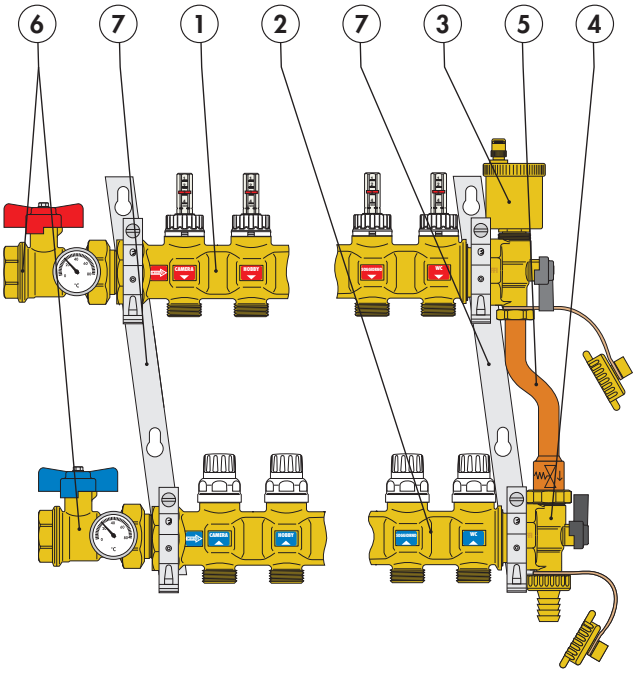
Performance

Medium:	water, glycol solutions
Max. percentage of glycol:	30%
Max. working pressure:	10 bar
End fitting max. discharge pressure:	2,5 bar
Working temperature range:	0–80°C
Flow meter scale:	1–5 l/min
Accuracy:	±15%
Main connections:	1”, 1 1/4” F
Centre distance:	195 mm
Outlets:	3/4” M - Ø 18
Centre distance:	50 mm

Dimensions



Code (1")	6686C5S1	6686D5S1	6686E5S1	6686F5S1	6686G5S1	6686H5S1	6686I5S1	6686L5S1	6686M5S1	6686N5S1	6686O5S1	6686P5S1
Code (1 1/4")	6687C5S1	6687D5S1	6687E5S1	6687F5S1	6687G5S1	6687H5S1	6687I5S1	6687L5S1	6687M5S1	6687N5S1	6687O5S1	6687P5S1
No. of outlets	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
L TOTAL	380	430	480	530	580	630	700	750	800	850	900	950
Mass (kg)	7,2	7,8	8,3	9,4	10,1	10,6	11,4	12,2	13,0	13,7	14,5	15,3



Characteristic components

1 Flow manifold with built-in flow meters and flow rate balancing valves

2 Return manifold with built-in shut-off valves fitted for thermo-electric actuator

3 Flow end fitting with two-position ball valve, automatic air vent and fill/drain hose connection

4 Return end fitting with three-position ball valve, by-pass connection and fill/drain hose connection

5 Off-centre by-pass kit with fixed setting complete with manifold connecting pipe

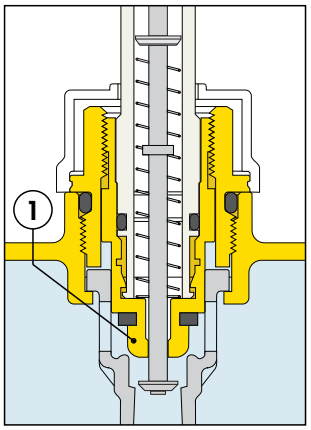
6 Shut-off ball valves

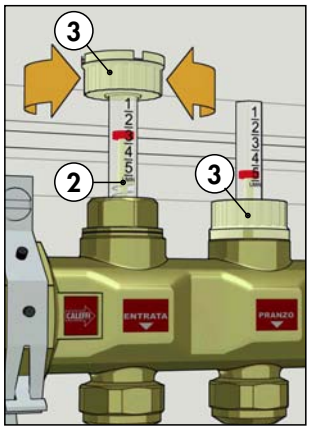
7 Brackets for box or wall mounting

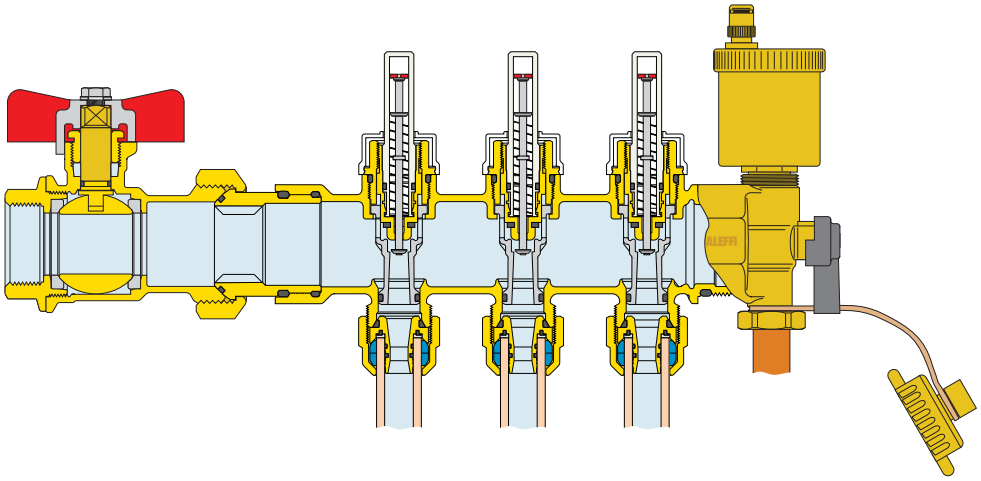
Construction details

Flow manifold

The flow manifold is equipped with built-in flow meters and flow rate balancing valves.
Using the balancing valve with the special tapered obturator, the flow rate to the individual circuits can be adjusted accurately as required, with the setting being read directly from the single flow meter with a scale of 1–5 l/min (2). This simplifies and speeds up the circuit setting process, with no need for reference graphs. After adjustment, the valve can be locked in its open position by means of its tamper-proof cover (3) which can be used as knob to adjust the flow rate, when turned upside down.
The valve itself makes it possible to seal off each individual circuit, if necessary.

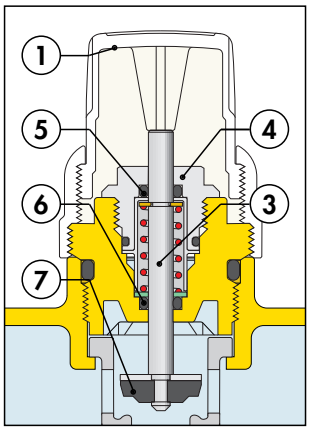


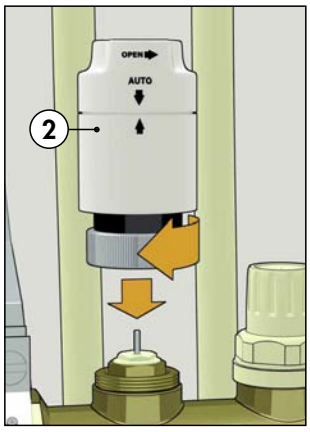


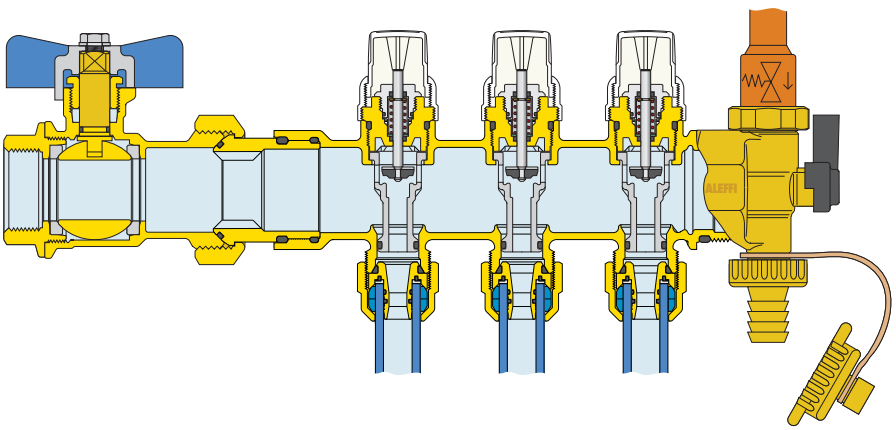


Return manifold

The return manifold is equipped with manual shut-off valves (1), in order to cut off the flow rate to each individual circuit.
They can also be fitted with a thermo-electric actuator (2) that, when used with a room thermostat, maintains the ambient temperature at the set values in spite of thermal load variations.
The obturator stem (3) consists of a single piece of ground stainless steel, in order to minimise friction and prevent building up of dangerous limescale deposits.
The headwork (4) has a double EPDM O-Ring seal (5)-(6) on the sliding stem.
The EPDM obturator (7) is shaped so as to optimise the hydraulic characteristics of the valve, preventing any sticking in the seal seat after the circuit has been shut off. It minimises the noise caused by the flow of the medium, also during the progressive opening or closing action when working with thermo-electric actuator.

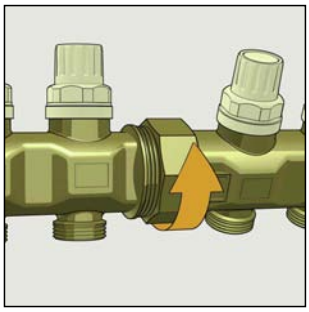






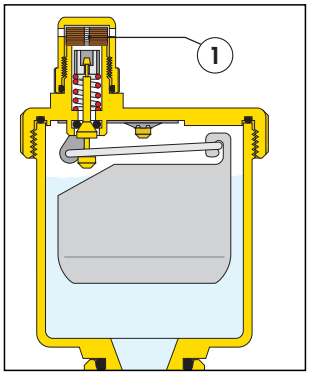
Manifold modularity

The manifolds are modular thanks to the threaded connections with O-ring seal.
The special machining of the thread on these connections enables perfect alignment between the two coupled parts once they are fully screwed in.



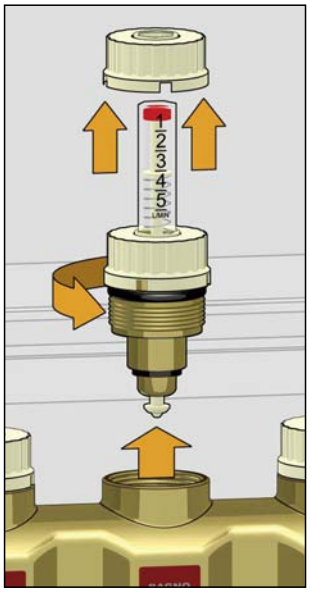
End fitting

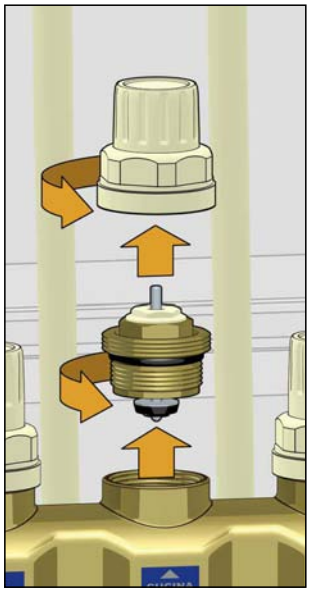
Automatic air vent
The automatic air vent automatically expels the air accumulating in the circuits of the air conditioning system. It is equipped with a hygroscopic safety cap (1) that prevents water from getting out in order to protect the installation.



Maintenance

The headwork of each manifold can be removed and replaced with suitable spare parts.

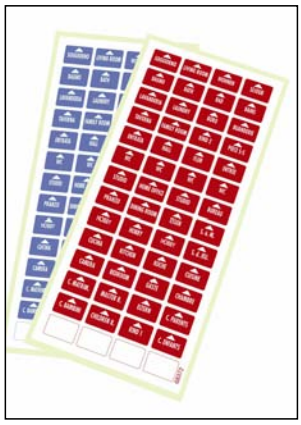




Room identification

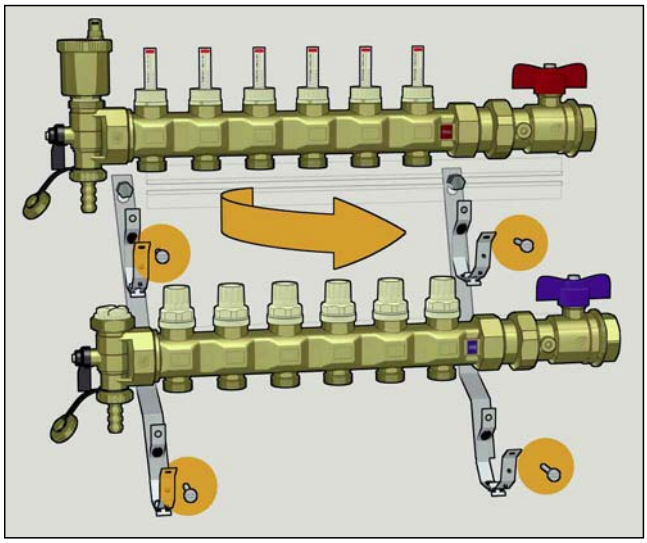
On the manifold body, at each individual panel circuit outlet, there is a special seat for affixing an adhesive label identifying the corresponding room.





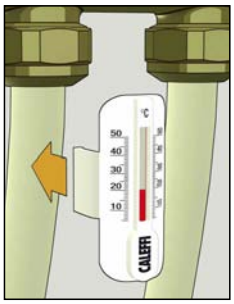
Manifold reversibility

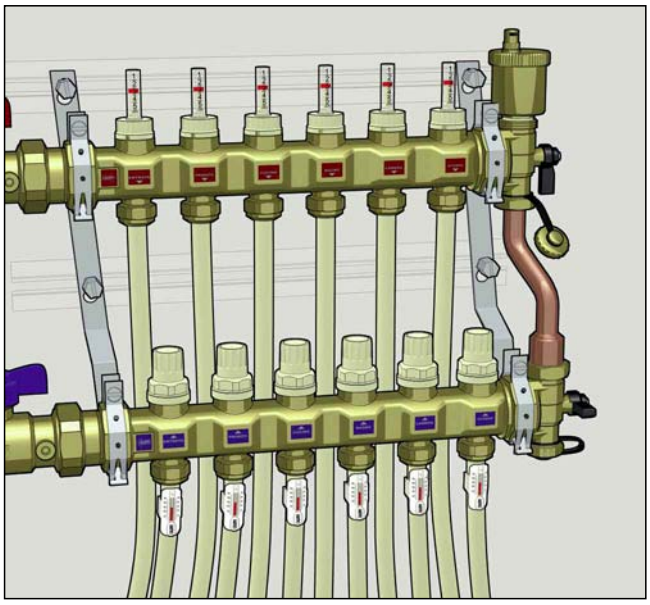
The manifolds are reversible, so they can be positioned with the inlet on the right or left.



Thermometers for circuit pipes

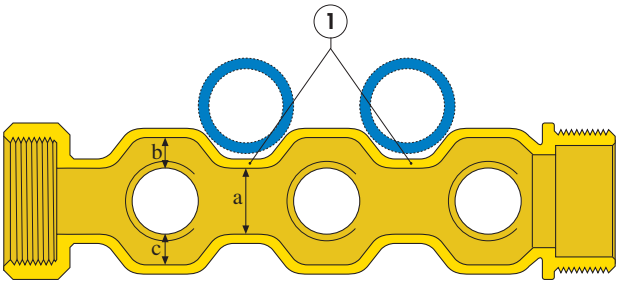
A special spirit thermometer with a scale of 5–50°C is available as an accessory; it is equipped with a push-fit plastic body for the individual panel pipe, with external diameter of 15 to 18 mm.
When installed on the return pipe, this thermometer measures the actual temperature of the medium returning from the circuit, making it easy to accurately check the thermal exchange condition of the individual panel.



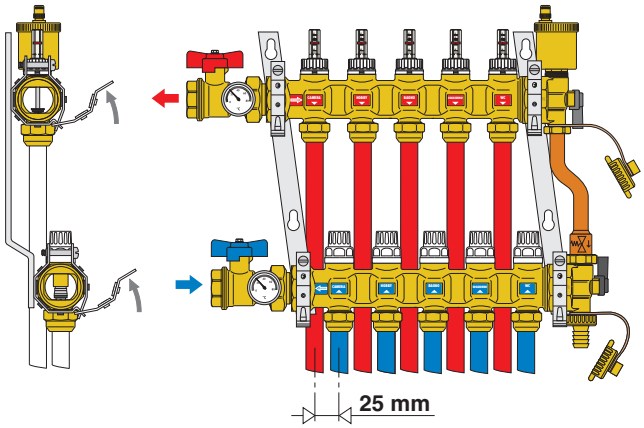


External shape of the manifolds and brackets

The casting process makes it possible to shape the external manifold geometry as required.
In this way, recesses (1) have been made in correspondence with the pipe passage coming down from the upper manifold, to allow it to be partially housed, for the benefit of depth. This special external shaping does not affect the head loss values, since the cross-sections of the recesses (a) are the same as in correspondence with the outlets (b)+(c) and where the control devices (setting lockshield and shut-off valves) obstruct the medium flow.



The partial pipe housing in the manifold shaping is moreover helped by the brackets, constructed with a precise angle in order to obtain a 25 mm shift between the upper and lower manifold.
As shown in the figure, this shift creates a perfect automatic alignment between the pipe position and the manifold shape at the installation site.



End fittings with multi-position valves

The ball valves in the end fittings can be positioned to perform different functions.

Fill/drain



Filling the circuits. Filling via the flow manifold and draining via the return manifold: both valves are in the open position.

Closing



Closing the connection to the fill and drain valves. Both valves are in the closed position. The automatic air vent on the flow manifold is always connected and cannot be shut off.

Operation with by-pass

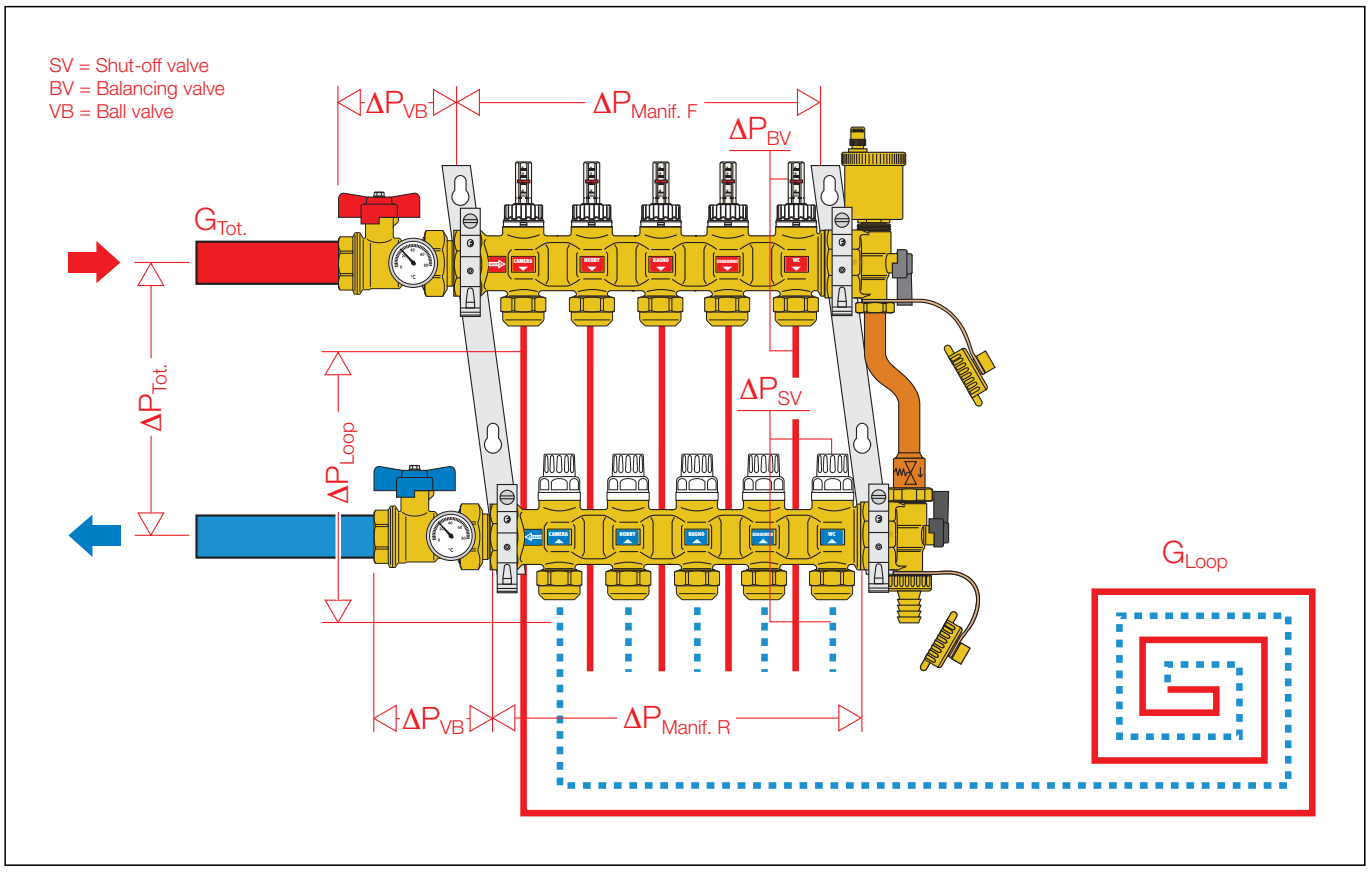


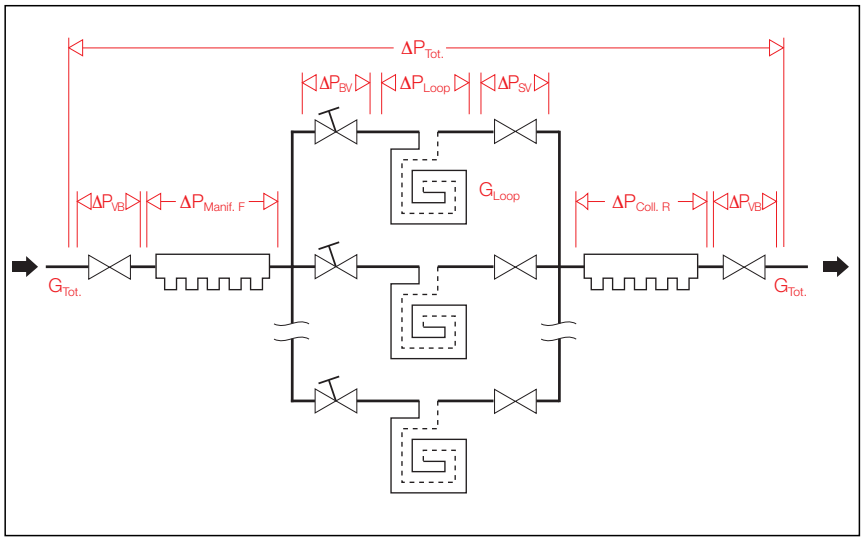
Normal operation. The return manifold valve is in the by-pass connection position and the flow manifold valve is in the open position.

Hydraulic characteristics

In order to determine the hydraulic characteristics of the circuit, it is necessary to calculate the total head loss suffered by the flow rate of medium on passing through the devices forming the manifold assembly and the radiant panel circuits.

From a hydraulic point of view, the system consisting of the manifold assembly and the circuits can be represented as a set of hydraulic elements arranged in series and in parallel.





$\Delta P_{Tot.}$ = Total loss at the ends of the manifold (Flow + Return + Loop)

ΔP_{BV} = Localised loss at loop balancing valve (loop flow rate)

ΔP_{Loop} = Loop loss (loop flow rate)

ΔP_{SV} = Localised loss at panel circuit shut-off valve (loop flow rate)

$\Delta P_{Manif.\ F}$ = Distributed loss of the flow manifold (total flow rate)

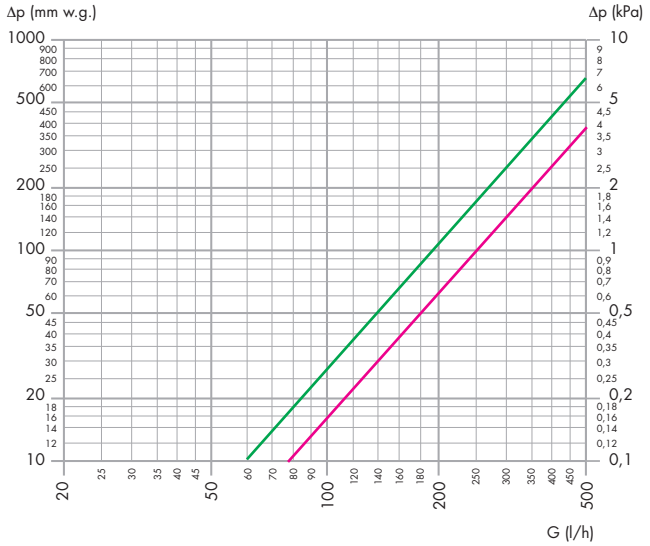
$\Delta P_{Manif.\ R}$ = Distributed loss of the return manifold (total flow rate)

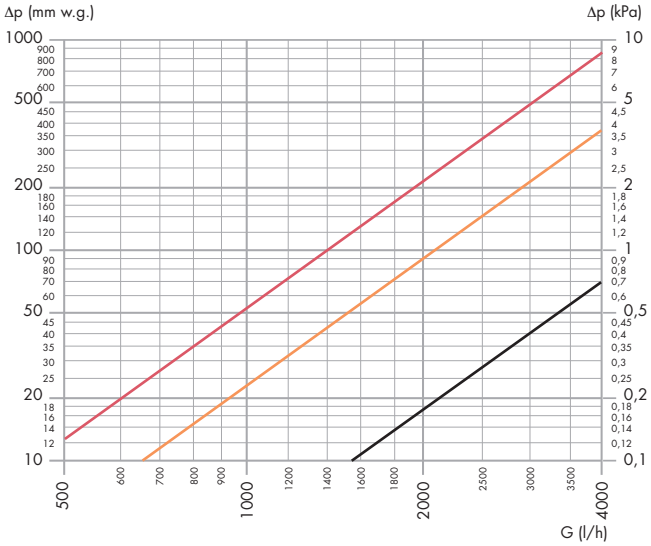
ΔP_{VB} = Ball valve loss (total flow rate)

$$\Delta P_{Tot.} = \Delta P_{BV} + \Delta P_{Loop} + \Delta P_{SV} + \Delta P_{Manif.\ F} + \Delta P_{Manif.\ R} + \Delta P_{VB} \times 2 \qquad (1.1)$$

When the hydraulic characteristics of each component and the design flow rates are known, the total loss can be calculated as the sum of the partial head losses for each specific component in the system, as indicated by the formula *(1.1)*.

Hydraulic characteristics





	Kv	$Kv_{0,01}$
Flow rate balancing valve fully open (BV)	1,85	185
Panel circuit shut-off valve (SV)	2,50	250

- *Kv = flow rate in m^3/h for a head loss of 1 bar*
- *$Kv_{0,01}$ = flow rate in l/h for a head loss of 1 kPa*

	Kv	$Kv_{0,01}$
Flow or return manifold, 3 – 7 outlets	21,0*	2100*
Flow or return manifold, 8 – 14 outlets	14,0*	1400*
Ball valve (VB)	47,5	4750

** Average value*

Example of total head loss calculation

Supposing we need to calculate the head loss of a manifold with three circuits with the following characteristics:

Total manifold flow rate: 450 l/h

The flow rate and head loss of the three loops are as follows:

Circuit 1	Circuit 2	Circuit 3	
ΔP1 = 10 kPa	ΔP2 = 20 kPa	ΔP3 = 7 kPa	*(1.2)*
G1 = 120 l/h	G2 = 250 l/h	G3 = 80 l/h	

Each segment of the formula *(1.1)* is calculated using the following relationship:

$$\Delta P = G^2/Kv_{0,01}{}^2$$

· G = flow rate in l/h
· ΔP = head loss in kPa (1 kPa = 100 mm w.g.)
· $Kv_{0,01}$ = flow rate in l/h through the device, which corresponds to a head loss of 1 kPa

It should be highlighted that the calculation of $\Delta P_{Tot.}$ must be made taking account of the circuit in which there are the greatest head losses distributed along the entire panel pipe loop.
In the case we are examining, the relevant circuit is No. 2.

It follows that:

$\Delta P_{BV2} = 250^2/185^2 = 1,82$ kPa
$\Delta P_{Loop2} = 20$ kPa
$\Delta P_{SV2} = 250^2/250^2 = 1$ kPa
$\Delta P_{Manif.\ F} = 450^2/2100^2 = 0,04$ kPa
$\Delta P_{Manif.\ R} = 450^2/2100^2 = 0,04$ kPa
$\Delta P_{VB} = 450^2/4750^2 = 0,01$ kPa

Values obtained by disregarding changes due to drawing off flow rate to the individual branched circuits

Using formula *(1.1)*, adding up all the calculated terms, we obtain:

$\Delta P_{Tot.} = 1,82 + 20 + 1 + \cancel{0,04} + \cancel{0,04} + \cancel{0,01}x2 = 22,82$ kPa

Note:
We can ignore the three terms for the head losses associated with the ball valves and manifolds because of their low values.
In general, the total head loss is fairly close to the branched panel circuit head loss.

Using the balancing valves with flow meter

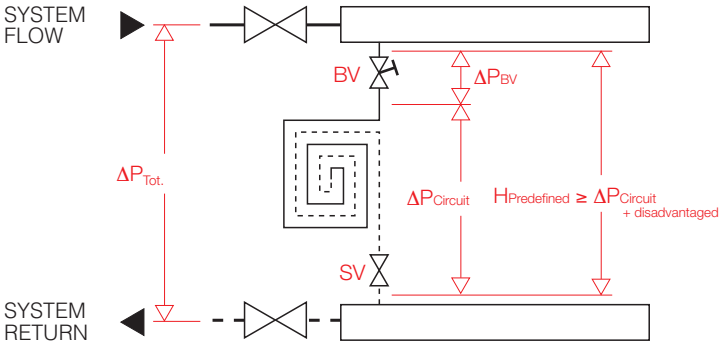
The balancing valves in the flow manifold make it possible to balance each individual panel circuit to obtain the design flow rates in each loop.

Considering the following data:

- medium flow rate across each circuit
- head loss generated in each circuit by this flow rate:
  $\Delta P_{Circuit} = \Delta P_{Loop} + \Delta P_{SV}$ ($\Delta P_{Shut\text{-}off\ valve}$)

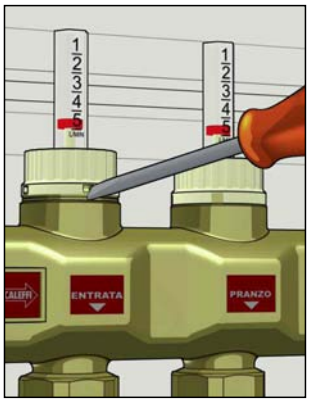
- available head on the panel circuit or predefined head:
  $H_{Predefined} \geq \Delta P_{Circuit\ +\ disadvantaged} = \Delta P_{BV} + \Delta P_{Loop} + \Delta P_{SV}$

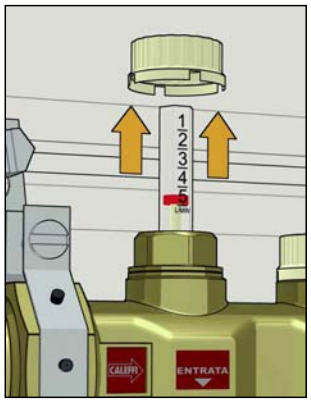
Referring to the adjacent diagram, for the loop flow rate the balacing valve must provide an additional head loss equal to the difference ΔP_{BV} ($\Delta P_{Balancing\ valve}$).

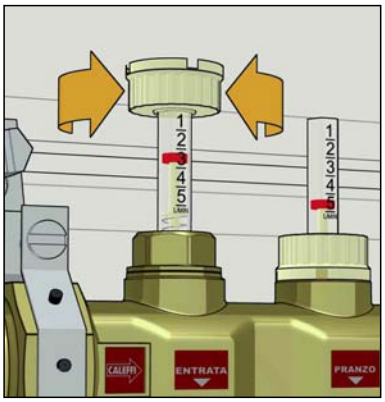


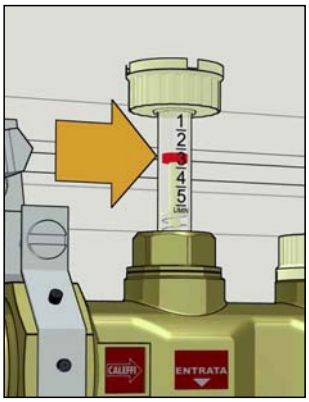
Flow rate regulation and reading

Lift the locking cover with the aid of a screwdriver and turn it over onto the flow meter. Adjust the flow rate of the individual panels by turning the flow meter body acting on the built-in regulating valve.
The flow rate must be read on the graduated scale, expressed in l/min, printed on the flow meter itself.
After making all the adjustments, reposition and lock all the knobs in their seats to prevent tampering.







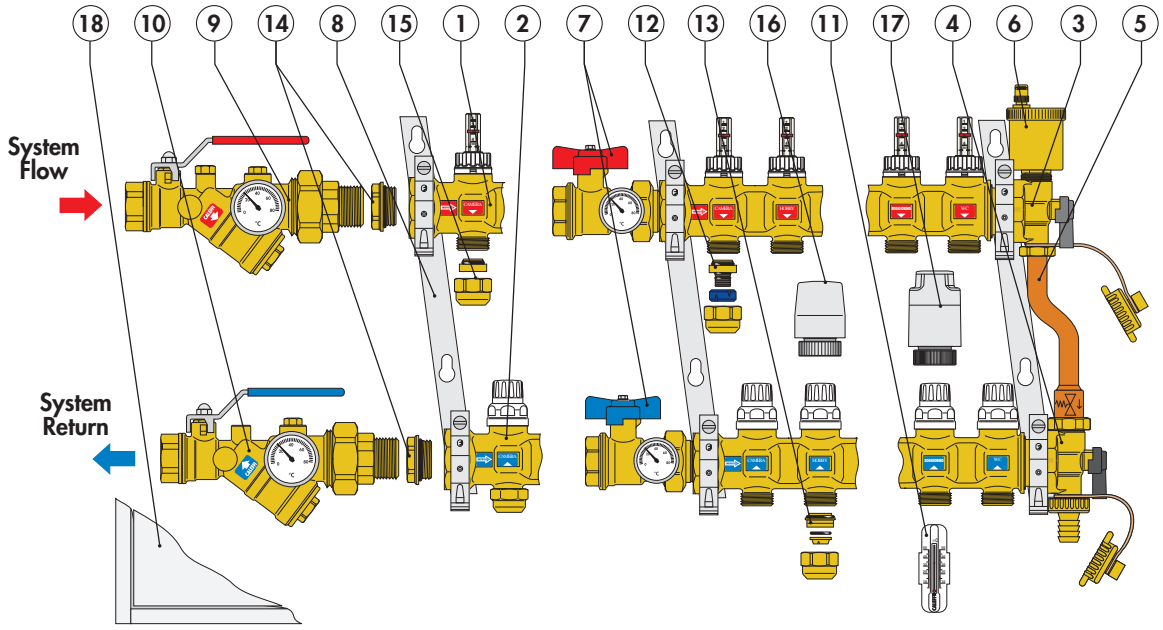


SPECIFICATION SUMMARY

668...S1 series

Pre-assembled distribution manifold for radiant panel systems with 3 (from 3 to 14) outlets. Brass body. EPDM hydraulic seals. Threaded main connections 1" (and 1 1/4") F, centre distance 195 mm. 3/4" M - Ø 18 outlet connections, centre distance 50 mm. Medium water and glycol solutions; maximum percentage of glycol 30%. Maximum working pressure 10 bar. Temperature range 0–80°C. Maximum automatic air vent discharge pressure 2,5 bar.
Complete with:
- Flow manifold with flow rate balancing valves and flow meters with graduated scale 1–5 l/min. Accuracy ±15%.
- Return manifold complete with shut-off valves fitted for thermo-electric actuator.
- Pair of end fittings complete with automatic air vent with hygroscopic cap, fill/drain hose connection, multi-position ball valves for coupling with the off-centre fixed setting differential by-pass kit supplied in the package.
- Off-centre fixed setting by-pass kit. Threaded connections 1" M x 3/4" M. Brass body and nuts. Gauged copper pipe. PA obturator, stainless steel spring, EPDM seals, asbestos-free fibre seals. Fixed setting differential pressure 25 kPa.
- Adhesive labels indicating the rooms.
- Pair of shut-off ball valves, brass body. EPDM union seals.
- Pair of fixing brackets.

MANIFOLDS AND ACCESSORIES



1) **Flow manifold with flow meters and flow rate balancing valves, 667...S1 series**
2) **Return manifold with built-in shut-off valves fitted for thermo-electric actuator, 666...S1 series**
3) **Flow end fitting with two-position ball valve, automatic air vent and fill/drain hose connection, code 599674**
4) **Return end fitting with three-position ball valve, by-pass connection and fill/drain hose connection, code 599675**
5) **Off-centre fixed setting by-pass kit complete with pipe for manifold connection code 668000S1**
6) **Automatic air vent, code 502043**
7) **Shut-off ball valve, 391...S1 series**
8) **Brackets for box or wall mounting, code 658100**
9) **Strainer, 120 series**
10) **AUTOFLOW®, 120 series**
11) **Push-fit thermometer for panel pipe, code 675900**
12) **Fitting for plastic or multilayer panel pipe, 680 series**
13) **Compression fitting for annealed copper, hard copper, brass, mild steel and stainless steel, specifically designed for use with 668...S1 manifolds, O-Ring seal, 347...S1 series.**
14) **Reduction fitting, code 3642..S1**
15) **Screw plug, code 386500**
16) **Thermo-electric actuator, 6561 series**
17) **Thermo-electric actuator with manual opening and position indicator, 6563 series**
18) **Box, code 659..4 and code 661..5**

Off-centre fixed setting by-pass kit, code 668000S1



Function

In radiant panel systems, the medium distribution circuits can be totally or partially shut off by closing the thermo-electric valves in the manifolds.
After reducing the flow rate, the differential pressure in the circuit may increase up to values which can result in noise, high medium speed, mechanical erosion and hydraulic unbalancing within the system.
The differential by-pass kit for manifolds keeps the flow and return pressure of the manifold circuit balanced as the flow rate varies.
This valve is fitted for quick coupling with the 668...S1 series manifolds, reducing the overall dimensions to a minimum.

Product range

Code 668000S1 Off-centre assembly with fixed setting by-pass ____ sizes 1" x 3/4"

Technical specifications

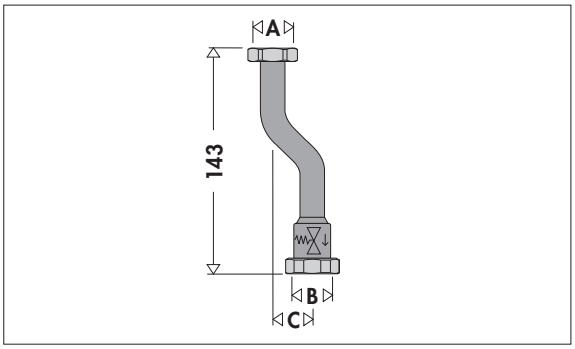
Materials

Nuts:	brass EN 12165 CW617N
Ø 18 gauged pipe with folder:	copper
Check valve obturator:	PA
Spring:	stainless steel
Seals:	EPDM
Seals:	non-asbestos fibre

Performance

Medium:	water, glycol solutions
Max. percentage of glycol:	30%
Max. working pressure:	10 bar
Working temperature range:	0–100°C
Fixed setting differential pressure:	25 kPa (2500 mm w.g.)
Connections:	1" x 3/4" F with captive nut

Dimensions



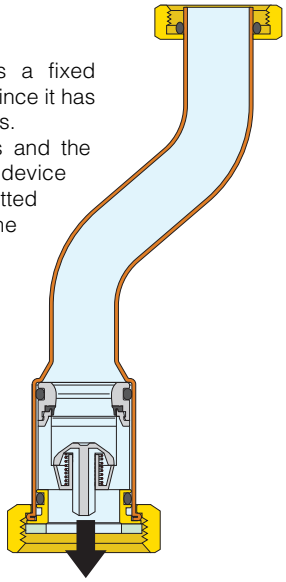
Code	A	B	C	Mass (kg)
668000S1	3/4"	1"	25	0,16

Operating principle

The by-pass valve contains a check obturator integrated with a counter-acting spring.
When the fixed setting differential pressure value is reached, the valve obturator opens gradually.
In this way the flow rate is recirculated and, being proportional to the closure of the thermo-electric valves, keeps the differential pressure in the manifold circuit at a constant level.

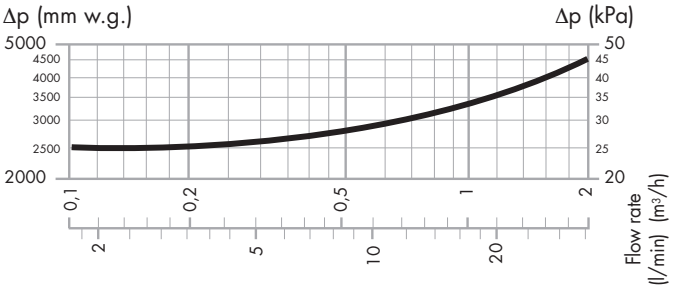
Construction details

The off-centre by-pass kit has a fixed setting that cannot be changed since it has no accessible adjustment devices.
The reduced overall dimensions and the offset connections make this device particularly easy to install when fitted as a consequence of the installation of thermo-electric valves on the manifold. Furthermore, its installation does not require any wider or deeper zone boxes than those required for normal manifolds.



Hydraulic characteristics

By-pass differential pressure: 25 kPa (2500 mm w.g.)



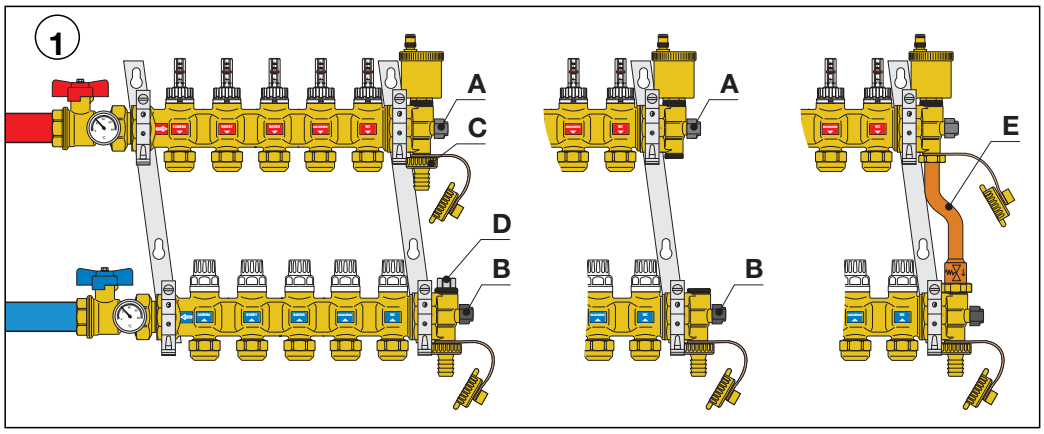
SPECIFICATION SUMMARY

Code 668000S1
Off-centre fixed setting by-pass kit. Threaded connections 1” x 3/4” female with captive nut. Brass nuts. Gauged copper pipe. PA check valve obturator, stainless steel spring, EPDM seals, asbestos-free fibre gaskets. Medium water and glycol solutions. Maximum percentage of glycol 30%. Maximum working pressure 10 bar. Working temperature range 0–100°C. Fixed setting differential pressure 25 kPa.

By-pass installation

To fit the differential by-pass on 668...S1 series manifolds, proceed as follows:

1) Close the multi-position valves (A and B) of both end fittings (flow and return).
2) Remove the hose connection (C) from the multi-position valve of the upper manifold.
3) Remove the plastic cap (D) from the end fitting of the lower manifold.
4) Install the differential by-pass kit (E) code 668000S1 and move the multi-position valve levers back into by-pass mode as shown in figure 2





Self-adjustable diameter fitting for single and multilayer plastic pipe 680 series



Function

The self-adjustable fitting for single and multilayer plastic pipes is a mechanical device that allows safe and easy connection of the radiant panel system pipes to the relevant manifolds.
Due to the specific requirements of this type of system, it has been designed to meet the need of having a versatile fitting, capable of adjusting to different pipe diameters.
Patented

Product range

6805 series Self-adjustable fitting for single and multi-layer plastic pipes size 3/4”

Technical specifications

Materials

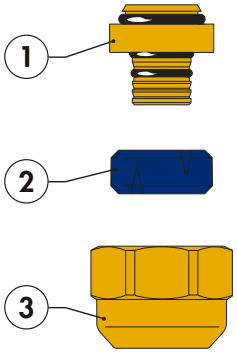
Nut:	brass EN 12164 CW614N
Adapter:	brass EN 12164 CW614N
Seals:	EPDM
Dielectric seal ring:	EPDM
Olive:	PA 66 G50

Performance

Medium:	water, glycol solutions
Max. percentage of glycol:	30%
Max. working pressure:	10 bar
Working temperature range:	5–80°C (PE-X)
	5–75°C (Multilayer marked 95°C).

Characteristic components

1) Adapter
2) Olive
3) Nut

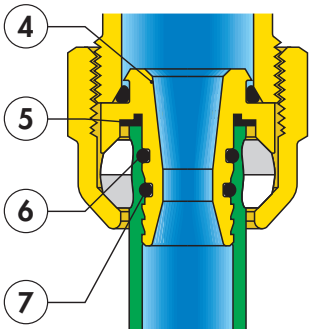


Code		$Ø_{inner}$	$Ø_{outer}$
680507	3/4”	7,5– 8	10,5–12
680502	3/4”	7,5– 8	12 –14
680503	3/4”	8,5– 9	12 –14
680500	3/4”	9 – 9,5	14 –16
680501	3/4”	9,5–10	12 –14
680506	3/4”	9,5–10	14 –16
680515	3/4”	10,5-11	14 –16
680517	3/4”	10,5–11	16 –18
680524	3/4”	11,5–12	14 –16
680526	3/4”	11,5–12	16 –18
680535	3/4”	12,5–13	16 –18
680537	3/4”	12,5–13	18 –20
680544	3/4”	13,5–14	16 –18
680546	3/4”	13,5–14	18 –20
680555	3/4”	14,5–15	18 –20
680556	3/4”	15 –15,5	18 –20
680564	3/4”	15,5–16	18 –20
680505	3/4”	17	22,5

Construction details

Pipe-to-fitting coupling flexibility

This fitting is specifically designed in order to adjust to several pipe diameters.
The great variety of single and multilayer plastic pipes on the market, and the range of permissible tolerances, have made it necessary to design an innovative method for coupling the fittings with mechanical tightening. Keeping the nominal dimensions of the fittings currently on the market, the new construction solution makes it possible to use the same fitting for pipes with external diameter differences of up to 2 mm and internal diameter differences of up to 0,5 mm.



Pull-out resistance

This fitting offers high resistance to pipe pull-out. Its special tightening system makes it suitable for all applications, ensuring a perfect hydraulic seal.

Low head losses

The internal profile of the adapter (4) is shaped to obtain a Venturi effect as the medium flows.
It allows head loss reduction of about 20% in relation to the passages of the same diameter.

Dielectric seal ring

The fitting is equipped with a rubber insulating element (5) to prevent contact between the aluminium of the multi-layer pipe and the brass of the fitting. This prevents any galvanic corrosion generated by the two different metals coming into contact.

Double O-Ring seal

On the adapter there are two EPDM O-Ring seals (6) - (7) in order to avoid potential losses even at high working pressures.

SPECIFICATION SUMMARY

680 series

Self-adjusting diameter fitting for single and multilayer plastic pipes with internal profile offering a Venturi effect to limit head losses. Size 3/4” F. Brass nut and adapter, EPDM seals, EPDM dielectric ring, PA olive. Medium water and glycol solutions. Maximum percentage of glycol 30%. Maximum working pressure 10 bar. Working temperature range 5–80°C (PE-X); 5–75°C (Multi-layer marked 95°C).

Thermo-electric actuators



6561

tech. broch. 01042

Thermo-electric actuator for manifolds.
For 668...S1 series manifold
Normally closed.

Code	Voltage (V)
656102	230
656104	24



6561

tech. broch. 01042

Thermo-electric actuator for manifolds.
For 668...S1 series manifolds
Normally closed.
With auxiliary microswitch.

Code	Voltage (V)
656112	230
656114	24

Technical specifications

Materials

Protective shell:	self-extinguishing polycarbonate
Colour:	(code 656102/04) white RAL 9010 (code 656112/14) grey RAL 9002

Performance

Normally closed	
Electric supply:	230 V (ac) - 24 V (ac) - 24 V (dc)
Starting current:	≤ 1 A
Running current:	230 V (ac) = 13 mA 24 V (ac) - 24 V (dc) = 140 mA
Running power consumption:	3 W
Auxiliary microswitch contact rating (code 656112/114):	0,8 A (230 V)
Protection class:	IP 44 (in vertical position)
Double insulation construction:	CE
Max. ambient temperature:	50°C
Operating time:	opening and closing from 120 s to 180 s.
Length of supply cable:	80 cm.

Thermo-electric actuators with manual opening and position indicator



6563

tech. broch. 01142

Thermo-electric actuator for manifolds.
For 668...S1 series manifolds
Normally closed.

Code	Voltage (V)
656302	230
656304	24



6563

tech. broch. 01142

Thermo-electric actuator for manifolds.
For 668...S1 series manifolds
Normally closed.
With auxiliary microswitch.

Code	Voltage (V)
656312	230
656314	24

Technical specifications

Materials

Protective shell:	self-extinguishing polycarbonate
Colour:	(code 656302/04) white RAL 9010 (code 656312/14) grey RAL 9002

Performance

Normally closed	
Electric supply:	230 V (ac) - 24 V (ac) - 24 V (dc)
Starting current:	≤ 1 A
Running current:	230 V (ac) = 13 mA 24 V (ac) - 24 V (dc) = 140 mA
Running power consumption:	3 W
Auxiliary microswitch contact rating (code 656312/14):	0,8 A (230 V)
Protection class:	IP 40
Double insulation construction:	CE
Max. ambient temperature:	50°C
Operating time:	opening and closing from 120 s to 180 s
Length of supply cable:	80 cm

Patent application No. MI2005A000742

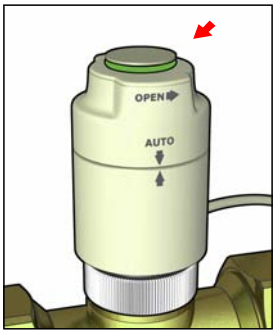
The 6563 series thermo-electric actuator is equipped with a control knob for manual opening, valve opening/closing indicator and a device for returning to automatic operation from the manual position when the electric supply is restored.

The control knob for manual opening and the automatic return from the manual to the automatic position is particularly useful when testing or servicing the system if:

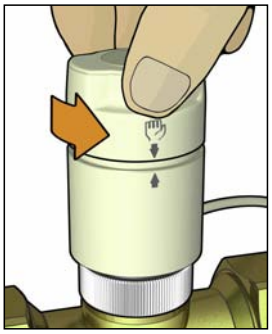
- hydraulic tests need to be carried out, without necessarily having to connect and power up the controls.

- the knob is left on the manual position at the end of the tests. In this case the actuator automatically reverts to automatic operation when the system is electrically put into operation.

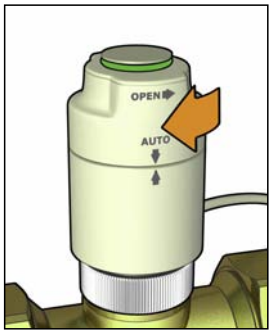
Normal valve operation in automatic mode.



Using the knob to open the valve manually



Automatic return from manual to automatic position.





120 AUTOFLOW®

tech. broch. 01041

Combination of automatic flow rate regulator and ball valve.
Factory set to automatically maintain the flow rate between ±5% of the established value.
Can be inspected, cleaned and the internal cartridge replaced without having to remove the valve body from the pipe.
Fitted for use with pressure test ports to check operation.
Fitted for connection to a drain pipe. The control stem of the ball valve has an anti-slip stem and the closing lever is covered with vinyl. Reversible lever.
Female - male connections with union.

Technical specifications

With temperature gauge scale 0–80°C - Ø 40 mm
Max. working pressure: 25 bar
Max. working temperature: 110°C
Δp range: 22–220 kPa
Accuracy: ±5%

Code		Flow rate (m^3/h)
120961 1L2	1" F x 1 1/4" M	1,20
120961 1L4	1" F x 1 1/4" M	1,40
120961 1L6	1" F x 1 1/4" M	1,60
120961 1L8	1" F x 1 1/4" M	1,80
120961 2L0	1" F x 1 1/4" M	2,00
120961 2L2	1" F x 1 1/4" M	2,25
120961 2L5	1" F x 1 1/4" M	2,50

Code		Flow rate (m^3/h)
120971 1L2	1 1/4" F x 1 1/4" M	1,20
120971 1L4	1 1/4" F x 1 1/4" M	1,40
120971 1L6	1 1/4" F x 1 1/4" M	1,60
120971 1L8	1 1/4" F x 1 1/4" M	1,80
120971 2L0	1 1/4" F x 1 1/4" M	2,00
120971 2L2	1 1/4" F x 1 1/4" M	2,25
120971 2L5	1 1/4" F x 1 1/4" M	2,50

• Available with other flow rate values on request



120 STRAINER

tech. broch. 01041

Combination of Y-strainer and ball valve.
Can be inspected, cleaned and the strainer replaced without having to remove the valve body from the pipe. Fitted for the application of pressure test ports to check strainer clogging levels.
Fitted for connection to a drain pipe, so that the strainer can be cleaned without being removed from the body.
The control stem of the ball valve has an anti-slip stem and the closing lever is covered with vinyl. Reversible lever.
Female - male connections with union.

Technical specifications

With temperature gauge scale 0–80°C - Ø 40 mm
Max. working pressure: 25 bar
Max. working temperature: 110°C
Strainer mesh size Ø: 0,87 mm

Code	
120961 000	1" F x 1 1/4" M

Code	
120971 000	1 1/4" F x 1 1/4" M

Manifolds



666...S1

Return manifold with built-in shut-off valves fitted for thermo-electric actuator.

Code	Connection	No. of outlets	Outlets
666735S1	1 1/4" F	x 3	3/4" M
666745S1	1 1/4" F	x 4	3/4" M
666755S1	1 1/4" F	x 5	3/4" M
666765S1	1 1/4" F	x 6	3/4" M
666775S1	1 1/4" F	x 7	3/4" M
666785S1	1 1/4" F	x 8	3/4" M



667...S1

Flow manifold with built-in flow meters and flow rate balancing valves.

Code	Connection	No. of outlets	Outlets
667735S1	1 1/4" F	x 3	3/4" M
667745S1	1 1/4" F	x 4	3/4" M
667755S1	1 1/4" F	x 5	3/4" M
667765S1	1 1/4" F	x 6	3/4" M
667775S1	1 1/4" F	x 7	3/4" M
667785S1	1 1/4" F	x 8	3/4" M

Technical specifications

Materials

Return manifold

Body:	brass EN 1982 CB753S

Shut-off valve

Headwork:	PA66GF
Obturator stem:	stainless steel
Obturator:	EPDM
Springs:	stainless steel
Seals:	EPDM
Knob:	ABS

Flow manifold

Body:	brass EN 1982 CB753S

Flow rate balancing valve

Headwork:	brass EN 12164 CW614N
Obturator:	brass EN 12164 CW614N
Flow meter body:	PSU
Spring:	stainless steel
Hydraulic seals:	EPDM
Adjustment locking cover:	ABS

Performance

Medium:	water, glycol solutions
Max. percentage of glycol:	30%
Max. working pressure:	10 bar
Working temperature range:	0–80°C
Flow meter scale:	1–5 l/min
Accuracy:	± 15%
Main connections:	1 1/4" F
Outlets:	3/4" M - Ø 18
Centre distance:	50 mm

Shut-off valves



391...S1

Pair of ball valves.
Female - male connections with union and O-Ring seal.
With temperature gauge scale 0–80°C, Ø 40 mm.
Max. working pressure: 10 bar.
Working temperature range: 0–100°C.

Code	Connections
391167S1	1" x 1 1/4"
391177S1	1 1/4" x 1 1/4"



391...S1

Pair of ball valves.
Female - male connections with union and O-Ring seal.
With temperature gauge connection.
Max. working pressure: 10 bar.
Working temperature range: 0–100°C.

Code	Connections
391067S1	1" x 1 1/4"
391077S1	1 1/4" x 1 1/4"

End fittings



5996

Flow end fitting consisting of double radial fitting with two-position ball valve, automatic air vent and fill/drain hose connection.
Max. working pressure: 10 bar.
Max. drain pressure: 2,5 bar.
Working temperature range: 0–100°C.

Code	
599674	1 1/4"



5996

Return end fitting consisting of double radial fitting with three-position ball valve, by-pass connection with cap and fill/drain hose connection.
Max. working pressure: 10 bar.
Working temperature range: 0–100°C.

Code	
599675	1 1/4"

Air vent



5020

Automatic air vent with hygroscopic cap.
In stamped brass.
Max. working pressure: 10 bar.
Max. drain pressure: 2,5 bar.
Max. working temperature: 110°C.

Code	
502043	1/2" M

Brackets



658

Pair of brackets for use with 659 and 661 series boxes or for direct wall mounting.
Complete with screws and wall anchors.

Code
658100

Screw plug



386

Screw plug with nut, for manifold outlets.

Code	
386500	3/4"

Fitting



347...S1

Mechanical fitting for annealed copper, hard copper, brass, mild steel and stainless steel pipes.
O-Ring seal.
Specifically designed for use with 668...S1 series manifolds.
Max. working pressure: 10 bar.
Working temperature range: -25–120°C.

Code	
347512S1	3/4" - Ø 12
347514S1	3/4" - Ø 14

Reduction fitting



3642..S1

Reduction fitting.

Code	
364276S1	1" F x 1 1/4" M

Temperature gauge



675

Push-fit thermometer for panel pipe.

System test pump



695

System test pump.
Complete with pressure gauge and system connection hose.
Also suitable for use with glycol solutions for solar thermal systems.

Technical specifications

Materials

Body:	PA6GF
Temperature gauge fluid:	alcohol
Temperature gauge scale:	5–50°C
Max. working temperature:	60°C
Range of use external diameter (Øe) of pipes:	from 15 to 18 mm

Conducting paste supplied in package

Code
675900

Technical specifications

Materials

Body:	bronze
Piston:	brass
Control lever:	galvanised steel
Max. working pressure:	50 bar
Water content:	12 l
Pressure gauge scale:	0–60 bar
Hose connection:	1/2"
Length of hose:	1,5 m

Code
695000



659

Box for 668....S1 series manifolds.
Wall or floor installation (with 660 series).
Closure with a push-fit clamp.
Made of painted sheet steel.
Depth adjustable from 110 to 140 mm.

Code	(h x w x d)
659044	500 x 400 x 110–140
659064	500 x 600 x 110–140
659084	500 x 800 x 110–140
659104	500 x 1000 x 110–140
659124	500 x 1200 x 110–140



660

Floor installation KIT for box, 659 series.
Complete with:
- 2 supports - height (cm) 20,
- 2 side panels,
- 1 pipe-bending bar.

Code	
660040	for 659044
660060	for 659064
660080	for 659084
660100	for 659104
660120	for 659124

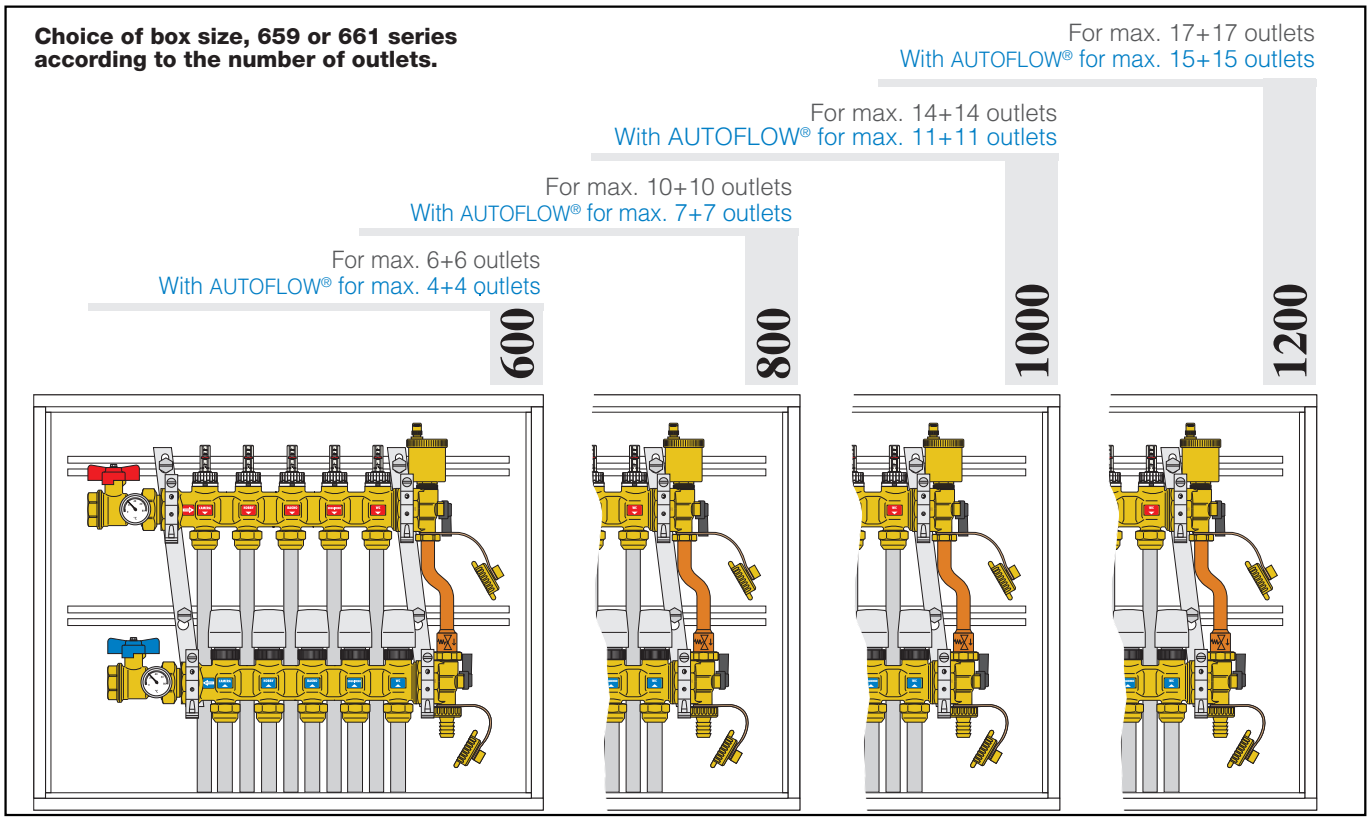


661

Box for 668...S1 series manifolds.
Closure with a push-fit clamp.
Made of painted sheet steel.
Depth adjustable from 110 to 150 mm.
Complete with supports for floor installation.
Height adjustable from 270 to 410 mm.

Code	(h x w x d)
661045	500 x 400 x 110–150
661065	500 x 600 x 110–150
661085	500 x 800 x 110–150
661105	500 x 1000 x 110–150
661125	500 x 1200 x 110–150

Choice of box size, 659 or 661 series according to the number of outlets.



We reserve the right to change our products and their relevant technical data, contained in this publication, at any time and without prior notice.

CALEFFI

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