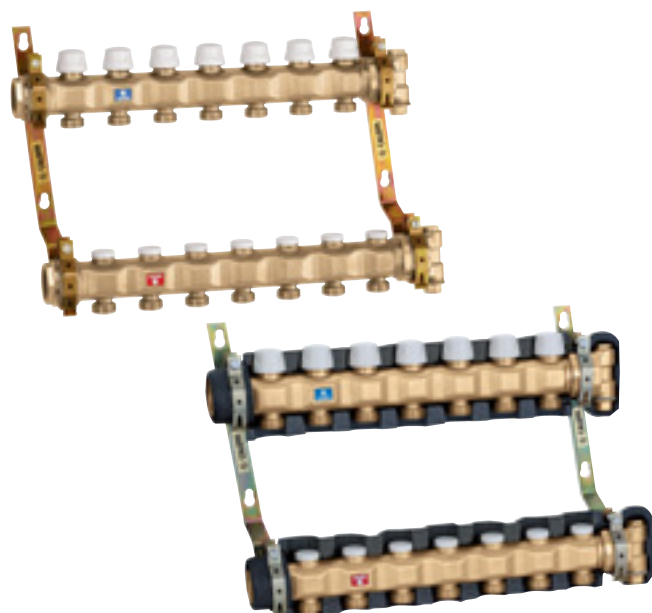


Preassembled distribution manifolds for heating and air-conditioning systems

663 series



cert. n° 0003
ISO 9001



Function

The preassembled distribution manifolds are designed to optimize the distribution of the medium in the circuits of the heating and air-conditioning systems.

They ensure accuracy in controlling the flow to the single circuits, cutting them off and reduced depth that, at the time of assembly, facilitates hooking up with the outlet pipes.

They are also offered in a version complete with hot pre-formed insulation to limit thermal losses and above all to prevent condensation on the surface when used in air-conditioning systems.

Reference documentation

- Tech. Broch. 01042 Thermo-electric actuator 6561 series
- Tech. Broch. 01142 Thermo-electric actuator with manual opening and position indicator 6563 series
- Tech. Broch. 01041 Automatic flow stabilizers
- Tech. Broch. 01054 Automatic air vent valves 5020 series

Product range

663 series	Preassembled distribution manifold	size 1 1/4"
663... IS series	Preassembled distribution manifold for air-conditioning systems	size 1 1/4"

Technical specifications

Materials:

Flow manifold

- body:	brass EN 1982 CB753S
Lockshield valve	
- control device upper part	brass EN 12164 CW614N
- stem	brass EN 12164 CW614N
- seals	EPDM
- plug	self-extinguishing polycarbonate
- adjustment key:	5 mm allen key

Return manifold

- body:	brass EN 1982 CB753S
Shut-off valve	
- control device upper part:	brass EN 12164 CW614N and PA
- obturator stem:	stainless steel
- obturator:	EPDM
- springs:	stainless steel
- seals:	EPDM
- knob:	ABS

End fitting

- body:	brass EN 12165 CW617N
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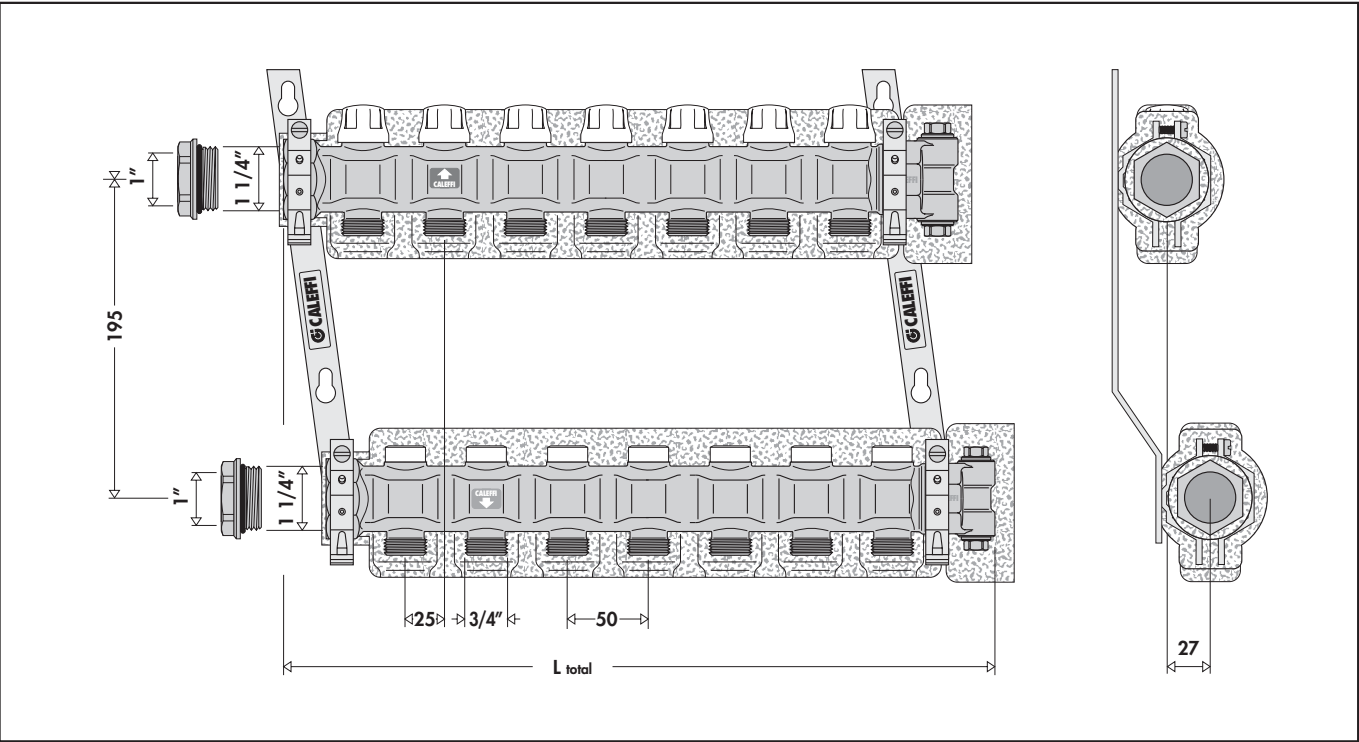
Performance:

Medium:	water, glycol solutions
Max. percentage of glycol:	30%
Max. working pressure:	10 bar
Temperature range:	5–100°C
Main connections:	1 1/4" F; 1" F with reduction as standard
Centre distance:	195 mm
Outlets:	3/4" M - Ø 18
Centre distance:	50 mm

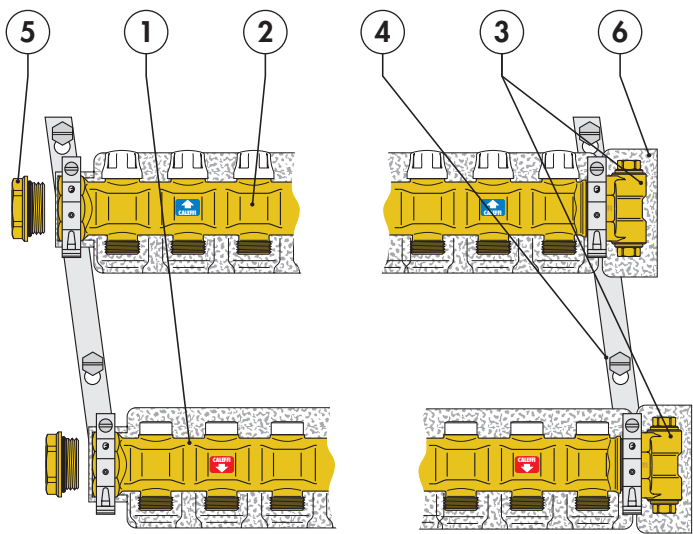
Technical specifications of insulation

Material:	expanded PE-X with closed cells
Thickness:	20 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 the diffusion of water vapour (DIN 52615):	>1.300
Temperature range:	0–100°C
Reaction to fire (DIN 4102):	Class B2

Dimensions



Code without insul.	6637C5	6637D5	6637E5	6637F5	6637G5	6637H5	6637I5	6637L5	6637M5	6637N5	6637O5
Code with insul.	6637C5 IS	6637D5 IS	6637E5 IS	6637F5 IS	6637G5 IS	6637H5 IS	6637I5 IS	6637L5 IS	6637M5 IS	6637N5 IS	6637O5 IS
Nr. outlets	3	4	5	6	7	8	9	10	11	12	13
Total L	220	270	320	370	420	470	550	600	650	700	750
Weight (kg)	4,8	5,4	5,9	6,8	7,4	8,1	8,5	9,6	10,5	11	11,6

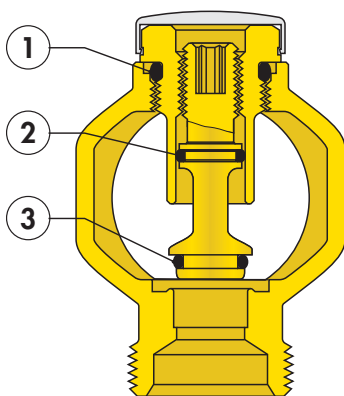


Characteristic components

- 1 Flow manifold with lockshield valves for flow rate adjustment
- 2 Return manifold with shut-off valves fitted for thermo-electric actuator
- 3 End fittings composed of union with double radial connection and plugs
- 4 Pair of brackets fastening to the box
- 5 Reduction 1 1/4" M x 1" F
- 6 Hot pre-formed shell insulation (version with insulation)

Construction details

Flow manifold



The flow manifold is equipped with outlet circuit shut-off and setting lockshield valves. In order to prevent leaks or seepage over time, the assembly seal is guaranteed by the EPDM O-Rings on the headwork (1) and on the control stem (2) while the O-Ring on the obturator (3) permits fully closing the outlet circuit, if necessary.

Return manifold

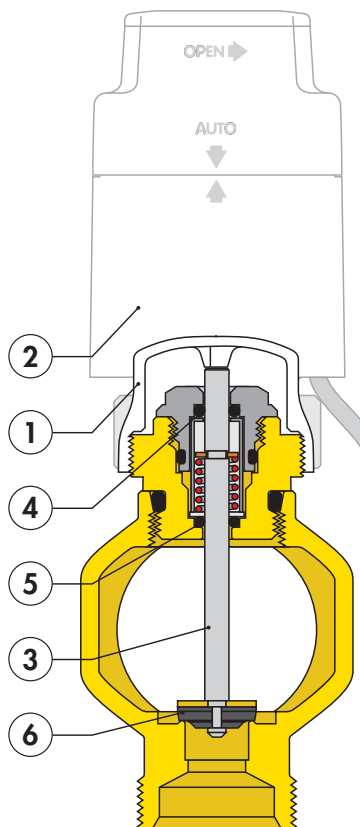
The return manifold is equipped with manual shut-off valves (1), by means of which the flow to the single circuits can be cut off.

They are moreover fitted for an electro-thermal control (2) that, used with a room thermostat, permits keeping the ambient temperature on the set values as the thermal load varies.

The obturator stem (3) is made of ground stainless steel in order to minimize friction and prevent dangerous encrustation.

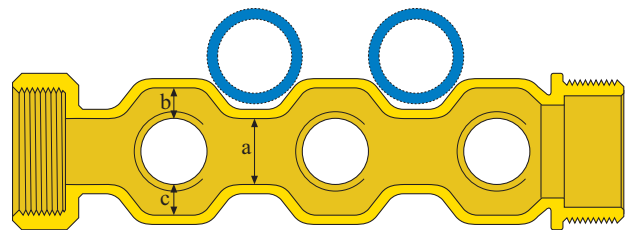
The headwork has a double seal (4) - (5) on the slide stem in the form of an O-Ring in EPDM.

The EPDM obturator (6) is shaped so as to optimize the hydraulic characteristics of the valve and minimize the noise caused by the flow of the medium, also during the progressive action of opening or closing in operation with thermo-electric actuator.

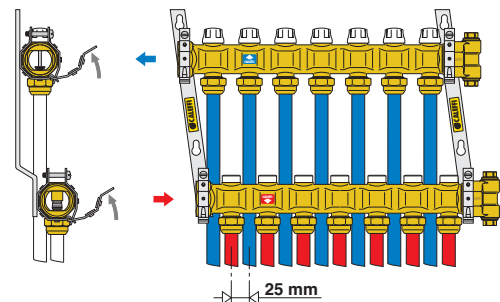


External shape of the manifolds and brackets

A special mention should be given to the outer shape of the manifold that, thanks to the casting process, can be shaped as needed. In this case, recesses have been made in correspondence with the passage of the pipe that comes down from the upper manifold, allowing it to be partially housed, for the benefit of depth. This is without interfering with the values of head losses, since the cross-sections of the recesses (a) are the same as in correspondence with the zones where the outlets (b)+(c) branch out and where the adjusters (lockshield valves and shut-off valves) obstruct the flow of the medium.

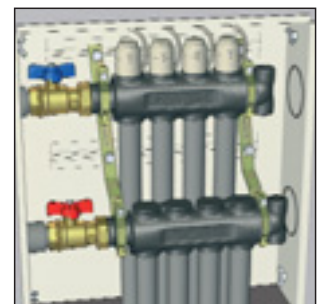
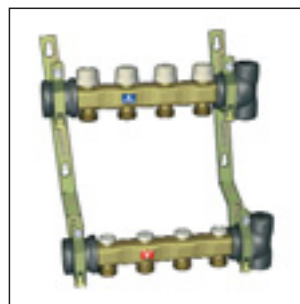


The partial housing of the pipe in the manifold shaping is moreover helped by the brackets, made with such an angle as to obtain a misalignment of 25 mm between the upper and lower manifolds. As shown in the figure, this misalignment, at the time of installation, makes a perfect match automatic between the position of the piping and the shape of the manifold.



Pre-formed insulation

The manifold 663 series is also offered in a version complete with hot pre-formed insulation. This solution is recommended in applications where it is necessary to limit thermal losses (installations outdoors in particularly cold places) or, specifically, to prevent condensation on its surface when used in air-conditioning systems.

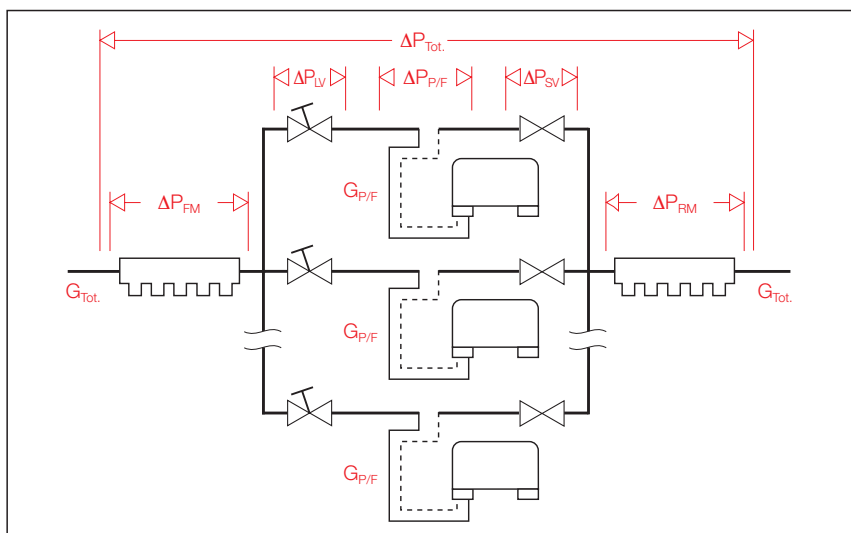
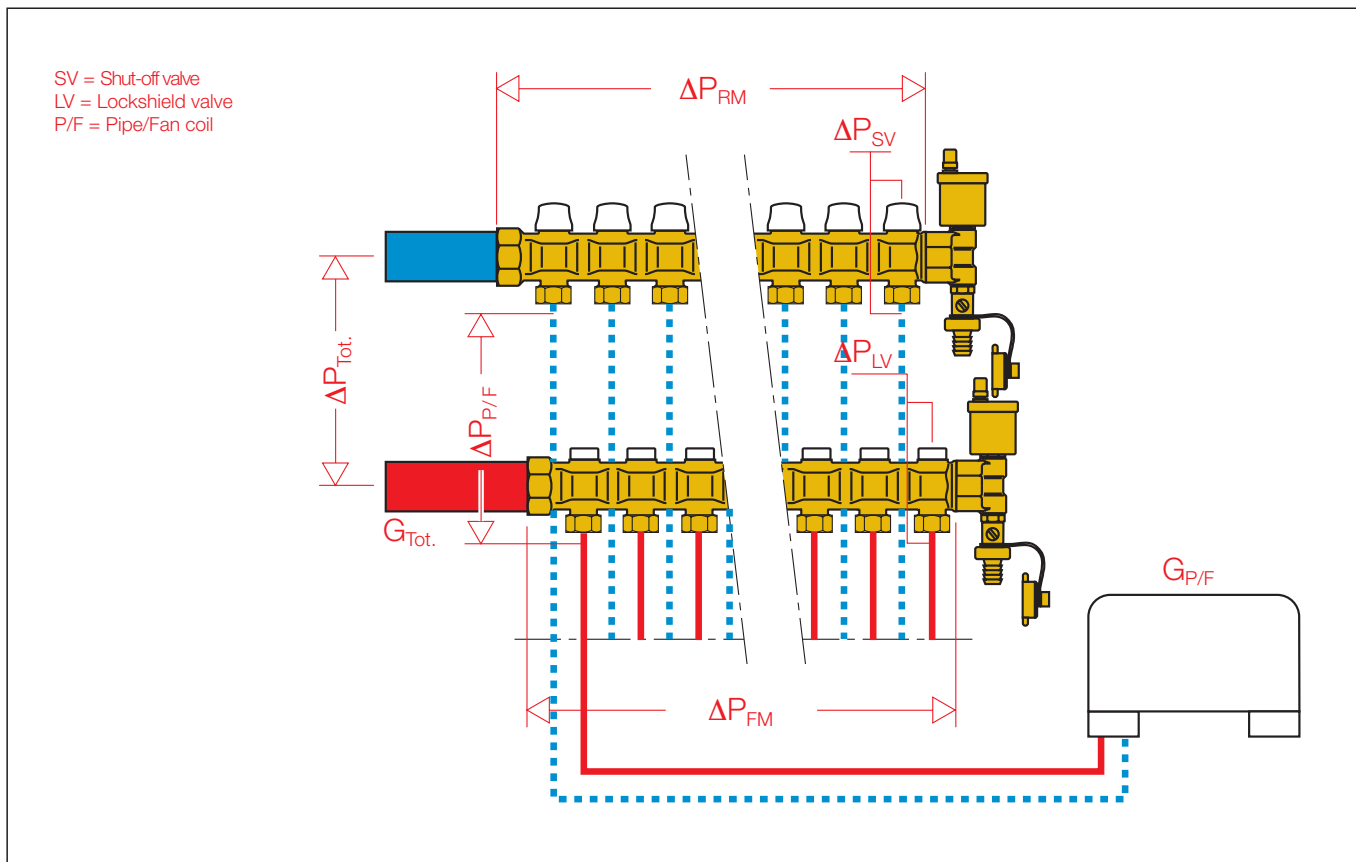


The insulation has been specially designed to aid its coupling with the manifold and any accessories, such as the thermo-electric actuators, as well as its installation in boxes.

Hydraulic characteristics

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

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

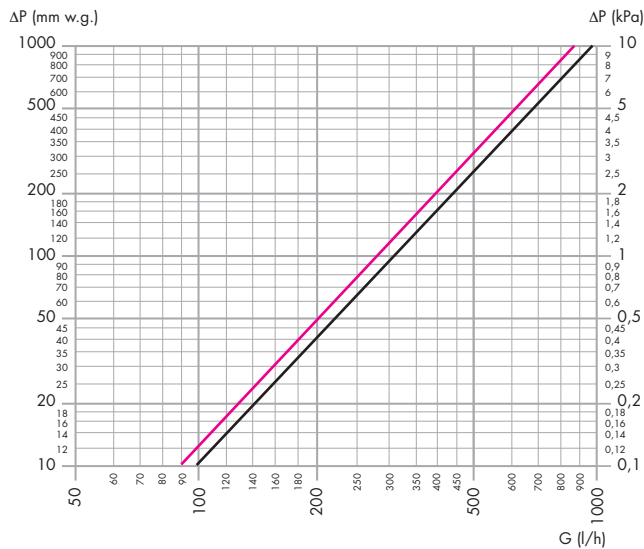


- $\Delta P_{Tot.}$ = Total loss at the ends of the manifold (Flow + Return + Pipe/Fan coil)
- ΔP_{LV} = Localised loss of circuit setting lockshield valve (P/V circuit flow rate)
- $\Delta P_{P/F}$ = Pipe/Fan coil (P/F) loss (P/F circuit flow rate)
- ΔP_{SV} = Localized loss of P/F circuit shut-off valve (P/F circuit flow rate)
- ΔP_{FM} = Distributed loss of the flow manifold (total flow rate)
- ΔP_{RM} = Distributed loss of the return manifold (total flow rate)

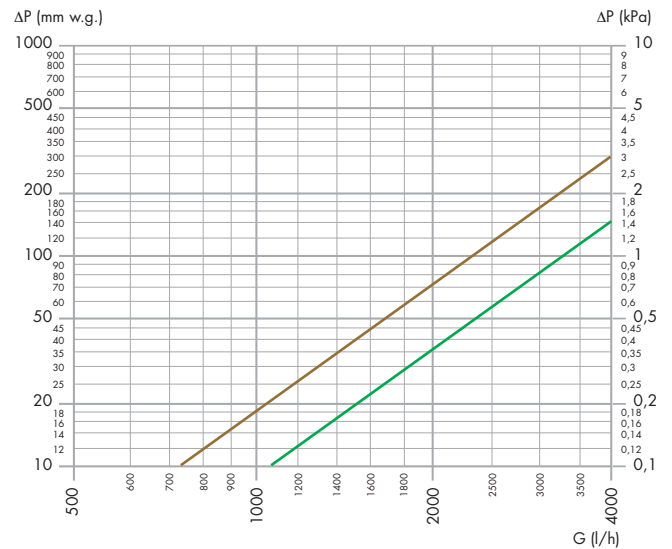
$$\Delta P_{Tot.} = \Delta P_{LV} + \Delta P_{P/F} + \Delta P_{SV} + \Delta P_{FM} + \Delta P_{RM}$$

(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 losses of head for each specific component of the system, as indicated with the formula (1.1).



	Kv	Kv _{0,01}
Lockshield valve fully open	3,10	310
Shut-off valve	2,87	287



	Kv	Kv _{0,01}
Flow/return manifold 3–7 outlets	33,5*	3350*
Flow/return manifold 8–13 outlets	23,5*	2350*

* Average value

- Kv = flow rate in m³/h for a loss of head of 1 bar

- Kv_{0,01} = flow rate in l/h for a loss of head of 1 kPa

Example of calculation of total head loss

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

Total manifold flow rate: 900 l/h

The pipes and fan coils of the three circuits have the following characteristics of flow rate and loss of head:

Circuit 1	Circuit 2	Circuit 3
G ₁ = 200 l/h	G ₂ = 300 l/h	G ₃ = 400 l/h
ΔP _{F 1} = 1,3 kPa	ΔP _{F 2} = 3 kPa	ΔP _{F 3} = 5,3 kPa
ΔP _{Pipe 1} = 1,7 kPa	ΔP _{Pipe 2} = 7,8 kPa	ΔP _{Pipe 3} = 7,2 kPa
ΔP _{P/F1} = 1,7 + 1,3 = 3 kPa	ΔP _{P/F2} = 7,8 + 3 = 10,8 kPa	ΔP _{P/F3} = 7,2 + 5,3 = 12,5 kPa

We calculate each term of the formula (1.1), using the relationship:

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

- G = flow rate in l/h
- ΔP = loss of head 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 stressed that the calculation of ΔP_{Tot.} must be made taking account of the circuit in which there are the greatest head losses distributed along the entire circuit composed of piping + fan coil. In the case we are examining, the relevant circuit is No. 3.

It follows that:

$$\begin{aligned} \Delta P_{LV} &= 400^2 / 310^2 = 1,7 \text{ kPa} \\ \Delta P_{P/F} &= 12,5 \text{ kPa} \\ \Delta P_{SV} &= 400^2 / 287^2 = 1,9 \text{ kPa} \\ \Delta P_{FM} &= 900^2 / 3350^2 = 0,07 \text{ kPa} \\ \Delta P_{RM} &= 900^2 / 2350^2 = 0,07 \text{ kPa} \end{aligned} \quad \left. \vphantom{\begin{aligned} \Delta P_{LV} \\ \Delta P_{P/F} \\ \Delta P_{SV} \\ \Delta P_{FM} \\ \Delta P_{RM} \end{aligned}} \right\} \text{Values obtained by neglecting the changes due to flow rate to the single branched circuits.}$$

By means of (1.1) adding up all the calculated terms, we have:

$$\Delta P_{Tot} = 1,7 + 12,5 + 1,9 + 0,07 + 0,07 \approx 16 \text{ kPa}$$

Note:

Because of the low head losses for the manifolds, the two terms relating to them can be neglected.

In general, the total head loss is reasonably approximate to that of the circuit composed of the piping, fan coil and lockshield valve fully open.

Using the lockshield valve

The lockshield valve permits balancing the single circuits of the fan coils to obtain the actual flow rates in each of them that are determined at the design stage. We consider each single circuit composed of: lockshield, pipe/fan coil and shut-off valve. To be able to set the system correctly it is necessary to take into account the following data:

- the flow rate of the medium that must pass through each circuit (project data).

- the loss of head that, for this flow rate, is generated in each circuit:

$$\Delta P_{\text{Circuit}} = \Delta P_{P/F} + \Delta P_{SV} \quad (1.3)$$

- the loss of head of the most disadvantaged circuit:

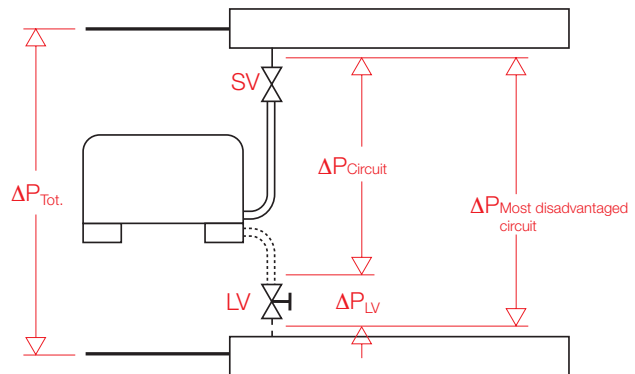
$$\Delta P_{\text{Circuit}} = \Delta P_{LV} + \Delta P_{P/F} + \Delta P_{SV} \quad (1.4)$$

+ disadvantaged

In all the circuits the lockshield, for the flow rate G_{Circuit} , must provide an additional loss of head equal to the difference, which we can indicate as ΔP_{LV} (Δp lockshield).

To permit an increase in flow rate, we sometimes consider the lockshield valve of the circuit with the greatest losses of head open 80%.

Once we know the data ΔP_{LV} and G_{Circuit} for each circuit, we need to go to the graph of hydraulic characteristics of the lockshield valve and choose the optimum adjustment curve to which the valve adjustment position corresponds.



Example of adjustment

Suppose we need to balance three circuits with the characteristics of loss of head and flow rate for the pipe/fan coil shown in the example (1.2):

Since circuit No. 3 is the most disadvantaged one, because it has the greatest loss of head for the pipe/fan coil, we need to adjust the remaining circuits:

Circuit 3
 $\Delta P_{P/F} = 12,5 \text{ kPa}$
 $G_3 = 400 \text{ l/h}$

$\Delta P_{LV} = 400^2/310^2 = 1,7 \text{ kPa}$
 $\Delta P_{SV} = 400^2/287^2 = 1,9 \text{ kPa}$

With the relationship (1.4):

$\Delta P_{\text{Circuit } 3} = 1,7 + 12,5 + 1,9 = 16,1 \text{ kPa}$
 most disadvantaged

Circuit 1
 $\Delta P_{P/F} = 3 \text{ kPa}$
 $G_1 = 200 \text{ l/h}$

$\Delta P_{SV} = 200^2/287^2 = 0,5 \text{ kPa}$

with the relationship (1.3):

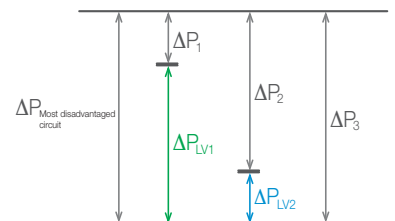
$\Delta P_{\text{Circuit } 1} = 3,0 + 0,5 = 3,5 \text{ kPa}$

Circuit 2
 $\Delta P_{P/F} = 10,8 \text{ kPa}$
 $G_2 = 300 \text{ l/h}$

$\Delta P_{SV} = 300^2/287^2 = 1,1 \text{ kPa}$

with the relationship (1.3):

$\Delta P_{\text{Circuit } 2} = 10,8 + 1,1 = 11,9 \text{ kPa}$



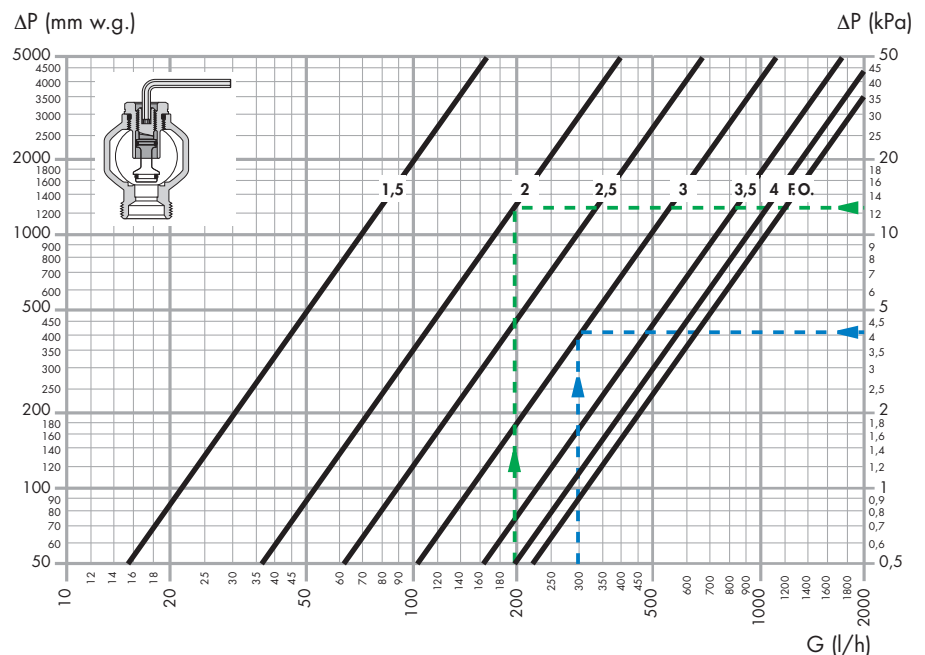
$P_{\text{Circuit}} \approx 16 \text{ kPa}$
 + disadvantaged

To adjust circuits 1 and 2, the data we need for each one to go and read the lockshield valve adjustment position will be the following:

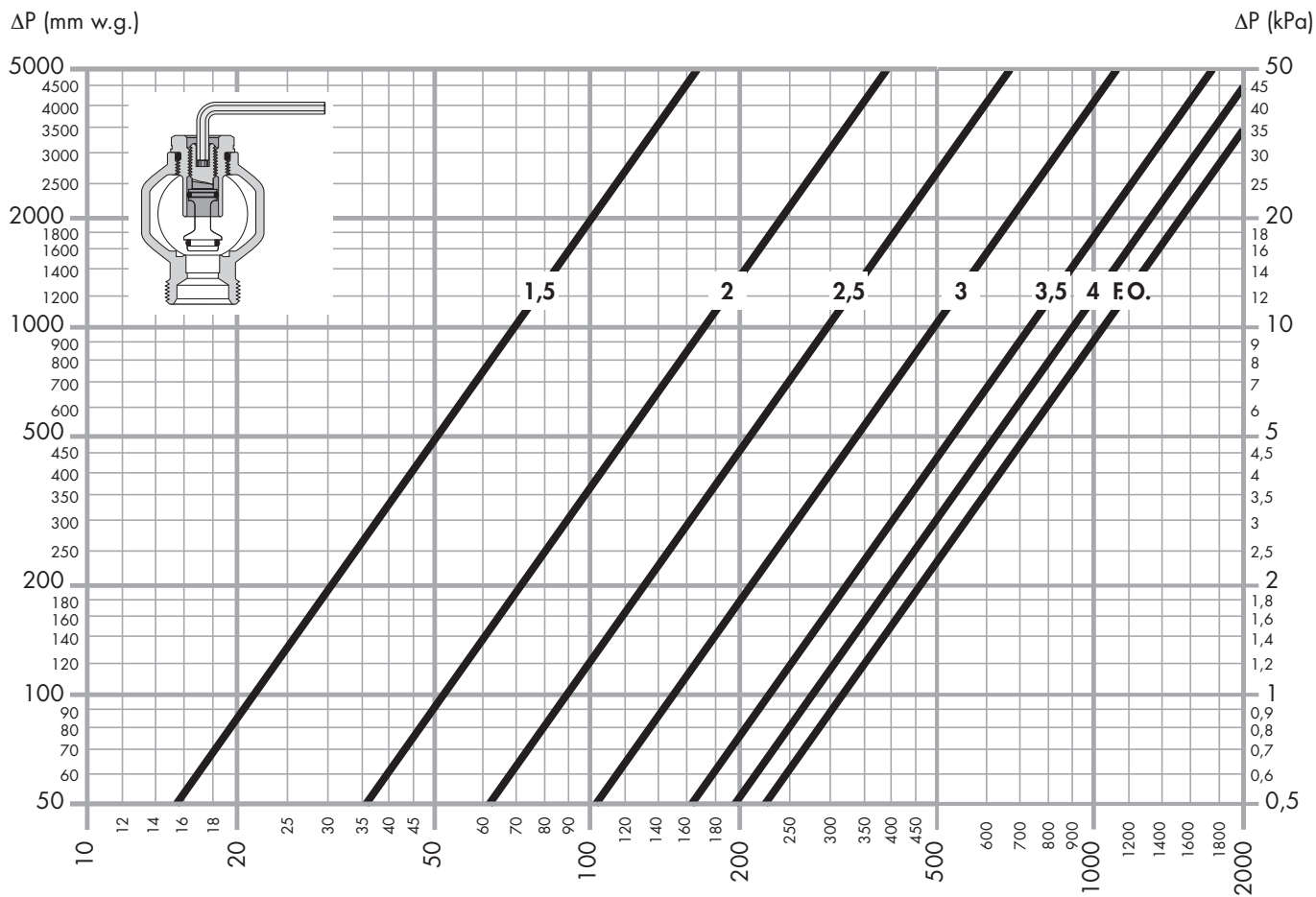
Circuit 1
 $\Delta P_{LV1} = 16 - 3,5 = 12,5 \text{ kPa}$
 $G_1 = 200 \text{ l/h}$
 Nr. of turns of adjustment = 2

Circuit 2
 $\Delta P_{LV2} = 16 - 11,9 = 4,1 \text{ kPa}$
 $G_2 = 300 \text{ l/h}$
 Nr. of turns of adjustment = 3

Circuit 3
 Adjustment position fully open



Hydraulic characteristics of lockshield valve



Adjustment position	1,5	2	2,5	3	3,5	4	F.O.
Kv	0,22	0,53	0,90	1,50	2,30	2,90	3,10
Kv _{0,01}	22	53	90	150	230	290	310

- Kv = flow rate in m³/h for a loss of head of 1 bar

- Kv_{0,01} = flow rate in l/h for a loss of head of 1 kPa

SPECIFICATION SUMMARIES

663 series

Preassembled distribution manifold for heating systems with 3 (from 3 to 13) outlets. Brass body. Seals of EPDM. Head connections 1 1/4" (1" with reduction as standard) threaded F, centre distance 195 mm. Outlet connections 3/4" M - Ø 18, centre distance: 50 mm. Medium: water and glycol solutions. Maximum percentage of glycol: 30%. Maximum working pressure: 10 bar. Temperature range: 5–100°C. Composed of:

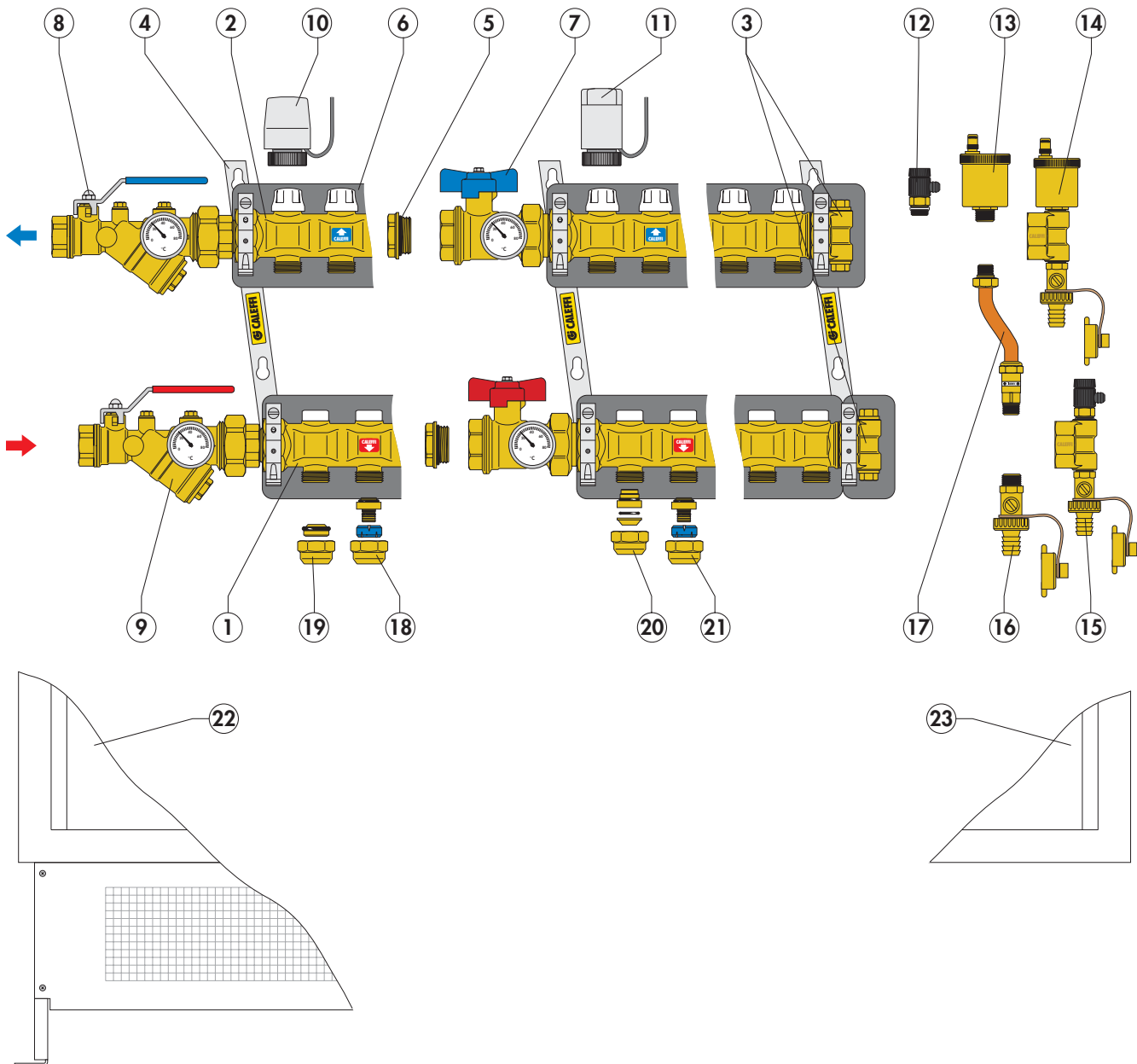
- Flow manifold with lockshield valves with 5 full turns of adjustment.
- Return manifold, with shut-off valves fitted for thermo-electric actuator.
- End fittings composed of union with double radial connection and plugs.
- Pair of brackets.
- Reduction 1 1/4" M x 1" F.

663 IS series

Preassembled distribution manifold for air-conditioning systems, with hot pre-formed insulation, with 3 (from 3 to 13) outlets. Brass body. Seals of EPDM. Head connections 1 1/4" (1" with reduction as standard) threaded F, centre distance 195 mm. Outlet connections 3/4" M - Ø 18, centre distance 50 mm. Medium: water and glycol solutions. Maximum percentage of glycol: 30%. Maximum working pressure: 10 bar. Temperature range: 5–100°C. Composed of:

- Flow manifold with lockshield valves with 5 full turns of adjustment.
- Return manifold, with shut-off valves fitted for electro-thermal control.
- End fittings composed of union with double radial connection and plugs.
- Pair of brackets.
- Reduction 1 1/4" M x 1" F.
- Hot pre-formed shell insulation made of expanded PE-X with closed cells.

MANIFOLDS AND ACCESSORIES



- 1) Flow manifold with lockshield valve to adjust flow rate, 6631 series
- 2) Return manifold with shut-off valves fitted for thermo-electric actuator, 6630 series
- 3) End fittings composed of union with double radial connection and plugs, 5994 series
- 4) Pair of brackets fastening to the box, 658 series
- 5) Reduction 1 1/4" M x 1" F, 3642 series
- 6) Hot pre-formed shell insulation (version with insulation) 663 IS series
- 7) Ball shut-off valves, 391 series
- 8) Autoflow, 120 series
- 9) Filter, 120 series
- 10) Thermo-electric actuator, 6560 - 6561 series
- 11) Thermo-electric actuator with manual opening and position indicator, 6563 series

- 12) Manual air vent valve, code 337131
- 13) Automatic air vent valve, code 59575
- 14) End fitting with automatic air vent valve, code 599671
- 15) End fitting with manual air vent valve, code 599672
- 16) Drain cock, code 538400
- 17) By-pass eccentric kit, code 663000
- 18) DARCAL fitting, 680 series
- 19) Plug disc, 386 series
- 20) Compression fitting, code 3475 ..
- 21) DARCAL fitting, code 679
- 22) Box, 659 series
- 23) Box, 5902 series

By-pass eccentric kit with fixed setting, code 663000



Function

In heating and air-conditioning systems, the medium distribution circuits can be totally or partially shut off by closing the thermoelectric valves in the manifolds or the thermostatic valves of the radiators. After reducing the flow rate, the differential pressure in the circuit may increase up to values able to generate problems of noise, high medium speed, mechanical erosion and hydraulic unbalancing of the system itself. The differential by-pass kit for 663 series manifolds performs the function of keeping the flow and return pressure of the manifold circuit balanced when the flow rate varies. This valve is fitted for quick coupling with the 663 series manifolds, reducing the overall dimensions to a minimum.

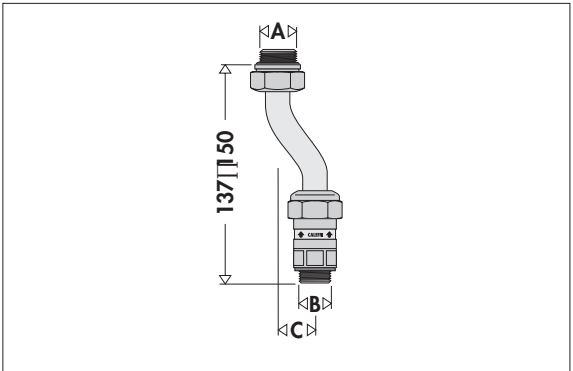
Product range

Code 663000 By-pass eccentric kit with fixed setting _____ sizes 3/8" x 1/2"

Technical specifications

Materials:	- body:	brass EN 12164 CW614N
	- nuts:	brass EN 12165 CW617N
	- Ø 18 pipe with plate:	copper
	- check valve obturator:	POM
	- spring:	stainless steel
	- seals:	EPDM
	- gaskets:	asbestos-free fibre
Medium:		water, glycol solutions
Max. percentage of glycol:		30%
Max. working pressure:		10 bar
Temperature range:		-10–110°C
Fixed pressure setting:		20 kPa (2000 mm w.g.)
Flow manifold connection:		3/8" M
Return manifold connection:		1/2" M

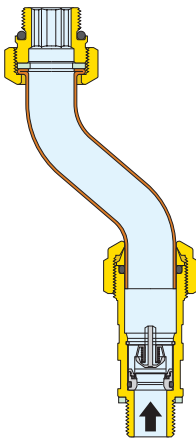
Dimensions



Code	A	B	C	Weight (kg)
663000	1/2"	3/8"	35	0,3

Principle of operation

The by-pass valve contains a non-return obturator connected to a contrast spring. When the fixed setting pressure is reached, the valve obturator gradually opens, recirculating the flow in proportion to the closing of the thermo-electric valves and maintaining a constant differential pressure in the manifold circuit.

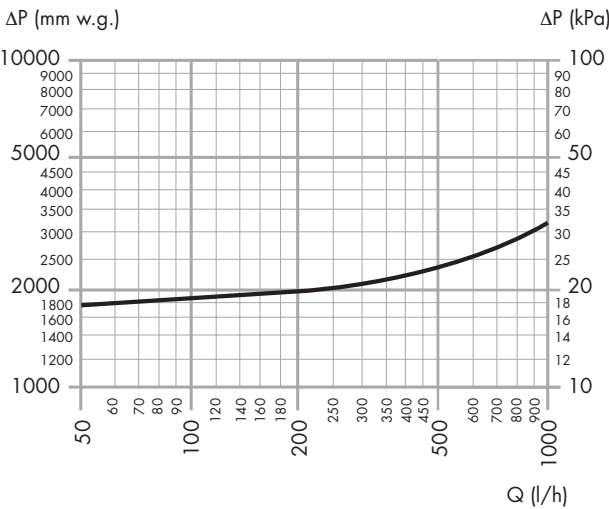


Construction details

The differential by-pass assembly features a fixed setting that cannot be changed because it does not contain accessible adjustment parts. The small, compact size and offset connections makes this kit particularly easy to install, deciding to mount it after installing thermo-electric valves on the manifold. It does not require a larger or deeper zone box than those used for normal manifolds.

Hydraulic characteristics

By-pass pressure differential: 20 kPa (2000 mm w.g.)



SPECIFICATION SUMMARIES

Code 663000

By-pass eccentric kit with fixed setting. Threaded connections 3/8" M x 1/2" M. Brass body and nuts. Ø 18 pipe with plate in copper. POM 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. Temperature range: -10–110°C. Fixed pressure setting: 20 kPa.

Standard thermo-electric actuator



6561 **tech. broch. 01042**

Thermo-electric actuator.
For manifolds 663 series.
Normally closed.

Code	Voltage (V)
656102	230
656104	24

Technical specifications

Materials: - protective shell self-extinguishing polycarbonate
 - colour (codes 656102/04) white RAL 9010
 (codes 656112/14) grey RAL 9002

Normally closed
Electric supply: 230 V (ac) - 24 V (ac) - 24 V (dc)
Starting current: ≤ 1 A
Working current: 230 V (ac) = 13 mA
 24 V (ac) - 24 V (dc) = 140 mA
Power consumption: 3 W
Auxiliary microswitch contacts rating (codes 656112/14): 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



6561 **tech. broch. 01042**

Thermo-electric actuator.
For manifolds 663 series.
Normally closed.
With auxiliary microswitch.

Code	Voltage (V)
656112	230
656114	24

Thermo-electric actuator with manual opening and position indicator



6563 **tech. broch. 01142**

Thermo-electric actuator.
For manifolds 663 series.
Normally closed.

Code	Voltage (V)
656302	230
656304	24

Technical specifications

Materials: - protective shell self-extinguishing polycarbonate
 - colour (codes 656302/04) white RAL 9010
 (codes 656312/14) grey RAL 9002

Normally closed
Electric supply: 230 V (ac) - 24 V (ac) - 24 V (dc)
Starting current: ≤ 1 A
Working current: 230 V (ac) = 13 mA
 24 V (ac) - 24 V (dc) = 140 mA
Power consumption: 3 W
Auxiliary microswitch contacts rating (656312/14 codes): 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



6563 **tech. broch. 01142**

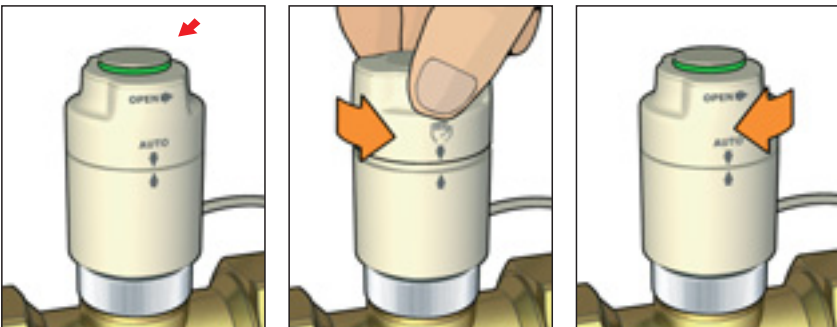
Thermo-electric actuator.
For manifolds 663 series.
Normally closed.
With auxiliary microswitch.

Code	Voltage (V)
656312	230
656314	24

The thermo-electric actuator 6563 series 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 electricity 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 having necessarily 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 control automatically goes back onto automatic operation when the system is electrically put into operation.



Automatic flow stabilizers



120 AUTOFLOW version

 tech. broch. 01041

Combination of automatic flow stabilizer and ball valve.

Factory set to keep the flow rate automatically within $\pm 5\%$ of the set value.

Inspecting, cleaning and replacing the internal cartridge without having to remove the valve body from the piping.

Suitable for fitting pressure points to check operation.

Suitable for connecting to a drain pipe. The control stem of the ball valve has a blowout-proof stem and the closing lever is covered with vinyl. Reversible lever.

Male connections with union nut.

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

Technical specifications

Thermometer scale:	0–80°C - Ø 40 mm
Max. working pressure:	25 bar
Max. working temperature:	110°C
Δp Range:	14–220 kPa
Accuracy:	$\pm 5\%$

- They are available on request with other flow rates



120 FILTER Version

 tech. broch. 01041

Combination of Y-filter and ball valve.

Inspecting, cleaning and replacing the filter without having to remove the valve body from the piping. Fitted for fitting pressure points to check the degree of filter clogging. Fitted for connecting to a drain pipe to clean the filter without having to remove it from the body.

The control stem of the ball valve has a blowout-proof stem and the closing lever is covered with vinyl. Reversible lever.

Male connections with union nut.

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

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

Technical specifications

Thermometer scale:	0–80°C - Ø 40 mm
Max. working pressure:	25 bar
Max. working temperature:	110°C
Filter mesh Ø:	0,87 mm

Manifolds



6630

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

Code	Connection	No. outlet	Outlets
663030	1 1/4" F	x 3	3/4" M
663040	1 1/4" F	x 4	3/4" M
663050	1 1/4" F	x 5	3/4" M
663060	1 1/4" F	x 6	3/4" M
663070	1 1/4" F	x 7	3/4" M
663080	1 1/4" F	x 8	3/4" M

Technical specifications

Materials:

Return manifold

- body: brass EN 1982 CB753S

Shut-off valve

- control device upper part: brass EN 12164 CW614N and PA
- obturator stem: stainless steel
- obturator: EPDM
- springs: stainless steel
- seals: EPDM
- knobs: ABS

Flow manifold

- body: brass EN 1982 CB753S

Lockshield valve

- control device upper part: brass EN 12164 CW614N
- obturator stem: brass EN 12164 CW614N
- seals: EPDM
- plug: self-extinguishing polycarbonate

Max working pressure: 10 bar
Temperature range: 5–100°C

Main connections: 1 1/4" F x M
Outlets: 3/4" M - Ø 18
Outlet centre distance: 50 mm



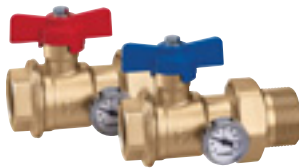
6631

Flow manifold with lockshield valves.

Code	Connection	No. outlet	Outlets
663130	1 1/4" F	x 3	3/4" M
663140	1 1/4" F	x 4	3/4" M
663150	1 1/4" F	x 5	3/4" M
663160	1 1/4" F	x 6	3/4" M
663170	1 1/4" F	x 7	3/4" M
663180	1 1/4" F	x 8	3/4" M

Shut-off valves

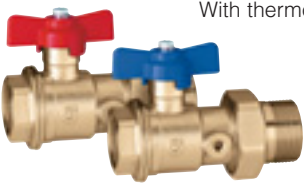
391



Pair of ball valves.
Female - male connections with union.
With thermometer scale 0-80°C, Ø 40 mm.
Max. working pressure: 10 bar.
Max. working temperature: 100°C.

Code		Kv (m³/h)
391167	1" x 1 1/4"	47,5
391177	1 1/4" x 1 1/4"	47,5

391



Pair of ball valves.
Female - male connections with union.
With thermometer connection.
Max. working pressure: 10 bar.
Max. working temperature: 100°C.

Code		Kv (m³/h)
391067	1" x 1 1/4"	47,5
391077	1 1/4" x 1 1/4"	47,5

End fittings

5996



End fitting composed of union with double radial connection, 5994 series with automatic air vent valve code 59575 and drain cock, 538 series.
Max. working pressure: 10 bar.
Max. discharge pressure: 2,5 bar.
Max. working temperature: 110°C.

Code	
599671	1 1/4"

5996



End fitting composed of union with double radial connection, 5994 series, with automatic air vent valve, 337 series and drain cock, 538 series.
Max. working pressure: 6 bar.
Max. working temperature: 85°C.

Code	
599672	1 1/4"

Mounting brackets

658



Pair of mounting brackets for use with boxes 659 series or direct fixing.
Complete with screws and fixings.

Code	
658100	for manifolds 666, 667 and 668 series

Automatic air vent valves

59575



Automatic air vent valve.
Hot forged brass.
Max. working pressure: 10 bar.
Max. discharge pressure: 2,5 bar.
Max. working temperature: 110°C.

Code	
59575	3/8" M

337



Mini drain cock.
Adjustable outlet.
PTFE seal on thread.
Max. working pressure: 6 bar.
Max. working temperature: 85°C.

Code	
337131	3/8" M

Drain cock

538



Drain cock
with hose connection and cap.
Max. working pressure: 10 bar.
Max. working temperature: 110°C.

Code	
538400	1/2" M

Fittings



680 DARCAL

Self-adjustable diameter fitting for single and multilayer plastic pipes.
Max. working pressure: 10 bar.
Temperature range:
5–80°C (PE-X)
5–75°C (Multilayer marked 95°C)
Patented.

Code		Ø _{inside}	Ø _{outside}
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
680564	3/4"	15,5–16	18–20
680505	3/4"	17	22,5



347

Compression fitting for copper pipe with O-Ring seal.
Max. working pressure: 10 bar.
Temperature range: -25–120°C.

Code	
347510	3/4" - Ø 10
347512	3/4" - Ø 12
347514	3/4" - Ø 14
347515	3/4" - Ø 15
347516	3/4" - Ø 16
347518	3/4" - Ø 18



386

Screw plug with nut, for manifold outlets.

Code	
386500	3/4"



679 DARCAL

Fitting for multilayer pipe for continuous high temperature use.
Max. working pressure: 10 bar.
Temperature range: 0–95°C.

WARNING: For a correct use, calibrate the multilayer pipe before installation.

Code	
679514	3/4" - Ø 14x2
679524	3/4" - Ø 16x2
679525	3/4" - Ø 16x2,25
679544	3/4" - Ø 18x2
679564	3/4" - Ø 20x2
679565	3/4" - Ø 20x2,25
679566	3/4" - Ø 20x2,5

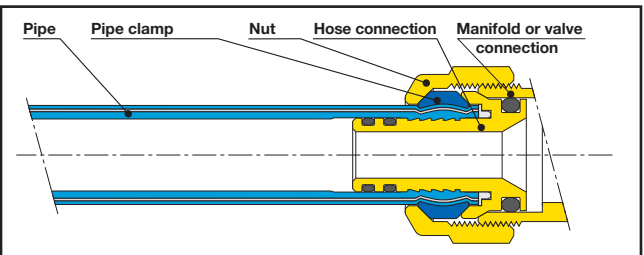
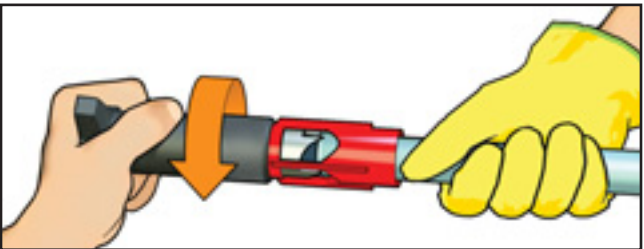


679

Case kit to calibrate multilayer pipes before use with fittings 679 series.

Code	
679000	Set calibrators
679001	calibrator Ø 14x2
679002	calibrator Ø 16x2
679003	calibrator Ø 16x2,25
679004	calibrator Ø 18x2
679006	calibrator Ø 20x2
679007	calibrator Ø 20x2,25
679008	calibrator Ø 20x2,5
679005	handle for calibrator

Calibration of the multilayer pipe and assembly of the fitting components, 679 series



Box



5902
Ventilated box with frame.
For single manifolds 663 series.
Adjustable depth
from 110 to 140 mm.
Closure with a push-fit clamp.
In painted sheet steel.

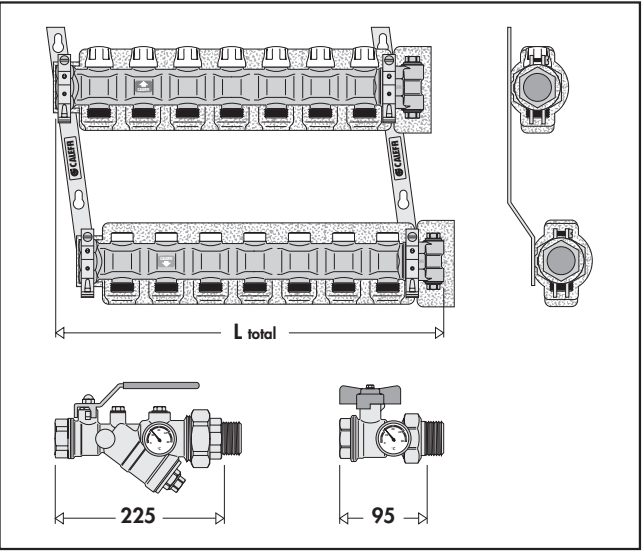


659
Inspection wall box for
manifold systems.
For manifolds 668 series.
Wall or floor installations
(with 660 series).
Adjustable depth
from 110 to 140 mm.
Closure with a push-fit clamp.
In painted sheet steel.

Code	Useful dim. (h x b x d)		
590204	450 x	400 x	110-140
590206	450 x	600 x	110-140
590208	450 x	800 x	110-140
590210	450 x	1000 x	110-140

Code	(h x b x d)		
659040	450 x	400 x	110-140
659060	450 x	600 x	110-140
659080	450 x	800 x	110-140
659100	450 x	1000 x	110-140
659120	450 x	1200 x	110-140

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



660

Floor installation kit for inspection wall boxes 659 series.
Consists of:
- 2 supports of 20 cm height,
- 2 side panels,
- 1 pipe bending bar.



Code	
660040	for 659040
660060	for 659060
660080	for 659080
660100	for 659100
660120	for 659120

Code without insulation	6637C5	6637D5	6637D5	6637F5	6637G5	6637H5	6637I5	6637L5	6637M5	6637N5	6637O5
Code with insulation	6637C5 IS	6637D5 IS	6637D5 IS	6637F5 IS	6637G5 IS	6637H5 IS	6637I5 IS	6637L5 IS	6637M5 IS	6637N5 IS	6637O5 IS
Nr. outlets	3	4	4	6	7	8	9	10	11	12	13
Tot. length manifold (mm)	220	270	270	370	420	470	550	600	650	700	750
Box length (mm)	400	400	400	600	600	800	800	800	800	1000	1000
Box code, 5902 series	590204	590204	590204	590206	590206	590208	590208	590208	590208	590210	590210
Box code, 659 series	659040	659040	659040	659060	659060	659080	659080	659080	659080	659100	659100

Radiator system with wall-mounted boiler with direct distribution

The diagram illustrates a heating system layout. On the left, a wall-mounted boiler unit is shown with two valves. Solid lines represent the main supply and return pipes. These pipes lead to a central manifold unit, which is a box containing multiple vertical pipes. From the manifold, solid lines branch out to two radiators on the right. Each radiator has a small circular valve on its supply line. Dashed lines represent the return paths from the radiators back to the manifold and from the manifold back to the boiler. The radiators are labeled 'RT' in a box. The entire system is connected to a network of pipes at the bottom, which are shown as a bundle of lines entering the room.

The diagram illustrates a two-pipe heating and air-conditioning system. A central boiler (represented by a triangle) is connected to a network of pipes. The system includes a pump (circle with an arrow) and several valves (X symbols). The pipes branch out to multiple rooms, each containing a fan coil unit (labeled 'RT'). The fan coil units are connected to the main supply and return lines. The return line from the fan coil units passes through a filter (zigzag line) and a pump before returning to the boiler. The system is designed to provide both heating and cooling to the rooms.

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



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