Zone valves

series 676

cert. n° 0003
ISO 9001

01072/02 GB

Function

Zone valves are used to control the thermal carrier fluid in heating and air-conditioning systems. Coupled with a thermo-electric actuator and managed by a room thermostat, they allow automatic on/off control of the part of the hydraulic circuit on which they are inserted.

Their special feature is their low flow rate coefficient and they can therefore be installed to control small areas or used directly on the emitters.

Product range

Zone valves are available in the following configurations:

Series 676	2-way	sizes 1/2", 3/4", 1"
Series 677	3-way	sizes 1/2", 3/4", 1"
Series 678	4-way	sizes 1/2", 3/4", 1"

They can be coupled with thermo-electric actuator heads:

Code 656102/4	220 V / 24 V	without auxiliary microswitch
Code 656112/4	220 V / 24 V	with auxiliary microswitch

Technical specification

Valves

Materials: - body:	brass UNI EN 12165 CW617N
- obturator:	brass UNI EN 12165 CW617N
- control spindle:	stainless steel
- hydraulic seals:	EPDM
- Medium:	water, glycol solutions
- Max. percentage of glycol:	30%
- Temperature range:	0÷95°C
- Max. pressure:	10 bar
- Max. pressure differential:	1,2 bar
- Connections:	1/2", 3/4", 1", M with union
- Bottom 3-way connection:	1/2" M with union

Actuator without auxiliary microswitch

Normally closed	
Supply:	220 V o 24 V
Starting current:	220 V = 0,6 A; 24 V = 2 A
Power consumption:	220 V e 24 V = 3 W
Level of protection:	IP44 (in vertical position)
Max. ambient temperature:	50°C
Operating time:	opening and closing from 120 s to 180 s
Supply cable length:	80 cm

Actuator with auxiliary microswitch

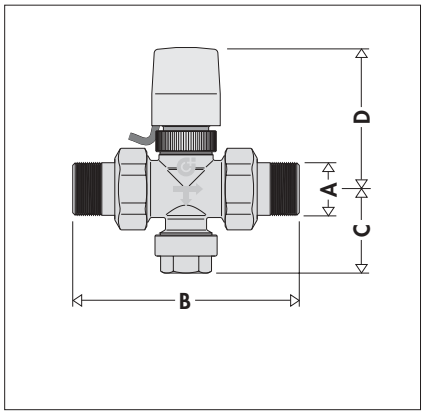
Normally closed with auxiliary contact	
Supply:	220 V o 24 V
Starting current:	220 V =0,6 A and 24 V = 2 A
Power consumption:	220 V and 24 V = 3 W
Auxiliary microswitch contacts current:	0,8 A (220 V)
Level of protection:	IP44 (in vertical position)
Max. ambient temperature:	50°C
Operating time:	opening and closing from 120 s to 180 s
Supply cable length:	80 cm

Reference documentation

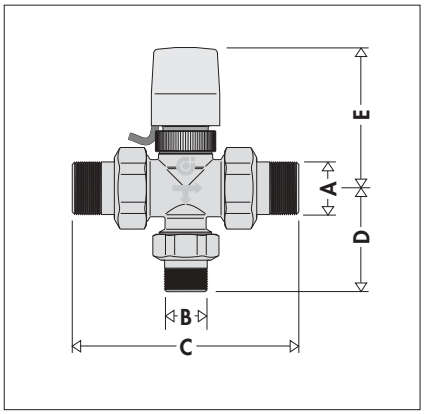
For further details of the characteristics of series 656 thermo-electric actuators, see the following leaflet:

- Thermo-electric actuators — leaflet **01042**

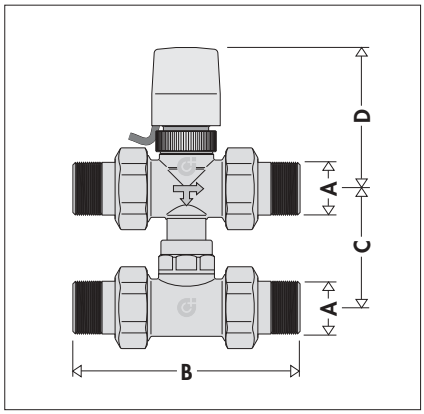
Dimensions



Code	A	B	C	D
676040	1/2″	113	41	81
676050	3/4″	113	41	81
676060	1″	122	41	81



Code	A	B	C	D	E
677040	1/2″	1/2″	113	52	81
677050	3/4″	1/2″	113	52	81
677060	1″	1/2″	122	52	81



Code	A	B	C	D
678040	1/2″	113	49÷63	81
678050	3/4″	113	49÷63	81
678060	1″	122	49÷63	81

Operating principle

When a room thermostat operates, the thermo-electric actuator causes the opening or closing of the valve obturator controlling the thermal carrier fluid.
The actuator operates via a wax expansion thermostat heated up by a PTC resistor, which automatically limits the current once reaching regime temperature.

Construction details

· Control spindle

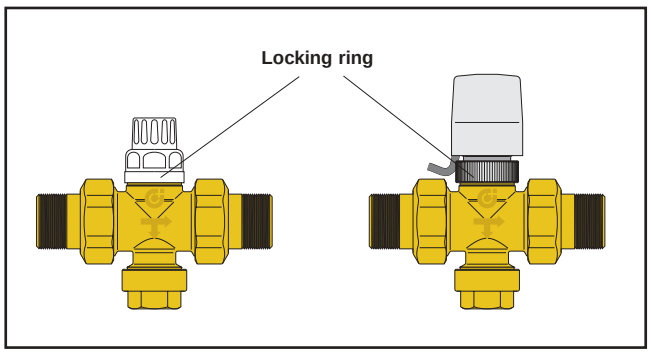
The stainless steel control spindle has a double hydraulic seal consisting of two EPDM O-rings; this means that the upper part of the unit can be replaced even when the system is operating.

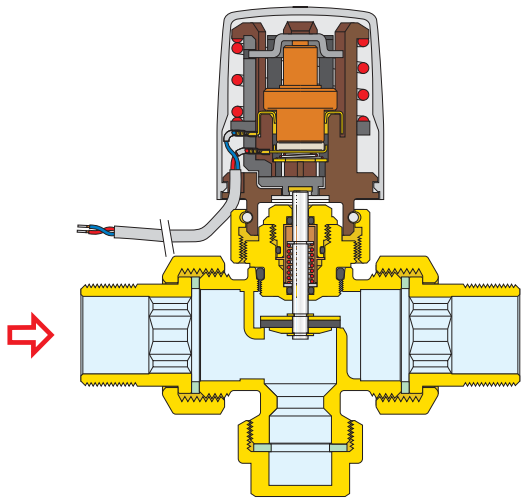
· Variable centre distance

The series 678 4-way valve allows for adjustable centre distance between connections from 49 to 63 mm, permitting direct connection to twin parallel type manifolds.

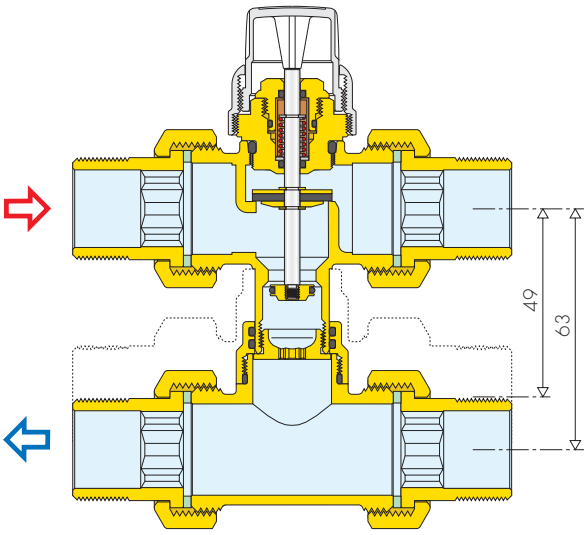
· Manual opening

The manual knob on the valve can be used for any preliminary opening/closing operations. It is removed to fit the thermo-electric actuator by unscrewing the lower metal ring.
The valve, with the servo-actuator fitted, is in the “normally closed” position; for manual opening, remove the thermo-electric actuator.





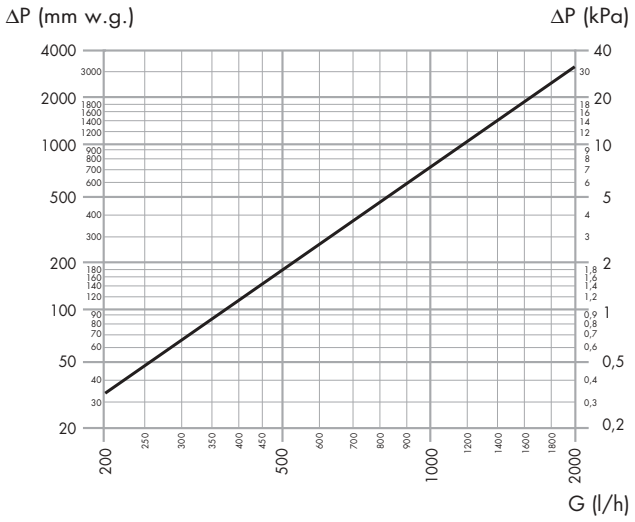
2-way valve, series 676 + actuator, series 656



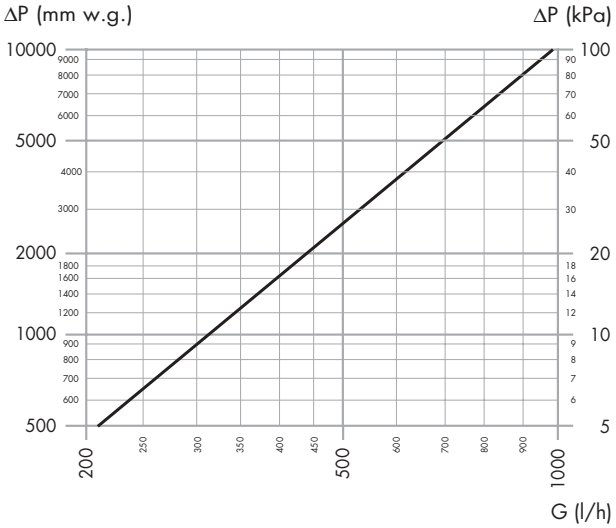
4-way valve, series 678

Hydraulic characteristics

Valves in “OPEN” position



Valves in “BY-PASS” position



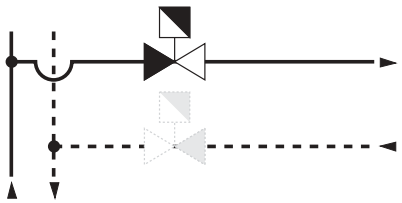
Thermo-electric actuators codes: **656**102, **656**104, **656**112, **656**114 + zone valves	Series	DN	Kv (m³/h) straight	Kv (m³/h) by-pass	Δp_{max} * (bar)
	676	1/2”-3/4”-1”	3,7	-	1,2
	677		3,7	1,0	1,2
	678		3,7	1,0	1,2

* Max. differential pressure ensured by servo-actuator in normal operation

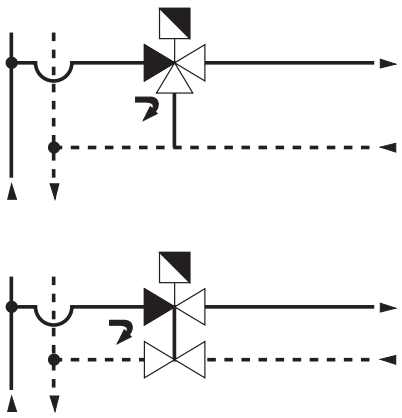
Installation

The zone valves must be installed in line with the direction of flow indicated by the arrow on the valve body.

The 2-way valve, series 676, can be installed in the flow or return pipework.



The 3-way valve, series 677 and 4-way valve, series 678 must be installed in the flow pipework.



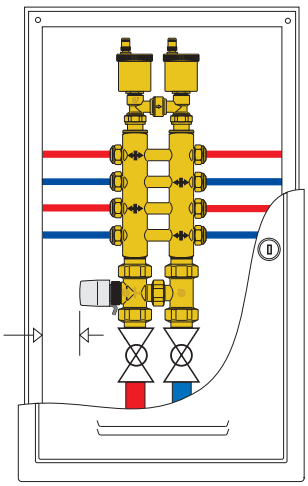
The valve is installed with the control knob at the top or in the horizontal position, never upside down.

The 2-way valve cannot be converted into a 3-way valve or vice versa.

Assembly in manifold box

When installing the valves in the relevant zone manifold box, adequate space (20 mm) must be left above the servo-actuator head to permit its replacement.
To prevent excessively high temperatures being reached, ensure that sufficient air can circulate inside the manifold box.

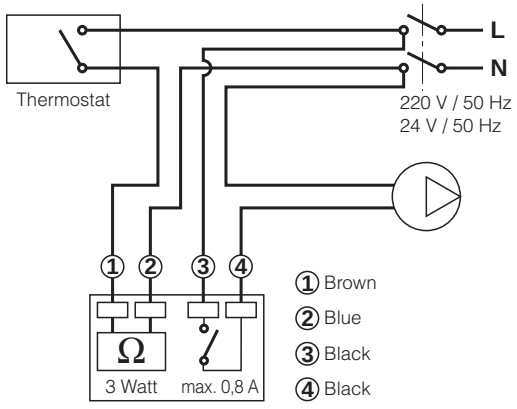
The figure represents installation in inspection box, series 5901 with controlled pressure twin parallel manifold, series 356.



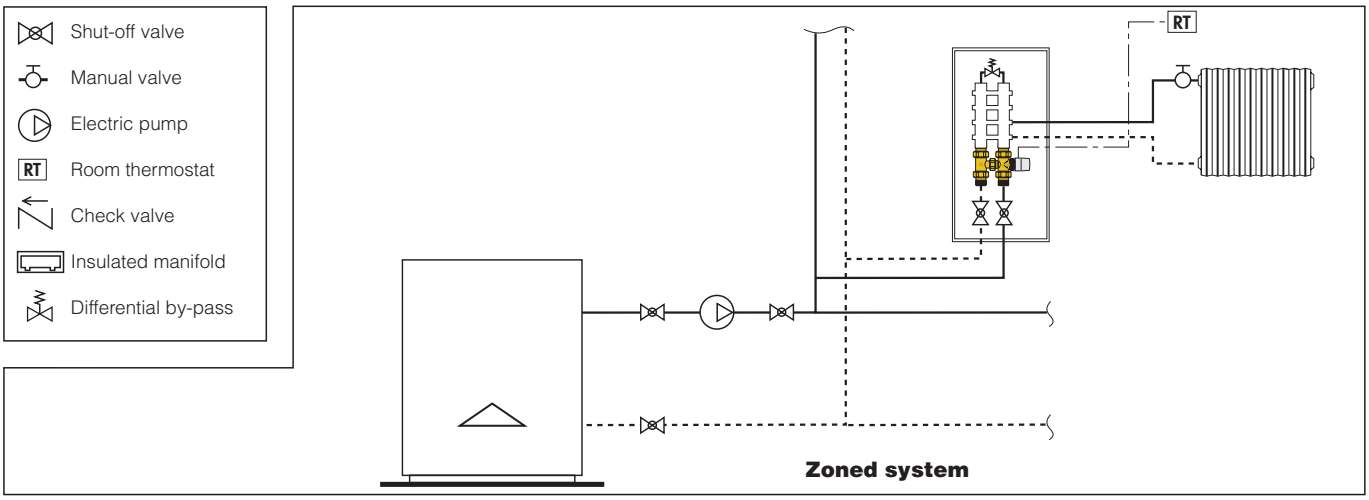
Electrical connections with auxiliary microswitch

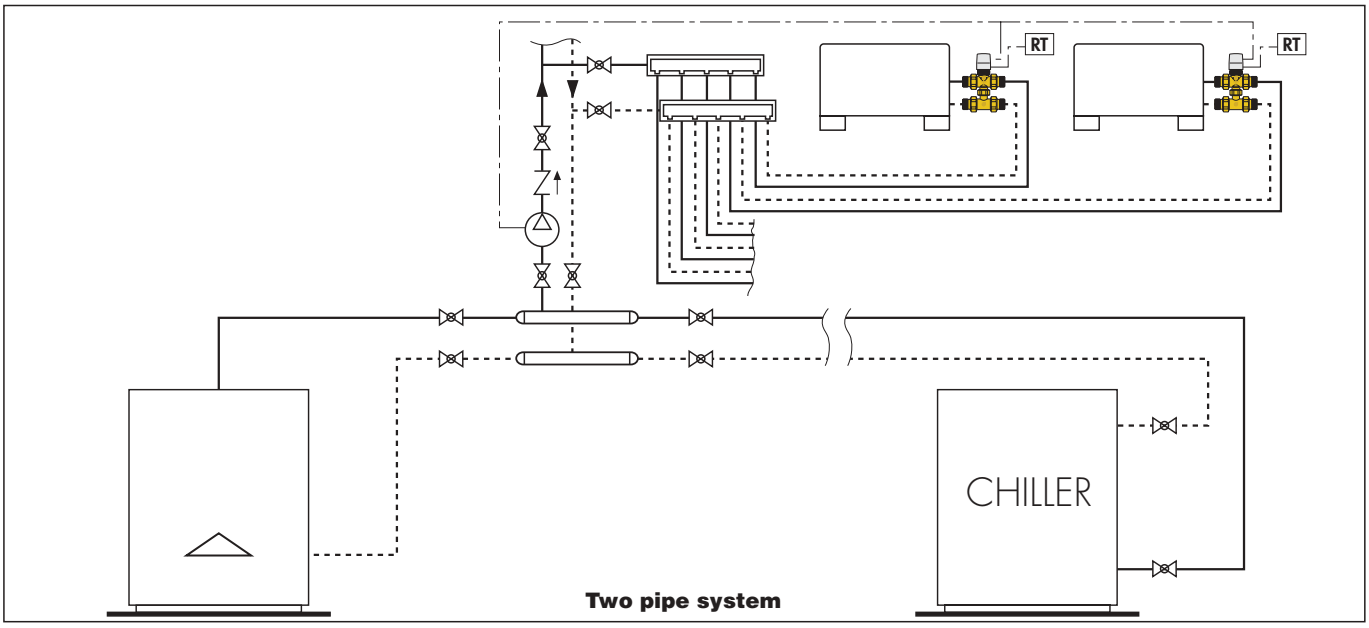
Diagram with pump disconnected

The auxiliary microswitch can be used to switch off the pump when heat is not required and the valve is closed.
If the pump’s power consumption exceeds the capacity of the contacts, equal to 0,8 A, an intermediate relay should be used.



Applications diagrams





SPECIFICATION SUMMARIES

Series 676

2-way zone valve. Designed for thermo-electric actuator. Connections 1/2" (from 1/2" to 1") M, with union. Brass body. Stainless steel control spindle. Control spindle seal with EPDM double O-ring. ABS manual control knob. Temperature range 0÷95°C. Max. working pressure 10 bar. Max. differential pressure 1,2 bar.

Series 677

3-way zone valve. Designed for thermo-electric actuator. Connections 1/2" (from 1/2" to 1") M, with union. Lower connection 1/2" M, with union. Brass body. Stainless steel control spindle. Control spindle seal with EPDM double O-ring. ABS manual control knob. Temperature range 0÷95°C. Max. working pressure 10 bar. Max. differential pressure 1,2 bar.

Series 678

4-way zone valve. Designed for thermo-electric actuator. Connections 1/2" (from 1/2" to 1") M, with union. Brass body. Stainless steel control spindle. Control spindle seal with EPDM double O-ring. ABS manual control knob. Temperature range 0÷95°C. Max. working pressure 10 bar. Max. differential pressure 1,2 bar.

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