

# Motorised ball zone valves with 3-contact actuator

**6442 - 6443 - 6444 series**



01131/11 GB

Replaces 01131/06 GB



## Function

The motorised zone valves permit automatically shutting off the medium in air conditioning or hydraulic and domestic water systems.

The high hydraulic performance level of this particular series of valves, combined with reduced dimensions and practical on-site operation, make them especially suitable for zone heating systems.

The motorised ball valves are used in the above-mentioned systems predominantly thanks to the following features:

- no seepage
- short operating times (valve opening - closing)
- operational capacity with high differential pressures
- low head losses
- **compatibility with any type of 3-contact controller** for complete control during the opening and closing phases, thanks to the electrical construction features.

**Patent application No. MI2005A001282**

## European directive conformity

CE mark directives 2006/95/CE and 2004/108/CE.



## Product range

6442 series	Motorised two-way ball zone valve with 3-contact actuator	sizes 1/2", 3/4" and 1"
Code 6443.. 3BY	Motorised three-way ball zone valve, by-pass version with 3-contact actuator	sizes 1/2", 3/4" and 1"
6444 series	Motorised three-way ball zone valve with telescopic by-pass tee and 3-contact actuator	sizes 1/2", 3/4" and 1"

## Technical specifications

### Materials

#### Valve body

Body:	brass EN 12165 CW617N
Ball:	brass EN 12164 CW614N, chrome plated
Ball hydraulic seal:	PTFE with EPDM O-ring
Control stem hydraulic seal:	double EPDM O-ring
Union hydraulic seal:	EPDM O-ring

#### Actuator

Protective shell:	self-extinguishing polycarbonate
Colour:	grey RAL 9002

#### Ambient condition

Medium working temperature range:	-5-110°C
Ambient temperatures:	
- Operation:	0-55°C EN 60721-3-3 Class 3K3 max. umidity 85%
- Transport:	-20-70°C EN 60721-3-2 Class 2K2 max. umidity 95%
- Storage:	-5-50°C EN 60721-3-1 Class 1K2 max. umidity 95%

## Performance

### Valve body

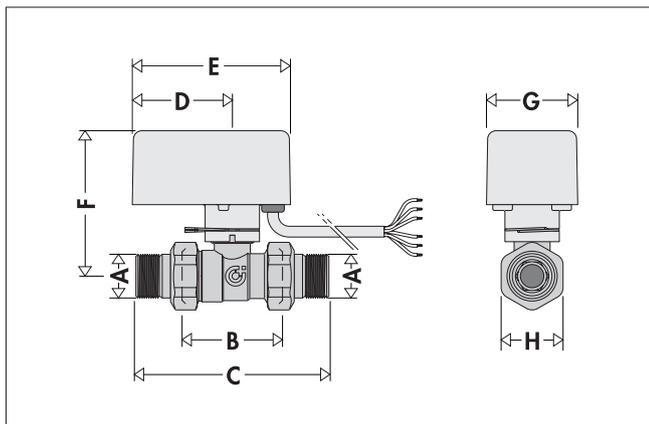
Medium:	water, glycol solutions
Max. percentage of glycol:	50%
Maximum working pressure:	10 bar
Working temperature range:	-5-110°C
Maximum differential pressure:	10 bar
Connections:	1/2"-1" M with union

### Actuator

Synchronous motor	
Electric supply:	230 V (±10%) - 50-60 Hz 24 V (±10%) - 50-60 Hz
Power consumption:	4 VA
Auxiliary microswitch contact rating:	0,8 A (230 V)
Protection class:	IP 44 (vertical control stem) IP 40 (horizontal control stem)
Operating time (angle of rotation 90°):	40 s
Ambient temperature range:	0-55°C
Dynamic torque:	8 N·m
Supply cable length:	100 cm

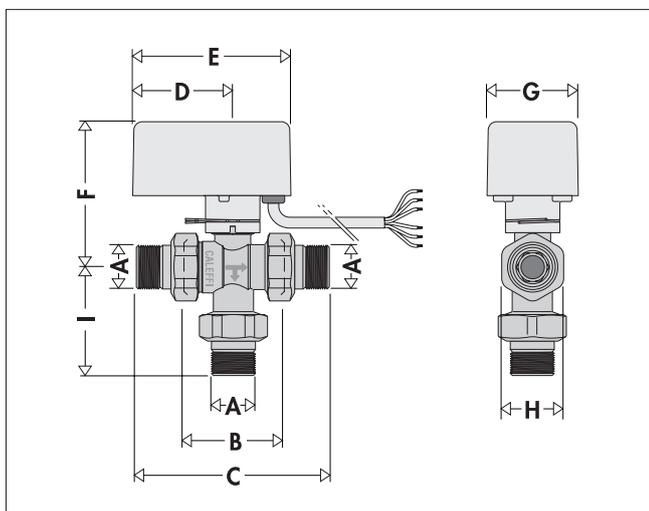
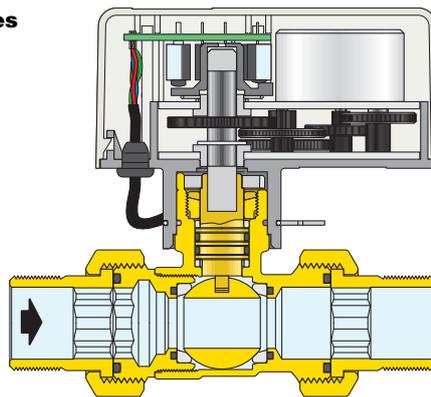
**Dimensions - Code completion ( )**

**2** → 230 V **4** → 24 V



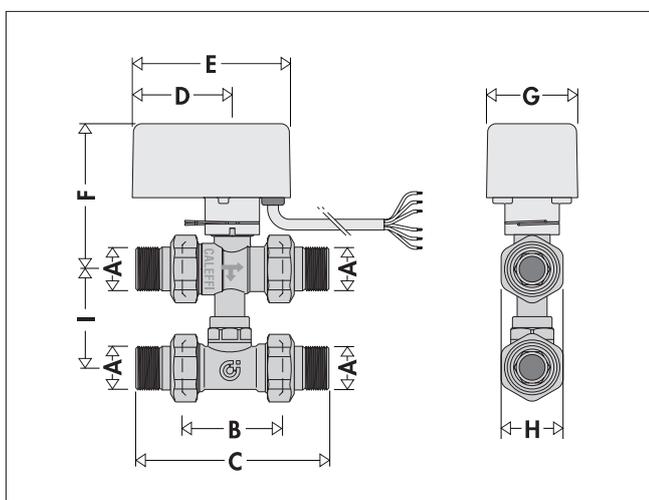
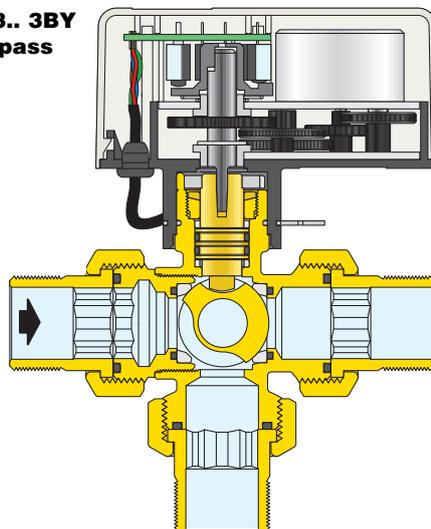
Code	A	B	C	D	E	F	G	H	Mass (kg)
64424.	1/2"	60	117	60	95	88	55	Ex. 37	0,97
64425.	3/4"	60	117	60	95	88	55	Ex. 37	0,97
64426.	1"	60	126	60	95	88	55	Ex. 47	1,00

**6442 series  
2-way**



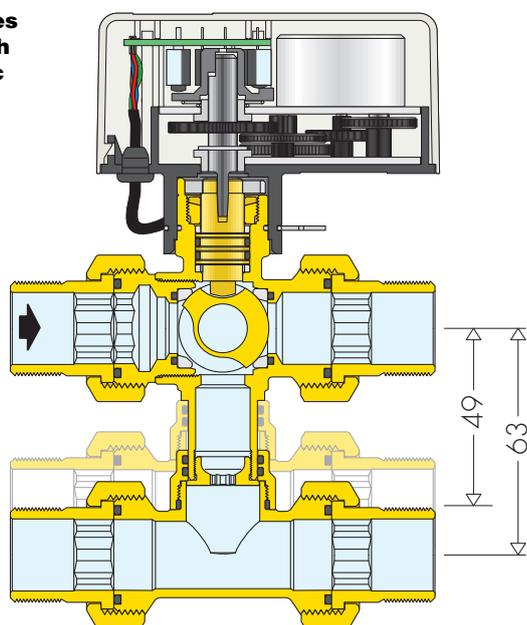
Code	A	B	C	D	E	F	G	H	I	Mass (kg)
64434. 3BY	1/2"	60	117	60	95	88	55	Ex.37	59	1,1
64435. 3BY	3/4"	60	117	60	95	88	55	Ex.37	59	1,1
64436. 3BY	1"	60	123	60	95	88	55	Ex.47	63	1,3

**Code 6443.. 3BY  
3-way, by-pass  
version**



Code	A	B	C	D	E	F	G	H	I	Mass (kg)
64444.	1/2"	60	117	60	95	88	55	Ex.37	49÷63	1,40
64445.	3/4"	60	117	60	95	88	55	Ex.37	49÷63	1,40
64446.	1"	60	126	60	95	88	55	Ex.47	49÷63	1,57

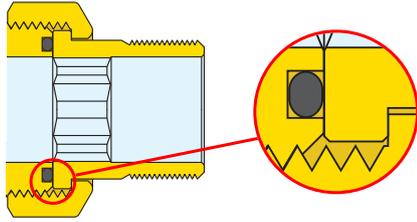
**6444 series  
3-way with  
telescopic  
by-pass**



## Construction details

### Seals

The valves are equipped with unions with a flat seat with EPDM O-Ring.



### Actuator

#### • ON/OFF mode

The valves may be used in ON/OFF mode with a single electrical signal for opening or closing provided by a three-contact thermostat/chrono-thermostat or an ordinary switch.

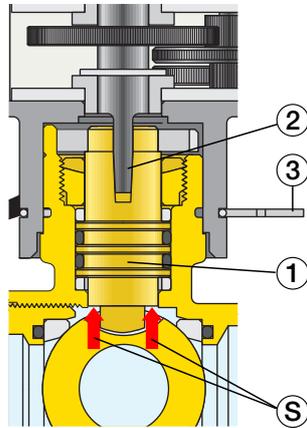
#### • Modulating mode

The electrical construction features of the actuator allow it to be combined with any type of three-point regulator.

#### • Drive transmission

Thanks to the tapered coupling between the valve stem (1) and the gearmotor shaft (2), there is a constant connection between the two components.

This permits automatic compensation of the mechanical slack thanks to the thrust (S) on the stem applied by the pressure of the medium.

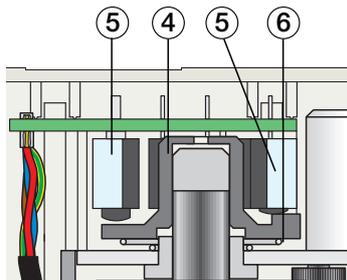


#### • Valve actuator coupling

An elastic steel clip (3) allows the valve to be coupled to the actuator quickly and easily, simply by pushing the two parts together until they click into place and are automatically locked together.

#### • Cam and limit microswitches

The cam (4), acting the limit microswitches (5), can move vertically and is supported by a tapered spring (6). This keeps the cam in constant contact with the microswitches and compensates for wear over time.



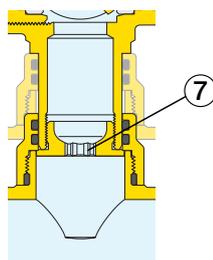
#### • Auxiliary microswitch

The actuator is equipped with an auxiliary microswitch to be used, for instance, to stop the pump on valve closing and vice-versa. It gets closed for an average valve opening value of 80%.

### Three-way valve with telescopic tee and calibrated nozzle

The 6444 series three-way valve with telescopic by-pass tee allows coupling with manifolds with a main centre distance of between 49 and 63 mm.

The by-pass tee is equipped with a calibrated nozzle U6 (7) in order to create head losses equivalent to those of the user circuit. This system makes it possible to keep the system flow rate (and therefore the pump head) constant, both when the valve is open and in by-pass mode.



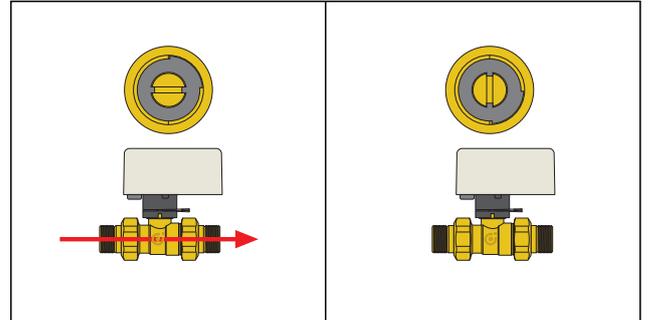
## Directions of flow and position indicator

Removing the actuator reveals a slot on the top of the control stem on which the actuator pin acts:

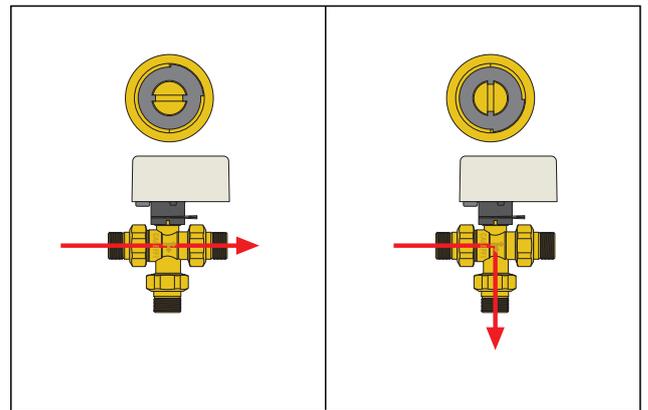
- it allows opening/closing the valve manually with a screwdriver;
- its position shows the direction of flow according to the position of the ball, which is especially helpful when testing or checking the system.

The following three diagrams illustrate the functioning of each valve type; the slot position indicates the flow direction.

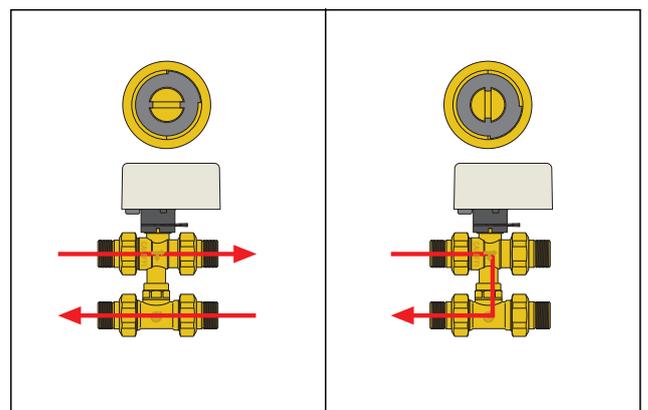
### Two-way valve 6442 series



### Three-way valve with by-pass code 6443.. 3BY



### Three-way valve with by-pass tee 6444 series

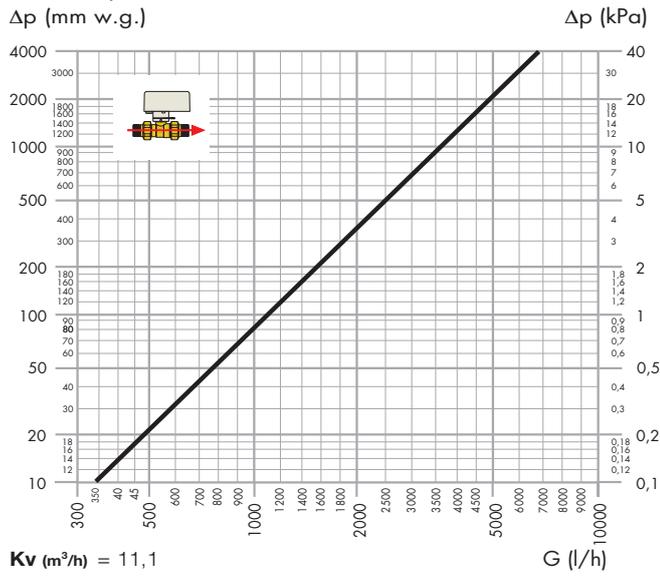


All the valves are supplied with the slot/indicator in the horizontal position.

## Hydraulic characteristics

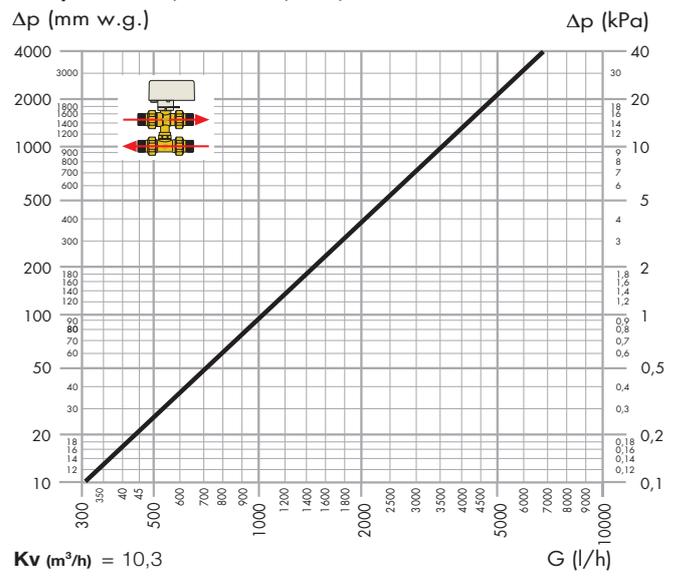
6442 series two-way zone valve, sizes 1/2", 3/4" and 1"

$\Delta p$  (mm w.g.)



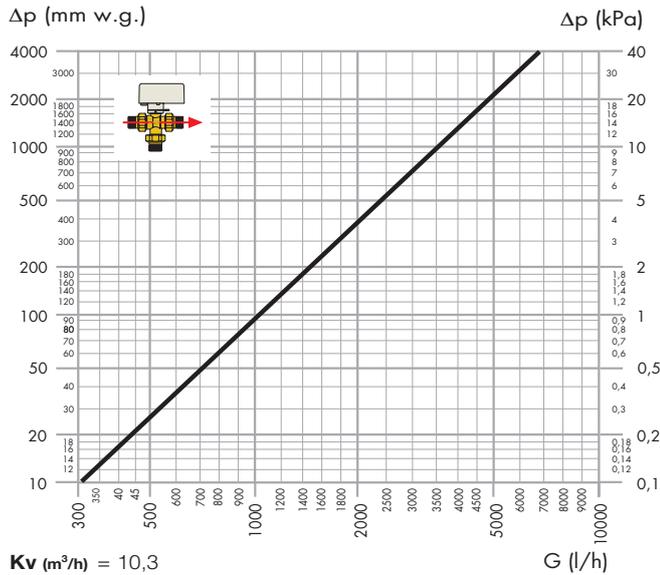
6444 series three-way zone valve with by-pass in "open" mode, sizes 1/2", 3/4", 1"

$\Delta p$  (mm w.g.)



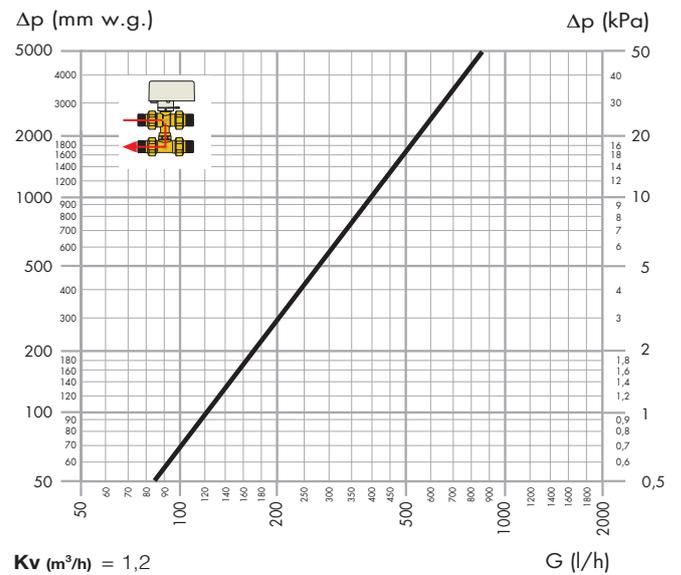
Three-way zone valve with by-pass code 6443.. 3BY in "open" mode, sizes 1/2", 3/4", 1"

$\Delta p$  (mm w.g.)



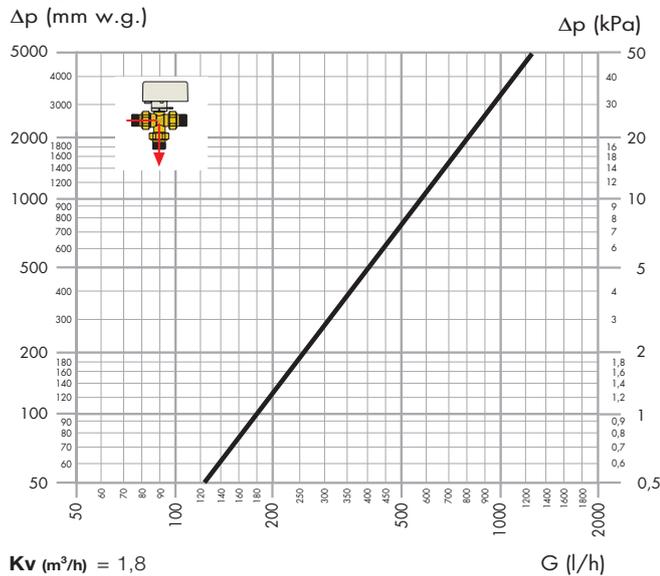
6444 series three-way zone valve, in "by-pass" mode with U6 nozzle, sizes 1/2", 3/4", 1"

$\Delta p$  (mm w.g.)



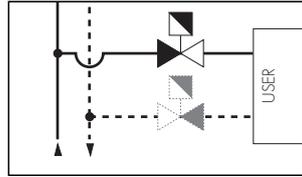
Three-way zone valve with by-pass code 6443.. 3BY in "by-pass" mode, sizes 1/2", 3/4", 1"

$\Delta p$  (mm w.g.)

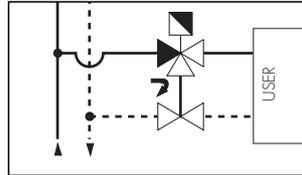


## Installation

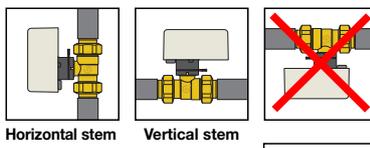
1. The two-way valve can be installed on both the flow and return pipe.



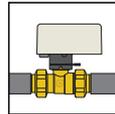
2. The three-way valves with by-pass and with by-pass tee must be installed on the flow pipe.



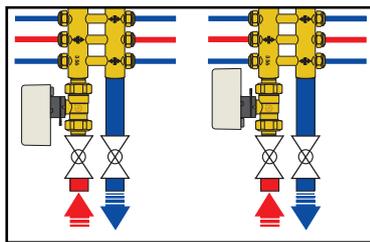
3. The valve must be installed with the control stem in a horizontal or vertical position, but **never in upside down position**.



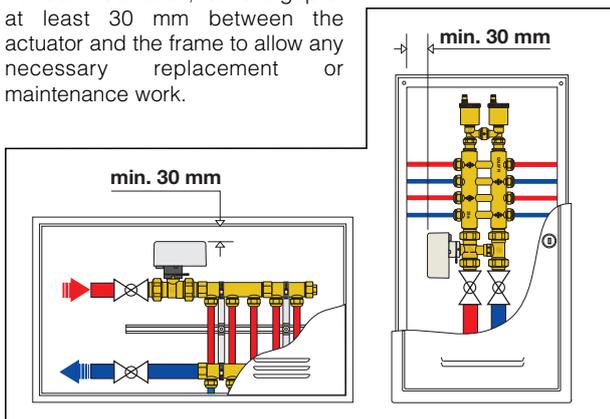
- 3b. In chilled water installations at risk of condensation, the actuator must be installed with the control stem in vertical position.



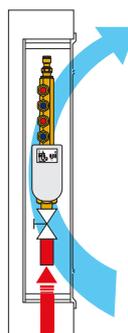
4. The actuator can be fitted onto the valve body in the two positions as indicated. Fastening takes place via an elastic stainless steel clip.



5. For box installation, leave a gap of at least 30 mm between the actuator and the frame to allow any necessary replacement or maintenance work.



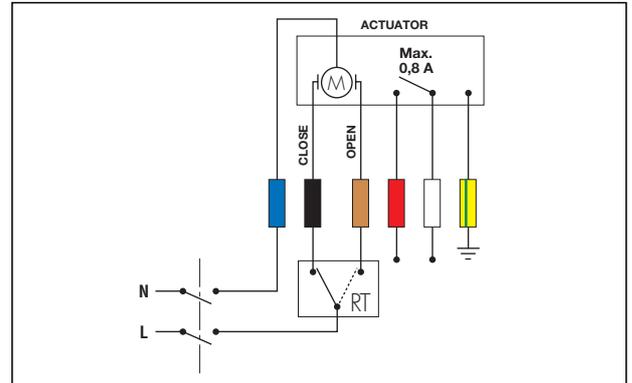
6. To prevent the temperature from becoming too high, make sure that air can circulate constantly around the zone valve.



## Electrical diagrams

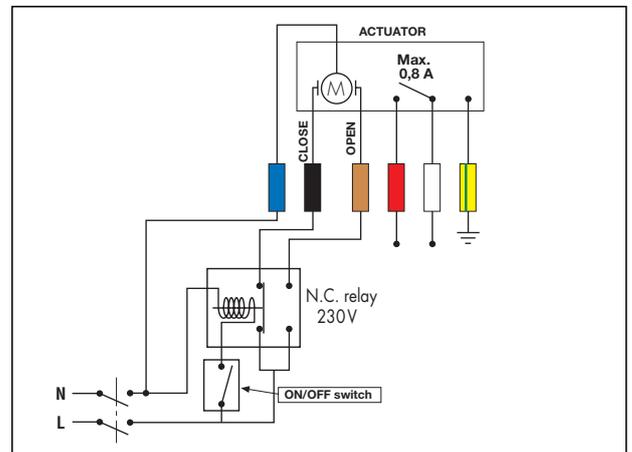
1. **Connection diagram for room thermostat (RT) and electric supply.**

The illustrated connection makes it possible to open and close the valve according to the three-contact room thermostat signal.



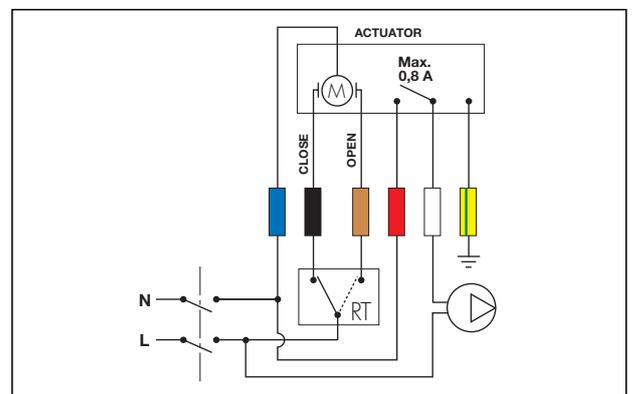
2. **Connection diagram with ON/OFF switch interruptor.**

The illustrated connection makes it possible to open and close the valve according to the switch signal, using an intermediate relay.



3. **Diagram of pump deactivation when no zone is in operation.**

This diagram, using the auxiliary microswitch, allows the pump to be deactivated when the diverter valve used as a zone valve is closed. If the pump has a power consumption level over 0,8 A (170 VA), an intermediate switch must be used.



## Microswitches

The actuator is equipped with limit microswitches that cut off the electric supply on reaching the valve open/closed positions.

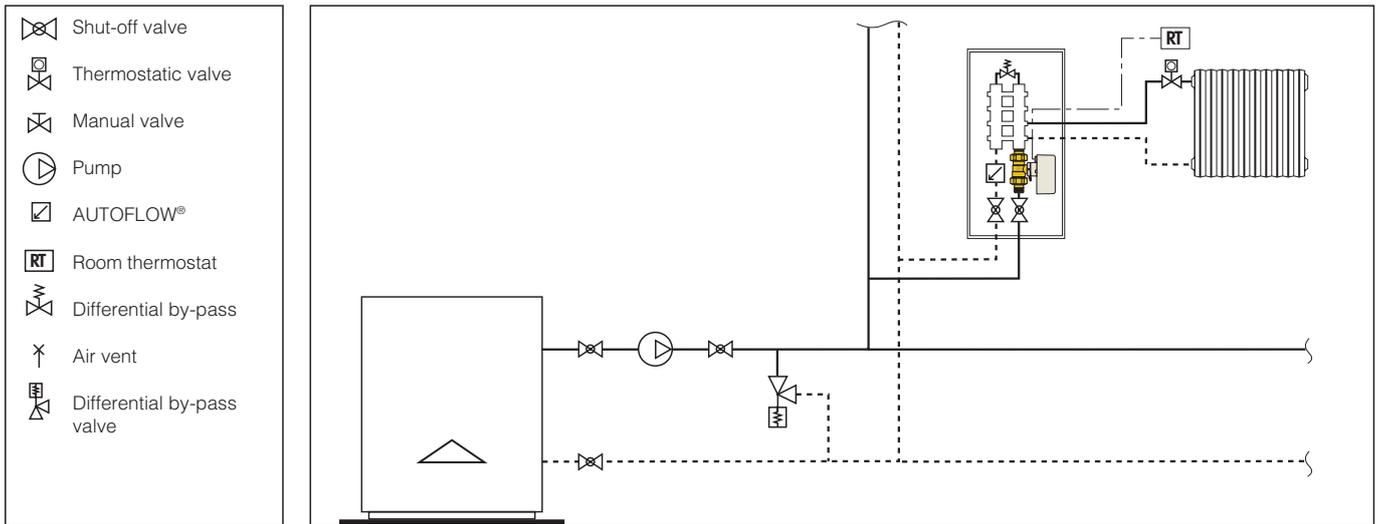
The auxiliary microswitch can be used to activate/deactivate components (such as pumps, boilers, etc.) during valve opening or closing phases respectively. The electrical contact gets closed for an average valve opening value of 80%.

## Application diagrams

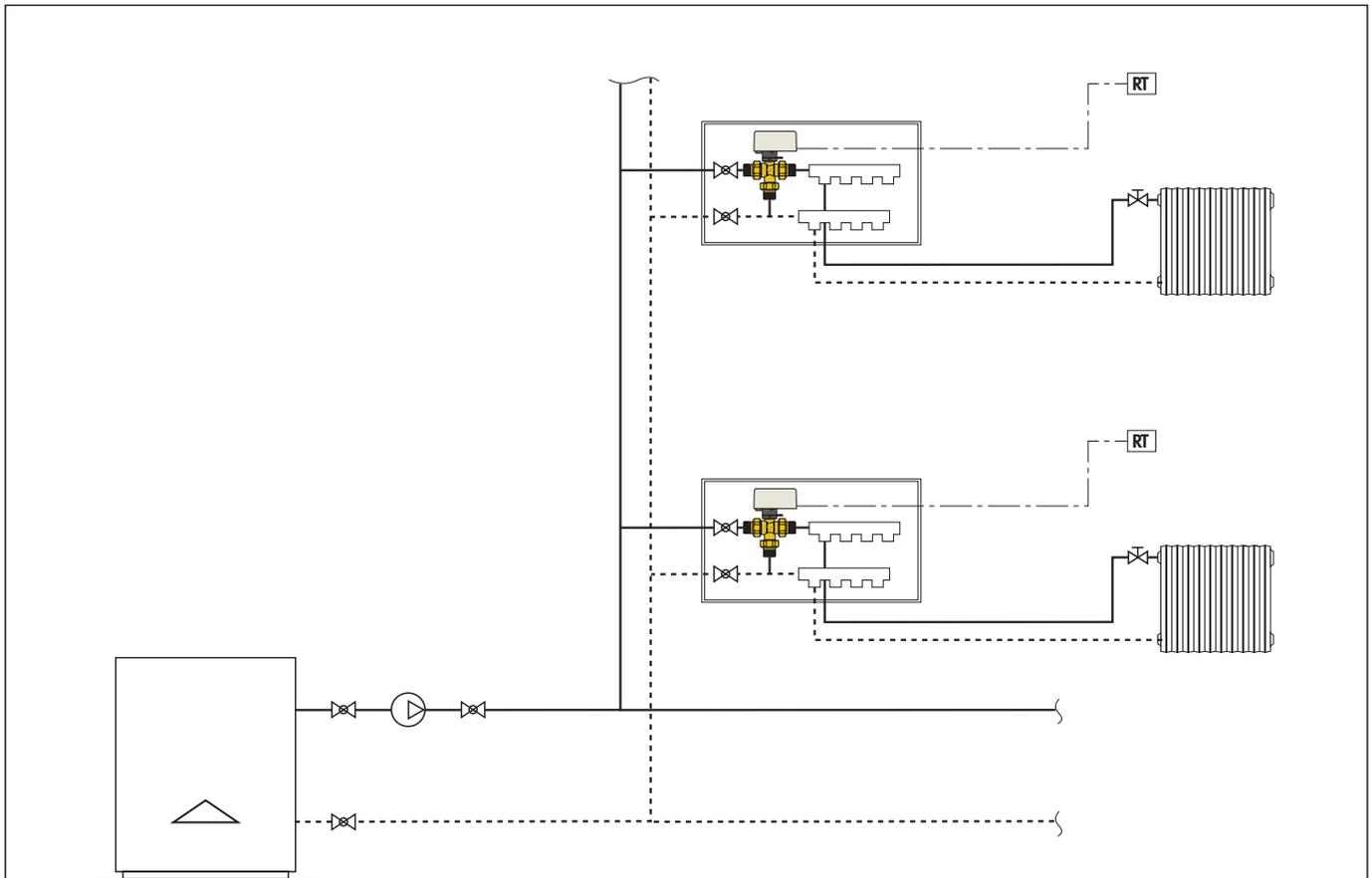
In systems with zone control, the hydraulic circuits, serving the heating terminals, are automatically cut off in accordance with the room temperature. This circuit closing can, however, cause changes in pressure and flow rate throughout the system, so it is essential to ensure these changes are kept under control within acceptable limits.

### System with two-way zone valves, differential by-pass valve and AUTOFLOW®, 6442 series.

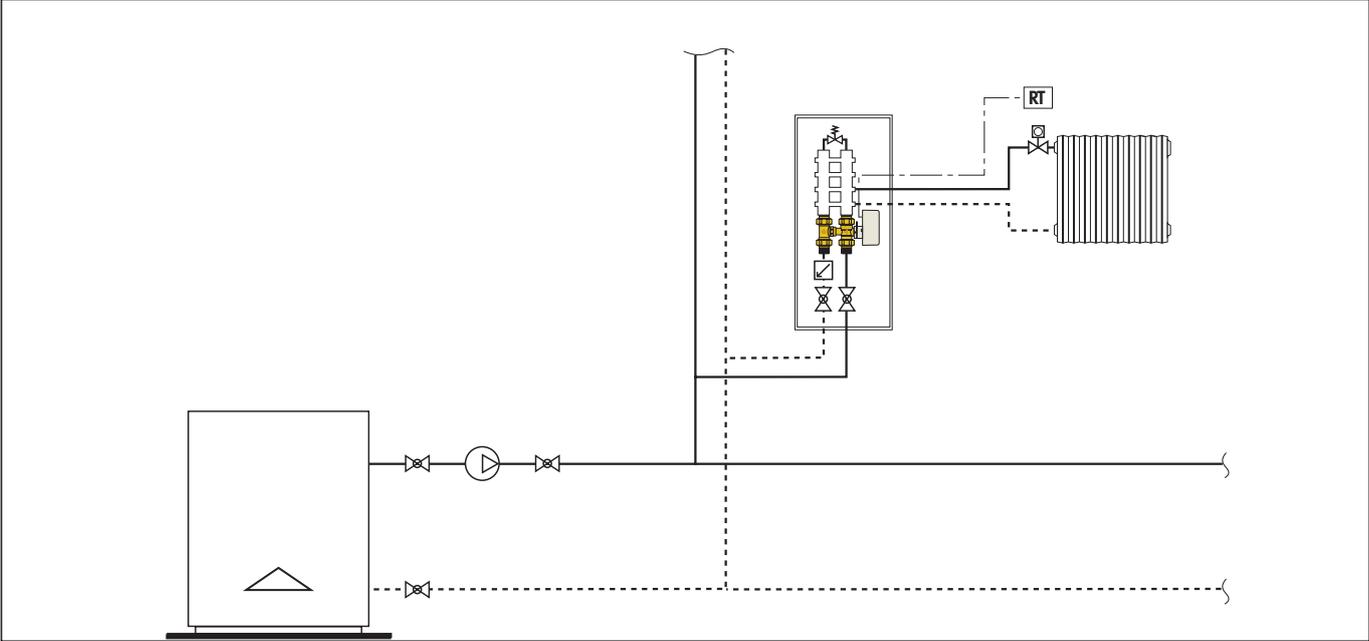
The system works with a variable flow rate and it is necessary to keep the differential pressure generated by the closure of the zone valves under control. This increase, which can reach levels that prevent the system from working properly, can generate an increase in the flow rate to the circuits which are still open, resulting in pump and boiler problems. It is therefore necessary to keep the differential pressure under control by using differential by-pass valves or variable speed pumps. Fitting the AUTOFLOW®, however, always keeps the flow rate to the open circuits at the nominal value.



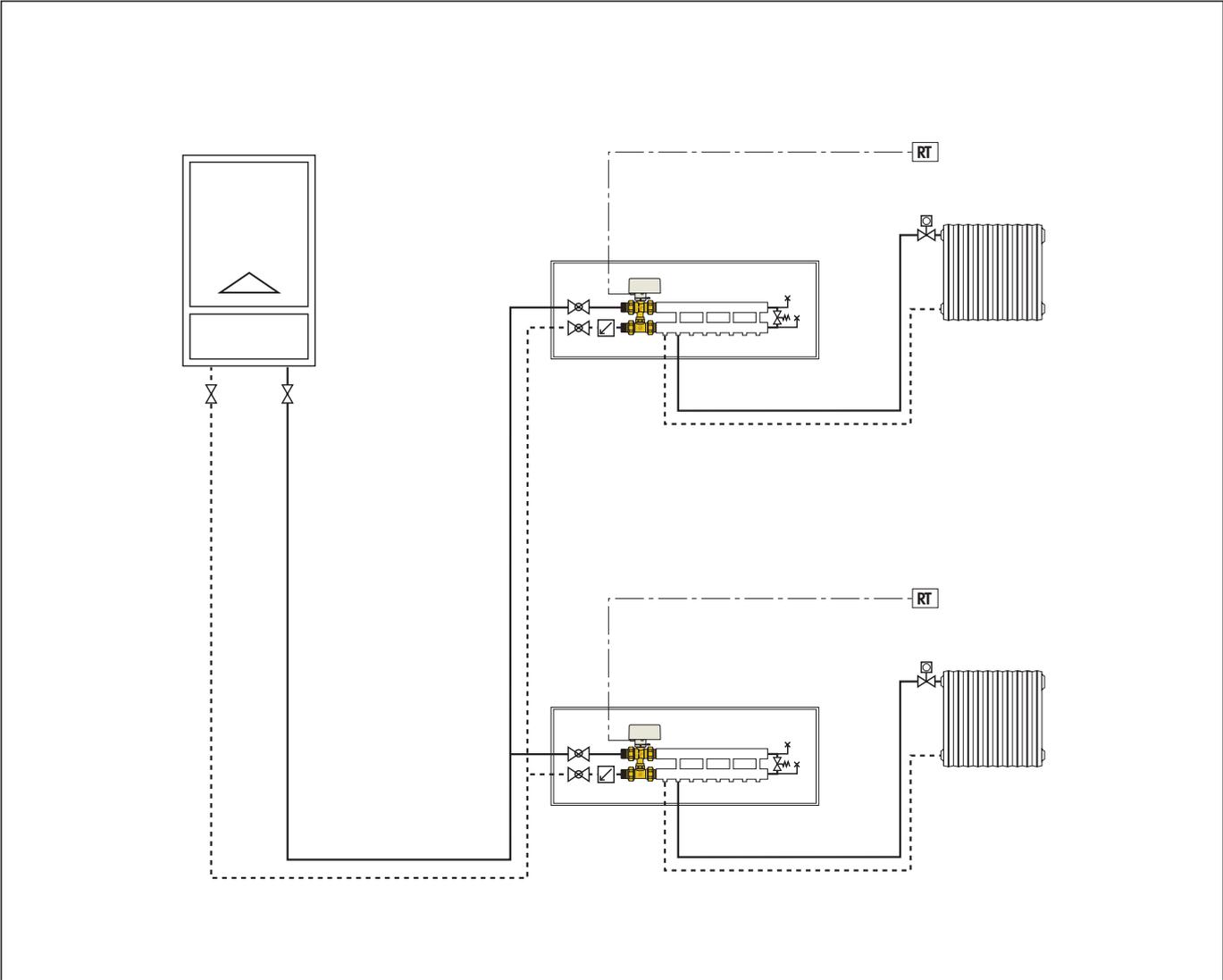
### System with three-way zone valve with by-pass, code 6443.. 3BY



System with three-way zone valves with by-pass tee and AUTOFLOW®, 6444 series



Independent system with three-way zone valves with by-pass tee and AUTOFLOW®, 6444 series



## SPECIFICATION SUMMARY

### 6442 series

Motorised two-way ball zone valve with three-contact actuator. Connections 1/2" M (from 1/2" to 1") with union. Brass body. Brass ball, chrome plated. PTFE ball hydraulic seal with EPDM O-Ring. Control stem hydraulic seal with double EPDM O-Ring. Union hydraulic seals with EPDM O-Ring. Medium water and glycol solutions; maximum percentage of glycol 50%. Maximum working pressure 10 bar. Working temperature range -5-110°C. Maximum working differential pressure 10 bar.

Self-extinguishing polycarbonate actuator; grey RAL 9002; synchronous three-contact actuator with auxiliary microswitch; electric supply 230 V (or 24 V); power consumption 4 VA; dynamic torque 8 N-m. Auxiliary microswitch contact rating 0,8 A. Protection class IP 44 with control stem in vertical position, IP 40 with control stem in horizontal position. Operating time (angle of rotation 90°C) 40 s; ambient temperature range 0-55°C.

### Code 6443.. 3BY

Motorised three-way ball zone valve with by-pass and three-contact actuator. Connections 1/2" M (from 1/2" to 1") with union. Brass body. Brass ball, chrome plated. PTFE ball hydraulic seal with EPDM O-Ring. Control stem hydraulic seal with double EPDM O-Ring. Union hydraulic seals with EPDM O-Ring. Medium water and glycol solutions; maximum percentage of glycol 50%. Maximum working pressure 10 bar. Working temperature range -5-110°C. Maximum working differential pressure 10 bar.

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### 6444 series

Motorised three-way ball zone valve with telescopic by-pass tee and three-contact actuator. Connections 1/2" M (from 1/2" to 1") with union. Brass body. Brass ball, chrome plated. PTFE ball hydraulic seal with EPDM O-Ring. Control stem hydraulic seal with double EPDM O-Ring. Union hydraulic seals with EPDM O-Ring. Medium water and glycol solutions; maximum percentage of glycol 50%. Maximum working pressure 10 bar. Equipped with a calibrated nozzle (U6) on the third way, to balance the system. Working temperature range -5-110°C. Maximum working differential pressure 10 bar. Centre distance between connections can be adjusted between 49 and 63 mm. Self-extinguishing polycarbonate actuator; grey RAL 9002; synchronous three-contact actuator with auxiliary microswitch; electric supply 230 V (or 24 V); power consumption 4 VA; dynamic torque 8 N-m. Auxiliary microswitch contact rating 0,8 A. Protection class IP 44 with control stem in vertical position, IP 40 with control stem in horizontal position. Operating time (angle of rotation 90°C) 40 s; ambient temperature range 0-55°C.

*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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