Motorised ball valves for central heating systems

638 series

01196/12 GB

Function

The motorised ball valves allow the thermal medium distributed in air-conditioning or water supply systems to be automatically shut off or diverted.
Their use is especially recommended in hydrothermal systems thanks to the following properties:
- possibility of being installed upside-down;
- possibility of being opened and closed thanks to the manual control lever on the actuator;
- no seepage;
- short operating times (valve opening/closing);
- operation with high differential pressures;
- low head losses;
- combination with any type of 3-contact controller;
- three-way versions can be used in diverting or mixing mode;

European directive conformity

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

Product range

638 series... Two-way motorised ball valves for central heating systems	230 V (ac) or 24 V (ac)
	DN 20 (3/4"), DN 25 (1"), DN 32 (1 1/4"), DN 50 (1 1/2" e 2") M with union
Code 6380.. Three-way motorised ball valves with "L" drilling for central heating systems	230 V (ac) or 24 V (ac)
	DN 20 (3/4"), DN 25 (1"), DN 32 (1 1/4"), DN 50 (1 1/2" and 2") M with union
Code 6381.. Three-way motorised ball valves with "T" drilling for central heating systems	230 V (ac) or 24 V (ac)
	DN 20 (3/4"), DN 25 (1"), DN 32 (1 1/4"), DN 50 (1 1/2" and 2") M with union

Technical specifications

Valve body

Materials

Body:	brass EN 12165 CW617N
Ball:	brass EN 12165 CW617N, chrome plated
Ball seal:	PTFE with EPDM O-Ring
Control stem seal:	double EPDM O-Ring
Union seal (from 3/4" to 11/4")	EPDM O-Ring

Performance

Medium:	water, glycol solutions
Max. percentage of glycol:	50%
Maximum working pressure:	16 bar
Maximum differential pressure:	10 bar
Reduced bore type	

Connections: 3/4", 1", 1 1/4", 1 1/2", 2" M (ISO 7-1) with union
3-way bottom connection: 3/4", 1", 1 1/4", 1 1/2", 2" F (ISO 228-1)

Ambient conditions (valve + actuator)

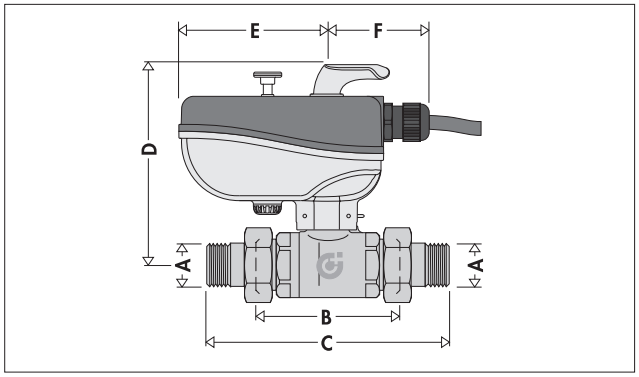
Medium working temperature range: -10–110°C
Ambient temperature:
Operation: -10–55°C EN 60721-3-3 Cl. 3K4, max. humidity 95%
Transportation: -30–70°C EN 60721-3-2 Cl. 2K3, max. humidity 95%
Storage: -20–70°C EN 60721-3-1 Cl. 1K2, max. humidity 95%

Technical specifications of actuator

Synchronous motor

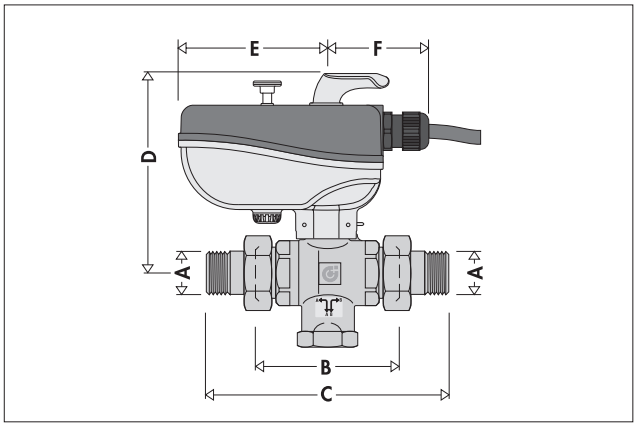
Electric supply:	230 V (ac), 24 V (ac)
Power consumption:	6 VA
Auxiliary microswitch contact rating:	6 (2) A (230 V)
Protection class:	IP 65
Operating time:	50 s (90° rotation), 100 s (180° rotation)
Electric supply cable length:	0,8 m
Dynamic torque:	15 N·m

Dimensions



Code	DN*	A**	B	C	D	E	F	Mass (kg)
638052/4	20	3/4"	84	141	121	85	59	1,47
638062/4	25	1"	96	177	126	85	59	1,90
638072/4	32	1 1/4"	103	193	127	85	59	2,54
638082/4	50	1 1/2"	120	232	194	85	59	5,50
638092/4	50	2"	120	240	194	85	59	5,63

* Valve body
** Connections

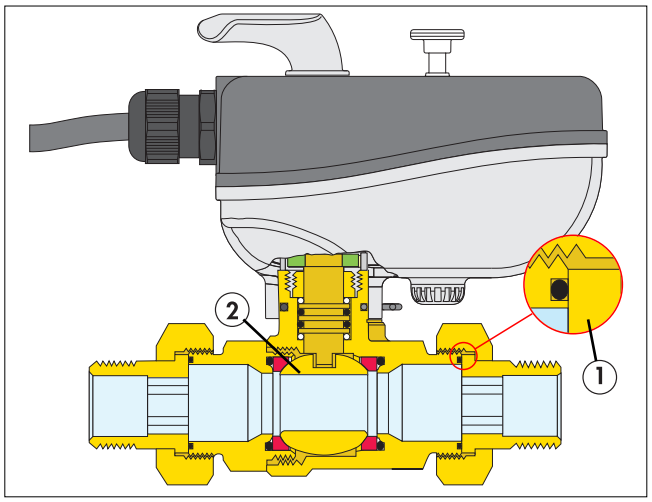


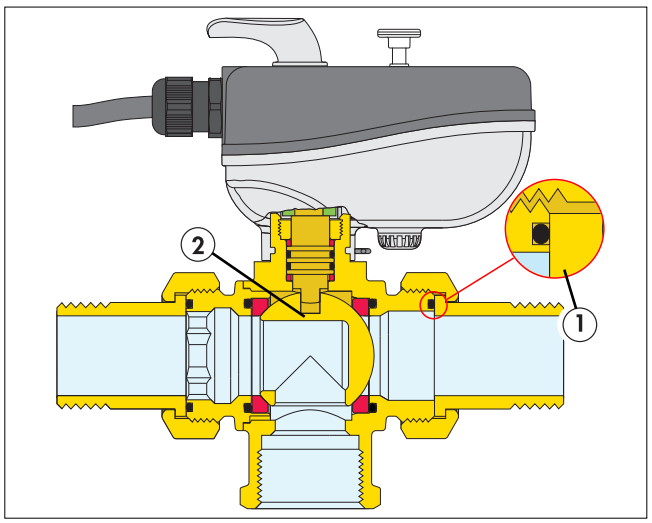
Code	DN*	A**	B	C	D	E	F	Mass (kg)
638.53/5	20	3/4"	70	135	117	85	59	1,40
638.63/5	25	1"	78	159	120	85	59	1,91
638.73/5	32	1 1/4"	94	184	124	85	59	2,61
638.83/5	50	1 1/2"	120	232	194	85	59	5,67
638.93/5	50	2"	120	240	194	85	59	5,83

Construction details

Valve

The valve is equipped with a flat seat union with EPDM O-Ring seal (from 3/4" to 11/4") ①. Using the ball shut-off mechanism ② enables high differential operating pressures and, when fully open, low head losses. The low torque values when opening/closing, together with an adequate actuator dynamic torque, make for short operating times.

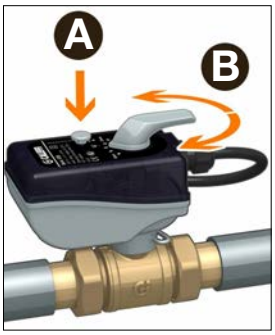


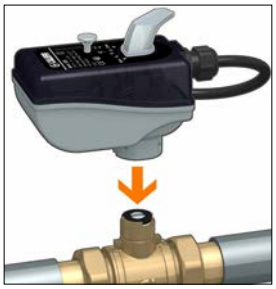


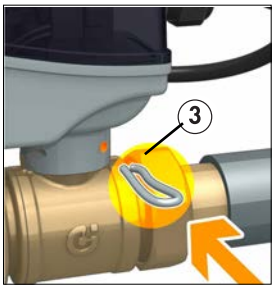
Actuator

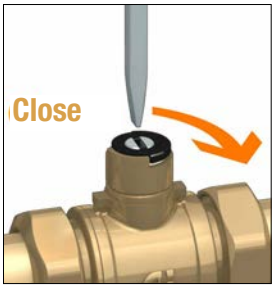
Manual opening/closing

The actuator is equipped with a control lever (B), for valve manual opening/closing, that can be operated by pressing the button (A). The lever also acts as a position indicator.
The fixing of the actuator to the valve body, by means of a stainless steel clip ③, enables quick disassembly in order to check and operate the control stem of the ball with the aid of a screwdriver.









Protection class

The valve can be installed in a vertical, horizontal or upside-down position, as shown in the figure, as the actuator is certified with an IP 65 protection class.

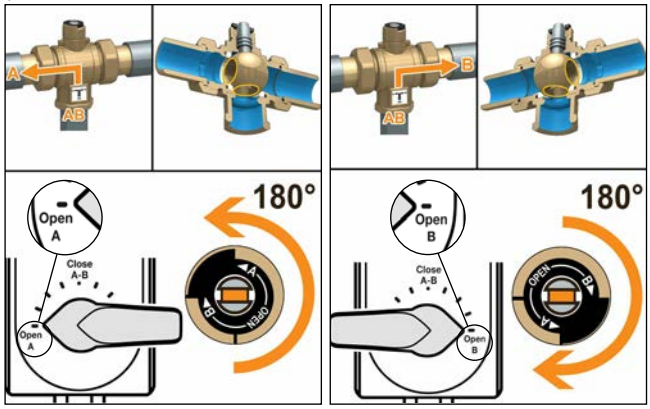
Directions of flow and position indicator

Removing the actuator reveals a slot on the top of the control stem on which the actuator pin acts:
- It allows the valve to be opened/closed manually with a screwdriver.
- Its position indicates the flow direction in relation to the position of the ball, which is especially helpful when commissioning or checking the system.

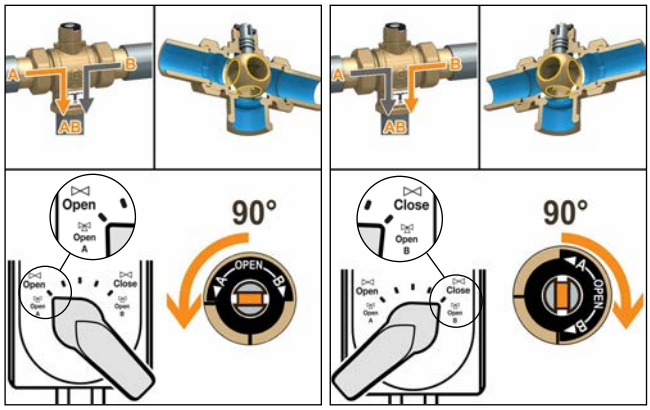
Position diagrams are provided below for the three-way valves, with “L” and “T” drilling.

638 series three-way valve with “L” drilling

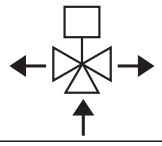
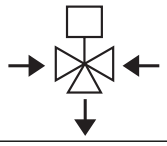
All the valves are supplied with the slot/indicator in the horizontal position.



638 series three-way valves with “T” drilling



Applications

Diverter valve	Mixing valve
1 inlet - 2 outlets	2 inlets - 1 outlet
	

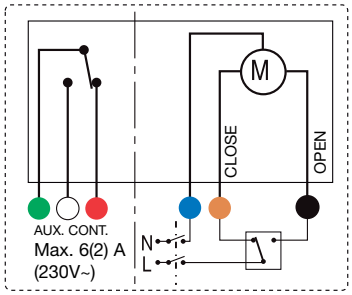
Electric connections

Wiring diagram

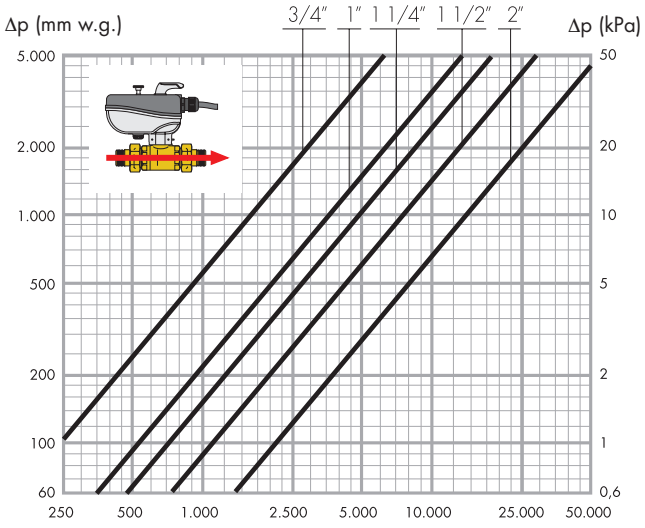
Internal diagram with valve in the following position:
- Closed, for two-way valve.
- Port **A** closed for three-way valves.

Auxiliary microswitch

The auxiliary microswitch is activated by the opening movement of the actuator. The auxiliary microswitch shuts off for an average actuator opening value of 95%.

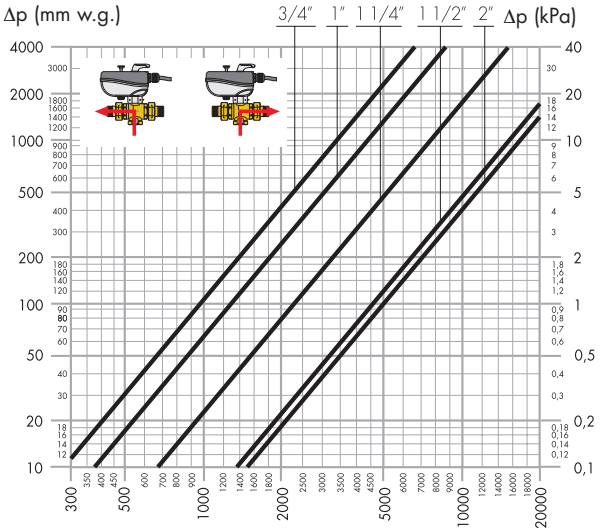


Hydraulic characteristics



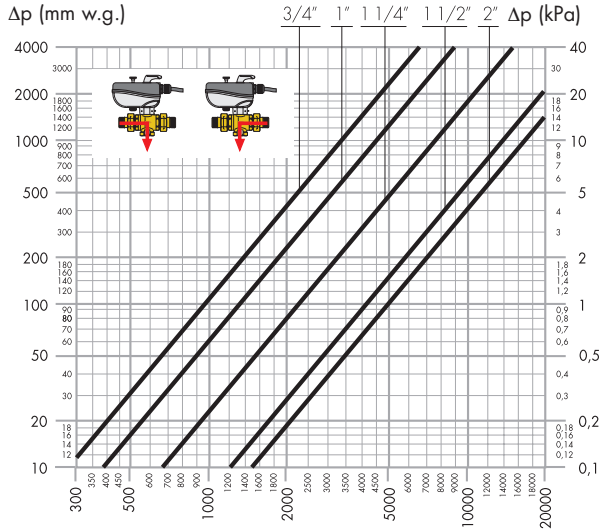
638 series two-way valve

DN	20	25	32	50	50
Connections	3/4"	1"	1 1/4"	1 1/2"	2"
Kv (m³/h)	17	36,5	48	77	140



638 series three-way valve, with "L" drilling

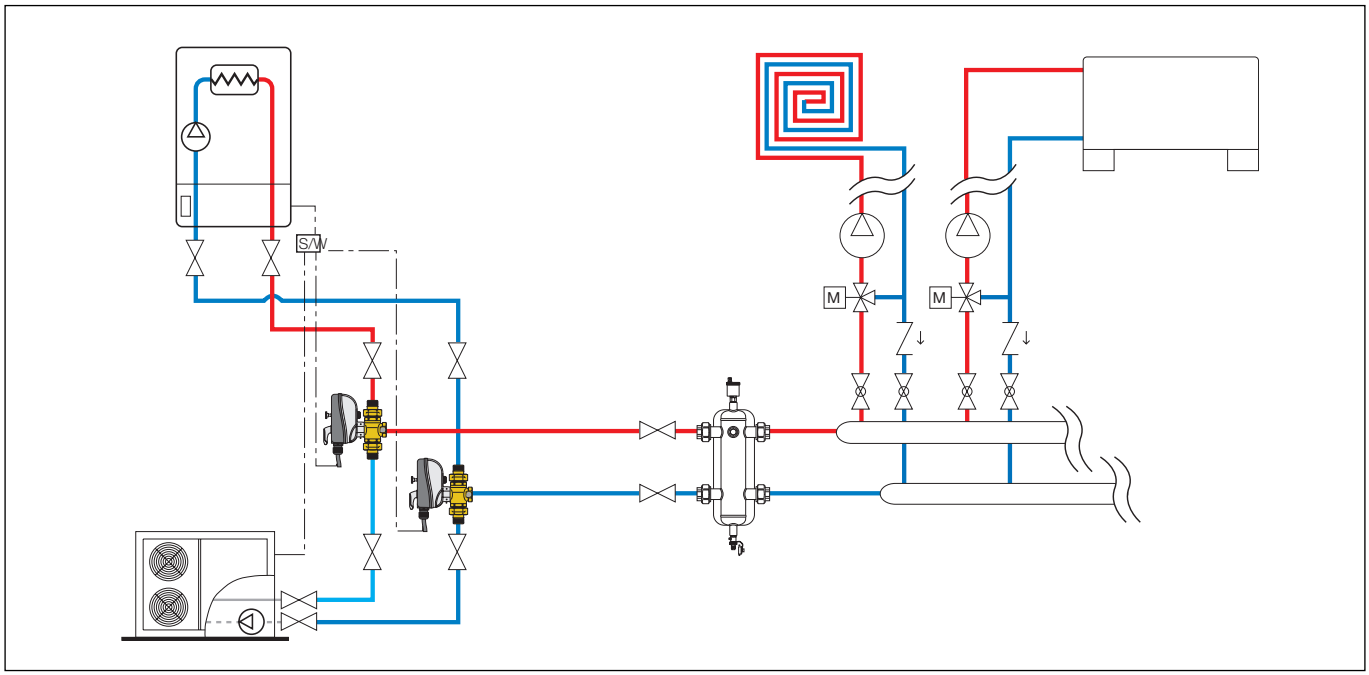
DN	20	25	32	50	50
Connections	3/4"	1"	1 1/4"	1 1/2"	2"
Kv (m³/h)	9,9	13,4	22,8	44	50



638 series three-way valve, with "T" drilling

DN	20	25	32	50	50
Connections	3/4"	1"	1 1/4"	1 1/2"	2"
Kv (m³/h)	9,5	12,9	24,7	47	50

Application diagram



SPECIFICATION SUMMARY

638 series

Two-way motorised ball valve for central heating systems. Size DN 20 (from DN 20 to DN 50). Connections 3/4" (from 3/4" to 2") M (ISO 7-1) with union. Ball passage: reduced bore. Brass body. Chrome plated brass ball. Control stem seal with double EPDM O-Ring. PTFE ball seal with EPDM O-Ring for compensation of mechanical slack. EPDM O-Ring union seals. Medium water and glycol solutions; maximum percentage of glycol 50%. Maximum working pressure 16 bar. Maximum differential pressure 10 bar. Actuator electric supply 230 V (ac) or 24 V (ac); power consumption 6 VA; with auxiliary microswitch, auxiliary microswitch contact rating 6 (2) A (230 V); dynamic torque 15 N·m. Operating time 50 seconds (90° rotation). Protection class IP 65. Electric supply cable length 0,8 m. Ambient conditions for valve with actuator: medium working temperature range -10–110°C; ambient temperature: operation -10–55°C EN 60721-3-3 Cl. 3K4, maximum humidity 95%; transportation: -30–70°C EN 60721-3-2 Cl. 2K3, maximum humidity 95%; storage: -20–70°C EN 60721-3-1 Cl. 1K2, maximum humidity 95%.

Code 638**0**..

Three-way motorised ball valve for central heating systems, with "L" drilling. Size DN 20 (from DN 20 to DN 50). Connections 3/4" (from 3/4" to 2") M (ISO 7-1) with union. Three-way bottom connection 3/4" (from 3/4" to 2") F (ISO 228-1). Ball passage: reduced bore. Brass body. Chrome plated brass ball. Control stem seal with double EPDM O-Ring. PTFE ball seal with EPDM O-Ring for compensation of mechanical slack. EPDM O-Ring union seals. Medium water and glycol solutions; maximum percentage of glycol 50%. Maximum working pressure 16 bar. Maximum differential pressure 10 bar. Actuator electric supply 230 V (ac) or 24 V (ac); power consumption 6 VA; with auxiliary microswitch, auxiliary microswitch contact rating 6 (2) A (230 V); dynamic torque 15 N·m. Operating time 100 seconds (180° rotation). Protection class IP 65. Electric supply cable length 0,8 m. Ambient conditions for valve with actuator: medium working temperature range -10–110°C; ambient temperature: operation -10–55°C EN 60721-3-3 Cl. 3K4, maximum humidity 95%; transportation: -30–70°C EN 60721-3-2 Cl. 2K3, maximum humidity 95%; storage: -20–70°C EN 60721-3-1 Cl. 1K2, maximum humidity 95%.

Code 638**1**..

Three-way motorised ball valve for central heating systems, with "T" drilling. Size DN 20 (from DN 20 to DN 50). Connections 3/4" (from 3/4" to 2") M (ISO 7-1) with union. Three-way bottom connection 3/4" (from 3/4" to 2") F (ISO 228-1). Ball passage: reduced bore. Brass body. Chrome plated brass ball. Control stem seal with double EPDM O-Ring. PTFE ball seal with EPDM O-Ring for compensation of mechanical slack. EPDM O-Ring union seals. Medium water and glycol solutions; maximum percentage of glycol 50%. Maximum working pressure 16 bar. Maximum differential pressure 10 bar. Actuator electric supply 230 V (ac) or 24 V (ac); power consumption 6 VA; with auxiliary microswitch, auxiliary microswitch contact rating 6 (2) A (230 V); dynamic torque 15 N·m. Operating time 50 seconds (90° rotation) Protection class IP 65. Electric supply cable length 0,8 m. Ambient conditions for valve with actuator: medium working temperature range -10–110°C; ambient temperature: operation -10–55°C EN 60721-3-3 Cl. 3K4, maximum humidity 95%; transportation: -30–70°C EN 60721-3-2 Cl. 2K3, maximum humidity 95%; storage: -20–70°C EN 60721-3-1 Cl. 1K2, maximum humidity 95%.

CALEFFI Hydronic Solutions

Caleffi S.p.A.
S.R. 229 n. 25 · 28010 Fontaneto d'Agogna (NO) · Italy
Tel. +39 0322 8491 · Fax +39 0322 863723
info@caleffi.com · www.caleffi.com