

# Motorised ball valve for central heating systems

## 638 series



01196/18 GB  
replaces dp 01196/12 GB



### Function

Motorised ball valves allows both automatic shut-off and diversion of the thermal medium in air conditioning or water supply systems.

The use of these components is particularly indicated in hydrothermal systems thanks to the following features:

- 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);
- can function with high differential pressures;
- low head losses;
- combination with any type of 3-contact actuator;
- in the three-way versions, possibility of use in diversion or mixing mode.

### European directive conformity

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



### Product range

638 series	Motorised ball valve, two-way 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 6380..	Motorised ball valve, three-way "L" drilling version, 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..	Motorised ball valves, three-way "T" drilling version, 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:	EPDM O-Ring

#### Performance

Medium:	water, glycol solutions
Max. percentage of glycol:	50%
Maximum working pressure:	16 bar
Maximum differential pressure:	
- two-way valve: -3/4"-1 1/4":	10 bar
1 1/2"-2":	5 bar
- three-way valve:	10 bar
Reduced bore type	

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

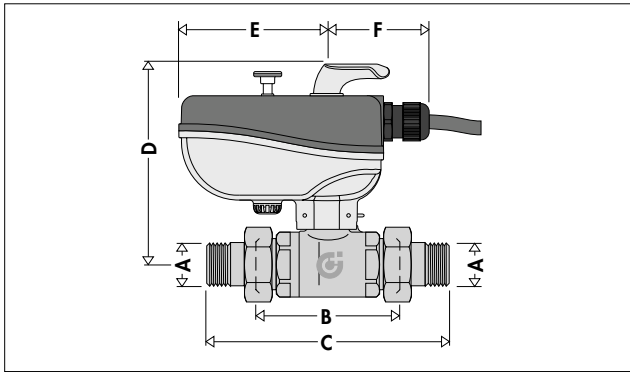
### Ambient conditions (valve + actuator)

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

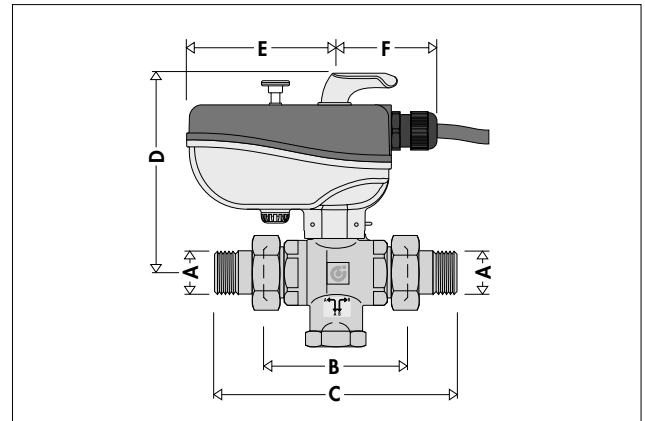
Synchronous motor	
Electric supply:	230 V (ac), 24 V (ac)
Power consumption:	6 VA
Auxiliary microswitch contact rating:	6 (2) A (230 V)
Protection class:	IP 65
Operating time:	50 s (90° rotation), 100 s (180° rotation)
Supply cable length:	0,8 m
Dynamic torque:	15 N·m

## 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

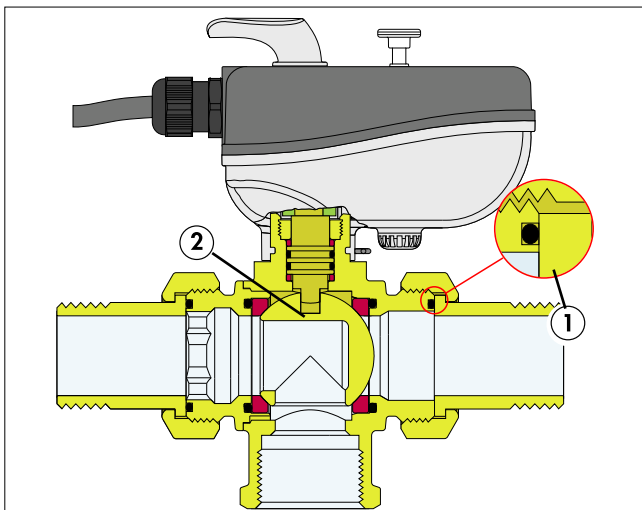
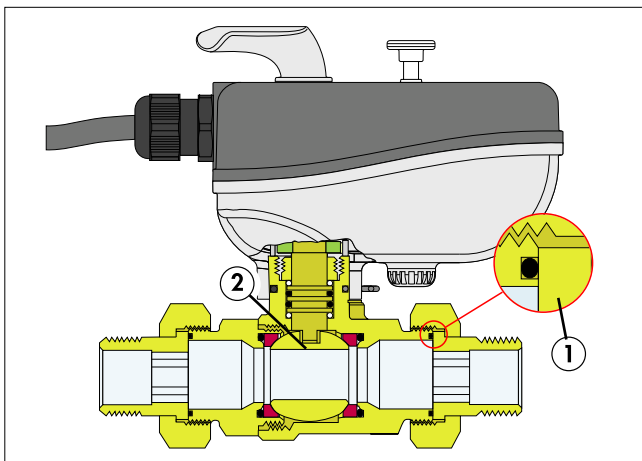


Code	DN*	A**	B	C	D	E	F	Mass (kg)
638.53/5	20	3/4"	70	135	117	85	59	1,40
638.63/5	25	1"	78	159	120	85	59	1,91
638.73/5	32	1 1/4"	94	184	124	85	59	2,61
638.83/5	50	1 1/2"	120	232	194	85	59	5,67
638.93/5	50	2"	120	240	194	85	59	5,83

## Construction details

### Valve

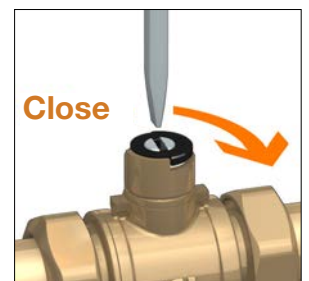
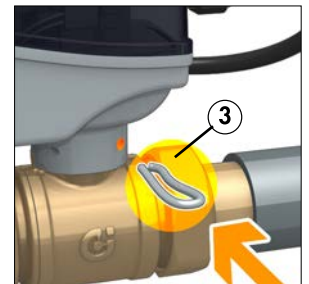
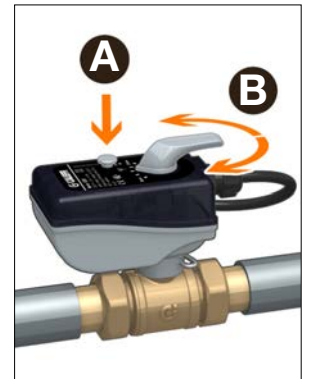
The valves are equipped with unions with a flat seat with EPDM O-Ring seal (from 3/4" to 1 1/4") ①. Using the ball shut-off mechanism ② allows high differential operating pressures and, when fully open, low lead losses. The low torque values when opening/closing, together with an adequate actuator dynamic 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 bottom (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.



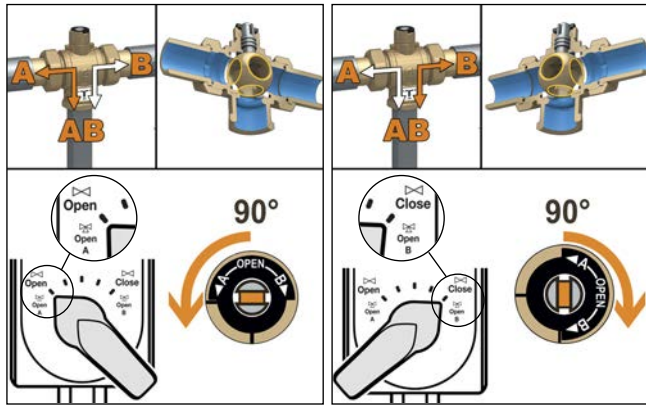
**Directions of flow and position indicator**

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

- it allows the valve to be opened/closed manually using 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.

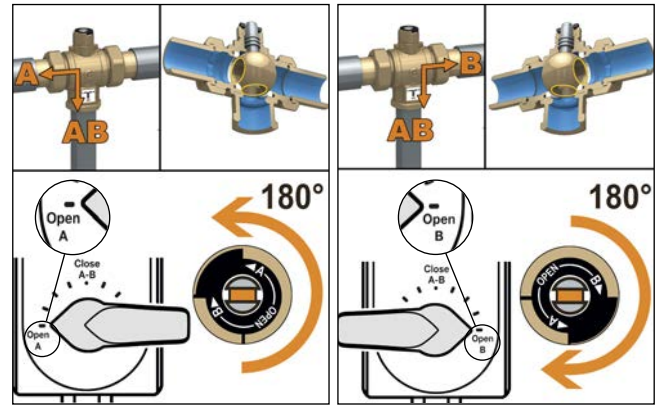
Below we give the position diagrams for the three-way valves, "T" drilling version and "L" drilling version.

**638 series three-way valve, "T" drilling version**

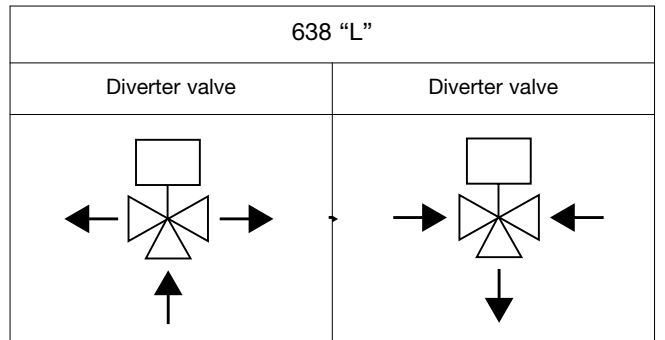
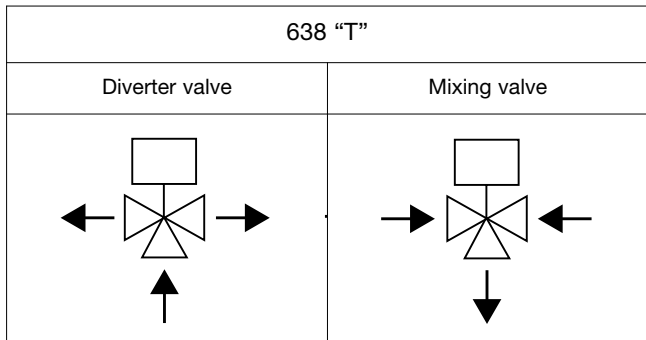


**638 series three-way valve, "L" drilling version**

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



**Applications**



The three-way valve, in the "T" drilling version, can be used in the diverter position (common inlet AB and outlet A or B) or in mixing valve position (inlets in A and B and common outlet AB). During 90° rotation of the ball the three ports AB, A and B are hydraulically connected.

The three-way valve in the "L" drilling version can be used in the diverter position (common inlet AB and outlet A or B) or in the opposite direction, still as a diverter valve, but with inlets in A and B and common outlet AB. It is not possible to obtain mixing with the "L" drilling version because during 180° rotation of the ball the three ports AB, A and B are hydraulically closed. Common port AB can be connected exclusively to a or B on completion of the respective rotation.

## Electric connections

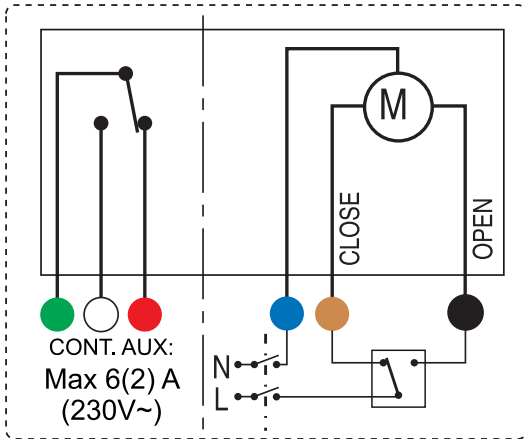
### Wiring diagram

Internal diagram with valve in the following position:

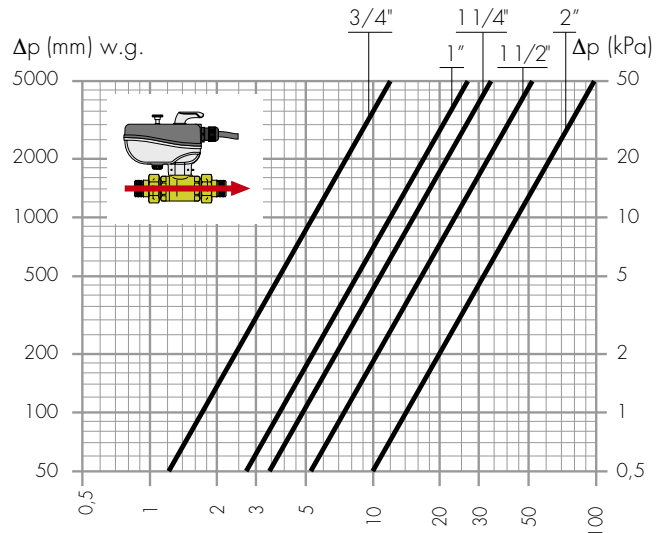
- closing, for two-way valve;
- closing of port **A** for three-way valve.

### 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%.

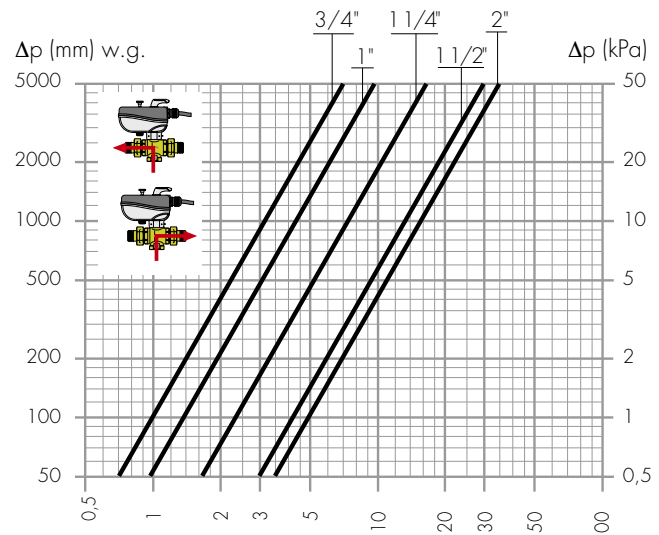


## Hydraulic characteristics



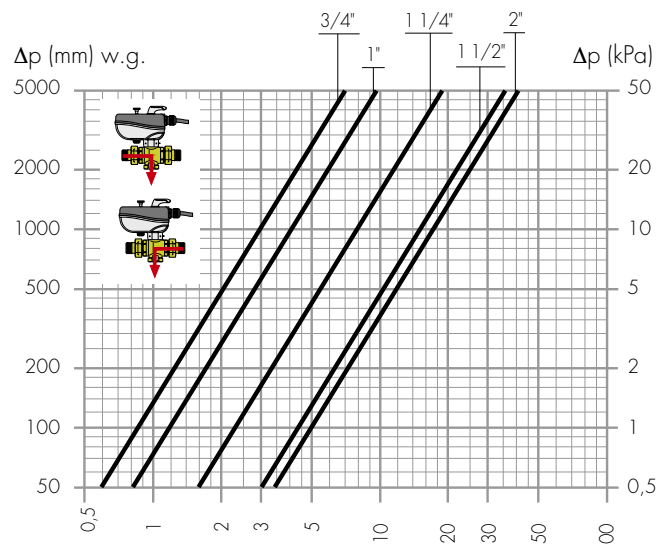
638 series  
two-way valve

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



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

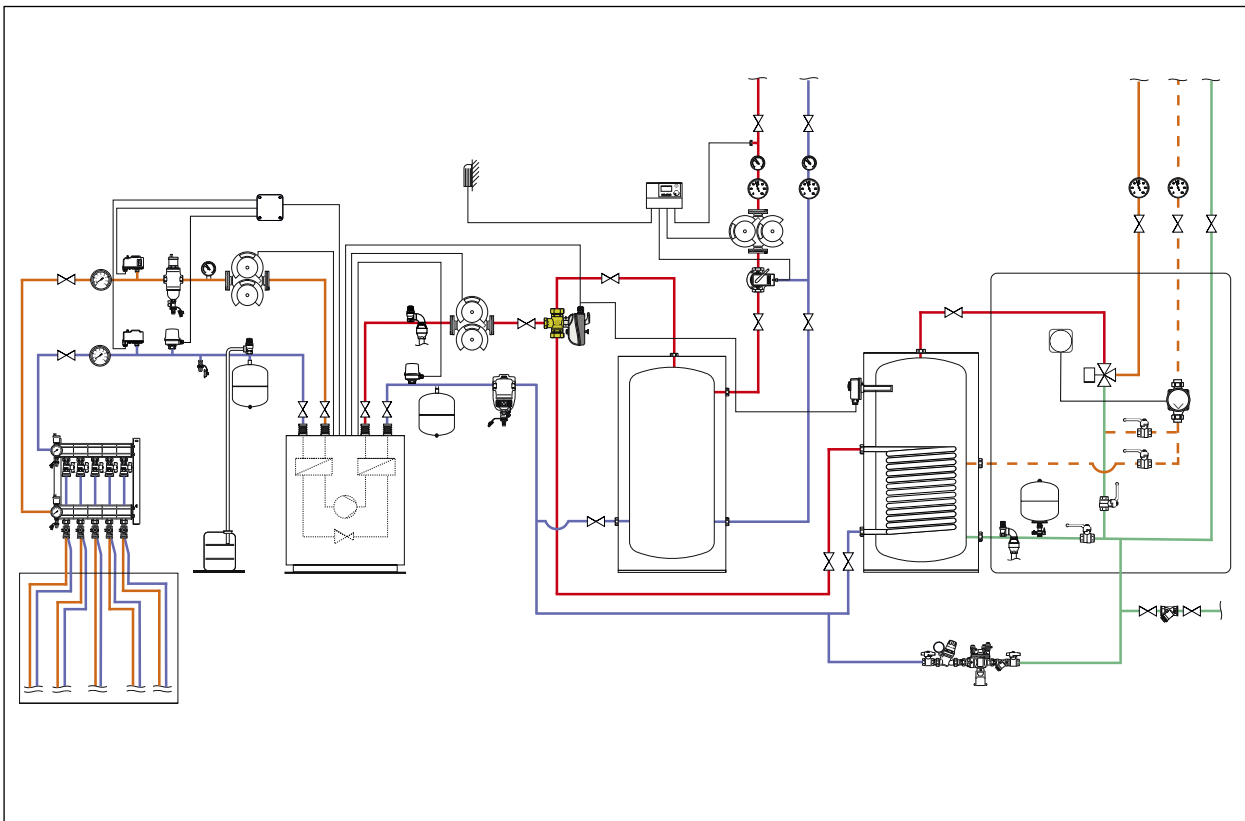
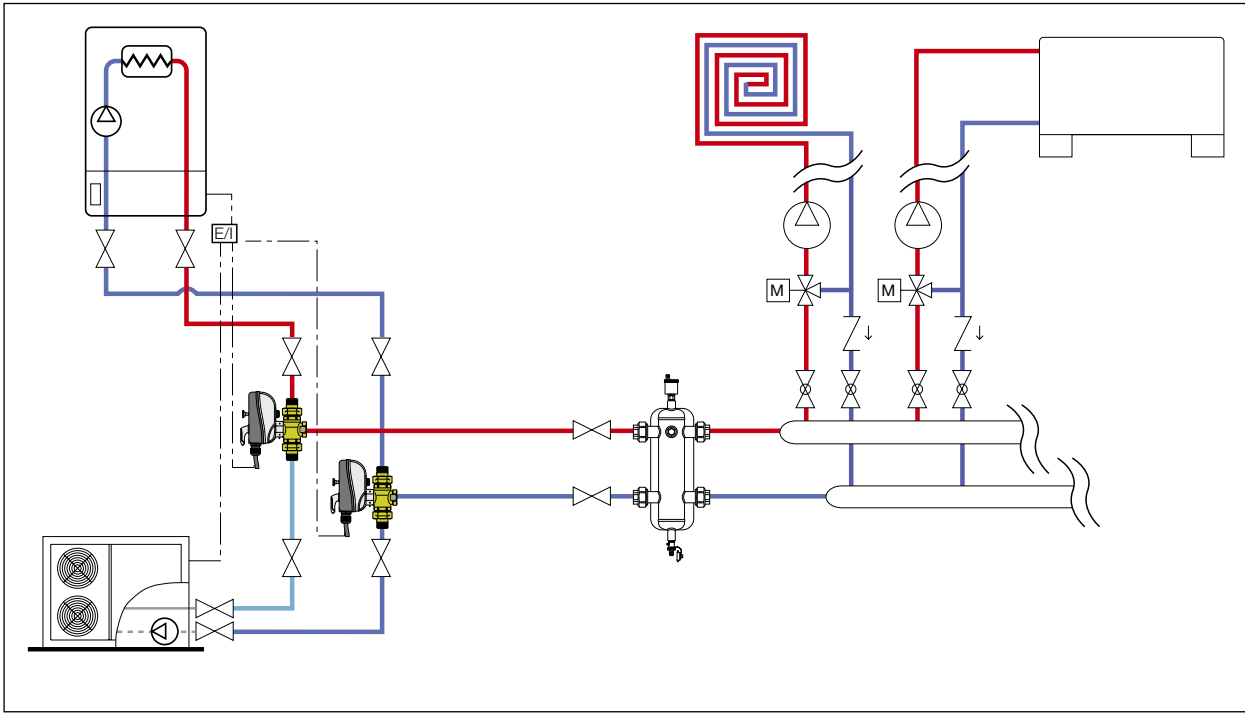
DN	20	25	32	50	50
Connections	3/4"	1"	1 1/4"	1 1/2"	2"
Kv (m <sup>3</sup> /h)	9,9	13,4	22,8	44	50



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

DN	20	25	32	50	50
Connections	3/4"	1"	1 1/4"	1 1/2"	2"
Kv (m <sup>3</sup> /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 seal. PTFE ball seal with EPDM O-Ring seal for compensation of mechanical slack. EPDM O-Ring union seals. Water and glycol solutions medium; max. percentage of glycol 50%. Maximum working pressure 16 bar. Maximum differential pressure 10 bar (from 3/4" to 1 1/4"), 5 bar (1 1/2"-2"). 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 6380.

Two-way motorised ball valve for central heating systems, "L" drilling version. Size DN 20 (from DN 20 to DN 50). Connections 3/4" (from 3/4" to 2") M (ISO 7-1) with union. 3/4" lower 3-way connection (from 3/4" to 2") M (ISO 228-1) with union. Ball passage: reduced bore. Brass body. Chrome plated brass ball. Control stem seal with double EPDM O-Ring seal. PTFE ball seal with EPDM O-Ring seal for compensation of mechanical slack. EPDM O-Ring union seals. Water and glycol solutions medium; max. 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 6381.

Three-way motorised ball valve for central heating systems, "T" drilling version. Size DN 20 (from DN 20 to DN 50). Connections 3/4" (from 3/4" to 2") M (ISO 7-1) with union. 3/4" lower 3-way connection (from 3/4" to 2") M (ISO 228-1) with union. Ball passage: reduced bore. Brass body. Chrome plated brass ball. Control stem seal with double EPDM O-Ring seal. PTFE ball seal with EPDM O-Ring seal for compensation of mechanical slack. EPDM O-Ring union seals. Water and glycol solutions medium; max. 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%.

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