

# Motorised diverter ball valve for heat pump systems

## 6445 series



### Function

Motorised diverter valves can be used to automatically divert the thermal medium in heating and cooling systems. The exceptional hydraulic performance levels, compact size and frontally-located common channel make this series of valves particularly suitable for use in air-conditioning/heat pump systems and in domestic hot water production. Complete with insulation, they are especially ideal for application in heat pump systems, which feature particularly low thermal medium working temperatures resulting in condensation build-up. The 6445 series was specifically developed to divert the thermal medium originating from the heat pump between the heating system and the storage used in the production of DHW.

### European directive conformity

CE mark directives 2014/35/EU and 2014/30/EU.



### Product range

6445 series Diverter ball valve for heat pump systems

size 1"

### Technical specifications

#### Materials

##### Valve body

Body: brass EN 12165 ADZ CW602N-M  
 Ball: brass EN 12165 ADZ CW617N  
 Ball seal: PTFE with EPDM O-Ring  
 Control stem seal: double EPDM O-Rings  
 Union seal: EPDM O-Ring

##### Actuator

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

#### Performance

##### Valve body

Medium: water, glycol solutions  
 Maximum percentage of glycol: 50 %  
 Maximum working pressure: 10 bar  
 Working temperature range: -5–110 °C  
 Maximum differential pressure: 10 bar  
 Connections: 1" M with union (ISO 228-1)

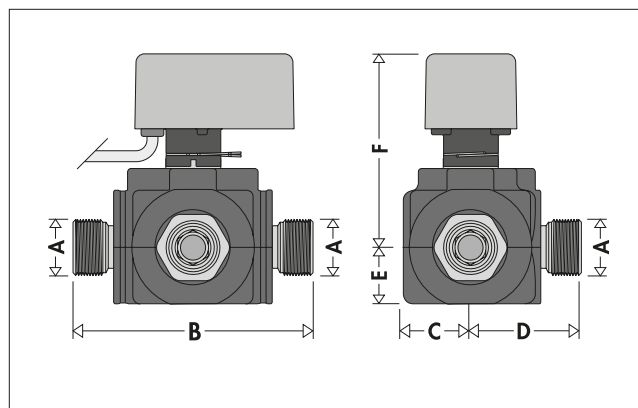
##### Actuator

Synchronous motor  
 Electric supply: 230 V - 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°):  
 - code 644562 40 s  
 - code 644566 10 s  
 Ambient temperature range: 0–55 °C  
 Dynamic torque: 8 N·m  
 Supply cable length: 100 cm  
 Conforms to: EN 60730-1 • EN 60730-2-14  
 2014/35/EC • 2014/30/EC

### Insulation

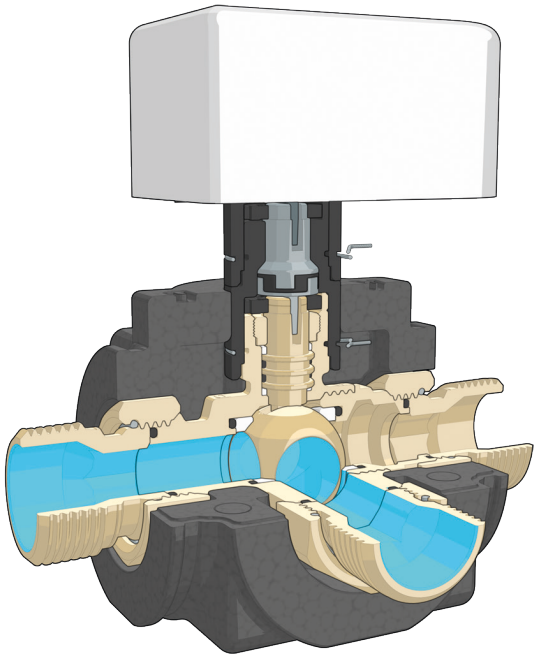
Material: closed cell expanded EPP  
 Density: 40 kg/m<sup>3</sup>  
 Thermal conductivity: 0,037 W/(m·K) (at 10 °C)  
 Reaction to fire (DIN 4102-1): class B

### Dimensions



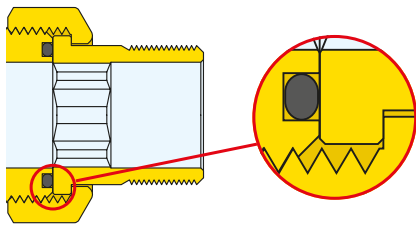
Code	A	B	C	D	E	F	Elec supp.	Op. T (s)	Mass (kg)
644562	1"	144	40	67	34	115	230 V	40	1,4
644566	1"	144	40	67	34	115	24 V	10	1,4

**Construction details**



**Seals**

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



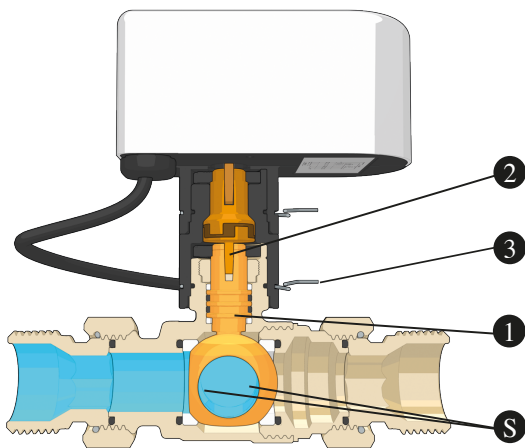
**Actuator**

**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-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.

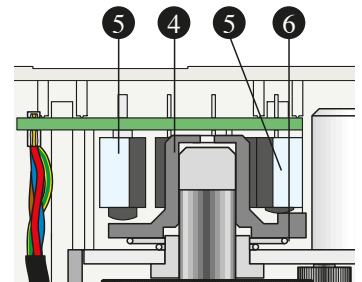


**Valve actuator coupling**

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 auxiliary microswitch is triggered by the opening motion of the actuator. The auxiliary microswitch shuts off at an actuator opening value of 80 %.

**Operating times**

The actuator is available in two versions, with an operating time of 10 seconds or 40 seconds (both with 90° angle of rotation).

**Directions of flow and position indicator**

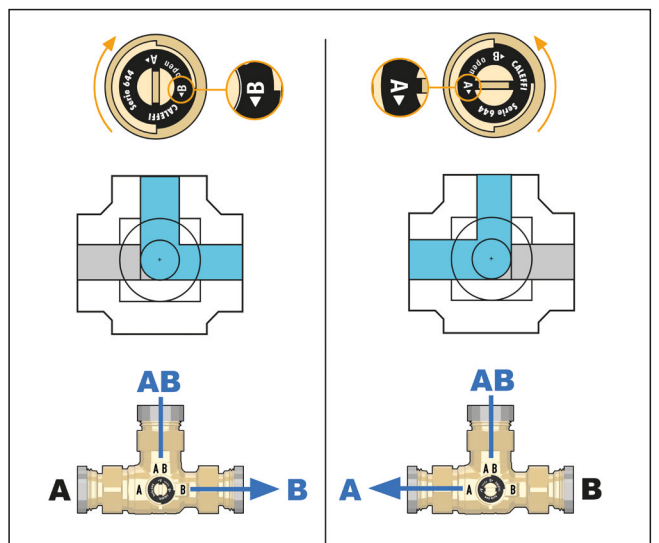
Removing the actuator reveals a slot in the top of the control stem on which the actuator pin acts:

- it allows the valve to be opened/closed manually using a screwdriver;
- its position indicates the position of the ball and therefore the direction of flow. This is extremely useful in system testing and checking procedures.

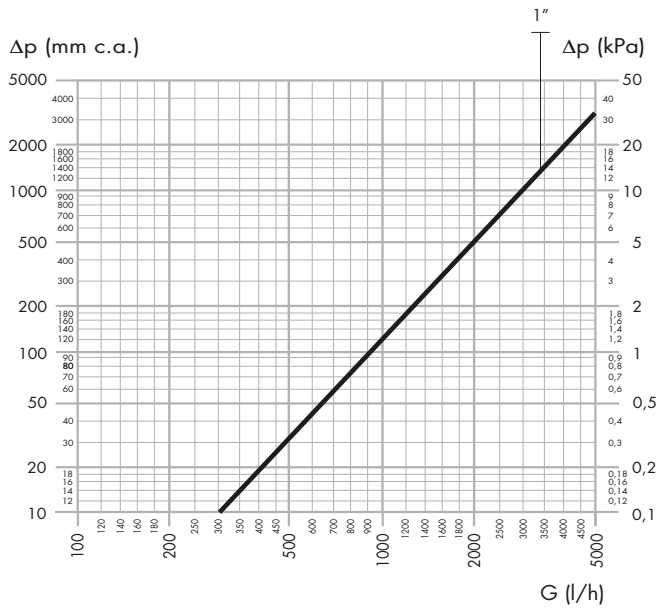
Below is a diagram illustrating how the slot position indicates the flow direction.

**T DRILLING**

**ON/OFF usage via thermostat or three-wire regulator 90° rotation**

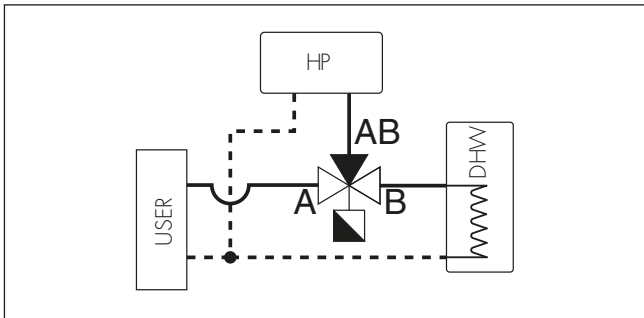


## Hydraulic characteristics

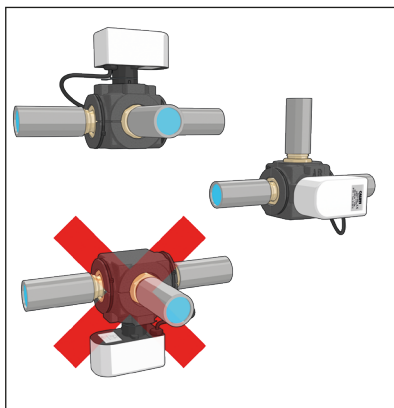


Code	DN	Connection	Kv (m³/h)
644562/66	20	1"	9.0

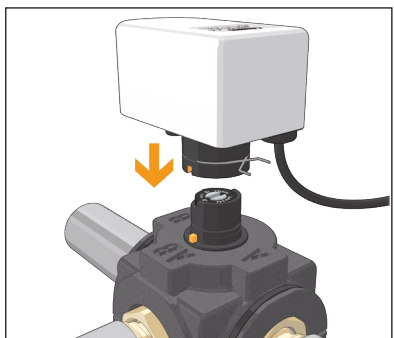
1. The three-way **diverter valve can be installed** on the flow line in the diverter position (common inlet AB and outlets A or B) and ON/OFF usage.



2. The valve should be installed with the control stem in a horizontal or upright position, **never upside down**.



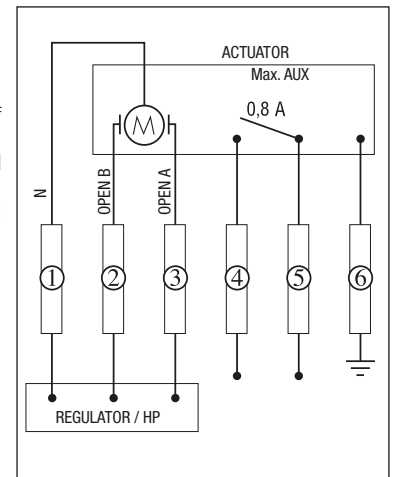
3. The actuator can be fitted on the valve body in the two shown positions. It is secured by means of an elastic stainless steel clip.



## Wiring diagrams

The illustrated connection allows valve rotation, and therefore the diverting of thermal medium, based on the control signal emitted by the heat pump controller. Do not connect several actuators in parallel.

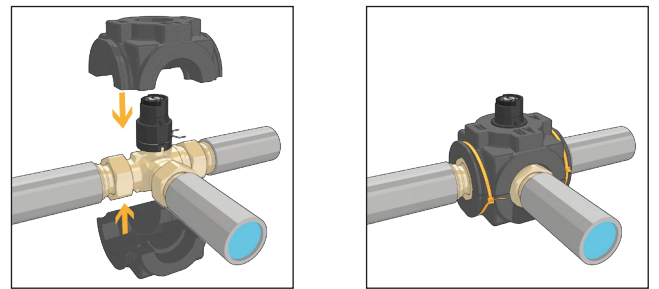
- 1 = Blue
- 2 = Black
- 3 = Brown
- 4 = Red
- 5 = White
- 6 = Yellow-green



## Pre-formed shell insulation

This particular series of motorised ball zone valves is offered, above all, for the specific application on air-conditioning systems, thanks to the hot pre-formed shell insulation, supplied in the package, that prevents condensation build-up on the valve body surface.

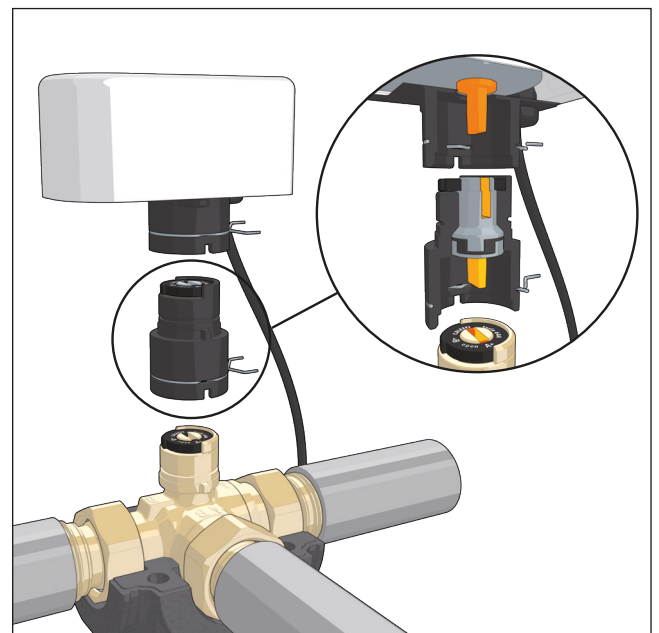
This system, moreover, ensures not only perfect thermal insulation, but also the tightness required to prevent water vapour entering the device from the ambient.



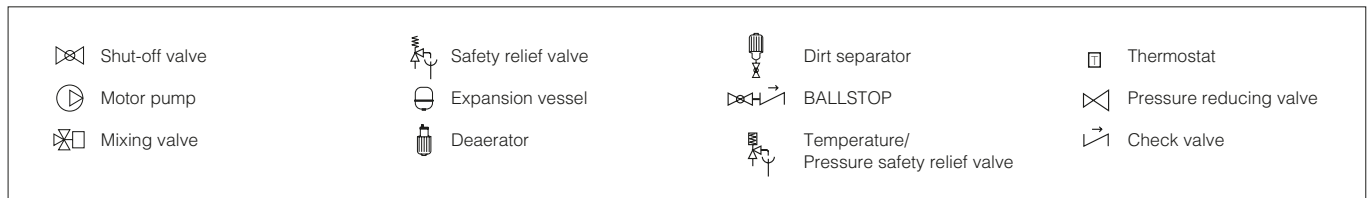
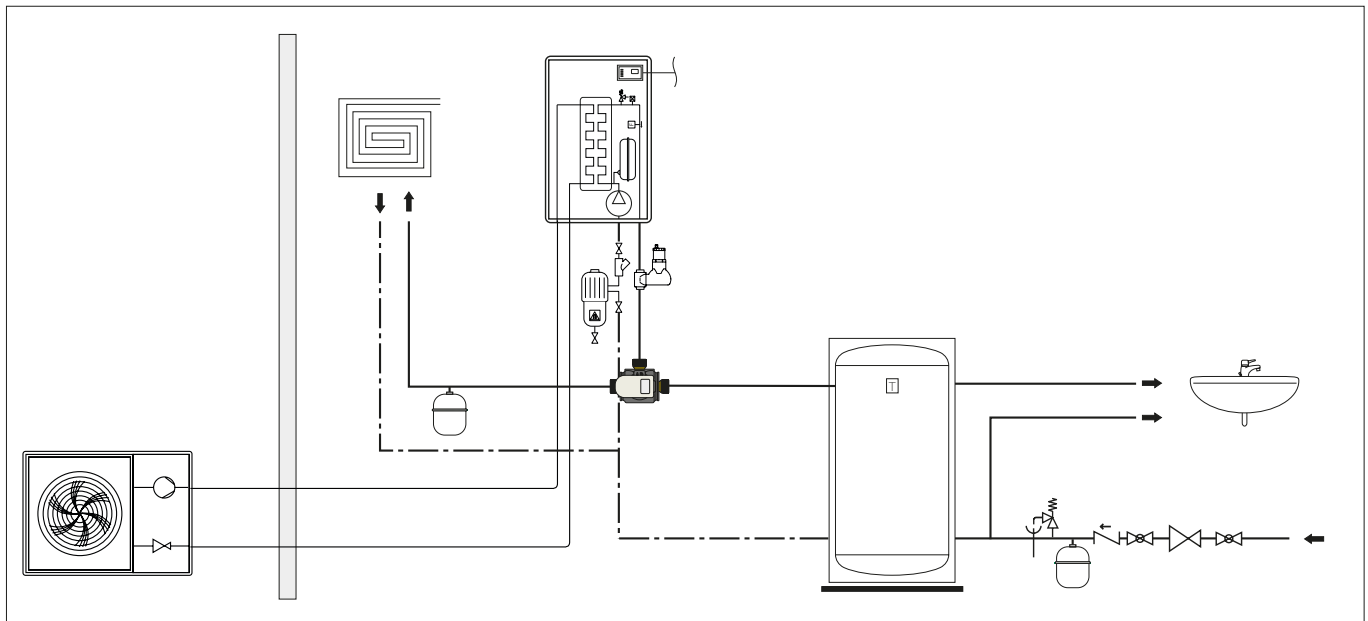
## Thermal decoupler

A composite thermal decoupler, containing two stainless steel stems and a central insulating ring, is positioned between the valve body and the actuator.

This prevents the transmission of heat to the electric actuator from the thermal medium. This prevents condensation build-up inside the actuator.



## Application diagram



## SPECIFICATION SUMMARY

### 6445 series

Motorised three-way ball diverter valve with three-point control for heat pump systems. Connections 1" M with union. Brass body. Chrome plated brass ball. PTFE ball seal with EPDM O-Ring. Control stem seal with double EPDM O-ring. Union seals with EPDM O-ring. Medium water and glycol solutions; max. 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. Colour grey RAL 9002. Three-contact synchronous motor with auxiliary microswitch. Electric supply 230 V- 50/60 Hz. Power consumption 4 VA Dynamic torque 8 N·m. Auxiliary microswitch contact rating 0,8 A. Protection class IP 44 with vertical control stem, IP 40 with horizontal control stem. Operating time (angle of rotation 90°) 40 s (10 s). Ambient temperature range 0–55 °C. PATENT

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