

# TwisTop™ and TwisTop+™ Thermo-electric zone valves

## 676 series

01072/23 NA

Replaces 01072/19 NA



### Function

Zone valves are used to control hot and chilled water in heating and air-conditioning systems. Coupled with a thermo-electric control actuator and controlled by a room thermostat, they allow automatic on/off control of the hydronic circuit. The 6762 series TwisTop™ and 6767 series TwisTop+™ are available with sweat union, press union and PEX expansion union connections. The union nut makes installation and maintenance fast, easy and efficient for a variety of end connection tailpiece options. The 676000A and 676500A valve bodies have 1" straight thread for field installing any of 5 end connections styles in sizes 1/2", 3/4" and 1". Choose between two styles of thermo-electric actuators with, or without, auxiliary micro-switch: The TwisTop actuator, code 6563x4, featuring a pop-up opening/closing indicator which can be manually opened with a twist of the top; or the code 6564x4 with pop-up opening/closing indicator, and quick-coupling for easy installation. Both styles have low inrush current draw and power consumption.

Separately orderable valve bodies, actuator styles and end connections, allows field assembly of the desired zone valve without compromise.

Caleffi code 290030 full-port ball valve is designed for isolating the TwisTop and TwisTop+ valve assemblies that have 1" metric "G" straight thread union connections. The isolation valve installs in between the valve body and the tailpiece fitting assembly. Male x Female configuration and bi-directional full ball valve flow capacity provides flexibility for using one or two isolation valves for the primary functioning valve. An optional stem extension is also available for those projects that require pipe insulation.

### Product range

- 676000A Two-way zone valve body only, Cv 4.0, 20 psid closeoff pressure for field installation of thermo-electric actuators, 1 inch straight threads inlet and outlet.....connections 1/2", 3/4", & 1" union NPT threaded, sweat, press, PEX crimp and PEX expansion, field installed
- 6762 series Two-way thermo-electric zone valve, Cv 4.0, 20 psid closeoff pressure with TwisTop™ code 656354 actuator.....connections 1/2", 3/4", & 1" union sweat, press, PEX expansion
- 676500A Two-way zone valve body only, Cv 5.6, 35 psid closeoff pressure for field installation of thermo-electric actuators, 1 inch straight threads inlet and outlet.....connections 1/2", 3/4", & 1" union NPT threaded, sweat, press, PEX crimp and PEX expansion, field installed
- 6767 series Two-way thermo-electric zone valve, Cv 5.6, 35 psid closeoff pressure with TwisTop™ code 656354 actuator.....connections 1/2", 3/4", & 1" union sweat, press, PEX expansion

### Technical specifications

#### Valve body

##### Materials

Body:	brass
Trim:	brass
Stem:	stainless steel
Spring:	stainless steel
Seals:	peroxide-cured EPDM
Press fittings:	Copper

##### Performance

Suitable Fluids:	water, glycol solutions
Max. percentage of glycol:	50%
Max. working pressure:	150 psi (10 bar)
Flow rating:	for 6762 series & 676000A, Cv = 4.0 (Kv = 3.5) for 6767 series & 676500A, Cv = 5.6 (Kv = 4.8)
Max. close-off pressure differential:	for 6762 series & 676000A...20 psid (1.2 bar) for 6767 series & 676500A... 35 psid (2.5 bar)

##### Certifications

PEX expansion fittings designed to ASTM F 1960

##### Connections

Main connections:  
code 6762 and 6767 series:  
1/2", 3/4", & 1" union sweat, press, PEX expansion  
code 676000A and 676500A:  
1" straight thread

Lay length (press connection):

size 1/2 inch: for 676246A - 2 3/16"; 676746A - 2 15/16"  
size 3/4 inch: for 676256A - 2 3/4"; 676756A - 3 1/2"  
size 1 inch: for 676266A - 3 3/8"; 676766A - 4 1/8"

#### Actuator

##### Materials

Protective shell:	self-extinguishing polycarbonate
Color:	gray RAL 9002
Double insulation construction:	CE

##### Performance

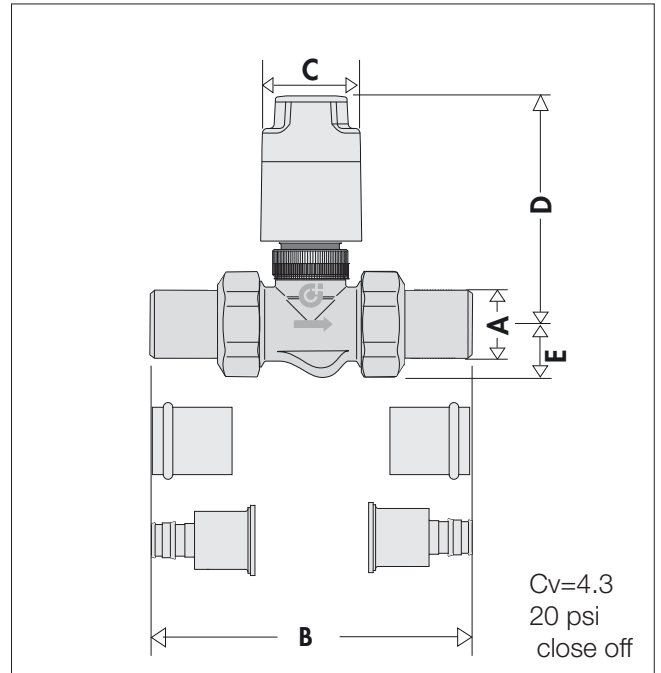
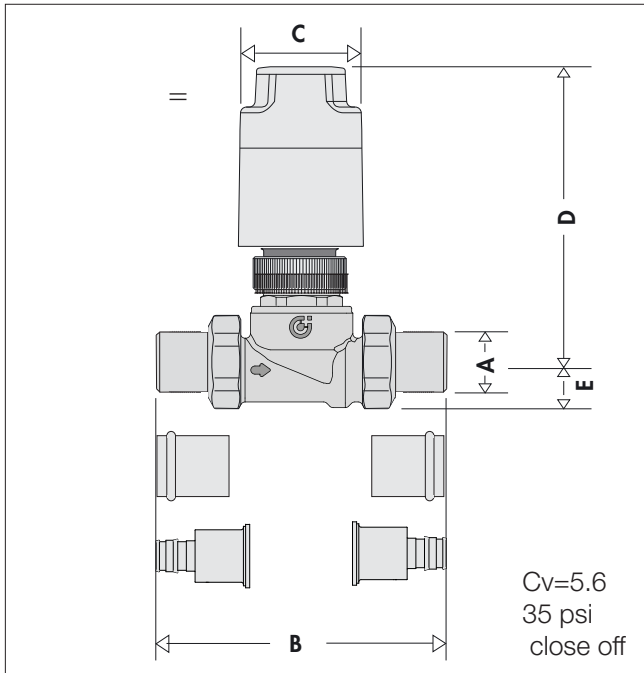
Type:	Normally closed
Supply voltage:	24V (AC) – 24 V (DC)
Starting (inrush) current:	6563 and 6564 series: ≤ 250mA
Holding current:	6563 series: 140 mA 6564 series: 125 mA
Power consumption: 6563 and 6564 series: inrush: 6 VA, holding: 3 W	
Protection class:	6563 series: IP 40 (in vertical position) 6564 series: NEMA 3/ IP 54 in all positions
Auxiliary micro-switch contact rating:	5 A (24 V)
Opening time:	6563 series: 120 to 180 sec. 6564 series: 80% open 300 sec.; 100% open 600 sec.
Closing time:	6563 series: 120 to 180 sec. 6564 series: 240 sec.
Auxiliary micro-switch closing time:	300 sec.

Medium (fluid) working temperature range: 40 to 200° F (5 to 95° C)

Ambient temperature:

Operation:	32 to 120° F (0 to 50° C), max. humidity 85%
Transportation:	15 to 160° F (-10 to 70° C), max. humidity 95%
Storage:	20 to 120° F (-5 to 50° C), max. humidity 95%

**Dimensions**



**TwisTop+** High-performance zone valve

Code	A	B	C	D	E	Wt. (lb./kg)
676746A	1/2" press union	5"	1 1/2"	4 1/2"	3/4"	2.2/1.0
676749A	1/2" sweat union	4 13/16"				
676748A	1/2" PEX expansion union	5 1/8"				
676756A	3/4" press union	5 1/2"				
676759A	3/4" sweat union	4 7/8"				
676758A	3/4" PEX expansion union	6 7/8"				
676766A	1" press union	5 7/8"				
676769A	1" sweat union	6"				
676768A	1" PEX expansion union	7 1/8"				

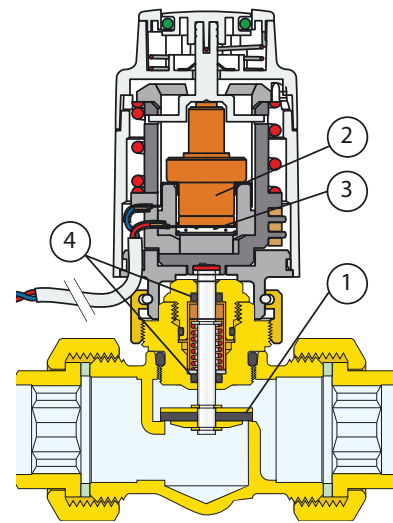
**TwisTop** Zone valve

Code	A	B	C	D	E	Wt. (lb./kg)
676246A	1/2" press union	4 1/4"	1 1/2"	3 3/4"	3/4"	1.4/0.63
676249A	1/2" sweat union	4 1/16"				
676248A	1/2" PEX expansion union	4 3/8"				
676256A	3/4" press union	4 3/4"				
676259A	3/4" sweat union	4 1/8"				
676258A	3/4" PEX expansion union	6 1/8"				
676266A	1" press union	5 1/8"				
676269A	1" sweat union	5 3/4"				
676268A	1" PEX expansion union	6 3/8"				

## Operating principle

When a room thermostat operates, the thermo-electric actuator causes the opening or closing of the valve actuator controlling the system heat transfer fluid (or medium). The actuator operates via a wax expansion thermostat heated up by a PTC resistor. When the power supply is OFF, the device (actuator + valve) is "normally closed" with the valve plug (1) pushed against the seat. When the power supply is ON, the valve opens as the wax thermostatic element expands (2) controlled directly by a PTC resistor (3). When the valve plug reaches an average opening value of 80% the auxiliary micro-switch contacts close, which can be used to start a circulator pump.

The stainless steel control spindle has a double hydraulic seal (4) consisting of two EPDM O-rings; this means that the upper part of the unit can be replaced even when the system is operating.



**TwisTop Zone valve**  
6762 series

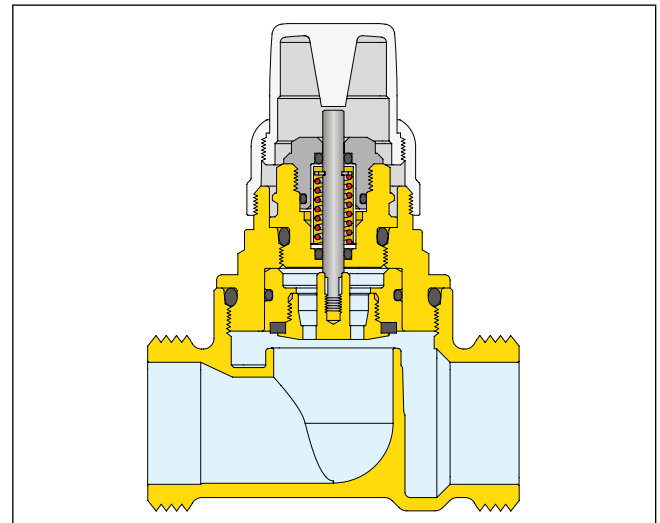
## TwisTop+ High-Performance Zone Valves

The 6767 series TwisTop+ thermo-electric zone valve family features a larger, pressure-balanced body with a higher Cv and higher close-off pressure rating, compared to the smaller 6762 series zone valves.

The TwisTop comes complete with actuator and fittings, as listed on the previous page, or buy separate components, including a wider variety of end connections styles to meet a specific installation need. Mix and match inlet and outlet fittings for pipe type transition at the valve, for example, from copper to PEX, to save money on adapters.

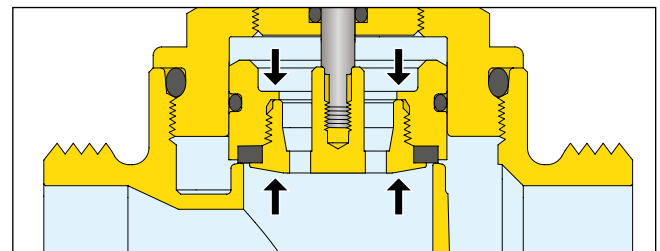
The 6767 TwisTop+ series offers:

- High flow capacity (Cv=5.6) and high close-off pressure (35 psid) to handle most heating and cooling applications.
- Dual unions and wide selection of connection types for application flexibility and easy installation and service.
- Pressure balanced seat/plug design for smooth operation
- 2-wire, 24V on/off spring-return TwisTop actuator with 5A end switch contacts, manual override and position indication.
- Completely silent operation perfect for living space locations.
- Slow actuator stroke eliminates the risk of water hammer.



### High maximum differential pressure

The zone valve, code 676500A, has a special valve plug that can work at high differential pressures. As shown in the figure, the thrust towards the opening is counterbalanced by the force created by the pressure acting on the internal surface of the valve plug. This feature reduces the thrust needed to close the valve plug.



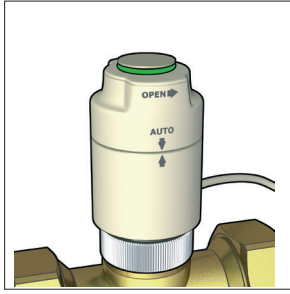
### High maximum differential pressure

The internal fluid-dynamic design of the valve plug and body allows for very low pressure drops.

## Using the TwisTop™ 6563 series actuator

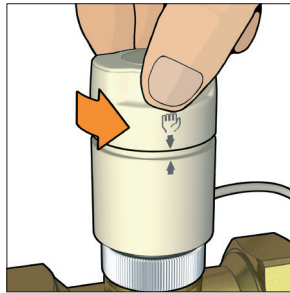
### 1. Normal operation in automatic mode.

In automatic mode, the thermo-electric actuator opens the valve when it is supplied power. The opening is displayed by the central disc raising on the top of the knob and the green circular indicator.



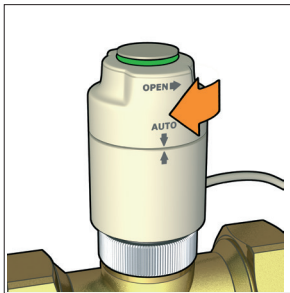
### 2. Simply twist to manually open actuator (and activate micro-switch on 656354).

Turn the knob on the top of the actuator counterclockwise until the limit stop trips and the arrow symbols and hand symbol align. To close the valve manually and restore automatic operation, turn the knob clockwise to "AUTO". For the 656354 with auxiliary micro-switch, the micro-switch contact is closed when in the manual opening position.



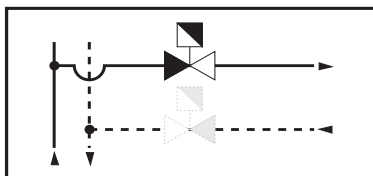
### 3. When power is applied it returns to AUTO position.

When the actuator in the manual position is powered, an internal mechanism enables automatic release from the position and a return to normal operation. A few seconds after powering up, the knob will automatically return to the "AUTO" position and the opening indicator will stay in the open position.



## Installation

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



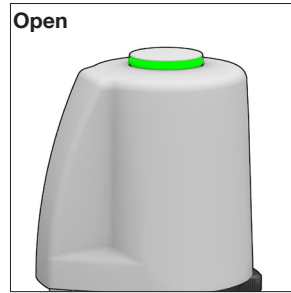
## Using the 6564 series actuator



### Opening/closing indicator

The 656404 and 656414 thermo-electric actuator, when electrically powered, opens the valve. The opening is displayed by the central disc raising on the top of the knob and the green circular indicator. The opening/closing indicator is especially useful during testing to check for proper operation without having to activate the system.

### Open



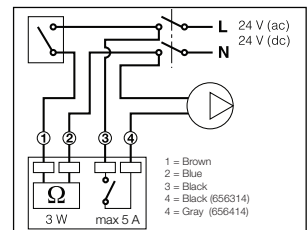
### Closed



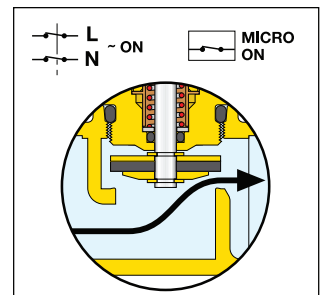
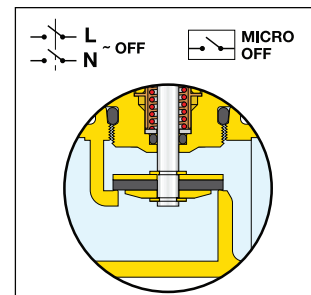
### Wiring diagram

#### Wiring diagram with auxiliary micro-switch for code 656354 and 656414 actuators:

The auxiliary micro-switch can be used to turn off the pump when there is no call for heat and the valves are closed. If the pump power consumption exceeds the contact rating of 5 A, a relay must be used.



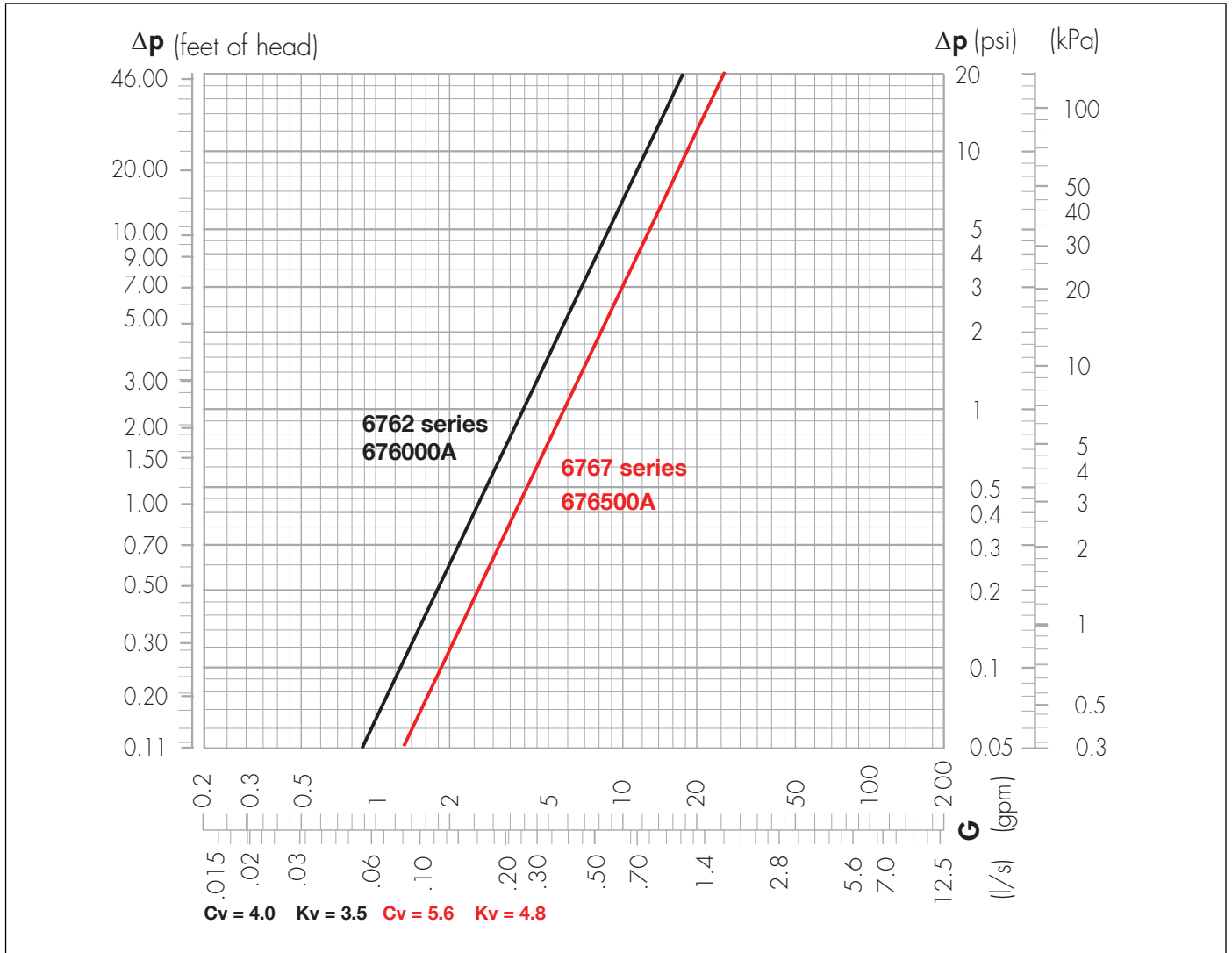
The auxiliary micro-switch shuts off at an average actuator opening value of 80%.



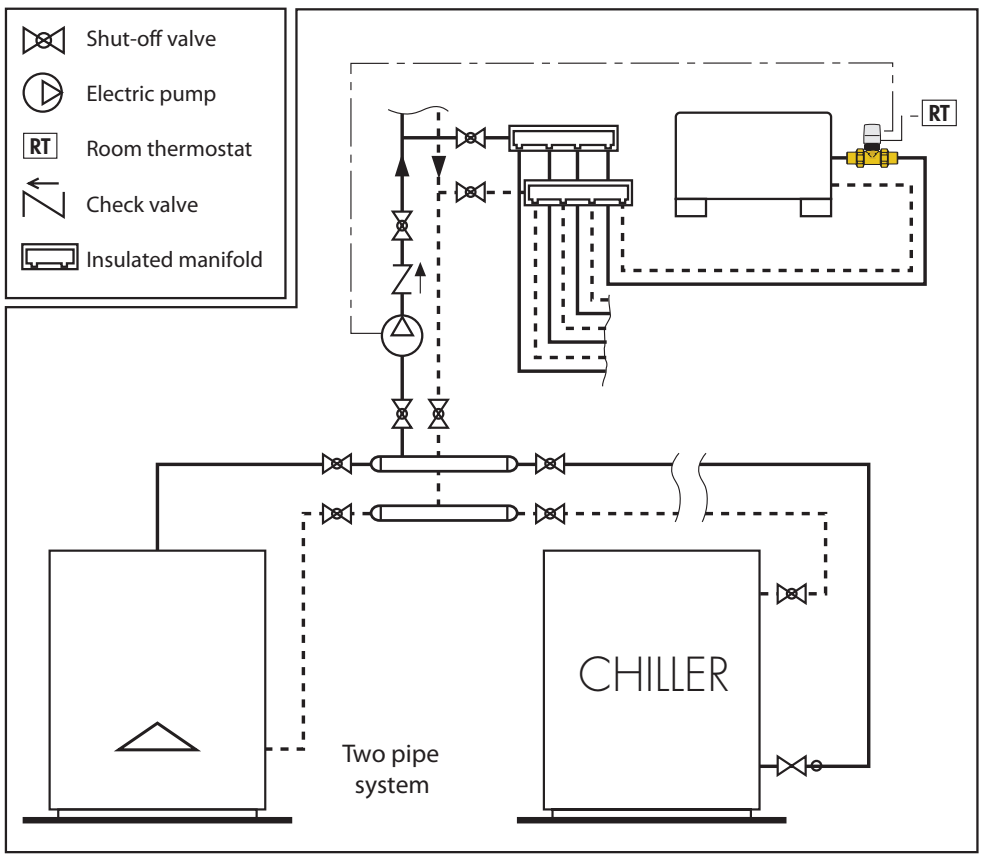
The 6564 actuator was formerly available assembled to the code 676000A valve body with press or sweat union end connections, size 1/2" to 1". Contact Caleffi to buy those models if desired. Otherwise, the 676 series zone valve bodies and a variety of union end connections can be field assembled to the 6564 actuator if desired.

Reference documentation for 6564 series: Tech brochure 01198 NA.

Hydraulic characteristics at 100% open



Application diagram



## Replacement parts and accessories

### Isolation ball valve



Low lead Male x Female union fits 1" valves between body and tailpiece. See below.

### Replacement fittings

Refer to current Caleffi Plumbing and Hydronics Catalog, fittings and miscellaneous components section for replacement tailpiece, union nut and washer parts.

290030.....isolation ball valve 1" M x 1" F union



Isolation ball valves, installed on TwisTop+



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## SPECIFICATION SUMMARIES

### 6762 series

TwisTop Thermo-electric two-way zone valve. Provided with code 676000A two-way straight-through style brass body. Connections: 1/2", 3/4" and 1" sweat union, press union or PEX expansion union. Brass trim, stainless steel stem and spring, and peroxide-cured EPDM seals. Maximum body pressure 150 psi (10 bar), Cv 4.3 (Kv 3.7). Maximum differential pressure 20 psi (1.2 bar). Water and glycol solutions to maximum 50 percent. Provided with code 656354 thermo-electric actuator, power open/spring-return closed (normally closed), with auxiliary micro-switch (contacts rated 5 A, 24 V), power supply 24 VAC or VDC, power consumption 3 W running, maximum temperature 200 degrees F (95 degrees C), maximum 20 psi (1.2 bar) close off pressure, 31.5 inch (80 cm) wire leads. Provide with optional inlet and outlet isolation ball valves, code 290030, separately sourced, field installed.

### 6767 series

TwisTop+ Thermo-electric two-way zone valve. Provided with code 676500A two-way straight-through style brass body. Connections: 1/2", 3/4" and 1" sweat union, press union or PEX expansion union. Brass trim, stainless steel stem and spring, and peroxide-cured EPDM seals. Maximum body pressure 150 psi (10 bar), Cv 5.6 (Kv 4.8). Maximum differential pressure 35 psi (2.5 bar). Water and glycol solutions to maximum 50 percent. Provided with code 656354 thermo-electric actuator, power open/spring-return closed (normally closed), with auxiliary micro-switch (contacts rated 5 A, 24 V), power supply 24 VAC or VDC, power consumption 3 W running, maximum temperature 200 degrees F (95 degrees C), maximum 35 psi (2.5 bar) close off pressure, 31.5 inch (80 cm) wire leads. Provide with optional inlet and outlet isolation ball valves, code 290030, separately sourced, field installed.

### 6563 series

TwisTop Thermo-electric actuator. code 6563 series. Provided with manual open/close knob with automatic reset, visual pop-up position indicator when activated, self-extinguishing polycarbonate protective shell, protection class IP 40 installed in vertical position. Made with double insulation per CE. Initial current draw: ≤250 mA. Holding current: 140 mA. Power consumption 3 W running. Inrush power consumption: 6 VA. Micro-switch contact rating: 5 A (24 V). Operating time 120 to 180 seconds full stroke opening, 120 to 180 seconds full stroke closing. Maximum operating temperature, valve plus actuator: 120 degrees F (50 degrees C). Code 656344, RAL 9010 white color. Code 656354, with micro-switch, RAL 9002 gray color.

### 6564 series

Thermo-electric actuator, code 6564 series. Provided with visual pop-up position indicator when activated, self-extinguishing polycarbonate protective shell, protection class NEMA 5 (IP 54) installed in all positions. Made with double insulation per CE. Initial current draw: ≤ 250 mA. Holding current: 125 mA. Inrush power consumption: 6 VA. Micro-switch contact rating: 5 A (24 V). Operating time 600 seconds full stroke opening, 240 seconds full stroke closing. Maximum operating temperature, valve plus actuator: 170 degrees F (75 degrees C). Code 656404, RAL 9010 white color. Code 656414, with micro-switch, RAL 9002 gray color.

*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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