



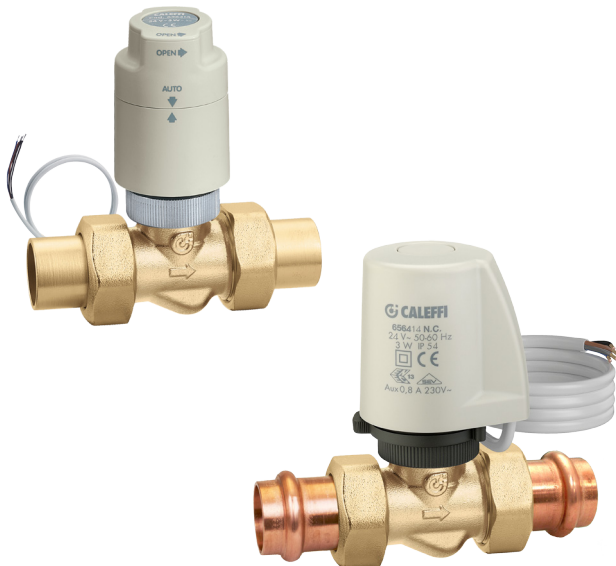
# Thermo-electric zone valves

## 676 series



01072/16 NA

Replaces 01072/14 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 676 series is available with conventional sweat union connections. Also available for all connection sizes, the Presscon™ copper tail-piece with union nut makes installation and maintenance fast, easy and efficient. Special slots in the EPDM O-ring allows fluid to leak during system testing if unpressed and provide a perfect leak proof seal when completely pressed.

Choose between two styles of thermo-electric actuators complete with auxiliary micro-switch: The TwisTop™ code 656314, featuring a pop-up opening/closing indicator which can be manually opened with a twist of the top; or the code 656414 with low inrush current draw and power consumption, pop-up opening/closing indicator, and quick-coupling for easy installation.



### Product range

- 6760 series Two-way zone valve bodies for field installation of thermo-electric actuators....connections 1/2", 3/4", & 1" sweat union and press union
- 6762 series Two-way thermo-electric zone valve with TwisTop™ 656314 actuator.....connections 1/2", 3/4", & 1" sweat union and press union
- 6763 series Two-way thermo-electric zone valve with low current draw 656414 actuator....connections 1/2", 3/4", & 1" sweat union and press union

### Technical specifications

#### Valve body

##### Materials

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

##### Performance

Suitable Fluids:	water, glycol solutions
Max. percentage of glycol:	50%
Max. working pressure:	150 psi (10 bar)
Flow rating:	Cv = 4.0 (Kv = 3.5)
Max. close-off pressure differential:	20 psid (1.2 bar)

##### Connections

Main connections:	1/2", 3/4", & 1" sweat with union
Lay length (press connection):	1/2", 3/4", & 1" sweat with union size 1/2 inch: 2 7/8" size 3/4 inch: 2 3/4" size 1 inch: 3 1/4"

#### Actuator

##### Materials

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

##### Performance

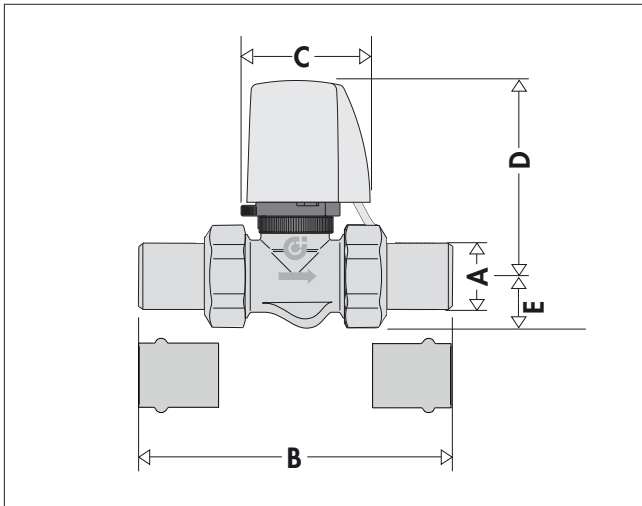
Type:	Normally closed
Supply voltage:	24V (ac) – 24 V (dc)
Starting (inrush) current:	656314: 800 mA 656414: ≤ 250mA
Holding current:	656314: 140 mA 656414: 125 mA
Power consumption:	656314: inrush: 19 VA, running: 3 W 656414: inrush: 6 VA, running: 3 W
Protection class:	656314: IP 40 (in vertical position) 656414: NEMA 1/ IP 44 in all positions
Auxiliary micro-switch contact rating:	5 A (24 V)
Opening time:	656314: 120 to 180 sec. 656414: 80% open 300 sec.; 100% open 600 sec.
Closing time:	656314: 120 to 180 sec. 656414: 240 sec.
Auxiliary micro-switch closing time:	300 sec.

Medium (fluid) working temperature range: 40 to 170° F (5 to 75° C)

##### Ambient temperature:

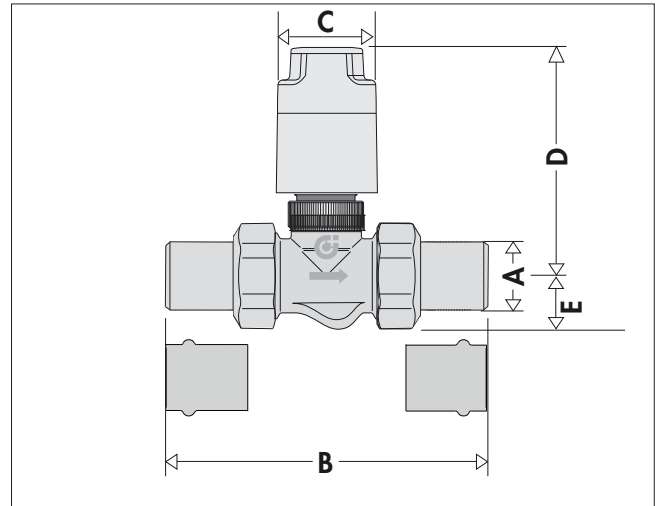
Operation:	32 to 120° F (0 to 50° C), max. humidity 85%
Transportation:	15 to 160° F (-10 to 70° C), max. humidity 95%
Storage:	20 to 120° F (-5 to 50° C), max. humidity 95%

## Dimensions



Code	A	B	C	D	E	F	Wt. (lb.)
676346A	1/2" press union	4 3/8"	2 3/8"	3 1/2"	3/4"	3/4"	1.4
676349A	1/2" sweat union	3 11/16"	2 3/8"	3 1/2"	3/4"	3/4"	1.4
676356A	3/4" press union	4 3/4"	2 3/8"	3 1/2"	3/4"	3/4"	1.4
676359A	3/4" sweat union	4 3/16"	2 3/8"	3 1/2"	3/4"	3/4"	1.4
676366A	1" press union	5"	2 3/8"	3 1/2"	3/4"	3/4"	1.4
676369A	1" sweat union	5 3/8"	2 3/8"	3 1/2"	3/4"	3/4"	1.4

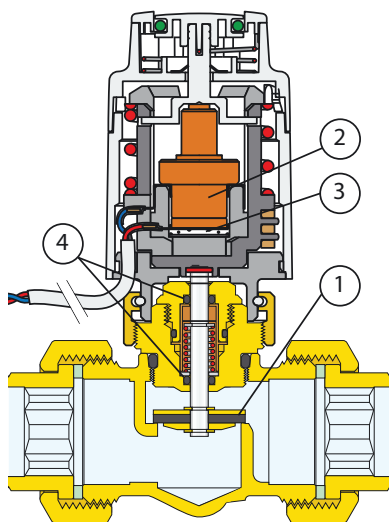
Two-way zone valve body codes: **676046A, 49A, 56A, 59A, 66A, 69A.**



Code	A	B	C	D	E	F	Wt. (lb.)
676246A	1/2" press union	4 3/8"	1 3/4"	3 3/4"	3/4"	3/4"	1.4
676249A	1/2" sweat union	3 11/16"	1 3/4"	3 3/4"	3/4"	3/4"	1.4
676256A	3/4" press union	4 3/4"	1 3/4"	3 3/4"	3/4"	3/4"	1.4
676259A	3/4" sweat union	4 3/16"	1 3/4"	3 3/4"	3/4"	3/4"	1.4
676266A	1" press union	5"	1 3/4"	3 3/4"	3/4"	3/4"	1.4
676269A	1" sweat union	5 3/8"	1 3/4"	3 3/4"	3/4"	3/4"	1.4

## 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.



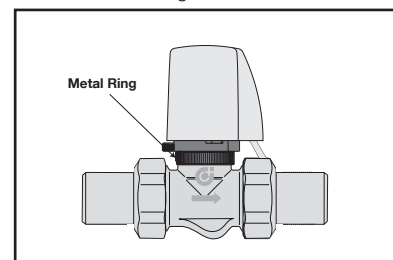
## Construction details

### Control spindle

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.

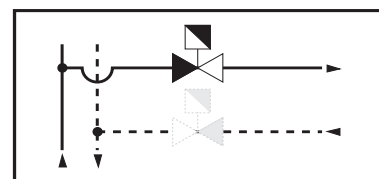
### Manual opening

With the electro-thermal actuator mounted, the valve is normally closed. For manual opening, remove the electro-thermal actuator by unscrewing the lower metal ring.



## Installation

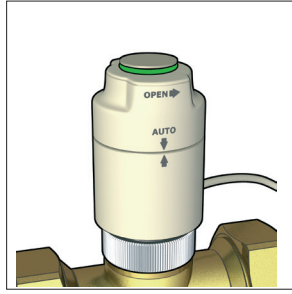
The 2-way valve, 676 series, can be installed in the supply or return piping.



## Using the TwisTop™ 656314 actuator

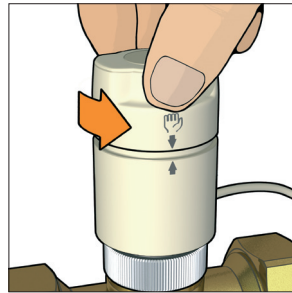
### 1. Normal operation in automatic mode.

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.



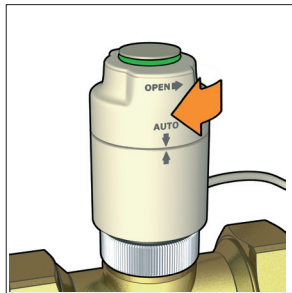
### 2. Simply twist to manually open actuator (and activate micro-switch on 656314).

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 656314 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.

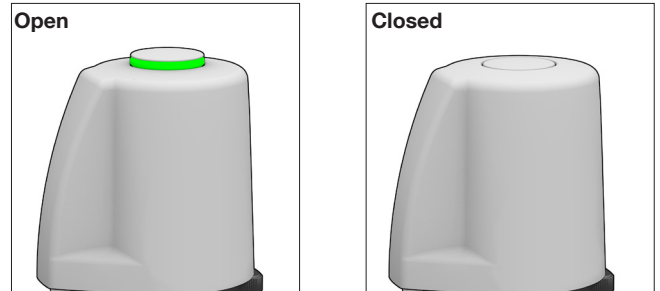


## Using the 6564 series actuator

### Opening/closing indicator

The 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.

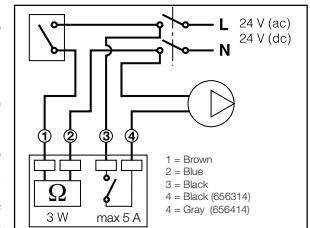
Reference documentation for 6564 series: Tech brochure 01198 NA.



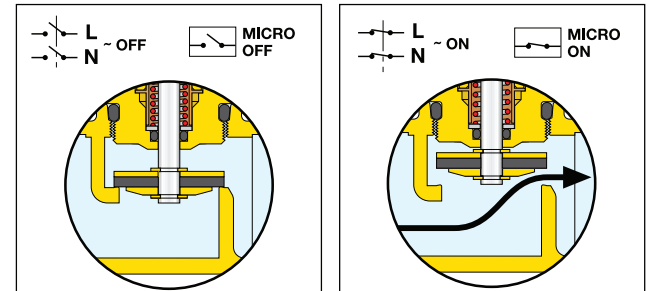
### Wiring diagram

#### Wiring diagram with auxiliary micro-switch for code 656314 and 656414 actuators:

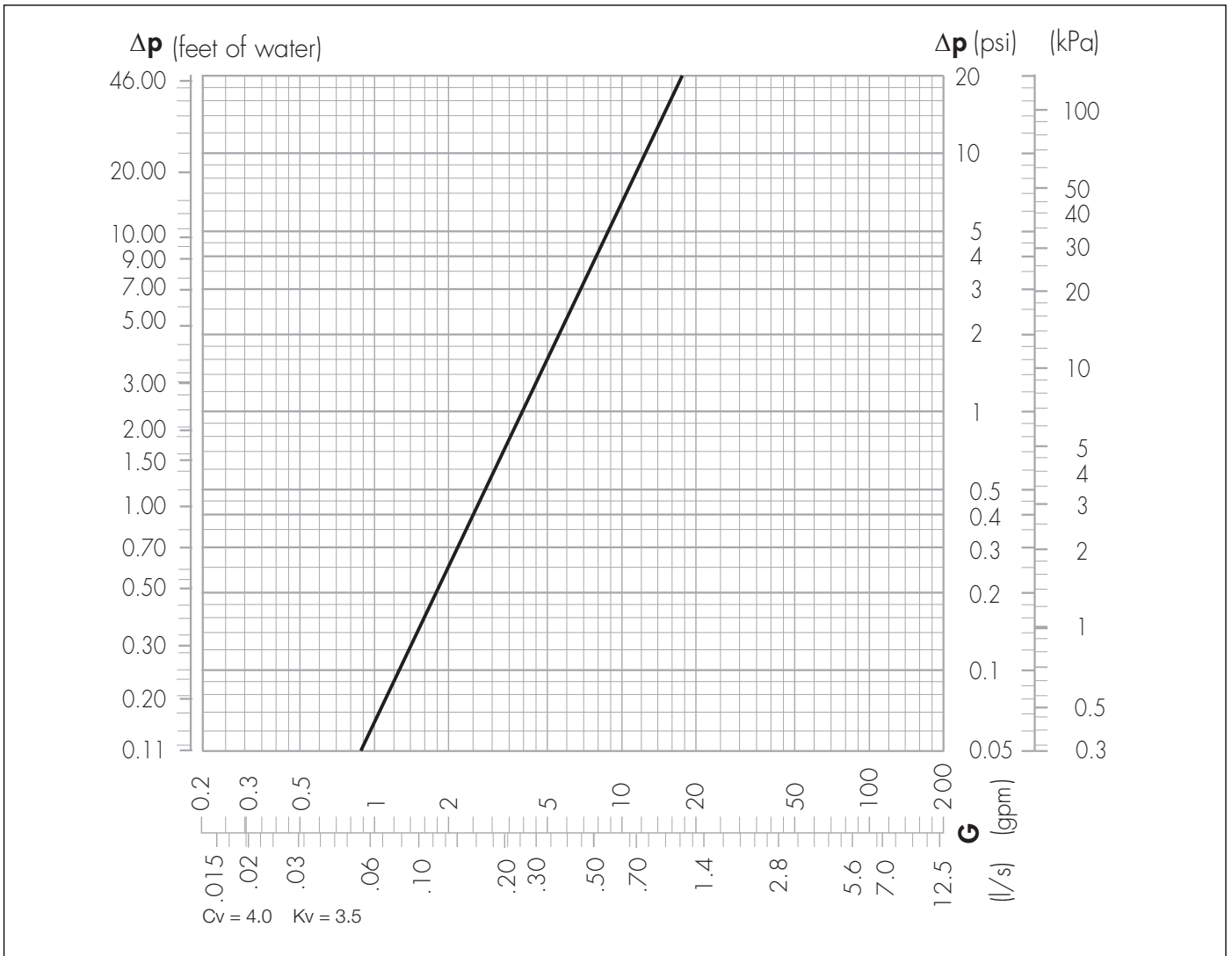
The auxiliary micro-switch can be used to turn off the pump when there is no call for heat and the valves are closed. If the pump power consumption exceeds the contact rating of 5 A, a relay must be used.



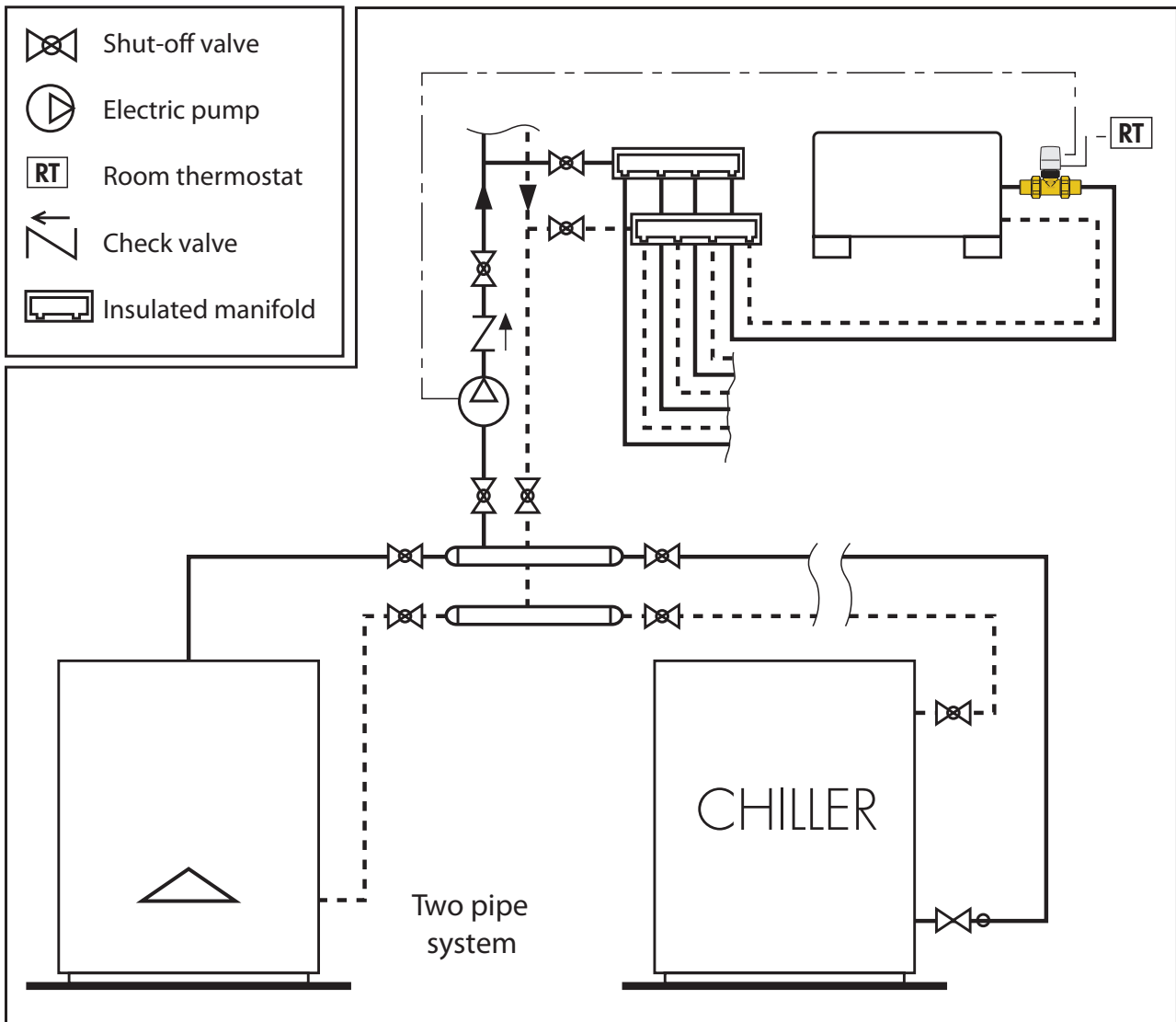
The auxiliary micro-switch shuts off at an average actuator opening value of 80%.



Hydraulic characteristics at 100% open



**Application diagram**



**SPECIFICATION SUMMARIES**

**676 series**

Thermo-electric two-way zone valve. Provided with 676 series two-way straight-through style brass body. Connections: 1/2", 3/4" and 1" sweat union, 1/2", 3/4" and 1" press union. Brass trim, stainless steel stem and spring, and EPDM seals. Maximum body pressure 150 psi (10 bar), Cv 4.0. Maximum differential pressure 20 psi (1.2 bar). Water and glycol solutions to maximum 50 percent. Provide with 656 series 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.

**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: 800 mA. Holding current: 140 mA. Inrush power consumption: 19 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 656304, RAL 9010 white color. Code 656314, 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.

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Caleffi North America, Inc.  
 3883 W. Milwaukee Rd  
 Milwaukee, WI 53208  
 Tel: 414-238-2360 · Fax: 414-238-2366  
 sales@caleffi.com · www.caleffi.com  
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