Macon ZMC/ZMO Series

The Macon ZMC/ZMO 24 V Standard is a thermoelectric actuator for opening and closing valves on heating and cooling systems. The main field of application is the energy-efficient individual room temperature control in the range of building management systems and home automation. The Macon ZMC/ZMO 24 V Standard is controlled by a 24 V room thermostat with two point output or pulse-width modulation.

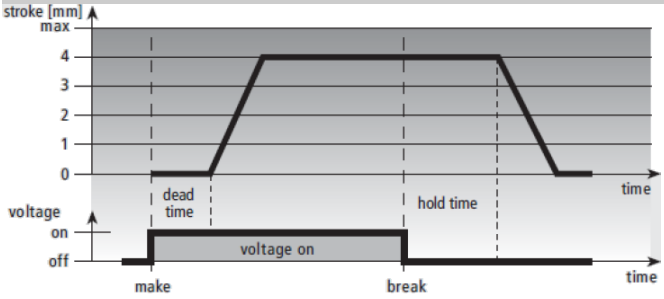
1) Features

- Available in normally closed (NC) or normally open (NO)
- Power consumption 1 watt
- Simple snap-on installation
- 360° installation position
- First-Open Function
- Alignment aid on the valve
- Compact size, small dimensions
- All around function indicator
- Noiseless and maintenance-free

2) Function

The actuator mechanism of the Macon ZMC/ZMO Series uses a PTC resistor-heated wax element and a compression spring. The wax element is heated by applying the operating voltage and moves the integrated ram. The force generated by the movement is transferred on the valve lifter and thus opens and closes the valve.

2.1 **Normally Closed** (valve closed)

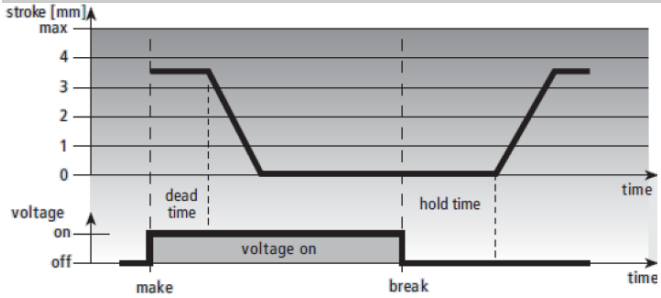


In case of the normally closed version, the valve is opened steadily by the ram motion upon switching on the operating voltage and after expiry of the dead time.

After the operating voltage is cut and after expiry of the hold time, the valve is closed evenly by the closing force of the compression spring. The closing force of the compression spring is matched to the closing force of commercially available valves and keeps the valve normally closed.

Figure: Example for 4 mm stroke. Characteristic line for stroke 5 mm results analogous.

2.2 **Normally Open** (valve open)



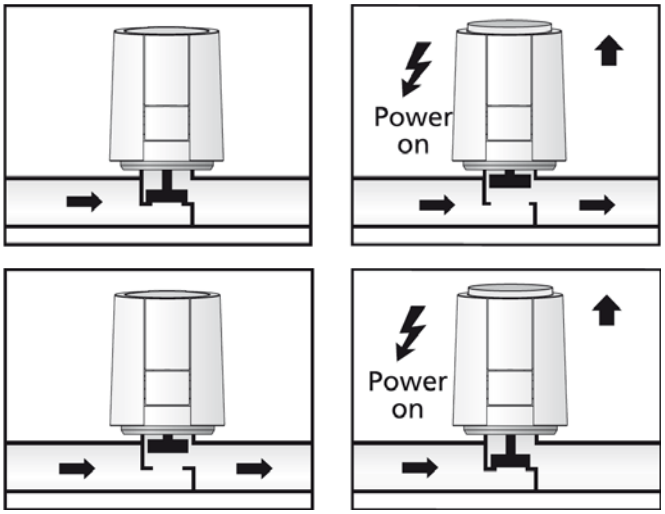
In case of the normally open version, the valve is closed evenly by the ram motion upon switching on the operating voltage and after expiry of the dead time.

After the operating voltage is cut and after expiry of the hold time the valve is opened evenly by the closing force of the compression spring.

Figure: Example for 4 mm stroke. Characteristic line for stroke 5 mm results analogous.

2.3 Function Indicator

The function indicator of the Macon ZMC / ZMO Series (all around view) allows identifying the operating condition (valve open or closed) at a glance. It is also possible to feel the current operating state when it's dark.



- In case of the **NC version**, an extended function display shows opening of the valve.
- In case of the **NO version**, an extended function display shows that the valve is closed.

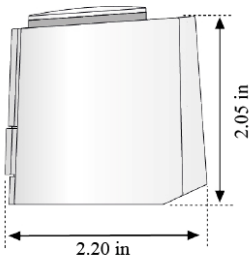
2.4 First-Open function (for NC only)

In its delivery condition, the Macon ZMC is kept open when de-energised due to the First-Open function. This enables heating operation during the carcass construction phase even when the electric wiring is not yet complete. During the later electrical start-up, the First-Open function is unlocked by applying the operating voltage for more than 6 minutes. The Macon ZMC will then be completely operable.

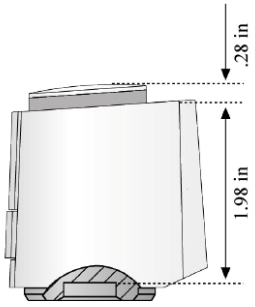
3) Technical Data

Operating voltage	24 V AC/DC +20%...-10%	
Max. inrush current	< 300 mA during max. 2 min.	
Operating power	1 W [1)]	
Stroke (actuator travel)	4.0 / 5.0 mm	
Actuating force	100 N ±5%	
Fluid temperature	32° F - 212° F [2)]	
Storage temperature	-130° F - 140° F	
Ambient temperature	32° F - 140° F	
Degree / class of protection	IP 54 [3)]	
CE conformity according to	EN 60730	
Housing material / housing color	Polyamide / light grey (RAL 7035)	1) measured with precision reference meter LMG95
Connection cable/ color	2 x 0.75 mm² PVC / light gray (RAL 7035)	
Cable length	3' 3"	2) in dependence of the adapter even higher
Weight with connecting cable (1 m)	approx. 5.3 oz	
Surge protection according to EN 60730-1	min. 2.5 kV	3) in all installation positions

3.1 Dimensions



Dimensions

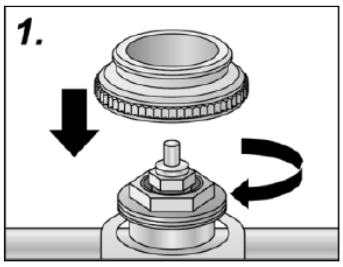


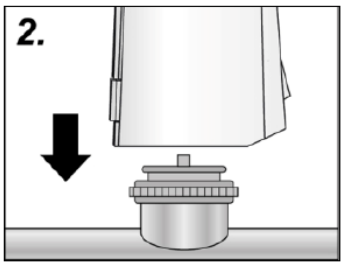
Installation height

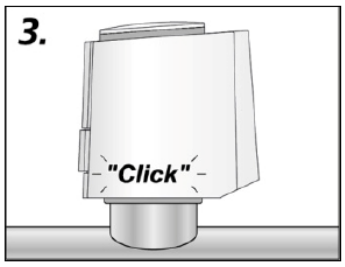
4) Installation notes

4.1 Installation with valve adapter

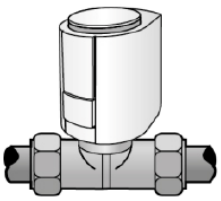
The valve adapter assortment guarantees a perfect match of the valve drive to almost any valve bottom and heating circuit distributor available on the market. Simply snap-on the Macon ZMC/ZMO Series to the manually pre-installed valve adapter.



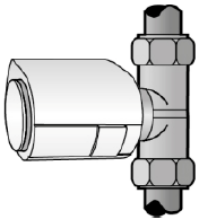




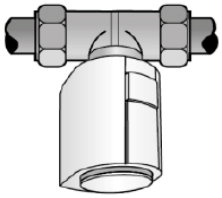
4.2 Installation position



vertical



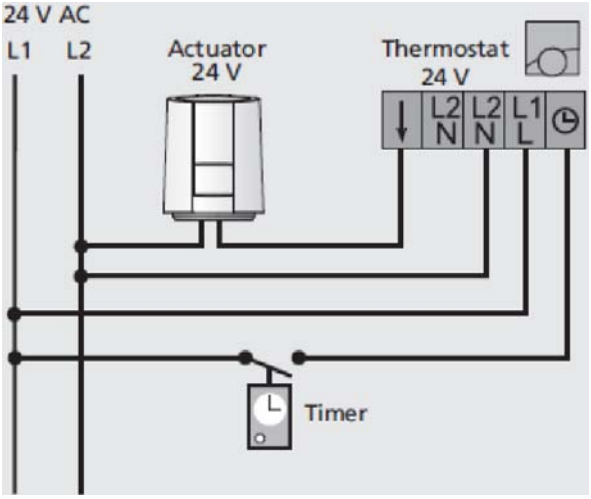
horizontal



overhead

Preferred installation position of the Macon ZMC/ZMO Series is vertical or horizontal. An upside down position may reduce product life through special circumstances (e.g. contaminated water).

4.3 Electrical Installation



Calculation of maximum cable length (copper cable) for 24 V rated voltage

L = K x A / n
L Cable length in m
K Constant (269 m/mm²)
A Conductor cross-section in mm²
n Number of Alpha-Actuators

We recommend the following cables for installing a 24 V system:

Telephone wire	J-Y(ST)Y	0.8 mm²
Light plastic-sheathed cable:	NYM	1.5 mm²
Flat webbed building wire:	NYIF	1.5 mm²

Transformer:
A safety isolating transformer according to EN 61558-2-6 (Europe) must always be used. Transformer dimensioning results from the making capacity of the Macon ZMC/ZMO Series.

Rule-of-thumb formula:
$P_{Transformer}$ = 6 W x n
n = Number of Actuators

5) Accessories

- Protection Cap AA SK 1004

Protection against theft and vandalism, available for valve drives with a stroke of 4mm or 5mm