

## Alpha-Actuator 24 V AA 4004 | AA 4104

The Alpha-Actuator is a thermoelectric actuator for opening and closing valves used in the fields of heating, ventilation and air conditioning engineering.

The Alpha-Actuator is available in version normally-close (AA 4004) and normally-open (AA 4104).

The Actuator control is by a room thermostat (e.g. Alpha-Thermostat 24 V) with two-point output or pulse-width modulation.

A wide choice of valve adapters guarantees perfect adaptation to a large number of valve bottoms and heating circuit distributors.

The compact and shapely design and functionality enables the Alpha-Actuator 24 V to be universally applicable and open the use in different systems.



### Features

- Functional design
- Small dimensions
- First-Open function
- Versions normally-closed (NC) / normally.open (NO)
- All around function indicator
- Maintenance free
- Noiseless
- High functional safety and long expected service life
- Low power consumption
- Connecting cable plug-in
- 360° installation positions
- Snap-on installation
- Valve-adapter concept
- Adaptation check on valve
- 100% protection against leaky valves
- Antitheft protection by detachable transparent visor

### Application

- Alpha-Actuator offers optimal control of radiators and heating circuit distributors.
- Control is done a room thermostat with two-point output or pulse-width modulation

### General information

#### Scope of Supply

- 1x Alpha-Actuator 24 V (normally closed)
- 1x cable 1 meter
- 1x Installation instructions in 9 languages

#### Type

AA 4004: Version 24 V – normally closed  
AA 4104: Version 24 V – normally open

#### Optional available extensions

- First-Open function (for NC only)
- Other cable length are available

#### Accessories

The valve adapter fitting your application has to be ordered sperately.

#### Ordering information

Our staff will be glad to assist you in finding the Alpha-Actuator fitting your application.

### Functions

#### General

The actuator mechanism of the OEM-Actuator uses a PTC resistor-heated elastic 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.

#### Standard Version

##### Normally Closed (valve closed)

The valve is opened steadily by the ram motion upon switching on the operating voltage and after expiry of the dead time. The elastic element cools down 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.

#### Valve-Adapter-Concept

A valve-adapter concept guarantees a perfect match of the actuator to almost any valve bottom or heating circuit distributor available on the market. Simply snap-on the Alpha-Actuator to the pre-installed valve adapter.

#### Function Display

The function display of the Alpha-Actuator (all-round display) allows identifying the operating condition (valve open or closed) at a glance.

#### Extended Version

##### First-Open Function (for NC only)

In its delivery condition, the Alpha-Actuator is normally open due to the First-Open function. This enables heating operation during the carcass construction phase even when the electric wiring of the single room control is not yet complete. When commissioning the system at a later date, the First-Open function is automatically unlocked by applying the operating voltage (for more than 6 minutes) and the Alpha-Actuator is fully operable.

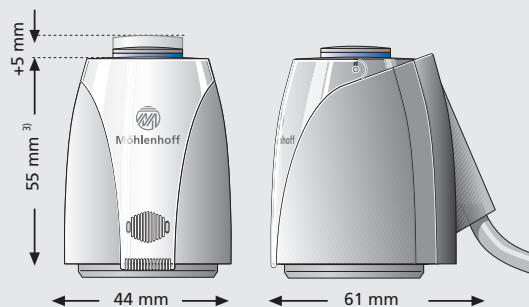
#### Alternative Version

##### Normally Open (valve open)

In case of the normally open version, ram motion is redirected by mechanical means, resulting in precisely opposite actuator function.

Technical data

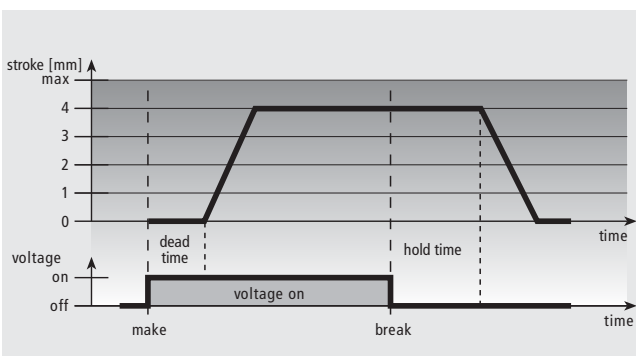
Type	AA 4004   AA 4104
Version	normally closed   normally open
Voltage	24 V AC/DC, +20%...-10%, 0-60 Hz
Max. inrush current	250mA during 2 min. max.
Operating current	75 mA
Operating power	1,8 W
Closing and opening times	ca. 3 min.
Actuator travel	4 mm
Actuator force	100 N ± 5%
Fluid temperature	0 - 100 °C <sup>1)</sup>
Storage temperature	-25 to +60°C
Ambient temperature	0 to +60°C
Protection type / protection class	IP 54 <sup>2)</sup> / III
CE conformity according to	EN 60730
Housing / housing colour	white, RAL 9003
Weight	73 g without adapter and cable
Connecting cable / length	2 x 0,75 mm <sup>2</sup> PVC, grey 1 m



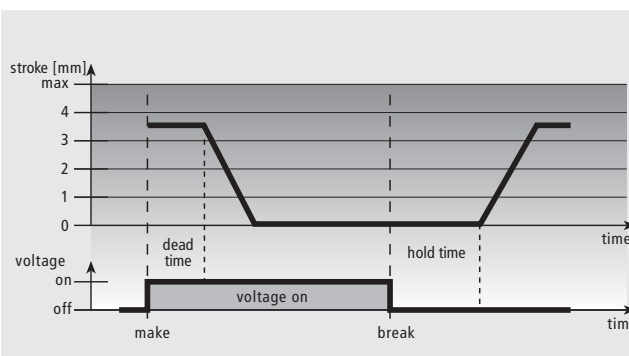
<sup>1)</sup> in dependence of the adapter even higher  
<sup>2)</sup> in all installation positions  
<sup>3)</sup> referring to standard valves

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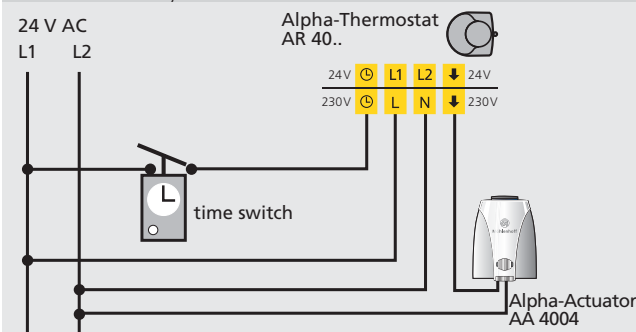
Normally Closed (NC)



Normally Open (NO)



Connection survey



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

$$L = K \times A / n$$

A Conductor cross-section in mm<sup>2</sup>  
n Number of Alpha Actuators  
K Constant (269 m/mm<sup>2</sup>)  
L Cable length in m

Für die Installation einer 24 V Anlage empfehlen wir folgende Leitungen:

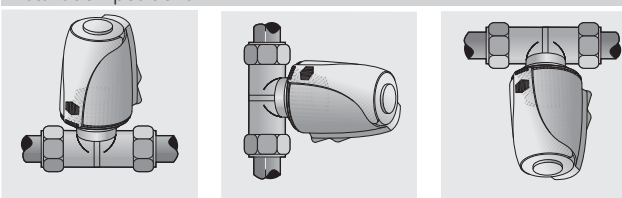
Bell wire:	Y(R)	0,6 mm <sup>2</sup> / 0,8 mm <sup>2</sup>
Light plastic-sheathed cable:	NYM	1,5 mm <sup>2</sup>
Flat webbed building wire:	NYIF	1,5 mm <sup>2</sup>

Transformer:

A safety isolating transformer according to EN 61558-2-6 (Europe) or class II FCC-quality proofed (North America) must always be used. Transformer dimensioning results from the making capacity of the Alpha Actuators.

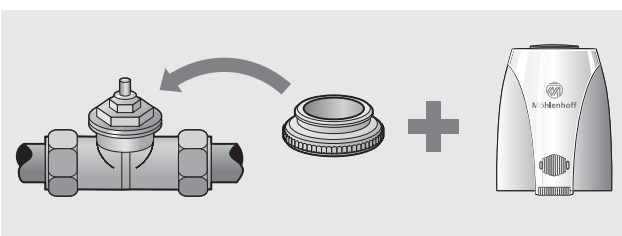
Rule-of-thumb- formula:  $P_{\text{Transformer}} = 6W \times n$   
n = Number of Alpha-Actuators

Installation positions



Preferred installation positions of the Alpha-Actuator are vertical and horizontal. An up-side down position may reduce product life through special circumstances (e.g. contaminated water).

Valve adaptation



Valve adaptation is achieved by a valve adapter which is available in different versions to suit the most common valve bottoms and heating circuit distributors (please consider when ordering).