

ACTUATOR_c 0-10V

Thermoelectric actuator for cooling and heating systems, AC/DC



QUICK FACTS

- Modern design
- Travel path variants 6.5 mm
- Designs "normally closed" (NC)
- Power consumption of only 1 watt
- Supply voltage 24 V AC/DC
- Control by a 0-10 V DC signal
- With valve stroke recognition
- Short response times, resulting in improved control response
- Closing point verification and possible adaptation during operation
- Complete compatibility to the valve adapter system
- Simple plug-in installation
- 360° installation position
- Patented 100% protection in case of leaky valves
- "First open" function
- Adaptation check on the valve
- Plug-in connecting cable
- Alignment aid on the valve
- Compact size, small dimensions
- All around function display
- Noiseless and maintenance-free
- High functional safety and long expected service life
- Certified by the TÜV

Technical description

The Actuator is a thermoelectric actuator for the discrete control of heating and cooling systems. The control of the actuators is performed by a 0-10 V DC signal via a central DDC system or by a room thermostat. Principal area of application is the building management systems range.

Furthermore, the variants with valve stroke recognition automatically register the stroke for an optimum use of the active control voltage range. This guarantees an even more precise control of all valves.

The ACTUATOR 0-10 V is delivered in a neutral design plugged connection cable, function display white/white, with stroke recognition, with valve adapter VA 41.

Type	Operating voltage	Stroke
ACTUATOR 0-10V NC	24V AC/DC	6.5

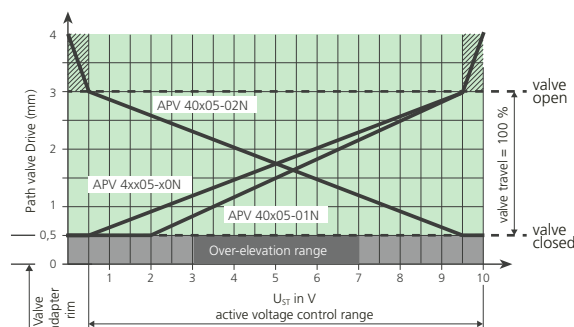
Function

The actuator mechanism of the Actuator uses a PTC resistor-heated elastic element and a compression spring. The elastic element is heated by applying the operating voltage and moves the integrated plunger. The force generated by this movement is transferred to the plunger, thus opening or closing the valve.

In factory setting, NC actuators keep the valve opened. The first-open function is unlocked initially for the NC actuator after switching on the operating voltage for the first time. Subsequently actuator type NC automatically determine the valve closing point. For actuators with valve stroke recognition, the stroke is detected additionally. After this process the actuators assume their normal operation. The saved values are used for control requirements and for position determination after a voltage interruption. The saved values are checked during the running operation and adapted as needed in order to counteract deviations. This process guarantees an optimum adaptation of the actuator to the valve. If a control voltage is applied after the closing point detection, the actuator opens the valve evenly with the plunger movement after the dead time has elapsed, and the actuator moves precisely to the calculated position.

An internal wear-free position detection controls the temperature required for the maximum stroke (minus over-elevation) and consequently the energy intake of the elastic element. No excess energy is stored inside the elastic element. If the control voltage is reduced, the electronic control system immediately adapts the heat input to the elastic element. In the range of 0 – 0.5 V (depending on the model) the actuator remains in a quiescent state in order to ignore ripple voltage occurring in long cables (rpm). The closing force of the compression spring is matched to the closing force of commercially available valves and keeps the valve closed when de-energised.

With stroke recognition



For the variant with valve stroke recognition, the actuator calculates the stroke and automatically adapts the active control voltage range to this. This allows an even more precise control of the valve. The complete voltage spike of the thermostat is used for flow control purposes.

Function display

The function display (all around display) of the actuator shows at the first glance whether the valve is open or closed; this can also be felt in the dark.

For the version NC:

Normally closed extracts the function display when the valve opens.

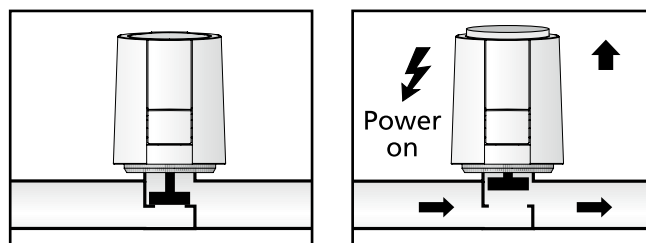


Figure 1. Function display

"First Open" function (for NC variants only)

In its delivery condition, the 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 room-by-room temperature 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 actuator is fully operable.

Installation

Installation with valve adapter

The valve adapter assortment guarantees a perfect match of the actuator to almost all valve bottoms and heating circuit distributors available on the market. The Actuator is simply plugged on to the valve adapter previously installed manually.

Installation position

The Actuator must be installed preferably in vertical or horizontal installation position. In case of "overhead" installation, special circumstances (e. g. drainwater) can reduce the lifetime of the actuator.

Electric connection

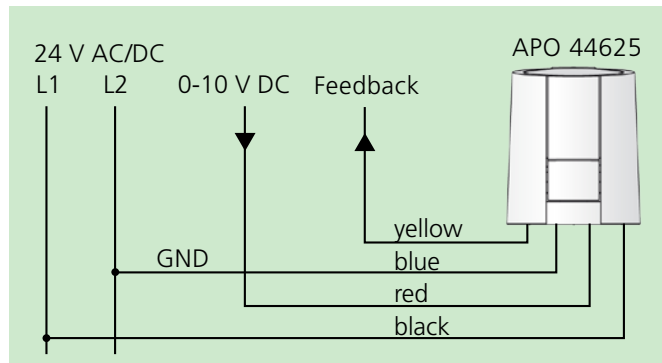


Figure 2. Electric connection

Cable

We recommend the following cable lengths for installing a 24 V system:

Cable	Section	Length
Standard DDC line	0.22 mm ²	20 m
J-Y(ST)Y	0.8 mm	45 m
NYM / NYIF	1.5 mm ²	136 m

Transformer/power supply

A safety isolating transformer according to EN 61558-2-6 (for the AC variant) or a switching power supply according to EN 61558-2-16 (for DC variant) must always be used.

The dimensioning of the transformer or the switching power supply results from the making capacity of the Actuators.

Rule-of-thumb formula:	$P_{\text{transformer}} = 6 \text{ W} \times n$
	$n = \text{number of Actuators}$

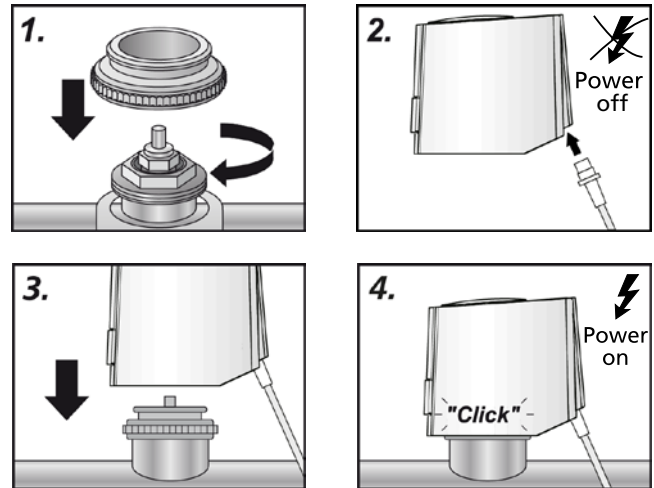
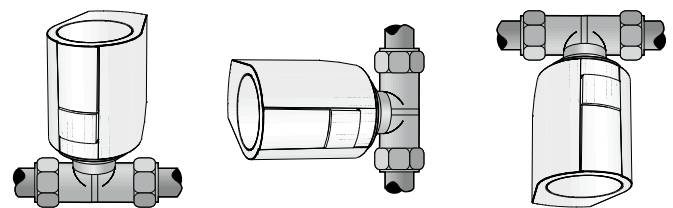


Figure 3.

1. Screw the valve adapter manually onto the valve.
2. Connect the line to the actuator.
3. Position the Actuator manually in vertical position to the valve adapter.
4. Latch the Actuator to the valve adapter by manually applied vertical pressure until a clicking sound is heard.



A: vertical

B: horizontal

C: "overhead"

Figure 4. Installation position

Technical data

ACTUATORc 0-10V NC 24V AC/DC

Voltage	24 V AC/DC, -20 % ... +20 %,	
Control voltage range	0 V... 10 V (reverse polarity protected)	
Max. inrush current	< 320 mA for max. 2 min.	
Power rating, start-up:	6 VA for a maximum of 2 minutes	
Power rating, operation:	1 VA	
Resistance of control voltage input	100 kΩ	
Stroke	6.5 mm (minus 0.5 mm over-elevation)	
Actuation force	125 N +5 %	
Fluid temperature	0 °C to +100 °C ¹⁾	
Storage temperature	-25 °C to +65 °C	
Ambient temperature	0 °C to +60 °C	
Degree of protection	IP 54 ²⁾	
Protection class	III	
CE conformity according to	EN 60730	
Casing	Material	Polyamide
	Colour	White
Connection line (Halogen-free)	Type	3 x 0.22 mm ² PVC
	Colour	White
	Length	1 m; 10 m
Weight with connection cable (1 m)	111 g	
Overvoltage strength according to EN 60730-1	1 kV	
1) or higher, depending on the adapter		
2) in all installation positions		

Dimensions

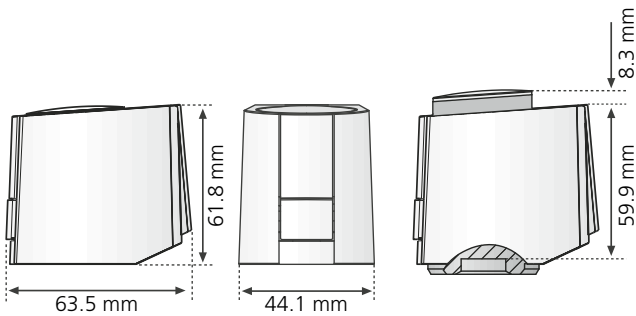


Figure 5. Dimensions, ACTUATOR 0-10V NC, 24V AC/DC

Specification

Valve actuator ACTUATOR -c -0-10V NC AC/DC -bb

Version:

Variant:
0-10 V NC

Type:
AC/DC

Cable:
L = 1 m
L = 10 m

Accessories

VA 41-adapter (included)

- ACTUATOR c ADAPTER T&A
- ACTUATOR c ADAPTER OVENTROP
- ACTUATOR c ADAPTER DIV1
- ACTUATOR c ADAPTER MMA
- ACTUATOR c ADAPTER RAV/L
- ACTUATOR c ADAPTER RAV
- ACTUATOR c ADAPTER RA

- CABLE ACTUATOR 0-10V 1M
- CABLE ACTUATOR 0-10V 10M