



ATS ACTUATORS

THERMAL ACTUATORS 5 Series

ATS Thermal Actuator: Proportional 0-10V

If not innovative... It's not ATS

ATS Thermal Actuator 5: Proportional 0-10 V

The ATS Actuator 5: Proportional 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 ATS Actuator of the 5th generation has been specially developed for the customer-specific use in ATS businesses. The modular structure offers diverse differentiation possibilities for customer-specific designs.



1.1 FEATURES

- ▶ Modern ATS design
- ▶ Travel path variants 4.0 mm
- ▶ Designs “normally closed” (NC)
- ▶ Power consumption of only 1 watt
- ▶ Control by a 0-10 V DC signal
- ▶ Optionally 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
- ▶ Optionally also as 24 V DC variant
- ▶ Certified by the TÜV

1.2 VARIANTS

The following variants are available in the basic versions.

Types	Stroke recognition	Operating voltage		Control voltage	Stroke	Closing force	Control direction	Average actuation delay
<i>APR 40405-00N</i>	no	24 V	AC	0 - 10 V	4.0 mm	100 N	NC	30 s/mm
<i>APR 40405-01N</i>	no	24 V	AC	2 - 10 V	4.0 mm	100 N	NC	30 s/mm
<i>APR 40405-02N</i>	no	24 V	AC	10 - 0 V	4.0 mm	100 N	NC	30 s/mm
<i>APR 42405-00N</i>	no	24 V	DC	0 - 10 V	4.0 mm	100 N	NC	30 s/mm

Scope of supply

- ▶ ATS Actuator 5: Proportional in individual packing
- ▶ 1 m connection line (plug-in), white PVC 3 x 0.22 mm²
- ▶ Installation instruction in 12 languages

Optional available extensions

- ▶ Line lengths Standard : 2 m, 3 m, 5 m, 10 m, 15 m; PVC in white - 3 x 0.22 mm²
(special lengths up to 20 m)
- ▶ Line lengths Non-halogen line: 1 m, 2 m, 3 m, 5 m, Hal F LiYY 3 x 0.22 mm² / white
For the compliance with fire protection and environmental regulations

Accessories

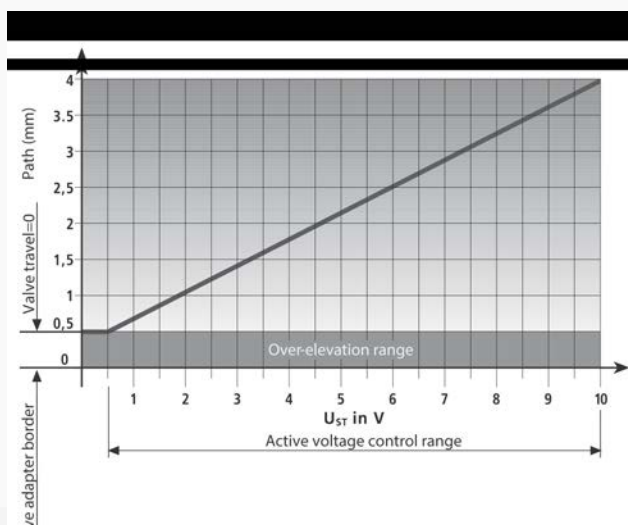
- ▶ A valve adapter suiting your application can be enclosed in the actuator packing
- ▶ Protection cap SK 1004

2.0 FUNCTION

The actuator mechanism of the ATS 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.

2.1 Version NC: Normally-closed without valve stroke recognition (valve closed)

For the design “normally closed”, the first open function is unlocked after the first application of the operating voltage of 24 V AC. Directly after that, the drive detects the valve closing point and switches to regular operation. This ensures an optimum match with the specific valve used.

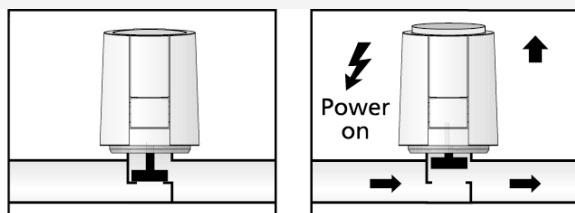


If a control voltage of 0.5 - 10 V DC is applied after the closing point detection; the drive opens the valve - after the dead time has elapsed- with the plunger movement, evenly and permanently corresponding to the valve travel.

An internal wear-free position detection controls the temperature required for the maximum stroke of 4 mm (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, the actuator remains in a quiescent state in order to ignore ripple voltage occurring in long cables (rpm). After the waiting time is elapsed, the valve is closed evenly with 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 closed when de-energised (NC).

2.2 Function Display

The function display (all around display) of the ATS 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.

2.3 “First Open” function

In its delivery condition, the ATS 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.

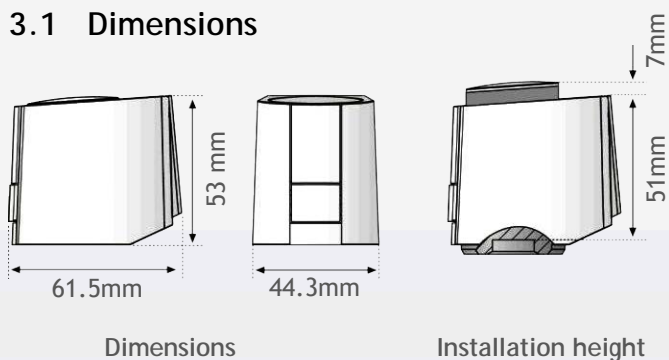
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3.0 TECHNICAL DATA_ MODEL APR 40405-00N

Voltage (according to variant)	24 V AC, -10 % ... +20 %, 50-60 Hz	
Control voltage range	0 V... 10 V (reverse polarity protected)	
Max. inrush current	< 320 mA for max. 2 min.	
Operating power	1 W ¹⁾	
Resistance of control voltage input	100 kΩ	
Stroke	4.0 (minus 0.5 mm over-elevation)	
Actuation force	100 N +5 %	
Fluid temperature	0 °C to +100 °C ²⁾	
Storage temperature	-25 °C to +60 °C	
Ambient temperature	0 °C to +60 °C	
Degree of protection	IP 54 ³⁾	
Protection Class	III	
CE conformity according to	EN 60730	
Casing	material	Polyamide
	colour	white
Connection line	type	3 x 0.22 mm ² PVC
	colour	white
	length	1 m
Weight with connection cable (1 m)	111 g	
Overvoltage strength according to EN 60730-1	1 kV	

- 1) measured with precision power meter LMG95
- 2) or higher, depending on the adapter
- 3) in all installation positions

3.1 Dimensions



3.2 Certificates

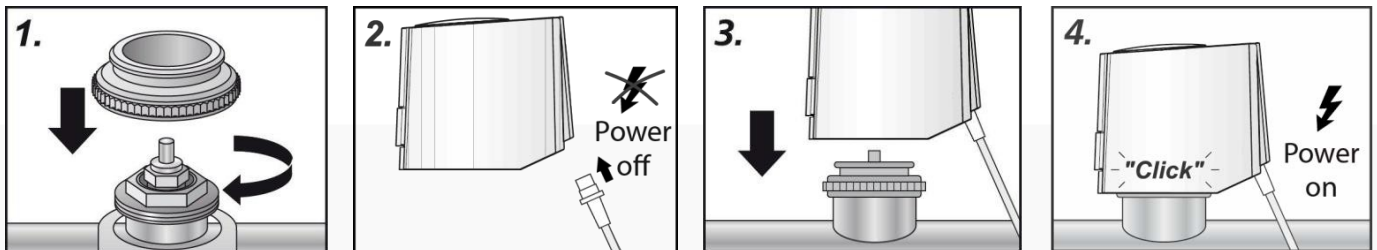


The ATS Actuator 5 is certified by TÜV Süd

4.0 INSTALLATION NOTES

4.1 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 ATS Actuator 5 is simply plugged on to the valve adapter previously installed manually.



Screw the valve adapter manually onto the valve.

Connect the line to the actuator.

Position the ATS Actuator manually in vertical position to the valve adapter.

Latch the ATS Actuator 5 to the valve adapter by manually applied vertical pressure until a clicking sound is heard.

4.2 Installation position



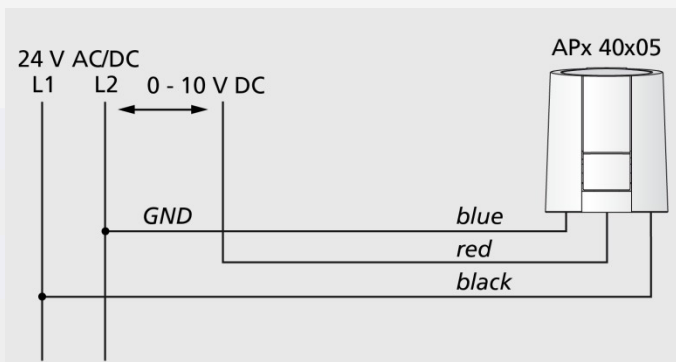
vertical

horizontal

"overhead"

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

4.3 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 ATS Actuators.

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

ATS Thermal Actuator: 230V Standard

If not innovative... It's not ATS

ATS Actuator 5: 230 V Standard

The ATS-Actuator 5: 230 V Standard is a thermoelectric valve drive for opening and closing valves on heating circuit distributors of concealed floor 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 ATS-Actuator 230 V is controlled by a 230 V room thermostat with two point output or pulse-width modulation.

The ATS-Actuator of the fifth generation has been developed especially for customer-specific usage in the ATS business. The modular design offers several possibilities for differentiations for tailor-made versions



1.1 FEATURES

- ▶ Modern ATS design
- ▶ Stroke variants 4.0 mm
- ▶ Normally closed (NC)
- ▶ Power consumption 1 watt
- ▶ Complete compatibility to Valve-Adapter-System
- ▶ Simple snap-on installation
- ▶ 360° installation position
- ▶ Patented 100% protection against leaky valves
- ▶ First-Open function (NC type only, optional)
- ▶ Adaptation check on valve
- ▶ Alignment aid on the valve
- ▶ Compact size, small dimensions
- ▶ All around function indicator
- ▶ Noiseless and maintenance-free
- ▶ High functional safety and long expected service life
- ▶ Surge protection guarantee
- ▶ Certified by TÜV

1.2 VARIANTS

The following variants are available in the basic versions.

Versions 230 V:	Stroke	actuating force	de-energized state	closing and opening time	"First-Open" function
A 20405-00N	4.0 mm	100 N	NC	~ 3.5 min	Yes
A 20405-10N	4.0 mm	100 N	NC	~ 3.5 min	No
A 21405-10N	4.0 mm	100 N	NO	~ 3.5 min	No

Scope of supply

- ▶ ATS Actuator 5: 230 V in single package
- ▶ 1 meter connecting cable, grey PVC H03VV 2 x 0.75 mm²
- ▶ Installation instruction in 12 languages

Optional available extensions

- ▶ Cable length : 2 m, 3 m, 5 m; PVC H03VV in grey - 2 x 0.75 mm²
- ▶ Line lengths Non-halogen line : 1 m, 2 m, 3 m, 5 m, Hal FH03Z1Z1 in white - 2 x 0.75 mm²
Compliance with fire protection and environmental regulations

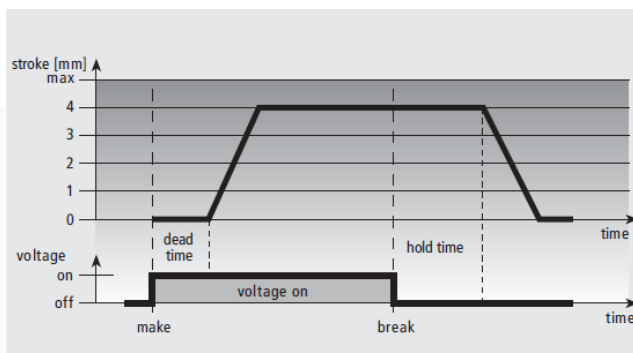
Accessories

- ▶ A valve adapter suiting your application can be enclosed in the actuator packing
- ▶ Protection cap SK 1004

2.0 FUNCTION

The actuator mechanism of the ATS-Actuator 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.

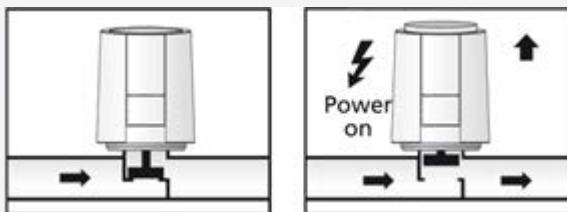
After the operating voltage is cut and after expiry of the hold time, the valve is closed evenly by the closing force of the compression spring.

The closing force of the compression spring is matched to the closing force of commercially available valves and keeps the valve normally closed.

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

2.2 Function Display

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



In NC version, an extended function display shows opening of the valve

2.3 First Open function (for NC nly)

In its delivery condition, the ATS-Actuator 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 ATS-Actuator will then be completely operable.

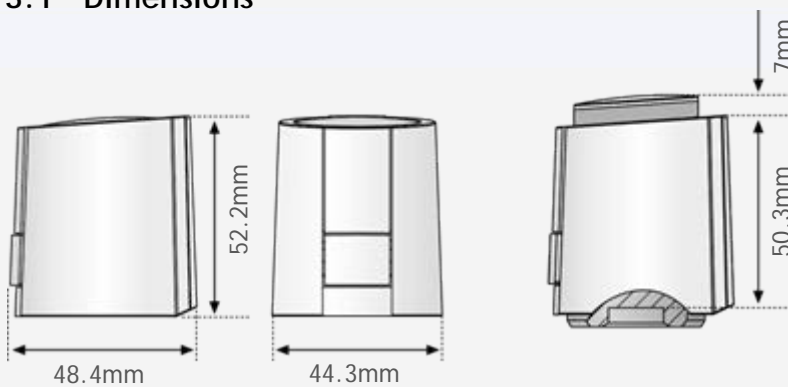
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3.0 TECHNICAL DATA_ *Model A20405-00N*

Operating voltage	230 V AC, +10%...-10%, 50/60 Hz
Max. inrush current	< 550 mA during 100 ms max.
Operating power	1 W ¹⁾
Stroke (actuator travel)	4.0
Actuating force	100 N +5 %
Fluid temperature	0 to +100°C ²⁾
Storage temperature	-25°C to +60°C
Ambient temperature	0 to +60°C
Degree of protection	II
Type of protection	IP 54 ³⁾
CE conformity according to	EN 60730
Housing material/housing colour	Polyamide / light grey (RAL 7035)
Connecting cable/colour	2 x 0.75 mm ² PVC / light grey (RAL 7035)
Cable length	1 m
Weight with connecting cable (1 meter)	100 g
Surge protection according to EN 60730-1	2.5 kV

- 1) measured with precision reference instrument LMG95
- 2) in dependence of the adapter even higher
- 3) in all installation positions

3.1 Dimensions



Dimensions

Installation height

3.2 Certificates

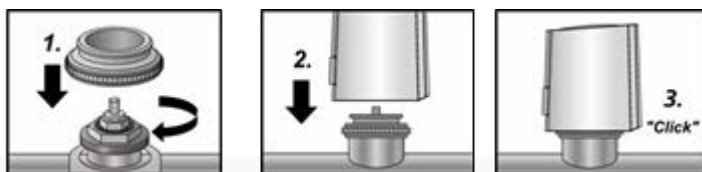


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4.0 INSTALLATION NOTES

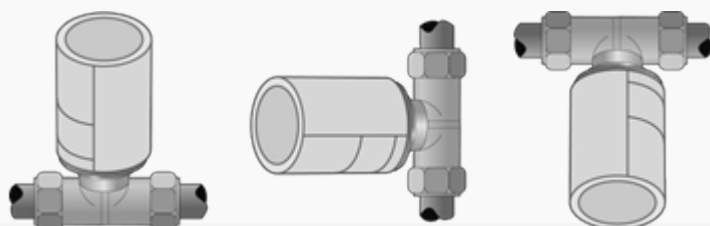
4.1 Installation with valve adapter

The wide selection of valve adapters guarantees a perfect match of the ATS-Actuator to almost any valve bottom or manifold available on the market. Simply snap-on the ATS-Actuator to the manually pre-installed valve adapter.



- ▶ First the valve adapter is screwed on the valve manually
- ▶ The ATS-Actuator is placed vertically on the valve adapter.
- ▶ The ATS-Actuator snaps onto the valve adapter with a "click" when pressed down vertically by hand

4.2 Installation position



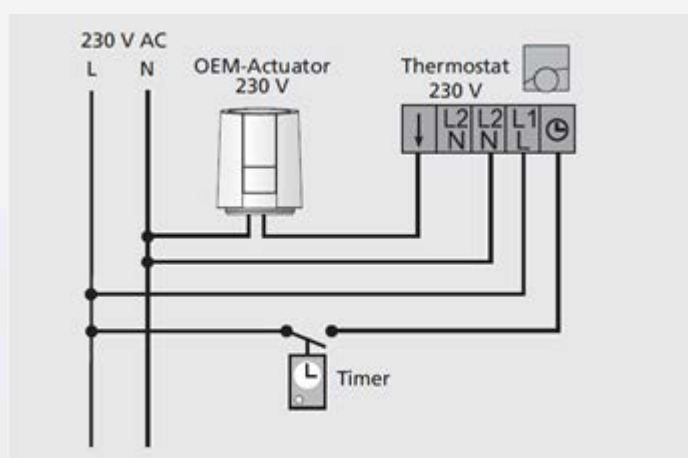
Vertical

Horizontal

Upside Down

Preferred installation position of the ATS- Actuator is vertical or horizontal. An upside down position may reduce product life through special circumstances (e.g. contaminated water)

4.3 Electric connection



Cable

We recommend usage of the following lines for installing a 230 V system:

Light plastic-sheathed cable	NYM	1.5 mm ²
Flat webbed building wire	NYIF	1.5 mm ²

ATS Thermal Actuator: 24V Standard

If not innovative... It's not ATS

ATS Actuator 5: 24 V Standard

The ATS Actuator 5: 24 V Standard is a thermoelectric actuator for opening and closing valves and small valves on heating circuit distributors of surface heating and cooling systems. The predominant area of application is the energy-efficient room-by-room temperature control in the area of building services and automation. The ATS Actuator 24 V Standard is controlled by a 24 V room thermostat with two-point output or pulse-width modulation.

The ATS Actuator of the 5th generation has been specially developed for the customer-specific use in ATS businesses. The modular structure offers diverse differentiation possibilities for customer-specific designs.



1.1 FEATURES

- ▶ Modern ATS design
- ▶ Travel path variants 4.0 mm
- ▶ Designs "normally closed" (NC)
- ▶ Power consumption 1 watt
- ▶ 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
- ▶ 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

1.2 VARIANTS

The following variants are available in the basic versions.

24 V types	Stroke	Closing force	Control direction	closing and opening time	"First-Open" function
A 40405-00N	4.0 mm	100 N	NC	Approx. 3.5 min	Yes
A 40405-10N	4.0 mm	100 N	NC	Approx. 3.5 min	No
A 41405-10N	4.0 mm	100 N	NO	Approx. 3.5 min	No

Scope of supply

- ▶ ATS Actuator 5: 24 V in individual packaging
- ▶ 1 meter connection line, grey PVC H03VV 2 x 0.75 mm²
- ▶ Installation instruction in 12 languages

Optional available extensions

- ▶ Cable length standard : 2 m, 3 m, 5 m; PVC H03VV in grey - 2 x 0.75 mm²
(special lengths shorter than 25m)
- ▶ Line lengths Non-halogen line : 1 m, 2 m, 3 m, 5 m, Hal F H03Z1Z1 in white - 2 x 0.75 mm²
Compliance with fire protection and environmental regulations

Accessories

- ▶ A valve adapter suiting your application can be enclosed in the actuator packing
- ▶ Protection cap SK 1004

2.0 FUNCTION

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

2.1 Version NC: Normally-Closed (valve closed)

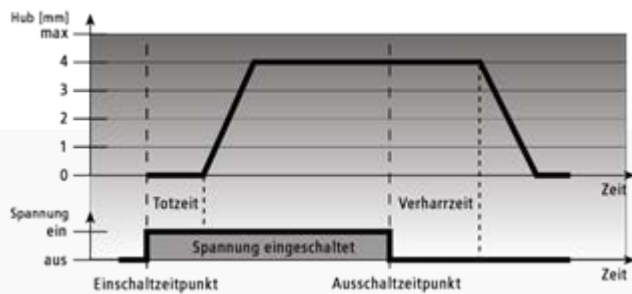


Fig.: Example with respect to the travel path of 4 mm
The characteristic curve of the travel path of 5 mm is the result.

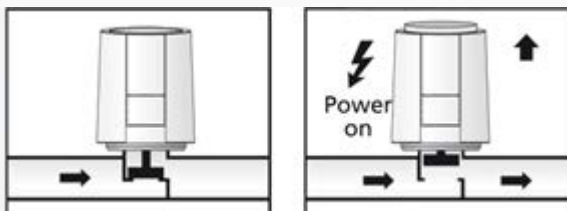
In case of the normally closed version, the valve is opened steadily by the plunger motion upon switching on the operating voltage and after expiry of the dead time.

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 closed when de-energised.

2.2 Function Display

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



For the version NC: Normally closed extracts the function display when the valve opens.

2.3 "First Open" function (for NC variants only)

In its delivery condition, the ATS 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.

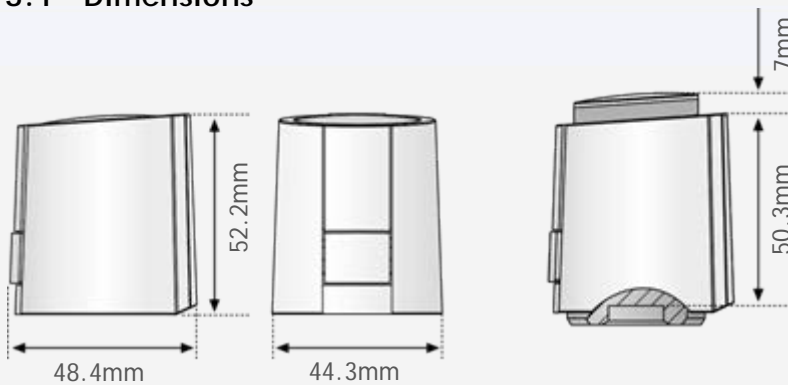
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3.0 TECHNICAL DATA _Model A40405-00N

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 mm
Actuating force	100 N +5 %
Fluid temperature	0 to +100°C ²⁾
Storage temperature	-25°C to +60°C
Ambient temperature	0 to +60°C
Protection class	III
Degree of protection	IP 54 ³⁾
CE conformity according to	EN 60730
Housing material/housing colour	Polyamide / light grey (RAL 7035)
Connecting cable/colour	2 x 0.75 mm ² PVC / Light grey (RAL 7035)
Cable length	1 m
Weight with connecting cable (1 meter)	100 g
Surge protection according to EN 60730-1	2.5 kV

- 1) measured with precision reference instrument LMG95
- 2) in dependence of the adapter even higher
- 3) in all installation positions

3.1 Dimensions



Dimensions

Installation height

3.2 Certificates

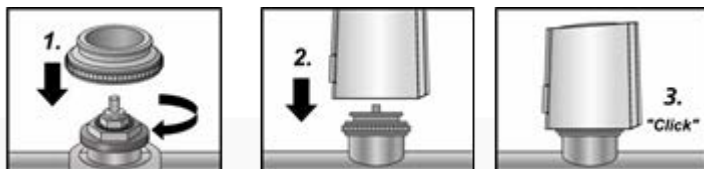


The ATS Actuator 5 is certified by TÜV Süd

4.0 INSTALLATION NOTES

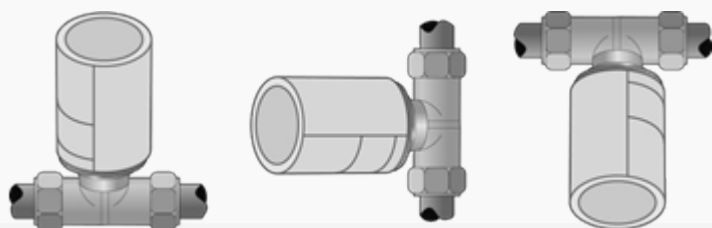
4.1 Installation with valve adapter

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 ATS Actuator 5 is simply plugged on to the valve adapter previously installed manually.



- ▶ Screw the valve adapter manually onto the valve.
- ▶ Position the ATS Actuator manually in vertical position to the valve adapter.
- ▶ Latch the ATS Actuator 5 to the valve adapter by manually applied vertical pressure until a clicking sound is heard.

4.2 Installation position



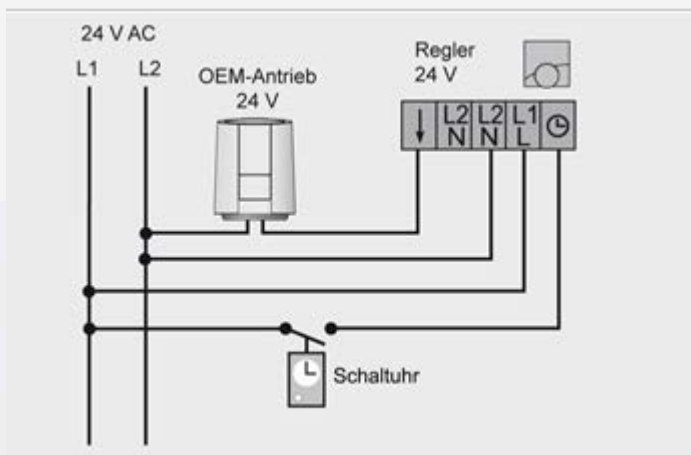
Vertical

Horizontal

"overhead"

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

4.3 Electric connection



Cable

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

Cable	Section	Length
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 61558-2-16 (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 ATS Actuators.

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