

AXT 301: Thermal actuator for unit valves with stroke indicator

Improving energy efficiency

Reliable actuation in efficient control systems

Features

- Actuation of underfloor heating collectors and conventional unit valves from other manufacturers
- For controllers with a switching output, 2-point control or quasi-continuous control with a "pulse pause" signal, in conjunction with single-room control systems
- Easily attached to the valve by means of adaptor ring
- Fitted onto valve via plastic adaptor M30 x 1.5 or M28 x 1.5
- Pushing force max. 100 N
- With 230 V or 24 V thermal expansion element
- Large tangible and visible position indicator
- NC "normally closed" and NO "normally open" versions
- Silent and maintenance-free
- Connection cable white, without plug for the electric connection
- Contemporary design
- Version with integrated auxiliary contacts, with potential-free contacts
- Warm-up time for max. 4 mm stroke at 21 °C: min. 4 min (230 V or 24 V)
- Fitting in any position, including upside down



AXT301K***



Technical data

Power supply		
Power supply 230 V~		±15% 50...60 Hz
Power supply 24 V~/=		±20% 50...60 Hz
Power consumption during operation	1 W	
Start-up current 230 V~	550 mA for max. 100 ms	
Start-up current 24V~/=	300 mA for max. 2 min	
Power for auxiliary contacts 230 V	5(1) A, 50/60 Hz	
Power for auxiliary contacts 24 V	3(1) A, 50/60 Hz	
Switching point	For approx. 2 mm stroke	
Parameters		
Stroke	3.5 mm	
Closing force	100 N ±5%	
Running time	4.0 min	
Ambient conditions		
Admissible ambient temperature	0...60 °C	
Storage and transport temperature	-25...70 °C	
Operating temperature at valve	Max. 100 °C	
Humidity without condensation	< 85% rh	
Construction		
Housing	Pure white (RAL 9010), surface structured according to VDI 2400/7 (fire protection as per EN 60695-2-11, EN 60695-10-2)	
Housing material	Flame-retardant plastic	
Power cable	Standard length 1 m, H03..., made of PVC, Ø 0.75 mm ² , white	
Standards and directives		
Type of protection	IP 54	
Protection class 230 V	II (EN 60730-1)	
Protection class 24 V	III (EN 60730-1)	
CE conformity as per	Low-voltage directive 2006/95/EC	EN 60730-1, EN 60730-2, EN 60730-14

Overview of types

Type	Voltage	NC/NO	Weight
AXT301K110	230 V	NC	0.13 kg
AXT301K112	24 V	NC	0.13 kg
AXT301K210	230 V	NO	0.13 kg
AXT301K212	24 V	NO	0.13 kg
AXT301HK110	230 V	NC	0.19 kg
AXT301HK112	24 V	NC	0.19 kg

💡 AXT301K***: White version, including M30 × 1.5 adapter ring and for closing dimension 10.5 mm, cable 1 m, pack of one

💡 AXT301HK11*: White version, with auxiliary contacts, including M30 × 1.5 adapter ring and for closing dimension 10.5 mm, cable 1 m, pack of one

Accessories

i Adaptor set: The name of the manufacturer is only provided for information purposes. The closing dimension can be changed at any time. For this purpose we require a sample in order to measure the closing dimension and specify which adaptor is correct. Other adaptors are also available. You can also use thermal actuator AXT 201 with automatic adaptation of the closing dimension.

Type	Description
0550389K001	Adaptor, light-grey, set of 5 pcs., closing dimension 11 mm, for manufacturers: Dumser, Beulco (from 2005), Purmo, Strawa, Oventrop (also Cocon, Cocon 4, Hycocon, Oventrop stainless steel distributor, Vesca (Metaplast), Cronatherm, eht Siegmund, Gampper, KaMo (H) before Sept. 2005, Aquatherm (brass distributor), Valvex brass distributor, Viega stainless steel distributor (Fonterra & pro Radiant), Thermotech, KaMo INOX distributor, Bianchi valves (series 401T & 403T) and brass distributor (series 332T), Unipipe (ECO distributor), CronaTech, Fränkische, Zehnder, ATS stainless steel distributor, Frese Optima (2.5 mm), Hesag / Herb (Profi-Line distributor), Luxor (CD distributor), TECE stainless steel (Strawa), Watts brass distributor (HKV-T), Tiemme valves, Watts (Vogel & Noot, Cosmo Objektline), Acome (Strawa), Multibeton HKV (Oventrop)
0550389K002	Adaptor, red, set of 5 pcs., closing dimension 8.25 mm for manufacturers: Polytherm (H), Buderus, Thermoal, KAN-Therm (brass distributor)
0550389K003	Adaptor, dusty grey, set of 5 pcs., closing dimension 11.5 mm for manufacturer: MMA (EDVH 25, FVXR 15, VXR 20), ICMA (BAS), industry technology Italy (DB VZ2)
0550389K103	Adaptor like 0550389K003, set of 100 pcs.
0550389K004	Adaptor, dusty grey, set of 5 pcs., closing dimension 4 mm for manufacturers: Giacomini
0550389K005	Adaptor, dark grey, set of 5 pcs., closing dimension 10 mm for manufacturers: Honeywell & Braukmann, Broen (type: Ballorex Dynamic), Böhnisch/SBK (before 1998), Cazzaniga, Reich, MNG (before 1998), Frese, Schütz, Seppelfricke, Cufix, KaMo (from Sept. 2005), FAR (from 2007), Pantherm, Unicor, emcal (stainless steel from March 2013), Comap HKV module, black (H)
0550389K006	Adaptor, pure white, set of 5 pcs., closing dimension 17.8 mm for manufacturers: Pettinaroli
0550389K106	Adaptor like 0550389K006, set of 100 pcs.
0550389K007	Adaptor, pure white, set of 5 pcs., closing dimension 28.8 mm for manufacturer: Danfoss RA, Oventrop type: V3D, GD & GDF), Jaga
0550389K008	Adaptor, pure white, set of 5 pcs., closing dimension 10.5 mm for manufacturer: Heimeier, Herb, Onda, IVAR, Thermoal, Schlösser (from 1993), Kermi, Cazzaniga, Oventrop, Multiblock (from 1997), Frank (from 2003), Athe-Therm (brass up to Feb. 2005), Athe-Therm (stainless steel), BHS distributor, Jupiter, Böhnisch/SBK (from 1998), Simplex, RBM, Emmeti, Cosmo, Watts, Roth, Delphis-Therm, GC distributor, Cuprotherm, Caleffi distributor series 670 (plastic), Wieland, Caleffi, SKV distributor, Aquatechnik Italy (Multirapid, before 2007, from 2009), Brugman, TKM, Bianchi, Jaga, Gomacal, Nereus angle valve DN 10, Strasshofer, Taco (Vogel & Noot, Cosmo stainless steel and CMV module distributor), Caleffi (with thread ring on manufacturer side), Watts, Voogel & Noot (Cosmo brass distributor), RDZ (brass distributor), VIR (series 9520), Herz regulating valve and distributor
0550389K108	Adaptor like 0550389K008, set of 100 pcs.
0550389K009	Adaptor, dusty grey, set of 5 pcs., closing dimension 11.5 mm for manufacturer: Chemidro, TECE (plastic distributor), KWH Pipe, Prandelli (brass HKV), Athe-Therm (brass from Feb. 2005), Roth DE (H) (type: Universal HK2), Uponor stainless steel distributor, Reliance stainless steel, SAS brass distributor, Luxor, Tiemme brass distributor (series: 'Floor'), Honeywell VSMF, Afriso pro Calida EF1 (plastic)
0550389K109	Adaptor like 0550389K009, set of 100 pcs.

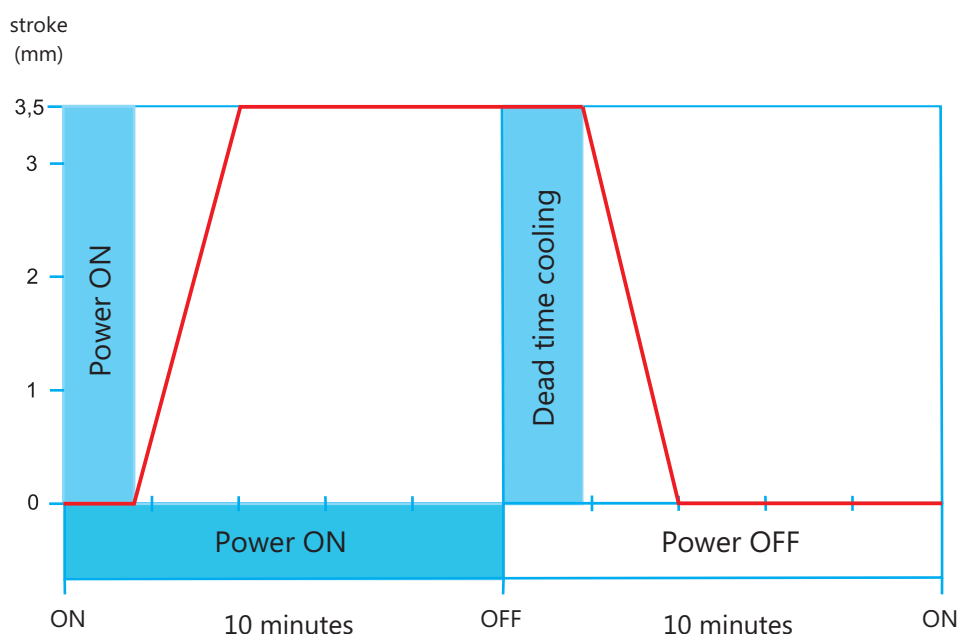
Description of operation

Actuation of underfloor heating collectors, VUT and BUT unit valves and conventional unit valves from other manufacturers. For controllers with a switching output, 2-point control or quasi-continuous control with a "pulse pause" signal, in conjunction with single-room control systems.

The actuator has an electrically heated expansion element which transfers its stroke directly to the attached valve. It operates noiselessly and is maintenance-free. If the heating element is turned on when it is cold (ambient temperature approx. 21 °C), the valve begins opening after a warming-up time of approx. 1 min (230 V and 24 V versions), and after an additional period of approx. 3 min (230 V and 24 V), the valve has carried out a stroke of 3.5 mm. When the heating element is turned off, the expansion element cools and the valve is closed by spring force.

With a "pulse-pause" signal that causes a periodic OPEN or CLOSE position, quasi-continuous control is possible.

Runtime behaviour with a switch cycle of 10 min; ambient temperature approx. 25 °C



The thermal SAUTER actuators are suitable for efficient controlling of inert systems such as panel heating and cooling systems or thermo-active building system (TABS), and with medium-inertia systems such as radiators or chilled beams. With the proper control strategy, the actuators contribute to energy savings.

Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product documents must also be adhered to. Changing or converting the product is not admissible.

Version

The version of the thermal actuator with integrated auxiliary contacts can be connected to a circulation pump, for example. The auxiliary contacts switch on at a stroke of approx. 2 mm. The switching capacity of these auxiliary contacts in the 230 V version is 5 A for a resistive load and 1 A for an inductive load, and in the 24 V version it is 3 A for a resistive load and 1 A for an inductive load. The switch rating for DC is: 4...30 V, 1...100 mA, 1 A, 48 V=.

The electrical circuits on the auxiliary contacts and the actuator must come from the same phase. It is not admissible to operate different electrical circuits on this cable, such as extra low voltage and low voltage.

When the actuator opens, the internal contact is closed.

Control with thermal actuator

Controller type

For control with AXT3, there are two basic options: quasi-continuous and discontinuous control (on/off controller). The quasi-continuous controller can always be used if the section has linear behaviour, as

is usually the case with room temperature control. The control performance using a quasi-continuous controller is better than with a discontinuous controller.

Discontinuous controllers (2-point) are recommended for control of non-linear sections.

Continuous control is not possible with AXT3 actuators; AXS 215S actuators are provided for this purpose.

Position control

With a controller it cannot be assumed that the AXT3 actuator can be moved to any position. Only the "extended" and "retracted" actuator positions are ensured with a controller. This is why this actuator is known as a 2-point actuator.

Energy limiter

The power consumption of the heating element of the AXT3 is limited to 1 W after a specific switch-on time. For the 230 V version this is after 100 ms, and for the 24 V version after 2 minutes.

Definition of NC/NO

NC version "normally closed"

After the actuator is fitted, the valves on the hydraulic distributor are closed in the idle state. When voltage is applied to the actuator, the actuator spindle retracts and the valve spindle extends. The valve is opened.

Valve state with actuator without power: Closed.

NO version "normally open"

After the actuator is fitted, the valves on the hydraulic distributor are open in the idle state. When voltage is applied to the actuator, the actuator spindle extends and pushes the valve spindle. The valve is closed.

Valve state with actuator without power: Open.

Definition of the closing dimension

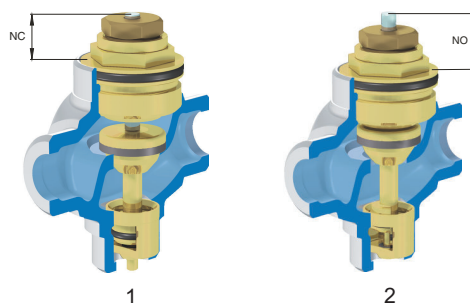
NC version "normally closed"

The closing dimension of a valve is the distance between the front surface of the spindle, pressed in with a preloading of < 100 N and the contact surface of the lower thread. The adaptor rests on this surface.

NO version "normally open"

The closing dimension of a valve is the distance between the front surface of the spindle when it is not pressed in and the contact surface of the lower thread. The adaptor rests on this surface.

Cross-section of the unit valve



1: Fig. NC valve

2: Fig. NO valve

Notes on engineering and installation

When selecting the switching contacts and the mains fuses, the start-up current of the heating element must be considered. To comply with the specified technical data, the voltage loss due to the electric lines must not exceed 10%.

The BU wire (light blue) must not be switched and must be connected to the neutral wire locally. The controller must always switch the BN wire.

Fitting

The actuator is fitted to the valve without force by attaching the actuator to the adaptor. First the adaptor must be screwed onto the valve and tightened by hand (approx. 2 Nm).

The actuator is normally open when it is new. The actuator can be attached easily, and the valve of the heating circuit distributor is open. This enables the heating mode even if the electric wiring is not completed yet. During the start-up, the actuator is automatically unlocked, and therefore made operational. by connecting the voltage for more than 5 minutes. When an actuator is unlocked and detach-

ed from the valve, during the fitting you must make sure that the actuator is attached correctly and not crookedly.

Position indicator

The knob in the cover is the biggest possible position indicator. It is clearly visible from all positions and can be felt in the dark. In the “normally closed” version, the cover rises and the grey indicator on the lifting part becomes visible. When fully raised, the cover is up to 5 mm above the top edge of the cover.

With the “normally open” model, the knob lowers in the cover until it is level with the top of the cover. The grey indicator is no longer visible.

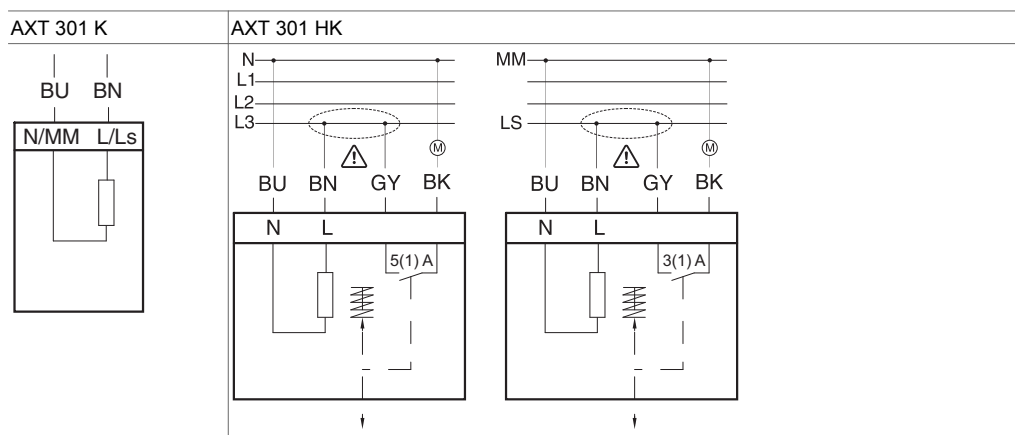
Additional information

Fitting instructions	P100013787
Declaration on materials and the environment	MD 55.102

Disposal

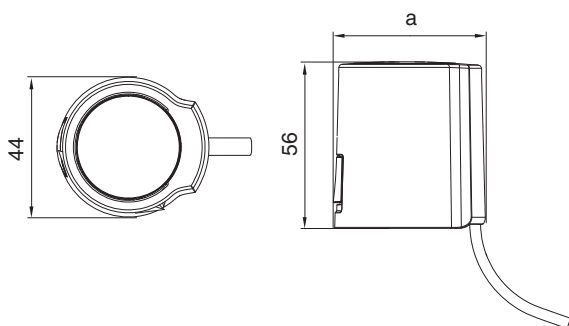
When disposing of the product, observe the currently applicable local laws. More information on materials can be found in the Declaration on materials and the environment for this product.

Wiring diagram



BU = blue
 BN = brown
 GY = grey
 BK = black

Dimension drawing



a: 48 mm for AXT 301 K
 a: 56 mm for AXT 301 HK