SIEMENS

4877

Thermal actuators

for radiator valves, small valves and zone valves

STA21...
STA71...

- **STA21... AC 230 V operating voltage, 2-position control signal**
- **STA71... AC/DC 24 V operating voltage, 2-position control signal or PDM (pulse-duration modulation)**
- **Positioning force 105 N**
- **For direct mounting with union nut (no tools required)**
- **Standard versions with 1.2 m or 5 m connecting cables**
- **Two-wire connection**
- **Position indication**
- **Robust construction, quiet operation, no maintenance required**
- **Optional tamper-proof fitting to prevent dismantling**

Application

2-position control of heating systems, chilled ceilings and terminal units

- For Siemens radiator valve types VDN…, VEN… and VUN…
- For Siemens MiniCombiValves (MCV) VPD… and VPE…
- For Siemens small valves VD1…CLC
- For Siemens zone valves V…I46… and V…S46…
- For valves, radiator valves and distributors from other manufacturers

- DESIGO RX… controllers: Use STA72E – Data sheet N4875

Type summary

Type	Operating voltage	Positioning time at 20 °C	Positioning signal	Connecting cable
STA21	AC 230 V	3 min	2-position	1.2 m
STA21/50				5.0 m
STA71	AC /DC 24 V		2-position, PDM [1]	1.2 m
STA71/50				5.0 m

[1] pulse-duration modulation

Accessories

Adapter type	For valve makes	Adapter type	For valve makes
AV51	Beulco old (M30x1.0)	**AV56**	Giacomini
AV52	Comap	**AV57**	Herz
AV53	Danfoss RA-N (RA2000)	**AV58**	Oventrop old (M30 x 1.0)
AV54	Danfoss RAVL	**AV59**	Vaillant
AV55	Danfoss RAV	**AV60**	TA [1]
		AV61	Markaryd

[1] No adapter required for type TBV-C.

Type	Description
AL41	Tamper-proof fitting to prevent dismantling of actuators

Ordering

When ordering please specify the quantity, product name and type code.

Example: 1 actuator, type STA21 with 1.2 m cable and
1 adapter, type AV53

Delivery: The valves, actuators and accessories are supplied in separate packages.

Equipment combinations

Valve type	Description	k_{vs} [m^3/h]	$\dot{V}$ [l/h]	PN class	Data sheet
VDN..., VEN..., VUN...	Radiator valves	0.09...1.41		PN 10	N2105, N2106
VPD..., VPE...	MCV radiator valves		25…483		N2185
VD1…CLC	Small valves	0.25…2.6			N2103
V…I46, V…S46…	Zone valves	2…5		PN 16	N4842

Radiator valves (M30 x 1.5) from other manufacturers, without adapter:

- Heimeier
- Cazzaniga
- Oventrop M30 x 1.5 (from 2001)
- Honeywell-Braukmann
- MNG
- TA-type TBV-C
- Junkers
- Beulco new

For other radiator valves, with type AV… adapters, see «Type summary / Accessories»

k_{vs} = Nominal flow rate of cold water (5 to 30 °C) through the fully opened valve (H_{100}) at a differential pressure of 100kPa (1bar).

$\dot{V}$ = Volumetric flow at a stroke of 0.5 mm

Technical note

NO, NC valves

NO valves	• Valve is open without actuator (normally open). • Valve stem is extended. • Radiator valves like VDN…, VEN…, VUN…, VPD… or VPE… are usually NO valves.
NC valves	• Valve is closed without actuator (normally closed). • Valve stem is extended. • Small valves like V…P47… are usually NC valves.

Valve and actuator combinations

NO function	• STA … actuator stem is extended, when de-energized. • NC valve is required.
NC function	• STA … actuator stem is extended, when de-energized. • NO valve is required.

Application note

		STA…	STP…
		Actuator de-energized	
Radiator valves	• VDN…, VEN…, VUN… • VPD…, VPE…	closed	open [1]
Small valves	• V…P47…	A ↔ AB open [1]	A ↔ AB closed
	• VD1…CLC	closed	open [1]
Zone valves	• V…I46…, V…S46…	AB ↔ A closed	AB ↔ A open [1]

[1] Not applicable with DESIGO RX…

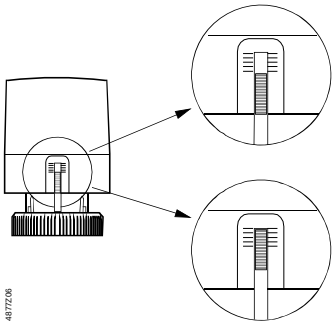
Technical and mechanical design

Function

When the control signal is applied to the actuator, the temperature of the heating element rises, which causes the solid expansion medium to expand. This expansion is converted into a linear movement, causing the actuator stem to retract. The valve is opened by the force of the spring. When the actuator is de-energized, the actuator stem is extended and the valve closes. The STA21… and STA71… thermal actuators have no rotating parts. Consequently, they operate quietly and are not subject to wear.

Position indication

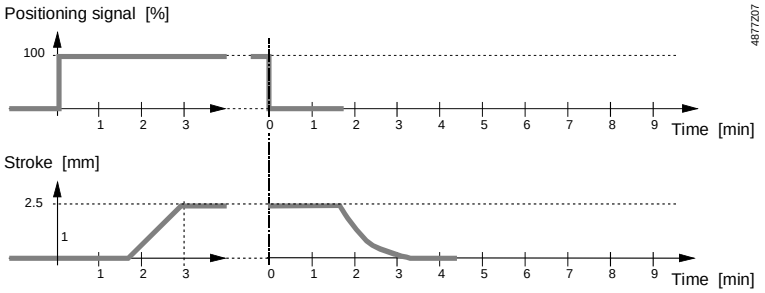
The valve position is indicated by a blue bar which moves up and down the actuator stem.



Actuator is de-energized
- The actuator stem is extended
- The radiator valve is closed

Actuator has been connected to the power supply for at least three minutes.
- The actuator stem is retracted
- The radiator valve is open

Positioning times opening / closing



at 20° C ambient temperature

The positioning time depends on the voltage and the ambient temperature.
Duty cycle of the control signal is 100 %

⚠ **Warning**

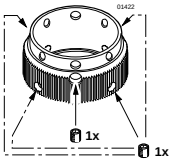
Some controllers drive the valve actuators with pulsed signals. Due to this, the response time increases. For optimal control, the ambient temperature of the actuator must be < 40°C.

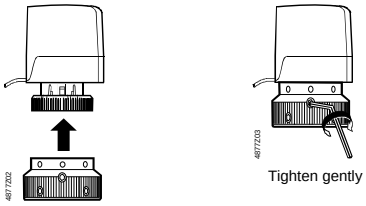
Accessories

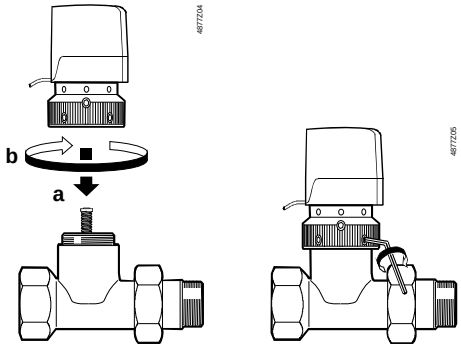
Adapter type AV… for third-party valves

Adapter types AV51 to AV61 are available for mounting the STA… actuators on third-party radiator valves as shown under «Type summary / Accessories», page 2.

Tamper-proof fitting AL41







Mounting and installation notes

Mounting instructions are printed on the plastic packaging.

The STA… actuator and valve are delivered as separate units. They are easy to assemble on site shortly before commissioning:

- Remove the protective cover from the valve body
- Put the actuator in position and tighten the union nut manually.

⚠ **Warning**

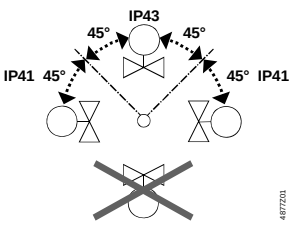
Do not use pipe wrenches, spanners or similar!

- The plastic packaging can be used as a temporary cover for protection from dust etc.

Orientation

⚠ **Warning**

The actuators must be installed only in a position from upright to horizontal. Under no circumstances must the actuator be suspended below the horizontal.



Notes on electrical installation

- Installation must be carried out in compliance with local installation regulations.
- The cable must be connected downwards so that it leads away from the bottom.
- A means of isolation from the power supply must be provided, for example by connecting an automatic circuit breaker or switch fuse upstream of the control unit.

Maintenance

The actuator is maintenance-free.

Repair

The connecting cable must not be replaced by any other cable. Opening the actuator can cause it irreparable damage. The actuator cannot be repaired, it must be replaced as a complete unit.

Disposal

The device must not be disposed of as domestic waste.
Legislation may demand special handling of certain components, or it may be sensible from an ecological point of view.
Current local legislation must be observed.

Warranty

The technical data given for these applications is valid only for valves used in conjunction with the Siemens and third-party actuators listed under «Equipment combinations», page 2.
If the STA… actuators are used with other valves, then the user is responsible for ensuring correct functioning and all claims under Siemens Switzerland Ltd / HVAC Products warranty are invalidated.

Technical data

		STA21, STA21/50	STA71, STA71/50
Power supply	Operating voltage	AC 230 V, 50...60 Hz	Low voltage [1] AC 24 V, 50...60 Hz or DC 24 V
	Voltage tolerance	± 15 %	± 20 %
	Power consumption Operation	2.5 W	2.5 W
	On power-up	58 VA	6 VA
	Switch-on current (transient)	250 mA	
	Primary fuse	external	
Control	Positioning signal	2-position	2-position PDM (pulse-duration modulation)
Operating data	Positioning time at 20 °C	3 min	
	Nominal stroke	2.5 mm	
	Positioning force	105 N -4/+20 %	
	Permissible temperature of medium in the connected valve	1…110 °C	
	Actuator de-energized	Actuator stem extended	
	Radiator valves VDN…, VEN…, VUN…	closed	
	MCV radiator valves VPD…, VPE…	closed	
	Small valves VD1…CLC	closed	
	Small valves V…P47	A ↔ AB open	
	Zone valves V…I46…, V…S46…	AB ↔ A closed	
	Maintenance	No maintenance required	
Electrical connection	Connecting cable (integral)	Stranded conductor / 2 x 0.75 mm^2	
	Cable length STA...	1.2 m	
	STA.../50	5.0 m	
Mounting	Fixing on valve	Union nut, M30 x 1.5	
	Orientation	Upright to horizontal; do not suspend	
Use		Suitable for indoor use	
Norms and standards	Meets requirements for CE marking:EMC directive	2004/108/EC	
	Immunity	EN 61000-6-1 Residential	
	Emission	EN 61000-6-3 Residential	
	Low voltage directive	2006/95/EC	
	Electrical safety	SELV-E (PELV to IEC364-4-41)	
	Protection class to EN 60730	Class II	Class III
	Contamination level to EN 60730	Class 2	
	Protection standard		
	Mounted upright ± 45°	IP 43 to EN 60529	
	Mounted between upright and horizontal	IP 41 to EN 60529	
	Environmental compatibility	ISO 14001 (Environment)	
		ISO 9001 (Quality)	
		SN 36350 (Environmentally compatible products)	
		RL 2002/95/EG (RoHS)	
Dimensions / Weight	Dimensions	See «Dimensions», page 7	
	Weight	0.15 kg (1.2 m)	
		0.29 kg (5 m)	
Materials	Cover and base	Polycarbonate	

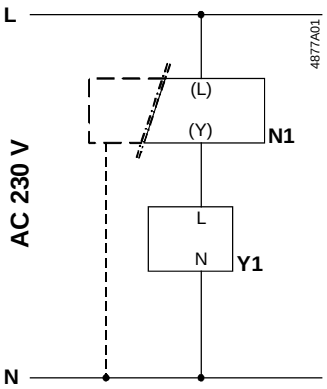
[1] Only admissible with extra low voltage (SELV or PELV)

General environmental conditions

	Operation EN 60721-3-3	Transport EN 60721-3-2	Storage EN 60721-3-1
Temperature	+5...+50 °C	–20...+60 °C	+5...+50 °C
Humidity	5…85 % r.h.	5…95 % r.h.	5… 95 % r.h.

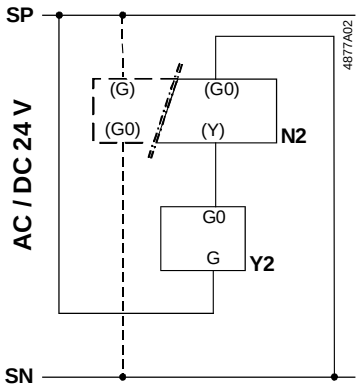
Connection diagrams

STA21, STA21/50



Y	Positioning signal
N1	Controller
Y1	Actuator
L	System potential AC 230 V
N	System neutral

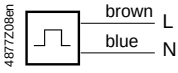
STA71, STA71/50



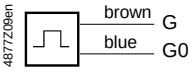
Y	Positioning signal
N2	Controller
Y2	Actuator
SP, G	System potential AC / DC 24 V
SN, G0	System neutral

Connecting cable

STA21, STA21/50



STA71, STA71/50



Dimensions

Dimensions in mm