SIEMENS

Smart valve actuator

SSA911.01TH

Wireless radiator valve actuator, works with RDS110.R

- RF-controlled actuator communication based on THREAD protocol (2.4 GHz, bidirectional)
- Connection and operation with RDS110.R and optionally RCR114.1
- Battery-powered by commercially available 1.5 V AA batteries
- Valve thread connection M30x1.5 mm
- Nominal stroke 2.5 mm
- Valve positioning force 90 N
- Automatic adaptation to valve
- Integrated temperature sensor and PI controller

- The SSA911.01TH wireless radiator valve actuator is designed to work on radiator valves of different manufacturers in HVAC applications using M30x1.5 thread. It operates the valve to control the water flow and controls the room temperature.
- The valve actuator works only in combination with Siemens Smart Thermostat RDS110.R and optionally with wireless repeater RCR114.1.
- One RDS110.R can be paired with up to 6 radiator valve actuators in parallel. Up to 3 wireless repeaters RCR114.1 can be used to extend the range of the network.
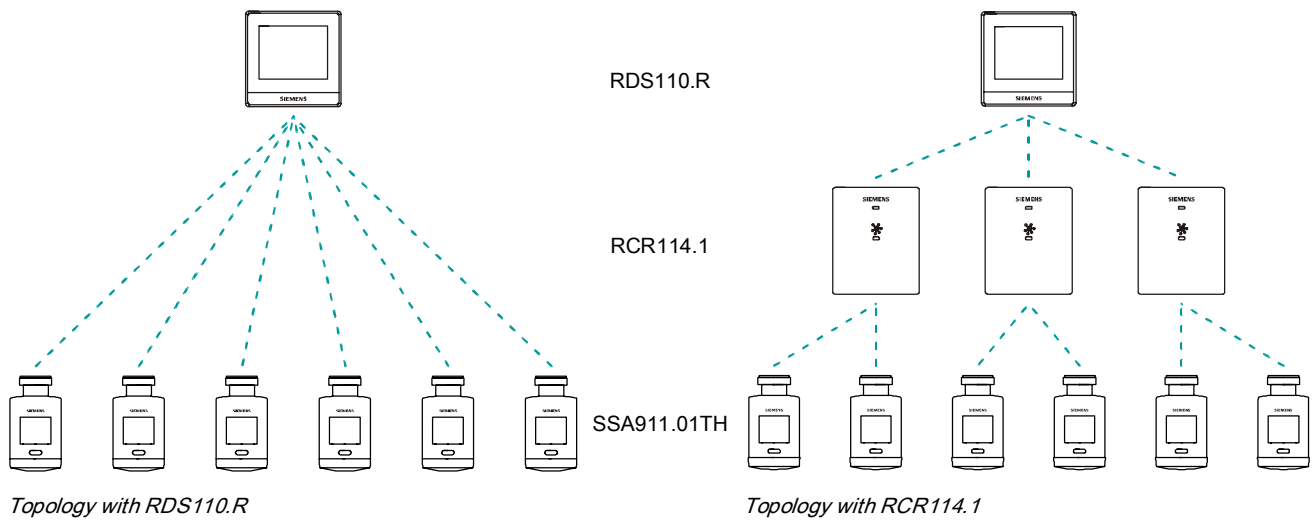
| Smart Thermostat RDS (Application) | RDS110.R | SSA911.01TH | RCR114.1 |

Topology with RDS110.R

Topology with RCR114.1

RDS110.R

RCR114.1

SSA911.01TH

Function	Description
Communication	The communication protocol used is THREAD. THREAD is a low-power wireless mesh networking protocol and enables device-to-device and device-to-cloud communication. THREAD is based on IEEE 802.15.4 radio standard.
Parallel operation	Up to 6 actuators can be paired and operated with 1 RDS110.R or RCR114.1
Pairing	The pairing process must be started on the Smart Thermostat and via HMI on the SSA911.01TH
Calibration	At first start-up, the SSA911.01TH automatically detects the end positions of the radiator valve and calculates the available stroke. The actuator uses this information for positioning between 0 and 100 %
Displaying status information	Actuator status information is indicated on the display • Setpoint temperature • Connection to Smart Thermostat • Radio signal strength • Battery status (only active when the battery is low) • Error codes
Connection test	When this function is activated, the actuator sends a signal to the connected Smart Thermostat. Information about the actuator will be shown on the display of the Smart Thermostat.
Reset and start new pairing	The current connection to RDS110.R or RCR114.1 is deleted. A new pairing process to connect to another Smart Thermostat device starts automatically.
Adaptation to valve	This function starts a new calibration of the SSA911.01TH to the attached valve.
Factory reset	Reset the actuator to factory settings. Any existing connection to RDS110.R or RCR114.1 is deleted and the stem is retracted.
Firmware version	Shows the running version of the firmware.
Back up mode	In case of a loss of communication, the internal PI-controller controls the temperature according to the last setpoint received from the Smart Thermostat using the internal temperature sensor.
Low batteries	When the battery capacity drops to 20 %, the actuator displays the battery symbol as a pre-warning. A command is sent to the Smart Thermostat and a low battery indication is shown on the RDS110.R. Once the batteries are empty, the actuator sends a signal to the Smart Thermostat controller and shuts down operation with a minimum valve position of 15 %.
Error codes	In case of an actuator malfunction or communication error with the Smart Thermostat, an error code is shown on the display of the SSA911.01TH. See Error codes [➜ 9]

Type summary

Type	Stock no.	Description
SSA911.01TH	S55181-A101	Smart radiator valve actuator

Scope of delivery

Every SSA911.01TH is supplied with 2 inserted AA alkaline batteries (LR6) and a Quick guide (A5W00046617).

Adapter AV.. for third-party valves

Type (= stock no.)	For radiator valves from:
AV51	Beulco distributor M30x1.0
AV52	Comap
AV53	Danfoss RA-N (RA2000)
AV54	Danfoss RAVL
AV56	Giacomini

Theft protection kit

Type	Stock no.
ATN5	S55845-Z244

The theft protection kit secures the actuator; it prevents the batteries from being removed and the actuator from being unscrewed from the radiator valve without the use of a tool.

Equipment combinations

Siemens valves

The SSA911.01TH is suited for use with the following types of Siemens radiator valves:

| Type		k_{VS} [m3/h]	PN	Data sheet
VDN1.., VEN1..	Radiator valves	0.25…1.41	10	CE1N2105
VDN2.., VEN2.., VUN2..	Radiator valves	0.25…1.41	10	CE1N2106
VD1..CLC..	Radiator valves	1.9…2.6	10	CE1N2103
VPD.., VPE..	MCV radiator valves	0.02…0.48	10	CE1N2185
VD1.., VE1.. *	Radiator valves	0.25…3.4	10	CE1N2145,
VD2.., VE2.., VU2.. *	Radiator valves	0.25…3.4	10	CE1N2146
For radiator valves with AV.. adapters, see Accessories [→ 4]				

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

* No longer available

Third-party valves without adapter

The SSA911.01TH can operate third-party radiator valves without adapter, provided they have a M30x1.5 mm connecting thread and meet the following requirements:

Force	90 N nominal
Fully closed	$x > 9.0$ mm
Fully open	$y \leq 14.5$ mm
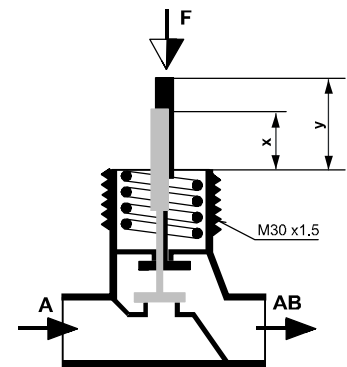
Valves of the following manufacturers may be used with the SSA911.01TH:

- Honeywell MNG
- Cazzania
- Heimeier
- TA

- Finimetall
- Oventop M30x1.5 (from 2001 onward)
- Junkers
- Danfoss

Valve pre-adjustment / k$_V$-limitation

For valve pre-adjustments, refer to the relevant technical documentation on the valves. Ensure a minimum valve stroke of > 0.5 mm.

Product documentation

Title	Contents	Document ID
Smart valve actuator SSA911.01TH	Data sheet: product description	A6V11739247
Quick guide Smart Valve Actuator SSA911.01TH	Instructions for mounting, commissioning and operating SSA911.01TH	A5W00046617
Mounting instructions Smart Thermostat RDS110.R	Instructions for mounting RDS110.R	A5W90008181
Quick guide Smart Thermostat RDS110.R	Instructions for commissioning and operating RDS110.R	A5W90008183
Smart Thermostat Wireless RDS110.R	Data sheet: product description	A6V11562461
RDS110.R Smart Thermostat Wireless – User Guide	Detailed information on RDS110.R, including installation, commissioning and operation	A6V11562455
Mounting instructions Smart Thermostat Receiver RCR114.1	Instructions for mounting RCR114.1	A5W90008182
Quick guide Smart Thermostat Receiver RCR114.1	Instructions for commissioning and operating RDS110.R	A5W90008184
Smart Thermostat Receiver RCR114.1	Data sheet: product description	A6V11562464

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:

http://siemens.com/bt/download

Security

⚠	**⚠ CAUTION**
	National safety regulations
	Failure to comply with national safety regulations may result in personal injury and property damage.
	• Observe national provisions and comply with the appropriate safety regulations.

⚠	**⚠ WARNING**
	Burns from hot surface
	The screw nut with which the actuator is fastened on the radiator valve will become hot. Risk of burns from contact with the screw nut.
	When servicing the actuator:
	• Switch off the radiator.
	• Allow the radiator to cool off.

⚠	**⚠ WARNING**
	Explosion due to fire or short circuit, even with discharged batteries
	Risk of injury due to flying parts
	• Prevent the batteries from coming into contact with water.
	• Do not recharge batteries.
	• Do not damage or disassemble batteries.
	• Do not beat batteries over 85 °C.

⚠	**⚠ WARNING**
	Leakage of electrolyte
	Severe burns
	• Handle damaged batteries only wearing suitable protective gloves.
	• In case of contact with electrolyte, rinse eyes immediately with plenty of water. Consult a doctor.

Observe the following:
- Observe the polarities (+/-).
- The batteries must be new and undamaged.
- Do not mix new and used batteries.

Store, transport and dispose of the batteries in compliance with local requirements, regulations and laws. Also observe the instructions of the battery manufacturer.

Mounting

The SSA911.01TH is mounted on the radiator valve. There are no preferred mounting positions; the actuator SSA911.01TH may be operated in all mounting positions. Make sure the display is visible and the button is accessible.

⚠	⚠ **WARNING**
	Falling objects
	Overhead installation may result in injury from falling objects.
	• Do not install the actuator more than 2 m above ground.

Firmly tighten the screw nut by hand. No tools are required to tighten the actuator on the valve.

Commissioning

▷ Install and commission the RDS110.R and (optionally) the RCR114.1

▷ Choose the "Radiator valve" application on the Smart Thermostat (for documentation, see Product documentation [➜ 5])

▷ Start the installation and commissioning of the SSA911.01TH (see also Quick guide A5W00046617)

1. Mechanical mounting of the SSA911.01TH on the radiator valve

   – Tighten the threaded screw nut firmly by hand (do not use tools)

2. Remove plastic slip securing the batteries from the SSA911.01TH and wait for the actuator to start up (approximately 5 s)

3. Press the button on the SSA911.01TH for automatic calibration process (> 2 s) and wait for the confirmation of the calibration on the display

4. Start the pairing process on the RDS110.R in the advanced setting menu by pressing "Pair new devices"

5. Press the button on the SSA911.01TH to start pairing (> 2 s). Pairing to Smart Thermostat may take up to 30 s.

   ⇨ Once the SSA911.01TH is paired to the RDS110.R, the display will confirm the connection and switch off.

⇨ The SSA911.01TH is now controlled by the Smart Thermostat

Unsuccessful pairing or calibration to the valve is indicated by an error code on the display (see Error codes [➜ 9]).

HMI

The interface consists of an LCD display [1] and one push button [2].

During normal operation, the display is switched off in order to conserve energy and ensure a long battery life.
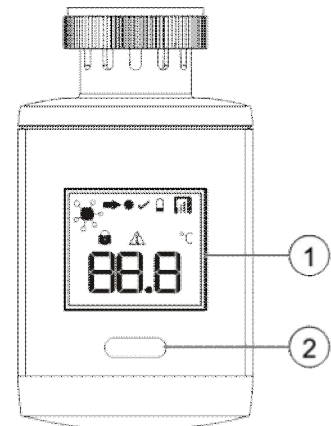
Display	Function	Description
THREAD symbol	THREAD Communication	Blinks during pairing mode with Smart Thermostat
➡●	Valve adaptation	Shown during adaptation of the actuator to the radiator valve
✓	Confirmation / acknowledgment	Confirms a positive result after any successful operation
battery	Low battery status	Shown when status information feature is activated if the battery is low
▮▮▮	Connection test	Shown for 30 s while a connection test is performed The ID of the connected device will be shown on the RDS110.R display
lock	Key lock	Shown when pressing the button if key lock mode is activated In key lock mode, no manipulation on the actuator is possible.
⚠	Error	Shown with error code when an error has occurred Disappears when normal status has been reached again
rSt	Factory reset	Shown during a factory reset process
21.5	Setpoint temperature	
°F | °C	Temperature unit	
	Interactive symbols shown during pairing, adaptation and factory reset functions:	
no	• **no**: appears after choosing function – short button press (< 1 s) exits the function, turns the display off and sends the actuator to sleep mode – long button press (> 2 s) confirms the chosen function	
YES	• **yes**: appears after confirming the function (except during factory reset)	
Go	• **Go**: indicates the confirmed function is starting	

Error codes

In case of an actuator malfunction or communication error with the Smart Thermostat, an error code is shown on the display of the SSA911.01TH.

Error codes cannot be acknowledged on the SSA911.01TH. The error code is shown on the display for as long as the error is active and will disappear once normal status has been reached.

Error notifications are also sent to the Smart Thermostat and shown on the Smart Thermostat display. E53 is at first only shown on SSA911.01TH and not immediately shown on the Smart Thermostat. It will take some time to appear on the Smart Thermostat.

| Code	Error	Cause	Measures
⚠ E36	Automatic adaptation failed	• The actuator did not correctly adapt to the valve or could not detect the end positions of the valve • The actuator is not connected to a radiator valve	• Check the valve type and stroke compatibility with the SSA911.01TH and repeat the adaptation • Check the mechanical valve connection, adjust, and repeat the adaption • Ensure that the valve is working correctly and that the valve stem is not stuck and repeat the adaptation
⚠ E40	Mechanical valve actuator error	• The movement of the actuator was too short to detect the end positions of the valve • Motor movement failure • The actuator is not connected to a radiator valve • The stroke and/or end positions of the valve are not compatible with the SSA911.01TH	
⚠ E49	No controller found – pairing failed	• No RDS110.R or RCR114.1 is available to connect • The Smart Thermostat is out of range • RF chip failure	• Check and adjust the settings on Smart Thermostat and re-start the pairing process • Decrease the distance between the SSA911.01TH and the Smart Thermostat and re-start the pairing process
⚠ E53	Connection to Smart Thermostat lost	• The current connection to the Smart Thermostat is not available anymore (RF chip failure) • The paired RDS110.R or RCR114.1 is not available anymore (e.g. loss of power) • The Smart Thermostat is out of range	• Check the power supply and availability of the Smart Thermostat • Decrease the distance between the SSA911.01TH and the Smart Thermostat ℹ No new pairing process is required to resolve E53. The SSA911.01TH will automatically re-connect to the Smart Thermostat once the network is available again.

Maintenance

The SSA911.01TH is maintenance free.

The actuator and the Smart Thermostat will indicate when replacing the batteries is required approximately 2 months before the batteries are completely empty and the actuator switches off.

Replacing the batteries

To replace the batteries, the SSA911.01TH should remain mounted on the radiator valve and the Smart Thermostat should remain on power and switched on. Replacing the batteries does not require any tools. For optimal performance, the use of high performance alkaline batteries is recommended.

1. Remove the batteries
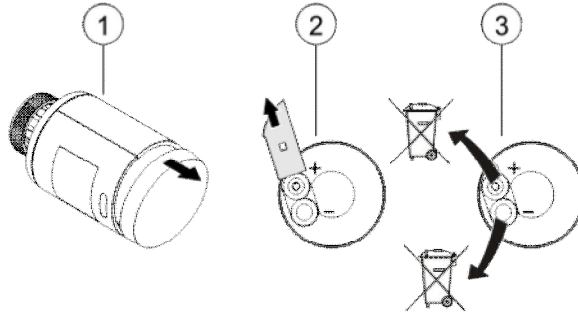
– Open the white battery cover [1]

– Remove the metallic slider [2]

– Take the batteries out [3]

2. Insert new batteries - 2 x LR6 (Alkaline AA) [4]
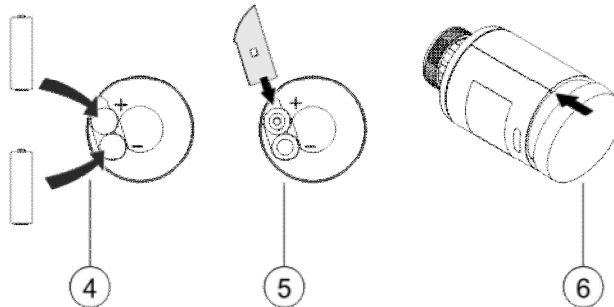
3. Re-insert the metallic slider [5] and put the white battery cover back on [6]

⇨ The actuator will automatically start a new calibration and after successful calibration will automatically re-establish the connection to the Smart Thermostat

Unsuccessful pairing or calibration is indicated by an error code on the display (see Error codes [➜ 9]).

Disposal

	The device is considered an electronic device for disposal in accordance with the European Guidelines and may not be disposed of as domestic garbage.
	• Dispose of the device through channels provided for this purpose.
	• Comply with all local and currently applicable laws and regulations.
	• Dispose of empty batteries in designated collection points.

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Radio equipment directive

The device is using harmonized frequency in Europe, and is also in compliance with the Radio Equipment Directive (2014/53/EU, formerly 1999/5/EC).

Open Source Software (OSS)

Software License Summary

These devices incorporate open source software (OSS), please refer to the OSS document for the specific controller type and valid version set.

Title: Readme OSS "SSA911.01TH – Rev. FS-01"

All open source software components used within the product (including their copyright holders and the license conditions) can be found in the document A6V11938504 at http://siemens.com/bt/download.

Cyber security disclaimer

Siemens provides a portfolio of products, solutions, systems and services that includes security functions that support the secure operation of plants, systems, machines and networks. In the field of Building Technologies, this includes building automation and control, fire safety, security management as well as physical security systems.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art security concept. Siemens' portfolio only forms one element of such a concept.

You are responsible for preventing unauthorized access to your plants, systems, machines and networks which should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place. Additionally, Siemens' guidance on appropriate security measures should be taken into account. For additional information, please contact your Siemens sales representative or visit https://www.siemens.com/global/en/home/company/topic-areas/future-of-manufacturing/industrial-security.html.

Siemens' portfolio undergoes continuous development to make it more secure. Siemens strongly recommends that updates are applied as soon as they are available and that the latest versions are used. Use of versions that are no longer supported, and failure to apply the latest updates may increase your exposure to cyber threats. Siemens strongly recommends to comply with security advisories on the latest security threats, patches and other related measures, published, among others, under https://www.siemens.com/cert/en/cert-security-advisories.htm.

Technical data

Power supply

Battery type	2 x alkaline batteries LR6 (AA) 1.5 V
Battery life	2 years

Radio communication

Frequency range	2.4…2.4385 GHz
Max. transmission power	3.5 dBm
Range	≤ 30 m, depending on application and building
Protocol	THREAD, 6LoWAN IEEE802.15.4

Actuator

Stroke	nominal	2.5 mm
	minimal	0.5 mm
Positioning force	typically	90 N
Noise level		EN ISO 3741
		< 30 dBA

Built-in temperature sensor

Sensing element	NTC 4.7 kΩ resistor
Measuring range	0…50 °C

Internal controller

Type	PI

Degree of protection

Protection class	Class III according to IEC 60730-1
Protection degree of housing	IP 30 [1] according to IEC 60529
Pollution degree	Class 2 according to IEC 60730

Environmental conditions

Operation		
	Temperature	-20…54°C
	Humidity (non-condensing)	65 % r.h. ± 20 %
Transportation		
	Temperature	-30...45 °C
	Humidity	65 % r.h. ± 20 %
Storage		
	Temperature	-30...45 °C
	Humidity	65 % r.h. ± 20 %
Medium temperature permissible in connected valve		1…70 °C

Directives and standards

Product standard	IEC 60730-x
Electromagnetic compatibility (field of use)	For residential, commercial, and industrial environments
EU conformity (CE)	A5W00090263A [2]
EAC compliance	Eurasian compliance for all SAY..P..

| Environmental compatibility |
| --- |
| Product environmental declarations A6V11952727 [2] include data on environmentally friendly product design and testing (RoHS compliance, material composition, packaging, environmental benefits, disposal). |

Materials and Dimensions		A6V11739247_en--_a
Display		LCD
Housing	material	Plastic ASA+PC
	color	White NCS S 052-G
Thread		M30x1.5
W x H x D		See Dimensions [➜ 13]
Weight		

[1]   Completely mounted

[2]   Documents can be downloaded at http://www.siemens.com/bt/download

Dimensions

M30 x 1.5
103
⌀ 57
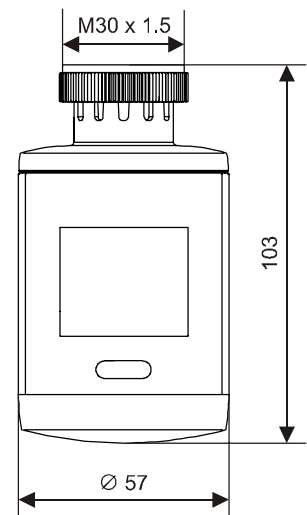
Dimensions in mm

kg [kg]
0.305

Revision numbers

Type	Valid from rev. no.
SSA911.01TH S55181-A101	..01