SIEMENS

Electromotoric actuators

SSD..

For VP..46.. Series Pressure Independent Control Valves (PICV)

- SSD161S.05DUT (fail-in-place) and SSD161S.25DUT (fail-safe) operating voltage AC/DC 24 V, positioning signal DC 0...10 V
- SSD131.09UT (fail-in-place) and SSD131.29UT (fail-safe) operating voltage AC 24 V, 3-position control signal
- Nominal force 300N
- Automatic identification of valve stroke
- Direct mounting with brass M30×1.5 coupling nut, no tools required
- Manual override
- Position and actuator motion indication (LED)
- Parallel operation of multiple actuators possible
- SSD161.. are DIP switch configurable for equal percentage/linear flow characteristic, direct/reverse acting, and the fail-safe variant for fail up/fail down
- SSD131.29UT and SSD161S.25DUT fail-safe variant is DIP switch configurable for fail up/fail down
- SSD..UT 5-pin terminal block with M16x1.5 threaded integrated conduit adapter cover, no cable
- Load-dependent switch-off in the event of overload and in stroke end positions

Use

For water-side control of hot and chilled water in heating, ventilation and air conditioning systems with:

- Siemens VPP46.. and VPI46.. Series Pressure Independent Control Valves (DN ≤ 32)

NOTICE	
!	• SSD131.29U floating fail-safe actuators cannot be run in parallel with legacy SSD81.5U actuators. • For parallel operation of floating fail-safe SSD actuators all actuators in parallel must be the same part number.

Technical design

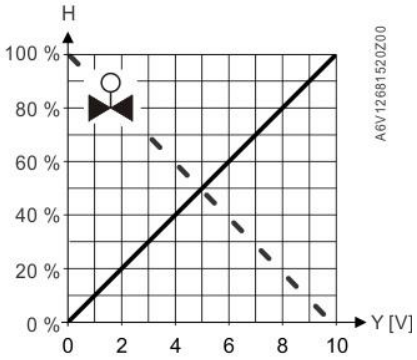
When the actuator is driven by a 3-position or DC 0…10 V control signal, it produces a stroke which is transmitted to the valve spindle.

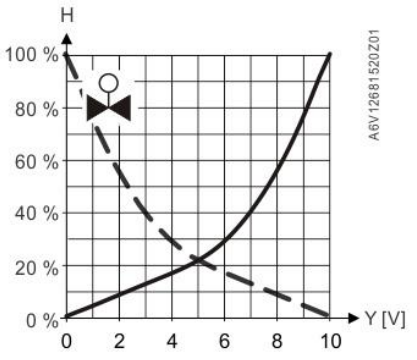
3-position control signal

Voltage at Y1:	Spindle extends	Normally open valve (VPI/VPP46..) closes, normally closed valve (VPI45..) opens
Voltage at Y2:	Spindle retracts	Normally open valve (VPI/VPP46..) opens, normally closed valve (VPI45..) closes
No voltage at Y1 or Y2:	Actuator maintains its current position	
No power supply	The SSD131S.25DUT fails with either the spindle fully retracted or fully extended, depending on the position of the associated fail up/fail down DIP switch.	

DC 0…10 V positioning signal

- At DC 0 V, actuator spindle will be either extended or retracted, resulting in the valve being either fully closed or open, depending on the position of the associated reverse/direct acting DIP switch and whether the valve is a normally open or normally closed valve.
- The valve opens / closes in proportion to the control signal at Y. The SSD161.. UT actuators can be set to either a linear or equal percentage control signal response, depending on the position of the associated flow characteristic DIP switch.
- When no power is supplied, the SSD161S.05DUT actuator maintains its current position and the SSD161S.25DUT fails with either the spindle fully retracted or fully extended, depending on the position of the associated fail up/fail down DIP switch.
- This actuator provides a DC 0…10 V position feedback signal proportional to the stroke of the actuator spindle.





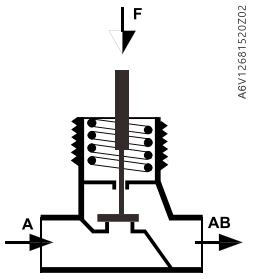
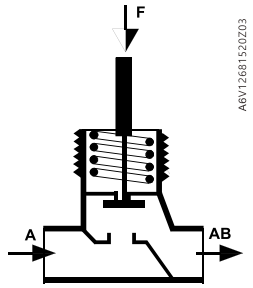
Y = Control signal Y [V]

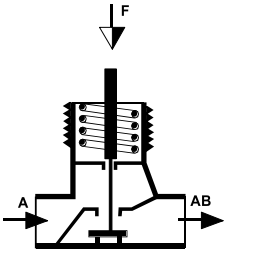
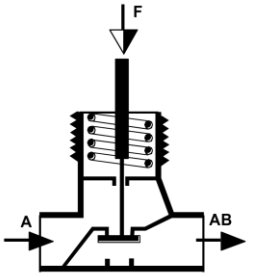
H = Percentage of calibrated valve stroke

——— = Acting direction: Direct

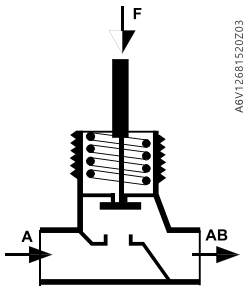
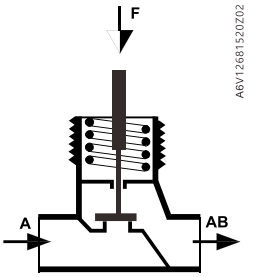
– – – = Acting direction: Reverse

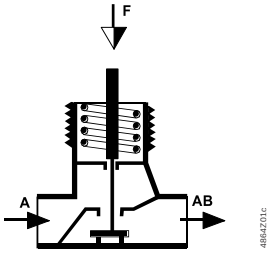
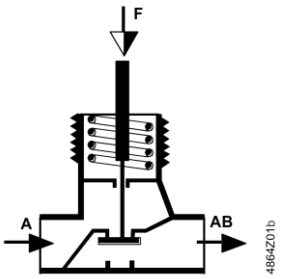
Acting direction: Reverse (Default factory setting)

Positioning Signal	SSD161.. Actuator's spindle	VPP46.. and VPI46.. Normally Open Valves' stem	
0 V	Extended 	Retracted (valve closed)	
10 V	Retracted 	Extended (valve open)	

Positioning Signal	SSD161.. Actuator's spindle	VPI45.. Normally Closed Valves' stem	
0 V	Extended 	Retracted (valve open)	
10 V	Retracted 	Extended (valve closed)	

Acting direction: Direct

Positioning Signal	SSD161.. Actuator's spindle	VPP46.. and VPI46.. Normally Open Valves' stem	
0 V	Retracted 	Extended (valve open)	
10 V	Extended 	Retracted (valve closed)	

Positioning Signal	SSD161.. Actuator's spindle	VPI45.. Normally Closed Valves' stem	
0 V	Retracted 	Extended (valve closed)	
10 V	Extended 	Retracted (valve open)	

LED indications

SSD131.09UT

Variants	LED	Color	Pattern	Description
SSD131.09UT	LED 1	Green	Constant	Actuator spindle is fully extended.
	LED 2	Green	Constant	Actuator spindle is moving in-between.
	LED 3	Green	Constant	Actuator spindle is fully retracted.

SSD131.29UT, SSD161..

Status	LED indication patterns
Modulation: Stem retracting	Flashing green in sequence: LED1-->LED2-->LED3 (500 ms each)
Modulation: Stem extending	Flashing green in sequence: LED3-->LED2-->LED1 (500 ms each)
Stem position	At H0 - H40: Constant green (LED3) At H40 - H60: Constant green (LED2) At H60 - H100: Constant green (LED1)
Fail-safe*	Flashing red (LED2): 500 ms on, 500 ms off
Calibration	Flashing green (LED2): 100 ms on, 100 ms off
Error	Constant red (LED2)
Manual operation	Flashing green/red alternatively (LED2): Green 500 ms, red 500 ms
Ultra-cap initial charging*	Constant green & red simultaneously (LED2): Constant orange

* Only available for SSD161S.25DUT, SSD131.29UT

Type summary

Type	Stock number	Operating voltage	Control signal	Force	Feedback	Fail safe	Running speed at 50 Hz	Actuator characteristic	Cable length	Cable cover
SSD131.09UT	S55180-A181	AC 24 V	3-position	300 N	-	-	16 s/mm	-	-	M16x1.5 threaded integrated conduit adapter
SSD131.29UT	S55180-A182					Yes				
SSD161S.05DUT	S55180-A183	AC/DC 24 V	DC 0...10 V		DC 0...10 V	-	5 s/mm	Linear or equal percentage (selectable)		
SSD161S.25DUT	S55180-A184					Yes				

Ordering

When ordering, specify both type and quantity.

Example:

Type	Stock number	Designation	Quantity
SSD161S.25DUT	S55180-A184	Electromotoric actuator	2

Delivery

Valves and actuators must be ordered separately. For easier valve assembly, actuators ordered separately have the actuator spindle fully retracted.

The cable gland is not within the scope of delivery and needs to be ordered separately (supplied by thirds).

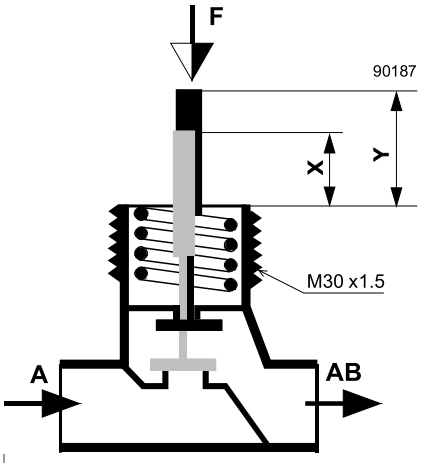
Equipment combinations

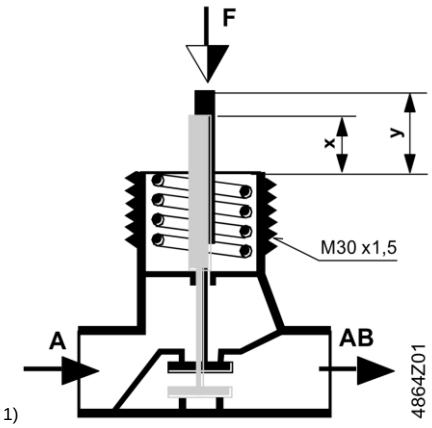
Valves

Type reference	Valve type	$\dot{V}$ [l/h]	PN class	Data sheet
VPP46.., VPI46..	PICV DN10..32	30…4001	PN25	N4855
VPI45..	PICV DN10..32	90…3050	PN25	Phased out product
VQP46.., VQI46..	PICV DN10..25	30…1800	PN25	A6V11877580

Note: To ensure trouble-free operation of third-party valves with the actuators, the valves must satisfy the following requirements:

- Threaded connections with coupling nut M30 × 1.5.
- Nominal force F ≤ 300 N
- Dimension X ≥ 8.5 mm
- Dimension Y ≤ 14.6 mm





[1)]This applies to Normally Closed valves, e.g., VPI45..

Controllers

Type	SSD131..	SSD161..
	AC 24 V	AC/DC 24 V
	3-position	DC 0…10 V
DXR2	DXR2..09T.., DXR2..10.., DXR2..11.., DXR2..12P.., DXR2..18.., DXR2..10PL..	DXR2..
RXB..	RXB21.1.., RXB24.1..	RXB39.1..
Synco 700, Synco 200	RMH760B-1, RMK770-1, RLU202, RLU222	RMU7...0B-1, RMS705B-1, RMH760B-1, RMK770-1, RLU220, RLU222, RLU232, RLU236

Room thermostats

Type	SSD131..	SSD161..
	AC 24 V	AC/DC 24 V
	3-position	DC 0…10 V
RDG..	RDG200T, RDG200KN, RDG204KN, RDG405KN	RDG260T, RDG260KN, RDG264KN, RDG160T, RDG160KN, RDG405KN
RDF..	-	-
RDU..	-	RDU340..
RCU..	-	RCU50..

Product documentation

Topic	Title	Document ID
Mounting and installation	Mounting instructions [1]	A6V15662823
Standards and directives	CE conformity declarations	A5W00254962A
	RCM conformity declarations	A5W00254983A
	UKCA conformity declarations	A5W00257055A
Environmental compatibility	Environmental declarations for SSD131.29UT, SSD161S.05DUT, SSD161S.25DUT	A5W01944293A
	Environmental declarations for SSD131.09UT	A5W00734970A

[1] The mounting instructions are enclosed with the product.

Related documents such as the environmental declarations, declarations of conformity, etc., can be downloaded from the following Internet address:

www.siemens.com/bt/download

Notes

Engineering

The actuators must be electrically connected in accordance with local regulations (see "Connection diagrams [▶ 20]").

⚠ 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.

Observe permissible temperatures (see "Technical data [▶ 16]").

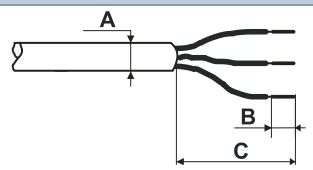
Mounting

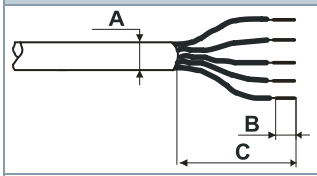
⚠ WARNING

- Do not use pipe wrenches, spanners or similar tools.
- Before mounting, fit the actuator in a position where the actuator spindle is fully retracted (see “Manual operation”).
- Avoid lateral pressure or (cable) tension on the mounted actuator!

Valve and actuator are easy to assemble on site before commissioning:

- Remove protective cover from the valve body.
- Position the actuator and tighten the union nut manually.
- See Mounting instructions enclosed with the product package for graphical instructions.

		A [mm]	B [mm]	C [mm]
	SSD131..	4.5	6.0	60
Crimp ferrule on stripped wire of connecting cable.				

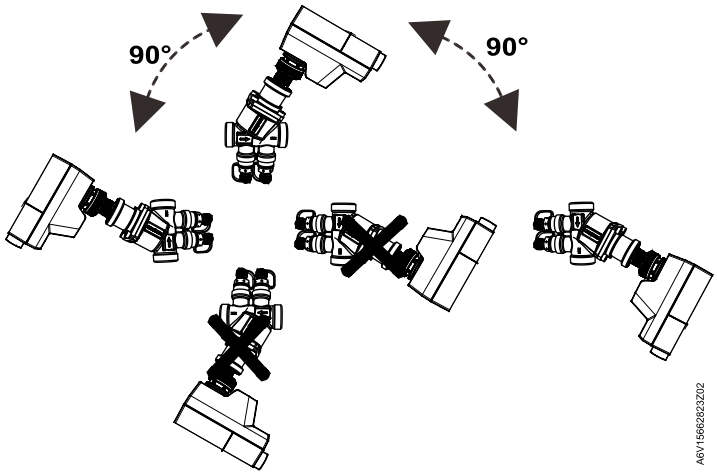
		A [mm]	B [mm]	C [mm]
	SSD161..	5.5	6.0	60
Crimp ferrule on stripped wire of connecting cable.				

- Observe all admissible temperatures (see “Technical data [▶ 16]”).
- Operate the actuator only with alternating current for SSD131.. and SSD331.. (see “Technical data [▶ 16]”).
- Do not twist the cable.
- Magnets can damage the actuator.
- Provide a means for isolation from the power supply, e.g., connecting a circuit breaker or switch fuse upstream of the control unit.

⚠ 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.

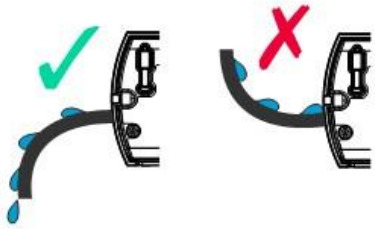
⚠ CAUTION	
	**Phase cut and pulse-duration-modulated (PDM) signals are not suitable.** **Regulations and requirements to ensure the safety of people and property must be observed at all times!**

Orientation



The SSD..UT actuators cannot be installed upside down. In case the SSD..UT actuators are installed horizontally and hanging, the cable must always be installed pointing down-wards.

Otherwise, the IP protection is not guaranteed, as water running down the cable might en-ter the actuator.



Commissioning

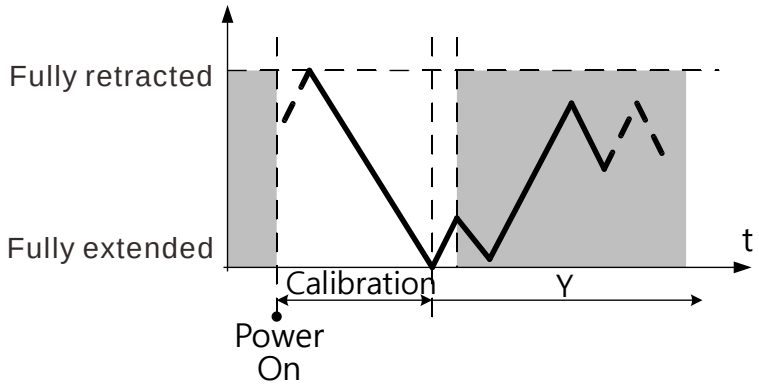
When commissioning, check both wiring and functioning of the actuator.

- Actuator spindle extends Normally open valve closes, normally closed valve opens
- Actuator spindle retracts Normally open valve opens, normally closed valve closes

NOTICE	
!	The actuator must be commissioned only with a correctly mounted valve in place!

Self-calibration

When operating voltage is applied, the actuator self-calibrates (fully retracted → fully extended → setpoint).

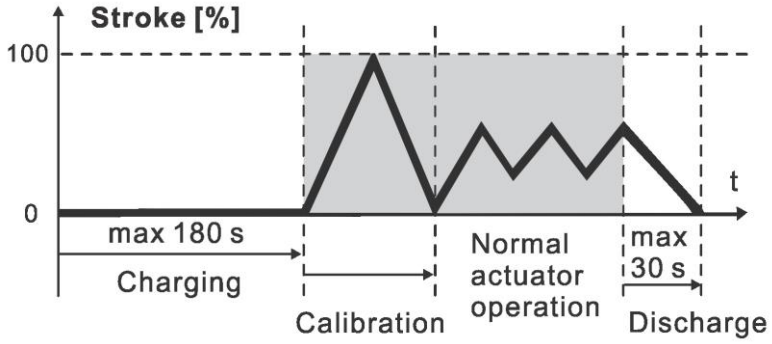


⚠ CAUTION	
	Never intervene manually during self-calibration.

NOTICE	
!	• Correct calibration is only possible with valve stroke > 1.2 mm. Valve stroke < 1.2 mm results in calibration failure. • If calibration fails, the actuator performs another calibration automatically after 10 seconds. • After three failed calibration attempts, the actuator spindle remains in the extended position and the valves are closed. The state of the LED then changes to "stays red".

Electrical fail-safe function (for SSD161S.25DUT, SSD131.29UT only)

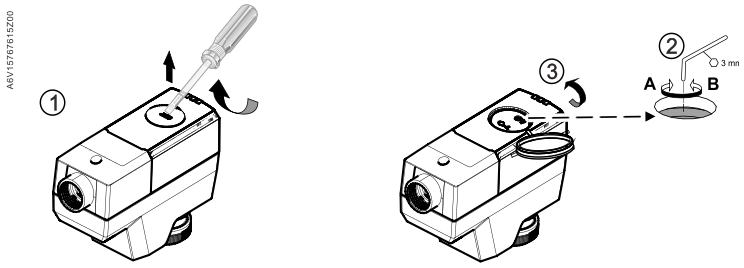
When first connected to power, or after a power failure, the capacitor which stores energy for the fail-safe function will be charged. This process takes up to 180 seconds. While the capacitor is being charged, the actuator cannot respond to any control signal. In the event of a power failure of more than 5 seconds, the actuator will return to its fail-safe position within 30 seconds.



A 3-mm hexagonal wrench can be used to move the actuator to any position.

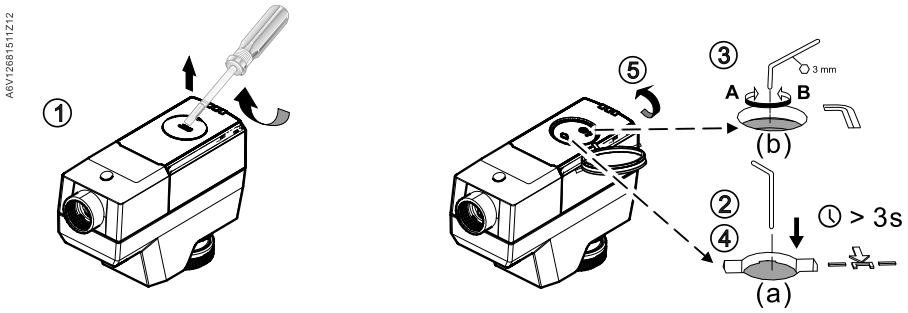
To move the actuator spindle manually (3-position control, SSD131.09UT)

1. Open the cover using a proper screwdriver. Note that IP54 protection does not apply if the cover is open.
2. Adjust the position of the actuator spindle by rotating Allen wrench illustrated below clockwise or counter-clockwise.
   – The actuator spindle moves down if you rotate clockwise; it moves up if you rotate counter-clockwise. The manually set position is retained.
3. Close the cover to ensure IP54 protection.



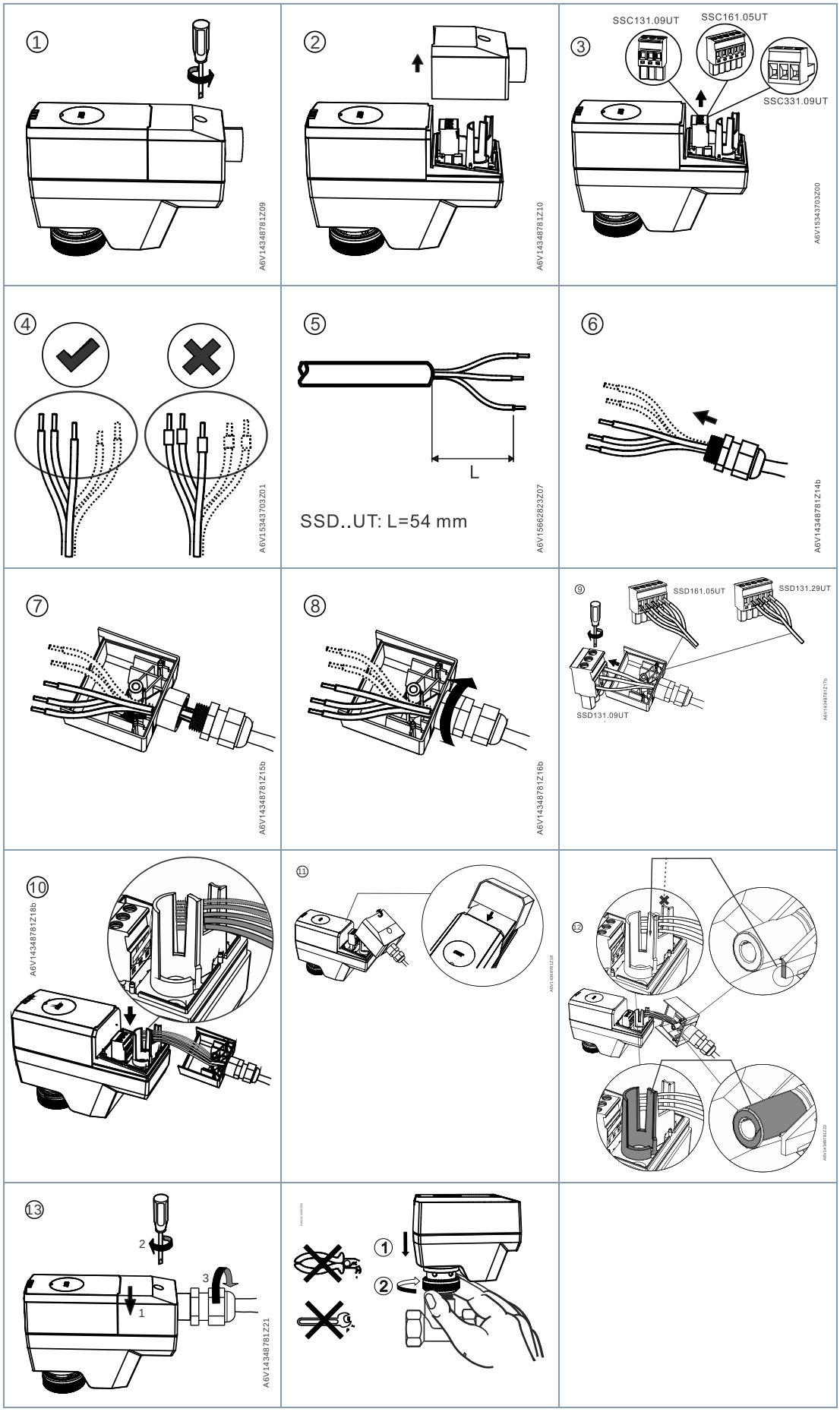
To move the actuator spindle manually (DC 0...10 V control, SSD161.., SSD131.29UT)

1. Open the cover using a proper screwdriver. Note that IP54 protection does not apply if the cover is open.
2. Press and hold down button (a) illustrated below for at least three seconds.
   – The actuator ignores any positioning signal from the controller.
3. Adjust the position of the actuator spindle by rotating Allen wrench (b) illustrated below clockwise or anti-clockwise.
   – The actuator spindle moves down if you rotate clockwise; it moves up if you rotate anti-clockwise. The manually set position is retained.
4. To exit manual operation mode, press and hold down button (a) illustrated below again for at least three seconds.
   – The actuator runs a self-calibration automatically. Positioning signal sent from the controller takes effect.
5. Close the cover to ensure IP54 protection.



NOTICE	
!	**If operating voltage is applied to actuator, press button (a) before and after manually adjusting the position of the actuator spindle so that the actuators ignores the positioning signal.** If no operating voltage and positioning signal are applied, manual operation can be done without pressing button (a). If the actuator position is manually adjusted in automatic operation (without carrying out point b), this can lead to errors (see LED indication)

Cabling operation



DIP switch configurations

DIP Switches	Product types
	SSD161S.05DUT **Factory Setting:** Running direction: Reverse Stroke characteristic: LIN
	SSD161S.25DUT **Factory Setting:** Running direction: Reverse Stroke characteristic: LIN Fail direction: Fail-down
	SSD131.29UT **Factory Setting:** Fail direction: Fail-down

Running direction	Direct	Spindle extends as voltage increases
	Reverse	Spindle retracts as voltage increases
Stroke characteristic	EQ	Stroke control provides equal percentage flow characteristic
	LIN	Stroke control provides linear flow characteristic
Fail direction	Fail-up	Spindle retracts to end position
	Fail-down	Spindle extends to end position

Maintenance

The actuators require no maintenance.

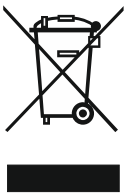
⚠ WARNING	
	**Operating voltage must be switched off during any maintenance!**

NOTICE	
!	When carrying out service work on the plant, note the following: ● Switch off operating voltage. ● If necessary, disconnect electrical connections from the terminals. ● The actuator must be commissioned only with a correctly mounted valve in place!

Repair

The actuators cannot be repaired; the complete unit must be replaced.

Disposal

	The device is considered an electronic device for disposal in accordance with European guidelines and may not be disposed of as domestic waste. ● Dispose of the device through channels provided for this purpose. ● Comply with all local and currently applicable laws and regulations.

Warranty

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.

Open Source Software (OSS) (SSD131.29UT, SSD161S.05DUT, SSD161S.25DUT)

Software license overview

These devices use Open Source Software (OSS). All Open Source Software components used in the product (to include copyrights and licensing agreement) are available at http://siemens.com/bt/download.

Firmware version	OSS document		Device
	Document ID	Title	
2.10.0 or above	A6V13503690	Readme OSS for Modulating Room Actuator 200 N, 300 N	All

Technical data

Power supply			
Operating voltage		SSD131.09UT SSD131.29UT	AC 24 V ± 20 %
		SSD161S.05DUT SSD161S.25DUT	AC 24 V (± 15 %) or DC 24 V (± 20 %)
Frequency		50/60 Hz	
Power consumption	SSD131.09UT	Normal Operation: 1 VA (AC) Holding: 0.2 VA	
	SSD131.29UT	Normal Operation: 3 VA (AC); 1.5 W (DC) Peak (Ultra cap recharge): 6 VA (AC); 4 W (DC)	
	SSD161S.05DUT	Normal Operation: 3.5 VA (AC); 1.5 W (DC)	
	SSD161S.25DUT	Normal Operation: 3.5 VA (AC); 1.5 W (DC) Peak (Ultra cap recharge): 8 VA (AC); 4 W (DC)	
Primary fuse or breaker rating	External, 2 A quick blow		

Signal input	
Control signal	Modulating: DC 0...10 V to Y Floating: AC 24 V to Y1 or Y2
Input impedance	100 kOhm
Parallel operation (number of actuators)[1)]	Max. 10 modulating or 24 floating actuators[1)]

[1)] Provided that the controller output is sufficient.

Signal output (SSD161S.05DUT, SSD161S.25DUT)	
Feedback signal U	DC 0...10 V
Max. output current	1 mA
Resolution	1:100

Operating data	
Position with de-energized contact Y/Y1/Y2	See "Technical design [▶ 2]"
Running speed (time for 5.5 mm)	SSD161S.05DUT, SSD161S.25DUT: 5 s/mm (27.5 s) SSD131.09UT, SSD131.29UT: 16 s/mm (88 s)
Positioning force	300 N
Stroke	6.1 mm
Permissible temperature of medium in the connected valve	1...120 °C
Sound level	< 30 dB(A)

Electrical connection (connecting cable integral) (SSC..UT)	
Cable length	<20 m
Cross section of prewired connection cables	0.5...1.5 mm^2
Cable diameter	<5.5 mm

Electrical connection (connecting cable integral)	SSD161..	SSD131..
Cable length	<20 m	
Cross section of prewired connection cables	0.5...1.5 mm^2 (5 ×)	0.5...1.5 mm^2 (3 ×)
Cable diameter	<5.5 mm	

Mounting	
Connection to valve	Brass coupling nut M30 × 1.5
Orientation	270°, cable down

Standards	
EU conformity (CE)	A5W00254962A
RCM conformity	A5W00254983A
UK conformity declaration (UKCA)	A5W00257055A
Housing protection degree	NEMA 2 / IP20 (EN 60529)
Protection class according to EN 60730	III
Pollution degree	2
Overvoltage category	I
Environmental compatibility	The product environmental declaration (SSD131.29UT, SSD161S.05DUT, SSD161S.25DUT: A5W01944293A; SSD131.09UT: A5W00734970A) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).
UL Approval Federal Communications Commission	UL as per UL60730-1, UL60730-2-14 http://ul.com/database cUL as per CSA – CAN E60730-1, E730-2-14 FCC CFR 47 Part 15 Class B
ICES003	CAN ICES-3 (B)/NMB-3(B)

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation

FCC Caution: Changes or modifications not expressly approved by Siemens Switzerland Ltd. could void user authority to operate the equipment. United States representative https://new.siemens.com/us/en/products/buildingtechnologies/home.html

Housing color	
Cover/base	2003, Ti-Gray

General ambient conditions			
	Operation	**Transport**	**Storage**
Temperature	1...50 ℃	-25...70 ℃	-25...70 ℃
Humidity	5...95 % r.h. non condensing	<95 % r.h. non condensing	5...95 % r.h. non condensing
Atmospheric pressure	Min. 700 hPa, corresponding to max. 3,000 m above see level		

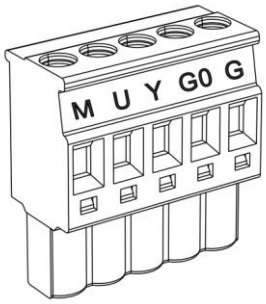
Material	
Cover/base	PC + ABS
Connecting nut	Brass

Product	**Weight**
SSD161S.05DUT	271 g
SSD161S.25DUT	294 g
SSD131.09UT	276 g
SSD131.29UT	293 g

Diagrams

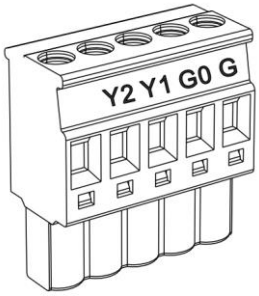
Connection terminals

Connection terminals for SSD161S.05DUT, SSD161S.25DUT



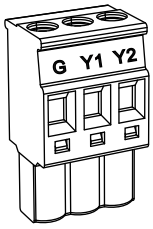
G	System potential (AC/DC 24 V)
G0	System neutral
Y	Control signal DC 0...10 V
U	Feedback signal
M	Measurement reference

Connection terminals for SSD131.29UT



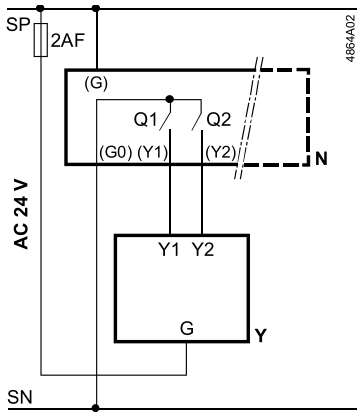
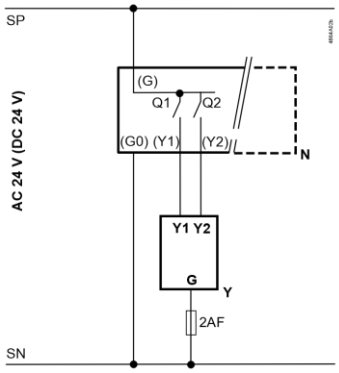
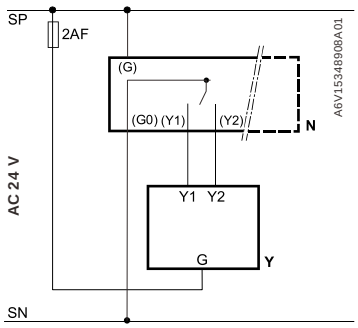
G	System potential (AC 24 V)
G0	System neutral
Y1	Spindle extends
Y2	Spindle retracts

Connection terminals for SSD131.09UT



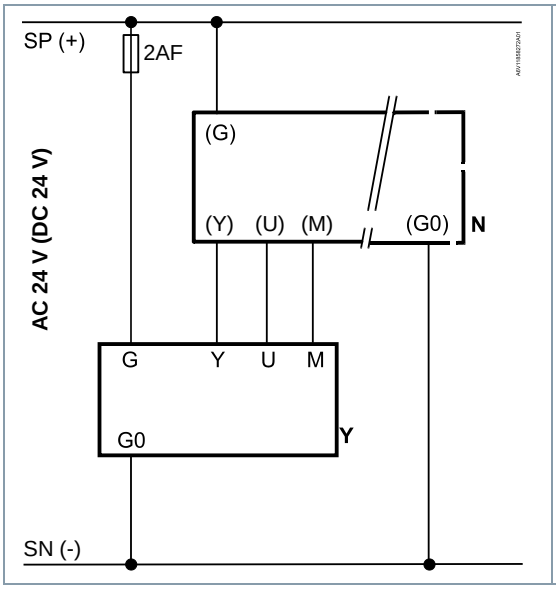
G	System potential (AC 24 V)
Y1	Control signal OPEN (AC 24 V)
Y2	Control signal CLOSE (AC 24 V)

Connection diagrams for SSD131.09UT, SSD131.29UT

Neutral switch	Hot switch	SPDT
		

N = Controller
Y = Actuator
SP, G = System potential AC 24 V
SN, G0 = System neutral
Y1, Y2 = Control signal OPEN, CLOSE

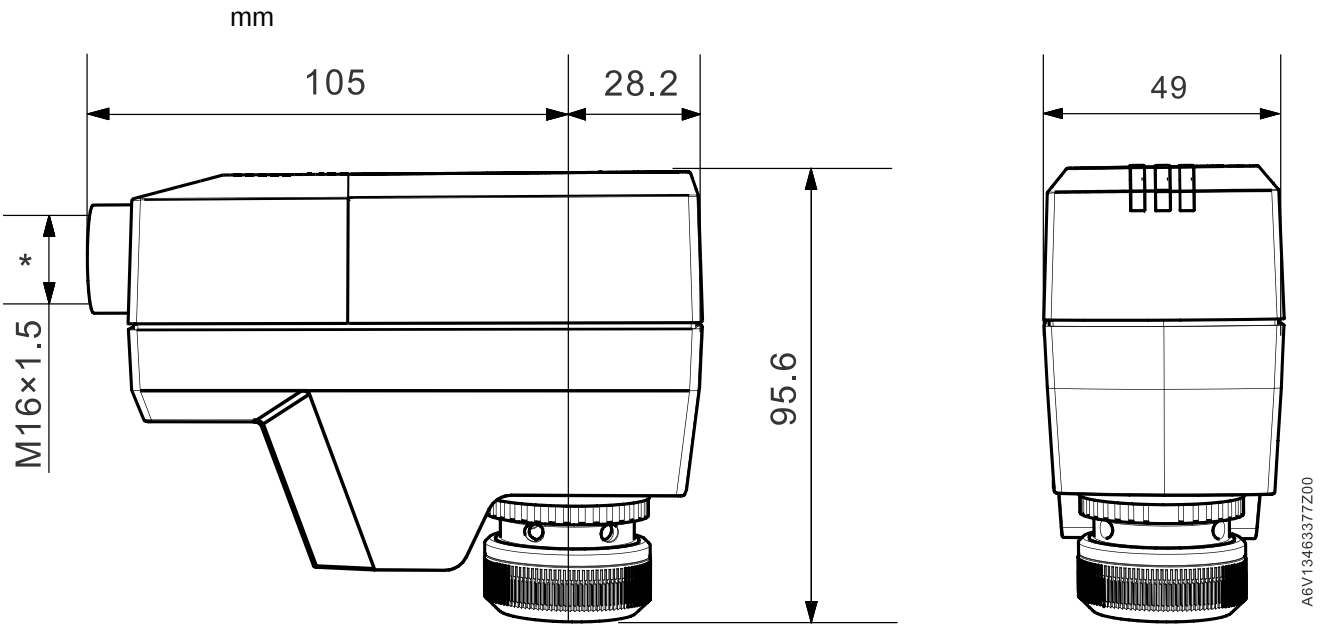
Connection diagrams for SSD161S.05DUT, SSD161S.25DUT



N = Controller
Y = Positioning signal (DC 0…10 V)
SP, G = System potential (AC/DC 24 V)
SN, G0 = System neutral
U = Positioning feedback signal
M = Measurement reference

NOTICE	
!	SSD131.29UT floating fail-safe actuators cannot be run in parallel with legacy SSD81.5U actuators. For parallel operation of floating fail-safe SSD actuators all actuators in parallel must be the same part number.

Dimensions



Revision numbers

Type	Valid from rev. no.
SSD161S.05DUT	..A
SSD161S.25DUT	..A
SSD131.29UT	..A
SSD131.09UT	..A

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