



Electromotoric Actuators

SFA21/18

SFA71/18

for zone valves VVI46..., VXI46..., VVS46... and VXS46...

- SFA21/18 AC 230 V operating voltage, 2-position control signal
- SFA71/18 AC 24 V operating voltage, 2-position control signal
- Positioning force **200 N**
- Spring return
- Manual adjustment
- For direct mounting with union nut (no tools required)
- Integral 1.8 m connecting cable
- Auxiliary switch, type ASC2.1/18 (optional)

Use

The SFA21/18 and SFA71/18 actuators are used in conjunction with zone valves V...I46... und V...S46..., primarily in heating, ventilation, air conditioning and refrigeration systems for water-based control of low-temperature hot water and cooling water.

Type summary

Type	Operating voltage	Positioning time	Positioning signal	Connecting cable
SFA21/18	AC 230 V	10 s	2-position	1.8 m
SFA71/18	AC 24 V			

Accessories

Type	Description	Switching point	Switching capacity	Connecting cable
ASC2.1/18	Auxiliary switch	at approx. 50 % stroke	AC 250 V / 3(2) A	1.8 m

Ordering

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

Example 2 electric actuators, type SFA71/18 and
2 auxiliary switches, type ASC2.1/18

Delivery

Actuators, valves and accessories are supplied separately.

Equipment combinations

Zone valves

Type reference	Valve type	k_{vs} [m ³ /h]	PN class	DN	Data sheet
VVI46...	2-port valves, internal thread Rp	2.0...5.0	PN16	15...25	N4842
VVS46...	2-port valves, solder connection				
VXI46... ¹⁾	3-port valves, internal thread Rp				
VXS46...	3-port valves, solder connections				

¹⁾ 3-port valve with tight bypass order separately: VXI46.25T with SFA... electromotoric actuator, for details see datasheet N4842

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

Thermostats

Type	Compatible thermostats for SFA21/18 and SFA71/18
RAA...	RAA10; RAA20; RAB30...; RAA40
RAB...	RAB10; RAB10.1; RAB20; RAB20.1; RAB30; RAB30.1; RAB40.1
RCC...	RCC10; RCC20; RCC20.1; RCC30
RDX...	RDX42.2
RDF...	RDF10; RDF10.1; RDF10.2; RDF20; RDF30; RDF110; RDF210
RDE...	RDE10; RDE10.1; RDE20.1
RDD...	RDD10; RDD10.1
RCU...	RCU10; RCU10.1

Technical design / mechanical design

The electric actuator requires an on/off controller (thermostat) to control the valve. If the temperature of the medium deviates from the setpoint, the controller output signal causes the actuator to drive the valve open. When the temperature of the medium reaches the setpoint, the control signal is cut off and the valve closes again.

The valve is opened electrically by the actuator and closed by spring force. It incorporates a synchronous motor, a gear mechanism and a return spring. The electric motor is overload-resistant and anti-locking, so that continuous operation is possible. The maximum stroke is limited mechanically. The closing motion, by contrast, includes an overrun for the gear mechanism. This protects the gear mechanism from mechanical shock and increases service life.

The valve is connected by an 1.8 m cable, which is an integral part of the actuator.

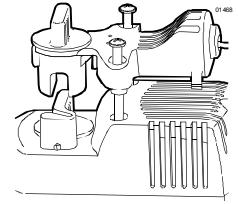
Accessories

Auxiliary switch ASC2.1/18

The optional auxiliary switch can be fitted to the actuator with two screws.

It switches at a stroke of approx. 50 %.

0 ... 50 % : Q11 → Q12 closed Q11 → Q14 open
50 % ... 1 : Q11 → Q12 open Q11 → Q14 closed



See «Technical data» on page 5 for further information on the auxiliary switch.

Engineering notes

The admissible temperatures (see «Technical data», page 5) must be observed.

Electrical connection

- The actuator may be operated only with alternating current (AC 230 V for SFA21/18 and AC 24 V for SFA71/18).

- For safety and protection reasons connect the actuator with a suitable cable conduit, e.g.



⚠ Caution

- **Phase cut and pulse-duration-modulated signals are not suitable.**
- Recommended number of opening/closing operations: approx. 50 per day, with 200 heating or cooling days

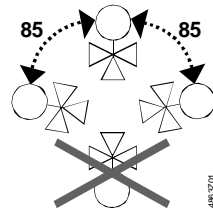
Mounting notes

Mounting instructions 74 319 0407 0 are enclosed with the packaging. **Mount AL50 supporting ring on valve V...46... beforehand.**

⚠ Caution

Do not encase actuator with heat insulation.

Orientation



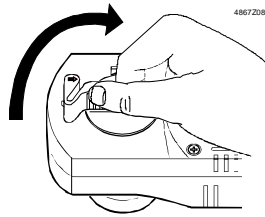
Commissioning notes

- Check the wiring.
- Check the functioning of the actuator and of the auxiliary switch, if fitted.

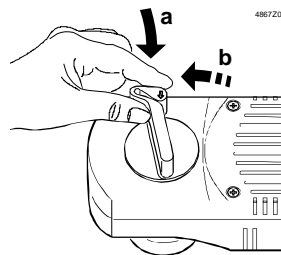
Manual adjustment

The valve can be opened manually by use of a lever on the actuator. When the valve is approximately 90 % open the lever locks into position. When electrical operation is resumed, the locking mechanism is released automatically.

Open the valve manually

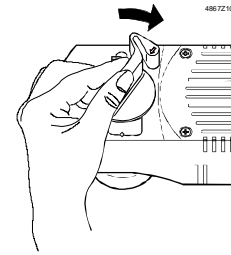


Rotate lever



The lever is locked into position at a valve opening of approx. 90%

Releasing the lever manually



Rotate lever as far as the mechanical stop, and release

Maintenance

The actuators require no maintenance.

They cannot be repaired. In the event of a fault, the actuator can be replaced without removing the valve.

Caution 

The operating voltage must be switched off during this process.

Disposal



The device includes electrical components and 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 when the valves are used with the actuators described under «Equipment combinations». Page 2.

The use of type SFA... actuators with third-party valves invalidates any warranty offered by Siemens Switzerland Ltd / HVAC Products.

Technical data

		SFA21/18	SFA71/18	
Power supply	Operating voltage	AC 230 V	AC 24 V	
	Voltage tolerance	± 15 %	± 20 %	
	Frequency	50 Hz	50 / 60 Hz	
	Power consumption	12 VA		
	Primary fuse	external		
Control	Positioning signal	2-position ¹⁾		
	Parallel operation of several actuators	permitted ²⁾		
	Opening / closing operations	recommended number: approx. 10'000 / year (equivalent to approx. 50 / day)		
Operating data	Position with de-energized actuator			
	2-port valve (VVI46..., VVS46...)	A → AB closed		
	3-port valve (VXI46..., VXS46...)	AB → A closed		
	Positioning time (opening / closing)	10 s (at 50 Hz)		
	Nominal stroke	2.5 mm		
	Positioning force	200 N		
	Admissible temperature of medium in the connected valve	+1...110 °C		
	Manual adjustment	0...90 %		
Electrical connection	Connecting cable (integral)	2-core, 1.8 mm / 18 AWG (0.96 mm ²)		
Norms and standards	Meets requirements for CE marking: EMC directive	89/336/EEC		
		Immunity	EN 61000-6-2 Industrial ²⁾	
		Emission	EN 61000-6-3 Residential	
	Low voltage directive	73/23/EEC		
		Electrical safety	EN 60730-1	
		Product standards for automatic electrical controls	EN 60730-2-14	
	Protection class to EN 60730	II		III
	Contamination level	EN 60730, Class 2		
	Housing protection	IP30 to DIN 40050, EN 60529		
	Upright to 85 ° horizontal, do not suspend			
Environmental compatibility	ISO 14001 (Environment) ISO 9001 (Quality) SN 36350 (Environmentally compatible products) RL 2002/95/EG (RoHS)			
Mounting	Fixing on valve	union nut M30 x 1,5		
Dimensions / weight	Dimensions	refer to « Dimensions », page 6		
	Weight without auxiliary switch	0.585 kg		
	Weight with auxiliary switch	0.692 kg		
Materials	Base plate	die-cast aluminium		
	Housing	PBT		
	Union nut	brass, nickel plated mat		
Housing colors	Base and cover	light gray RAL7035		
	Lever	pigeon blue RAL5014		
	Switching type	changeover contact		
Auxiliary switch (optional)	Switching point	at approx. 50 % stroke		
	Switching capacity	AC 250 V, 3 A resistive, 2 A inductive		
	Connecting cable	3-core, 1.8 mm 18 AWG (0.96 mm ²)		

¹⁾ Phase cut and pulse-duration-modulated signals are not suitable.

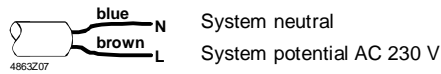
²⁾ Consider controller's power output

General ambient conditions

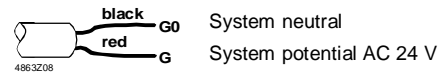
	Operation	Transport	Storage
	EN 60721-3-3	EN 60721-3-2	EN 60721-3-2
Environmental conditions	Class 3K3	Class 2K3	Class 2K3
Temperature	+1...+50 °C	-25...+70 °C	-25...+70 °C
Humidity	5...85 % r. h.	< 95 % r. h.	< 95 % r. h.

Connecting cable

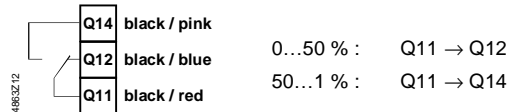
SFA21/18 actuator



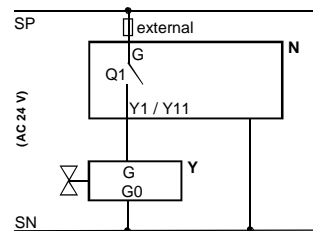
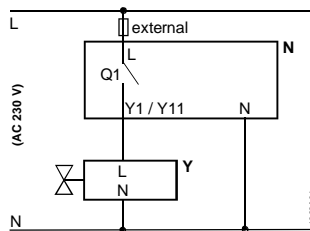
SFA71/18 actuator



ASC2.1/18 auxiliary switch



Connection diagrams



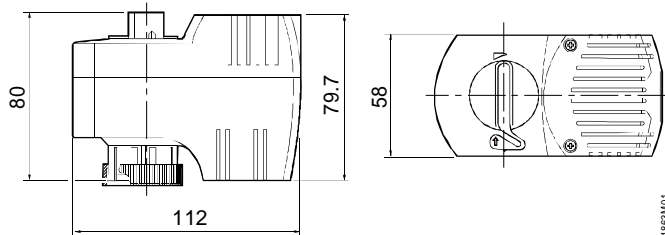
- N controller (thermostat)
- Y actuator with zone valve
- L system potential AC 230 V
- N system neutral
- Y1 control signal OPEN
- Q1 controller contact

- N controller (thermostat)
- Y actuator with zone valve
- G system potential AC 24 V (SP)
- G0 system neutral(SN)
- Y1 control signal OPEN
- Q1 controller contact

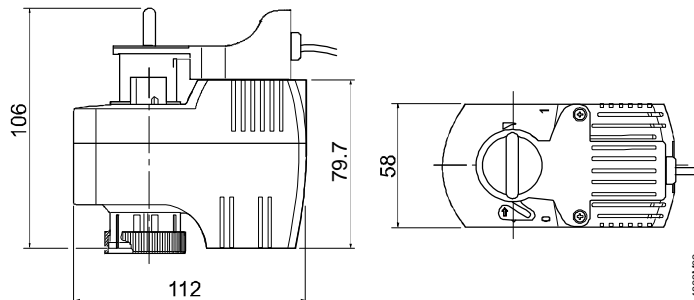
Dimensions

Dimensions in mm

Actuator without auxiliary switch
SFA21/18, SFA71/18



Actuator with auxiliary switch
SFA21/18, SFA71/18
with ASC2.1/18





Electrical Actuators

for valves VVP45..., VXP45..., VMP45...

SSC31
SSC81
SSC61...

- **SSC31** operating voltage AC 230 V 3-position control signal
- **SSC81** operating voltage AC 24 V 3-position control signal
- **SSC61** operating voltage AC/DC 24 V DC 0...10 V control signal
- **SSC61.5** same as SSC61, plus electrical fail-safe function
- **Nominal force 300 N**
- **Automatic identification of valve stroke**
- **Direct mounting with coupling nut, no tools required**
- **Cable connection via screw terminals**
- **Manual override with indication of position and direction of travel**
- **Parallel connection of multiple actuators**

Use

For operation of Siemens valves of the V...P45... range for water-side control of hot water and cooling water in heating, ventilation and air conditioning systems. In conjunction with the ASK30 mounting kit, the former Landis & Gyr valves VVG45..., VXG45... and X3i... can also be operated.

Type summary

Standard versions

Type reference	Rated voltage	Running time at 50 Hz	Control signal	Remarks
SSC31	AC 230 V	150 s	3-position	
SSC81	AC 24 V			
SSC61	AC/DC 24 V	30 s	DC 0...10 V	
SSC61.5				

Accessories

Type reference	Description
ASK30	Mounting kit for use with former Landis & Gyr valves VVG45..., VVG45... and X3i...

Ordering

When ordering, please give quantity, product name and type reference.

Example: 2 actuators SSC81

Delivery

The actuators, valves and accessories are packed separately.

Equipment combinations

Type reference	Type of valve	k_{vs} [m ³ /h]	PN class	Data Sheet
VVP45...	2-port valves	0.25...25	PN16	N4845
VXP45...	3-port valves			
VMP45...	3-port valves with T-bypass	0.25...4		
VVG45... ¹⁾	2-port valves	0.63...25		Retrofitting to former L&G valves
VVG45... ¹⁾	3-port valves			
X3i... ¹⁾	3-port valves	0.7...14		

¹⁾ With ASK30 mounting kit

Function / mechanical design

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

3-position control signal

SSC31 / SSC81

- Voltage at Y1: Actuator stem extends valve opens
- Voltage at Y2: Actuator stem retracts valve closes
- No voltage at Y1 or Y2: Actuator maintains the current position

DC 0...10 V control signal

SSC61

- The valve opens / closes in proportion to the control signal at Y.
- At DC 0 V, the valve is fully closed (A → AB).
- When power supply is removed, the actuator maintains its current position.

Electrical fail-safe function

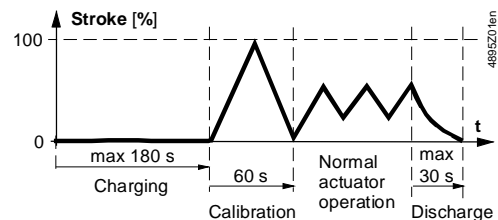
SSC61.5

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 Y control signals.

On completion of the charging process and self-calibration (see below), the "Open" and "Close" travel are proportional to the DC 0...10 V control signal.

In the event of a power failure of more than 5 seconds, the actuator will return mechanically to its 0 % stroke position within 30 seconds, closing the valve (A → AB).



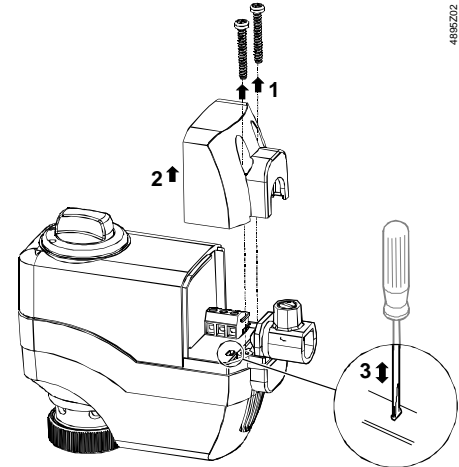
Self-calibration

SSC61 and SSC61.5

When the AC / DC 24 V supply is applied for the first time, the actuators calibrate themselves independent of the control signal. In this process, the actuator drives the valve to the mechanical end stops and stores the associated positions permanently in the form of electronic values. The positioning signal is only active on completion of this calibration process. Calibration takes about 60 seconds. The SSC61.5 only performs self-calibration when the charging process of 180 seconds is completed.

Recalibration

If the calibrated actuator is used with some other valve (e.g. a replacement valve), it must be recalibrated. For that purpose, the PCB beneath the terminal cover has a slot (see illustration). To make the recalibration, use a screwdriver and connect the 2 contacts behind the slot for about 1 second.



The calibration can only be made correctly if the actuator is fitted to a valve (refer to «Equipment combinations»).

Features and benefits

- Plastic cover
- Locking-proof, maintenance-free gear train
- Manual adjustment with rotary knob
- Reduced power consumption in the holding positions
- Load-dependent switch-off in the event of overload and in stroke limit positions

Accessories

Mounting kit



Type ASK30

Notes

Engineering

The actuators must be electrically connected in accordance with local regulations (refer to «Connection diagrams»).



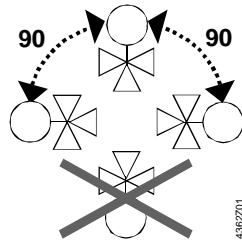
Regulations and requirements to ensure the safety of people and property must be observed at all times!

The permissible temperatures must be observed (refer to «Technical data»).

Mounting

Mounting Instructions 74 319 0260 0 are enclosed with each pack. Assembly is made with the coupling nut; no tools or adjustments are required. The actuators should be installed so that they are initially in position 0 (also refer to «Manual override»).

Orientation



Commissioning

When commissioning the system, check wiring and the functions of the actuator.

⚠ Caution

Before testing the functioning of the SSC..., always check to ensure that the actuator concerned is mounted on a valve (refer to «Equipment combinations»).

Calibrating the SSC61 or SSC61.5 without a valve connected causes the actuator to lock in position 1. To recalibrate (after mounting on a valve), disconnect power and reset the stroke manually from position 1 to 0 (refer to «Recalibration»).

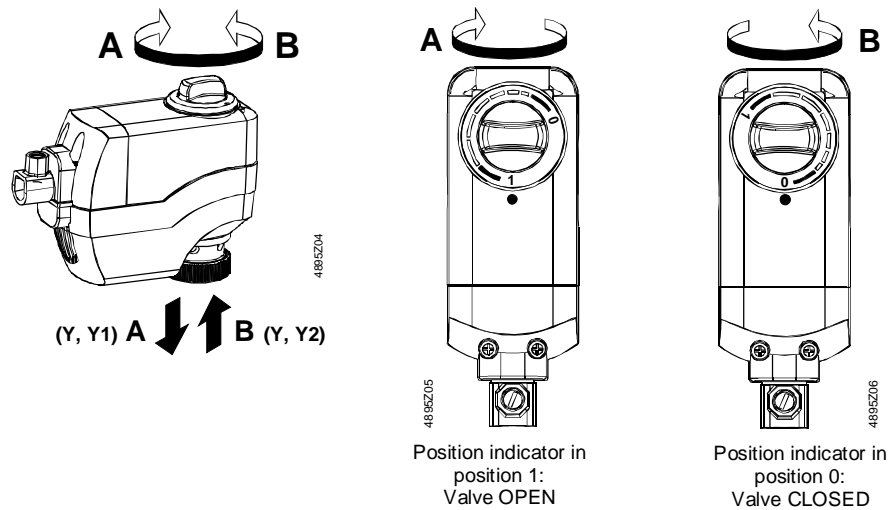
Operation

The rotary knob can be used to drive the actuator into any position between 0 and 1. If a control signal from the controller is present, this will take priority in determining the position.

Note

To retain the manually set position, unplug the connecting cable or switch off the rated voltage and the control signal. Due to the reset function, the SSC61.5 will first travel to position 0 and can then be driven manually to the required position.

Manual override



Maintenance

When servicing the actuator:

- Switch off power
- If necessary, disconnect the terminals
- The actuator must only be commissioned with a correctly mounted valve in place!

Repair

The SSC... actuators cannot be repaired. They must be replaced as a complete unit.

Disposal



The device must not be disposed of together with domestic waste. This applies in particular to the PCB. 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 relating to specific applications are valid only in conjunction with the Siemens valves listed in this Data Sheet under «Equipment combinations».

The use of the SSC... actuators in conjunction with third-party valves invalidates any warranty offered by Siemens Building Technologies / HVAC Products.

Technical data

		SSC31	SSC81	SSC61	SSC61.5
Power supply	Rated voltage	AC 230 V	AC 24 V	AC 24 V or DC 24 V	
	Voltage tolerance	± 15 %	± 20 %	± 20 %	± 25 %
	Rated frequency	50 / 60 Hz			
	Max. power consumption	6 VA	0.8 VA	2 VA	2 VA ¹⁾
	△ Fuse for incoming cable (fast)	2 A			
Control	Control signal	3-position		DC 0...10 V	
	Input impedance for DC 0...10 V	—		> 100 kOhm	
	Positioning accuracy for DC 0...10 V	—		< 2 % of nominal stroke	
	Parallel operation (number of actuators) ²⁾	max. 10			
Functional data	Running time for 5.5 mm stroke at 50 Hz	150 s		30 s	
	Capacitor charging time	—			max. 180 s
	Fail-safe run time	—			30 s
	Nominal stroke	5.5 mm			
	Nominal force	300 N			
	Permissible temperature of medium in the connected valve	1...110 °C			
Electrical connections	Terminal block, pluggable	screw terminals for max. 3 mm ²			
	Terminal block color	green	grey	red	red
	Cable strain relief	for cables 4...11 mm dia.			
Industry standards	Meets the requirements for CE marking:				
	EMC directive	89/336/EEC	Emissions	EN 50081-1	
			Immunity	EN 61000-6-2	
	Low-voltage directive	73/23/EEC	EN 60730-1		
	UL approval ³⁾	UL873-listed			
	CUL approval ³⁾	Certified to Canadian Standard C22.2 No. 24-93			
	Safety class to EN 60730	II	III		
	Housing protection standard	IP40 to EN 60529			
Dimensions / weight	Dimensions	refer to «Dimensions»			
	Coupling thread to valve	coupling nut G ³ / ₄ inch			
	Weight	0.26 kg	0.25 kg	0.27 kg	
Housing colors	Base, rotary knob	RAL 7035, light-grey			
	Cover	RAL 5014, pigeon-blue			

¹⁾ 3 VA, when capacitor charged for automatic reset

²⁾ Provided the controllers' output is sufficient

³⁾ For SSC81 and SSC61... only

General ambient conditions

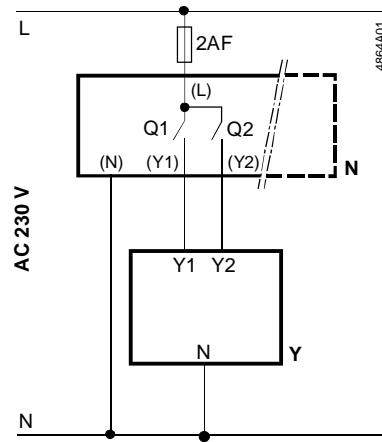
	Operation IEC 721-3-3	Transport IEC 721-3-2	Storage IEC 721-3-1
Environmental conditions	class 3K3	class 2K3	class 1K3
Temperature	+5...+50 °C	-25...+70 °C	-25...+70 °C
Humidity	5...95 % r.h.	< 95 % r.h.	5...95 % r.h.

Connection terminals

SSC31	<table border="1"><tr><td>Y2</td><td rowspan="3">4895Z06</td></tr><tr><td>Y1</td></tr><tr><td>N</td></tr></table>	Y2	4895Z06	Y1	N	Control signal CLOSE (AC 230 V) Control signal OPEN (AC 230 V) Neutral	.
Y2	4895Z06						
Y1							
N							
SSC81	<table border="1"><tr><td>Y2</td><td rowspan="3">4864Z15</td></tr><tr><td>Y1</td></tr><tr><td>G</td></tr></table>	Y2	4864Z15	Y1	G	Control signal CLOSE (AC 24 V) Control signal OPEN (AC 24 V) System potential AC 24 V
Y2	4864Z15						
Y1							
G							
SSC61 SSC61.5	<table border="1"><tr><td>Y</td><td rowspan="3">4895Z71</td></tr><tr><td>G</td></tr><tr><td>G0</td></tr></table>	Y	4895Z71	G	G0	Control signal DC 0...10 V System potential AC 24 V (+ with DC 24 V) System neutral (- with DC 24 V)	
Y	4895Z71						
G							
G0							

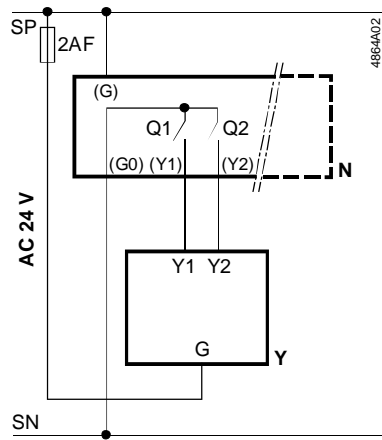
Connection diagrams

SSC31



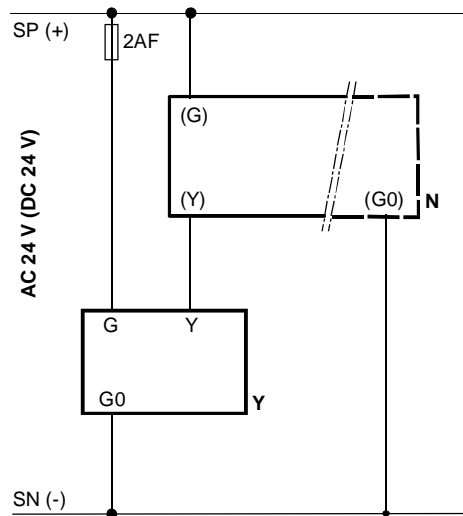
N Controller
 Y Actuator
 L System potential AC 230 V
 N System neutral
 Q1, Q2 Controller contacts

SSC81



N Controller
 Y Actuator
 SP System potential AC 24 V
 SN System neutral
 Q1, Q2 Controller contacts

SSC61
 SSC61.5



N Controller
 Y Actuator
 SP System potential AC 24 V
 SN System neutral

Dimensions

All dimensions in mm

