



Electromotoric Actuators

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

SFA21..
SFA11U
SFA71

- **SFA21..** AC 230 V operating voltage, 2-position control signal
- **SFA11U** AC 110 V operating voltage, 2-position control signal
- **SFA71** 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)
- Visual position indication
- Auxiliary switch, type ASC2.1/18 (optional)
- UL approved for plenum installation

Use

The SFA21.., SFA11U and SFA71 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
SFA21	AC 230 V	10 s	2-position
SFA21U ¹⁾			
SFA11U ¹⁾	AC 110 V		
SFA71	AC 24 V		

¹⁾ Actuators with type suffix U are UL approved

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 SFA11U and
2 auxiliary switches, type ASC2.1/18

Delivery

Actuators, valves and accessories are supplied separately.

Equipment combinations

Zone valves

PN 16

Type	Valve type	k_{vs} [m ³ /h]	PN-class	DN	Data sheet
VVI46..	2-port valves, internal thread Rp	2.0...5.0	PN 16 / 20	15...25	N4842..
VVS46..	2-port valves, solder connection				
VXI46.. ¹⁾	3-port valves, internal thread Rp				
VXS46..	3-port valves, solder connection				

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..., SFA11U and SFA71
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.

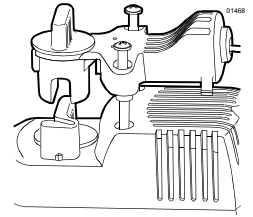
The valve is opened electrically by the actuator and closed by spring force. It incorporates a synchronous motor, a gear mechanism and a return spring. The electric motor is overload-resistant and anti-locking, so that continuous operation is possible. The maximum stroke is limited mechanically. The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

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» for further information on the auxiliary switch.

Engineering notes

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

Electrical connection

- The actuator may be operated only with alternating current (see «Technical data»).
- For safety and protection reasons connect the actuator with a suitable cable conduit, e.g. 

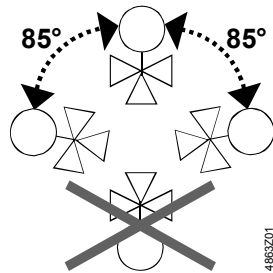
⚠ Caution

- **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.

Orientation



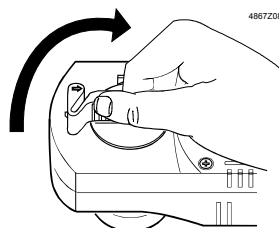
Commissioning notes

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

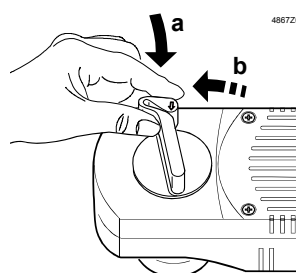
Manual adjustment

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

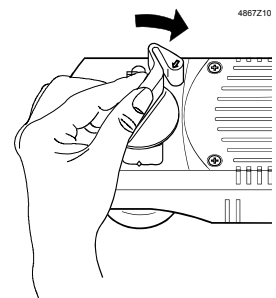


Rotate lever



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

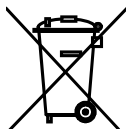
The actuators require no maintenance.

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».

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

Technical data

		SFA21	SFA21U	SFA11U	SFA71
Power supply	Operating voltage	AC 230 V		AC 110 V	AC 24 V
	Voltage tolerance	± 15 %		-15 / +25 %	± 20 %
	Frequency	50 Hz		60 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			
	Positioning force	200 N			
	Nominal stroke	2.5 mm			
	Admissible temperature of medium in the connected valve	+1...110 °C			
	Manual adjustment	0...90 %			
	Housing protection				
	Upright to 85 ° horizontal, do not suspend	IP30			
Mounting location		NEMA 1 (interior only)			
Conformity	UL		UL 873		
	cUL (Canadian Standard)		cUL C22.2 No. 24-93		
Mounting	Fixing on valve	plastic union nut M30 x 1.5			
	Orientation	upright to 85° horizontal, do not suspend			
Dimensions / weight	Dimensions	refer to « Dimensions »			
	Weight without auxiliary switch	0.585 kg			
	with auxiliary switch	0.692 kg			
Materials	Base plate	die-cast aluminium			
	Housing	PBT			
Housing colors	Base and cover	light gray RAL7035			
	Lever, union nut	pigeon blue RAL5014			
Auxiliary switch (optional)	Switching type	changeover contact			
	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 (PDM) signals are not suitable.

²⁾ Consider controller's power output.

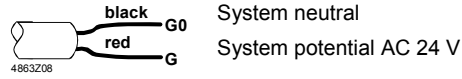
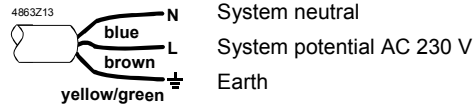
³⁾ Standard is only met when the actuator is connected with a suitable cable conduit.

General ambient conditions

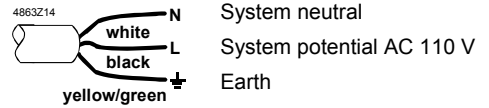
	Operation	Transport	Storage
	EN 60721-3-3	EN 60721-3-2	EN 60721-3-2
Environmental conditions	Class 3K3	Class 2K3	Class 2K3
Temperature	+1...+50 °C	-25...+70 °C	-25...+70 °C
Humidity	5...85 % r. h.	< 95 % r. h.	< 95 % r. h.

Connecting cable

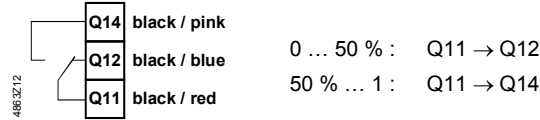
SFA21, SFA21U actuator



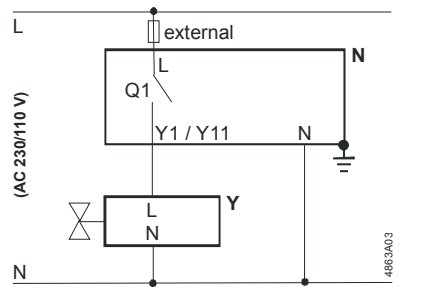
SFA11U actuator



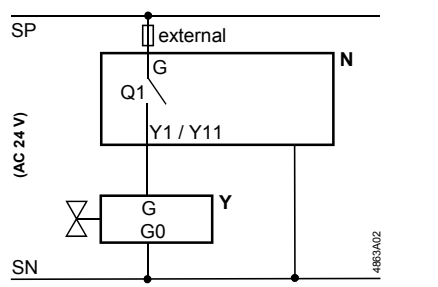
ASC2.1/18 auxiliary switch



Connection diagrams



- N controller (thermostat)
- Y actuator with zone valve
- L system potential AC 230/110 V
- N system neutral
- Y1 control signal OPEN
- Q1 controller contact
- Earth connection

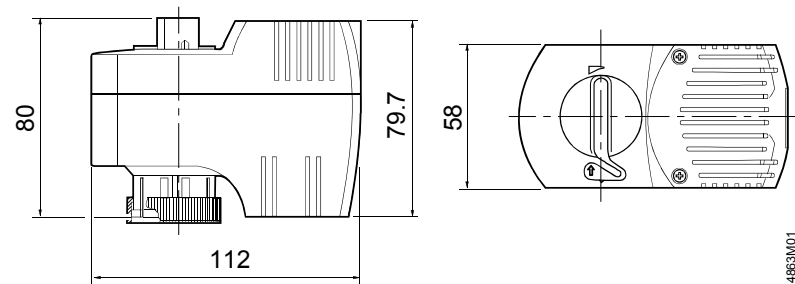


- N controller (thermostat)
- Y actuator with zone valve
- G system potential AC 24 V (SP)
- G0 system neutral (SN)
- Y1 control signal OPEN
- Q1 controller contact

Dimensions

Dimensions in mm

Actuator without auxiliary switch
SFA21..., SFA11U,
SFA71



Actuator with auxiliary switch
SFA21..., SFA11U,
SFA71 with ASC2.1/18

