



Electro-hydraulic actuators for valves

**SKD32...
SKD82...**

with a 20 mm stroke

- **SKD32...: Operating voltage AC 230 V, 3-position control signal**
- **SKD82...: Operating voltage AC 24 V, 3-position control signal**
- **Actuator versions with or without spring-return function**
- **Positioning force 1000 N**
- **For direct mounting on valves; no adjustments required**
- **Manual adjuster and position indicator**
- **Additional functions with auxiliary switches, potentiometer, stem heater and mechanical stroke inverter**
- **SKD82...U are UL-approved**

Use

For the operation of Siemens two-port and three-port valves, types VVF..., VVG..., VPF..., VXF... and VXG... with a 20 mm stroke.

- **Field of application in accordance with IEC 721-3-3 Class 3K5**
- **Ambient temperatures: -15 ... +50 °C**
- **Temperature of medium in the connected valve: -25 ... +140 °C**
 >140 °C: use type SKB... actuators
 < 0 °C: type ASZ6.5 stem heater required

Functions

- Electro-hydraulic actuators; no maintenance required
- Pump, pressure cylinder and piston to open valve
- Return spring and bypass valve to close valve
- Choice of actuators with or without spring-return function to DIN 32730
- Manual adjuster and position indication
- Mounting spaces for dual auxiliary switches and a potentiometer
- Stem heater can be fitted if required
- Mechanical stroke inverter can be installed if required
- SKD82...U actuators are UL-approved

Types

Type	Operating voltage	Control (Control signal)	Spring-return		Running time		
			Function	Time	Opening	Closing	
SKD32.50	AC 230 V	3-position	No	--	120 s	120 s	
SKD32.51			Yes	8 s			
SKD32.21						30 s	10 s
SKD82.50	AC 24 V		No	--	120 s	120 s	
SKD82.50U *			Yes	8 s			
SKD82.51							
SKD82.51U *							

* UL-approved versions

Accessories

Type	Description
ASC9.3	Dual auxiliary switches
ASZ7.3 *	Potentiometer 1000 Ω
ASZ7.31 *	Potentiometer 135 Ω
ASZ7.32 *	Potentiometer 200 Ω
ASZ6.5	Stem heater AC 24 V
ASK50	Mechanical stroke inverter

* Only one potentiometer per actuator may be installed

Ordering

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

*Example: 1 actuator, type SKD32.50 and
1 potentiometer, 135 W, type ASZ7.31*

Delivery

The actuator, valve and accessories are supplied in separate packaging and not assembled prior to delivery.

Compatibility

Controllers

The actuators can be driven by all control systems which have an AC 24 V SELV/PELV supply (SKD82...) or AC 230 V supply (SKD32...) and which operate with 3-position signals.

Mounting on linear valves

The actuators are suitable for operation of the following Siemens two-port and three-port valves with a 20 mm stroke:

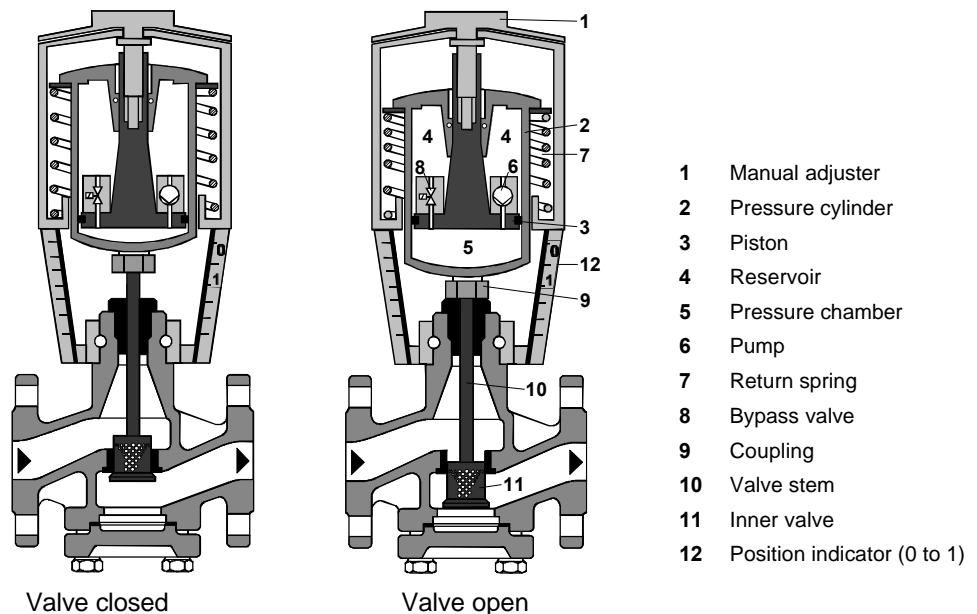
Valve	DN	PN	Data sheet
<i>Two-port valves VV... (control valves or safety shut-off valves):</i>			
VVF21... (Flange)	25 ... 80 mm	6 bar	4310
VVF31... (Flange)	25 ... 80 mm	10 bar	4320
VVF40... (Flange)	15 ... 80 mm	16 bar	4330
VVF41... (Flange)	50 mm	16 bar	4340
VVG41... (Screwed)	15 ... 50 mm	16 bar	4363
VVF52... (Flange)	15 ... 40 mm	25 bar	4373
VVF61... (Flange)	15 and 25 mm	40 bar	4382
<i>Three-port valves, VX... (control valves for mixing and distribution)</i>			
VXF21... (Flange)	25 ... 80 mm	6 bar	4410
VXF31... (Flange)	25 ... 80 mm	10 bar	4420
VXF40... (Flange)	15 ... 80 mm	16 bar	4430
VXF41... (Flange)	15 ... 50 mm	16 bar	4440
VXG41... (Screwed)	15 ... 50 mm	16 bar	4463
VXF61... (Flange)	15 and 25 mm	40 bar	4482
<i>Combination valve VP... (Two-port valve with integrated differential pressure controller):</i>			
VPF52... (Flange)	15 ... 40 mm	25 bar	4374

For admissible differential pressures Δp_{max} and closing pressures Δp_s , refer to the relevant valve data sheets.

Note Third-party valves with strokes between 6 and 20 mm can be motorized, provided they are «closed with the de-energized» fail-safe mechanism and provided that the necessary mechanical coupling is available. The Y1 signal must be routed via an additional freely-adjustable end switch (ASC9.3) to limit the stroke. We recommend that you contact your local Siemens office for the necessary information.

Technology

Principles of electro-hydraulic actuators



- **Voltage at Y1:** The pump (6) forces hydraulic oil from the reservoir (4) into the pressure chamber (5) thereby generating the stroke: the valve stem (10) retracts and the valve plug opens (11).
- **Voltage at Y2:** The bypass valve (8) opens, allowing the hydraulic oil to flow back from the pressure chamber (5) into the reservoir (4) via the return spring (7). The valve stem (10) extends and the valve plug closes (11).
- **No voltage at Y1 or Y2:** The actuator and valve hold the current stroke position.

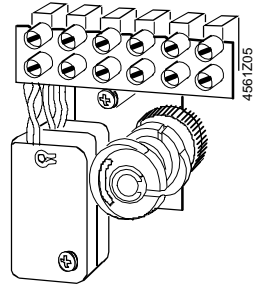
Spring-return function

The SKD32.51, SKD32.21 and SKD82.51(U) actuators, which have a spring-return feature, incorporate a second bypass valve which opens if the power fails. The return spring causes the actuator to move to the «0%» stroke position, and closes the valve in accordance with the safety requirements set out in DIN 32730.

Accessories

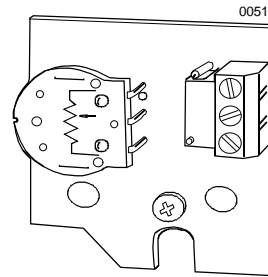
Dual auxiliary switches, ASC9.3

- Adjustable switching points



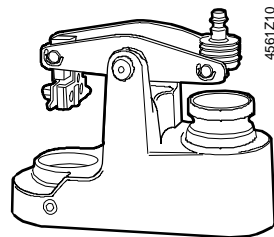
ASZ7.3... potentiometer

- 0...1000 Ω, 0...135 Ω, 0...200 Ω



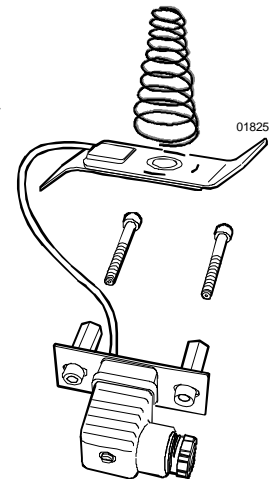
ASK50 mechanical stroke inverter

- 0% actuator stroke corresponds to 100% valve stroke
- 100% actuator stroke corresponds to 0% valve stroke
- Mount between valve and actuator



ASZ6.5 stem heater

- Media below 0°C
- Mount between valve and actuator



See «Technical data» for further information.

Engineering notes



The actuators must be electrically connected in accordance with local wiring regulations and with the wiring diagrams on page 7/8.

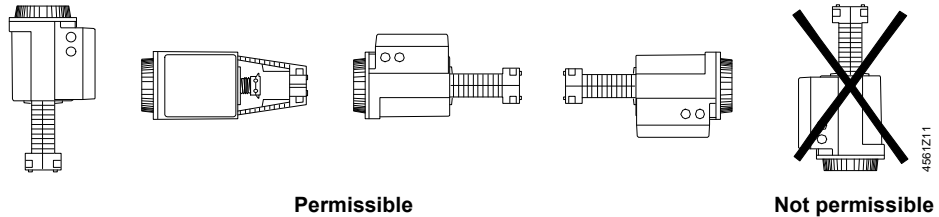
Regulations and requirements designed to ensure the safety of people and property must be observed at all times.

The ASZ6.5 stem heater has a heat output of 30 VA and is required to keep the valve stem free of ice in the cooling range 0 °C ... - 25 °C. In this case, in order to ensure adequate air circulation, the actuator bracket and the valve stem must not be insulated. Physical contact with unprotected hot components can cause burns. Failure to observe the above advice can result in accidents or fire.

The admissible temperatures (see «Application» and «Technical data») must be observed. If auxiliary switches are used, their switching points must be shown on the plant schematic.

Mounting instructions

Orientation



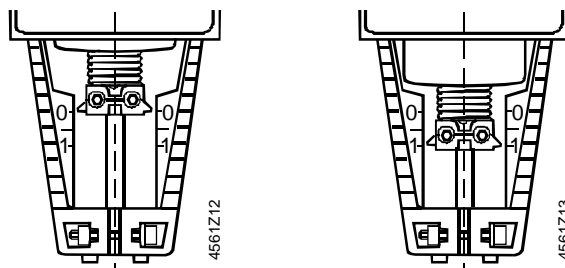
Permissible

Not permissible

Instructions for fitting the actuator to the valve are bypacked in the actuator packaging. The instructions for accessories are enclosed with the accessories themselves.

Commissioning notes

When commissioning the system, check the wiring and functions, and set any auxiliary switches and potentiometers as necessary, or check the existing settings.

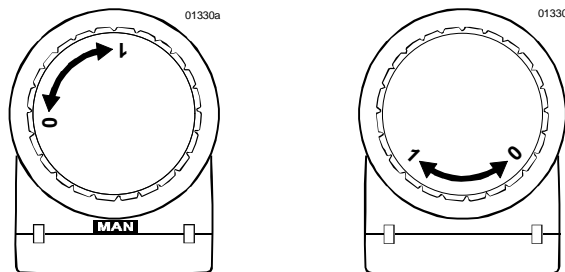


Coupling fully retracted
→ stroke = 0%

Coupling fully extended
→ stroke = 100 %



The manual adjuster must be rotated counterclockwise to the end stop, i.e. until the red indicator marked «MAN» is no longer visible. This causes the Siemens valves, types VVF..., VVG..., VPF..., VXF... and VXG... to close (stroke = 0%).



« MAN »

Manual operation

« AUTO »

Automatic operation

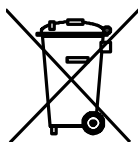
Maintenance



When servicing the valve:

- **Switch OFF the pump and power supply, close the main shut-off valves in the pipework, release pressure in the pipes and allow them to cool down completely. If necessary, disconnect electrical connections from terminals.**
- **The valve must be re-commissioned only with the actuator correctly assembled.**

Disposal



The actuator includes electrical and electronic components and must not be disposed of as domestic waste.

Current local legislation must be observed.

Warranty

The application-related technical data (Δp_{max} , Δp_s , leakage, noise levels and service life) is valid for the Siemens actuators only in conjunction with the Siemens valves listed in the section on «Compatibility».



Before using these actuators with third-party valves, written approval must be obtained from Siemens Building Technologies. A failure to obtain this approval invalidates any guarantee.

Technical data

Power supply	Operating voltage		
	SKD32...	AC 230 V $\pm 15\%$	
	SKD82...	AC 24 V $\pm 20\%$	
	Frequency	50 or 60 Hz	
	Power consumption		
	SKD32.50	16 VA / 11 W	
	SKD82.50(U)	13 VA / 8 W	
	SKD32.21	20 VA / 13 W	
	SKD32.51	21 VA / 13 W	
	SKD82.51(U)	18 VA / 11 W	
Fuse for supply cable	SKD32...	Min. 0,5 A slow blow, max. 6 A slow blow	
	SKD82...	Min. 1 A slow blow, max. 10 A slow blow	
	Operating data	Type of control	3-position
	Running time at 50 Hz	<u>Opening</u>	<u>Closing</u>
SKD32.5..., SKD82.5...(U)	120 s	120 s	
	SKD32.21	30 s	10 s
Spring-return time (closing)	SKD32.21, SKD32.51, SKD82.51(U)	8 s	
	Nominal stroke	20 mm	
Positioning force	1000 N		
General ambient conditions	Maximum admissible temperature of medium in the connected valve:	$\leq 140^\circ\text{C}$	
	Operation	To IEC 721-3-3	
	Environmental conditions	Class 3K5	
	Temperature	$-15 \dots +50^\circ\text{C}$	
	Humidity	5 ... 95 % rh	
	Transport	To IEC 721-3-2	
	Environmental conditions	Class 2K3	
	Temperature	$-30 \dots +65^\circ\text{C}$	
	Humidity	$< 95\%$ rh	
	Storage	To IEC 721-3-1	
Environmental conditions	Class 1K3		
Temperature	$-15 \dots +50^\circ\text{C}$		
Humidity	5 ... 95 % rh		

Industry standards

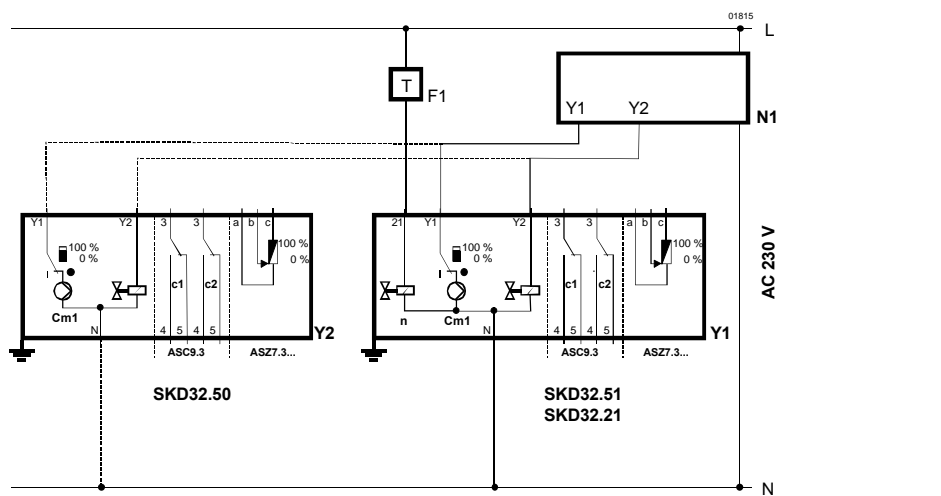
Meets the requirements for CE marking in	
EMC Directive	89/336/EEC
Low Voltage Directive	73/23/EEC
Electromagnetic compatibility	
Interference emission	EN 61000-6-3 Residential
Interference immunity	EN 61000-6-2 Industrial
Product standards for automatic electric controls	
C-tick	N474
Protection standard	IP54 to EN 60529
Protection class	
SKD82...	III to EN 60730
SKD32...	I to EN 60730
UL approval	UL 873
Dimensions	See «Dimensions»
Weight	
SKD32..., SKD82...	3.60 kg (including packaging)
SKD82...U	3.85 kg (including packaging)
ASK50 stroke inverter	1.10 kg (including packaging)
Materials	
Actuator housing and bracket	Die-cast aluminum
Housing box and manual adjuster	Plastic
Cable glands	
SKD32..., SKD82...	Pg 11 (4 x)
SKD82...U	Pg 16 (4 x)

Accessories

Dual auxiliary switches, ASC9.3	Switching capacity of one auxiliary switch	AC 250 V, 6 (2.5) A
ASZ7.3... potentiometer	Change in overall resistance of potentiometer at nominal stroke	0 ... 1000 Ω (ASZ7.3) 0 ... 135 Ω (ASZ7.31) 0 ... 200 Ω (ASZ7.32)
ASZ6.5 stem heater	Operating voltage	AC 24 V ±20 %
	Power consumption (heat output)	30 VA

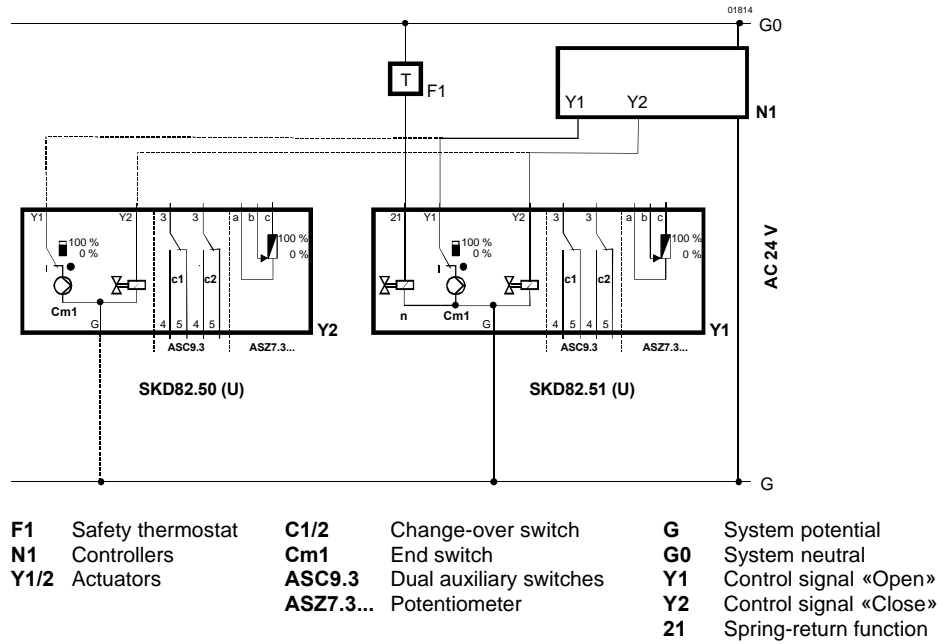
Connection diagrams

SKD32...



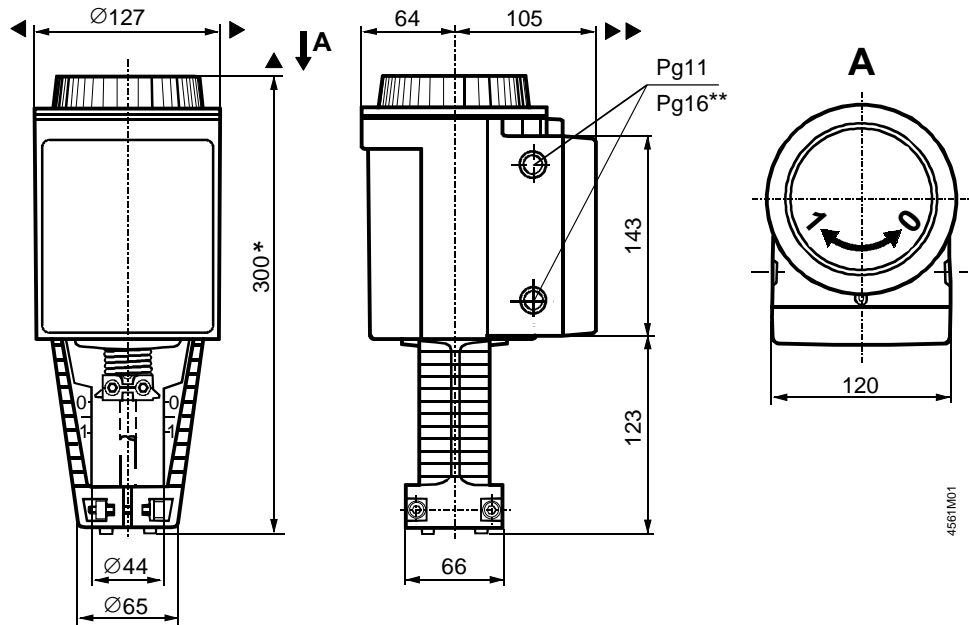
F1 Safety thermostat	C1/2 Change-over switch	L Phase
N1 Controller	Cm1 End switch	N Neutral conductor
Y1/2 Actuators	ASC9.3 Dual auxiliary switches	Y1 Control signal «Open»
	ASZ7.3... Potentiometer	Y2 Control signal «Close»
		21 Spring-return function

SKD82...



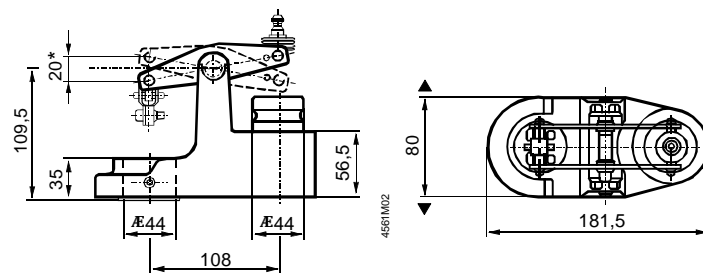
Dimensions

All dimensions in mm



- * Height of actuator from valve plate without stroke inverter **ASK50 = 300 mm**
Height of actuator from plate with stroke inverter **ASK50 = 357 mm**
- ** The hole diameter on the SKD82...U actuators corresponds to the Pg16 gland.
- ▲ = > 100 mm | Minimum clearance from ceiling or wall for mounting,
- ▲▲ = > 200 mm | connection, operation, maintenance etc.

ASK50 stroke inverter



* Maximum stroke = 20 mm