SIEMENS

4564

Electro-hydraulic actuators for valves

with 20 or 40 mm stroke

SKB32... SKC32...
SKB82... SKC82...
SKB62... SKC62...

- **SK...32...: AC 230 V operating voltage, 3-position signal**
- **SK...82...: AC 24 V operating voltage, 3-position signal**
- **SK...62 : AC 24 V operating voltage, DC 0...10 V positioning signal**
- **SK...62U: AC 24 V operating voltage, DC 0...10 V or 4...20 mA positioning signal**
- **The units come with or without spring return as per DIN 32 730**
- **Function enhancement by means of auxiliary switch, potentiometer, stroke limiter, stem heating element, and stroke inverter**
- **Positioning force 2800 N**
- **For direct valve mounting without additional setting tasks**
- **With manual adjustment and position indication**
- **SK...U are UL approved**

Use

To actuate two-port and three-port valves of type series VVF... and VXF... with 20 or 40 mm stroke.

- Field of use as per IEC 721-3-3 Class 3K5
- Ambient temperatures: −15 ... +55°C
- Medium temperature inside the valve: −25 ... +220°C
  > 220 ... 350°C: use special extension on valve
  < 0°C: ASZ6.5 stem heating element required

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Siemens Building Technologies
Landis & Staefa Division

SK...32..., SK...82...
3-position signal

- *Voltage on Y1*: The pump delivers hydraulic oil from the suction chamber to the pressure chamber and thereby generates the stroke: the valve stem retracts, the through-port opens.
- *Voltage on Y2*: The bypass valve opens and thereby enables the hydraulic oil to return from the pressure chamber to the suction chamber by means of the tensioned return spring in the actuator: the valve stem extends, the through-port closes.
- *No voltage on Y1 or Y2*: Both actuator and valve remain in the respective stroke position.
- The **SKB32.51**, **SKB82.51**, **SKC32.61**und **SKD82.61** actuators with spring return feature a second bypass valve that opens on voltage failure. The actuator returns to 0% stroke via the return spring and closes the valve as per the DIN 32 730 safety requirements.

SK...62..., SK...62...
Positioning signal
DC 0...10 V or DC 4...20 mA

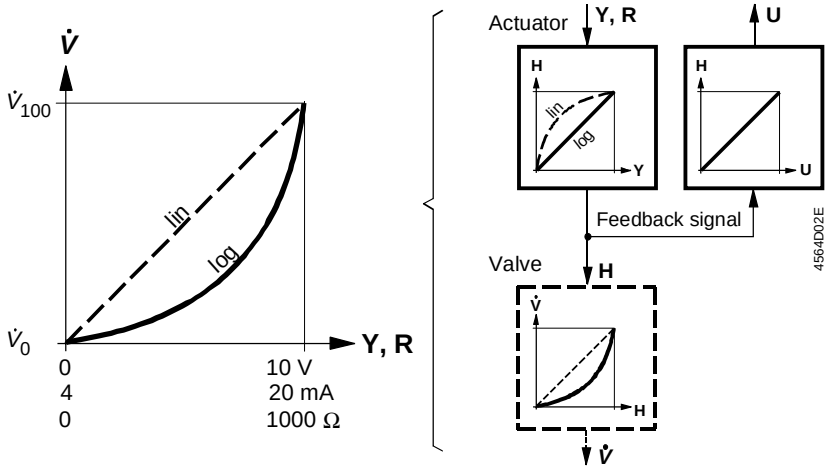
The «open» or «close» functions largely match those of actuators with 3-position signals, but feature an intermediary electronic circuit with AC 24 V operating voltage and a DC 0...10 V or DC 4...20 mA positioning signal.
The **SK...62...** and **SK...62...U** actuators have a factory-installed spring return, i.e., on interruption of the positioning signals or the operating voltage, the actuator returns to «0%» stroke.
The **SK...62U** actuators can either be driven via a DC 0...10 V or a DC 4...20 mA positioning signal and, additionally, they are UL approved.

Selection of
flow characteristic

Via a selector plug on the circuit board, the flow characteristics for the VVF... and VXF... valves can be changed from «equal percentage» to «linear». On delivery, the actuator with the above listed L&S valves generates an equal-percentage flow characteristic.

Flow characteristics

Relationship between the DC 0…10 V or DC 4…20 mA positioning signal and volumetric flow:



Y = DC 0...10 V
R = 0...1000 Ω *or* DC 4...20 mA (only for **SK...62U**)
U = DC 0 ... 10 V *or* DC 4 ... 20 mA
H = Stroke (Valve)

$\dot{V}$ = Air volume
$\dot{V}_{100}$ = Volumetric flow 100 %
$\dot{V}_0$ = Volumetric flow 0 %
log = Equal-percentage valve characteristic (factory setting)
lin = Linear valve characteristic

Type summary

Standard versions

Type	Stroke	Operating voltage	Control type (Positioning signal)	Spring return function	Spring return time	Runtime open	Runtime close
SKB32.50	20 mm	AC 230 V	3-position	no	--	120 s	120 s
SKB32.51				yes	10 s		
SKB82.50		AC 24 V		no	--		
SKB82.51				yes	10 s		
SKB62			DC 0 ... 10 V	yes	15 s		15 s
SKC32.60	40 mm	AC 230 V	3-position	no	--		120 s
SKC32.61				yes	18 s		
SKC82.60		AC 24 V		no	--		
SKC82.61				yes	18 s		
SKC62			DC 0 ... 10 V	yes	20 s		20 s

Special,
UL-approved versions:

Type	Stroke	Operating voltage	Control type (Positioning signal)	Spring return function	Spring return time	Runtime open	Runtime close
SKB82.50U	20 mm	AC 24 V	3-position	no	--	120 s	120 s
SKB82.51U				yes	10 s		
SKB62U			DC 0 ... 10 V or DC 4 ... 20 mA	yes	15 s		15 s
SKC82.60U	40 mm		3-position	no	--		120 s
SKC82.61U				yes	18 s		
SKC62U			DC 0 ... 10 V or DC 4 ... 20 mA	yes	20 s		20 s

Accessories

Name	Type	For actuators	Mounting location
Double auxiliary switch	**ASC9.3**	SK...32...	1 x ASC9.3
Potentiometer 1000 Ω	**ASZ7.3**	SK...82...	1 x ASZ7.3
Potentiometer 135 Ω	**ASZ7.31**		1 x ASZ7.31
Potentiometer 200 Ω	**ASZ7.32**		1 x ASZ7.32
Auxiliary switch	**ASC1.6**	SK...62...	1 x ASC1.6
Stroke limiter [1]	**ASZ62.6**		1 x ASZ62.6
AC 24 V stem heating	**ASZ6.5**	SK...32... SK...82...	1 x ASZ6.5 or
Stroke inverter	**ASK50**	SK...62...	1 x ASK50 [2]

[1] can only be driven by a DC 0...10 V signal

[2] Only one accessory may be mounted between the valve and the actuator

Ordering

On ordering, indicate the actuator type and, where required, the accessory type:

Example: **1 SKC32.60 actuator** and
1 ASZ7.31 potentiometer 135 Ω

Delivery

Actuator, valve and accessories are packed and delivered separately and are not mounted on delivery.

Equipment combinations

The **SKB...** and **SKC...** actuators allow for actuating two-port and three-port valves of type series VVF... and VXF... with 20 or 40 mm stroke:

Type	DN	PN	Data sheet
Two-port valves VV... (control or safety shutoff valves)			
VVF21... (Flange)	25 ... 100 mm	6 bar	4310
VVF31... (Flange)	25 ... 150 mm	10 bar	4320
VVF40... (Flange)	15 ... 150 mm	16 bar	4330
VVF41... (Flange)	50 ... 150 mm	16 bar	4340
VVF45... (Flange)	50 ... 150 mm	16 bar	4345
VVF52... (Flange)	15 ... 40 mm	25 bar	4373
VVF61... (Flange)	15 ... 150 mm	40 bar	4382
Zhree-port valves VX... (control valves for «mixing» and «diverting» functions)			
VXF21... (Flange)	25 ... 100 mm	6 bar	4410
VXF31... (Flange)	25 ... 150 mm	10 bar	4420
VXF40... (Flange)	15 ... 150 mm	16 bar	4430
VXF41... (Flange)	15 ... 150 mm	16 bar	4440
VXF61... (Flange)	15 and 25 mm	40 bar	4482

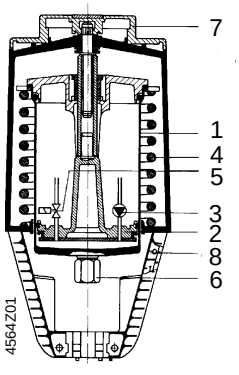
See the associated valve data sheets for permissible differential and close-off pressures Δp_{max} and Δp_s

Mechnical design

- Maintenance-free, electro-hydraulic actuators
- Pump, pressure cylinder and piston to open the valve
- Return spring and bypass valve to close the valve
- The **SK...32...** and **SK...82...** actuators alternately come with or without spring return as per DIN 32 730
- **SK...62**... actuators have a spring return as a serial standard
- Mounting spaces for double auxiliary switches and potentiometer with **SK...32...** and **SK...82...**
- Mounting spaces for auxiliary switch and stroke limiter with **SK...62...**
- Integration of stem heating planned for all actuators
- Manual stroke adjustment; integrated as a series standard with manual adjustment knob and position indication
- The **SKD...U** actuators are UL-approved

Principle of the electro-hydraulic actuators

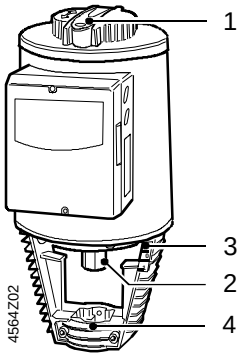
SK...32..., **SK...82...**, **SK...62...**



1 Pressure cylinder
2 Piston
3 Pump
4 Return spring
5 Bypass valve
6 Coupling
7 Manual adjustment
8 Position indication (0 to 1)

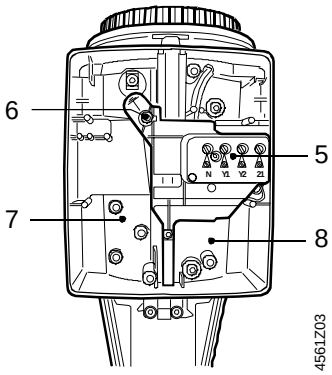
Operating and connecting elements

SK...32..., **SK...82...**, **SK...62...**



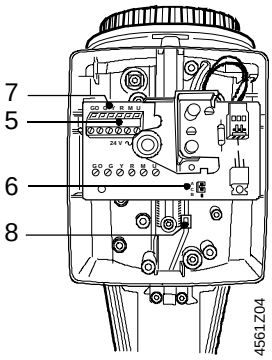
1 Manual adjustment
2 Coupling to valve stem
3 Position indication (0 to 1)
4 Console

SK...32..., **SK...82...**



5 Terminal strip
6 Earthing screw (SKD32...)
7 Mounting space for **ASC9.3** auxiliary switch
8 Mounting space for **ASZ7.3** potentiometer

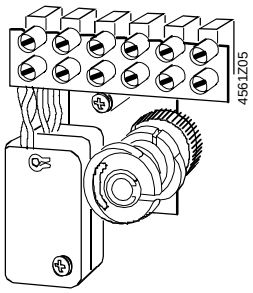
SK...62...



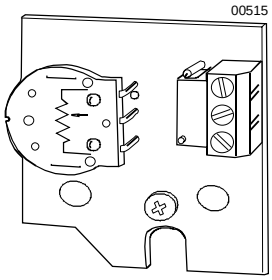
5 Terminal strip
6 Selector plug for flow characteristic «**lin**»/«**log**»
7 Mounting space for **ASZ62.6** stroke limiter
8 Mounting space for **ASC1.6** auxiliary switch

Accessories

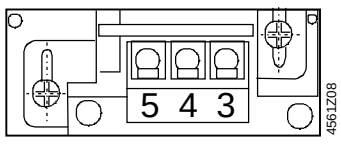
ASC9.3 double auxiliary switch
Adjustable switching points



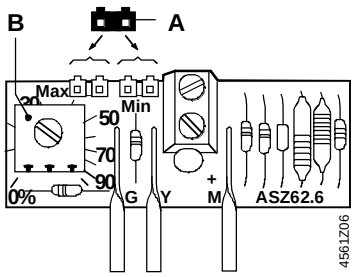
ASZ7.3... potentiometer
0...1000 Ω, 0...135 Ω, 0...200 Ω



ASC1.6 auxiliary switch

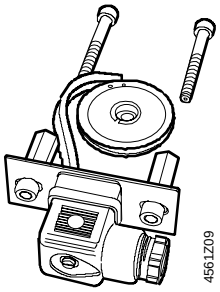


ASZ62.6 stroke limiter

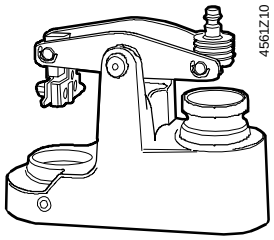


A Plug to select minimum or maximum limitation
B Potentiometer to set desired limitation variable

ASZ6.5 stem heating
- for media below 0°C
- mounting between valve and actuator [1)]



ASK50 stroke inverter
- 0% stroke on the actuator corresponds to 100% stroke on the valve
- mounting between valve and actuator [1)]



[1)] Only one accessory may be mounted between the valve and the actuator.

See section «Technical data» for more information.

Disposal

The various material types used require that you disassemble the unit and sort the components prior to disposal.

Engineering notes

Conduct the electric connections in accordance with local regulations on electric installations as well as the internal or connection diagrams on pages 11 and 12.

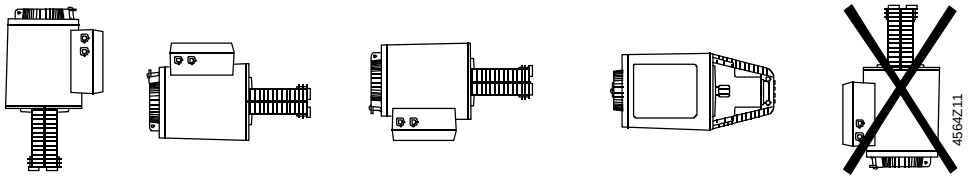
⚠ **Observe all safety-related requirements and restrictions to prevent injuries and damages to goods.**

⚠ **The ASZ6.5 stem heating has a heating output of 30 VA and must keep the valve stem from freezing when used in a cooling range of 0°C ... –25°C. For this case, do not insulate the actuator console and the valve stem, as air circulation must be ensured. Do not touch the hot parts without prior protective measures to avoid burns.**
Non-observance of the above may result in accidents and fires !

Additionally, pay attention to permissible temperatures as listed in sections «Use» and «Technical data». If an auxiliary switch is required, indicate its switching point on the plant schematic.

Mounting notes

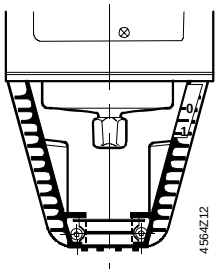
Mounting positions



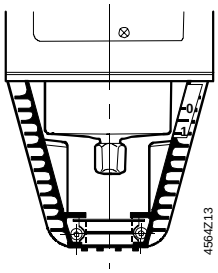
permissible **permissible** **permissible** **permissible** **not permissible**

The valve mounting instructions are supplied with the actuator. Accessory instructions are located in the respective accessory's packaging.

During commissioning, check the wiring and conduct a functional check. Additionally, check or make the required settings at the auxiliary switch, the potentiometer, and the stroke limiter.



Coupling fully retracted

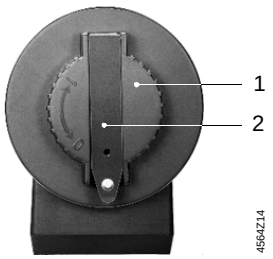


Coupling fully extended

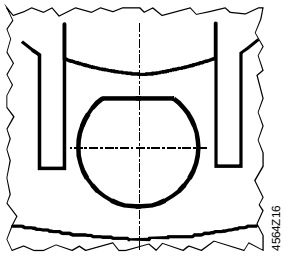
⚠ **If the manual adjustment is turned counter-clockwise to the end position, the Landis & Staefa valves of type series VVF... and VXF... are closed (stroke = 0 %).**

Automatic operation

For automatic operation, the crank (2) on the manual adjustment knob (1) must be engaged. If not engaged, turn the crank counter-clockwise until the display window (3) neither shows the scale (4) nor the crank engagement bar.



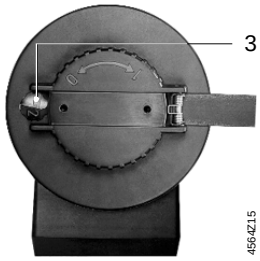
Engaged crank (2) on the manual adjustment knob (1)



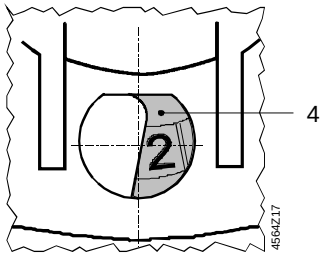
Display window with invisible scale dial and crank engagement bar

Manual operation

For manual operation, swung out the crank (2) so that the display window (3) becomes visible. By rotating the crank or the manual adjustment knob (1), the display window shows the engagement bar and/or the scale dial with stroke indication.



Swung-out crank (2), display window (3)



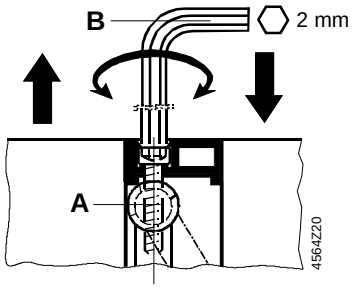
Display window with scale dial (4) and stroke indication

Position potentiometer

only for **SK...62** and **SK...62U.**

Adjustments at the position potentiometer serve to balance the measuring voltage to the stroke position of the valve. Adjustments are necessary only if voltage is required on terminal U, e.g., for an indicating device, management system or position-dependent switching.

Stroke position 0 %: permissible measuring voltage on terminal U = min. DC 0.03... max. 0.4 V.



A Adjustment screw
B Allen key 2 mm

Characteristic flow factory setting

⚠ only for **SK...62** and **SK...62U**: equal percentage

Maintenance notes

⚠ **For actuator service work:**

- **Turn off the pump and the operating voltage, close the shutoff valves, depressurize the pipes and allow them to cool down. Disconnect the electrical connections from the terminals, where required.**
- **Re-commission the val ve only if the actuator has been mounted correctly.**

Warranty

Landis & Staefa actuators guarantee the technical data (Δp_{max}, Δp_s, leakage rate, noise level and life) only when used together with the Landis & Staefa valves as listed in «Equipment combinations».

⚠ **Use with third-party valves expressly voids any warranty claims.**

Technische Daten

Power supply	Operating voltage		
	SK...32...	AC 230 V ± 15%	
	SK...82...	AC 24 V ± 20%	
	SK...62...	AC 24 V ± 20%	
	Frequency	50 or 60 Hz	
	Control type		
	SK...32..., SK...82(U)	3-position	
	SK...62...	DC 0 ... 10 V (proportional)	
	SK...62U	DC 0 ... 10 V or	
		DC 4 ... 20 mA (proportional)	
	Power consumption		
	SKB32.50	10 VA	
	SKB82.50(U)	13 VA	
	SKB32.51	15 VA	
	SKB82.51(U)	18 VA	
	SKC32.60, SKC82.60(U)	19 VA	
	SKC32.61, SKC82.61(U)	24 VA	
	SKB62(U)	18 VA	
	SKC62(U)	28 VA	
Function data	Positioning force	2800 N	
	Nominal stroke		
	SKB...	20 mm	
	SKC...	40 mm	
	Runtime at 50 Hz	*open*	*close*
	SK...32..., SK...82...(U)	120 s	120 s
	SKB62(U)	120 s	15 s
	SKC62(U)	120 s	20 s
	Spring return time (close)		
	SKB32.51, SKB82.51(U), SKB62(U)	15 s	
	SKC32.61, SKC82.61(U), SKC62(U)	20 s	
Signal inputs	Terminal Y [1]		
SK...62(U)	Voltage	DC 0 ... 10 V	
	Current	max. 0.1 mA	
	Terminal R [1]		
	SK...62: Resistance [2]	0 ... 1000 Ω	
	SK...62U: Resistance [2]	0 ... 1000 Ω	
	Current	DC 4 ... 20 mA	
	max. impedance	250 Ω	
Signal outputs	Terminal U [3]		
SK...62(U)	SK...62: Voltage	DC 0 ... 10 V	
	SK...62U: Voltage	DC 0 ... 10 V	
	Current	DC 4 ... 20 mA	
Housing protection	Housing protection	IP54 as per EN 60 529	
	Cable entry glands		
	SK...32..., SK...82..., SK...62	Pg 11 (4 x)	
	SK...U	Pg 16 (4 x)	

[1] If a DC 4…20 mA control signal is switched to terminal R on **SK...62U**, terminal Y cannot be used simultaneously!

[2] If a 0...1000 Ω signal is supplied to input R, the serially integrated wire jumper labelled R – M on the circuit board must be separated.

[3] U at the **SK...62U** corresponds to either the input signal Y (DC 4...10 V) or the input signal R (if terminal R has a DC 4...20 mA signal).

Environmental conditions	Maximum permissible medium temperature	
	inside valve	≤ 220°C
	Operation	as per IEC 721-3-3
	Climatic conditions	Class 3K5
	Temperature	– 15 ... + 55°C
	Humidity	5 ... 95% r.h.
	Transport	as per IEC 721-3-2
	Climatic conditions	Class 2K3
	Temperature	– 30 ... + 65°C
	Humidity	< 95% r.h.
	Storage	as per IEC 721-3-1
	Climatic conditions	Class 1K3
	Temperature	– 15 ... + 55°C
	Humidity	0 ... 95% r.h.
Standards	**CE** conformity as per the	
	EMC directive	89/336/EEC
	Low voltage directive	73/23/EEC
	UL approval	UL 873
Dimensions		see «Dimensions»
Weights	SKB...	8,40 kg (ohne Verpackung)
		8,70 kg (mit Verpackung)
	SKB82...U, SKB62U	9,70 kg (ohne Verpackung)
		10,00 kg (mit Verpackung)
	Stroke inverter ASK50	0,95 kg (ohne Verpackung)
		1,10 kg (mit Verpackung)
Materials	Actuator housing and console	Die-cast aluminium
	Housing box and manual adjustment knob	Plastic

Accessories

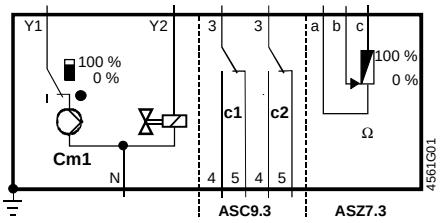
Double auxiliary switch **ASC9.3**	Switching output of one auxiliary switch	AC 250 V, 6 A ohm., 2.5 A ind.
Potentiometer **ASZ7.3...**	Change of overall resistance of the potentiometer at nominal stroke	0 ... 1000 Ω (ASZ7.3) 0 ... 135 Ω (ASZ7.31) 0 ... 200 Ω (ASZ7.32)
Auxiliary switch **ASC1.6**	Switching output of auxiliary switch	AC 24 V, 10 mA ... 4 A ohm., 2 A ind.
Stroke limiter **ASZ2.6** [1)]	Possible settings – maximum stroke limitation for valves, that should not provide the full stroke – minimum stroke limitation for valves, that must not fully close in a controlled throughput	 6 ... 20 mm (30 ... 100%) [2)] 0 ... 14 mm (0 ... 70%) [2)]
Stem heating **ASZ6.5**	Operating voltage	AC 24 V ± 20%
	Power consumption (heating output)	30 VA

[1)] Can only be driven by a DC 0...10 V signal

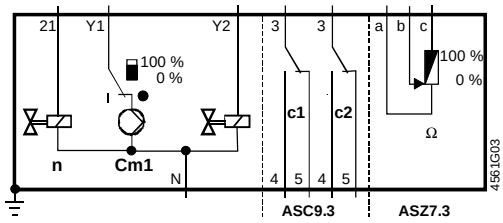
[2)] The reference point for limitation is the 0% stroke position of the actuator (coupling of the actuator fully retracted)

Actuators
SK...32..., SK...82...

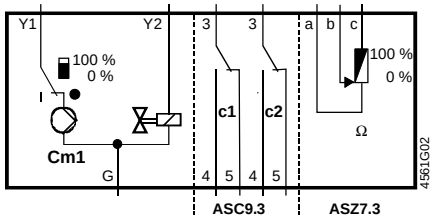
SKB32.50, SKC32.60
without spring return
AC 230 V, 3-position



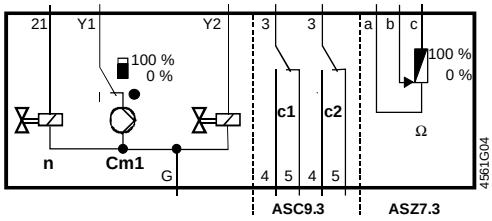
SKB32.51, SKC32.61
with spring return
AC 230 V, 3-position



SKB82.50(U), SKC82.60(U)
without spring return
AC 24 V, 3-position



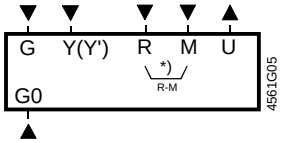
SKB82.51(U), SKC82.61(U)
with spring return
AC 24 V, 3-position



Y1 Open control valve
Y2 Close control valve
21 Spring return (no voltage = 0% stroke = valve closed)
Cm1 Limit switch for 100% stroke
c1, c2 Double auxiliary switch **ASC9.3**
Ω Potentiometer **ASZ7.3...**

Possible mounting spaces for **SK...32...** and **SK...82...**:
1 Double auxiliary switch **ASC9.3**
1 Potentiometer **ASZ7.3...**
1 Stem heating **ASZ6.5**
ASC9.3, ASZ7.3... and **ASZ6.5** can be mounted together.

Actuators
SK...62...



G, G0 AC 24 V operating voltage:
G System potential (SP)
G0 System neutral (SN)
Y Control signal input for DC 0...10 V signal
Y' Control signal input for DC 0...10 V signal (only for integrated stroke limiter **ASZ62.6)**

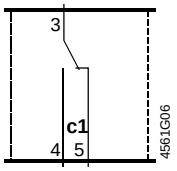
R Signal input for positioner or frost monitor with 0...1000 Ω signal (for **SK...62** and **SK...62U**) or DC 4...20 mA signal (for **SK...62U**). When DC 4 ... 20 mA is to be connected, + belongs to R and – to M.

M Measuring neutral

U DC 0...10 V measuring signal output (at Y = DC 0...10 V and/or R = 0...1000 Ω) or DC 4...20 mA measuring signal output (at R = DC 4...20 mA)

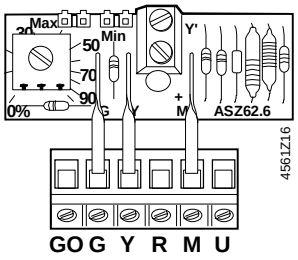
*) Wire jumper with label R – M on circuit board. This jumper must be separated when a 0...1000 Ω input signal is supplied to terminal R.

Auxiliary switch **ASC1.6**



Switching states related to 100 % stroke of the actuator:
– Contact on opening (coupling extension):
Switchover of terminals 3 and 5 to terminals 3 and 4
– Contact on closing (coupling retraction):
Switchover of terminals 3 and 4 to terminals 3 and 5

Stroke limiter **ASZ62.6**



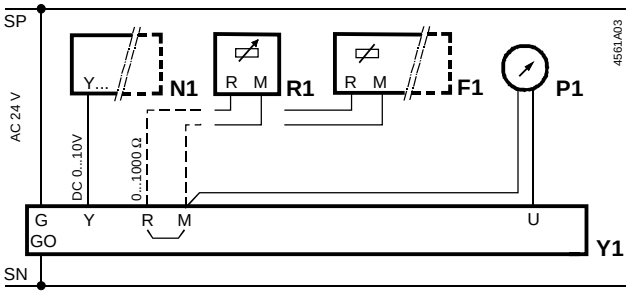
Electric plug connection with terminal lugs that are connected directly to the terminal strip of an **SKD62...**. When a stroke limiter is mounted, the control signal DC 0...10 V on terminal Y' must be activated on the stroke limiter.

Connection diagrams

The connection diagrams show examples for connection possibilities with actuators **SK...62...**. The number and type of connections depend on the plant.

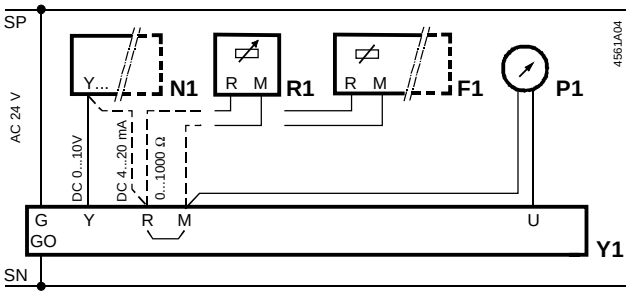
Connection diagram 1

SK...62: AC 24 V, DC 0...10 V and/or 0...1000 Ω



Connection diagram 2

SK...62U: AC 24 V, DC 4...20 mA or DC 0...10 V and/or 0...1000 Ω



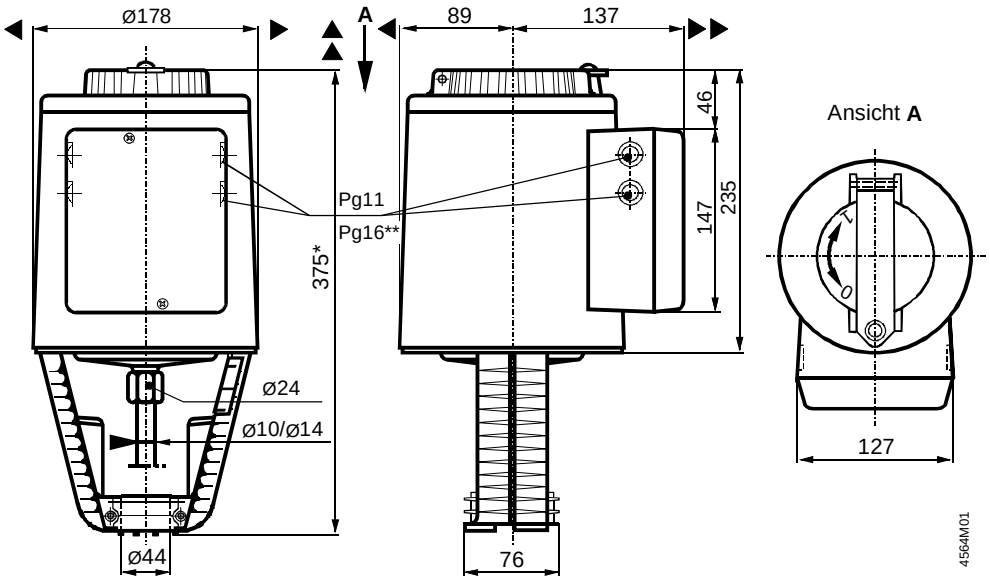
N1 Controller with DC 0...10 V or DC 4...20 mA output signal
Y1 Actuator SKD62...
R1 Positioner
F1 Frost monitor
P1 Position indicator

If a 0...1000 Ω signal is supplied to input R, the serially integrated wire jumper labelled R – M on the circuit board must be separated.
On using the **ASZ62.6** stroke limiter, input R cannot be used.

Dimensions

All Dimensions in mm

Actuators
SK...32...
SK...82...
SK...62...



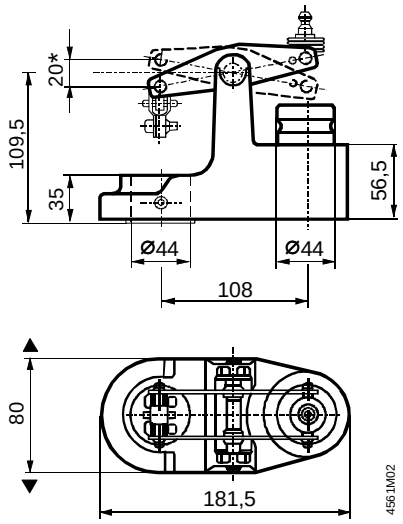
* Actuator height from valve plate without stroke inverter **ASK50 = 300 mm**
Actuator height from valve plate with stroke inverter **ASK50 = 357 mm**

** For the SK...82...U and SK...62U actuators, the plug hole diameter corresponds to the cable entry glands Pg16

▲ = >100 mm ⎧ Minimum mounting distance to wall or ceiling,

▲▲ = >200 mm ⎩ Connection, operation, maintenance, etc.

Stroke inverter
ASK50



* maximum stroke = 20 mm