SIEMENS

ACVATIX™

Electro-hydraulic actuators for valves

SKD..

with a 20 mm stroke

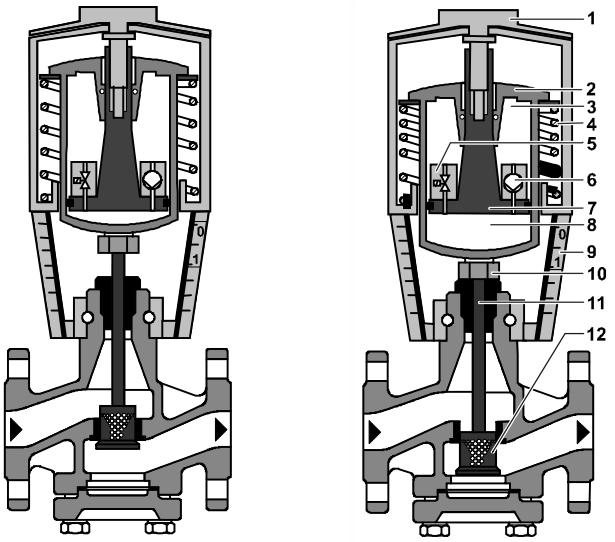
- SKD32.. Operating voltage AC 230 V, 3-position control signal
- SKD82.. Operating voltage AC 24 V, 3-position control signal
- SKD6.. Operating voltage AC 24 V
  - Control signal DC 0...10 V, 4...20 mA or 0...1000 Ω
  - SKD62/MO RS-485 for Modbus RTU communication
  - Selection of flow characteristic, position feedback, stroke calibration, LED status indication, override control
  - SKD62UA with selection of direction of operation, stroke limit control, sequence control with adjustable start point and operation range, operation of frost protection monitors QAF21.. and QAF61..
- Positioning force 1000 N
- Versions with or without spring-return function
- For direct mounting on valves; no adjustments required
- Manual adjuster and position indicator
- Optional functions with auxiliary switches, potentiometer, stem heater and mechanical stroke inverter
- SKD..U are UL-approved

Use

For the operation of Siemens 2-port and 3-port valves of the types VVF.., VVG.., VXF.. and VXG.. with a 20 mm stroke as control and safety shut-off valves in heating, ventilation and air conditioning plants.

Technical design

Principle of electro-hydraulic actuators



Valve closed Valve opened

1	Manual adjuster
2	Pressure cylinder
3	Suction chamber
4	Return spring
5	Solenoid valve
6	Hydraulic pump
7	Piston
8	Pressure chamber
9	Position indicator (0 to 1)
10	Coupling
11	Valve stem
12	Plug

Opening the valve

The hydraulic pump [6] forces oil from the suction chamber [3] to the pressure chamber [8], thereby moving the pressure cylinder [2] downwards. The valve stem [11] retracts and the valve opens. Simultaneously, the return spring [4] is compressed.

Closing the valve

Activating the solenoid valve [5] allows the oil in the pressure chamber to flow back into the suction chamber. The compressed return spring moves the pressure cylinder upwards. The valve stem extends and the valve closes.

Manual operation mode

Turning the manual adjuster [1] clockwise moves the pressure cylinder downwards and opens the valve. Simultaneously, the return spring [4] is compressed.

In the manual operation mode, the positioning signals Y and Z can further open the valve but cannot move to the 0 % stroke position of the valve. To retain the manually set position, switch off the power supply or disconnect the positioning signals Y and Z. The red indicator marked “MAN” is visible.

Note: When setting the controller to manual operation for a longer period of time, we recommend adjusting the actuator with the manual adjuster to the desired position. This guarantees that the actuator remains in this position for that period of time.

Attention: Do not forget to switch back to automatic operation after the controller is set back to automatic control.

Automatic operation mode

For automatic operation, turn the manual adjuster [1] counter-clockwise to the end stop. The pressure cylinder moves upward to the 0 % stroke position of the valve. The red indicator marked “MAN” is no longer visible.

Minimal volumetric flow

The actuator can be manually adjusted to a stroke position > 0%, allowing its use in applications requiring a constant minimal volumetric flow.

SKD32.. SKD82..

3-position control signal

The actuator is controlled by a 3-position signal either via terminals Y1 or Y2 and generates the desired stroke, which is transferred to the valve stem:

● Voltage on Y1:	Piston extends	Valve opens
● Voltage on n Y2:	Piston retracts	Valve closes
● No voltage on Y1 and Y2:	Piston and valve stem remain in the respective position	

SKD62.. SKD60

Y positioning signal

DC 0...10 V and/or 0...1000 Ω, DC 4...20 mA

The actuator is either controlled via terminal Y or override control Z. The positioning signals generate the desired stroke by means of the above described principle of operation, which is transferred to the valve stem:

● Signal Y increasing:	Piston extends	Valve opens
● Signal Y decreasing:	Piston retracts	Valve closes
● Signal Y constant:	Piston and valve stem remain in the respective position	
● Override control Z:	See Functions [→ 8]	

Frost protection monitor

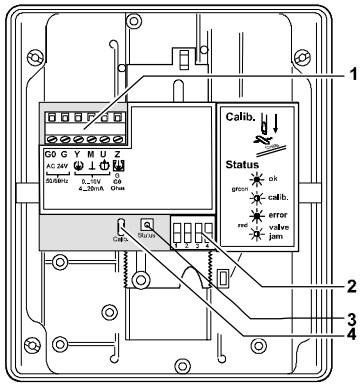
Frost protection thermostat

A frost protection thermostat can be connected to the SKD6.. actuator.

The added signals from the frost protection monitors QAF21.. and QAF61.. require the use of SKD62UA actuators. Notes on special programming of the electronics are described under Electronics [→ 5].

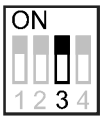
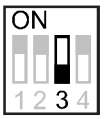
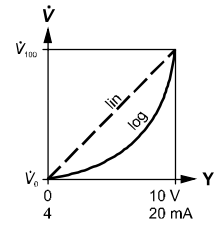
Connection diagrams for operation with frost protection thermostat or frost protection monitor can be found under Connection diagrams [→ 26].

SKD60 [1)]

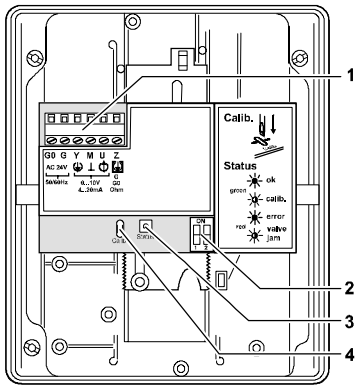


1 Connection terminals
2 DIL switches
3 LED status indication
4 Stroke calibration

1) From version ..L onward

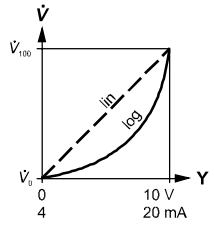
DIL switches								
	Direction of operation		**Fail-in-place (behaviour in case of control signal loss) ****		**Positioning signal Y Positioning feedback U**		**Flow characteristic**	
ON		Reverse acting		Stops at current position		DC 4...20 mA		lin = linear
OFF *		Direct acting		Closes		DC 0...10 V		log = equal percentage
					Relationship between positioning signal Y and volumetric flow			
*	Factory setting: all switches OFF							
**	Only considered when DIL switch 3 ON (control signal = DC 4…20 mA)							

SKD60 [2)], SKD62..

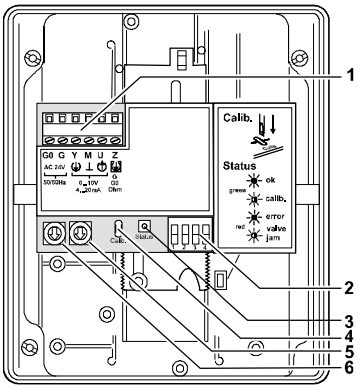


1 Connection terminals
2 DIL switches
3 LED status indication
4 Stroke calibration

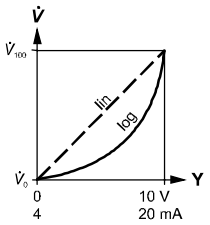
2) Up to and including version ..K

DIL switches				
	Positioning signal Y **Positioning feedback U**		**Flow characteristic**	
ON		DC 4...20 mA		lin = linear
OFF *		DC 0...10 V		log = equal percentage
			Relationship between positioning signal Y and volumetric flow	
*	Factory setting: all switches OFF			

SKD62UA



1 Connection terminals
2 DIL switches
3 LED status indication
4 Stroke calibration
5 Rotary switch UP (factory setting 0)
6 Rotary switch LO

DIL switches								
	Direction of operation		**Sequence control or stroke limit control**		**Positioning signal Y** **Positioning feedback U**		**Flow characteristic**	
ON		Reverse acting		Sequence control Signal addition QAF21../QAF61..		DC 4...20 mA		lin = linear
OFF *		Direct acting		Stroke limit control		DC 0...10 V		log = equal percentage
					Relationship between positioning signal Y and volumetric flow			
*	Factory setting: all switches OFF							

SKD62/MO

The Modbus converter is designed for analog control at 0...10 V.

Keep the analog signal setting on the actuator as is (switch 1 to OFF); adjustment not permitted.

The actuators are factory configured for equal-percentage characteristic.

DIL switch (internal actuator characteristic changeover) to "log" (switch 2 to OFF).

Functions

Notstellfunktion

The SKD32.21, SKD32.51, SKD82.51.. and SKD62.. actuators, which feature a spring-return function, incorporate a solenoid valve which opens if the control signal or power fails. The return spring causes the actuator to move to the 0% stroke position and closes the valve.

Calibration

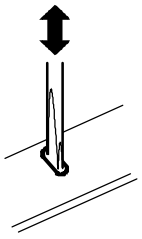
SKD60, SKD62.., SKD62/MO

In order to determine the stroke positions 0% and 100% in the valve, calibration is required on initial commissioning.

- Mechanical coupling of the actuator SKD6.. with a Siemens valve.
- ⚠ **Actuator must bin in „Automatic operation mode“ enabling stroke calibration to capture the effective 0% and 100% values.**
- AC 24 V power supply applied.
- Housing cover removed.

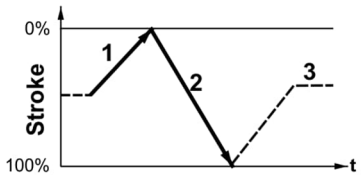
1. Short-circuit contacts in calibration slot (e.g. with a screwdriver) and trigger calibration process.
2. Actuator moves to 0% stroke position [1].
   - Valve closes.
3. Actuator moves to 100% stroke position [2].
   - Valve opens.

- Measured values are stored.



LED flashes grün, positioning feedback U inactive

- Normal operation:
  Actuator moves to the position [3] as indicated by signals Y or Z.
  LED is lit green permanently, positioning feedback U active, values correspond to the actual positions.



A red lit LED on the actuator indicates a calibration error.

The LED on the SKD62/MO cable adapter flashes red during the calibration, as the positioning signal Y and the positioning feedback U do not correspond anymore. This is interpreted as a blockage and thus indicated as an error.

If necessary, the calibration can be repeated any number of times.

LED indication of operational status

SKD60, SKD62.., SKD62/MO

The dual-colored LED indicating the operational status is visible when the cover is removed.

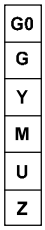
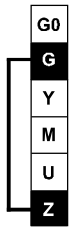
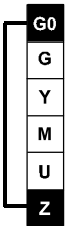
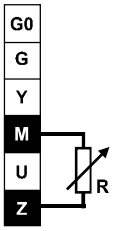
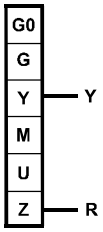
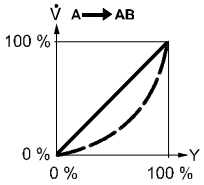
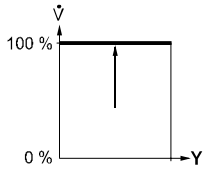
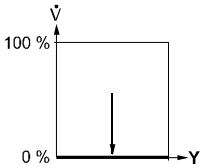
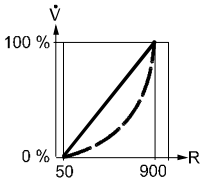
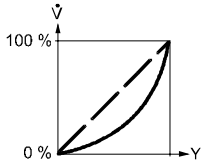
LED indication	Function	Remarks, troubleshooting
 Lit green	Normal operation	Automatic operation; everything o.k.
 Flashing green	Stroke calibration in progress	Wait until calibration is finished (LED stops flashing, will be lit green or red)
 Lit red	Faulty stroke calibration	Check mounting; restart stroke calibration (by short-circuiting calibration slot)
	Internal error	Replace electronics
 Flashing red	Inner valve jammed	Troubleshoot, check valve, restart stroke calibration
 Dark	No power supply	Check mains network, check wiring
	Electronics faulty	Replace electronics

As a general rule, the LED can only assume the states shown above – continuously lit red or green, flashing red or green, or off/dark.

Override control Z

SKD60, SKD62..

D The override control input Z can be operated in the following modes of operation:

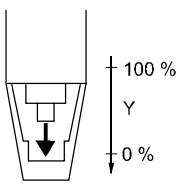
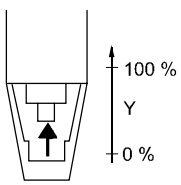
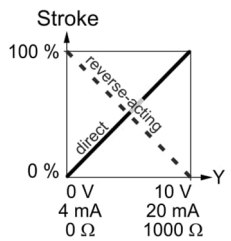
Z-mdoe					
	No function	**Fully open**	**Closed**	**Override with 0…1000 Ω**	**Signal addition** SKD62UA only
Connections					
Transfer					
	Equal percentage or linear			Equal percentage or linear	
	• Z-contact not connected	• Z-contact directly connected to G	• Z-contact directly connected to G0	• Z-contact connected to M via resistor R • Starting position at 50 Ω End position at 900 Ω	• Z-contact connected to R of frost protection monitor QAF21.. or QAF61..
	• Valve stroke follows Y-input	• Y-input has no effect			• Valve stroke follows Y **and** R(Z) signal

Shown operation modes are based on the factory setting “direct acting”.
Y-input has no effect in Z-mode.

Selection of direction of operation

SKD60 (from version ..L), SKD62UA

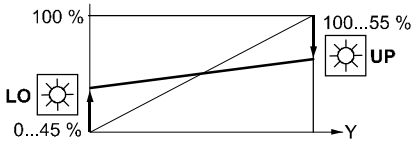
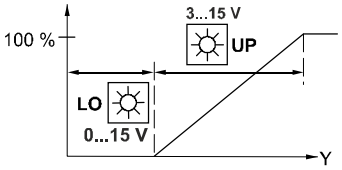
- With normally-closed valves, “direct acting” means that with a signal input of 0 V, the valve closes (applies to all Siemens valves listed under Equipment combinations [→ 12]).
- With normally-open valves, “direct acting” means that with a signal input of 0 V, the valve is open.

Direct acting		**Reverse acting**		**Stroke**
				
Input	DC 0...10 V DC 4...20 mA 0...1000 Ω	Input	DC 0...10 V DC 4...20 mA 0...1000 Ω	

The mechanical spring-return function is not affected by the direction of operation selected.

Stroke limit control and sequence control

SKD62UA

Setting the stroke limit control		Setting the sequence control
The rotary switches LO and UP can be used to apply a lower and upper limit to the stroke in increments of 3%, up to a maximum of 45%.		The rotary switches LO and UP can be used to determine the start point or the operating range of a sequence.
		

Position of LO	Lower stroke limit	Position of UP	Upper stroke limit		Position of LO	Sequence control start point	Position of UP	Sequence control operating range
0	0 %	0	100 %		0	0 V	0	10 V
1	3 %	1	97 %		1	1 V	1	10 V *
2	6 %	2	94 %		2	2 V	2	10 V **
3	9 %	3	91 %		3	3 V	3	3 V ***
4	12 %	4	88 %		4	4 V	4	4 V
5	15 %	5	85 %		5	5 V	5	5 V
6	18 %	6	82 %		6	6 V	6	6 V
7	21 %	7	79 %		7	7 V	7	7 V
8	24 %	8	76 %		8	8 V	8	8 V
9	27 %	9	73 %		9	9 V	9	9 V
A	30 %	A	70 %		A	10 V	A	10 V
B	33 %	B	67 %		B	11 V	B	11 V
C	36 %	C	64 %		C	12 V	C	12 V
D	39 %	D	61 %		D	13 V	D	13 V
E	42 %	E	58 %		E	14 V	E	14 V
F	45 %	F	55 %		F	15 V	F	15 V

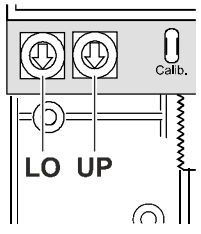
* Operating range of QAF21.. (see below)

** Operating range of QAF61.. (see below)

*** The smallest adjustment possible is 3 V; control with 0...30 V is only possible via Y.

Stroke control with QAF21.. / QAF61.. signal addition

SKD62UA

Setting the signal addition				
The operating range of the frost protection monitor QAF21.. or QAF61.. can be defined with rotary switches LO and UP.				
Position of LO	**Sequence control start point**	**Position of UP**	**QAF21.. / QAF61.. operating range**	
0	→	1	QAF21..	
0	→	2	QAF61..	

Type summary

Type			Operating voltage	Positioning signal	Spring-return		Positioning time	
					Function	Time		
SKD32.21 [1]		-	AC 230 V	3-position	yes	8 s	30 s	10 s
SKD32.50 [1]					-	-	120 s	120 s
SKD32.51 [1]					yes	8 s		
SKD82.50 [1]			AC 24 V		-	-		
SKD82.50U [2]								
SKD82.51 [1]					yes	8 s		
SKD82.51U [2]								
SKD60 [1], [3]		Standard electronics		DC 0...10 V 4...20 mA 0...1000 Ω	-	-	30 s	15 s
SKD60U [2], [3]					yes	15 s		
SKD62 [1]								
SKD62U [2]								
SKD62UA [2], [4]		Enhanced electronics						
SKD62/MO [2]	S55195-A129	Standard-elektronik		Modbus RTU				

[1] Approbation: CE

[2] Approbation: CE, UL

[3] Enhanced functions, from version ..L onward: Direction of operation, fail-in-place

[4] Enhanced functions: Direction of operation, stroke control limit, sequence control, signal addition

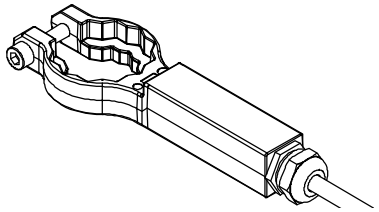
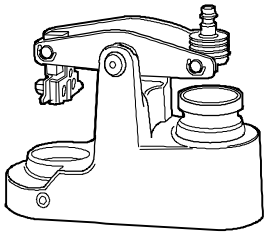
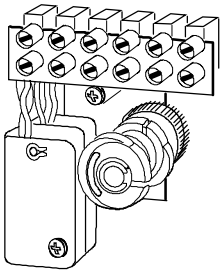
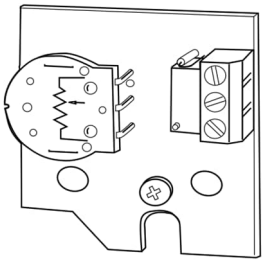
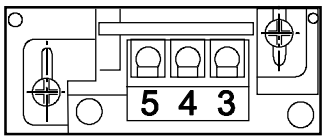
Scope of delivery

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

Accessories / spare parts

Accessories

Type	Auxiliary switch	Double auxiliary switch	Potentiometer 1000 Ω	Stem heater AC 24 V	Mechanical stroke inverter
	ASC1.6	ASC9.3	ASZ7.3	ASZ6.6 (S55845-Z108)	ASK50
	Max. 2				
SKD32..	-	Max.1	Max.1	Max.1	Max.1
SKD82					
SKD6..	Max.1	-	-		

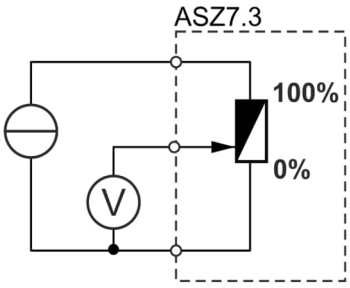
SKD..	**ASZ6.6** (S55845-Z108) Stem heater ● For media below 0 °C ● Mount between valve and actuator	
	ASK50 Mechanical stroke inverter ● 0% actuator stroke corresponds to 100% valve stroke ● Mount between valve and actuator	
SKD32.. **SKD82..**	**ASC9.3** Double auxiliary switch ● Adjustable switching points	
	ASZ7.3 Potentiometer ● 0…1000 Ω	
SKD60 **SKD62..**	**ASC1.6** Auxiliary switch ● Switching point 0...5 % stroke	

ASZ7.3

For the combination SIMATIC S5/S7 and use of positioning feedback, we recommend actuators with DC 0...9.8 V feedback signals.

The signal peaks that occur in the potentiometer ASZ7.3 may result in error messages on Siemens SIMATIC. This is not the case when combined with Siemens HVAC controllers. The reason is that SIMATIC has a higher resolution and faster response time.

Use the potentiometer as voltage divider on the 3-wire connection. Powering the potentiometer over the wiper may shorten the life cycle of the potentiometer. Signal peaks increase in frequency and scope over the lifespan in this operating mode.



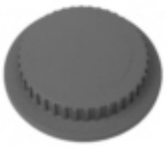
For more information, see Technical data [→ 19]

Ordering (example)

Type / Stock number [1]	Designation	Number of pieces
SKD62/MO / S55195-A129	Actuator Modbus RTU	1
ASC1.6	Auxiliary switch	1

[1] Specify stock number if available.

Spare parts

Actuator	Cover	Hand control [1]	Control unit
			
SKD32.21	410456348	426855048	-
SKD32.50			
SKD32.51			
SKD82.50			
SKD82.50U			
SKD82.51			
SKD82.51U			
SKD60			466857598
SKD60U			
SKD62			466857488
SKD62U			
SKD62UA			466857518
SKD62/MO			466857488

[1] Hand control, blue with mechanical parts

Equipment combinations

2-port valves VV.. (control or safety shut-off valves)

Valve type		DN	PN class	k_{vs} [m^3/h]	Data sheet
VVF21.. [1]	Flannged	25...80	6	1.9...100	N4310
VVF22..				2.5...100	N4401
VVF31.. [1]		15...80	10		N4320
VVF32..				1.6...100	N4402
VVF40.. [1]			16	1.9...100	N4330
VVF41.. [1]		50		19... 31	N4340
VVF42..		15...80		1.6...100	N4403
VVF52.. [1]		15...50	25	0.16...25	N4373
VVF53..		15...40		0.16...40	N4405
VVF61..		15...50	40	0.19...31	N4382
VVF63..		15...50		0.2...36	A6V11459527
VVG41..	Threaded	15...50	16	0.63...40	N4363

Admissible differential pressures Δp_{max} and closing pressures Δp_s: cf. relevant valve data sheets

[1] Valves are no longer available

3-port valves VX.. (control valves for “mixing” and “distribution”)

Valve type		DN	PN class	k_{vs} [m^3/h]	Data sheet
VXF21.. [1]	Flansch	25...80	6	1.9...100	N4410
VXF22..				2.5...100	N4401
VXF31.. [1]		15...80	10		N4420
VXF32..				1.6...100	N4402
VXF40.. [1]			16	1.9...100	N4430
VXF41.. [1]		15...50		1.9...31	N4440
VXF42..		15...80		1.6...100	N4403
VXF53..		15...50	25	1.6...40	N4405
VXF61..			40	1.9...31	N4482
VXF63..				0.2...36	A6V11459527
VXG41..	Gewinde		16	1.6...40	N4463

Admissible differential pressures Δp_{max} and closing pressures Δp_s: cf. relevant valve data sheets

[1] Valves are no longer available

Third-party valves with strokes between 6...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. For SKD32.. and SKD82.. 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.

Product documentation

SKD..				Accessories	Mounting instructions	
Mounting instructions SKD..	M3250	74 319 0325 0		**ASC1.6**	G4563.3	4 319 5544 0
		74 319 0326 0		**ASC9.3**	G4561.3	4 319 5545 0
		(Setting instructions Standard electronics)		**ASK50**	M4561.5	4 319 5549 0
		A5W00027551		**ASZ7.3**		74 319 0247 0
		(Mounting instructions Modbus converter)		**ACT control unit**	M4568	74 319 0554 0
		A6V12057657		**QAF21..**		74 319 0399 0
		(Communication profiles Modbus)		**ASZ6.6**	M4501.1	74 319 0750 0

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:

http://siemens.com/bt/download

Notes

Sicherheit

⚠ 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.

⚠ WARNING

Tensioned spring return

Opening the actuator housing can release the highly tensioned return spring, which can cause flying parts and injuries.

- Do not open the actuator housing.

⚠ WARNING

Risk of injury through broken housing or cover

Dismounting the actuator with broken housing from the valve can release the highly tensioned spring return, which can cause flying parts and injury.

- NEVER dismount actuator from valve.
- Dismount valve-actuator combination (control device) as complete unit.
- Disassembly only by qualified personnel.
- Send the control device along with an error report to the local Siemens office for analysis and disposal.
- Mount new control device (valve and actuator) properly.

⚠ WARNING

Risk of burns from hot actuator brackets

The actuator brackets on heating plants can also become hot from the contact with the hot valve during operation. The temperature of the actuator bracket can reach 100 °C.

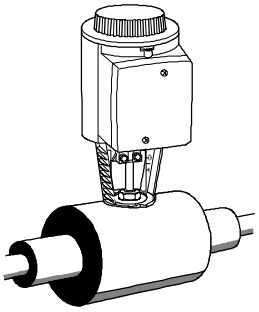
When servicing the actuator:

- Switch off both pump and operating voltage.
- Close the main shutoff valve in the piping.
- Release pressure in the pipes and allow them to cool off completely.

Der elektrische Anschluss ist gemäss den örtlichen Vorschriften für Elektroinstallationen und dem Kapitel Anschlussschaltpläne [→ 26] durchzuführen.

⚠	***NOTE***
	Using a safety limiter Failure to comply with applicable regulations for cable insulation may result in the suspension of the safety limiter function. ● Compliance with all applicable regulations for cable insulation must be ensured by the plant operator.

⚠	**⚠ WARNING**
	Risk of injury and fire from hot device parts For media below 0 °C, the stem heater ASZ6.6 keeps the valve stem ice-free. In this case, the actuator bracket and the valve stem must not be insulated in order to ensure air circulation. Touching heated parts without safety measures leads to burns. ● For safety reasons, the steam heater is operated with AC 24 V / 30 W. ● Recommendation: For media above 140 °C, the valve must be insulated.



Observe admissible temperatures, see Use [→ 2] and Technical data [→ 19].

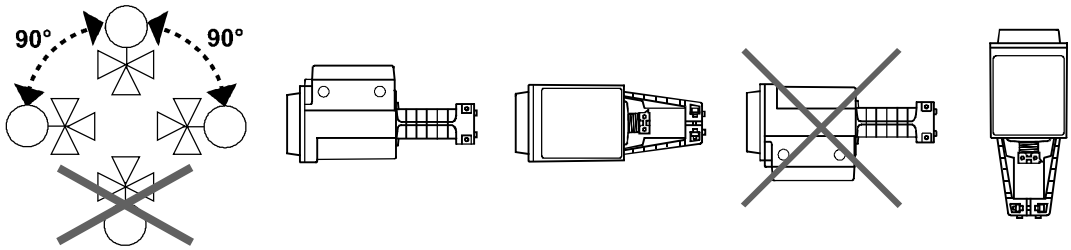
If an auxiliary switch is used, its switching point should be indicated on the plant schematic.

Every actuator must be driven by a dedicated controller, see Connection diagrams [→ 26].

Mounting

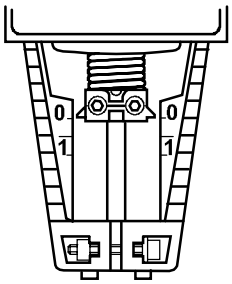
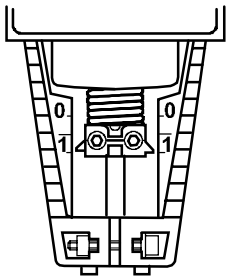
Mounting instructions 74 319 0324 0 for fitting the actuator to the valve and A5W00027551 for SKD62/MO are enclosed in the actuator packaging. The instructions for accessories are enclosed with the accessories themselves (see Product documentation [→ 13]).

Mounting positions

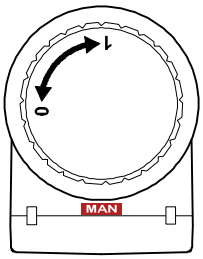
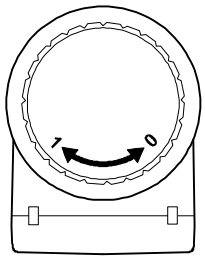


Commissioning

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 fullyextended → stroke = 100 %	

The manual adjuster must be rotated counter-clockwise to the end stop, i.e. until the red indicator marked “MAN” is no longer visible. This causes the Siemens valvse, types VVF.., VVG.., VXF.. and VXG.. to close (stroke = 0 %).

Manual operation	Automatic operation
	
“**MAN**”	“**AUTO**”

Maintenance

The actuators are maintenance-free.

When **servicing** the control device:

⚠ WARNING

Verbrennungsgefahr durch heisse Antriebskonsole

The actuator brackets on heating plants can also become hot from the contact with the hot valve during operation. The temperature of the actuator bracket can reach 100 °C.

When servicing the actuator:

- Switch off both pump and operating voltage.
- Close the main shutoff valve in the piping.
- Release pressure in the pipes and allow them to cool off completely.

⚠ WARNING

Risk of injury

- Disconnect electrical connections from the terminals as neede.
- The actuator must be properly installed prior to recommissioning the valve.

Recommendation SKD6..:

Trigger stroke calibration after maintenance.

Repair:

See Spare parts [→ 12]

⚠ WARNING

Risk of injury through broken housing or cover

Dismounting the actuator with broken housing from the valve can release the highly tensioned spring return, which can cause flying parts and injury.

- NEVER dismount actuator from valve.
- Dismount valve-actuator combination (control device) as complete unit.
- Disassembly only by qualified personnel.
- Send the control device along with an error report to the local Siemens office for analysis and disposal.
- Mount new control device (valve and actuator) properly.

Disposal

⚠ WARNUNG

Tensioned spring return

Opening the actuator housing can release the highly tensioned return spring, which can cause flying parts and injuries.

- Do not open the actuator housing.

The device is considered an electronic device for disposal in accordance with the European Guidelines and may not be disposed of as domestic garbage.

- 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.

Technical data

Power supply			
Operating voltage			
	SKD32..		AC 230 V ± 15 %
	SKD82..		AC 24 V ± 20 % (SELV/PELV)
	SKD6..		
	SKD62/MO		
Frequency			50 / 60 Hz
Maximum power consumption at 50 Hz			
	SKD32.21		16 VA / 12 W
	SKD32.50		11 VA / 8 W
	SKD32.51		17 VA / 12 W
	SKD82.50, SKD82.50U		9 VA / 7 W
	SKD82.51, SKD82.51U		14 VA / 10 W
	SKD60..		10 VA / 8 W
	SKD62..		14 VA / 10 W
External supply cable fuse			
	SKD32..		Min. 0.5 A, slow Max. 6 A slow
	SKD82..		Min. 1 A, slow Max. 10 A slow
	SKD6..		

Function data			
Positioning time at 50 Hz [1)]			
	SKD32.21	Opening	30 s
		Closing	10 s
	SKD32.5.. SKD82.5..	Opening, closing	120 s
	SK6..	Opening	30 s
		Closing	15 s
Spring-return time [1)]			
	SKD32..		8 s
	SKD82..		
	SKD62..		15 s
Positioning force			1000 N
Nominal stroke			20 mm
Maximum permissible medium temperature (valve fitted)			-25...150 °C
			< 0 °C: Requires stem heater ASZ6.6

Signal inputs / signal outputs		
Control signal		
	SKD32..	3-position
	SKD82..	
	SKD6..	DC 0…10 V
		DC 4…20 mA
		0…1000 Ω

Signal inputs / signal outputs			
Positioning signal Y SK6..			
	Input impedance	DC 0…10 V	100 kΩ
		DC 4…20 mA	240 Ω
	Signal resolution		< 1 %
	Hysteresis		1 %
Override control Z SK6..			
	Resistor		1000 Ω
	Z not connected, priority terminal Y		No function
	Z connected directly to G		Max. stroke 100 %
	Z connected directly to G0		Min. stroke 0 %
	Z connected to M via 0...1000 Ω		Stroke proportional to R
Position feedback U SK6..			
	Load impedance	DC 0…9,8 V	> 10 kΩ
		DC 4…19.6 mA	< 500 Ω

Enhanced functions SKD60 [2], SKD62UA			
Selection of direction of operation			
	SKD60, SKD62UA	Direct-acting / reverse-acting	DC 0...10 V / DC 10...0 V
			DC 4...20 mA / DC 20...4 mA
			0...1000 Ω / 1000...0 Ω
Stroke limit control			
	SKD62UA	Range of lower limit	0...45 % adjustable
		Range of upper limit	100...55% adjustable
Sequence control			
	SKD62UA	Terminal Y	
		Starting point of sequence	0...15 V adjustable
		Operating range of sequence	3...15 V adjustable
Signal addition			
	SKD62UA	Z connected to R of	
		Frost protection monitor QAF21..	0…1000 Ω, added to Y signal
		Frost protection monitor QAF61..	DC 1,6 V, added to Y signal

Communication SKD62/MO			
Communication protocol			
	Modbus RTU		RS-485, not galvanically isolated
	Number of nodes		Max. 32
	Adress range		1...248 / 255
		Factory setting	255
	Transmission formats		1-8-E-1 / 1-8-O-1 / 1-8-N-1 / 1-8-N-2
		Factory setting	1-8-E-1
	Baud rates (kBaud)		Auto / 9.6 / 19.2 / 38.4 / 57.6 / 76.8 / 115.2
		Factory setting	Auto
	Bus termination		120 Ω electronically switchable
		Factory setting	Off

Electrical connections and connecting cable			
Wire cross-sectional area			0.5...2.5 mm², AWG 21...14 [3]
Cable entries			4 x M20 (ø 20.5 mm)
	With knockouts for standard ½" conduit connectors (ø 21.5 mm)		Mit Ausbrechöffnungen für ½" Schlauchverbindungen (ø 21,5 mm)
	SKD62/MO		Fixed connection cable
		Cable length	0.9 m
		Number of cores	5 x 0.75 mm²

Degree and class of protection		
Protection class		As per EN 60730
	Automatic action	Typ 1AA / Typ 1AC / Modulation Action
	Pollution degree	2
Housing protection upright to sideways		IP 54 as per EN 60529

Environmental conditions			
Operation			IEC 60721-3-3
	Climatic conditions		Class 3K5
		Temperature, general	-15...<50 °C
		Humidity (non-condensing)	5...95 % r.h.
Transportation			IEC 60721-3-2
	Climatic conditions		Class 2K3
		Temperature	-30...65 °C
		Humidity (non-condensing)	5...95 % r.h.
Storage			IEC 60721-3-1
	Climatic conditions		Class 1K3
		Temperature	-15...50 °C
		Humidity (non-condensing)	-5...95 % r.h.

Directives and standards		
Product standarad		EN 60730-x
Electromagnetic compatibility (Applications)		For use in residential, commerical, and industrial environments
EU conformity (CE)		A5W00007752 [4]
RCM conformity		A5W00007898 [4]
EAC conformity		Eurasia conformity for all SKD..
UL, cUL	AC 230 V	-
	AC 24 V	UL 873 http://ul.com/database

Environmental compatibility
The product environmental declarations CE1E4561enX1 (SKD3.., SKD8..) [4], CE1E4561enX2 (SKD6..) [4] and A6V101083254 (external Modbus converter) [4] contain data on RoHS compliance, materials composition, packaging, environmental benefit and disposal.

Dimensions / weight			
Dimensions			See Dimensions [→ 30]
Weight			
	SKD32.21		3.65 kg
	SKD32.50		3.60 kg
	SKD32.51		3.65 kg
	SKD82.50		3.60 kg
	SKD82.50U		3.85 kg
	SKD82.51		3.65 kg
	SKD82.51U		3.90 kg
	SKD60 SKD62, SKD62/MO		3.60 kg
		External Modbus converter	0.15 kg
	SKD62U SKD62UA		3.85 kg
	Stroke inverter ASK50		1.10 kg

Materials	
Housing	Die-cast aluminium
Bracket	
Housing box	Plastic
Manual adjuster	

Accessories			
Auxiliary switch ASC1.6			
	SKD6..	Switching capacity	AC 24 V, 10 mA....4 A resistive, 2 A inductive
Double auxiliary switch ASC9.3			
	SKD32.., SKD82..	Switching capacity per auxiliary switch	AC 250 V, 6 A resistive, 2.5 A inductive
Potentiometer ASZ7.3			
	SKD32.., SKD82..	Change in overall resistance of potentiometer at nominal stroke	0...1000 Ω
Stem heater ASZ6.6			
		Operating voltage	AC 24 V ± 20 %
		Power consumption	40 VA / 30 W
		Inrush current	Max. 8.5 A (Max. temperature 85 °C / 185 °F

1) At room temperature (23 °C); low ambient temperatures or high Δp may prolong these times

2) From version ..L onward

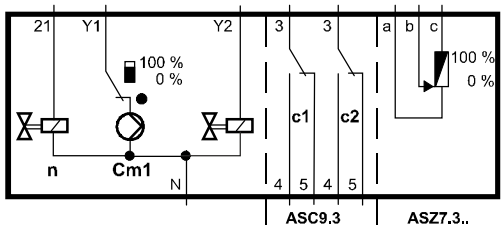
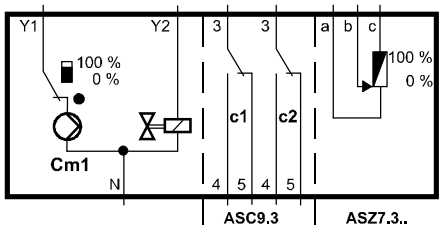
3) AWG = American wire gauge

4) The documents can be downloaded at http://www.siemens.com/bt/download

Connection diagrams

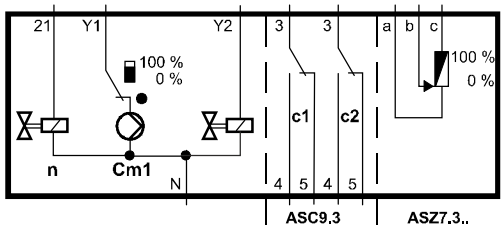
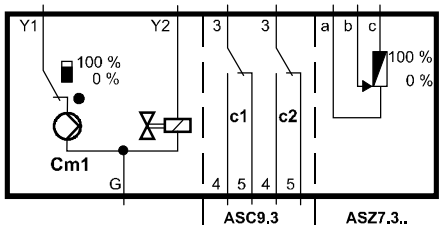
Internal diagrams

SKD32..

SKD32.21 SKD32.51	SKD32.50
AC 230 V 3-position	
	

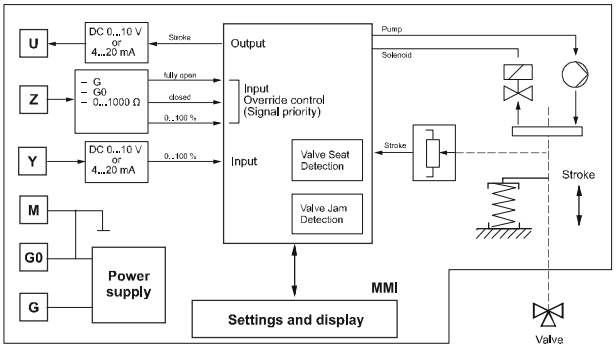
Cm1	End switch
n	Solenoid valve for spring-return
c1, c2	ASC9.3 double auxiliary switch
a, b, c	ASZ7.3 potentionmeter
Y1	Positioning signal „open“
Y2	Positioning signal „close“
21	Spring-return function
N	Neutral conductor

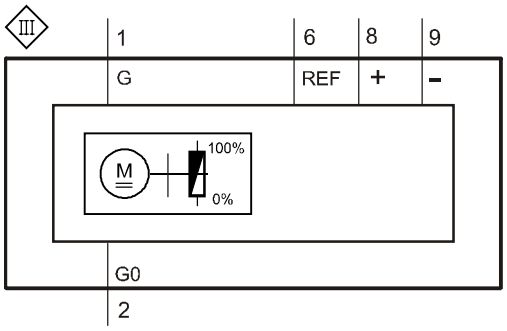
SKD82..

SKD82.51	SKD82.50
AC 24 V 3-position	
	

Cm1	End switch
n	Solenoid valve for spring-return
c1, c2	ASC9.3 double auxiliary switch
a, b, c	ASZ7.3 potentionmeter
Y1	Positioning signal „open“
Y2	Positioning signal „close“
21	Spring-return function
G	System potential

SKD6..

SKD60, SKD62 SKD62U, SKD62UA
AC 24 V
DC 0...10 V 4...20 mA 0...1000 Ω


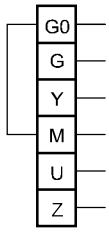
SKD62/MO
AC 24 V
Modbus RTU


U	Position indication	**REF**	Reference line (Modbus RTU)
Z	Override control	**+**	Bus + (Modbus RTU)
Y	Positioning signal	-	Bus - (Modbus RTU)
M	Measuring neutral		

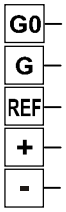
	G0	Operating voltage AC 24 V: System neutral (SN)	
	G	Operating voltage AC 24 V: System potential (SP) Switching without power as a spring-return function	

Connection terminals

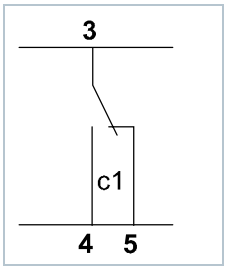
SKD6..

	AC 24 V	DC 0...10 V 4...20 mA 0...1000 Ω
	System neutral (SN)	
	System potential (SP)	
	Positioning signal DC 0...10 (30) V or DC 4...20 mA	
	Measuring neutral (= G0)	
	Position indication DC 0...10 V oder DC 4...20 mA	
	Override control (Functions [→ 8])	

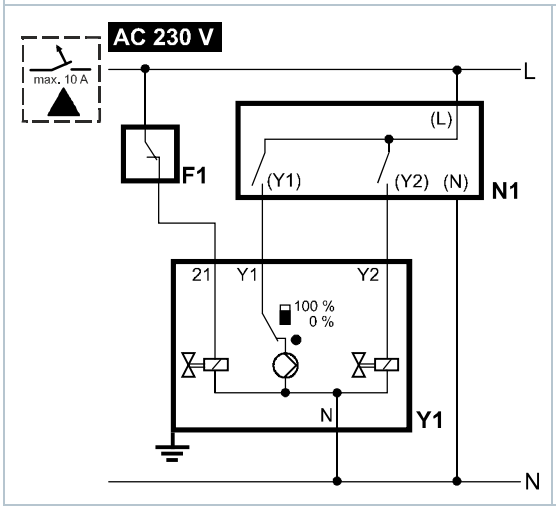
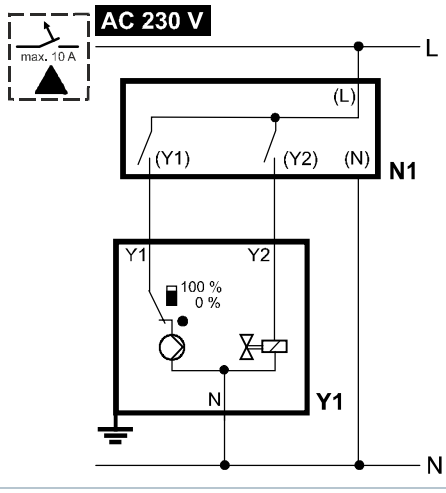
SKD62/MO

	AC 24 V	Modbus RTU Connection cable
	System neutral (SN)	Black
	System potential (SP)	Red
	Reference line (Modbus RTU)	Violet
	Bus + (Modbus RTU)	Gray
	Bus - (Modbus RTU)	Pink

Auxiliary switch ASC1.6

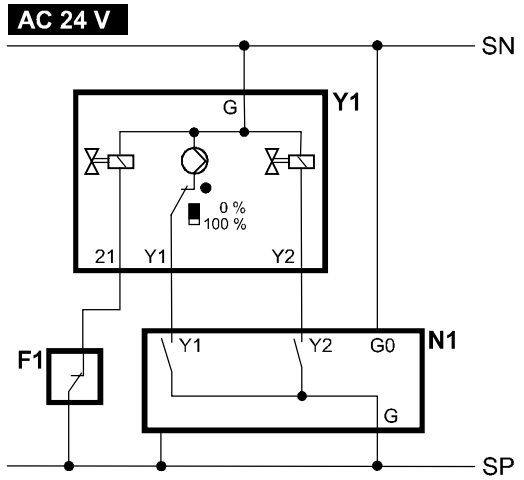
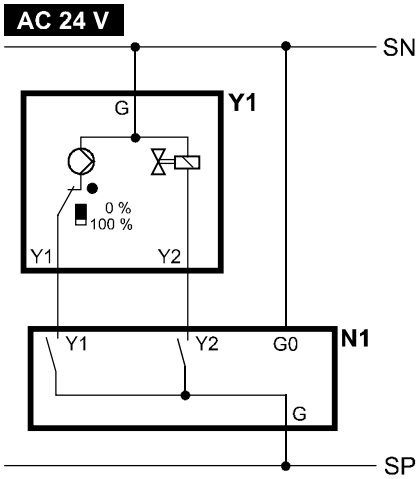
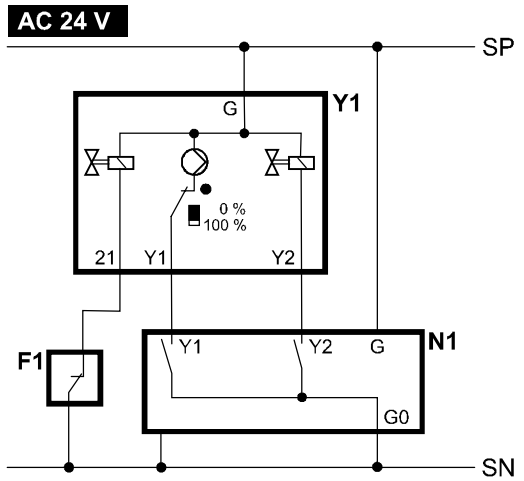
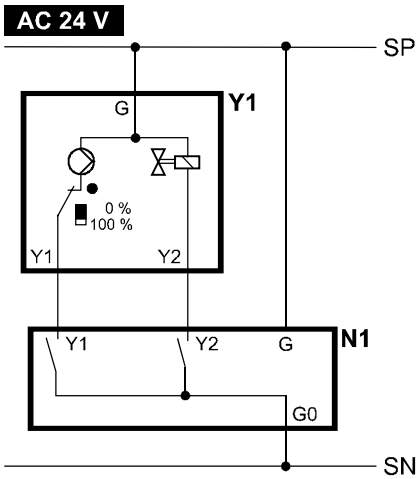


SKD32..

SKD32.21 SKD32.51	SKD32.50
AC 230 V 3-position	
	

F1	Safety limiter (e.g. temperature limiter)			**Y1**	Positioning signal „open“
N1, N2	Controller	**L**	Phase	**Y2**	Positioning signal „close“
Y1, Y2	Actuators	**N**	Neutral	**21**	Spring-return function

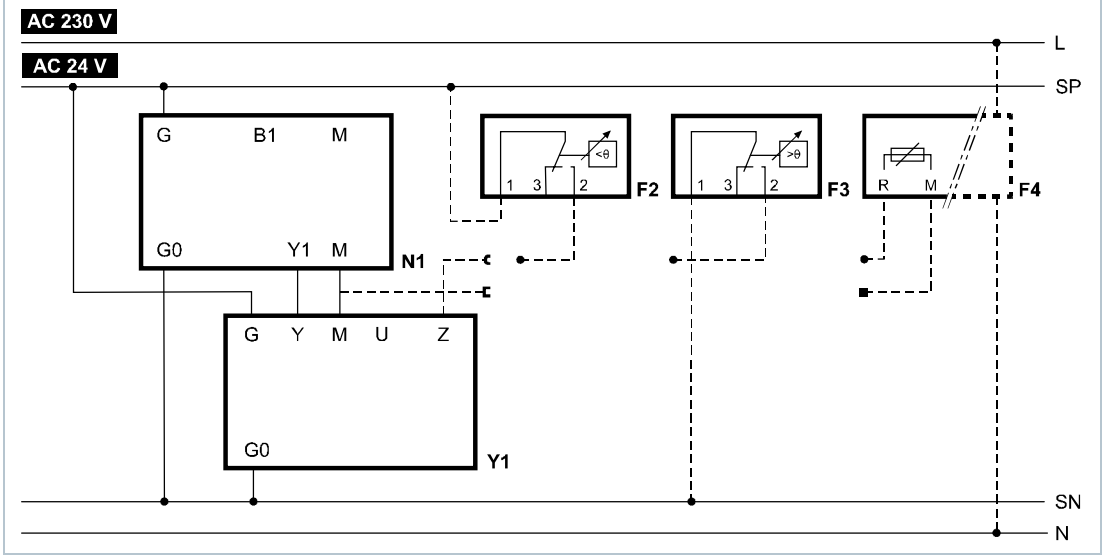
SKD82..

SKD82.51, SKD82.51U	SKD82.50, SKD82.50U
AC 24 V 3-position	
	
	

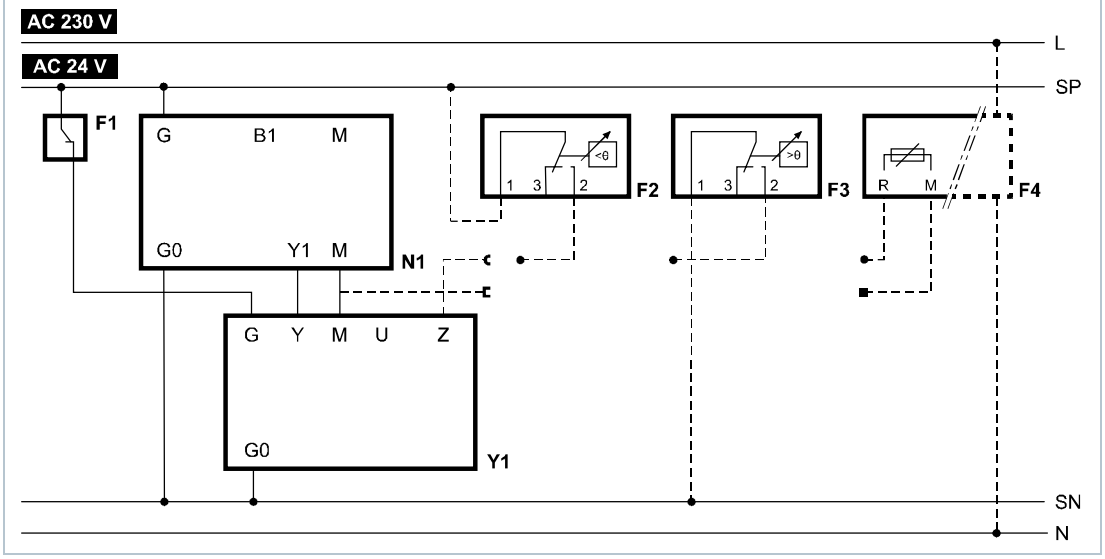
F1	Safety limiter (e.g. temperature limiter)			**(Y1), (Y2)**	Controller contacts
		SP	System potential AC 24 V	**Y1**	Positioning signal „open“
N1, N2	Controller	**SN**	System neutral	**Y2**	Positioning signal „close“
Y1, Y2	Actuators			**21**	Spring-return function

SKD6..

SKD60	
AC 24 V	DC 0...10 V 4...20 mA 0...1000 Ω

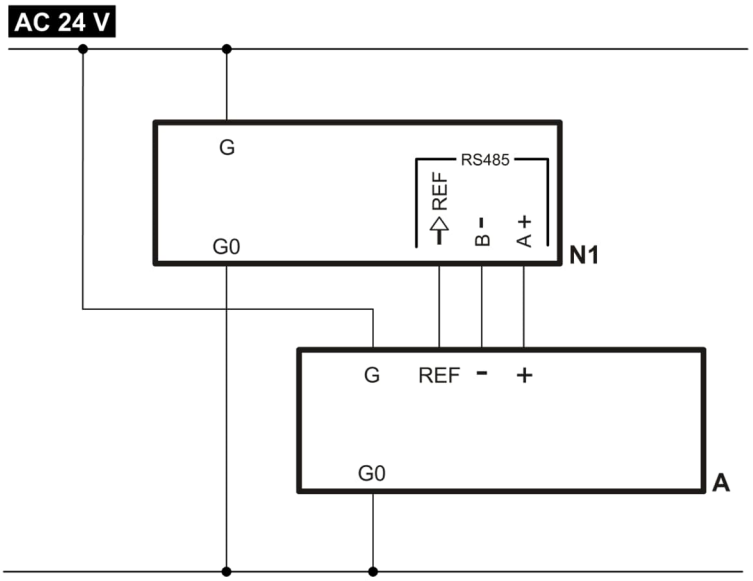


SKD62, SKD62U, SKD62UA	
AC 24 V	DC 0...10 V 4...20 mA 0...1000 Ω



Y1	Actuator			**F3**	Temperature detector
N1	Controller			**F4**	Frost protection monitor with 0...1000 Ω signal output, e.g. QAF21.. or QAF61.. (only SKB62UA) *)
F1	Safety limiter (e.g. temperature limiter)			**G (SP)**	System potential AC 24 V
F2	Frost protection thermostat			**G0 (SN)**	System neutral
	Terminals:	1-2	Frost hazard/sensor is interrupted (thermostat closes with frost)		
		1-3	Normal operation		

*) Only SKD62UA: only with sequence control and the appropriate selector switch settings, see Electronics [→ 5], Functions [→ 6]

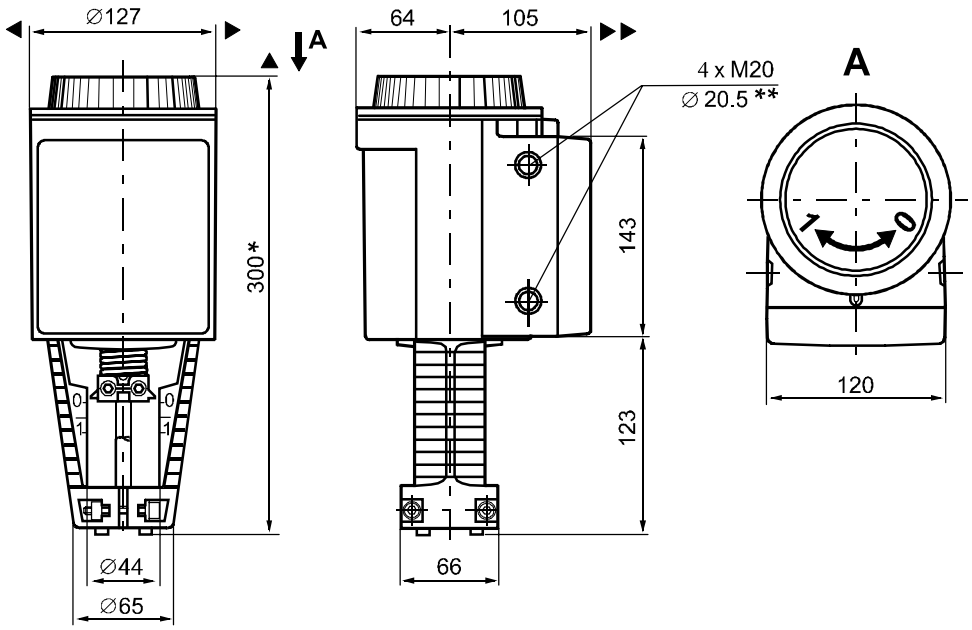
SKD62/MO
AC 24 V Modbus RTU


A	Actuator
N1	Controller
G	System potential
G0	System neutral
REF	Reference line (Modbus RTU)
+	Bus + (Modbus RTU)
-	Bus - (Modbus RTU)

⚠	***HINWEIS***
	Using safety limiter F1 When using the safety limiter F1, ensure that no mistakes may occur on cable insulation that may cancel out the temperature limiter function (applies to both 230 V as well as 24 V types). ● For SN earthing (e.g. PELV) comply under all circumstances with the note above.

Dimensions

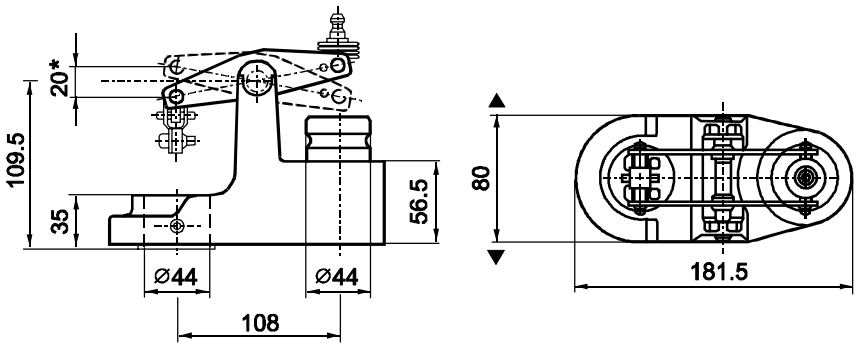
Actuator



All dimensions in mm

*	Height of actuator from plate **without** stroke inverter **ASK50 = 300 mm** Height of actuator from plate **with** stroke inverter **ASK50 = 357 mm**
**	**SKD..U: with knockouts for standard ½" conduit connectors (ø 21.5 mm)**
▶	> 100 mm, um clearance form ceiling or wall for mounting
▶▶	> 200 mm, connection, operation, maintenance, etc.

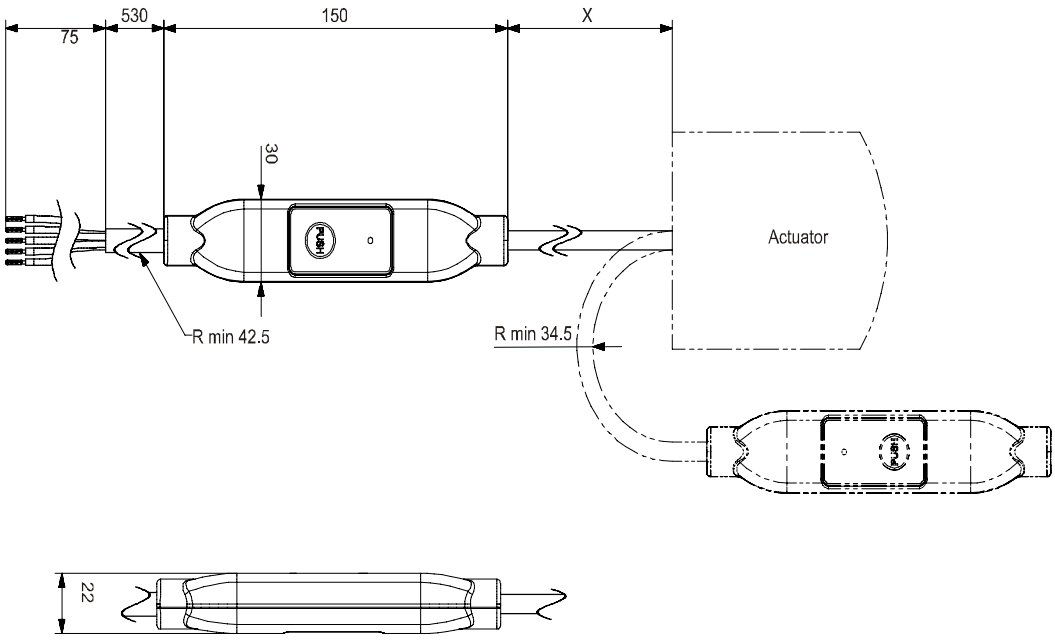
Stroke inverter ASK50



All dimensions in mm

*	Maximum stroke = 20 mm

External Modbus converter



All dimensions in mm

X	250 mm

Revision numbers

Type	Valid from rev. no.	Type	Valid from rev. no.
SKD32.50	..F	SKD62	..H
SKD32.51	..F	SKD62U	..H
SKD32.21	..F	SKD60	..H
SKD82.50	..F	SKD62UA	..H
SKD82.50U	..F	SKD62/MO	..I
SKD82.51	..F		
SKD82.51U	..F		

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