ACVATIX™ / OpenAir™

액추에이터 (Actuator)

Acvatix™ is a versatile range of valves and actuators designed for ease of use, superior control accuracy, and energy efficiency.

OpenAir™ is a comprehensive portfolio of damper actuators with a wide selection of positioning forces, control signals, communications standards and add-on options that can be tailored to your HVAC requirements.

더 알아보기

SIEMENS

Siemens Smart Infrastructure combines the real and digital worlds across energy systems, buildings and industries, enhancing the way people live and work and significantly improving efficiency and sustainability

Contents

SIEMENS

ACVATIX™

Electromotoric actuators for valves SAX..P..

Actuators with 20 mm stroke and 500 N force

- SAX31P03 Operating voltage AC 230 V, 3-position positioning signal
- SAX61P03 Operating voltage AC/DC 24 V, positioning signal 0...10V, 4...20 mA
  With position feedback, forced control, characteristic changeover
- SAX61P03/MO operating voltage AC/DC 24 V,
  RS-485 for Modbus RTU communication
- SAX81P03 Operating voltage AC/DC 24 V, positioning signal 3-position
- For direct mounting on valves; no adjustments required
- Manual adjuster, position and status indication (LED)
- Optional functions with auxiliary switches, potentiometer

Use

Electromotoric actuators to operate Siemens combi valves for type series VPF43.., VPF44.. and VPF53.. with 20 mm stroke, as control valves on ventilation, air conditioning, district heating and refrigeration plants.

Functions

Function	Description	Type
3-position control	A 3-position signal controls the actuator via connection terminals Y1 or Y2. The desired position is transmitted to the valve.	SAX31P03, SAX81P03
Modulating control	The modulating positioning signal provides stepless motor control. The positioning signal range (DC 0...10 V / DC 4...20 mA / 0...1000 Ω) corresponds to the positioning range (closed...open, or 0…100% stroke) in a linear manner.	SAX61P03
Positioning signal and characteristic changeover	Setting with DIL switch. Factory setting: • Characteristic curve: log = Equal percentage (switch set to Off) • Positioning signal: DC 0...10 V (switch set to Off)	
Position feedback U	Signal returned to acquire the position via input.	SAX61 P03, SAX61P03/MO
Forced control (Z-mode)	Forced control helps override automatic mode and is implemented via higher control.	
Calibration	Carry out during initial commissioning. The actuator drives to the top or bottom end position; the measured values are saved.	
Valve seat detection	The actuators have power-dependent seat detection. After calibration, the exact valve stroke is stored in the actuator's memory.	
Foreign body detection	After clogging is detected, three attempts are made to get past clogging. If unsuccessful, the actuator continues to following the positioning signal only within a limited range, and the LED blinks red.	
Modbus RTU (RS-485), not galvanically isolated	Setpoint 0..100 % valve position Actual value 0...100 % for valve position Override control Open / Close / Min / Max / Stop Setpoint monitoring and backup mode	SAX61P03/MO

Type summary

Type	Item No.	Stroke	Positio-ning force	Operating voltage	Positioning signal	Spring return time	Positio-ing time	LED	Manual adjust-ment [3]	Auxiliary functions
SAX31P03 [1]	S55150-A118	20 mm	500 N	AC 230 V	3-position	-	30 s	-	Push and fix	[4]
SAX61P03 [2]	S55150-A114			AC 24 V DC 24 V	DC ...10 V DC 4...20 mA 0...1000 Ω			Yes		[5] [7]
SAX61P03/MO [2]	S55150-A143				Modbus RTU					[6] [7]
SAX81P03 [2]	S55150-A116				3-position			-		[4]

[1] Approbation: CE

[2] Approbation: CE, UL

[3] Not designed for continuous operation.

[4] Optional accessories: Auxiliary switch, potentiometer

[5] Position feedback, forced control, characteristic changeover

[6] Position feedback, forced control

[7] Optional accessories: Auxiliary switch, sequence control, control action changeover

Scope of delivery

Actuators, valves and accessories are supplied in individual packs.

Accessories/ spare parts

Electrical accessories

Type	Auxiliary switch ASC10.51	Potentiometer ASZ7.5	Function module AZX61.1
Item No.	S55845-Z103	S55845-Z106	S55845-Z107
	Max. 2		
SAX31P..	Max. 2	Max. 1	-
SAX61P..		-	Max. 1
SAX61P../MO		-	
SAX81P..		Max. 1	-

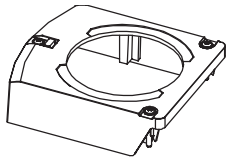
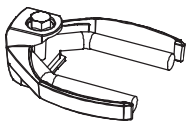
Mechanical accessory

Type	Weather shield ASK39.1
Item No.	S55845-Z109

Ordering (example)

Type	Stock number	Designation	Number of pieces
SAX81P03	S55150-A116	Actuator	1
ASZ7.5	S55845-Z106	Potentiometer	1

Spare parts

Product number / Stock number		
8000060843	Housing cover 	Screw (valve stem coupling)  U-bracket 

Equipment combinations

VPF43..

Valve type			DN	H_{100} [mm]	$\dot{V}_{Min.}$ [m³/h]	$\dot{V}_{m100}$ [m³/h]	Δp_{min} [kPa]	Data sheet
Standard flow	VPF43.50F16	S55266-V100	50	20	2.3	15	35	N4315
	VPF43.65F24	S55266-V102	65		4.4	25		
	VPF43.80F35	S55266-V104	80		5.3	34		
High flow rate	VPF43.50F25	S55266-V101	50		4.3	25	70	
	VPF43.65F35	S55266-V103	65		6	35		
	VPF43.80F45	S55266-V105	80		7	43		

VPF44..

Valve type			DN	H_{100} [mm]	$\dot{V}_{Min.}$ [m³/h]	$\dot{V}_{m100}$ [m³/h]	Δp_{min} [kPa]	Data sheet
Standard flow	VPF44.50F15	S55266-V136	50	20	2.9	15.9	25	A6V11466366
	VPF44.65F25	S55266-V138	65		4.0	28.0		
	VPF44.80F35	S55266-V140	80		5.5	36.7		
High flow rate	VPF44.50F25	S55266-V137	50		4.2	26.2	55	
	VPF44.65F35	S55266-V139	65		5.1	35.8		
	VPF44.80F45	S55266-V141	80		7.2	47.9		

VPF53..

Valve type			DN	H_{100} [mm]	$\dot{V}_{Min.}$ [m³/h]	$\dot{V}_{m100}$ [m³/h]	Δp_{min} [kPa]	Data sheet
Standard flow	VPF53.50F16	S55266-V112	50	20	2.3	15	35	N4316
	VPF53.65F24	S55266-V114	65		4.4	25		
	VPF53.80F53	S55266-V116	80		5.3	34		
High flow rate	VPF53.50F25	S55266-V113	50		4.3	25	70	
	VPF53.65F35	S55266-V115	65		6	35		
	VPF53.80F45	S55266-V117	80		7	43		

Product documentation

Title	Contents	Document ID
Actuators SAX.., SAY.., SAV.., SAL.. for valves	Basic documentation: Detailed information on stroke actuators including Modbus types Stroke actuators for valves with 15/20/40 mm stroke and rotary actuators for butterfly valves	CE1P4040en
Electromotoric actuators for valves SA.., Modbus RTU	Data sheet: Modbus communication profiles	A6V101037195
Mounting instructions G..161../MO and S..6/MO	Mounting instructions: Mounting and installation instructions for Modbus actuators	A5W00027551
Valve Actuator DIL Switch Characteristic Overview	Commissioning / Configuration: Describes the characteristics of valve and actuator combinations, it describes the DIL Switch function	A6V12050595

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

http://siemens.com/bt/download

Notes

Safety

⚠ 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

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.
- Allow the piping to cool off.

Engineering

SAX31P03 / SAX81P03

3-position actuators must be controlled by a controller, see Connection diagrams [→ 15].

SAX61P03

Up to 10 actuators can drive in parallel on a controller output with a rating of 1 mA. Modulating actuators have an input impedance of 100 kΩ.

SAX61P03/MO

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

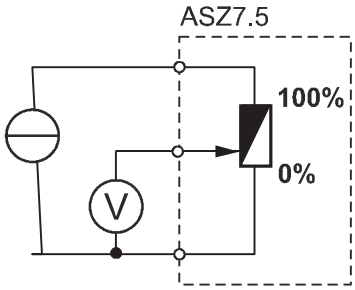
Keep the analog signal setting on the actuator as is (switch 1 to OFF); adjustment not permitted.

ASZ7.5

Actuators with a DC 0...9.8 V feedback signal are recommended for the combination SIMATIC S5/S7 and position feedback.

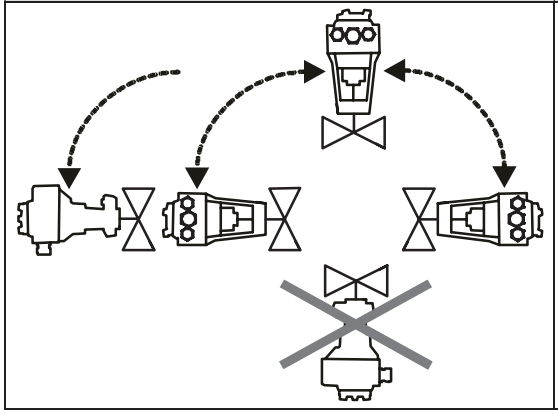
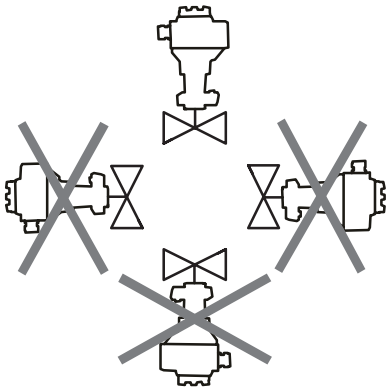
Signal peaks in potentiometer ASZ7.5 may result in error messages on Siemens SIMATIC. This is not the cause, however, when combined with Siemens HVAC controllers. The reason is the higher resolution and faster reaction time on SIMATIC.

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.



Mounting

Mounting positions

Indoor application	Outdoor application [1) 2)]
	

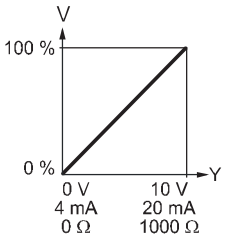
1) Only together with weather shield ASK39.2. IP54 housing protection remains unchanged.

2) SA../MO is not intended for outdoor use.

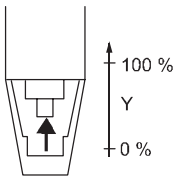
Mounting

Direction of control action

On valves where the stem retracts to the close position, "direct acting" means that the value is fully closed at positioning signal Y = 0 V or Z = 0 Ω (i.e. 100 %).



Direct acting



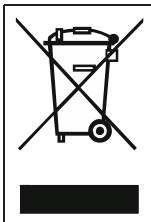
Positioning signal Y	DC 0...10 V, 4...20 mA
Positioning signal Z	0...1000 Ω

Y, Z	Positioning signal
V	Volume flow
_____	Control action: Direct acting

Maintenance

The actuators are maintenance-free.

Disposal



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 service

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			
Operating voltage			
	SAX31P03		AC 230 V ±15%
	SAX61P03..		AC 24 V ± 20 % / DC 24 V +20 % / -15 % (SELV / PELV)
	SAX81P03		
Frequency			45...65 Hz
External supply line fusing (EU)			• Non-renewable fuse 6...10 A slow • Circuit break max. 13 A, tripping characteristic B, C, D to EN 60898 • Power source with current limitation of max. 10 A
Power consumption at 50 Hz			
	SAX31P03	Stem retracts/extends	6.5 VA / 4 W
	SAX61P03		9.5 VA / 4.5 W
	SAX61P03/MO		10.2 VA / 5 W
	SAX81P03		7 VA / 4.5 W
Typical inrush current [1] (3-position actuators)			
	SAX31P03		2.3 A
	SAX81P03		4.5 A

Operating data		
Positioning times (with the specified nominal stroke)		The positioning time may vary depending on the type of valve (Type summary [→ 3])
	SAX31P03, SAX61P03, SAX81P03	30 s
Positioning force		500 N
Nominal stroke		20 mm
Permissible media temperature (valve fitted)		1...120 °C

Signal inputs			
Positioning signal "Y"			
	SAX31P03, SAX81P03		3-position
	SAX31P03	Voltage	AC 230 V ±15%
	SAX81P03		AC 24 V ± 20% / DC 24 V + 20% / - 15%
	SAX61P03		
	DC 0...10 V	Power consumption	≤ 0.1 mA
		Input impedance	≥100 kΩ
	DC 4...20 mA	Power consumption	DC 4...20 mA ± 1%
		Input impedance	≤ 500 kΩ

Communication SAX61P../MO			
Communication protocol			
	Modbus RTU		RS-485, not galvanically isolated
	Number of nodes		Max. 32
	Address 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

Parallel connection	
SAX61P03	≤ 10 (depending on controller output)

Forced control			
Z positioning signal			
	SAX61P03		R = 0...1000 Ω, G, G0
		R = 0...1000 Ω	Stroke proportional to R
		Z connected to G	Max. stroke 100 % [2]
		Z connected to G0	Max. stroke 0 % [2]
		Voltage	Max. AC 24 V ± 20 %
			Max. DC 24 V +20% / -15%
		Power consumption	≤ 0.1 mA

Position feedback			
Position feedback U			
	SAX61P03		DC 0...10 V
		Load impedance	> 10 kΩ resistive
		Load	Max. 1 mA

Connection cables			
Wire cross-sectional areas			0.75 mm², AWG 20...16 [3]
Cable entries			
	SAX..P..		• 2 entries ∅ 20.5 mm (for M20) • 1 entry ∅ 25.5 mm (for M25)
	SAX61P../MO		
		Fixed connection cable	0.9 m
		Number of cores	5 x 0.75 mm²

Degree of protection and class			
Housing from vertical to horizontal			IP 54 as per EN 60529 [4]
Protection class			As per EN 60730
	SAX31P03	AC 230 V	II
	SAX61P03 SAX81P03	AC / DC 24 V	III

Environmental conditions			
Operation			IEC 60721-3-3
	Climatic conditions		Class 3K5
		Mounting location	Indoors (weather-protected) [4]
		Temperature, general	-5...< 55 °C
		Humidity (non-condensing)	5...95 % r.h.
Transportation			IEC 60721-3-2
	Climatic conditions		Class 2K3
		Temperature	-25...70 °C
		Humidity	< 95% r.h.
Storage			IEC 60721-3-1
	Climatic conditions		Class 1K3
		Temperature	-15...55 °C
		Humidity	5...95 % r.h.
Max. media temperature when mounted on valve			120 °C

Directives and standards		
Product standard		EN 60730-x
Electromagnetic compatibility (field of use)		For residential, commercial, and industrial environments
EU conformity (CE)		CE1T4501X1 [5]
RCM conformity		CE1T4515X4 [5]
EAC compliance		Eurasian compliance for all SAX..P..
UL, cUL	AC 230 V	-
	AC / DC 24 V	UL 873 http://ul.com/database; file number E35198

Environmental compatibility
Product environmental declarations 71 7331 0559 [5] und A6V101083254 [5] include data on environmentally friendly product design and testing (RoHS compliance, material composition, packaging, environmental benefits, disposal).

Dimensions
See Dimensions [→ 17]

Accessories [6]		
Potentiometer ASZ7.5		0...1000 Ω ± 5 %
	Voltage	DC 10 V
	Current rating	<4 mA
Auxiliary switch ASC10.51	Switching capacity	AC 24…230 V, 6 (2) A, potential free
External fusing of supply line		• Non-renewable fuse 6...10 A slow • Circuit break max. 13 A, tripping characteristic B, C, D to EN 60898 • Power source with current limitation of max. 10 A
US installation, UL & cUL		AC 24 V class 2, 5 A general purpose

1) Switching time for RMS value of the sine wave at nominal voltage

2) Observe acting direction of DIL switches

3) AWG = American wire gauge

4) For outdoor operation, always use weather shield ASK39.1, housing protection class IP 54 remains as is. SAX61P../MO is not intended for outdoor use.

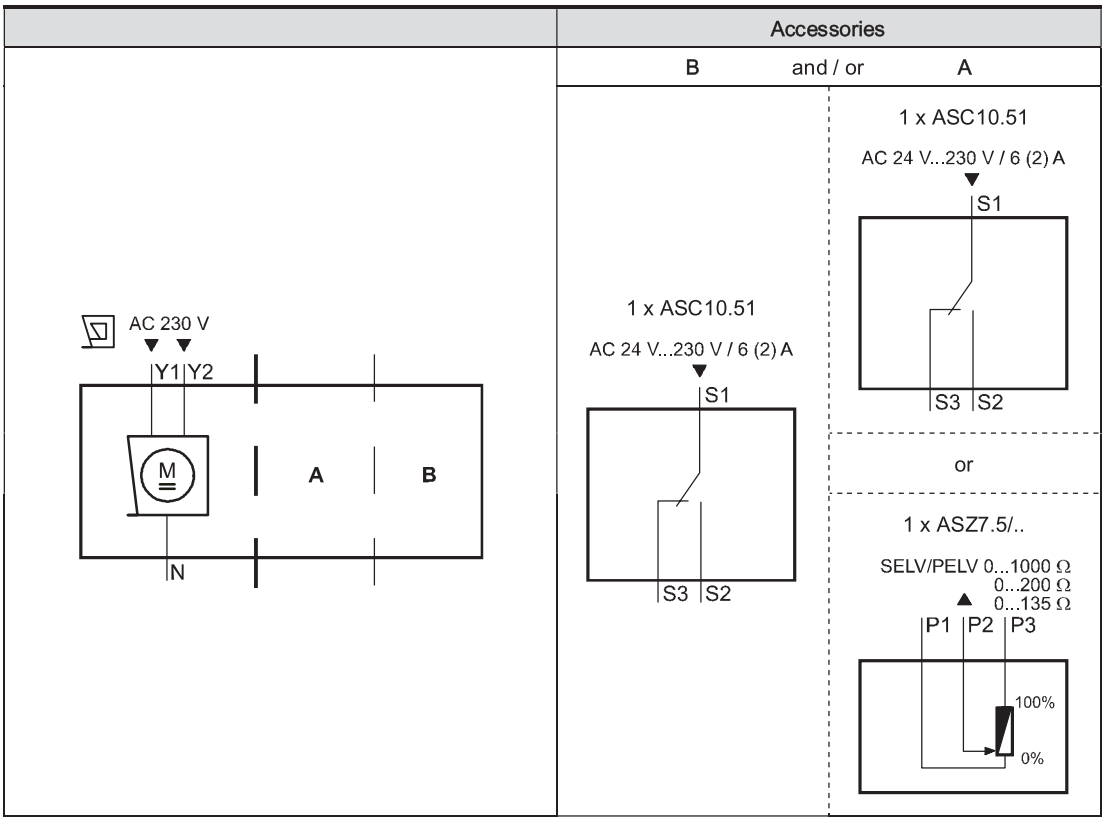
5) Documents can be downloaded at http://www.siemens.com/bt/download

6) UL-approved component

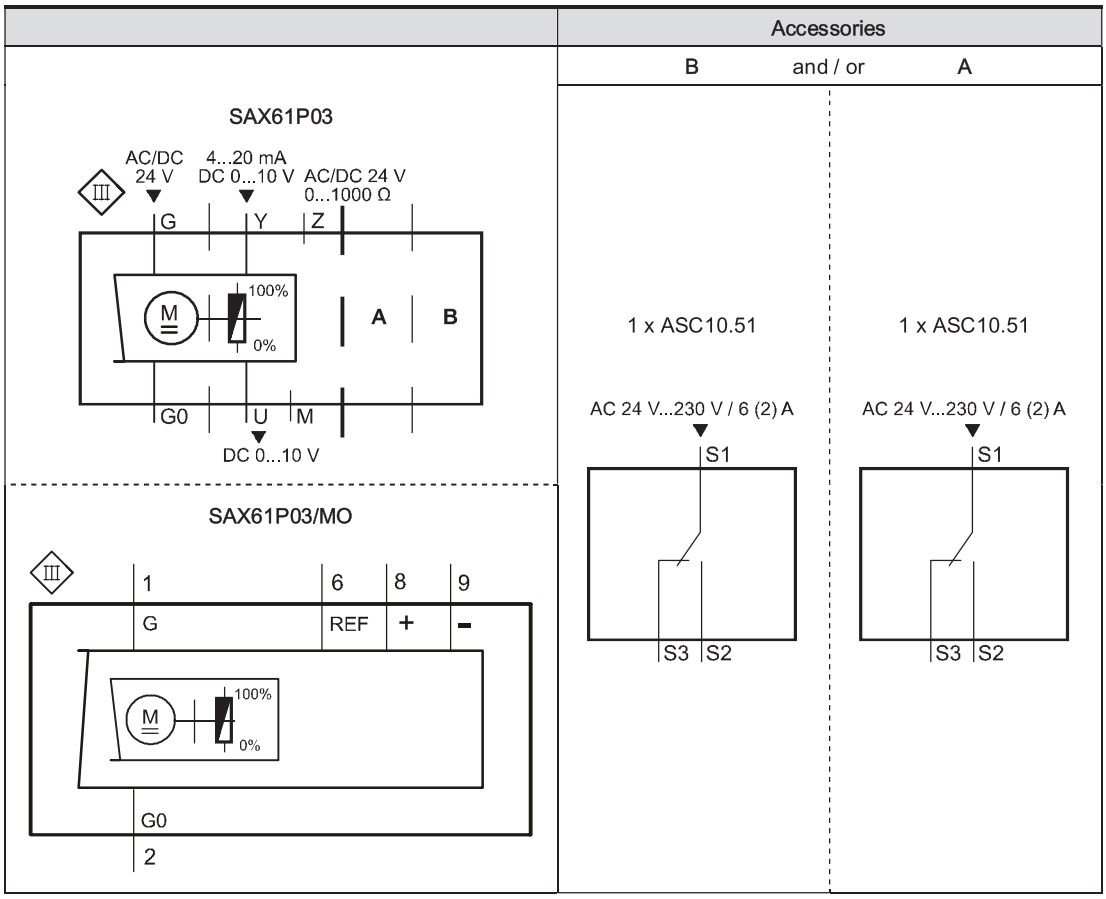
Connection diagrams

Internal Diagrams

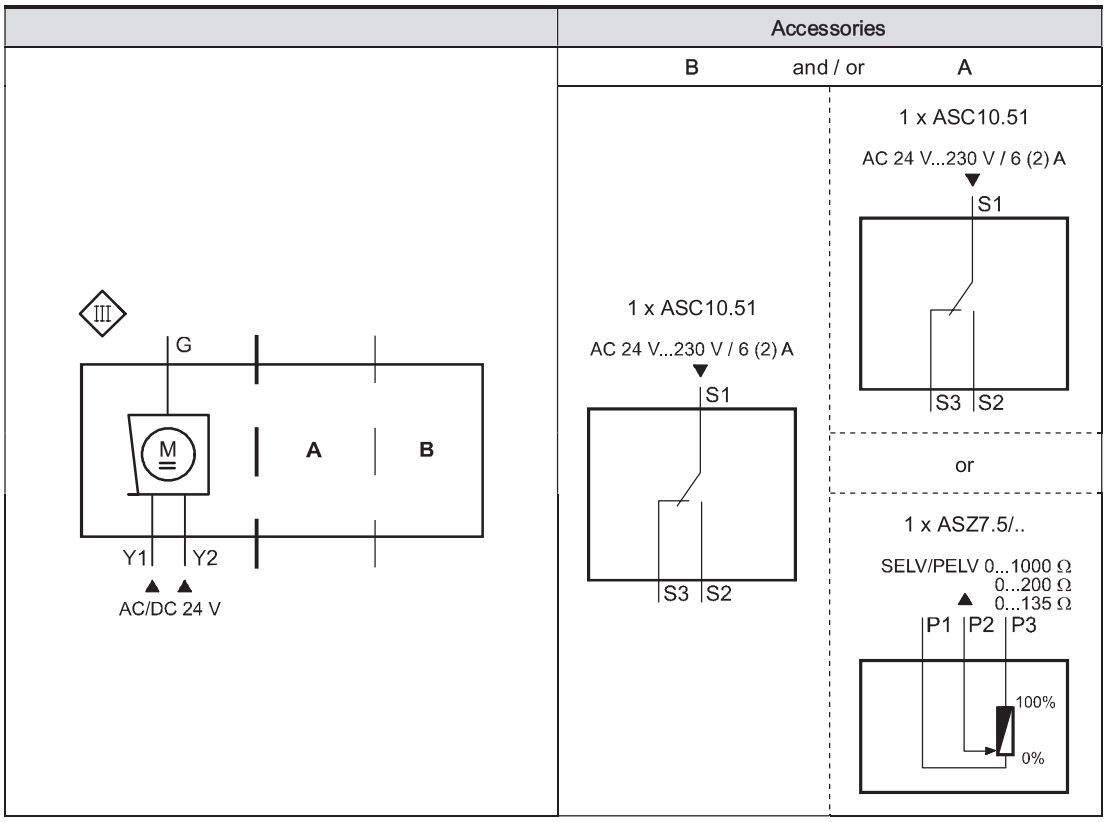
SAX31P03



SAX61P..



SAX81P03



Connection terminals

SAX31P03

	AC 230 V	3-position
N	System neutral (SN)	
Y1	Positioning signal (actuator's stem extends)	
Y2	Positioning signal (actuator's stem retracts)	

SAX61P03

	AC / DC 24 V	D 0...10 V 4...20 mA 0...1000
G0	System neutral (SN)	
G	System potential (SP)	
Y	Positioning signal for DC 0...10 V / 4...20 mA	
M	Measuring neutral	
U	Position feedback DC 0…10 V - (System neutral is measuring ground M)	
Z	Control signal forced control	

SAX61P03/MO

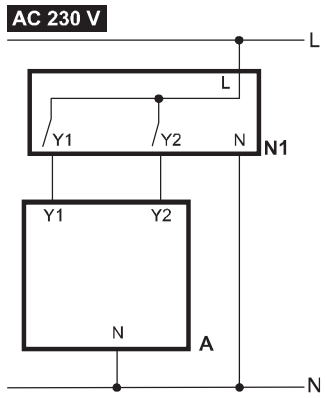
	AC / DC 24 V	Modbus RTU connecting cable
G0	System neutral (SN)	black
G	System potential (SP) AC 24 V / DC 24 V	red
REF	Reference line (Modbus RTU)	violet
+	Bus + (Modbus RTU)	gray
-	Bus - (Modbus RTU)	pink

SAX81P03

	AC / DC 24 V	3-position
G	System potential (SP)	
Y1	Positioning signal (actuator's stem extends)	
Y2	Positioning signal (actuator's stem retracts)	

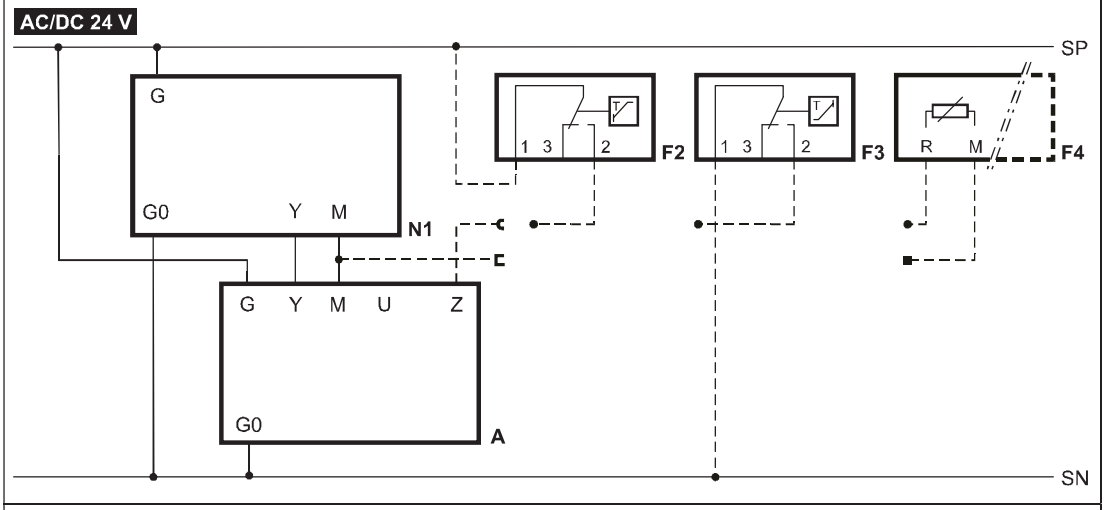
Connection diagrams

SAX31P03



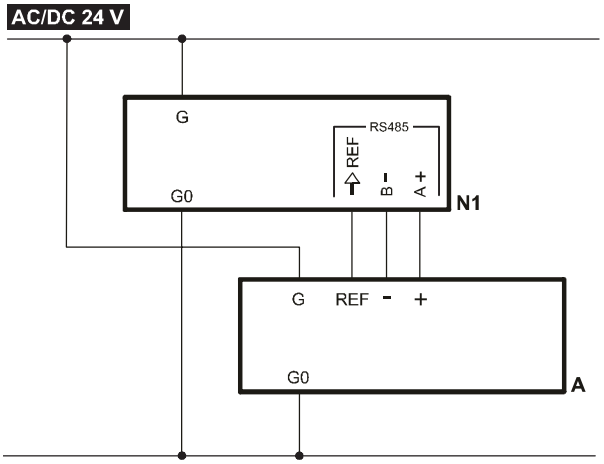
A	Actuator
L	Phase
N	Neutral
N1	Controller
Y1, Y2	Positioning signals

SAX61P03



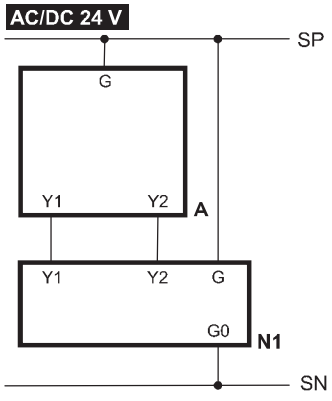
A	Actuator
F2	Frost protection thermostat: terminals: 1 – 2 frost hazard / sensor is interrupted (thermostat closes with frost) 1 – 3 normal operation
F3	Thermal reset limit thermostat
F4	Frost protection monitor with 0…1000 Ω signal output, does **NOT** support QAF21.. or QAQ61..
M	Measuring neutral
N1	Controller
SN	System zero
SP	System potential AC/DC 24 V
U	Position feedback - (System neutral is measuring ground M)
Y	Positioning signal
Z	Control signal forced control

SAX61P03/MO



A	Actuator
N1	Controller
G	System potential AC/DC 24 V
G0	System zero
REF	Reference line (Modbus RTU)
+	Bus + (Modbus RTU)
-	Bus - (Modbus RTU)

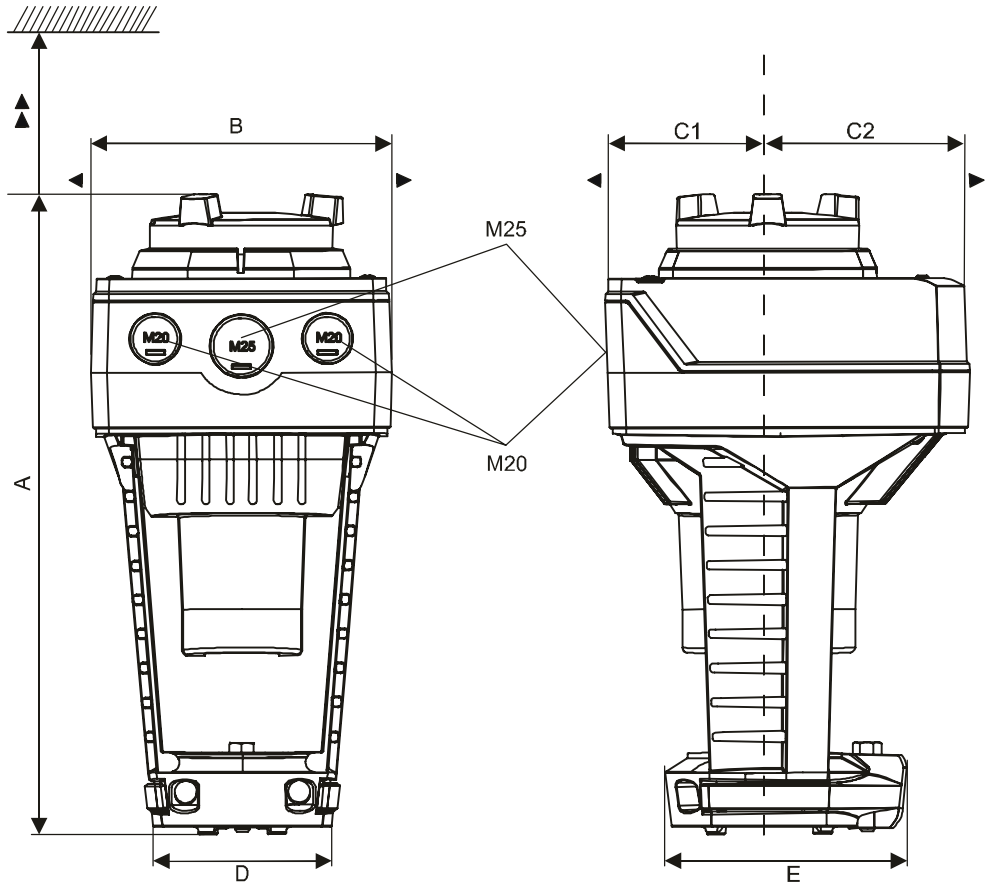
SAX81P03



A	Actuator
N1	Controller
SN	System zero
SP	System potential
Y1, Y2	Positioning signals

Dimensions

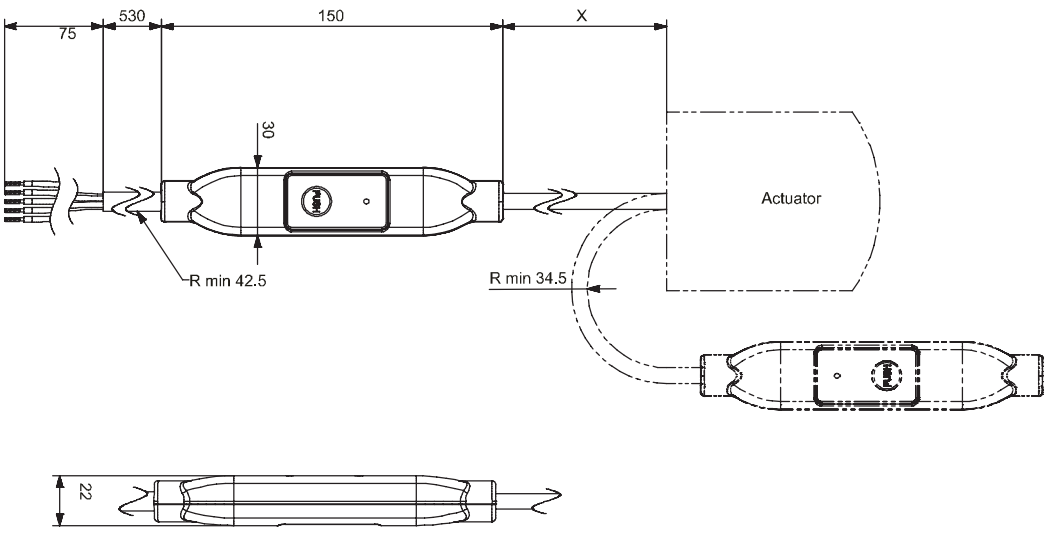
Actuator



Type	A	B	C	C1	C2	D	E	►	►►	kg
	[mm]									[kg]
SAX..P..	242	124	150	68	82	80	100	100	200	1.780
SAX61P03/MO 1)										1.930
With ASK39.1	267	154	300	200	100	-				2.010

1) Device has fixed connection cable – left cable entry occupied

External Modbus converter



Dimensions in mm

Type	X	kg
	[mm]	[kg]
SAX61P03/MO	250	0.15 [1]

[1] Included in total weight.

Revision numbers

Type	Valid from rev. no.
SAX31P03	..H
SAX61P03	..I
SAX61P03/MO	..B
SAX81P03	..I

SIEMENS

ACVATIX™

Electro-hydraulic actuators for valves

SKB..

with a 20 mm stroke

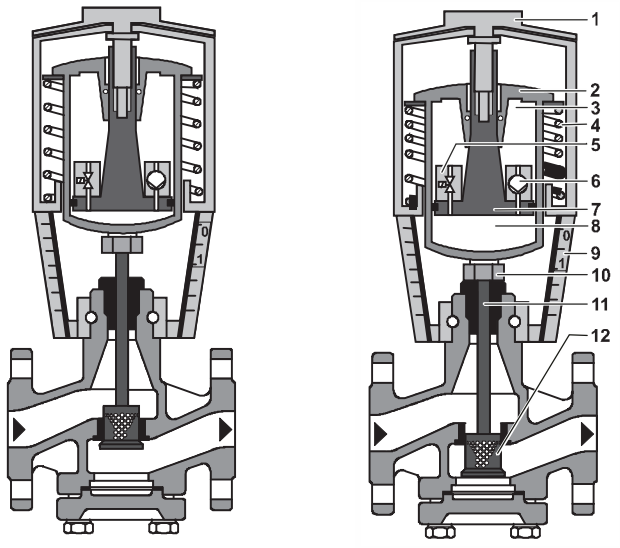
- SKD32.. Operating voltage AC 230 V, 3-position control signal
- SKD82.. Operating voltage AC 24 V, 3-position control signal
- SKD6.. Operating voltage AC 24 V
  - Control signal DC 0...10 V, 4...20 mA or 0...1000 Ω
  - SKD62/MO RS-485 for Modbus RTU communication
  - Selection of flow characteristic, 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

For manual operation, swing out the crank so that the display window becomes visible. By rotating the crank clockwise, the pressure cylinder is moved downwards. The display window shows the engagement bar and/or the scale dial with stroke indication.

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 crank remains swung out and in the display window the red indicator dial remains 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 clockwise to the end stop. The pressure cylinder moves upwards to the 0% stroke position of the valve. In the display window, the read scale disappears. Afterwards, swing the crank closed.

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.

SKB32.. SKB82..

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 Y2:	Piston retracts	Valve closes
• No voltage on Y1 and Y2:	Piston and valve stem remain in the respective position	

SKB62.. SKB60

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

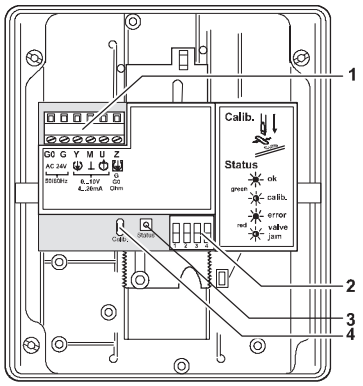
A frost protection thermostat can be connected to the SKB6.. actuator.

The added signals from the frost protection monitors QAF21.. and QAF61.. require the use of SKB62UA 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].

Electronics

SKB60 [1]

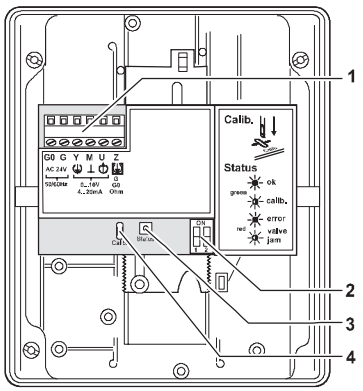


1 Connection terminals
2 DIL switches
3 LED status indication
4 Stroke calibration

[1] From version ..L onward

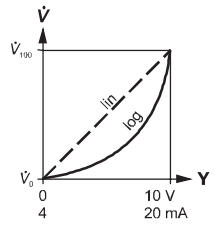
DIL switches								
	Direction of operation		Fail-in-place (behaviour in case of control signal loss) **		Positioning signal Y Positioning feedback U		Flow characteristic	
ON	ON 1 2 3 4	Reverse acting	ON 1 2 3 4	Stops at current position	ON 1 2 3 4	DC 4...20 mA	ON 1 2 3 4	lin = linear
OFF *	ON 1 2 3 4	Direct acting	ON 1 2 3 4	Closes	ON 1 2 3 4	DC 0...10 V	ON 1 2 3 4	log = equal percentage
					Relationship between positioning signal Y and volumetric flow		$\dot{V}$, $\dot{V}_{100}$, $\dot{V}_0$, lin, log, Y, 0, 4, 10 V, 20 mA	
*	Factory setting: all switches OFF							
**	Only considered when DIL switch 3 ON (control signal = DC 4…20 mA)							

SKB60 [2], SKB62..

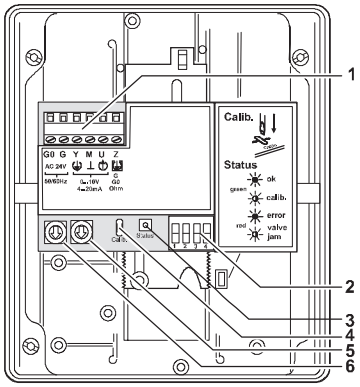


1 Connection terminals
2 DIL switches
3 LED status indication
4 Stroke calibration

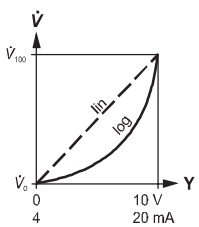
[2] Up to and including version ..K

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			

SKB62UA



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							

SKB62/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

Spring-return function

The SKB32.51, SKB82.51.. and SKB62.. 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

SKB60, SKB62.., SKB62/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 SKB6.. with a Siemens valve.

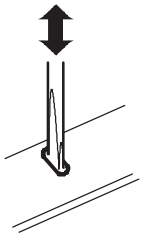
▷ ⚠ **Actuator must bin in „Automatic operation mode“ enabling stroke calibration to capture the effective 0% and 100% values.**

▷ AC 24 V power supply applied.

▷ Housing cover removed.

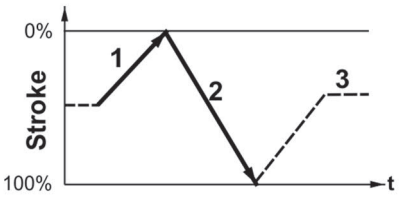
1. Short-circuit contacts in calibration slot (e.g. with a screwdriver) and trigger calibration process.
2. Actuator moves to 0% stroke position [1].
   ⇨ Valve closes.
3. Actuator moves to 100% stroke position [2].
   ⇨ Valve opens.

⇨ 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 SKB62/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

SKB60, SKB62.., SKB62/MO

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

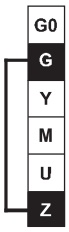
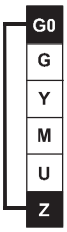
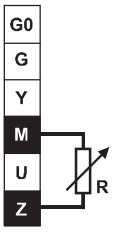
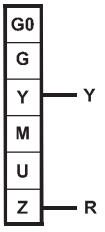
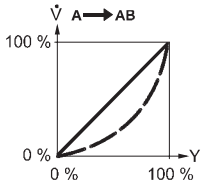
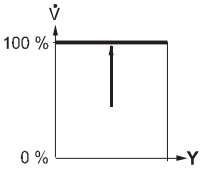
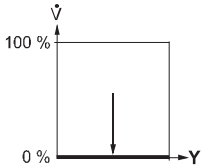
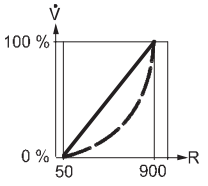
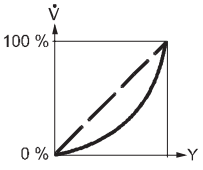
LED indication	Function	Remarks, troubleshooting
 Lit green	Normal operation	Automatic operation; everything o.k.
 Flashing green	Stroke calibration in progress	Wait until calibration is finished (LED stops flashing, will be lit green or red)
 Lit red	Faulty stroke calibration	Check mounting; restart 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

SKB60, SKB62..

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

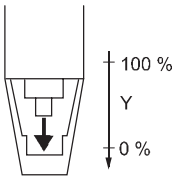
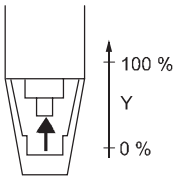
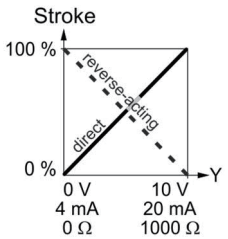
Z-mode					
	No function	Fully open	Closed	Override with 0…1000 Ω	Signal addition SKB62UA only
Connections					
Transfer					
	Equal percentage or linear			Equal percentage or linear	
	• Z-contact not connected	• Z-contact directly connected to G	• Z-contact directly connected to G0	• Z-contact connected 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

SKB60 (from version ..L), SKB62UA

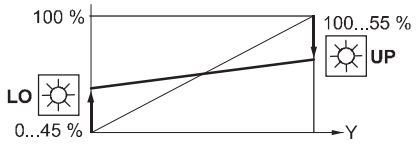
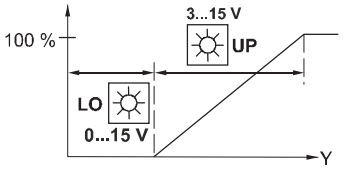
- With normally-closed valves, “direct acting” means that with a signal input of 0 V, the valve closes (applies to all Siemens valves listed under Equipment combinations [→ 12]).
- With normally-open valves, “direct acting” means that with a signal input of 0 V, the valve is open.

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

SKB62UA

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

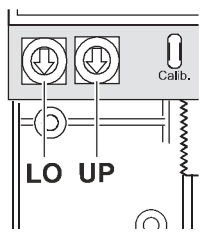
* Operating range of QAF21.. (see below)

** 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

SKB62UA

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	Opening	Closing
SKB32.50 [1]		-	AC 230 V	3-position	-	-	120 s	120 s
SKB32.50/F [1], [3]								
SKB32.51 [1]					yes	10 s		
SKB32.51/F [1], [3]								
SKB82.50 [1]			AC 24 V		-	-		
SKB82.50U [2]								
SKB82.51 [1]					yes	10 s		
SKB82.51U [2]								
SKB60 [1], [4]		Standard electronics		DC 0...10 V 4...20 mA 0...1000 Ω	-	-		10 s
SKB62 [1]					yes	10 s		
SKB62/F [1], [3]								
SKB62U [2]								
SKB62UA [2], [5]		Enhanced electronics						
SKB62/MO [2]	S55195-A127	Standard electronics		Modbus RTU				

[1] Approbation: CE

[2] Approbation: CE, UL

[3] Only available in France

[4] Enhanced functions (from version ..L): Direction of operation, fail-in-place

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

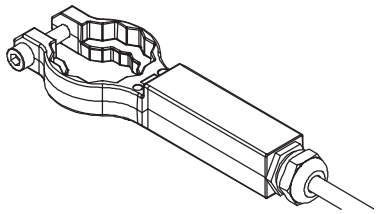
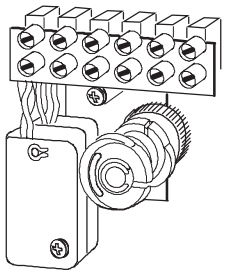
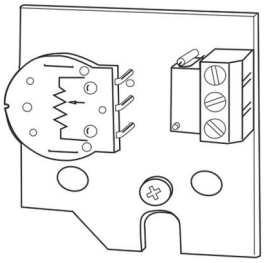
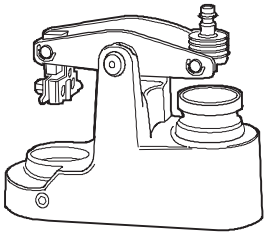
Scope of delivery

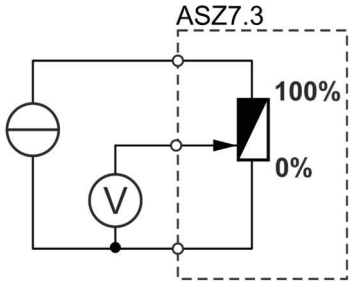
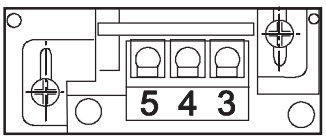
The actuator, valve and accessories are supplied in separate packaging and not assembled prior to delivery.

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)	ASK51
	Max. 2				
SKB32..	-	Max.1	Max.1	Max.1	Max.1
SKB82					
SKB6..	Max.1	-	-		

<table>
<tr><td>SKB..</td><td colspan="3">ASZ6.6 (S55845-Z108)
Stem heater
 
• For media below 0 °C
• Mount between valve and actuator</td></tr>
<tr><td rowspan="4">SKB32..
SKB82..</td><td>ASC9.3
Double auxiliary switch</td><td>ASZ7.3
Potentiometer</td><td>ASK51
Mechanical stroke inverter</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Adjustable switching points</td><td>0…1000 Ω</td><td>0% actuator stroke corresponds to 100% valve stroke
Mount between valve and actuator</td></tr>
<tr><td>Note: ASZ7.3</td><td colspan="2">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.
 
</td></tr>
<tr><td>SKB60
SKB62..</td><td colspan="3">ASC1.6
Auxiliary switch
 

Switching point 0...5% stroke</td></tr>
</table>

For more information, see Technical data [→ 19]

Ordering (example)

Type / Stock number [1]	Designation	Number of pieces
SKB62/MO / S55195-A127	Actuator Modbus RTU	1
ASC1.6	Auxiliary switch	1

[1] Specify stock number if available.

Spare parts

Actuator	Cover	Hand control [1]	Clamp	Stem connection	Control unit
					
SKB32.50, SKB32.50/F	410455828	426855108	410355768	417856498	-
SKB32.51, SKB32.51/F					
SKB82.50					
SKB82.50U			410356058		
SKB82.51			410355768		
SKB82.51U			410356058		
SKB60			410355768		466857598
SKB62, SKB62/F					466857488
SKB62U			410356058		
SKB62UA					466857518
SKB62/MO			410355768		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} [m³/h]	Data sheet
VVF21.. [1]	Flanged	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
VVF45..					N4345
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} [m³/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 SKB32.. and SKB82.. 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

SKB..				Accessories	Mounting instructions	
Mounting instructions SKB../SKC..	M3240	74 319 0324 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)		ASK51	M4561.6	4 319 5550 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

Safety

⚠ 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:

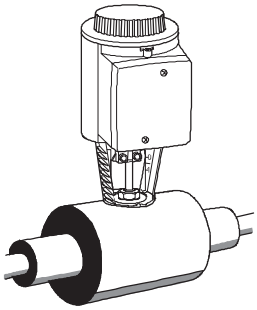
- Switch off both pump and operating voltage.
- Close the main shutoff valve in the piping.
- Release pressure in the pipes and allow them to cool off completely.

Engineering

Conduct the electrical connections in accordance with local regulations on electrical installations as well as the section Connection diagrams [→ 26].

⚠	*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].

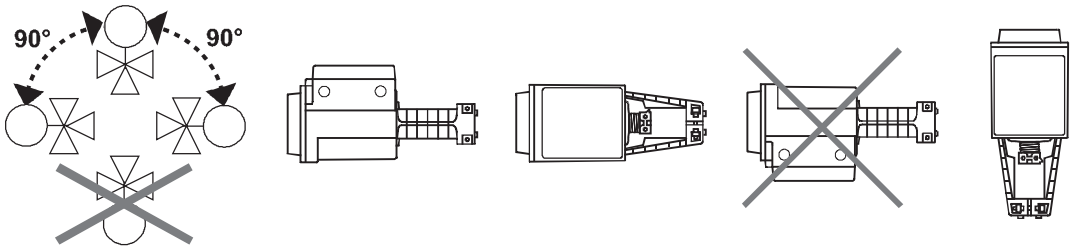
If an auxiliary switch is used, its switching point should be indicated on the plant schematic.

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

Mounting

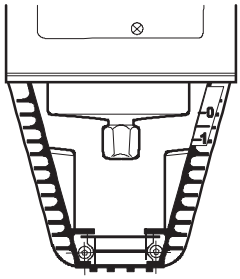
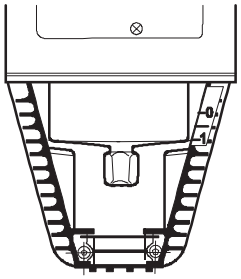
Mounting Instructions 74 319 0324 0 for fitting the actuator to the valve and A5W00027551 for SKB62/MO are enclosed in the actuator packaging. The instructions for accessories are enclosed with the accessories themselves (see Product documentation [→ 13]).

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.

Cylinder with valve stem connector fully retracted → stroke = 0 %		Cylinder with valve stem connector fully extended → stroke = 100 %	

The manual adjuster must be rotated counter-clockwise to the end stop.
This causes the Siemens valves, types VVF.. und VXF.. to close (stroke = 0 %).

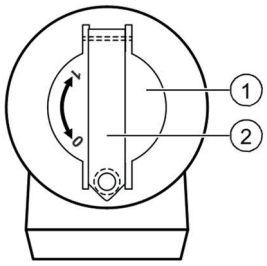
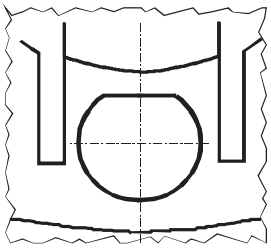
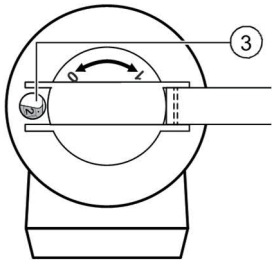
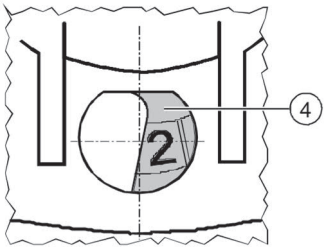
Operation

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] shows neither the scale [4] nor the crank engagement bar.

Manual operation

For manual operation, swing 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 [4] with stroke indication.

	
Engaged crank [2] on the manual adjustment knob [1]	Display window with invisible scale dial and crank engagement bar
	
Swung-out crank; display window [3]	Display window with scale dial [4] and stroke indication in mm

Maintenance

The actuators are maintenance-free.

When servicing the control device:

⚠ 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.

⚠ WARNING

Risk of injury

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

Recommendation SKB6..:
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

⚠ 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.

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.

Power supply			
Operating voltage			
	SKB32..		AC 230 V ± 15 %
	SKB82..		AC 24 V ± 20 % (SELV/PELV)
	SKB6..		
	SKB62/MO		
Frequency			50 / 60 Hz
Maximum power consumption at 50 Hz			
	SKB32.50, SKB32.50/F		10 VA / 8 W
	SKB32.51, SKB32.51/F		16 VA / 12 W
	SKB82.50, SKB82.50U		8 VA / 7 W
	SKB82.51, SKB82.51U		12 VA / 9 W
	SKB60..		10 VA / 8 W
	SKB62..		14 VA / 10 W
External supply cable fuse			
	SKB32..		Min. 0.5 A, slow Max. 6 A slow
	SKB82..		Min. 1 A, slow Max. 10 A slow
	SKB6..		

Function data			
Positioning time at 50 Hz [1)]			
	SKB32.5..	Opening, closing	120 s
	SKB82.5..	Opening, closing	120 s
	SK6..	Opening	120 s
		Closing	10 s
Spring-return time [1)]			10 s
Positioning force			2800 N
Nominal stroke			20 mm
Maximum permissible medium temperature (valve fitted)			-25...220 °C
			< 0 °C: Requires stem heater ASZ6.6

Signal inputs / signal outputs			
Control signal			
	SKB32..		3-position
	SKB82..		
	SKB6..		DC 0…10 V
			DC 4…20 mA
			0…1000 Ω
Positioning signal Y SK6..			
	Input impedance	DC 0…10 V	100 kΩ
		DC 4…20 mA	240 Ω
	Signal resolution		< 1 %
	Hysteresis		1 %

Signal inputs / signal outputs			
Override control Z SK6..			
	Resistor		0…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 SKB60 [2], SKB62UA			
Selection of direction of operation			
	SKB60, SKB62UA	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			
	SKB62UA	Range of lower limit	0...45 % adjustable
		Range of upper limit	100...55% adjustable
Sequence control			
	SKB62UA	Terminal Y	
		Starting point of sequence	0...15 V adjustable
		Operating range of sequence	3...15 V adjustable
Signal addition			
	SKB62UA	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 SKB62/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 (∅ 20.5 mm)
	SKB..U		With knockouts for standard ½" conduit connectors (∅ 21.5 mm)
	SKB62/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	Type 1AA / Type 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...<55 °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...55 °C
		Humidity (non-condensing)	-5...95 % r.h.

Directives and standards		
Product standard		EN 60730-x
Electromagnetic compatibility (Applications)		For use in residential, commerical, and industrial environments
EU conformity (CE)		A5W00007751 [4]
RCM conformity		A5W00007895 [4]
EAC conformityt		Eurasia conformity for all SKB..
UL, cUL	AC 230 V	-
	AC 24 V	UL 873 http://ul.com/database

Environmental compatibility
The product environmental declarations CE1E4564enX1 (SKB3.., SKB8..) [4], CE1E4564enX2 (SKB6..) [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		
	SKB32.50, SKB32.50/F	9.15 kg
	SKB32.51, SKB32.51/F	9.20 kg
	SKB82.50	9.15 kg
	SKB82.50U	9.45 kg
	SKB82.51	9.20 kg
	SKB82.51U	9.50 kg
	SKB60 SKB62, SKB62/MO	9.20 kg
	External Modbus converter	0.15 kg
	SKB62U SKB62UA	9.50 kg
	Stroke inverter ASK51	1.0 kg

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

Accessories			
Auxiliary switch ASC1.6			
	SKB6..	Switching capacity	AC 24 V, 10 mA....4 A resistive, 2 A inductive
Double auxiliary switch ASC9.3			
	SKB32.., SKB82..	Switching capacity per auxiliary switch	AC 250 V, 6 A resistive, 2,5 A inductive
Potentiometer ASZ7.3			
	SKB32.., SKB82..	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

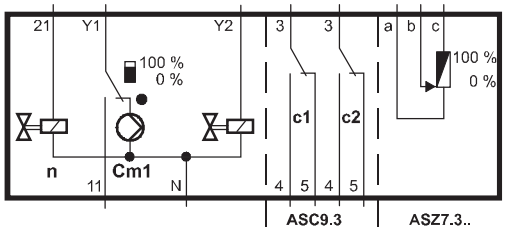
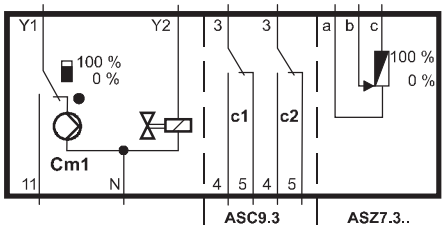
2) From version ..L onward

3) AWG = American wire gauge

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

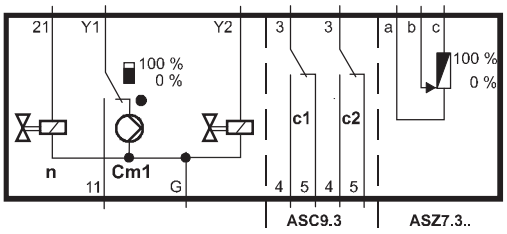
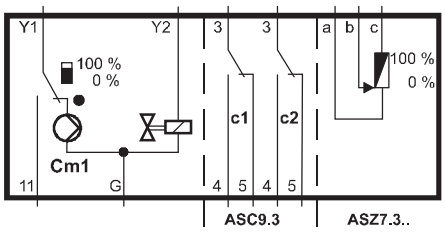
Internal diagrams

SKB32..

SKB32.51	SKB32.50
AC 230 V 3-position	
	

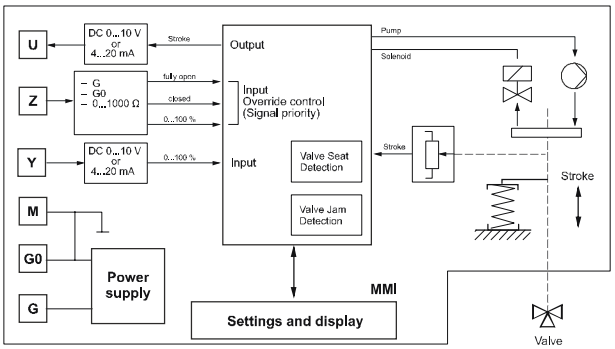
Cm1	End switch
n	Solenoid valve for spring-return
c1, c2	ASC9.3 double auxiliary switch
a, b, c	ASZ7.3 potentionmeter
Y1	Positioning signal „open“
Y2	Positioning signal „close“
21	Spring-return function
N	Neutral conductor

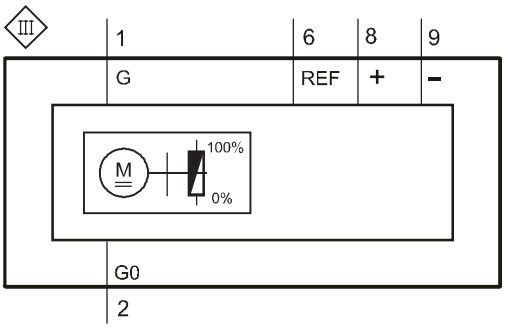
SKB82..

SKB82.51	SKB82.50
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

SKB6..

SKB60, SKB62 SKB62U, SKB62UA
AC 24 V
DC 0...10 V 4...20 mA 0...1000 Ω


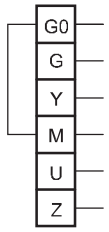
SKB62/MO
AC 24 V
Modbus RTU


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

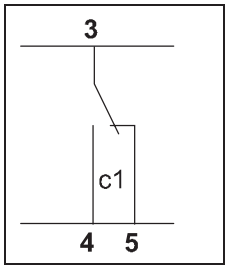
SKB6..

	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])	

SKB62/MO

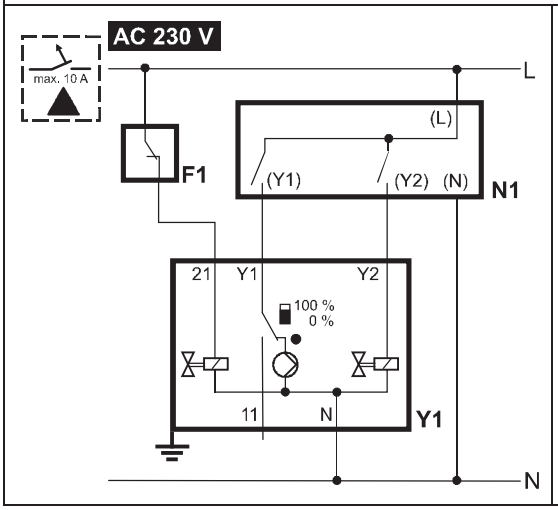
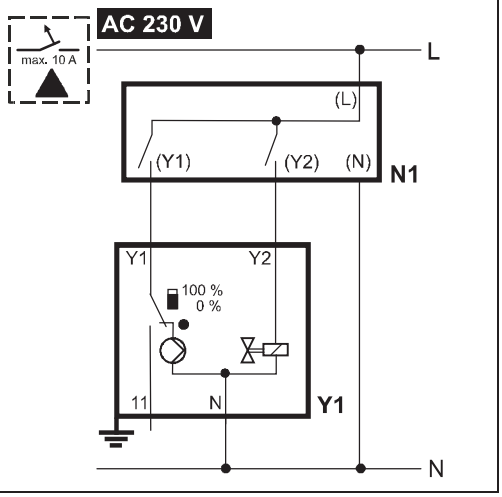
	AC 24 V	Modbus RTU Connention cable
	System neutral (SN)	Black
	System potential (SP)	Red
	Reference line (Modbus RTU)	Violet
	Bus + (Modbus RTU)	Gray
	Bus - (Modbus RTU)	Pink

Auxiliary switch ASC1.6



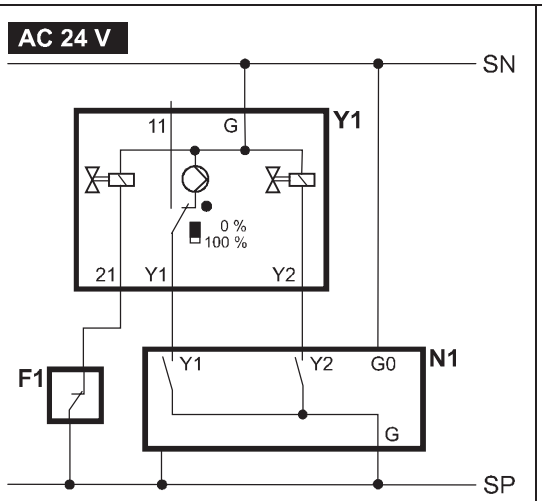
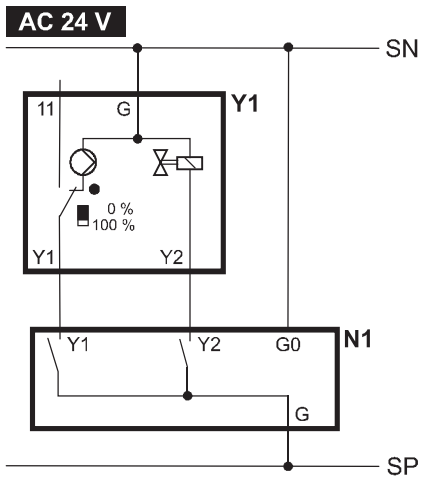
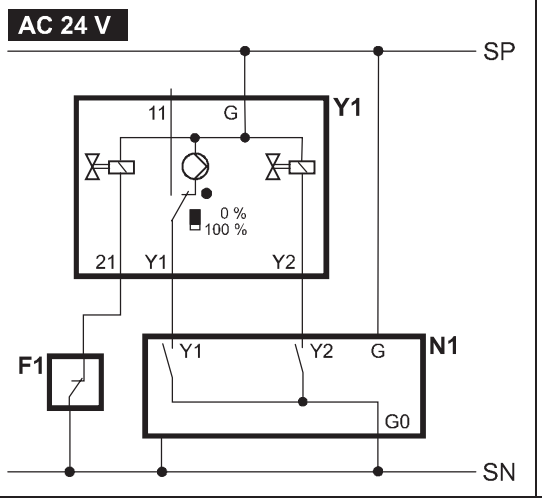
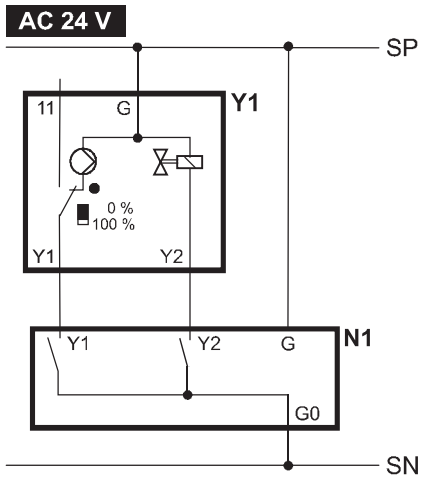
Connection diagrams

SKB32..

SKB32.51	SKB32.50
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

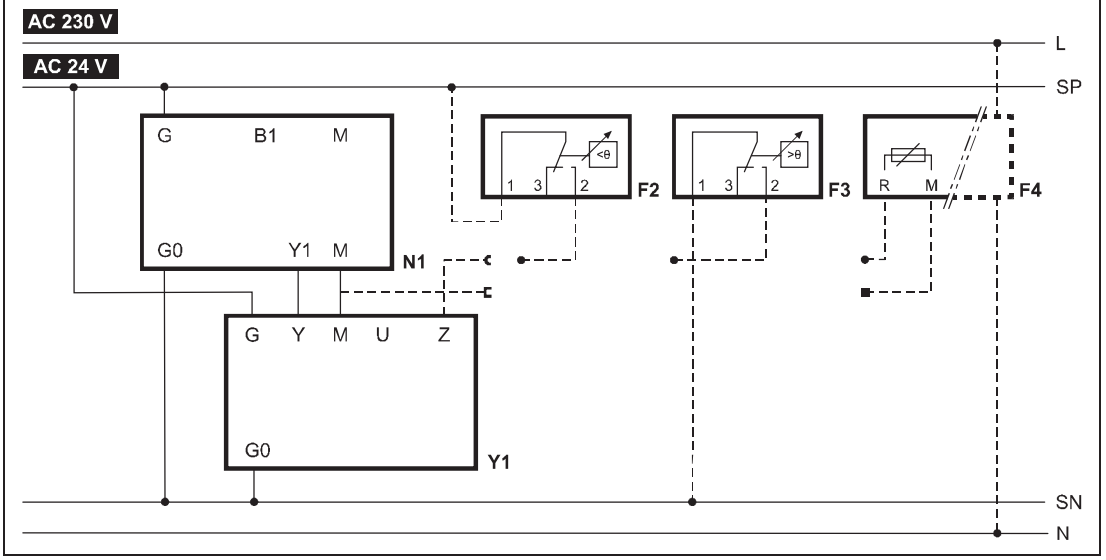
SKB82..

SKB82.51, SKB82.51U	SKB82.50, SKB82.50U
AC 24 V 3-position	
	
	

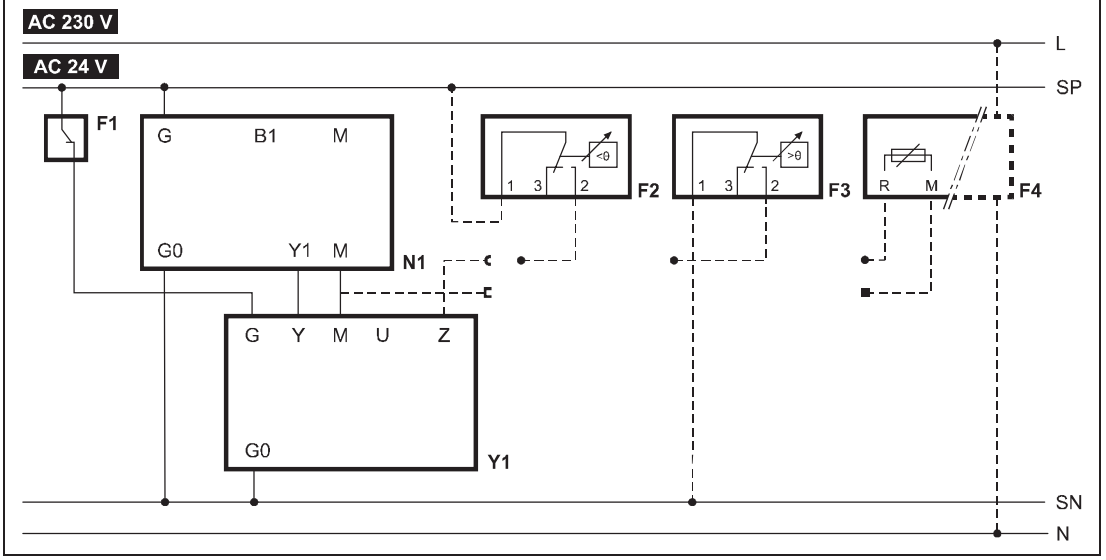
F1	Safety limiter (e.g. temperature limiter)			(Y1), (Y2)	Controller contacts
		SP	System potential AC 24 V	Y1	Positioning signal „open“
N1, N2	Controller	SN	System neutral	Y2	Positioning signal „close“
Y1, Y2	Actuators			21	Spring-return function

SKB6..

SKB60	
AC 24 V	DC 0...10 V 4...20 mA 0...1000 Ω

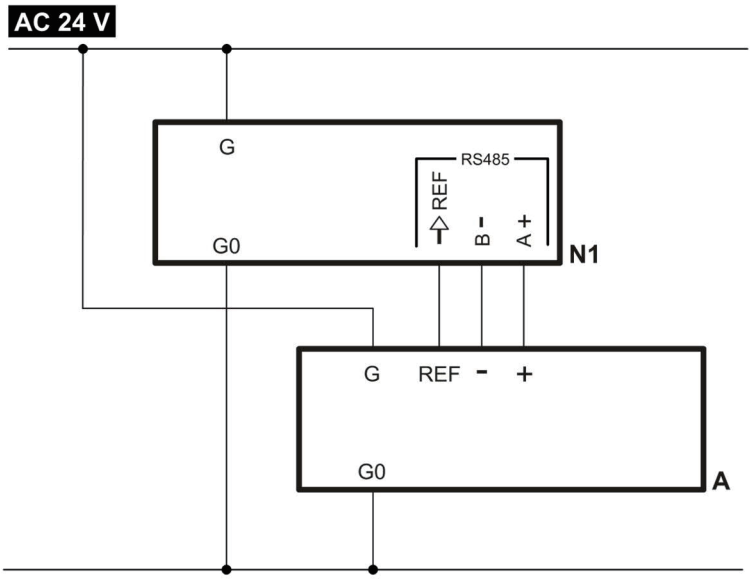


SKB62, SKB62U, SKB62UA	
AC 24 V	DC 0...10 V 4...20 mA 0...1000 Ω



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		

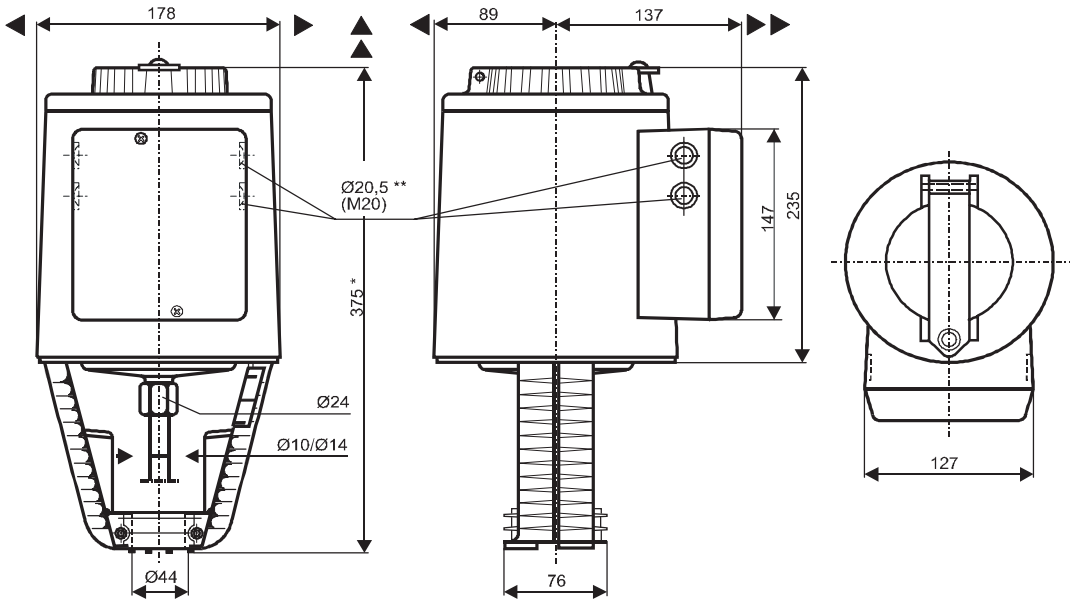
*) Only SKB62UA: only with sequence control and the appropriate selector switch settings, see Electronics [→ 5], Functions [→ 6]

SKB62/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)

⚠	*NOTE*
	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.

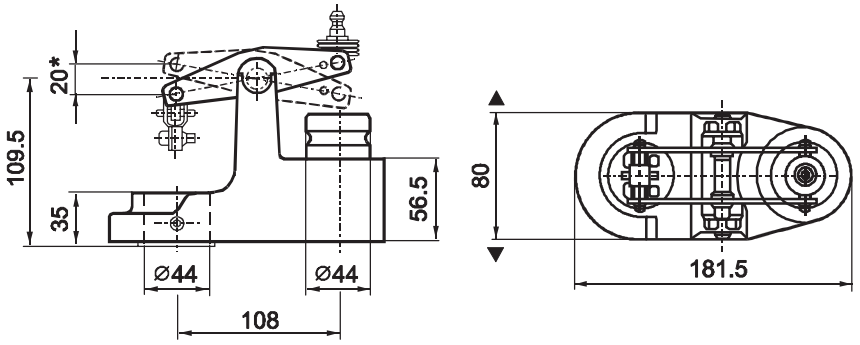
Actuator



All dimensions in mm

*	Height of actuator from plate with stroke inverter ASK51 = 432 mm
**	SKB..U: with knockouts for standard ½" conduit connectors (∅ 21.5 mm)
▶	> 100 mm, minimum clearance form ceiling or wall for mounting
▶▶	> 200 mm, connection, operation, maintenance, etc.

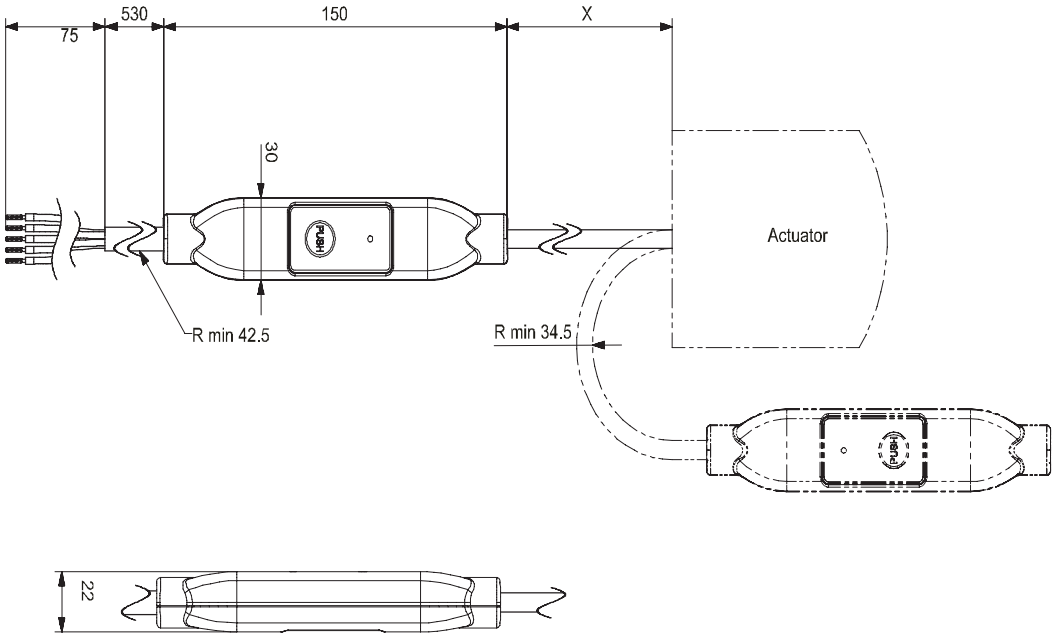
Stroke inverter ASK51



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.
SKB32.50	..D	SKB62	..G
SKB32.50/F	..D	SKB62/F	..G
SKB32.51	..D	SKB62U	..G
SKB32.51/F	..D	SKB60	..G
SKB82.50	..D	SKB62UA	..G
SKB82.50U	..D	SKB62/MO	..H
SKB82.51	..D		
SKB82.51U	..D		

SIEMENS

ACVATIX™

Electro-hydraulic actuators for valves

SKC..

with a 40 mm stroke

- SKC32.. Operating voltage AC 230 V, 3-position control signal
- SKC82.. Operating voltage AC 24 V, 3-position control signal
- SKC6.. Operating voltage AC 24 V,

– Control signal DC 0...10 V, 4...20 mA or 0...1000 Ω
– SKC62/MO RS-485 for Modbus RTU communication
– Selection of flow characteristic, position feedback, stroke calibration, LED status indication, override control
– SKC62UA 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..

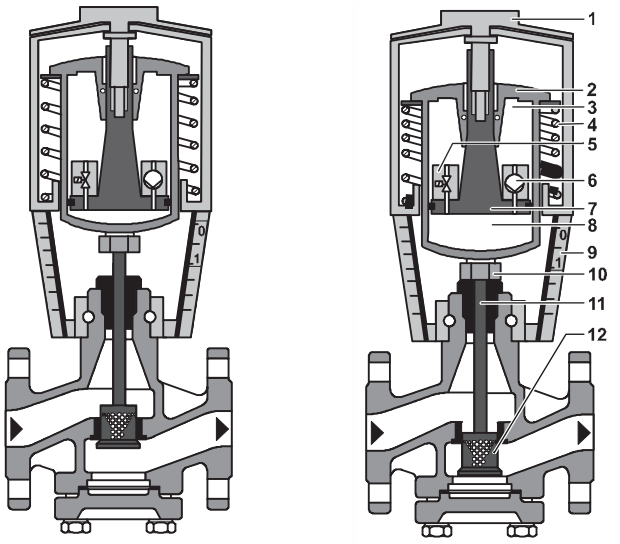
- Positioning force 2800 N
- Versions with or without spring-return function
- For direct mounting on valves; no adjustments required
- Manual adjuster and position indicator
- Optional functions with auxiliary switches, potentiometer and stem heater
- SKC..U are UL-approved

Use

For the operation of Siemens 2-port and 3-port valves of the types VVF.. and VXF.. with a 40 mm stroke as control and safety shut-off valves in heating, ventilation and air conditioning systems.

Technical designs

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

For manual operation, swing out the crank so that the display window becomes visible. By rotating the crank clockwise, the pressure cylinder is moved downwards. The display window shows the engagement bar and/or the scale dial with stroke indication.

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 crank remains swung out and in the display window the red indicator dial remains visible.

Hinweis: 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 clockwise to the end stop. The pressure cylinder moves upwards to the 0% stroke position of the valve. In the display window, the read scale disappears. Afterwards, swing the crank closed.

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.

SKC32.. SKC82..

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

SKC62.. SKC60

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

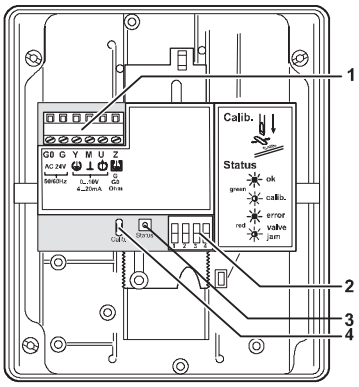
A frost protection thermostat can be connected to the SKC6.. actuator.

The added signals from the frost protection monitors QAF21.. and QAF61.. require the use of SKC62UA 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].

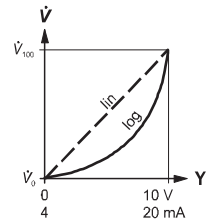
Electronics

SKC60 [1]

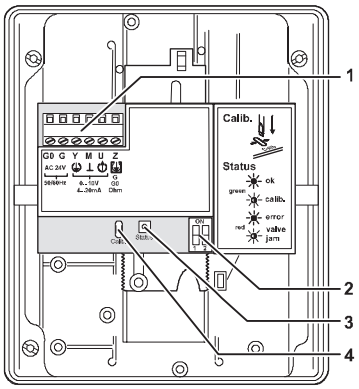


1 Connection terminals
2 DIL switches
3 LED status indication
4 Stroke calibration

[1] From version ..L onward

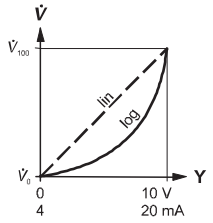
DIL switches								
	Direction of operation		**Fail-in-place (behaviour in case of control signal loss) ****		**Positioning signal Y Positioning feedback U**		**Flow characteristic**	
ON		Reverse acting		Stops at current position		DC 4...20 mA		lin = linear
OFF *		Direct acting		Closes		DC 0...10 V		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)							

SKC60 [2], SKC62..

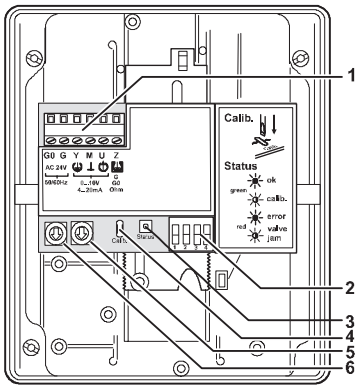


1 Connection terminals
2 DIL switches
3 LED status indication
4 Stroke calibration

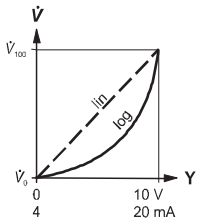
[2] Up to and including version ..K

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			

SKC62UA



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
					Beziehung zwischen Stellsignal Y und Volumendurchfluss			
*	Werkseinstellung: alle Schalter auf OFF							

SKC62/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

Spring-return function

The SKC32.61.., SKC82.61.. and SKC62.., 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

SKC60, SKC62.., SKC62/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 SKC6.. with a Siemens valve.

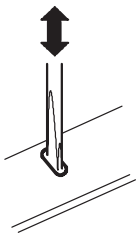
▷ ⚠ **Actuator must bin in „Automatic operation mode“ enabling stroke calibration to capture the effective 0% and 100% values.**

▷ AC 24 V power supply applied.

▷ Housing cover removed.

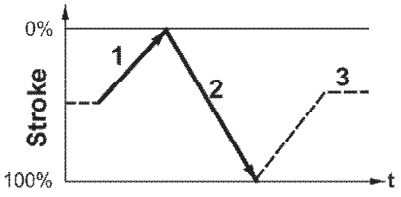
1. Short-circuit contacts in calibration slot (e.g. with a screwdriver) and trigger calibration process.
2. Actuator moves to 0% stroke position [1].
   ⇨ Valve closes.
3. Actuator moves to 100% stroke position [2].
   ⇨ Valve opens.

⇨ 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 SKC62/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.

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

LED indication of operational status

SKC60, SKC62.., SKC62/MO

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

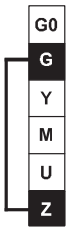
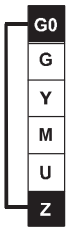
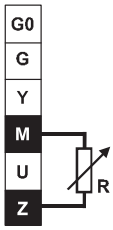
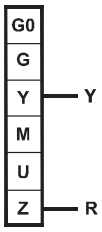
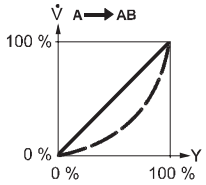
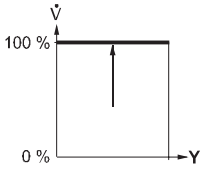
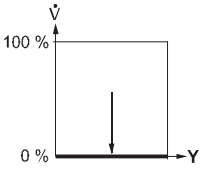
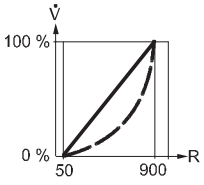
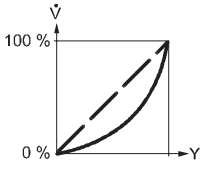
LED indication	Function	Remarks, troubleshooting
 Lit green	Normal operation	Automatic operation; everything o.k.
 Flashing green	Stroke calibration in progress	Wait until calibration is finished (LED stops flashing, will be lit green or red)
 Lit red	Faulty stroke calibration	Check mounting; restart 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

SKC60, SKC62..

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

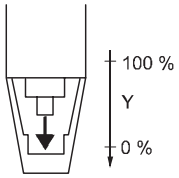
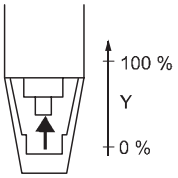
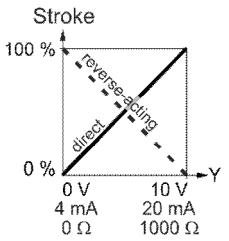
Z-mode					
	No function	**Fully open**	**Closed**	**Override with 0…1000 Ω**	**Signal addition** SKC62UA only
Connections					
Transfer					
	Equal percentage or linear			Equal percentage or linear	
	• Z-contact not connected	• Z-contact directly connected to G	• Z-contact directly connected to G0	• 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

SKC60 (from version ..L), SKC62UA

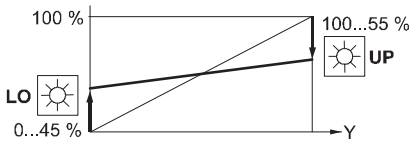
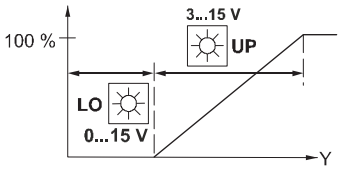
- With normally-closed valves, “direct acting” means that with a signal input of 0 V, the valve closes (applies to all Siemens valves listed under Equipment combinations [→ 12]).
- With normally-open valves, “direct acting” means that with a signal input of 0 V, the valve is open.

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

SKC62UA

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.

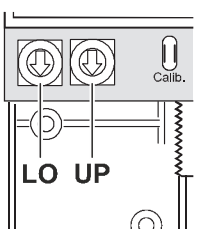
Stroke control with QAF21.. / QAF61.. signal addition

SKC62UA

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			Operasting voltage	Positioning signal	Spring-return-		Positioning	
					Function	Time	Opening	Closing
SKC32.60 [1]		-	AC 230 V	3-position	-	-	120 s	120 s
SKC32.60/F [1, 3]								
SKC32.61 [1]					yes	18 s		
SKC32.61/F [1, 3]								
SKC82.60 [1]			AC 24 V		-	-		
SKC82.60U [2]								
SKC82.61 [1]					yes	18 s		
SKC82.61U [2]								
SKC60 [1, 4]		Standard electronics		DC 0...10 V 4...20 mA 0...1000 Ω	-	-	120 s	20 s
SKC62 [1]					yes	20 s		
SKC62/F [1, 3]								
SKC62U [2]								
SKC62UA [2], [5]		Enhanced electronics						
SKC62/MO [2]	S55195-A128	Standard electronics		Modbus RTU				

[1] Approbation: CE

[2] Approbation: CE, UL

[3] Only available in France

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

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

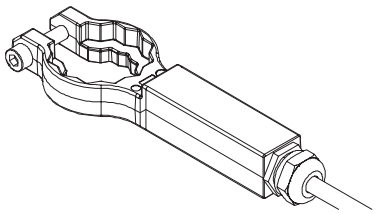
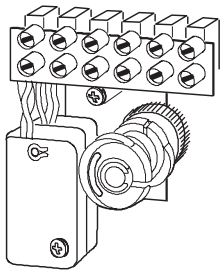
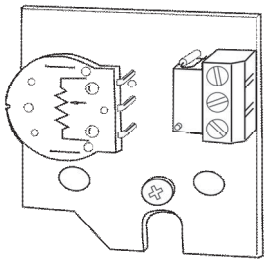
Scope of delivery

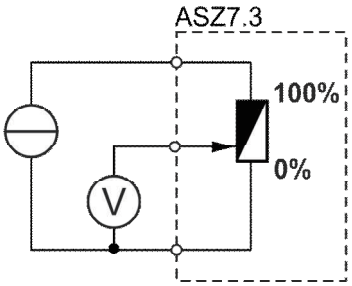
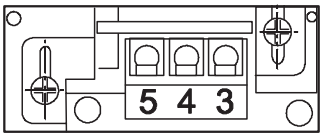
The actuator, valve and accessories are supplied in separate packaging and not assembled prior to delivery.

Accessories / spare parts

Accessories

Type	Auxiliary switch	Double auxiliary switch	Potentiometer 1000 Ω	Stem heater AC 24 V
	ASC1.6	ASC9.3	ASZ7.3	ASZ6.6 (S55845-Z108)
	Max. 2			
SKC32..	-	Max.1	Max.1	Max.1
SKC82				
SKC6..	Max.1	-	-	

<table>
<tr><td>SKC..</td><td colspan="2">ASZ6.6 (S55845-Z108)
Steam heater
 
● For media below 0 °C
● Mount between valve and actuator</td></tr>
<tr><td rowspan="4">SKC32..
SKC82..</td><td>ASC9.3
Double auxiliary switch</td><td>ASZ7.3
Potentiometer</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Adjustable switching points</td><td>0…1000 Ω</td></tr>
<tr><td>Note: ASZ7.3</td><td colspan="2">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.
 
</td></tr>
<tr><td>SKC60
SKC62..</td><td colspan="2">ASC1.6
Auxiliary switch
 

Switching point 0...5 % stroke</td></tr>
</table>

For more information, see Technical data [→ 19]

Ordering (example)

Type / Stock number [1]	Designation	Number of pieces
SKC62/MO / S55195-A127	Actuator Modbus RTU	1
ASC1.6	Auxiliary switch	1

[1] Specify stock number if available.

Spare parts

Actuator	Cover	Hand control [1]	Clamp	Stem connection	Control unit
					
SKC32.60	410455828	426855108	410355768	417856498	-
SKC32.61					
SKC82.60					
SKC82.60U			410356058		
SKC82.61			410355768		
SKC82.61U			410356058		
SKC60			410355768		466857598
SKC62					466857488
SKC62U			410356058		
SKC62UA					466857518
SKC62/MO			410355768		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]	Flanged	100	6	124...160	N4310
VVF22..				160	N4401
VVF31.. [1]		100...150	10	124...315	N4320
VVF32..				160...400	N4402
VVF40.. [1]			16	124...315	N4330
VVF41.. [1]		65...150		49...300	N4340
VVF45..					N4345
VVF43..		15...80		50...400	N4404
VVF42..		100...150	25	125...400	N4403
VVF53..		65...150	25	63...400	N4405
VVF61..		15...50	40	49...300	N4382
VVF63..		15...50		50...315	A6V11459527

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]	Flanged	100	6	124...160	N4410
VXF22..				160	N4401
VXF31.. [1]		100...150	10	124...315	N4420
VXF32..				160...400	N4402
VXF40.. [1]			16	124...315	N4430
VXF41.. [1]		65...150		49...300	N4440
VXF43..		15...80		63...400	N4404
VXF42..		100...150	25	125...400	N4403
VXF53..		65...150	25	63...400	N4405
VXF61..			40	49...300	N4482

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 SKC32.. and SKC82.. 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

SKC..				Accessories	Mounting instructions	
Mounting instructions SKB../SKC..	M3240	74 319 0324 0		**ASC1.6**	G4563.3	4 319 5544 0
74 319 0326 0 (Setting instructions Standard electronics)				**ASC9.3**	G4561.3	4 319 5545 0
				ASZ7.3		74 319 0247 0
A5W00027551 (Mounting instructions Modbus converter)				**ACT control unit**	M4568	74 319 0554 0
				QAF21..		74 319 0399 0
A6V12057657 (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

Safety

⚠ 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.

⚠ WARNUNG

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:

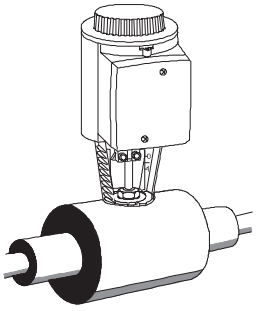
- Switch off both pump and operating voltage.
- Close the main shutoff valve in the piping.
- Release pressure in the pipes and allow them to cool off completely.

Engineering

Conduct the electrical connections in accordance with local regulations on electrical installations as well as the section Connection diagrams [→ 26].

⚠	***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].

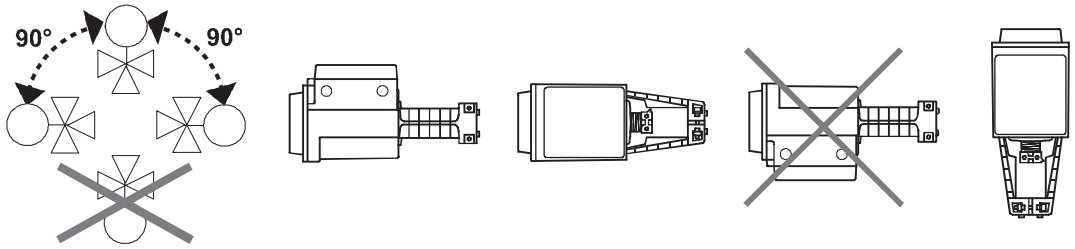
If an auxiliary switch is used, its switching point should be indicated on the plant schematic.

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

Mounting

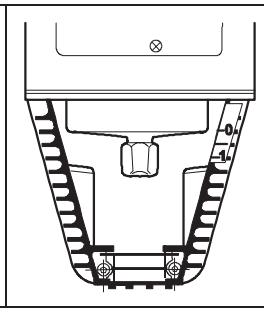
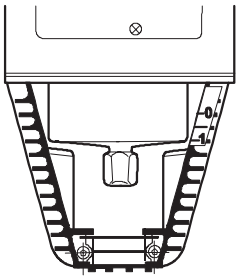
Mounting Instructions 74 319 0324 0 for fitting the actuator to the valve and A5W00027551 for SKC62/MO are enclosed in the actuator packaging. The instructions for accessories are enclosed with the accessories themselves (see Product documentation [→ 13]).

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.

Cylinder with valve stem connector fully retracted → stroke = 0 %		Cylinder with valve stem connector fully extended → stroke = 100 %	

The manual adjuster must be rotated counter-clockwise to the end stop.
This causes the Siemens valves, types VVF.. und VXF.. to close (stroke = 0 %).

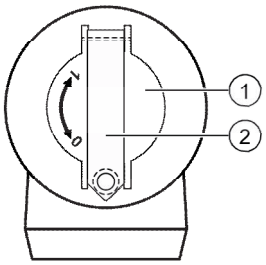
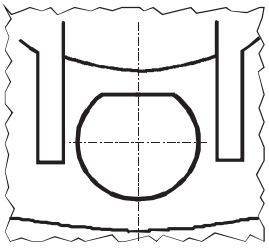
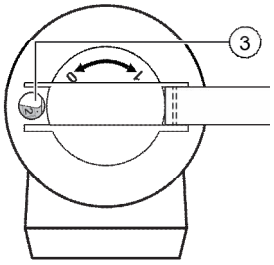
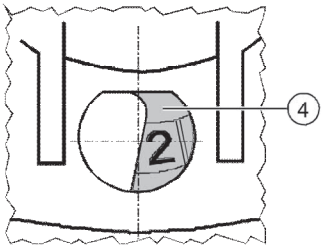
Operation

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] shows neither the scale [4] nor the crank engagement bar.

Manual operation

For manual operation, swing 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 [4] with stroke indication.

	
Engaged crank [2] on the manual adjustment knob [1]	Display window with invisible scale dial and crank engagement bar
	
Swung-out crank; display window [3]	Display window with scale dial [4] and stroke indication in mm

Maintenance

The actuators are maintenance-free.

When **servicing** the control device:

⚠ 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.

	⚠ **WARNING**
	Risk of injury ● Disconnect electrical connections from the terminals as neede. ● The actuator must be properly installed prior to recommissioning the valve.

Recommendation SKC6..:
Trigger stroke calibration after maintenance.

Repair:
See Spare parts [→ 12]

	⚠ **WARNING**
	VerlRisk 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

	⚠ **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.

	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		
	SKC32..	AC 230 V ± 15 %
	SKC82..	AC 24 V ± 20 % (SELV/PELV)
	SKC6..	
	SKC62/MO	
Frequency		50 / 60 Hz
Maximum power consumption at 50 Hz		
	SKC32.60, SKC32.60/F	18 VA / 14 W
	SKC32.61, SKC32.61/F	24 VA / 18 W
	SKC82.60, SKC82.60U	15 VA / 12 W
	SKC82.61, SKC82.61U	19 VA / 14 W
	SKC60..	17 VA / 13 W
	SKC62..	21 VA / 15 W
External supply cable fuse		
	SKC32..	Min. 0.5 A, slow Max. 6 A slow
	SKC82..	Min. 1.6 A, slow Max. 10 A slow
	SKC6..	

Function data			
Positioning time at 50 Hz [1]			
	SKC32.6..	Opening, closing	120 s
	SKC82.6..	Opening, closing	120 s
	SK6..	Opening	120 s
		Closing	20 s
Spring-return time [1]			
	SKC32.61, SKC32.61/F		18 s
	SKC82.61, SKC82.61U		
	SKC62..		20 s
Positioning force			2800 N
Nominal stroke			40 mm
Maximum permissible medium temperature (valve fitted)			-25...220 °C
			< 0 °C: Requires stem heater ASZ6.6

Signal inputs / signal outputs		
Control signal		
	SKC32..	3- position
	SKC82..	
	SKC6..	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		0…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 SKC60 [2], SKC62UA			
Selection of direction of operation			
	SKC60, SKC62UA	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			
	SKC62UA	Range of lower limit	0...45 % adjustable
		Range of upper limit	100...55% adjustable
Sequence control			
	SKC62UA	Terminal Y	
		Starting point of sequence	0...15 V adjustable
		Operating range of sequence	3...15 V adjustable
Signal addition			
	SKC62UA	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 SKC62/MO			
Communication protocol			
	Modbus RTU		RS-485, not galvanically isolated
	Number of nodes		Max. 32
	Adress range		1...248 / 255
		Factory setting	
	Transmission formats		1-8-E-1 / 1-8-O-1 / 1-8-N-1 / 1-8-N-2
		Factory setting	
	Baud rates (kBaud)		Auto / 9.6 / 19.2 / 38.4 / 57.6 / 76.8 / 115.2
		Factory setting	
	Bus termination		120 Ω electronically switchable
		Factory setting	

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)
	SKC..U		With knockouts for standard ½" conduit connectors (ø 21.5 mm)
	SKC62/MO		Fixed connecting 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	Type 1AA / Type 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...<55 °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...55 °C
		Humidity (non-condensing)	-5...95 % r.h.

Directives and standards		
Product standard		EN 60730-x
Electromagnetic compatibility (Applications)		For use in residential, commerical, and industrial environments
EU conformity (CE)		A5W00007751 [4]
RCM conformity		A5W00007895 [4]
EAC conformityt		Eurasia conformity for all SKC..
UL, cUL	AC 230 V	-
	AC 24 V	UL 873 http://ul.com/database

Environmental compatibility
The product environmental declarations CE1E4566enX1 (SKC3.., SKC8..) [4], CE1E4566enX2 (SKC6..) [4] and A6V101083254 (external Modbus converter) [4] enthalten Daten zu umweltverträglichem Produktdesign und Prüfungen (RoHS-Konformität, Materialzusammensetzung, Verpackung, ökologischer Nutzen, Entsorgung).

Dimensions / weight			
Dimensions			See Dimensions [→ 30]
Weight			
	SKC32.60, SKC32.60/F		9.80 kg
	SKC32.61, SKC32.61/F		9.85 kg
	SKC82.60		9.80 kg
	SKC82.60U		10.10 kg
	SKC82.61		9.85 kg
	SKC82.61U		10.15 kg
	SKC60 SKC62, SKC62/MO		9.85 kg
		External Modbus converter	0.15 kg
	SKC62U SKC62UA		10.15 kg

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

Accessories			
Auxiliary switch ASC1.6			
	SKC6..	Switching capacity	AC 24 V, 10 mA....4 A resistive, 2 A inductive
Double auxiliary switch ASC9.3			
	SKC32.., SKC82..	Switching capacity per auxiliary switch	AC 250 V, 6 A resistive, 2.5 A inductive
Potentiometer ASZ7.3			
	SKC32.., SKC82..	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

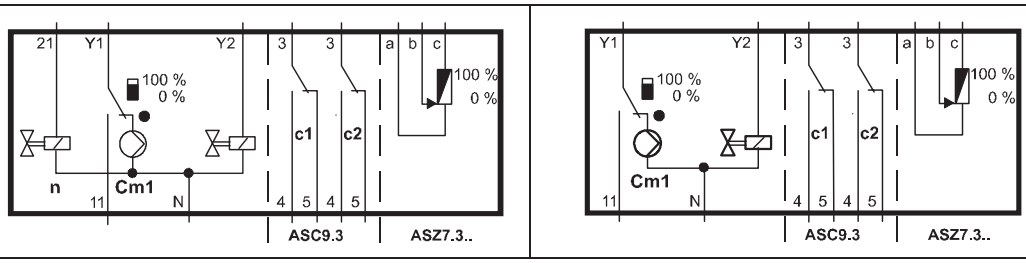
3) AWG = American wire gauge

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

Internal diagrams

SKC32..

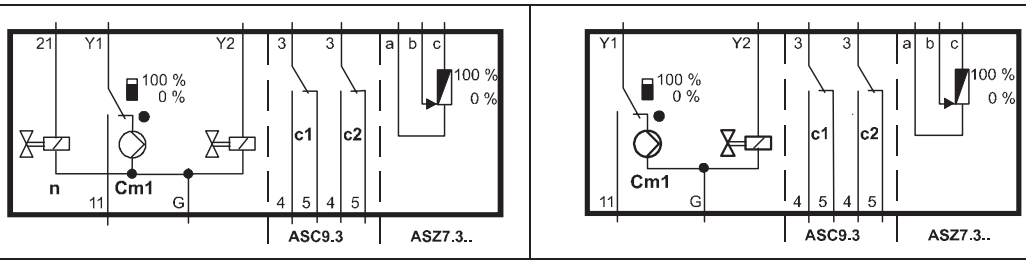
SKC32.61	SKC32.60
AC 230 V 3-position	



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

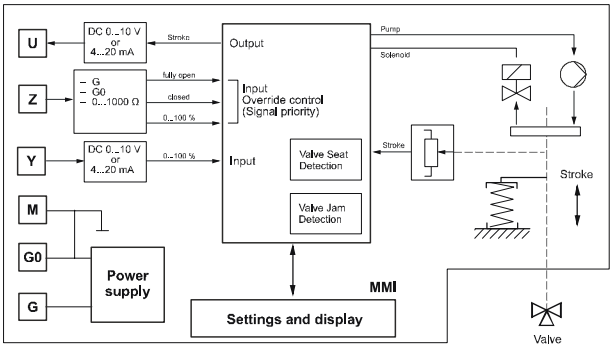
SKC82..

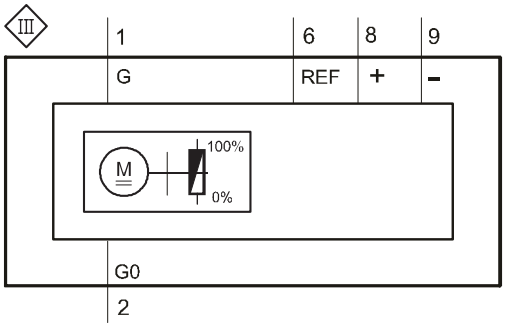
SKC82.61	SKC82.60
AC 24 V 3-position	



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

SKC6..

SKC60, SKC62 SKC62U, SKC62UA
AC 24 V
DC 0...10 V 4...20 mA 0...1000 Ω


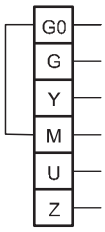
SKC62/MO
AC 24 V
Modbus RTU


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

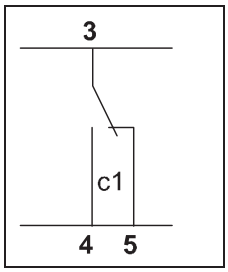
SKC6..

	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])	

SKC62/MO

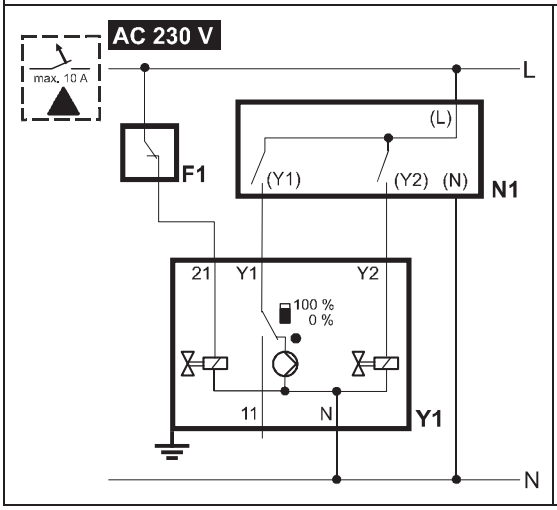
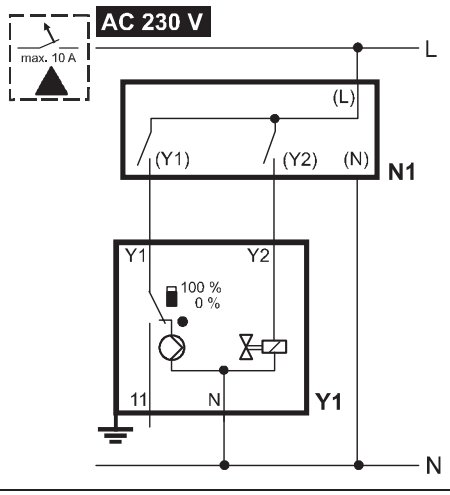
	AC 24 V	Modbus RTU Connecting cable
	System neutral (SN)	Black
	System potential (SP)	Red
	Reference line (Modbus RTU)	Violet
	Bus + (Modbus RTU)	Gray
	Bus - (Modbus RTU)	Pink

Auxiliary switch ASC1.6



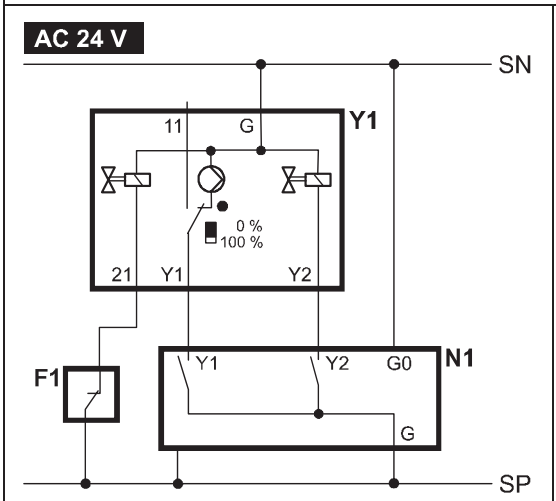
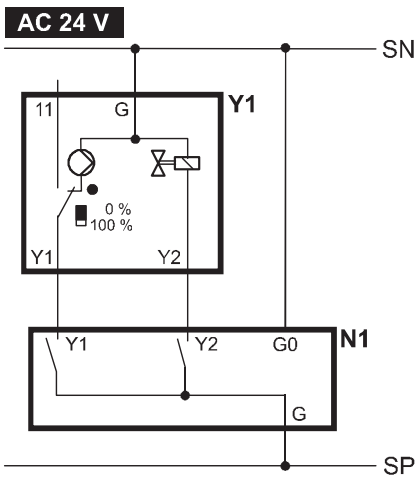
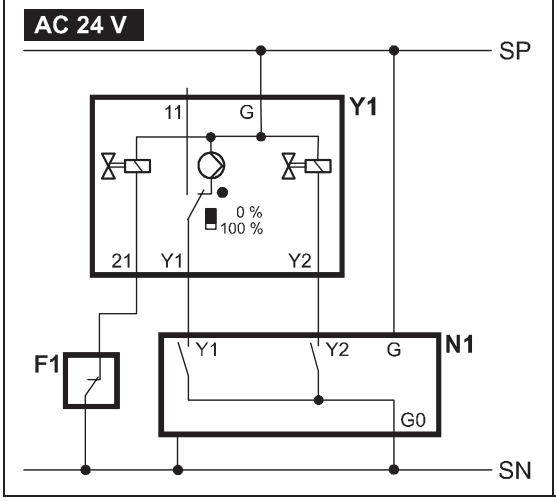
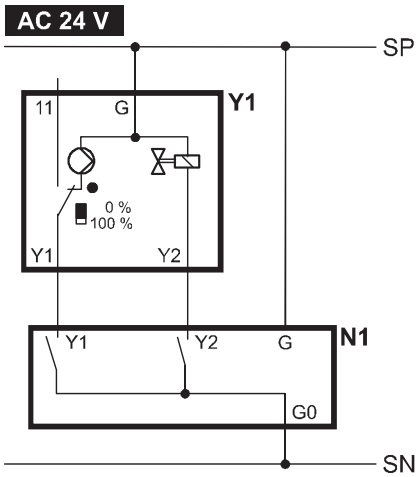
Connection diagrams

SKC32..

SKC32.61	SKC32.60
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

SKC82..

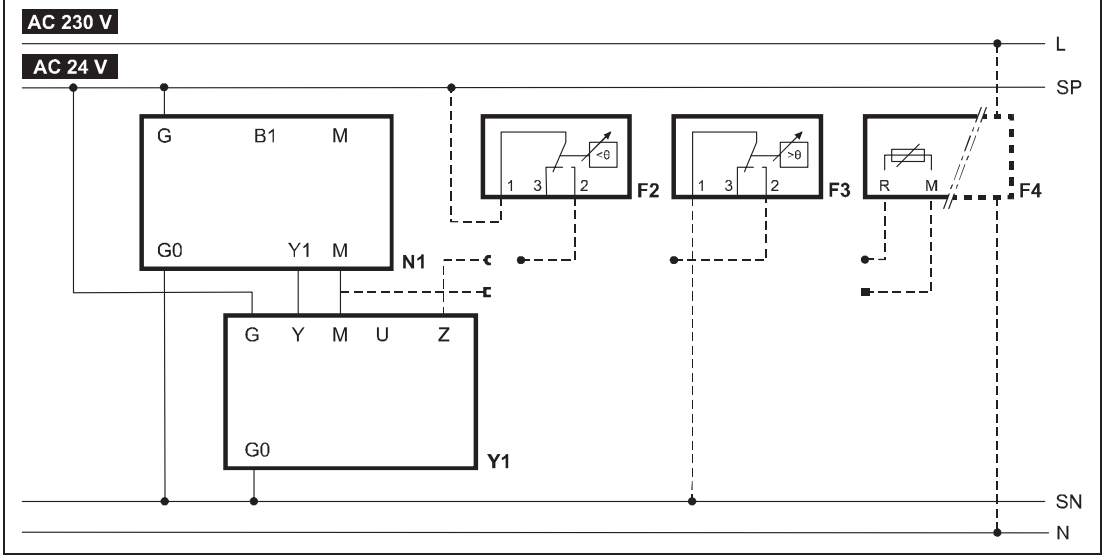
SKC82.61, SKC82.61U	SKC82.60, SKC82.60U
AC 24 V 3-position	
	
	

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

SKC6..

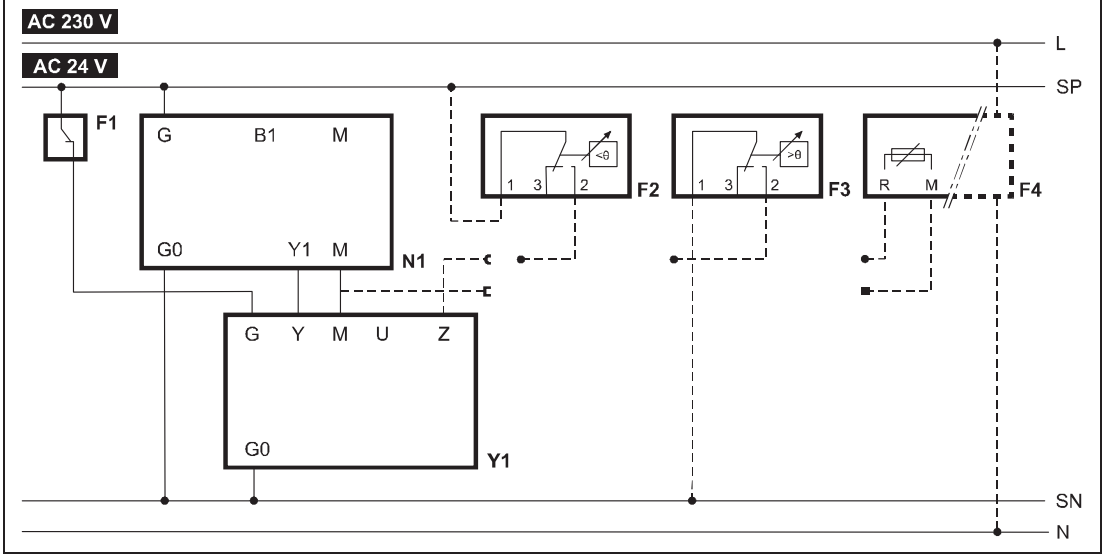
SKC60

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



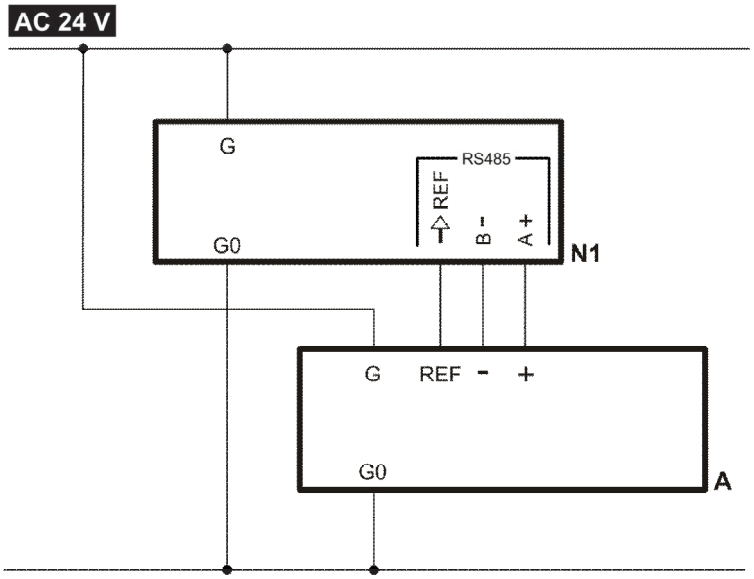
SKC62, SKC62U, SKC62UA

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 SKC62UA) *)
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 SKC62UA: only with sequence control and the appropriate selector switch settings, see Electronics [→ 5], Functions [→ 6]

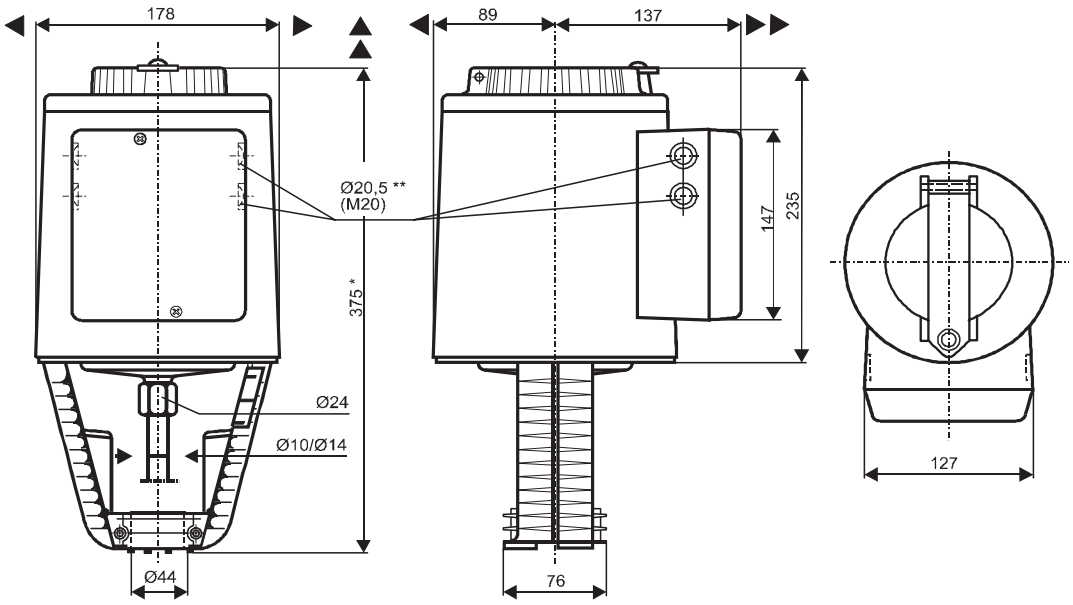
SKC62/MO
AC 24 V Modbus RTU


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

⚠	***NOTE***
	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

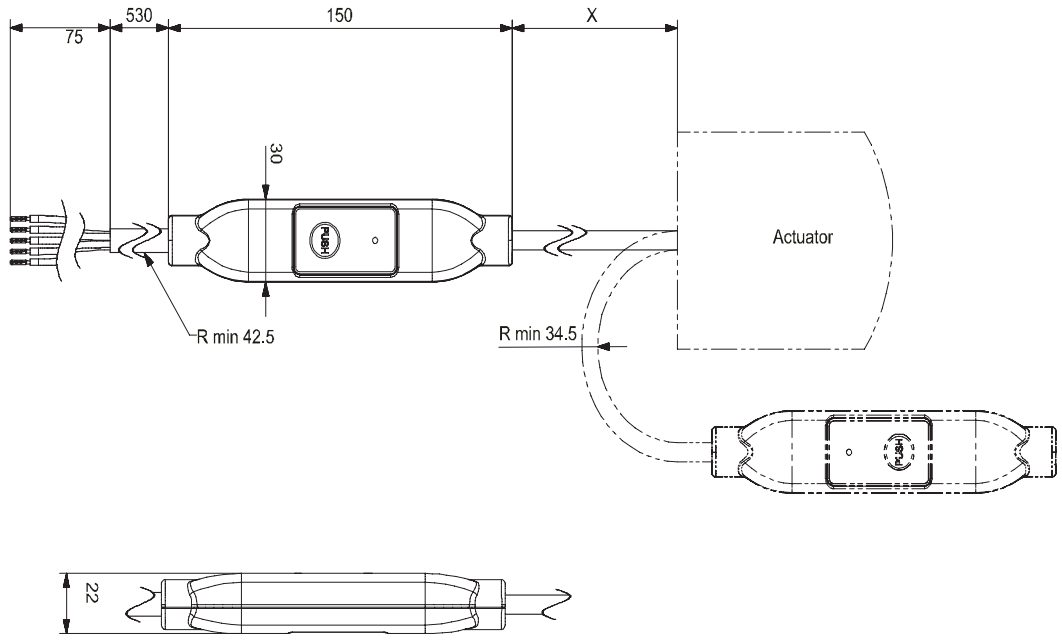
Actuator



All dimensions in mm

*	Height of actuator from plate **with** stroke inverter **ASK51 = 432 mm**
**	**SKC..U: with knockouts for standard ½" conduit connectors (ø 21.5 mm)**
▶	> 100 mm, minimum clearance form ceiling or wall for mounting
▶▶	> 200 mm, connection, operation, maintenance, etc.

External Modbus converter



All dimensions in mm

X	250 mm

Revision numbers

Type	Valid from rev. no.	Type	Valid from rev. no.
SKC32.60	..D	SKC62	..G
SKC32.60/F	..D	SKC62/F	..G
SKC32.61	..D	SKC62U	..G
SKC32.61/F	..D	SKC60	..G
SKC82.60	..D	SKC62UA	..G
SKC82.60U	..D	SKC62/MO	..H
SKC82.61	..D		
SKC82.61U	..D		

SIEMENS

ACVATIX™

Electro-hydraulic actuators for valves SKD..

with a 20 mm stroke

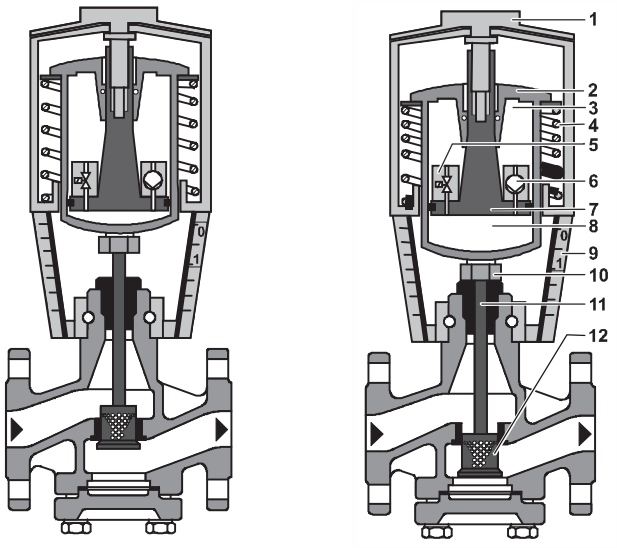
- SKD32.. Operating voltage AC 230 V, 3-position control signal
- SKD82.. Operating voltage AC 24 V, 3-position control signal
- SKD6.. Operating voltage AC 24 V
  - Control signal DC 0...10 V, 4...20 mA or 0...1000 Ω
  - SKD62/MO RS-485 for Modbus RTU communication
  - Selection of flow characteristic, 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

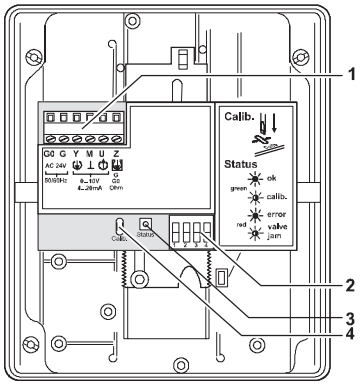
A frost protection thermostat can be connected to the SKD6.. actuator.

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].

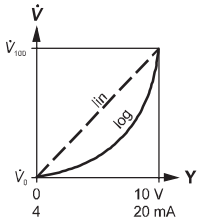
Electronics

SKD60 [1)]

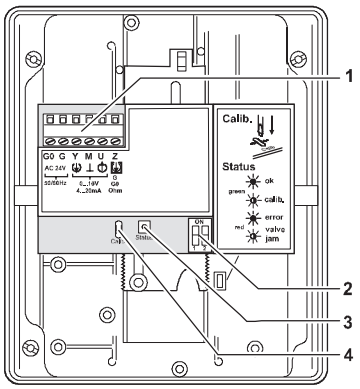


1 Connection terminals
2 DIL switches
3 LED status indication
4 Stroke calibration

[1)] From version ..L onward

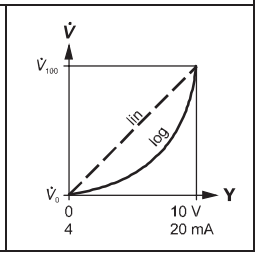
DIL switches								
	Direction of operation		**Fail-in-place (behaviour in case of control signal loss) ****		**Positioning signal Y Positioning feedback U**		**Flow characteristic**	
ON		Reverse acting		Stops at current position		DC 4...20 mA		lin = linear
OFF *		Direct acting		Closes		DC 0...10 V		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..

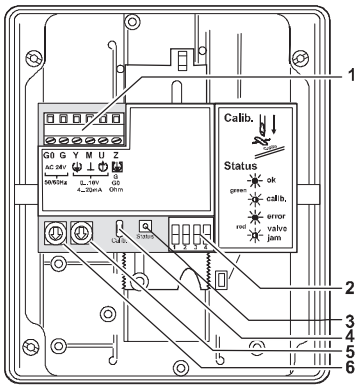


1 Connection terminals
2 DIL switches
3 LED status indication
4 Stroke calibration

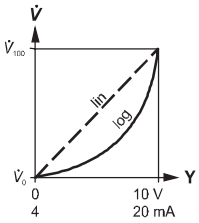
[2)] Up to and including version ..K

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

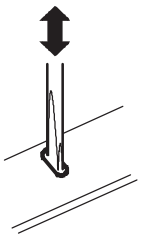
SKD60, SKD62.., SKD62/MO

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.

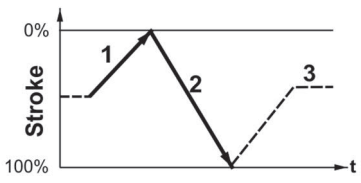
1. Short-circuit contacts in calibration slot (e.g. with a screwdriver) and trigger calibration process.
2. Actuator moves to 0% stroke position [1].
   - Valve closes.
3. Actuator moves to 100% stroke position [2].
   - Valve opens.

- 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.

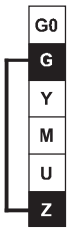
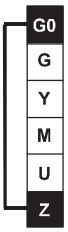
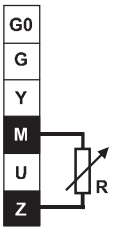
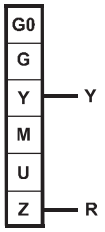
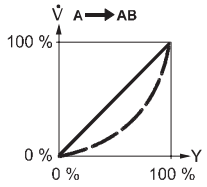
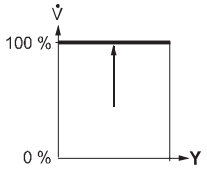
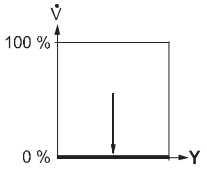
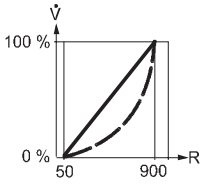
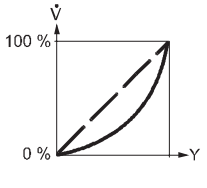
LED indication	Function	Remarks, troubleshooting
 Lit green	Normal operation	Automatic operation; everything o.k.
 Flashing green	Stroke calibration in progress	Wait until calibration is finished (LED stops flashing, will be lit green or red)
 Lit red	Faulty stroke calibration	Check mounting; restart 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:

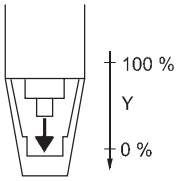
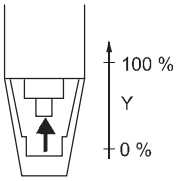
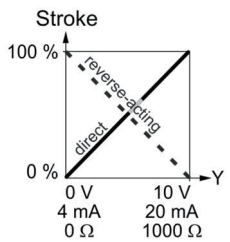
Z-mdoe					
	No function	**Fully open**	**Closed**	**Override with 0…1000 Ω**	**Signal addition** SKD62UA only
Connections					
Transfer					
	Equal percentage or linear			Equal percentage or linear	
	• Z-contact not connected	• Z-contact directly connected to G	• Z-contact directly connected to G0	• 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

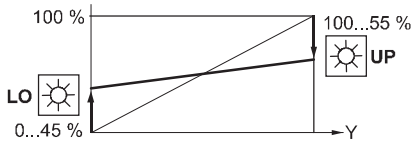
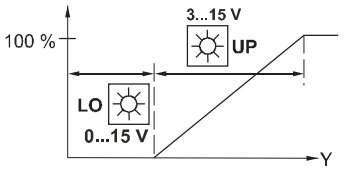
- With normally-closed valves, “direct acting” means that with a signal input of 0 V, the valve closes (applies to all Siemens valves listed under Equipment combinations [→ 12]).
- With normally-open valves, “direct acting” means that with a signal input of 0 V, the valve is open.

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

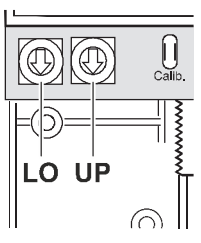
* Operating range of QAF21.. (see below)

** 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]								
SKD62 [1]					yes	15 s		
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

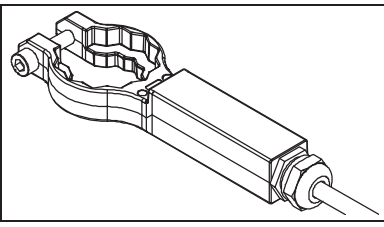
Scope of delivery

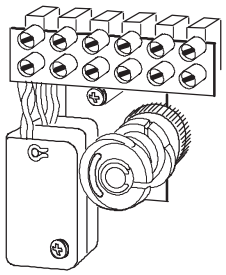
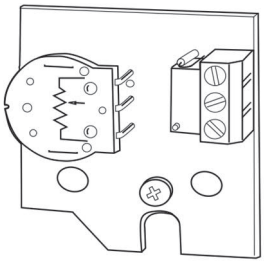
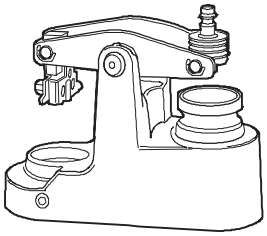
The actuator, valve and accessories are supplied in separate packaging and not assembled prior to delivery.

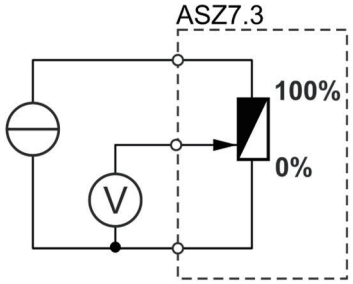
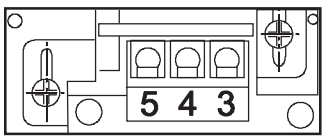
Accessories / spare parts

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	

<table>
<tr><td rowspan="4">SKD32..
SKD82..</td><td>ASC9.3
Double auxiliary switch</td><td>ASZ7.3
Potentiometer</td><td>ASK50
Mechanical stroke inverter</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Adjustable switching points</td><td>0…1000 Ω</td><td>0% actuator stroke corresponds to 100% valve stroke
Mount between valve and actuator</td></tr>
<tr><td>Note: ASZ7.3</td><td colspan="2">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.
 
</td></tr>
<tr><td>SKD60
SKD62..</td><td colspan="3">ASC1.6
Auxiliary switch
 

Switching point 0...5 % stroke</td></tr>
</table>

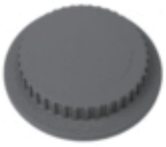
For more information, see Technical data [→ 19]

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 (Setting instructions Standard electronics)				**ASC9.3**	G4561.3	4 319 5545 0
				ASK50	M4561.5	4 319 5549 0
A5W00027551 (Mounting instructions Modbus converter)				**ASZ7.3**		74 319 0247 0
				ACT control unit	M4568	74 319 0554 0
A6V12057657 (Communication profiles Modbus)				**QAF21..**		74 319 0399 0
				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

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:

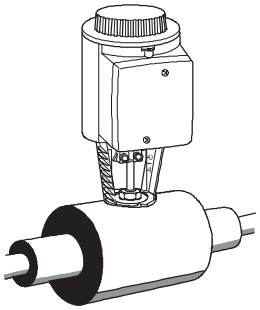
- Switch off both pump and operating voltage.
- Close the main shutoff valve in the piping.
- Release pressure in the pipes and allow them to cool off completely.

Engineering

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].

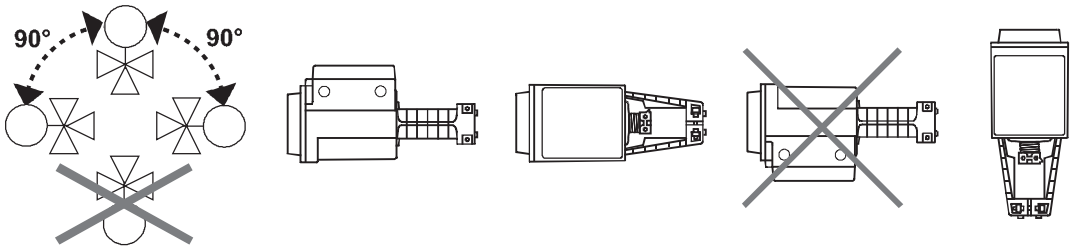
If an auxiliary switch is used, its switching point should be indicated on the plant schematic.

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

Mounting

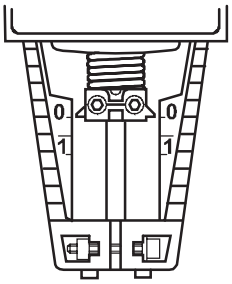
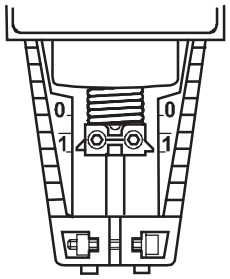
Mounting instructions 74 319 0324 0 for fitting the actuator to the valve and A5W00027551 for SKD62/MO are enclosed in the actuator packaging. The instructions for accessories are enclosed with the accessories themselves (see Product documentation [→ 13]).

Mounting positions

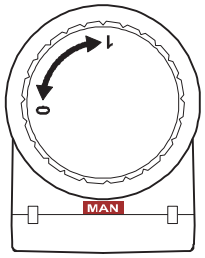
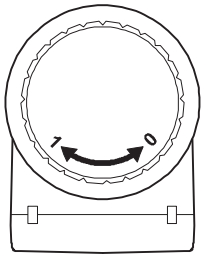


Commissioning

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

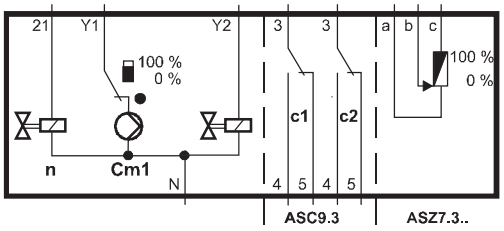
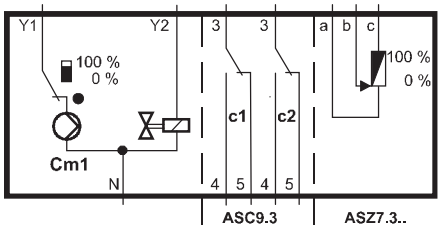
2) From version ..L onward

3) AWG = American wire gauge

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

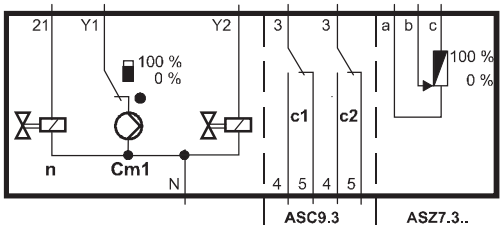
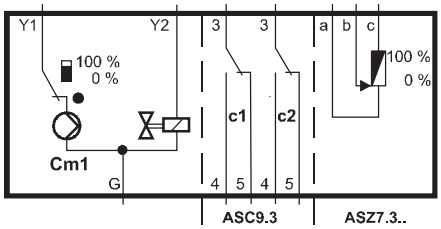
Internal diagrams

SKD32..

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

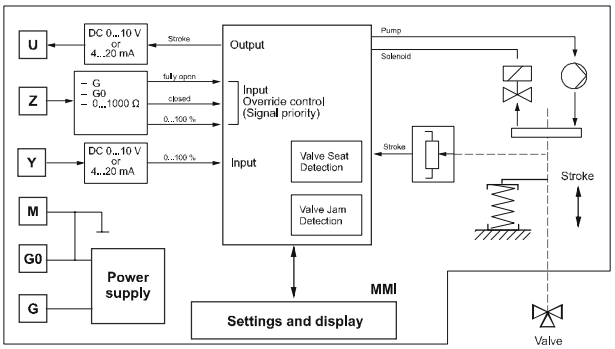
Cm1	End switch
n	Solenoid valve for spring-return
c1, c2	ASC9.3 double auxiliary switch
a, b, c	ASZ7.3 potentionmeter
Y1	Positioning signal „open“
Y2	Positioning signal „close“
21	Spring-return function
N	Neutral conductor

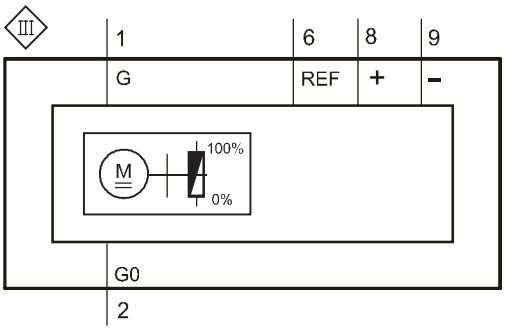
SKD82..

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..

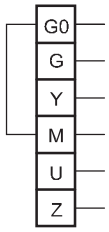
SKD60, SKD62 SKD62U, SKD62UA
AC 24 V
DC 0...10 V 4...20 mA 0...1000 Ω


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

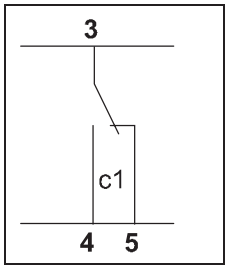
SKD6..

	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

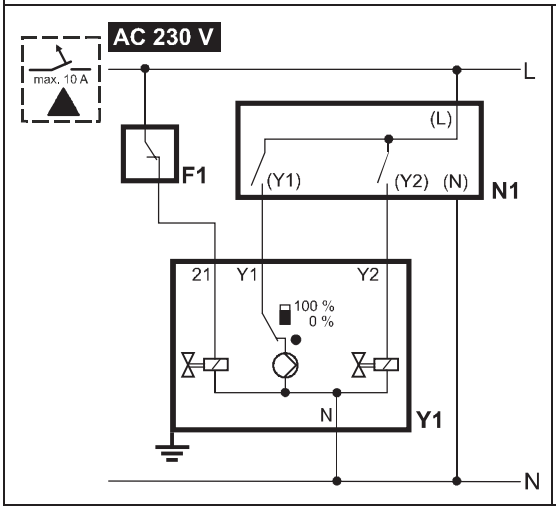
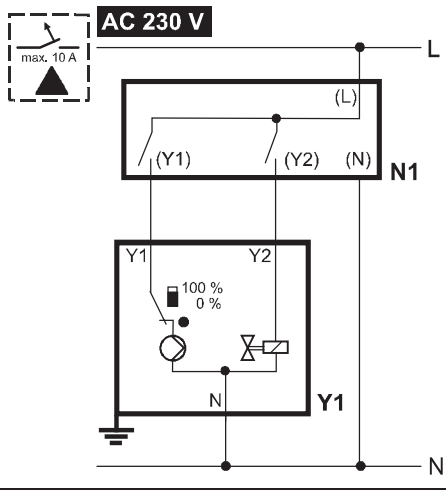
	AC 24 V	Modbus RTU Connection cable
	System neutral (SN)	Black
	System potential (SP)	Red
	Reference line (Modbus RTU)	Violet
	Bus + (Modbus RTU)	Gray
	Bus - (Modbus RTU)	Pink

Auxiliary switch ASC1.6



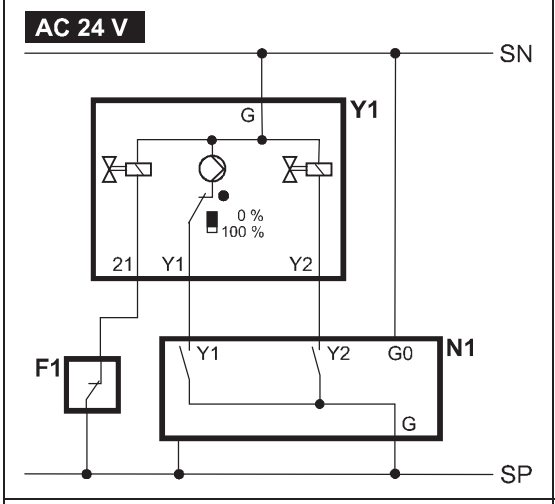
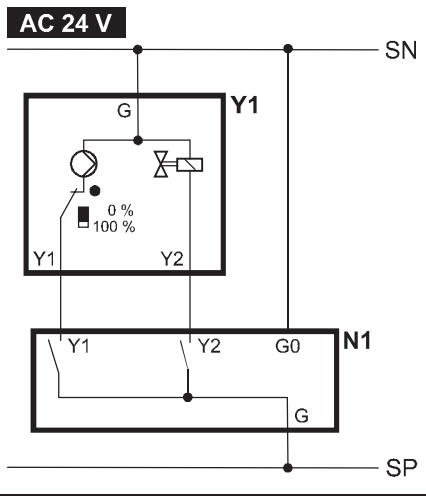
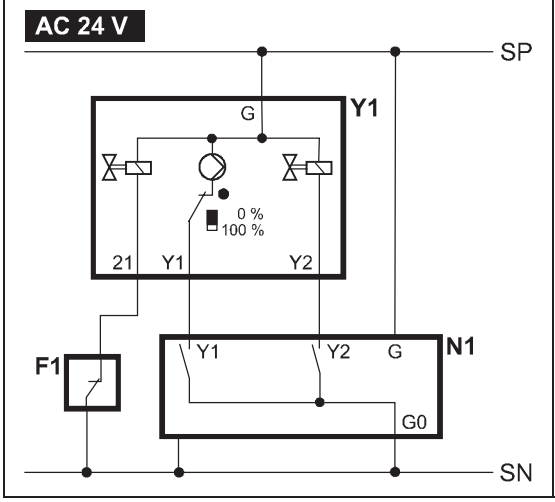
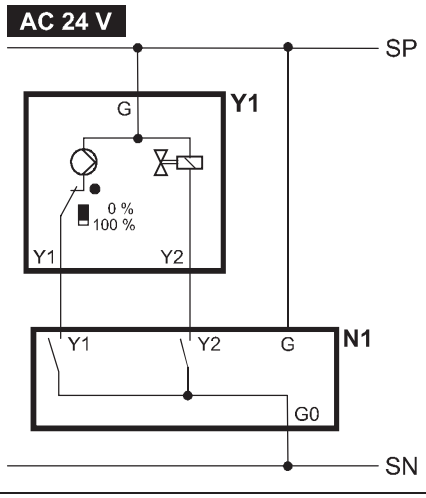
Connection diagrams

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..

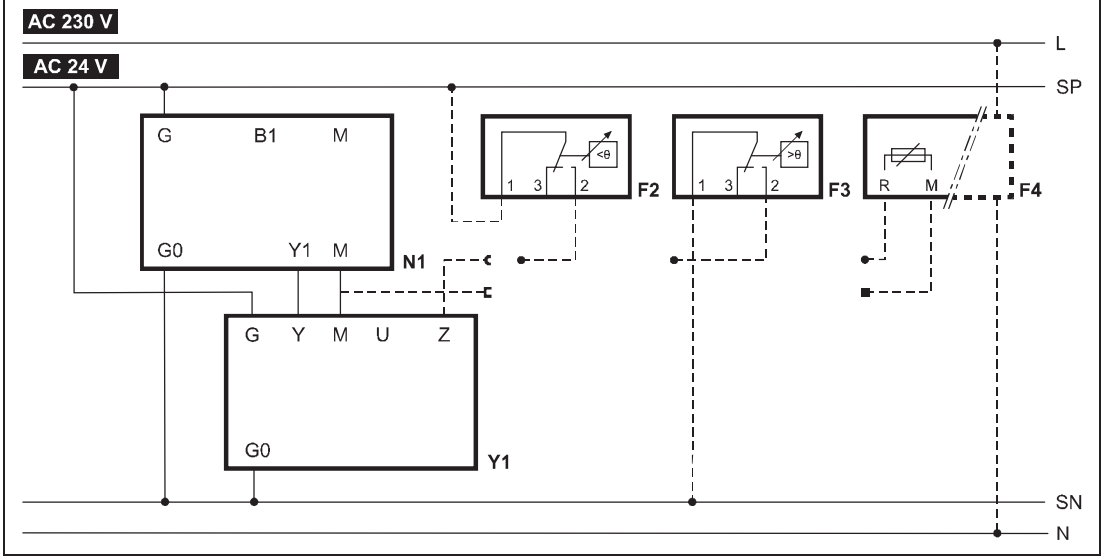
SKD82.51, SKD82.51U	SKD82.50, SKD82.50U
AC 24 V 3-position	
	
	

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..

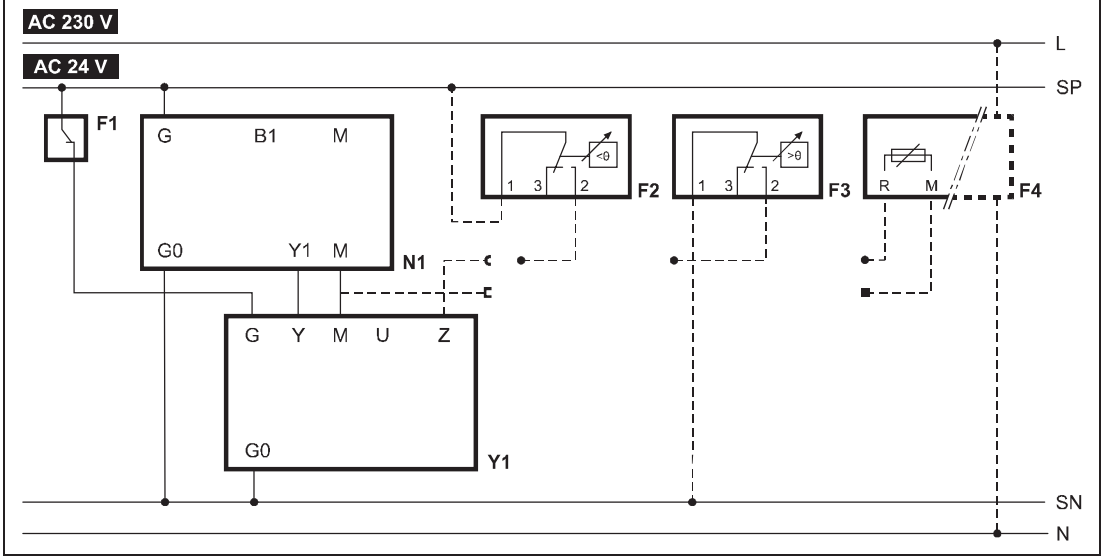
SKD60

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



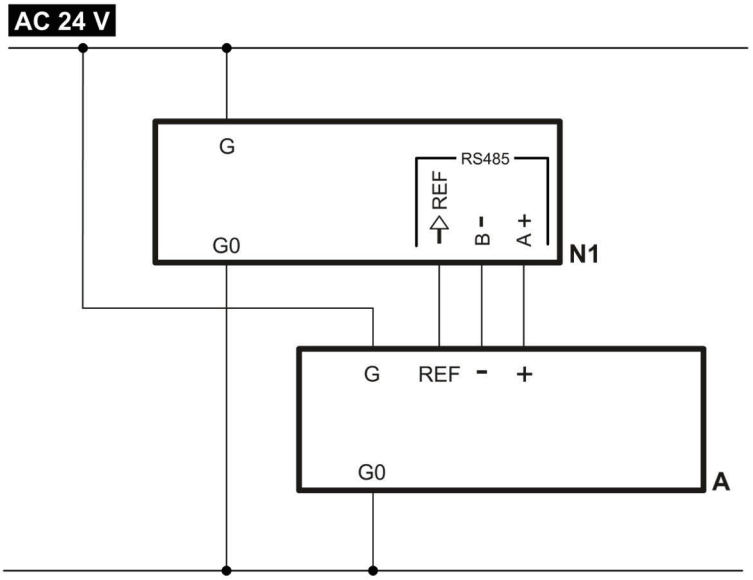
SKD62, SKD62U, SKD62UA

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]

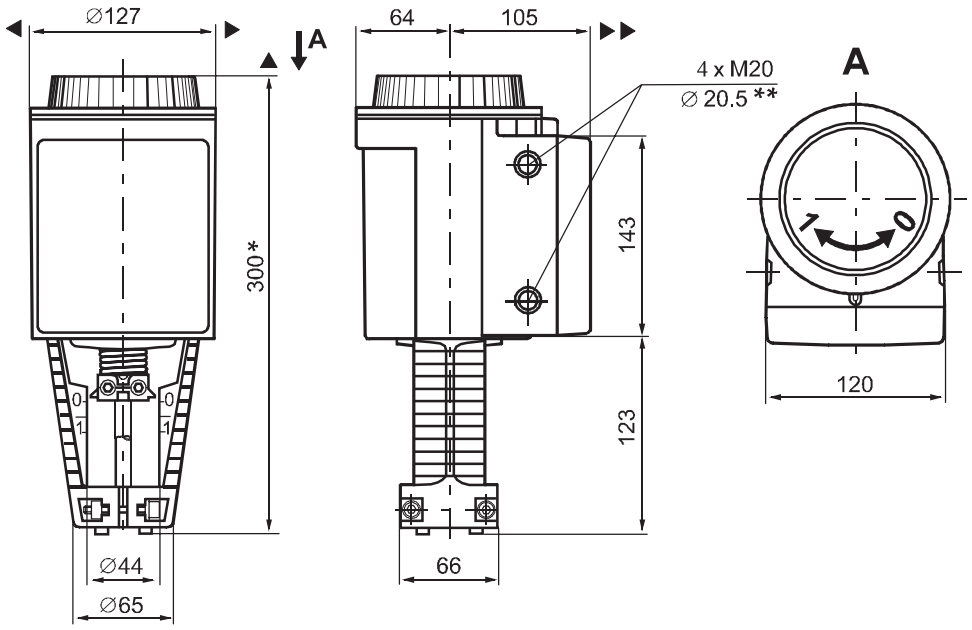
SKD62/MO
AC 24 V Modbus RTU


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

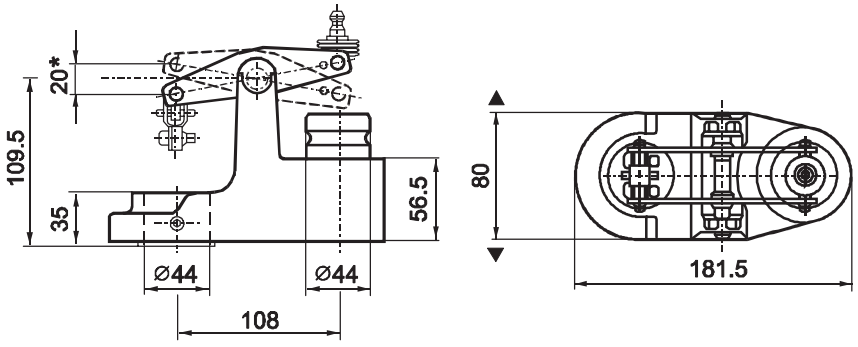
Actuator



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.

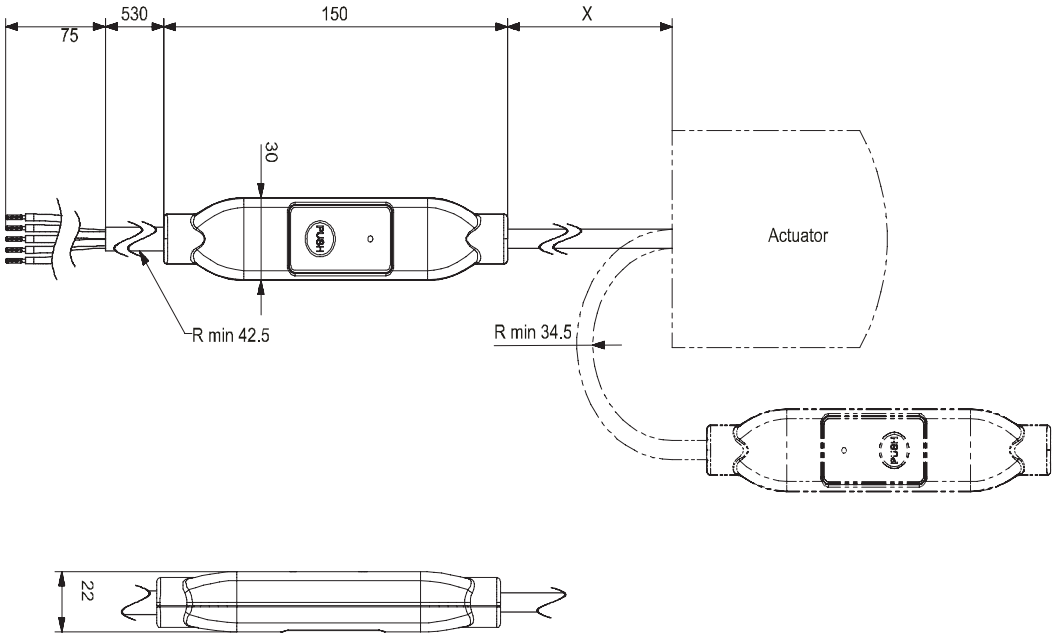
Stroke inverter ASK50



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		

SQL36E..

ACVATIX™

Electromotoric actuators SQL36E..

For VKF46.., VFW41.., VFL41.. butterfly valves

- **SQL36E.. operating voltage AC 230 V, 3-position control signal**
- **Nominal angle of rotation 90°**
- **Auxiliary switch and potentiometer for extra functions**
- **Manual adjuster and position indicator**
- **SQL36E.. built-in heating element to avoid condensation**
- **SQL36E.. compatible with EN ISO 5211 flanges**
- **SQL36E.. variable positioning time with SEZ31.1 auxiliary module**

Use

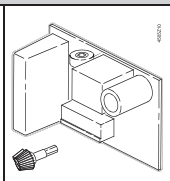
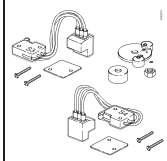
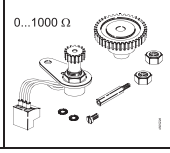
For operation of VKF46.. and VFW41.., VFL41.. butterfly valves as control and shutoff valves in heating, ventilation and air conditioning plants.

Type summary

Type	Operating voltage	Positioning signal	Positioning time for 90° at 50 Hz		Torque	Flange connection EN 5211
			without SEZ31.1	with SEZ31.1		
SQL36E50F04	AC 230 V	3-position	25 s		40 Nm	F04
SQL36E50F05						F05
SQL36E65			6 s	30…180 s	100 Nm	F07
SQL36E110			12 s	60…360 s	400 Nm	F10
SQL36E160			24 s	120…720 s	1200 Nm	[1]

[1] EN 5211 F12 / F16 flange connections for third-party butterfly valves are available on request.

Accessories

Type		Description	For actuators	Mounting position
SEZ31.1		Auxiliary module for variable positioning time (refer to «Function/mechanical design», page 3)	SQL36E65 SQL36E110 SQL36E160	1 x SEZ31.1 and 1 x ASC36 and 1 x ASZ36
ASC36		Double auxiliary switch	SQL36E50F04 SQL36E50F05 SQL36E65 SQL36E110 SQL36E160	
ASZ36		Potentiometer 1000 Ω		

Ordering

Example:

Type	*Order no.*	*Description*	*Quantity*
SQL36E65	SQL36E65	Electromotoric actuator	1
ASZ36	ASZ36	Potentiometer 1000 Ω	1

The actuator, butterfly valve and any accessories must be ordered separately.

Delivery

The actuator, butterfly valve and accessories are packed separately and delivered as individual items.

Rev.-no.

Overview see page 12.

Equipment combinations

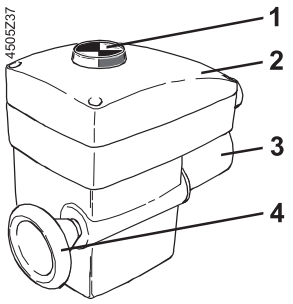
	Electromotoric actuators					
Butterfly valves	**SQL36E50F04**	**SQL36E50F05**	**SQL36E65**	**SQL36E110**	**SQL36E160**	**Data sheet**
VKF46.40	direct mounting					N4136
VKF46.50	direct mounting					
VKF46.65	direct mounting					
VKF46.80		direct mounting				
VKF46.100		direct mounting				
VKF46.125		direct mounting				
VKF46.150			direct mounting			
VKF46.200			direct mounting			
VKF46.250				direct mounting		
VKF46.300				direct mounting		
VKF46.350				direct mounting		
VKF46.400				direct mounting		
VKF46.450					direct mounting	
VKF46.500					direct mounting	
VKF46.600					direct mounting	
VFW41.40	direct mounting					A6V101029242
VFW41.50	direct mounting					
VFW41.65	direct mounting					
VFW41.80		direct mounting				
VFW41.100		direct mounting				
VFW41.125		direct mounting				
VFW41.150			direct mounting			
VFW41.200			direct mounting			
VFW41.250				direct mounting		
VFW41.300				direct mounting		
VFW41.350				direct mounting		
VFW41.400				direct mounting		
VFW41.450					direct mounting	
VFW41.500					direct mounting	
VFW41.600					direct mounting	
VFL41.40	direct mounting					A6V101029242
VFL41.50	direct mounting					
VFL41.65	direct mounting					
VFL41.80		direct mounting				
VFL41.100		direct mounting				
VFL41.125		direct mounting				
VFL41.150			direct mounting			
VFL41.200			direct mounting			
VFL41.250				direct mounting		
VFL41.300				direct mounting		
VFL41.350				direct mounting		
VFL41.400				direct mounting		
VFL41.450					direct mounting	
VFL41.500					direct mounting	
VFL41.600					direct mounting	

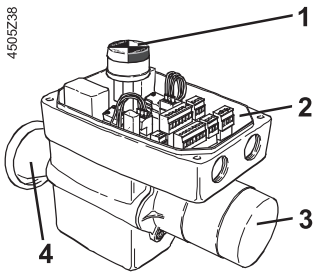
Function / mechanical design

The actuator is driven by a 3-position signal from the controller and generates a rotary motion which is transferred via a driver to the valve.

SQL36E...

These electromotoric actuators require no maintenance. They have a reversible asynchronous motor which drives the main shaft via spur gears and a self-locking worm gear, which accommodates the rectangular shaft of the butterfly valve. The worm shaft is fitted with a direct-acting manual adjuster.
The actuators are supplied with a 90° angle of rotation suitable for use with Siemens butterfly valves. During automatic operation, rotation is limited by two built-in non-adjustable end-switches.
The direction of rotation of the actuator can be reversed (refer to «Commissioning», page 5). To prevent the temperature inside the housing from falling below the dewpoint temperature, the actuators are supplied with a built-in heating element (AC 230 V, power consumption 5 W).

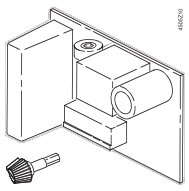




1 Position indication
2 Terminal compartment
3 Motor
4 Manual adjuster

Accessory for
SQL36E65
SQL36E110
SQL36E160

SEZ31.1 Auxiliary module



In the presence of a 3-position signal, the auxiliary module pulses the actuator. The output shaft rotates by approximately 2° with each pulse. The pulse-to-pause ratio is continuously adjustable and can therefore be used to achieve longer running times for an angle of rotation of 90° (refer to «Commissioning», page 5).

Engineering notes

Electrical installation

The actuators must be electrically connected in accordance with local regulations and with the connection diagrams.

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

Mounting notes

Overview of Mounting Instructions

Type	Mounting Instructions	
SQL36E..	M4505.1	74 319 0440 0
ASC36	M4505.3	74 319 0442 0
ASZ36	M4505.2	74 319 0441 0
SEZ31.1	M4505.4	74 319 0443 0

SQL36E...

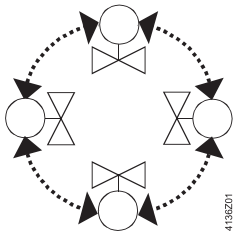
These actuators are mounted directly on type VKF46... and VFW41.., VFL41.. butterfly valves. The butterfly valves have to be closed during installation.
In case of unsteady ambient temperatures connect the built-in heating element to avoid condensation.

The valve and actuator can be assembled straightforwardly on site. There is no need for special tools.

Orientation

SQL36E..

Any



Commissioning notes

When commissioning the complete motorized valve consisting of actuator, mounting set and butterfly valve, always check the wiring and test the functions. This also applies to any additional components fitted, e.g. auxiliary switch, potentiometer or auxiliary module (variable positioning time).

VKF41.. or VKF46... butterfly valves can only be commissioned with a SQL36E.. actuator or with an ASK46... manual adjuster fitted.
VFW41.. or VFL41.. butterfly valves can only be commissioned with a SQL36E.. actuator or with an ASK41... manual adjuster fitted.

Warning ⚠ To avoid pressure shocks on the butterfly, the valves must be driven to its fully open position (either manually or via positioning signal Y1) prior to activating the pump(s).

The flow rate is adjusted either by driving the electric actuators as required, or by operating the manual adjuster.

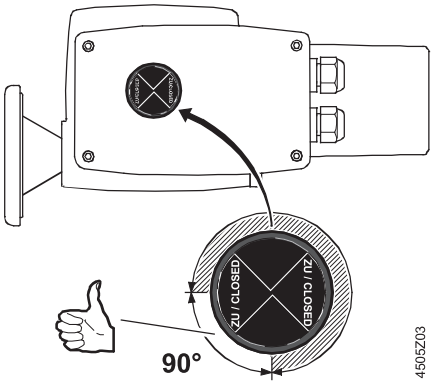
When using a SEZ31.1 auxiliary module set the desired positioning time:
SQL36E65: 30...180 s
SQL36E110: 60…360 s
SQL36E160: 120…720 s

Warning ⚠ The actuator is designed for a static load in the pipe system. Risks arising from loads caused by vibrations in the system are not covered: In such cases, the long term protection of the screw connections on the actuator must be agreed with Siemens.

Operating mode SQL36E...

In the case of the SQL36E..., the manual adjuster is always engaged and cannot be mechanically disconnected.

Direction of rotation
SQL36E...



The direction of rotation of these types of actuators for opening is counterclockwise.

Reversing the direction of rotation
SQL36E...

If the direction of rotation needs reversing, simply change the connections Y1/Y2.

Setting the angle of rotation

The 0...90° angle of rotation for the end switches is factory-set and. They cannot be adjusted.
The potential-free auxiliary switches have adjustable switching points.

Control

Every actuator must be driven by a dedicated controller (refer to «Connection diagrams», page 9).

Maintenance

The actuators and butterfly valves require no maintenance.

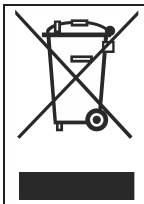
Caution ⚠

Before performing any service work on the valve or actuator:
- 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 manual adjuster or the actuator correctly assembled.

Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive 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

		SQL36E50..	SQL36E65	SQL36E110	SQL36E160
Power supply	Operating voltage	AC 230 V –5 / +10 %			
	Frequency	50 / 60 Hz			
	Power consumption [1]	35 VA	160 VA	235 VA	
	External supply line protection	Slow-blow fuse max. 10 A or Circuit breaker max. 13 A Characteristic B, C, D according to EN 60898			
Control	Positioning signal	3-position			
	Parallel operation	parallel operation of several actuators not possible			
Operating data	Positioning time for 90°				
	at 50 Hz	25 s	6 s [2]	12 s [2]	24 s [2]
	at 60 Hz	20 s	5 s	10 s	20 s
	Angle of rotation	90° ± 1° (factory setting)			
	Torque [1]	40 Nm	100 Nm	400 Nm	1200 Nm
	End switch	Switching capacity AC 250 V, 3 A resistive, 1.5 A inductive Switching differential approx. 1° End position non-adjustable			
	Heating element	AC 230 V, 5 W			
	Medium temperature	Permissible temperature of medium in the assembled valve: 120°C			
	Product standards for automatic electrical controls	EN 61010-1			
	EU conformity (CE)	8000059601 [3]			
	Housing protection standard	IP 67 to IEC 60529			
	Electromagnetic compatibility (Applications)	For use in residential, commerce, light-industrial and industrial environments			
	Environmental compatibility	Product environmental declaration (contains data on RoHS compliance, materials compo-sition, packaging, environmental benefit, disposal) CE1E4505en [3]			
	Flanges and shaft connection to actuator	EN ISO 5211 F04 / F05	F07	F10	□ 32mm F12 / F16
Dimensions / weight	Dimensions	see «Dimensions» (page 10)			
	Cable glands	2 x M20			
	Weight	4.5 kg	7 kg	14 kg	25 kg
Materials	Housing base, yoke	die-cast aluminum			
	Cover	die-cast aluminum			

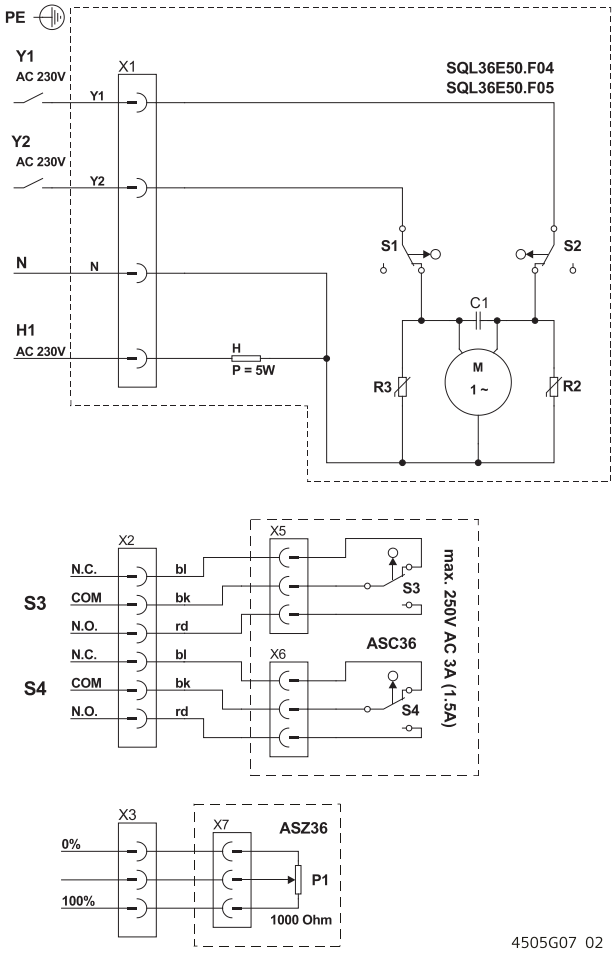
[1] These values apply at nominal voltage, at an ambient temperature of 20 °C and at the specified nominal running time
[2] Variable positioning time with SEZ31.1 auxiliary module (see below)
[3] The documents can be downloaded from http://siemens.com/bt/download.

Accessories for SQL36E..			Weight
• Double auxiliary switch ASC36	Switching capacity Switching differential	AC 250 V, 3 A resistive, 1.5 A inductive approx. 1°	60 g
• Potentiometer ASZ36	Change in resistance	0...1000 Ω corresponding to 0...90°	50 g
• Auxiliary module SEZ31.1	Positioning time for 90 ° at 50 Hz	SQL36E65: 30...180 s SQL36E110: 60…360 s SQL36E160: 120…720 s	60 g

General ambient conditions	Operation EN 60721-3-4	Transport EN 60721-3-2	Storage EN 60721-3-1
Environmental conditions	Class 4K2	Class 2K3	Class 1K3
Temperature	–20...+70 °C	–30...+65 °C	–15...+55 °C
Humidity	15...100 % r. h.	< 95 % r. h.	0...95 % r. h.

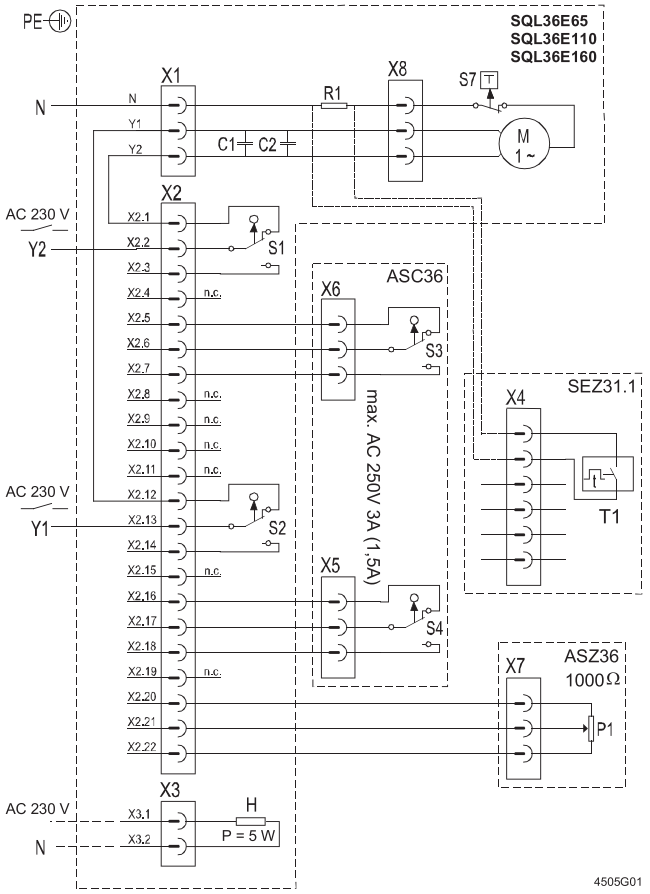
Internal diagrams

SQL36E50F04
SQL36E50F05



S1 End switch CLOSED (non-adjustable)
S2 End switch OPEN (non-adjustable)
S3 Auxiliary switch CLOSED (ASC36)
S4 Auxiliary switch OPEN (ASC36)
H Heating element
P1 Potentiometer (ASZ36)
Y1 Control phase OPEN
Y2 Control phase CLOSED
N Neutral conductor
N.C. Normally Closed
N.O. Normally Open
COM Common conductor

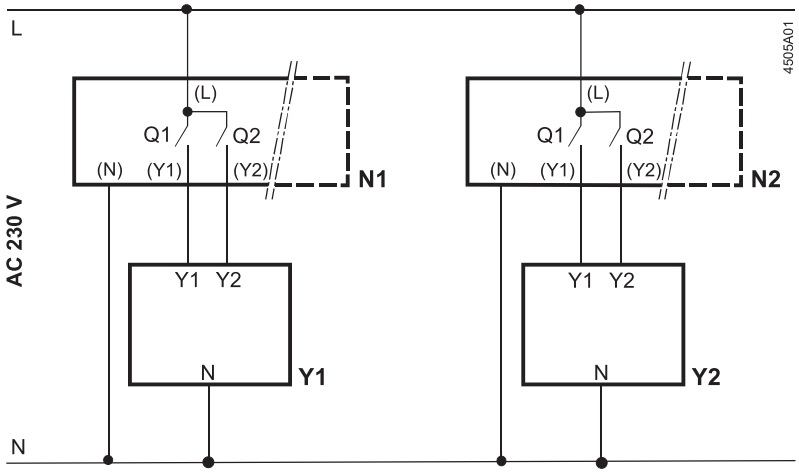
SQL36E65
SQL36E110
SQL36E160



S1 End switch CLOSED (non-adjustable)
S2 End switch OPEN (non-adjustable)
S3 Auxiliary switch CLOSED (ASC36)
S4 Auxiliary switch OPEN (ASC36)
S7 Thermal switch (integrated)
H Heating element
P1 Potentiometer (ASZ36)
T1 Auxiliary module (SEZ31.1)
Y1 Control phase OPEN
Y2 Control phase CLOSED
N Neutral conductor

Connection diagrams

SQL36E..

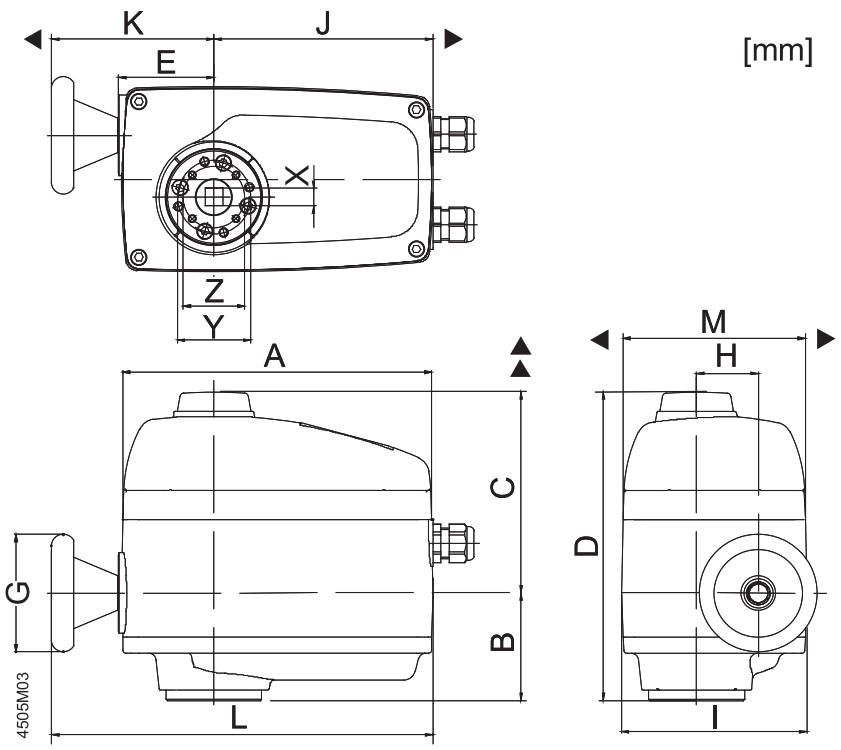


N1, N2 Controller
Y1, Y2 Actuator
L System potential AC 230 V
N System neutral
Q1, Q2 Controller contacts

Dimensions

Dimensions in mm

SQL36E50F04
SQL36E50F05



[mm]

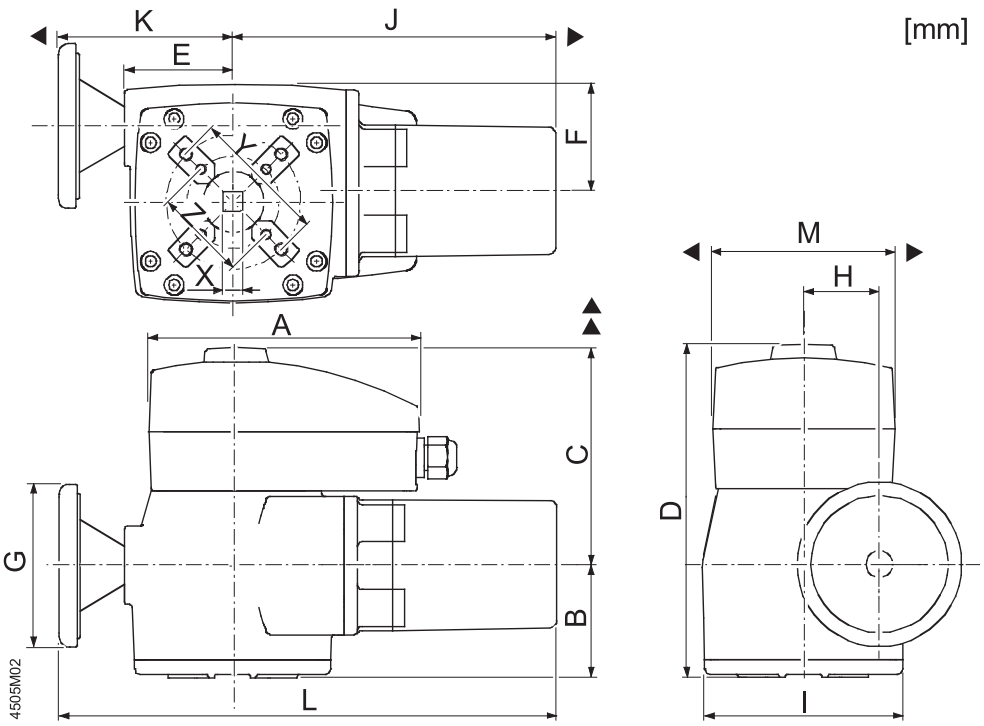
	SQL36E50F04	SQL36E50F05
DN	40…65	80…125
A	210	
B	73	
C	137	
D	210	
E	65	
G	Ø 80	
H	42	
I	126	
J	149	
K	110	
L	259	
M	124	
X	☐ 11	☐ 14
Y	42	
Z		50
EN 5211	F04	F05
kg	4.5 kg	

◀ > 100 mm: Minimum clearance from wall or ceiling

▲▲ > 200 mm: For mounting, connection, operation, service, etc.

SQL36E65
SQL36E110
SQL36E160

[mm]



	SQL36E65	SQL36E110	SQL36E160
DN	150…200	250…400	450…600
A	208	208	208
B	78	88	112
C	157	169	170
D	235	257	282
E	65	81	110
F	65	87	126
G	Ø 80	Ø 125	Ø 200
H	42	58	89
I	125	150	175
J	171	247	280
K	119	136	157
L	290	383	437
M	139	139	139
X	☐ 17	☐ 22	☐ 32
Y	70	102	165
Z	50	70	125
EN 5211	F07	F10	[1]
kg	7 kg	14 kg	25 kg

[1] EN 5211 F12 / F16 flange connections for third-party butterfly valves are available on request.

◀ > 100 mm: Minimum clearance from wall or ceiling

▲▲ > 200 mm: For mounting, connection, operation, service, etc.

Revision numbers

Product number	Valid from rev. no.
SQL36E50F04	..A
SQL36E50F05	..A
SQL36E65	..A
SQL36E110	..A
SQL36E160	..A

OpenAir™

Air damper actuators GCA..1

Rotary version with spring return,
AC 24 V / DC 24…48 V / AC 230 V

Electronic motor driven actuators for two-position, three-position, and modulating control, nominal torque 18 Nm, with spring return, self-centering shaft adapter, mechanically adjustable span between 0...90°, pre-wired with 0.9 m long connection cables.
Type-specific variations with adjustable offset and span for the positioning signal, position indicator, feedback potentiometer and adjustable auxiliary switches for supplementary functions.

Remarks

This data sheet provides a brief overview of these actuators. Please refer to the Technical Basics in document Z4613en for a detailed description as well as information on safety, engineering notes, mounting and commissioning.

Use

- For damper areas up to 3 m^2, friction-dependent.
- In ventilation sections where the actuator must move to the zero position (emergency position) during power failure.
- For dampers having two actuators on the same damper shaft (tandem-mounted actuators or Powerpack).

Type summary

GCA...	121.1E	126.1E	321.1E	326.1E	131.1E	135.1E	161.1E	163.1E	164.1E	166.1E
Control type	Two-position control				Three-position control		Modulating control			
Operating voltage AC 24 V / DC 24…48 V	X	X			X	X	X	X	X	X
Operating voltage AC 230 V			X	X						
Positioning signal Y DC 0...10 V							X			X
DC 0...35 V with characteristic function Uo, ΔU								X	X	
Position indicator U = DC 0...10 V							X	X	X	X
Feedback potentiometer 1 kΩ						X				
Auxiliary switches (two)		X		X		X			X	X
Powerpack (2 actuators)	X	X	X	X	X	X	X	X	X	X

Functions

Type	GCA12..1 / GCA32..1	GCA13..1	GCA16..1
Control type	Two-position control	Three-position control	Modulating control
Positioning signal with adjustable characteristic function			DC 0...35 V at Offset Uo = 0...5 V Span ΔU = 2...30 V
Rotary direction	Clockwise or counter-clockwise movement depends on the mounting position of the damper shaft…		
		and on the type of control	
Spring return function	On power failure or when the operating voltage is switched off, the spring return moves the actuator to its mechanical zero position.		
Position indication: Mechanical	Rotary angle position indication by using a position indicator.		
Position indication: Electrical		The feedback potentiometer can be connected to external voltage to indicate the position.	Output voltage U = DC 0...10 V is generated proportional to the rotary angle.
Auxiliary switch	The switching points for auxiliary switches A and B can be set independent of each other in increments of 5° within 5° to 90°.		
Powerpack (two actuators, tandem-mounted)	Mounting two of the same actuator types on the same damper shaft results in a double torque (with accessories ASK73.1).		Mounting two of the same actuator types on the same damper shaft results in a double torque (with accessories ASK73.2).
Rotary angle limitation	The rotational angle of the shaft adapter can be limited mechanically at increments of 5°.		

Ordering

Note — Potentiometer **cannot be added in the field**. For this reason, order the type that includes the required options.

Delivery — Individual parts such as position indicator and other mounting materials for the actuator are **not mounted** on delivery.

Accessories, spare parts — Accessories to functionally extend the actuators are available, e.g., linear/rotary sets, auxiliary switches (1 or 2 switches) and weather protection cover; see data sheet **N4699**.

Safety

> **⚠ 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.
> - Use only properly trained technicians for mounting, commissioning, and servicing.

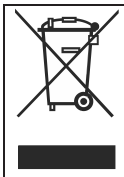
Technical data

⚠ AC 24 V / DC 24…48 V supply (SELV/PELV)	Operating voltage AC / Frequency		AC 24 V ± 20 % / 50/60 Hz
	Operating voltage DC		DC 24…48 V ± 20 %
	Power consumption	Running	AC: 7 VA / 5 W
		Running	DC: 4 W
		Holding	AC: 5 VA / 3 W
		Holding	DC: 3 W
⚠ AC 230 V supply	Operating voltage / Frequency		AC 230 V ± 10 % / 50/60 Hz
	Power consumption	Running	8 VA / 6 W
		Holding	6 VA / 4 W
Function data	Nominal torque		18 Nm
	Maximum torque (blocked)		50 Nm
	Nominal rotary angle / Max. rotary angle		90° / 95° ± 2°
	Runtime for rotary angle 90° (motor operation)		90 s
	Closing time with return spring (on power failure)		15 s
Positioning signal *for GCA13..1*	Switching current (at AC 24 V) for "Open"/"Close" (wires 6, 7)		typical 8 mA
Positioning signal *for GCA16..1*,	Input voltage Y (wires 8-2)		DC 0...10 V
	Max. permissible input voltage		DC 35 V
Characteristic functions	Input voltage Y (wires 8-2)		DC 0...35 V
for GCA161.1, 166.1	Non-adjustable characteristic function		DC 0...10 V
for GCA163.1, 164.1	Adjustable characteristic function	Offset Uo	DC 0...5 V
		Span ΔU	DC 2...30 V
Position indicator	Output voltage U (wires 9-2)		DC 0...10 V
for GCA16..1	Max. output current		DC ± 1 mA
Feedback potentiometer	Change of resistance (wires P1-P2)		0...1000 Ω
for GCA132.1	Load		< 1 W
⚠ Auxiliary switch	AC power supply		
for GCA..6.1, 164.1	Switching voltage		AC 24...230 V
	Nominal current res./ind.		AC 6 A / 2 A
	DC power supply		
	Switching voltage		DC 12…30 V
	Nominal current		DC 2 A
	Switching range for auxiliary switches / Setting increments		5°...90° / 5°
Connection cables	Cross-section		0.75 mm^2
	Standard length		0.9 m
Degree of protection of housing	Degree of protection as per EN 60 529 (note mounting instructions)		IP 54
Protection class	Insulation class		EN 60 730
	AC 24 V, feedback potentiometer		III
	AC 230 V, auxiliary switch		II
Environmental conditions	Operation / Transport		IEC 721-3-3 / IEC 721-3-2
	Temperature		–32...+55 °C / –32...+70 °C
	Humidity (non-condensing)		< 95% r. F. / < 95% r. F.
Norms and directives	Product safety: Automatic electrical controls for household and simi-lar use		EN 60 730-2-14 (Type 1)
	Electromagnetic compatibility (Application)		For residential, commercial and in-dustrial environments
	EU Conformity (CE)		A5W00004370 [1]
	RCM Conformity		A5W00004371 [1]
	Product environmental declaration [2]		CE1E4613en [1]
Dimensions	Actuator B x H x T (see "Dimensions")		100 x 300 x 67.5 mm 8...25.6 / 6...18 mm

	Damper shaft:	Round / square Min. shaft length	20 mm
Weight	Without packaging:	GCA1..1 / GCA32..1	2 kg / 2.1 kg

[1] The documents can be downloaded from http://siemens.com/bt/download
[2] The product environmental declaration contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

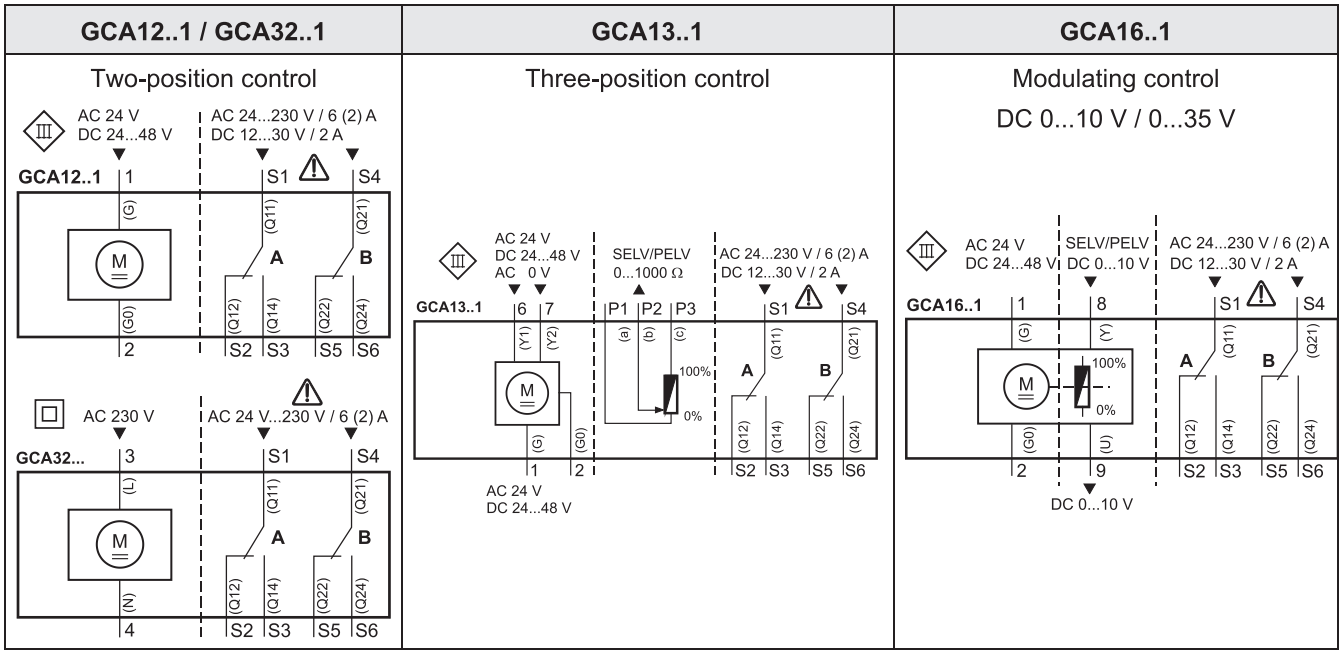
Disposal



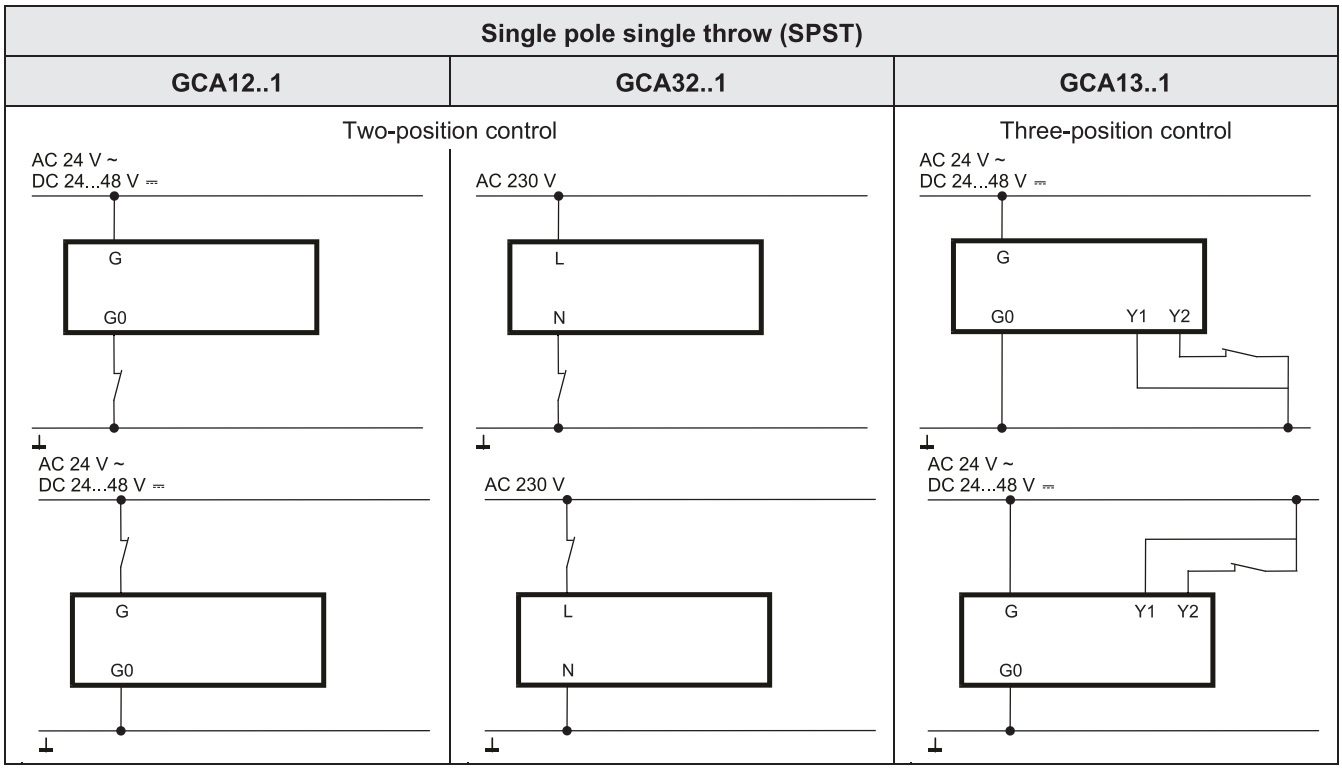
The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

Internal diagrams

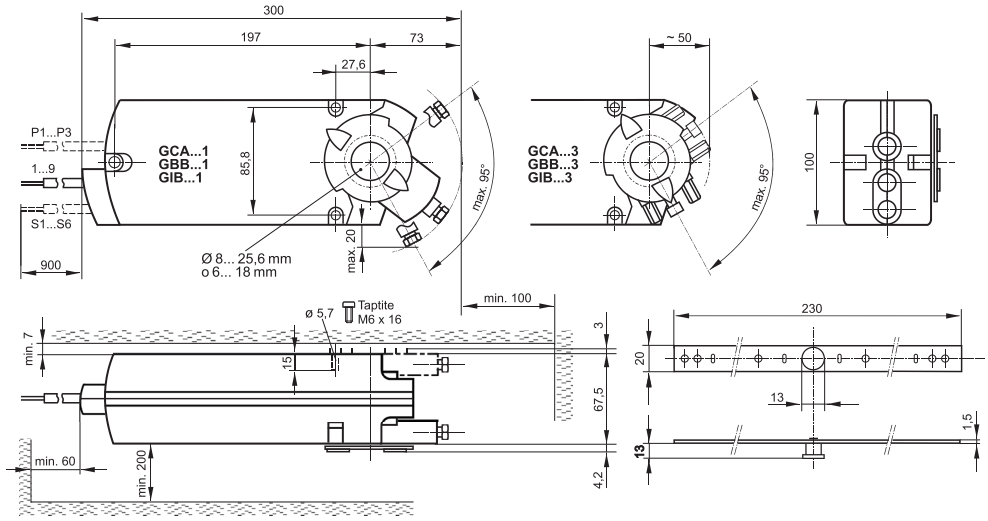


Connection diagrams



Pin	Cable labeling				Meaning
	Code	No.	Color	Abbreviation	
Actuators	G	1	red	RD	System potential AC 24 V / DC 24…48 V
AC 24 V	G0	2	black	BK	System neutral
DC 24…48 V	Y1	6	purple	VT	Pos. signal AC 0 V / AC 24 V / DC 24…48 V, "open"
	Y2	7	orange	OG	Pos. signal AC 0 V / AC 24 V / DC 24…48 V, "close"
	Y	8	grey	GY	Pos. signal DC 0...10 V, 0...35 V
	U	9	pink	PK	Position indication DC 0...10 V
Actuators	L	3	brown	BN	Phase AC 230 V
AC 230 V	N	4	blue	BU	Neutral conductor
Auxiliary switch	Q11	S1	grey/red	GY RD	Switch A input
	Q12	S2	grey/blue	GY BU	Switch A normally-closed contact
	Q14	S3	grey/pink	GY PK	Switch A normally-open contact
	Q21	S4	black/red	BK RD	Switch B input
	Q22	S5	black/blue	BK BU	Switch B normally-closed contact
	Q24	S6	black/pink	BK PK	Switch B normally-open contact
Feedback	a	P1	white/red	WH RD	Potentiometer 0...100 % (P1-P2)
potentiometer	b	P2	white/blue	WH BU	Potentiometer pick-off
	c	P3	white/pink	WH PK	Potentiometer 100...0 % (P3-P2)

Dimensions



Dimensions in mm

OpenAir™

Air damper actuators GMA..1

Rotary version with spring return, AC 24 V / DC 24…48 V / AC 230 V

Electronic motor driven actuators for two-position, three-position, and modulating control, nominal torque 7 Nm, with spring return, self-centering shaft adapter, mechanically adjustable span between 0...90°, prewired with 0.9 m long connection cables.
Type-specific variations with adjustable offset and span for the positioning signal, position indicator, feedback potentiometer and adjustable auxiliary switches for supplementary functions.

Remarks

This data sheet provides a brief overview of these actuators. Please refer to the technical basics in CM2Z4614en for a detailed description as well as information on safety, engineering notes, mounting and commissioning.

Use

- For damper areas up to 1.5 m^2, friction-dependent.
- In ventilation sections where the actuator must move to the zero position (emergency position) during power failure.
- For dampers having two actuators on the same damper shaft (tandem-mounted actuators or Powerpack).

Type summary

GMA...	121.1E	126.1E	321.1E	326.1E	131.1E	132.1E [1]	136.1E	161.1E	163.1E	164.1E	166.1E
Control type	Two-position control				Three-position control			Modulating control			
Operating voltage AC 24 V DC 24…48 V	X	X			X	X	X	X	X	X	X
Operating voltage AC 230 V			X	X							
Positioning signal Y DC 0...10 V								X			X
DC 0...35 V with characteristic function Uo, ΔU									X	X	
Position indicator U = DC 0...10 V								X	X	X	X
Feedback potentiometer 1kΩ						X					
Auxiliary switches (two)		X		X			X			X	X
Powerpack (2 actuators)	X	X	X	X	X	X	X				

[1] While stocks last

Functions

Type	GMA12..1 / GMA32..1	GMA13..1	GMA16..1
Control type	Two-position control	Three-position control	Modulating control
Positioning signal with adjustable characteristic function			DC 0...35 V at Offset Uo = 0...5 V Span ΔU = 2...30 V
Rotary direction	Clockwise or counter-clockwise movement depends on the mounting position of the damper shaft…		
		…and on the type of control.	
Spring return	On power failure or when the operating voltage is switched off, the spring return moves the actuator to its mechanical zero position.		
Position indication: Mechanical	Rotary angle position indication by using a position indicator.		
Position indication: Electrical		The feedback potentiometer can be connected to external voltage to indicate the position.	Output voltage U = DC 0...10 V is generated proportional to the rotary angle.
Auxiliary switch	The switching points for auxiliary switches A and B can be set independent of each other in increments of 5° within 5° to 90°.		
Powerpack (two actuators, tandem-mounted)	Mounting two of the same actuator types on the same damper shaft may result in a double torque.		Is not permitted
Rotary angle limitation	The rotational angle of the shaft adapter can be limited mechanically at increments of 5°.		

Ordering

Note — The potentiometer **cannot be added in the field**. For this reason, order the type that includes this option.

Delivery — Individual parts such as position indicator and other mounting materials for the actuator are **not mounted** on delivery.

Accessories, spare parts — Accessories to functionally extend the actuators are available, e.g. external auxiliary switch, linear/rotary sets and weather protection cover; see data sheet **N4697**.

Disposal

The document on technical basics and the environmental declaration provide information on environmental compatibility and disposal of this device.

Safety

> **⚠ 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.
> - Use only properly trained technicians for mounting, commissioning, and servicing.

Technical data

⚠ AC 24 V DC 24…48 V supply (SELV/PELV)	Operating voltage AC / Frequency	AC 24 V ± 20 % / 50/60 Hz
	Operating voltage (DC)	DC 24…48 V ±20 %
	Power consumption GMA1..1: Running	AC: 5 VA / 3.5 W // DC: 3.5 W
	GMA12..1, 13..1: Holding	AC/DC: 2 W
	GMA16..1,: Holding	AC/DC: 2.5 W
⚠ AC 230 V supply	Operating voltage / Frequency	AC 230 V ± 10 % / 50/ 60 Hz
	Power consumption GMA32..1: Running	7 VA / 4.5 W
	Holding	3.5 W
Function data	Nominal torque	7 Nm
	Maximum torque (blocked)	21 Nm
	Nominal rotary angle / Max. rotary angle	90° / 95° ± 2°
	Runtime for rotary angle 90° (motor operation)	90 s
	Closing time with return spring (on power failure)	15 s
Positioning signal *for GMA13..1*	Switching current (at AC 24 V / DC 24…48 V) for "Open"/"Close" (cores 6,7)	normally 8 mA
Positioning signal *for GMA16..1*	Input voltage Y (wires 8-2)	DC 0...10 V / DC 2...10 V
	Max. permissible input voltage	DC 35 V
Characteristic functions *for GMA161.1, 166.1 for GMA163.1, 164.1*	Input voltage Y (wires 8-2)	DC 0...35 V
	Non-adjustable characteristic function	DC 0...10 V / DC 2...10 V
	Adjustable characteristic function	
	Offset Uo	DC 0...5 V
	Span ΔU	DC 2...30 V
Position indicator *for GMA16..1*	Output voltage U (cores 9-2)	DC 0...10 V
	Max. output current	DC ± 1 mA
Feedback potentiometer *for GMA132.1*	Change of resistance (wires P1-P2)	0...1000 Ω
	Load	< 1 W

⚠ Auxiliary switch *for GMA..6.1, 164.1*	AC power supply	
	Switching voltage	AC 24...230 V
	Nominal current res./ind.	6 A / 2 A
	DC power supply	
	Switching voltage	DC 12..30 V
	Nominal current	DC 2 A
	Switching range for auxiliary switches / Setting increments	5°...90° / 5°
Connection cables	Cross-section	0.75 mm^2
	Standard length	0.9 m
Degree of protection of housing	Degree of protection as per EN 60 529 (note mounting instructions)	IP 54
Protection class	Insulation class	EN 60 730
	AC/DC 24 V, feedback potentiometer	III
	AC 230 V, auxiliary switch	II
Environmental conditions	Operation / Transport	IEC 721-3-3 / IEC 721-3-2
	Temperature	–32...+55 °C / –32...+70 °C
	Humidity (non-condensing)	< 95% r. h. / < 95% r. h.
Standards and directives	Product safety: Automatic electrical controls for household and similar use	EN 60 730-2-14 (Type 1)
	Electromagnetic compatibility (Application)	For residential, commercial and industrial environments
	EU Conformity (CE)	8000081792 [1]
	RCM Conformity	8000081793 [1]
	Product environmental declaration [2]	CE1E4614en [1]
Dimensions	Actuator W x H x D (see "Dimensions")	81 x 192 x 63 mm
	Damper shaft: Round / square	6.4...20.5 / 6.4...13 mm
	Min. shaft length	20 mm
Weight	Without packaging: GMA1..1 / GMA32..1	1.2 kg / 1.3 kg

[1] The documents can be downloaded from http://siemens.com/bt/download

[2] The product environmental declaration contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

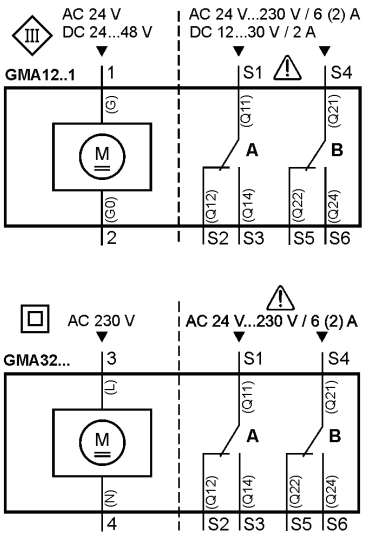
Disposal

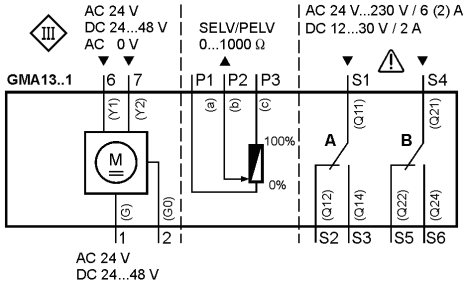
The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.

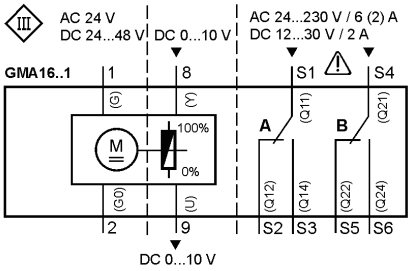
- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

Internal diagrams

GMA12..1 / GMA32..1	GMA13..1	GMA16..1
Two-position control	Three-position control	Modulating control DC 0...10 V / 0...35 V

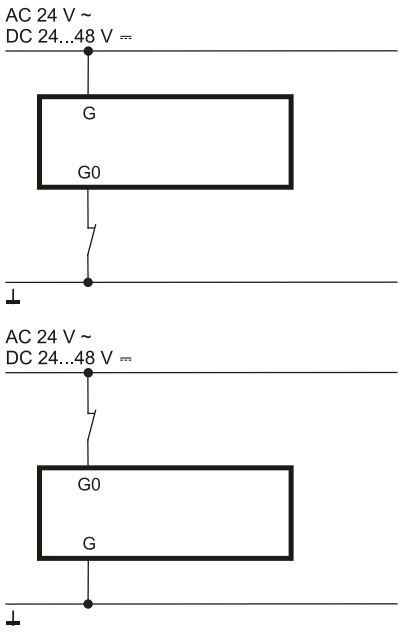


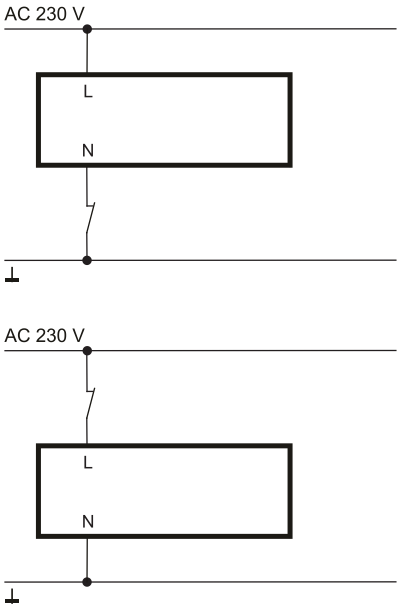


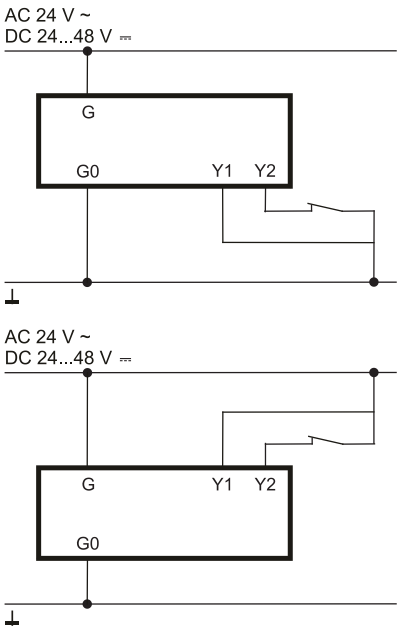


Connection diagrams

Single pole single throw (SPST)		
GMA12..1	GMA32..1	GMA13..1
Two-position control		Three-position control



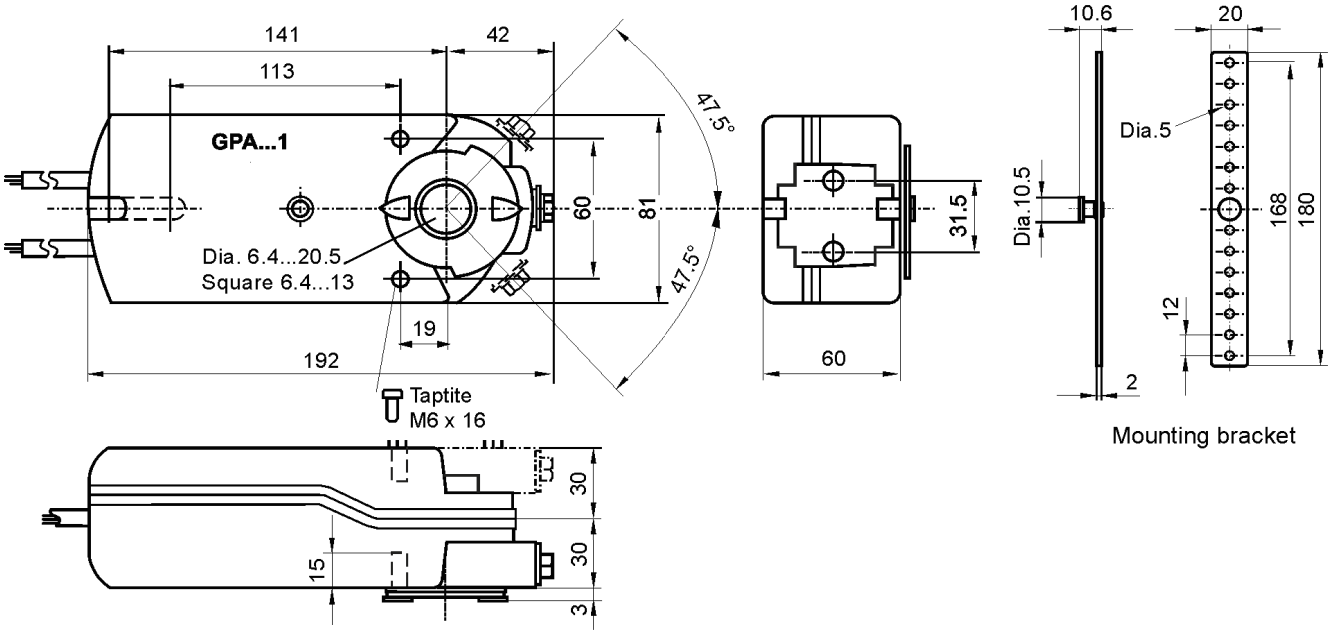




Cable labeling

Pin	Cable				Meaning
	Code	No.	Color	Abbreviation	
Actuators AC 24 V DC 24…48 V	G	1	red	RD	System potential AC 24 V/DC 24…48 V
	G0	2	black	BK	System neutral
	Y1	6	purple	VT	Pos. signal AC 0 V/AC 24 V/DC 24…48 V, “open”
	Y2	7	orange	OG	Pos. signal AC 0 V/AC 24 V/DC 24…48 V, “close”
	Y	8	grey	GY	Pos. signal DC 0...10 V, 0...35 V
	U	9	pink	PK	Position indication DC 0...10 V
Actuators AC 230 V	L	3	brown	BN	Phase AC 230 V
	N	4	blue	BU	Neutral conductor
Auxiliary switch	Q11	S1	grey/red	GY RD	Switch A input
	Q12	S2	grey/blue	GY BU	Switch A normally-closed contact
	Q14	S3	grey/pink	GY PK	Switch A normally-open contact
	Q21	S4	black/red	BK RD	Switch B input
	Q22	S5	black/blue	BK BU	Switch B normally-closed contact
	Q24	S6	black/pink	BK PK	Switch B normally-open contact
Feedback potentiometer	a	P1	white/red	WH RD	Potentiometer 0...100 % (P1-P2)
	b	P2	white/blue	WH BU	Potentiometer pick-off
	c	P3	white/pink	WH PK	Potentiometer 100...0 % (P3-P2)

Dimensions



Dimensions in mm

OpenAir™

Fast running actuators for air dampers GNP19..

Fast runner rotary version with electronic fail-safe function, AC/DC 24 V

Electronic rotary actuator for 2-position, 3-position, or modulating control, nominal torque 6 Nm, at 2 s running time, with electronic fail-safe function; self-centering shaft adapter, range mechanically adjustable between 0...90°, prewired with 0.9 m long standard connection cables.
GNP196.1E with adjustable auxiliary switches for auxiliary functions.

Use

- For damper areas up to 1 m^2, friction dependent.
- For laboratory fume hoods, etc.
- For air technology applications within the building technology.
- Suitable for use with continuous, 2-position, or 3-position controllers.

Type summary

Types	Power	Auxiliary switch	Torque	Damper size	Runtime
GNP191.1E	AC/DC 24 V	No	6 Nm	Ca. 1 m^2	2 s
GNP196.1E		Yes			

Note

When installing and operating rotary actuators types GNP.. in low-noise environments, check the acoustic response of the actuators operated together with the measuring and control equipment.
The combination with differential pressure sensors, sensors, and controllers may result in unwanted operational noise based on the operating settings, regardless of the given manufacturer.

Impacted applications

- Low-noise HVAC plants in general [1)]
- Supply and extract air plants
- Fume hood control plants
- Room pressure control plants

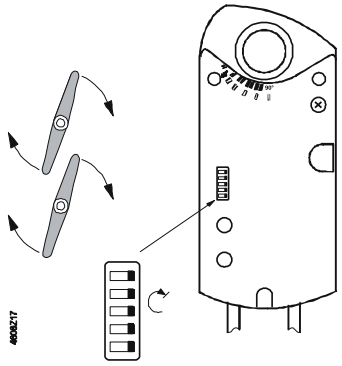
[1)] e.g. Laboratories / fume hoods, hospital rooms or similar plants

Alternative

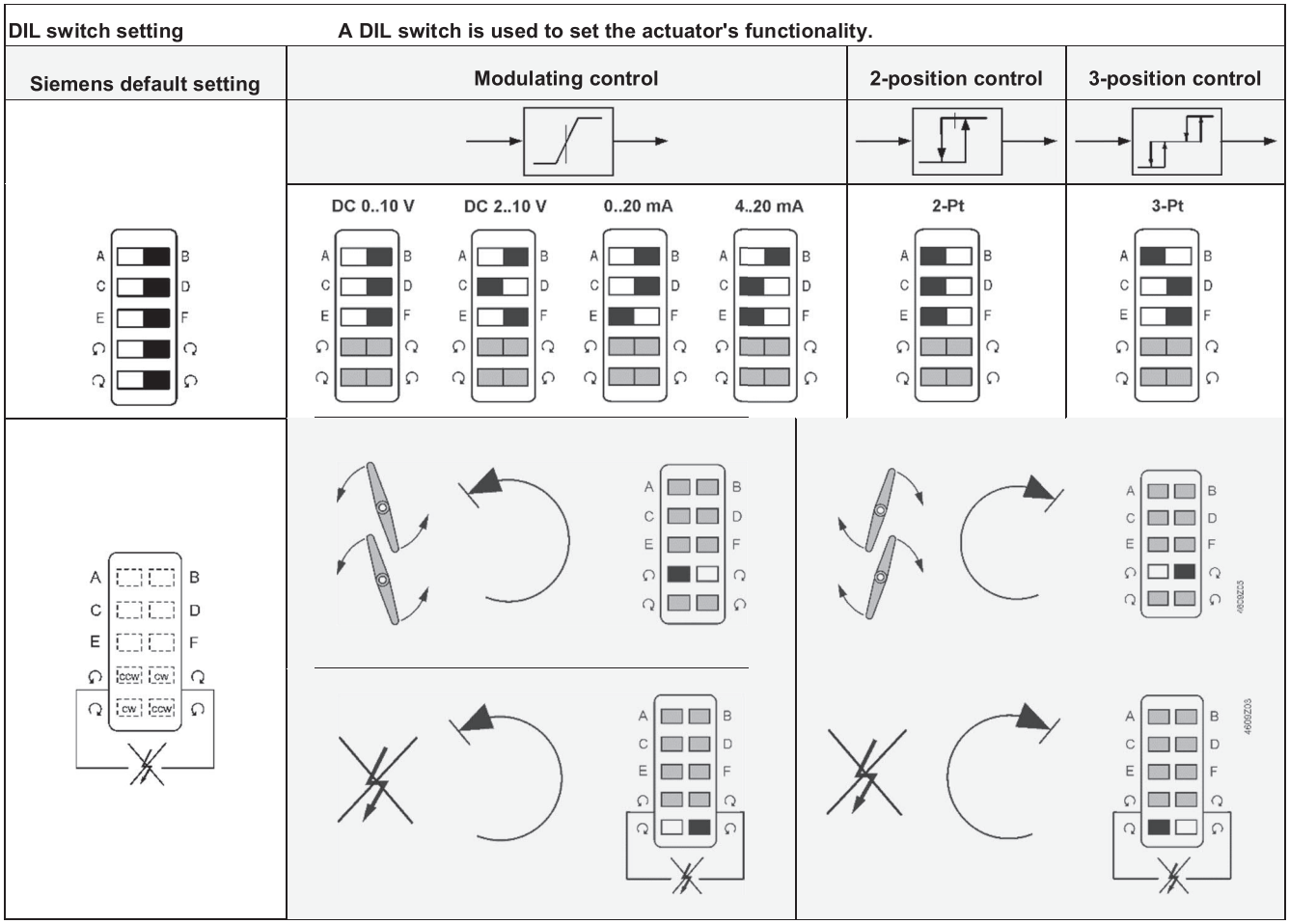
We recommend using rotary actuator HLV40.1 if the applications listed above are motorized or in the event of any general concerns regarding operational noise of GNP actuators (Contact your local Siemens representative).

Factory setting

The actuators preset at the factory to:
- 0… 10 V
- Clockwise rotary movement
- Counter-clockwise fail-safe movement



Functions



Position indication: Mechanical	Rotary angle position.
Position indication: Electric.	Output voltage U = DC 0...10 V is generated proportional to rotary angle. U depends on the DIL switch's rotary direction position.
Rotary angle limitation	The rotary angle of the shaft adapter can be limited mechanically to 5° increments.
GNP196.1E auxiliary switch	The switching points for auxiliary switches A and B can be set mutually independent in 5° increments from 0 to 90°.

Ordering

Delivery	Individual parts such as shaft adapter with position indication and other mounting materials for the actuator are delivered **unassembled**.
Accessories, spare parts	Various accessories are available to extend the actuators' functionality; e.g. rotary/linear mounting kit, external auxiliary switch (1 or 2 switches) and weather shield; see data sheet **N4697**.

Technical data

⚠ 24 VAC/VDC supply (SELV/PELV)	Operating voltage / Frequency		AC/DC 24 V ± 20 % / 50/60 Hz
	Power consumption:	Actuator running	20 VA / 13 W
		Hold	5 W
Functional data	Nominal torque		6 Nm
	Maximum torque (when blocked)		18 Nm
	Nominal rotary angle / max. rotary angle		90° / max. 95° ± 2°
	Runtime for 90° rotary angle		2 s (50 Hz)
Positioning signal Y/Y1	Input voltage Y/Y1+ (wires 8-2)		DC 0 (2)...10 V / 0 (4)…20 mA or AC/DC 0 V , AC/DC 24 V "open“
	Positioning resolution for DC 0 (2)...10 V / 0 (4)…20 mA		250 steps for 90 °
	Max. permissible input voltage		AC/DC 24 V ± 20 %
Positioning signal Y2	Input voltage Y2+ (wires 7-2)		AC/DC 0 V , AC/DC 24 V "close“
	Max. permissible input voltage		AC/DC 24 V ± 20 %
Position indicator	Output voltage U (wires 9-2)		DC 0 (2)...10 V
	max. output current		DC ± 1 mA
⚠ Auxiliary switch for GNP196.1E	Contact loading		6 A resistive, 2 A inductive
	Voltage (no mixed operation 24 VAC / 230 VAC)		AC 24...230 V
	Switching range for auxiliary switches		5°...90°
	Setting increments		5°
Connection cable	Cross-section		0.75 mm^2
	Standard length		0.9 m
Housing type	Protection class as per EN 60 529 (observe mounting notes)		IP 54
Protection class	Insulation class		EN 60 730
	230 VAC, auxiliary switch		II
Environmental conditions	Operation / Transport		IEC 721-3-3 / IEC 721-3-2
	Temperature		–18...50 °C / –32...70 °C
	Humidity (non-condensing)		< 95% r.h. / < 95% r.h.
Standards, guidelines	Product safety: Automatic electronic controls for household and similar use		EN 60 730-2-14 (Type 1)
	Electromagnetic compatibility (Application)		For residential, commercial and industrial environments
	EU Conformity (CE)		A5W00004382 [1]
	RCM Conformity		A5W00004383 [1]
	Product environmental declaration [2]		CE1E4608en [1]
Dimensions	Actuator W x H x D (see Dimensions)		81 x 192 x 63 mm
	Damper shaft:	Round	6.4…20.5 mm
		Square	6.4…13 mm
		Min. shaft length	20 mm
Weight	Excl. packaging		1.230 kg

[1] The documents can be downloaded from http://siemens.com/bt/download

[2] The product environmental declarations contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

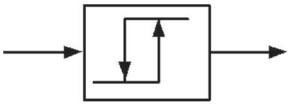
Disposal

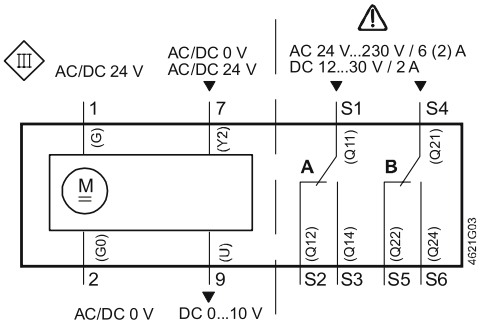
The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

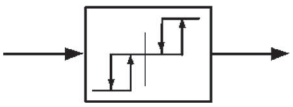
Internal diagrams

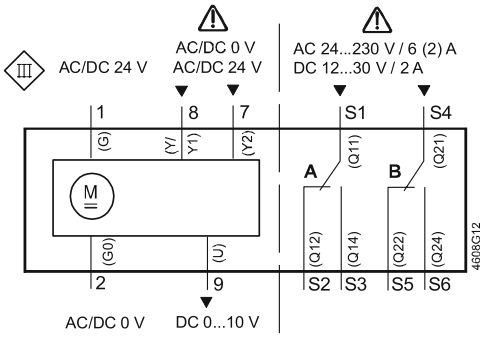
2-position control



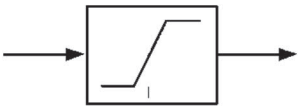


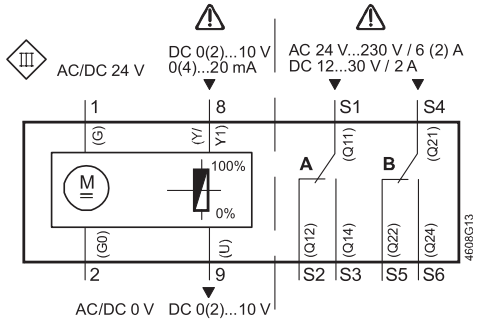
3-position control





Modulating control

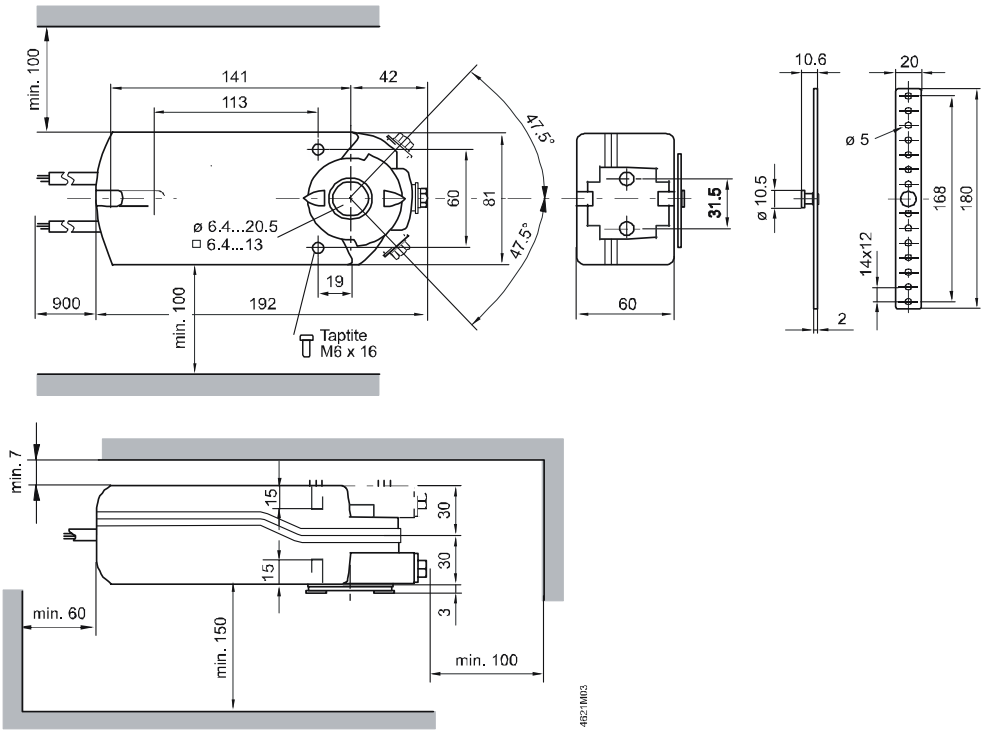




Cable designations

Pin	Cable				Meaning
	Code	No.	Color	Abbreviation	
Actuators	G	1	Red	RD	AC/DC 24 V system potential
AC/DC 24 V	G0	2	Black	BK	System neutral
	Y2	7	orange	OG	Pos. signal AC/DC 0 V, AC/DC 24 V "close"
	Y/Y1	8	gray	GY	Pos. signal DC 0 (2)…10 V 0 (4)…20 mA or Pos. signal AC/DC 0 V, AC/DC 24 V "open"
	U	9	pink	PK	Position indication DC 0 (2)...10 V
Auxiliary switch	Q11	S1	gray/red	GYRD	Switch A input
	Q12	S2	gray/blue	GYBU	Switch A Normally closed contract
	Q14	S3	gray/pink	GYPK	Switch A Normally open contact
	Q21	S4	black/red	BKRD	Switch B input
	Q22	S5	black/blue	BKBU	Switch B Normally closed contact
	Q24	S6	black/pink	BKPK	Switch B Normally open contact

Dimensions



Dimensions in mm

SIEMENS

OpenAir™

Air damper actuators with spring return

GPC..1A

Electric motor-driven rotary actuators for open-close, three-position and modulating control

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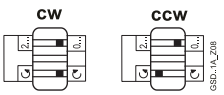
- 4 Nm nominal torque
- Operating voltage AC 24 V ~ / DC 24…48 V ⎓ or AC 100…240 V ~
- Emergency function with spring return
- Prewired with 0.9 m connecting cable
- Position indication
- Auxiliary switches for auxiliary functions

The spring return actuator drives the damper to the desired operating position after connecting the operating voltage. At the same time, the spring return, integrated in the actuator, is tensioned. In the event of a loss of operational voltage, the spring return automatically drives the damper to the defined emergency position.

- Brushless, robust DC motors ensure reliable operation regardless of load.
- The damper actuators do not require an end position switch, are overload proof, and remain in place upon reaching the end stop.
- The gears are maintenance free and low noise.
- Simple and reliable shaft fixation.
- Mounting bracket included.

The spring preload of 5° ensures safe closure of the air dampers.

- Rotary actuator with spring return. Used on ventilation and air conditioning plants to operate air dampers that must be rotated to a defined emergency position during a power outage.
- For damper areas up to 0.6 m^2, friction dependent.
- Suitable for use with modulating controllers (DC 0/2...10 V), open-close or three-position controllers.
- For directly driven zone dampers to control air flow in air ducts.
- We recommend a minimum pulse length of 500 ms on rotary actuators operated with 3-point control to ensure continuous and accurate operation.

Type	AC 24 V ~ / DC 24…48 V ⎓	GPC12..1A	GPC13..1A	GPC16..1A
	AC 100…240 V ~	GPC32..1A		GPC361.1A
Control type		Open-close	Three-position	Modulating control
Rotary direction		Clockwise (cw) or counter-clockwise (ccw) direction depends on the mounting position on the damper shaft …		
			… on the type of control.	... on the type of control … on the setting of the rotary direction DIL switch (cw / ccw) 
Emergency function		In the event of a power outage or switching off operating voltage, the spring return drives the actuator and damper, connected by the damper shaft, to the defined emergency position.		
Position indication: Mechanical		Rotary angle position indication by a position indicator.		
Position indication: Electrical				• Output voltage U = DC 0/2...10 V is generated proportional to the rotary angle. • U depends on the rotary direction of the DIL switch setting.
Auxiliary switches		Fixed position 5° / 85°		

Housing

The housing consists essentially of flame retardant, non brominated, non chlorinated glass fibre reinforced plastic.

Typ	Stock number	Control	Operating voltage	Position indicator U = DC 0/2…10 V	Aux. switches	Rotary direction switch	Aux. power supply DC 24 V (G+)
GPC121.1A	S55499-D233	Open-close	AC 24 V ~ / DC 24…48 V ⎓	–	–	–	–
GPC126.1A	S55499-D234				2		
GPC131.1A	S55499-D235	Three-position			–		
GPC136.1A	S55499-D236				2		
GPC161.1A	S55499-D237	Modulating		yes	–	yes	
GPC166.1A	S55499-D238				2		
GPC321.1A	S55499-D239	Open-close	AC 100…240 V ~	–	–	–	–
GPC326.1A	S55499-D240				2		
GPC361.1A	S55499-D241	Modulating		yes	–	yes	yes

Topic	Title	Document ID
Data sheet	Air damper actuators with spring return GPC..1A	A6V10636100_en--
Mounting instructions	Rotary-type actuator GPC..1A	A6V10636095_----

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

http://siemens.com/bt/download

Safety

⚠ 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.
- Use only properly trained technicians for mounting, commissioning, and servicing.

Engineering

Auxiliary switches

Auxiliary switches cannot be added in the field.

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers
Risk of fire and injury due to short-circuits

- Adapt the line diameters as per local regulations to the rated value of the installed fuse.

Maintenance

The rotary actuators with spring return GPC..1A are maintenance-free.

Disposal

The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive 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.

Power supply (GPC..1A)		
Operating voltage (SELV/PELV) / Frequency		AC 24 V ~ ±20 % (19.2…28.8 V ~) / 50/60 Hz DC 24…48 V ⎓ ±20 % (19.2…57.6 V ⎓) [1]
Power consumption running	GPC12..1A GPC13..1A	4.3 VA / 2.7 W
	GPC16..1A	3.7 VA / 2.2 W
Power consumption holding	GPC12..1A GPC13..1A	2.6 VA / 1.5 W
	GPC16..1A	2.7 VA / 1.5 W

Power supply (GPC3..1A)		
Operating voltage / Frequency		AC 100…240 V ~ ±10 % (90…264 V ~) / 50/60 Hz
Power consumption running	GPC32..1A GPC361.1A	6.9 VA / 2.9 W 6.7 VA / 2.9 W
Power consumption holding	GPC32..1A GPC361.1A	4.8 VA / 1.9 W 4.5 VA / 1.8 W

Functional data		
Nominal torque		4 Nm
Nominal rotational angle Maximum rotational angle (mechanically limited)		90° 95° ± 2°
Runtime at nominal rotational angle 90°		60 s
Closing time with return spring (on power failure) 90°		15 s
Duty cycle		100 %
Direction of rotation		Clockwise / counterclockwise
Mechanical life		100 000 cycles
Sound power level	Actuator Spring return	40 dB(A) 55 dB(A)

Inputs		
Positioning signal for GPC12..1A Operating voltage AC 24 V ~ / DC 24…48 V ⎓ / 0 V	(wires 1-2/G-G0)	open / close
Positioning signal for GPC32..1A Operating voltage AC 100…240 V ~	(wires 3-4/L-N)	open / close
Positioning signal for GPC13..1A Operating voltage AC 24 V ~ / DC 24…48 V ⎓ Switching current	(wires 1-6/G-Y1) (wires 1-7/G-Y2)	open close typically 8 mA
Positioning signal for GPC16..1.A Input voltage Current consumption Input resistance Max. permissible input voltage	(wires 8-2/Y-G0)	DC 0/2…10 V ⎓ 0.1 mA >100 kΩ DC 35 V

Outputs		
Position indicator Output signal (GPC16..1.A) Output signal (GPC361.1.A) Output voltage U Max. output current	(wires 9-2/U-G0) (wires 9-2/U-G-)	 DC 0...10 V ⎓ DC ±1 mA
Protected against faulty wiring		max. AC 24 V ~ / DC 24…48 V ⎓
Aux. power supply (GPC361.1A)	(wires 1-2/G+-G-)	DC 24 V ⎓ ±20 %, max. 10 mA

Auxiliary switches		
Switching voltage Contact rating		AC 24…250 V ~ / DC 12…30 V ⎓ 6 A resistive, 2 A inductive, min. 10 mA @ AC 4 A resistive, 2 A inductive, min. 10 mA @ DC 30 V ⎓ 0.8 A res., 0.5 A inductive, min. 10 mA @ DC 60 V ⎓
Electric strength auxiliary switches against housing		AC 4 kV
Factory switches setting:	Switch A / Switch B	5° / 85° (fixed position)
Mixed operation (AC 24 V ~ / DC 24…48 V ⎓ and AC 100…240 V ~) is not permissible.		

Connection cables	
Cable length	0.9 m
Cross-section	0.75 mm^2

Degree of protection	
Insulation protective class AC 24 V ~ / DC 24…48 V ⎓ AC 100…240 V ~	As per EN 60730 III II
Housing protection	IP54 as per EN 60529

Environmental conditions	
Operation – Climatic conditions – Mounting location – Temperature (extended) – Humidity, non-condensing	IEC 60721-3-3 Class 3K5 Interior, weather-protected -32...+55 °C <95 % r.F.
Transportation – Climatic conditions – Temperature (extended) – Humidity, non-condensing	IEC 60721-3-2 Class 2K3 -32...+70 °C <95 % r.F.
Storage – Climatic conditions – Temperature (extended) – Humidity, non-condensing	IEC 60721-3-1 Class 1K3 -32...+50 °C <95 % r.F.
Mechanical conditions	Class 3M3

Standards, directives and approvals	
Product standard	EN 60730 Part 2-14 / Particular requirements for electric actuators
Electromagnetic compatibility (Applications)	For use in residential, commerce, light-industrial and industrial environments
EU Conformity (CE)	A5W00029693 [2]
RCM Conformity	A5W00029694 [2]
EAC Conformity	Eurasian conformity
UL	UL [1] according UL 60730 http://ul.com/database cUL [2] according CSA-C22.2 No. 24-93

Environmental compatibility
The product environmental declaration A5W00030347-A [3] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions	
Actuator W x H x D	See "Dimensions" p. 9
Damper shaft round Square Min. shaft length Shaft hardness	 8…15 mm 6…11 mm 20 mm <300 HV

Weight	
Excl. packaging	Max. 0.55 kg, without switches Max. 0.8 kg, with switches

[1] Safety low voltage actuators without switches

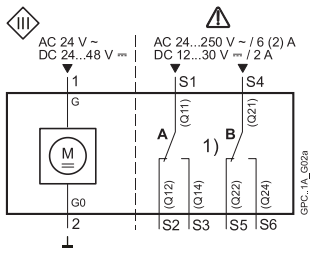
[2] Safety low voltage actuators without switches max. DC 30 V ⎓

[3] The documents can be downloaded from http://siemens.com/bt/download.

Internal Diagrams

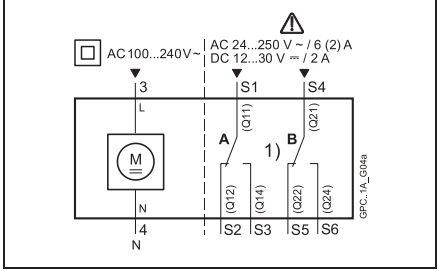
GPC12..1A (Open / close)

AC 24 V ~ / DC 24…48 V ⎓



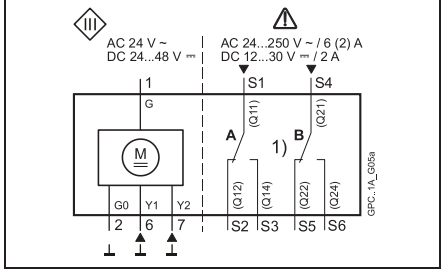
GPC32..1A (Open / close)

AC 100…240 V ~



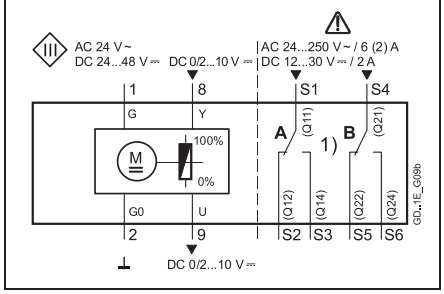
GPC13..1A (Three-position)

AC 24 V ~ / DC 24…48 V ⎓



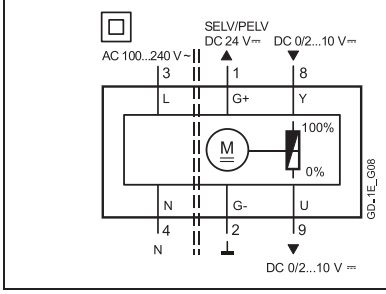
GPC16..1A (Modulating control)

AC 24 V ~ / DC 24…48 V ⎓

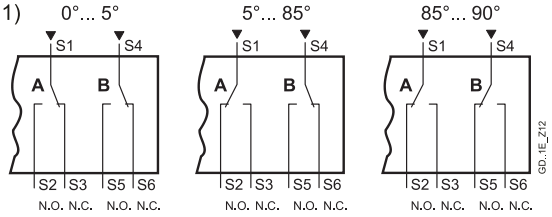


GPC361.1A (Modulating control)

AC 100…240 V ~



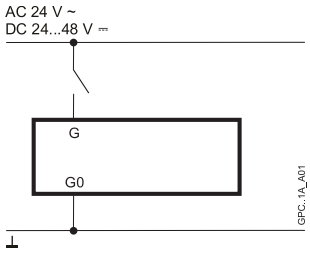
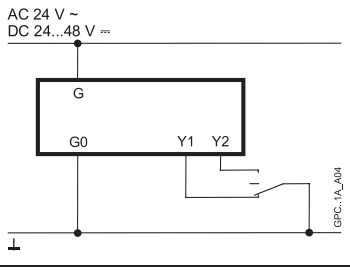
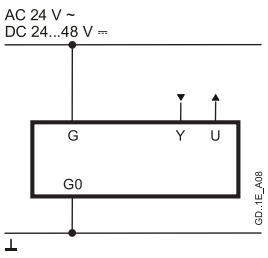
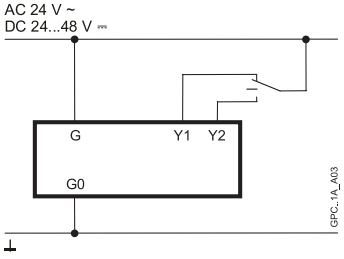
1) 0°... 5° 5°... 85° 85°... 90°



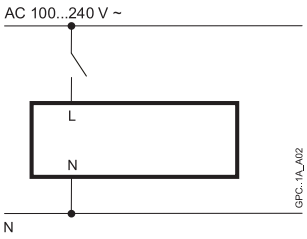
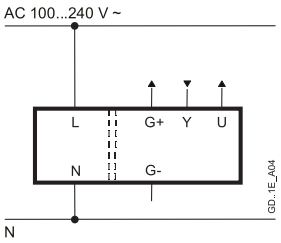
Actuator Position	**Switch A** Common S1 connected to	**Switch B** Common S4 connected to
0°…5°	S3	S6
5°…85°	S2	S6
85°…90°	S2	S5

Connection diagrams

GPC1..1A (AC 24 V ~ / DC 24…48 V ⎓)

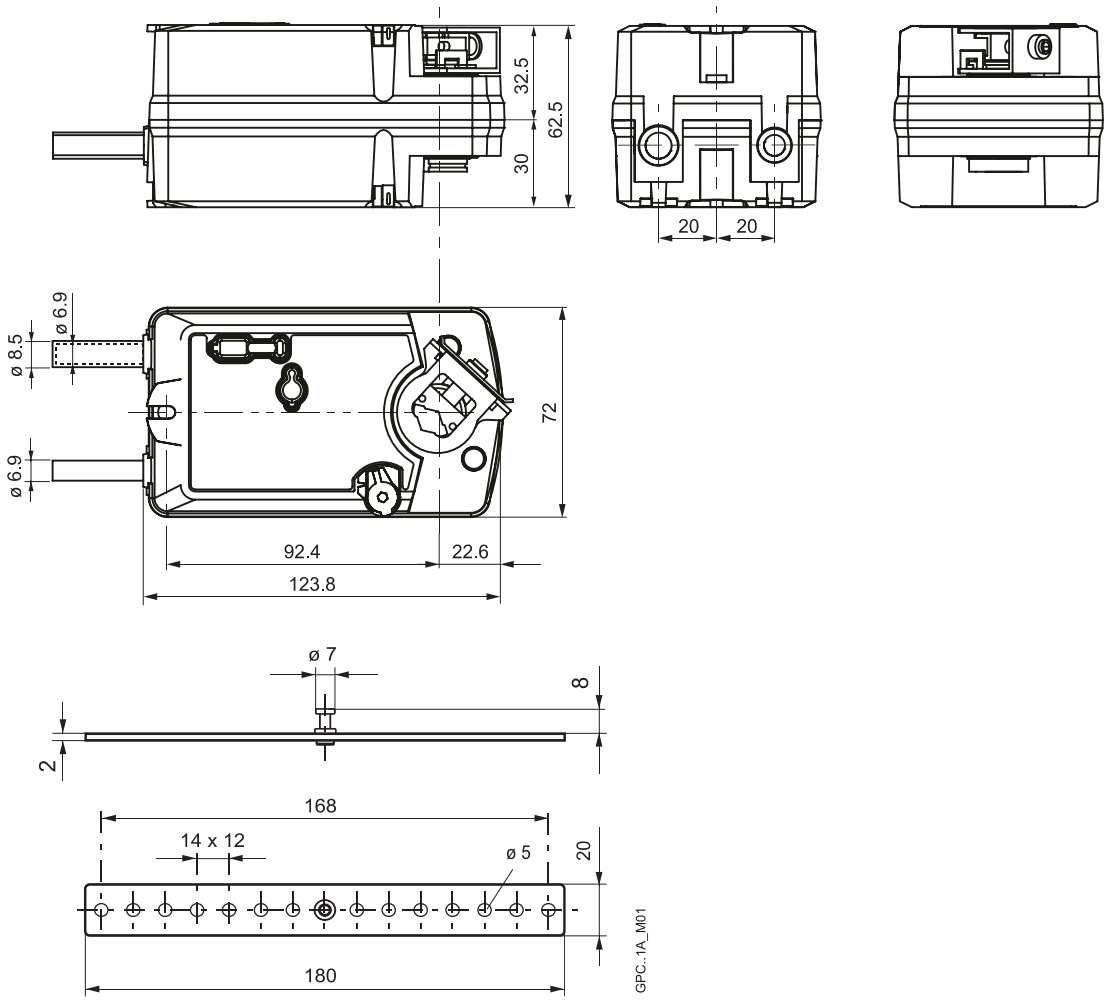
Open-close control	**Three-position control**	**Modulating control**
		
		

GPC3..1A (AC 100…240 V ~)

Open-close control	Modulating control
	

Cable labeling

Connection	Cable				Meaning
	Code	No.	Color	Abbreviation	
Actuators	G	1	red	RD	System potential AC 24 V ~ / DC 24…48 V ⎓
AC 24 V ~	G0	2	black	BK	System neutral
DC 24…48 V ⎓	Y1	6	purple	VT	Pos. signal AC/DC 0 V, AC 24 V ~ / DC 24…48 V ⎓, "open" (GPC13..1A)
	Y2	7	orange	OG	Pos. signal AC/DC 0 V, AC 24 V ~ / DC 24…48 V ⎓, "close" (GPC13..1A)
	Y	8	grey	GY	Signal in (GPC16..1A)
	U	9	pink	PK	Signal out (GPC16..1A)
Actuators	L	3	brown	BN	Line AC 100…240 V ~
AC 100…240 V ~	N	4	light blue	BU	Neutral conductor
	G+	1	red	RD	System potential DC 24V ⎓ (GPC361.1A)
	G-	2	black	BK	System neutral (GPC361.1A)
	Y	8	grey	GY	Signal in (GPC361.1A)
	U	9	pink	PK	Signal out (GPC361.1A)
Auxiliary switch	Q11	S1	grey/red	GY RD	Switch A input
	Q12	S2	grey/blue	GY BU	Switch A normally open contact
	Q14	S3	grey/pink	GY PK	Switch A normally closed contact
	Q21	S4	black/red	BK RD	Switch B input
	Q22	S5	black/blue	BK BU	Switch B normally open contact
	Q24	S6	black/pink	BK PK	Switch B normally closed contact



Dimensions in mm

OpenAir™

Air damper actuators

GQD...1

Rotary version, AC/DC 24 V and AC 230 V

GQD…1

- **Electric motor-driven actuators for two-position and three-position control as well as DC 0…10 V control**
- **2 Nm nominal torque**
- **AC/DC 24 V or AC 230 V rated voltage**
- **Prewired with 0.9 m connecting cable**
- **Spring return**
- **Auxiliary switch for auxiliary functions**

Use

- For damper areas up to 0.3 m², friction dependent.
- For directly driven zone dampers to control air flow in air ducts.

Type summary

Spring return
rotary actuators GQD

Type	Operating voltage	Control signal	Cable length	Coupling	Auxiliary switch
GQD121.1A	AC/DC 24 V	2-position	0.9 m	8…15 mm	-
GQD126.1A	AC/DC 24 V	2-position	0.9 m	8…15 mm	yes
GQD321.1A	AC 230 V	2-position	0.9 m	8…15 mm	-
GQD326.1A	AC 230 V	2-position	0.9 m	8…15 mm	yes
GQD131.1A	AC 24 V / DC 24…48 V	3-position	0.9 m	8…15 mm	-
GQD136.1A	AC 24 V / DC 24…48 V	3-position	0.9 m	8…15 mm	yes
GQD161.1A	AC 24 V / DC 24…48 V	DC 0…10 V	0.9 m	8…15 mm	-
GQD166.1A	AC 24 V / DC 24…48 V	DC 0…10 V	0.9 m	8…15 mm	yes

Functions

Type	**GQD121.1A GQD126.1A GQD321.1A GQD326.1A**	**GQD131.1A GQD136.1A**	**GQD161.1A GQD166.1A**
Control type	2-position	3-position	DC 0…10 V
Direction of rotation	Clockwise or counter-clockwise movement depends on the actuator's mounting position on the damper shaft…		
	-	…as well as the type of control	-
Spring return	On power failure or when the operating voltage is switched off, the spring return moves the rotary actuator to its mechanical zero position.		
Auxiliary switch	GQD...6.1A: Set switching points at 5° or 85°.		

Technical data

⚠ Power supply
AC/DC 24 V

Operating voltage AC / frequency		AC 24 V ± 20% ; 50 / 60 Hz
Operating voltage DC		DC 24 V ± 15%
Power consumption		
GQD121.1A / GQD126.1A:	(running)	6.5 VA / 4.5 W
	(holding)	4 VA / 2.5 W

⚠ Supply voltage
AC 24 V
DC 24…48 V

Operating voltage AC / frequency		AC 24 V ± 20% ; 50/60 Hz
Operating voltage DC		DC 24…48 V ± 20%
Power consumption		
– GQD131.1A / GQD136.1A:	(running)	4 VA / 2.5 W
	(holding)	3 VA / 1.5 W
– GQD161.1A / GQD166.1A:	(running)	4.5 VA / 3 W
	(holding)	3.5 VA / 2 W
Safety extra-low voltage (SELV) or Protective extra-low voltage (PELV) as per		HD 384
Requirements for external safety isolating		

	transformer (100% duty cycle)		EN 61 558
	Fuse for incoming supply line (fast)		2 A
⚠ Supply voltage AC 230 V	Operating voltage / Frequency		AC 230 V ± 15%; 50 / 60 Hz
	Fuse for incoming supply line (fast)		2 A
	Power consumption		
	GQD321.1A / GQD326.1A:	(running)	10 VA / 4.5 W
		(holding)	7 VA / 3 W
Functional data	Nominal torque		2 Nm
	Maximum torque		6 Nm
	Nominal rotational angle		90°
	Maximum rotational angle (mechanically limited)		95 ± 2°
	Runtime at nominal rotational angle 90°		30 s
	Closing time with spring return (on power failure)		15 s
	Duty cycle		100%
	Direction of rotation		Clockwise/counter-clockwise
	Mechanical life		60 000 cycles
Positioning signal for GQD131.1A / GQD136.1A	Contact voltage		AC 24 V / DC 24…48 V or AC 0 V
	Contact current		8 mA typical
Positioning signal for GQD161.1A / GQD166.1A	Input voltage Y (max.)		DC 0…35 V
	Working range Y		DC 0…10 V
Auxiliary switch	AC power		
	– Switching voltage		AC 24...230 V
	– Rated voltage resistive / inductive		6 A / 2 A
	No mixed operation AC 24 V / 230 V		
	DC power		
	– Switching voltage		DC 12…30 V
	– Rated current		DC 2 A
	Factory switch setting		
	– Switch A (set)		5°
	– Switch B (set)		85°
Connection cables	Cable length		0.9 m
	Cross-section		0.75 mm^2
Housing type	Protection as per EN 60 529		IP40
Protection class	Insulation protective class		EN 60 730
	– AC 230 V		⧈
	– AC/DC 24 V		⧫
Environmental conditions	Operation		IEC 721-3-3
	– Climatic conditions		Class 3K5
	– Mounting location		Interior, weather-protected
	– Temperature (extended)		-32...+55 °C
	– Humidity, non-condensing		< r.h. 95%
	Transportation		IEC 721-3-2
	– Climatic conditions		Class 2K3
	– Temperature (extended)		-32…+70 °C
	– Humidity, non-condensing		< 95% r.h.
	Storage		IEC 721-3-1
	– Climatic conditions		Class 1K3
	– Temperature (extended)		-32…+50 °C
	– Humidity, non-condensing		< 95% r.h.
	Mechanical conditions		Class 2M2

Standards	Product safety	
	Automatic electrical controls for household and similar use	IEC/EN 60 730-2-14 (Type 1)
	Electromagnetic compatibility (Application)	For residential, commercial and industrial environments
	EU Conformity (CE)	A5W00004364 [1]
	RCM Conformity	A5W00004365 [1]
	Product environmental declaration [2]	CM2E4604E [1]
Dimensions	Actuator	
	W × H × D	See "Dimensions"
	Damper shaft	
	– Rectangular	6…11 mm
	Min. length	20 mm
	Max. shaft hardness	300 HV
	– Round	8…15 mm
	Min. length	20 mm
	Max. shaft hardness	300 HV
Weight	Excl. packaging	
	– GQD121.1A	0.480 kg
	– GQD126.1A	0.600 kg
	– GQD321.1A	0.490 kg
	– GQD326.1A	0.615kg
	– GQD131.1A	0.500 kg
	– GQD136.1A	0.620 kg
	– GQD161.1A	0.500 kg
	– GQD166.1A	0.620 kg

[1] The documents can be downloaded from http://siemens.com/bt/download

[2] The product environmental declaration contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Mechanical design

Basic components

Housing	Fiberglass-reinforced plastic
Gear train	Maintenance-free, noise-free

Safety

⚠ 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.
- Use only properly trained technicians for mounting, commissioning, and servicing.

STOP

This section explains general and system-specific regulations for mains and operating voltages. It also contains important information on your own safety and that of your plant.

Intended use

Use these actuators as described in the basic system documentation for the applied control systems. In addition, take account of all actuator-specific features and conditions as described in the brief description on the front page of this data sheet (bold print) as well as the sections "Use", "Engineering notes", and "Technical data".

⚠

Sections flagged with the warning symbol to the left contain safety-related requirements and restrictions that must be adhered to at all times to prevent physical injury and equipment damage.

⚠ AC/DC 24 V supply

Operate the actuators only on safety extra-low voltage (SELV) or protective extra-low voltage (PELV) as per HD 384.

⚠ AC 230 V supply

The actuators are double-insulated and there is no connection for the protective ground.

⚠ Auxiliary switch

Apply only mains voltage or protective extra-low voltage to the switching outputs of the auxiliary switch. Mixed operation is not allowed. Operation at various phases is not allowed.

CAUTION

Do not open the actuators!

- The actuators are maintenance-free.
- Only the manufacturer may carry out repair work.
- Opening the actuator will void the warranty.
- Spring-return actuators contain pretensioned springs. Only trained staff may open this type of actuator (special tools required).

Electric, parallel connection of actuators

Up to 10 actuators of the same type can be electrically wired in parallel; cable length and cable cross-sections must be observed.

Required actuator type

Selection of the actuator depends on several torque factors. After obtaining the damper torque rating (Nm/m²) from the manufacturer and determining the damper area, calculate the total torque required to move the damper as follows:

Spring return damper actuators:

IF total torque (SF[1]):	Use type:
≤ 2 Nm	GQD…1.1A / GQD...6.1.A (2 Nm)
≤ 7 Nm	GMA…1 (7 Nm)
≤ 18 Nm	GCA…1 (18 Nm)

[1] Safety factor SF: When calculating the required torque, non-definable variables such as slight misalignment, damper age, etc. must be included as a safety factor. We recommend a safety factor of 0.8 (or 80 % of the torque characteristic).

Transformer sizing for AC 24 V

Use safety insulating transformers as per EN 61 558 with double insulation designed for 100 % duty to supply SELV or PELV circuits..

Observe all local safety rules and regulations pertaining to the sizing and protection of transformers.

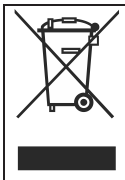
Determine the transformer power consumption by adding up the power consumption in VA for all actuators used.

Wiring and commissioning	Refer to the sections “Commissioning notes” and “Wiring diagrams” in this data sheet as well as to the HVAC job drawings.

Mounting notes

Mounting instructions	All information and steps to properly prepare and mount the actuator are listed in the mounting instructions supplied with the actuator.
Mounting position	Mount the actuator in a position which ensures easy access to the cables and to the shaft adapter. See "Dimensions”.
Damper shafts	Information on minimum length and diameter for the damper shaft is available in the "Technical data" section.

Disposal



The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU 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.

Commissioning notes

Reference	For commissioning, the following reference documentation must be available:: • This data sheet. • HVAC job diagram.
Environmental conditions	Check to ensure that all permissible values as contained in the section “Technical data" have been observed.
Mechanical check	• Check for proper mounting and ensure that all mechanical settings correspond to the plant-specific requirements. Additionally, ensure that the dampers are tightly closed when in the closed position. • Check the direction of rotation. • Fasten the actuator securely to avoid twisting and blocking of the actuator.
Electrical check	• Check to ensure that the cables are connected in accordance with the plant wiring diagram (see “Wiring diagrams”). • The operating voltage AC/DC 24 V (SELV/PELV) or AC 230 V must be within the tolerance values.

Functional check

GQD121.1A GQD126.1A	Power supply AC/DC 24 V wires red (1), black (2) • Supply ON: Actuator turns clockwise • Supply OFF: Actuator runs counter-clockwise (mechanical, via spring)
GQD321.1A GQD326.1A	Power supply AC 230 V wires brown (3), blue (4) • Supply ON: Actuator turns clockwise • Supply OFF: Actuator runs counter-clockwise (mechanical, via spring)

GQD131.1A
GQD136.1A

Power supply AC 24 V / DC 24…48 V wires red (1), black (2)
Positioning signal AC 24 V / DC 24…48 V or AC 0 V

- Wire violet (6) ON: Actuator turns clockwise
- Wire orange (7) ON: Actuator turns counter-clockwise
- Wire violet (6) and wire orange (7) ON: Actuator turns counter-clockwise
- Wire violet (6) and wire orange (7) OFF: Actuator stops
- Supply OFF: Actuator runs counter-clockwise (mechanical, via spring)

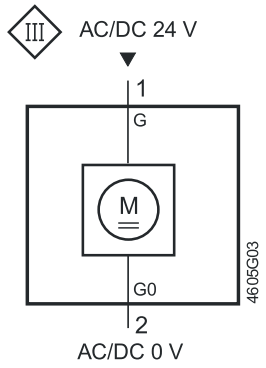
GQD161.1A
GQD166.1A

Power supply AC 24 V / DC 24…48 V wires red (1), black (2)
Positioning signal DC 10 V

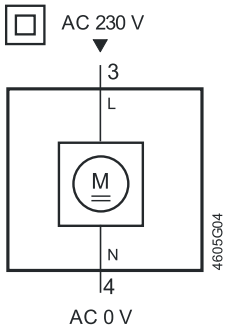
- Wire gray (8) ON: Actuator turns clockwise
- Wire gray (8) OFF: Actuator turns counter-clockwise (electric)
- Supply OFF: Actuator runs counter-clockwise (mechanical, via spring)

Wiring diagrams

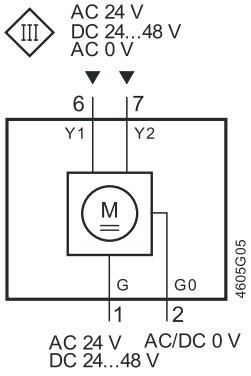
GQD121.1A



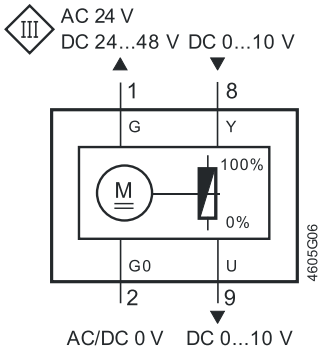
GQD321.1A



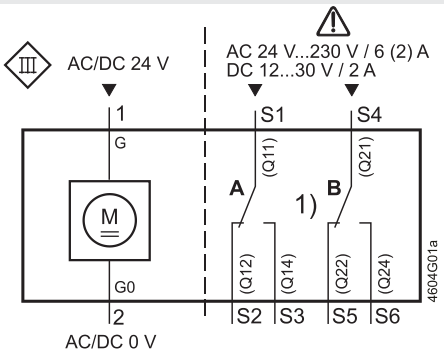
GQD131.1A



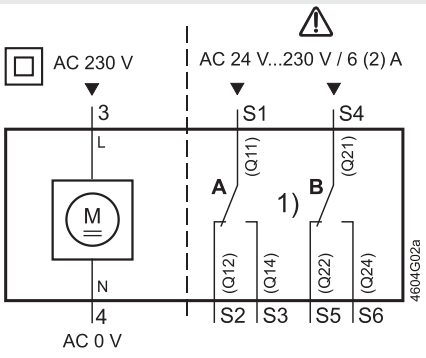
GQD161.1A



GQD126.1A



GQD326.1A



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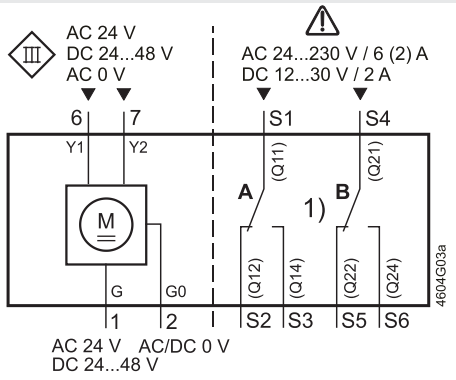
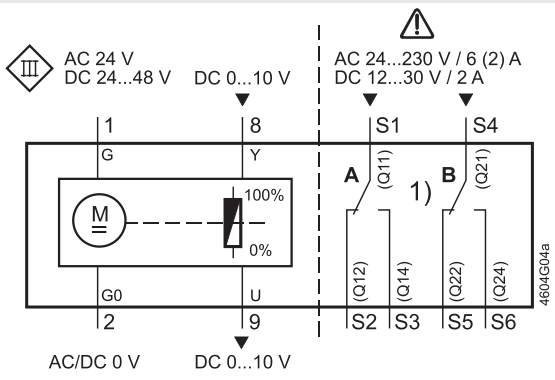
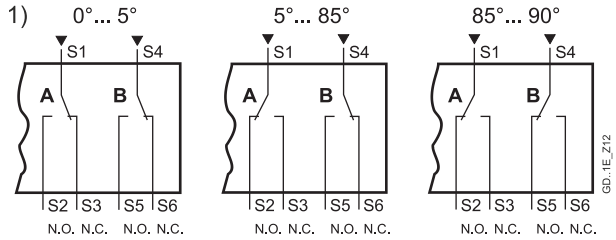


GQD166.1A



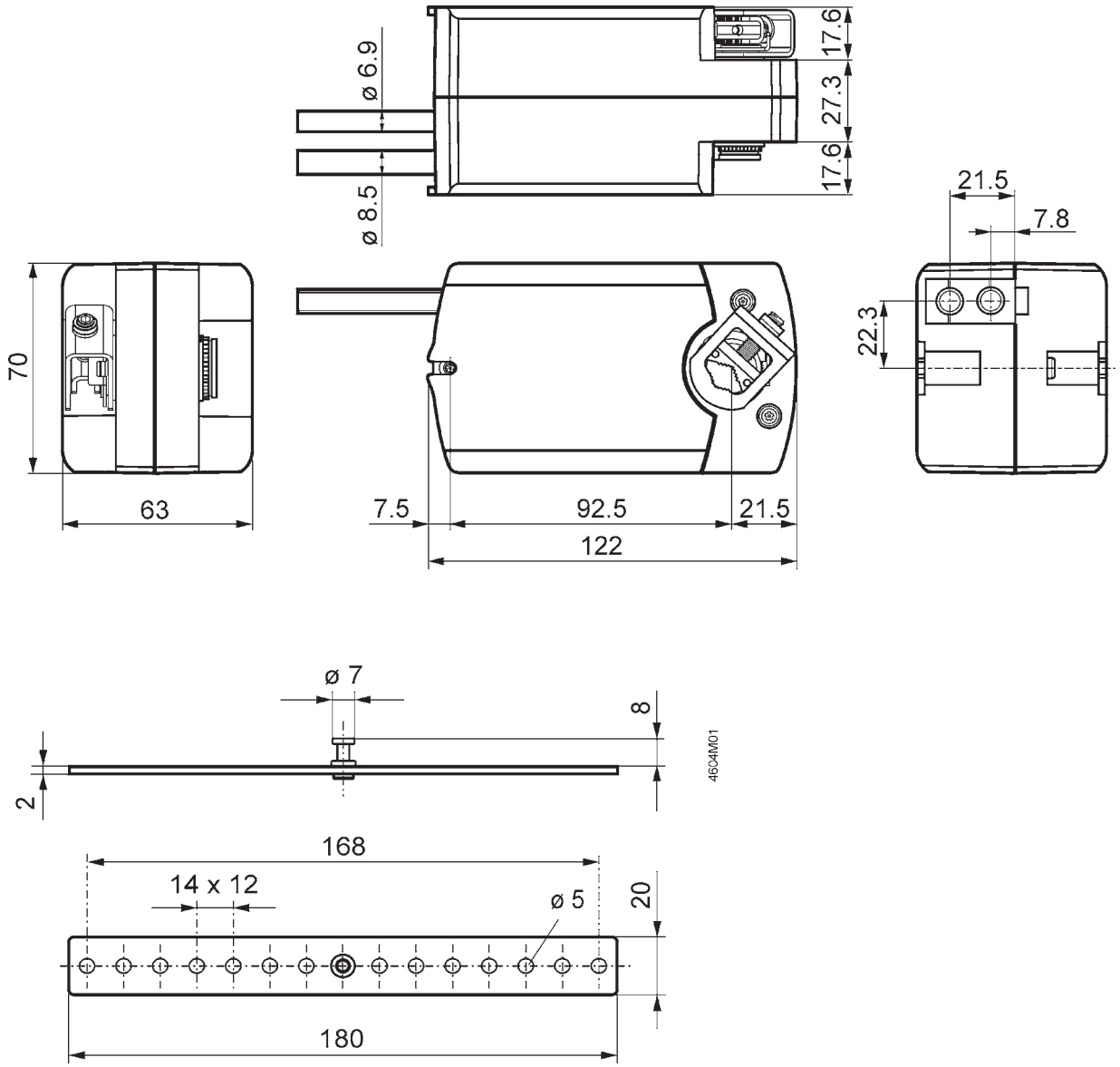


Actuator Position	Switch A Common S1 connected to	Switch B Common S4 connected to
0°…5°	S3	S6
5°…85°	S2	S6
85°…90°	S2	S5

Cable labeling

Connection	Cable Code	No.	Color	Abbr.	Description
GQD121.1A **GQD126.1A** AC/DC 24 V	G	1	red	RD	System potential AC/DC 24 V
	G0	2	black	BK	System neutral
GQD321.1A **GQD326.1A** AC 230 V	L	3	brown	BN	Phase AC 230 V
	N	4	blue	BU	Neutral conductor
GQD131.1A **GQD136.1A** AC 24 V DC 24…48 V	G	1	red	RD	System potential AC 24 V / DC 24…48 V
	G0	2	black	BK	System neutral
	Y1	6	violet	VT	Positioning signal clockwise AC 24 V / DC 24…48 V or AC 0 V
	Y2	7	orange	OG	Positioning signal clockwise AC 24 V / DC 24…48 V or AC 0 V
GQD161.1A **GQD166.1A** AC 24 V DC 24…48 V	G	1	red	RD	System potential AC 24 V / DC 24…48 V
	G0	2	black	BK	System neutral
	Y	8	gray	GY	Positioning signal DC 0...10 V
	U	9	pink	PK	Position indication DC 0 … 10 V
Aux. switch	Q11	S1	gray/red	GYRD	Switch A input
	Q12	S2	gray/blue	GYBU	Switch A normally open contact
	Q14	S3	gray/pink	GYPK	Switch A normally closed contact
	Q21	S4	black/red	BKRD	Switch B input
	Q22	S5	black/blue	BKBU	Switch B normally open contact
	Q24	S6	black/pink	BKPK	Switch B normally closed contact

Dimensions


ø 6.9
ø 8.5
17.6
27.3
17.6
21.5
7.8
22.3
70
63
7.5
92.5
21.5
122
ø 7
8
2
46C4M01
168
14 x 12
ø 5
20
180

SIEMENS

OpenAir™

Damper Actuato G..B111.1E/MO Modbus RTU

Damper actuator 5 / 10 Nm with Modbus communication

- GDB111.1E/MO Operating voltage AC 24 V, 5 Nm
- GLB111.1E/MO Operating voltage AC 24 V, 10 Nm
- For air-handling units (AHU) and other ventilation applications
- Operating voltage AC 24 V
- 5 and 10 Nm nominal torque
- Modbus RTU communication
- UL listed

Functions

Function	Description
Communication	Modbus RTU (RS-485), galvanically separated
Functions	- Setpoint 0..100% - Actual value for position 0..100% - Override control Open / Close / Min / Max / Stop - Setpoint monitoring and backup mode
Supported baudrates	9.6, 19.2, 38.4, 57.6, 78.4, 115.2 kbaud
Supported transmission formats	1-8-E-1, 1-8-N-1-, 1-8-O-1, 1-8-N-2
Termination	120 Ω electronically switchable
Supported Modbus function codes	03 Read Holding Registers, 04 Read Input Registers, 06 Write Single Register, 16 Write Multiple registers (max. 120 registers within one message)

For a detailed description of specific functions please refer to the product documentation CE1Z4634 [1].

Type summary

Product no.	Stock no.	Operating voltage	Positioning signal	Power consumption	Posit. time	Manual adjuster	Position feedback
GDB111.1E/MO	S55499-D191	AC 24 V	Modbus RTU	1 VA / 0,5 W 3 VA / 2,5 W [2]	150 s	Yes	Yes
GLB111.1E/MO	S55499-D199						
Please refer to data sheet **N4698** for information on accessories and spare parts.							

[2] Actuator rotates

Ordering (Example)

Product no.	Stock no.	Description	Amount
GDB111.1E/MO	S55499-D191	Damper actuator Modbus	1

Equipment combinations

Product no.	Stock no.	Description	Doc. type	Doc. number
AST20	S55499-D165	Handheld tool for commissioning and service	Datasheet	A6V10631836 [1]
			Operating manual	A6V10555077 [1]

Product documentation

Title	Topic	Document ID
Rotary damper actuators without spring return GDB/GLB..1	Detailed information about rotary actuators without spring return (5/10 Nm), incl. Modbus types	CE1Z4634 [1]
Installation Instruction	Mounting / installation instruction for rotary actuators 5 / 10 Nm	M4634 [1]

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

http://siemens.com/bt/download

For more detailed explanations on device states, functions and error display, cf. product documentation CE1Z4634 [1)].

Push-button operation

Activity	Push-button operation	Confirmation
Display current address (in reverse order)	Press button < 1s	Current address is displayed
Enter Modbus address with push-button	Press button > 1s and < 5s	See description next page
Enter push-button addressing mode (for use with Climatix™ controllers)	Press button > 5s and < 10s	LED shines orange (release button when red LED gets dark). Timeout after 1 min.
Reset to factory settings	Press button > 10s	LED flashes orange

LED colors and patterns

Color	Pattern	Description
Green	steady	Start-up
	1s on / 5s off	Fault free operation (“life pulse”)
	flashing	Bus traffic
Orange / green	1s orange / 1s green	Device is in override control
Orange	1s on / 1 off	Bus parameters not yet configured
Orange	1s on / 5s off	Backup mode entered
Red	Steady	Mechanical fault / device jammed
	1s on / 5s off	Internal error
	0.1s on / 1s off	Invalid configuration, e.g. Min = Max

Resetting the device by push button

The damper actuators can be reset by push-button:

1. Press button for >10s → LED starts flashing **orange**
2. Release button while LED still flashes → LED keeps flashing for 3s
3. If the button is pressed within these 3s, the reset is cancelled.
4. After those 3s → LED shines **red** (reset), then **green** (start-up).

[1)] Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:
http://siemens.com/bt/download

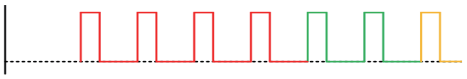
Push-button addressing

The Modbus address can be set without a separate tool by using the push-button and LED.

To display the current address, press button <1s.

Display current address (digits in reverse order)

Colors		
1-digits: **red**	10-digits: **green**	100-digits: **orange**

Example for address 124:	
LED	
Note	The address is entered and shown in reverse order.

Set new address (digits in reverse order)

1. **Enter addressing mode**: press button > 1s until LED shines **red**, then release button (before LED gets dark).
2. **Enter digits**: press button n-times → LED flashes per button press (feedback).
   Colors: 1-digits: **red** / 10-digits: **green** / 100-digits: **orange**
3. **Store digits**: press button until LED shines in color of following digits – release button,
4. **Save address**: press button until LED shines **red** (confirmation) → release button.
   An address can be stored at any time, i.e. after setting the 1-digits, or after setting the 1- and the 10-digits.
5. Entered address is repeated one times for confirmation.

Note: If button is released before LED shines red, the address is discarded.

Examples

Set address “124”:

1. Enter addressing mode
2. Set 1-digits: Press button 4-times → LED flashes **red** per button press
3. Store 1-digits: press button until LED shines **green** – release button
4. Set 10-digits: Press button 2-times → LED flashes **green** per button press
5. Store 10-digits: press button until LED shines **orange** – release button
6. Set 100-digits: Press button 1-times → LED flashes **orange** per button press
7. Store address: press button until LED shines **red** – release button
   → address is stored and displayed 1x for confirmation

Set address “50”:

1. Enter addressing mode
2. Skip 1-digits: Hold button pressed until LED shines **green** – release button
3. Set 10-digits: Press button 5-times → LED flashes **green** per button press
4. Store address (skip 100-digits): hold button pressed until LED shines **red** – release button
   → address is stored and displayed 1x for confirmation

Set address “5”:

1. Enter addressing mode
2. Set 1-digits: Press button 5-times → LED flashes **green** per button press
3. Store address: press button until LED shines **red**
   → address is stored and displayed 1x for confirmation

Modbus registers

For a detailed description of specific functions please refer to the product documentation Z4634 [1].

Reg.	Name	R/W	Unit	Scaling	Range / enumeration
Process Values					
1	Setpoint	RW	%	0.01	0..100
2	Override control	RW	--	--	0 = Off / 1 = Open / 2 = Close 3 = Stop / 4 = GoToMin / 5 = GoToMax
3	Actual position	R	%	0.01	0..100
256	Command	RW	--		0 = Ready / 1 = Adaption / 2 = Selftest 3 = ReInitDevice / 4 = RemoteFactory Reset
Parameters					
257	Opening direction	RW	--	--	0 = CW / 1 = CCW
258	Adaptive Mode	RW	--	--	0 = Off / 1 = On
259	Operating Mode	RW	--	--	1 = POS
260	MinPosition	RW	%	0.01	0..100
261	MaxPosition	RW	%	0.01	0..100
262	Actuator Running Time	R	s	1	150
513	Backup Mode	RW	--	--	0 = Go to BackupPosition 1 = Keep last position 2 = Disabled
514	Backup Position	RW	%	0.01	0..100
515	Backup Timeout	RW	s	1	0..65535
516	Startup Setpoint	RW	%	0.01	0..100
764	Modbus Address	RW	--	--	1..247 / 255 = “unassigned”
765	Baudrate	RW	--	--	0 = auto / 1 = 9600 / 2 = 19200 3 = 38400 / 4 = 57600 / 5 = 76800 6 = 115200
766	Transmission Format	RW	--	--	0 = 1-8-E-1 / 1 = 1-8-O-1 2 = 1-8-N-1 / 3 = 1-8-N-2
767	Bus Termination	RW	--	--	0 = Off / 1 = On
768	Bus Conf. Command	RW	--	--	0 = Ready / 1 = Load / 2 = Discard
769	Status	R	--	--	See below
Device information					
1281	Factory Index	R	--	--	Cf. product documentation CE1Z4634 [1]
1282-83	Factory Date	R	--	--	
1284-85	Factory SeqNo	R	--	--	
1409-16	TypeASN [Char_16..1]	R	--	--	

[1] The documents can be downloaded from http://siemens.com/bt/download

Register 769 “Status”

Status			
Bit 00	1 = Local override	Bit 06	1 = Adaption done
Bit 01	1 = Backup mode active	Bit 07	1 = Adaption in progress
Bit 02	1 = reserved	Bit 08	1 = Adaption error
Bit 03	1 = reserved	Bit 09	1 = Selftest failed
Bit 04	1 = Device jammed	Bit 10	1 = Selftest passed
Bit 05	1 = Nom. lifetime exceeded	Bit 11	1 = Invalid configuration

Supported function codes

Function codes	
03 (0x03)	Read Holding Registers
04 (0x04)	Read Input Registers
06 (0x06)	Write Single Register
16 (0x10)	Write Multiple registers (Limitation: Max. 120 registers within one message)

Notes

Safety

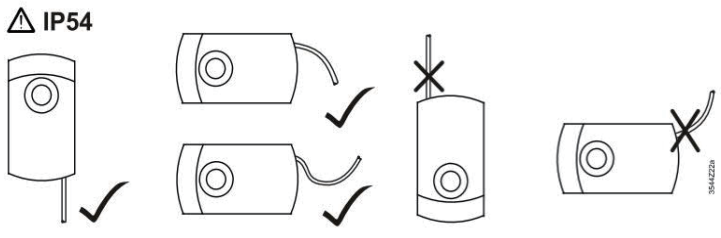
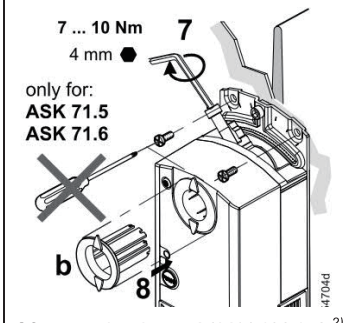
> ⚠ Caution
>
> **National safety regulations**
>
> Failure to comply with national safety regulations may result in personal injury and property damage.
>
> - Observe national provisions and comply with the appropriate safety regulations.

Mounting

- Do not open the damper actuators
- Do not use the accessory mounting holes for fixation of the damper actuators

Mounting

Mounting positions

IP54 protection in following mounting positions	Accessory mounting holes [1]
	 *Cf. mounting instr. A6V10409478* [2]

⚠ [1] Not to be used for fixation of the actuator, use anti-rotation-bracket instead.

[2] Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following internet address:

http://siemens.com/bt/download

Parameterization

The following parameters must be checked or set prior to commissioning:

Parameter	Range	Description	Factory setting
Opening direction	CW (R) / CCW (L)	Opening direction of air damper	CW (R)
Adaptive positioning	Off / On	Adaption of actual opening range to position feedback Off = No adaption / mapping 0°..90° → 0..100 % On = Pos. adaption / mapping e.g. 0°..60° → 0..100 %	Off

Commissioning workflow 1: Full or partial configuration by tool

When using the AST20 handheld tool, all bus and actuator parameters can be set.

- Connect the AST20 to the damper actuator and navigate to the bus configuration menu
- Set bus parameters as desired
- Optionally make changes on actuator parameters.

Note
With AST20, all parameters can be set using the mass configuration function. The bus parameters are included in the mass configuration function. It can be selected that the address is automatically incremented with each programmed damper actuator.

Commissioning workflow 2: Configuration over bus (full or partially)

The devices can be configured over bus if the pre-commissioning settings allow for a connection between the Modbus master / programming tool and peripheral devices (i.e. non-conflicting addresses and matching baudrate / transmission format).

- Full configuration over bus: If the address is unique per segment when powered up, the device can be accessed by the Modbus master (or programming tool) and the address and other parameters can then be set to the definitive values.
- Partial configuration over bus: If the address is not unique per segment when powered up, each device must get a non-conflicting address before connecting it to the bus (e.g. using the push-button addressing method). After addressing all devices, the remaining configuration can be done over the bus using the default settings for baudrate (auto-baud) and transmission mode for the Modbus master.
- Overwriting the bus configuration over bus uses a timeout. If „1 = Load“ is not written into Reg 768 within 30 seconds, all values are discarded.

Example: Table shows bus configuration registers before and after changing them over bus.

Reg.	Name	Pre-commissioning	New value (ex.)
764	MacAddress	46	12
765	Baudrate	0 = auto	1 = 9600
766	Transmission Mode	0 = 1-8-E-1	3 = 1-8-N-2
767	Termination	0 = Off	0 = Off
768	BusConfigCmd	0 = Ready	1 = Load

Maintenance

The damper actuators are maintenance-free.

Disconnect the electrical connections from the terminals if you want to work at the device.

Disposal

The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU 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	G..B111.1E/..	AC 24 V ± 20 % (SELV) or AC 24 V class 2 (US)
Frequency		50/60 Hz
Power consumption	at 50 Hz	
	Actuator holds	1 VA / 0.5 W
	Actuator rotates	3 VA / 2.5 W

Function data		
Positioning time for nominal rotation angle	G..B111.1E/..	150 s (50 Hz) 120 s (60 Hz)
Nominal torque	GDB..	5 Nm
	GLB..	10 Nm
Maximum torque	GDB..	< 7 Nm
	GLB..	< 14 Nm
Nominal / maximum rotation angle		90° / 95° ± 2°
Direction of rotation	Adjustable by tool or over bus	Clockwise (CW) / Counter-clockwise (CCW)

Connection cables		
Cable length		0.9 m
Power supply / Communication	Number of cores and cross-sectional area	5 x 0.75 mm^2
Service interface	Terminal strip	7-pin, grid 2.00 mm

Communication		
Communication protocol	Modbus RTU	RS-485, galvanically separated
	Number of nodes	Max. 32
	Address range	1...247 / 255 Default: 255
	Transmission formats	1-8-E-1 / 1-8-O-1 / 1-8-N-1 / 1-8-N-2 Default: 1-8-E-1
	Baudrates (kBaud)	Auto / 9.6 / 19.2 / 38.4 / 57.6 / 76.8 / 115.2 Default: Auto
	Termination	120 Ω electronically switchable Default: Off

Degree of protection		
Degree of protection	Degree of protection acc. to EN 60529 (see mounting instruction)	IP54
Safety class	Safety class acc. to EN 60730	III

Environmental conditions		
Applicable standard		IEC 60721-3-x
Operation	Climatic conditions	Class 3K6
	Mounting location	Indoors
	Temperature general	-32…55 °C
	Humidity (non condensing)	5…95 % r. h.
Transport	Climatic conditions	Class 2K3
	Temperature	-25…70 °C
	Humidity	5...95 % r. h.
Storage	Climatic conditions	Class 1K3
	Temperature	-5…45 °C
	Humidity	5...95 % r. h.

Directives and Standards			
Product standard		EN60730-x	
Electromagnetic compatibility (Application)		For residential, commercial and industrial environments	
		GDB111.1E/MO	**GLB111.1E/MO**
EU Conformity (CE)		A5W00003842 [1]	A5W00000176 [1]
RCM Conformity		A5W00003843 [1]	A5W00000177 [1]
UL, cUL	AC 24 V	UL 873 http://ul.com/database	

Environmental compatibility	
	The product environmental declaration A6V10209938 [1] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions / Weight		
Weight	Without packaging	0.6 kg
Dimensions		71 x 158 x 61 mm
Suitable drive shafts	Round shaft (with centering element)	8...16 mm (8...10 mm)
	Square shaft	6...12.8 mm
	Min. drive shaft length	30 mm
	Max. shaft hardness	<300 HV

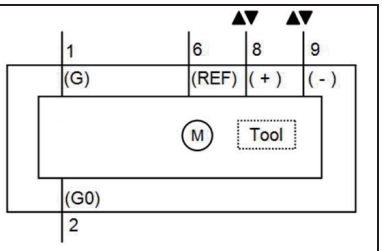
[1] The documents can be downloaded from http://siemens.com/bt/download

Diagrams

Internal diagrams

The damper actuators are supplied with a prewired connecting and communication cable. All interconnected devices must be connected to the same G0.

Core desig.	Core color	Terminal code	Description
1	red (RD)	G	System voltage AC 24 V
2	black (BK)	G0	System neutral AC 24 V
6	violet (VT)	REF	Reference
8	grey (GY)	+	Bus (Modbus RTU)
9	pink (PK)	-	Bus (Modbus RTU)

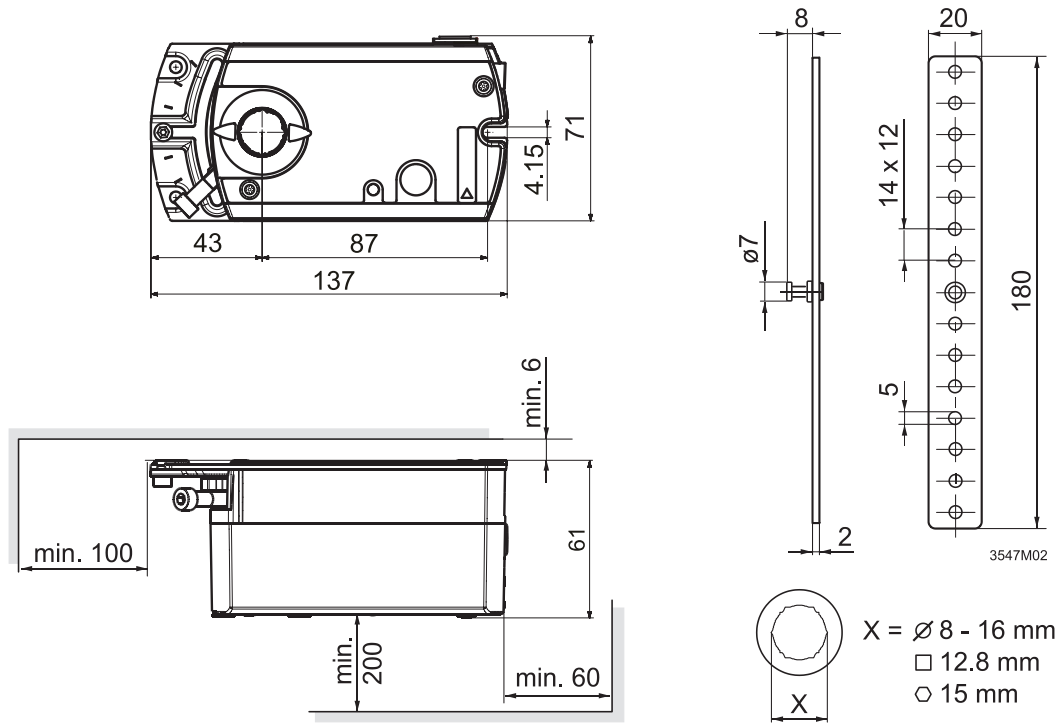


Note

The operating voltage at terminals G and G0 must comply with the requirements under SELV or PELV. Safety transformers with twofold insulation as per EN 61558 required; they must be designed to be on 100 % of the time.

Dimensions

G..B111.1E/..



Measurements in mm

SIEMENS

OpenAir™

Communicative Damper G..B111.1E/KN Actuators KNX / PL-Link

Damper actuators 5 / 10 Nm with KNX communication

- GDB111.1E/KN with 5 Nm nominal torque
- GLB111.1E/KN with 10 Nm nominal torque
- Operating voltage AC 24 V
- Supports KNX S-Mode, LTE-Mode, and PL-Link

Type summary

Product no.	Stock no.	Operating voltage	Positioning signal	Power consumption	Positioning time	Manual adjuster	Position feedback
GDB111.1E/KN	S55499-D190	AC 24 V	KNX-TP	1 VA / 0,5 W 3 VA / 2,5 W [1]	150 s	Yes	Yes
GLB111.1E/KN	S55499-D198						
Please refer to data sheet **N4698** for information on accessories and spare parts.							

[1] Actuator rotates

Ordering (Example)

Product no.	Stock no.	Description	Amount
GDB111.1E/KN	S55499-D190	Damper Actuator KNX	1

Equipment combinations

Product no.	Stock no.	Description	Doc. number / reference
ETS	Software	KNX Engineering/Commissioning Tool	www.knx.org
ABT 4.0 [2]	Software	Desigo Engineering/Commissioning Tool	A6V11159913

[2] Release planned for April 2020

Product and software versions

Product revision	Series A
Production period	From 02/2020
Bus module FW version	4.25
ETS device profile	v1d0.knxprod

The ETS device profile can be downloaded at the following Internet address:
http://siemens.com/hvac-td

Product documentation

Title	Topic	Document ID
Mounting Instruction damper actuators 5 / 10 Nm	Mounting / installation instruction for damper actuators 5 / 10 Nm without spring return	M4634
KNX bus communications	Detailed information about KNX bus communications: engineering, commissioning, addressing and settings	P3127

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:
http://siemens.com/bt/download

Notes

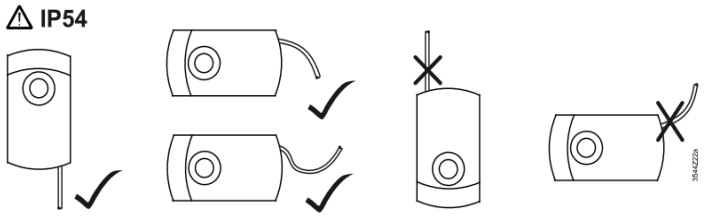
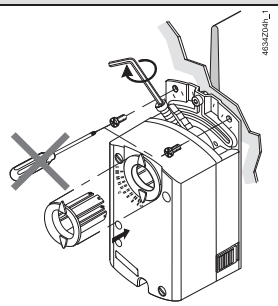
Safety

⚠ 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.

Mounting

- Do not open the damper actuators.
- Do not use the accessory mounting holes for fixation of the damper actuators. Instead use the shaft fixation screw and the enclosed anti-rotation-bracket.

Mounting positions

IP54 protection in following mounting positions	Accessory mounting holes [2]
	 *Cf. mounting instr. M4634*

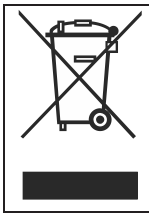
⚠ [2] Not to be used for fixation of the actuator, use anti-rotation-bracket instead.

Maintenance

The damper actuators are maintenance-free.

Disconnect the electrical connections from the terminals if you want to work at the device.

Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive 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.

HMI (Human-Machine Interface)

Push-button operation

Activity	Push-button operation	Confirmation
Enter / leave addressing mode	Press button <1 s	LED turns red or turns off
Reset to factory settings	Press button >20 s	LED flashes orange until device restarts
PL-Link connection test [4)]	Press key >2 s and <20 s	LED flashes orange 1x

LED colors and patterns

Color	Pattern	Description
Off	---	Fault free operation or device not powered
Green	steady	Connection test successful [4)]
Orange	flashing	a) Factory reset in progress b) When a connection test was triggered: wait [4)]
Red	steady	a) Device is in programming/addressing mode b) When a connection test was triggered: Connection test failed [4)]

[4)] Function or part of the function available in PL-Link operation only

Addressing and bus test with push button

The damper actuators can be set into addressing/programming mode by push-button:

- Press push button (>0.1 s and <1 s)
- KNX bus wiring OK → LED turns red until addressing/programming is finished
- KNX bus wiring not OK → LED stays dark

Reset with push button

The damper actuators can be reset to the OEM default values by push-button:

- Press push button > 20s
- LED flashes orange
- Device restarts

All parameters are set to factory settings.

The following parameters are checked or set during engineering and commissioning in the ETS engineering tool.

Parameter	Range	Description	Factory settings
Tab card “standard”			
Adaptive positioning	On / Off	Adaption of actual (if mechanically limited) opening range to position feedback 0...100% Off = No adaption / On = Adaption active	Off
Backup timeout	0..60 min 0 min = disabled	Time interval to detect communication interruption. If disabled, the actuator drives to the last received setpoint until a new valid setpoint is received.	30 min.
Backup mode	Backup position Keep last position	Actuator behavior when the communication timeout has been exceeded (no setpoint received within the defined time interval). ▪ Backup position: Actuator drives to defined position ▪ Keep last position: Actuator keeps position without flow control	Backup position
Backup position	0…100%	Position the damper drives to in case of communication interruption	50%
Tab card “advanced”			
Hysteresis (COV) damper position	1...20%	Threshold for the damper position. COV below this value are not sent over the bus	1%
Min. repetition time damper position	10...900 s	Minimum waiting time until a COV above the hysteresis threshold is sent over the bus	10 s
Minimum damper position	0...100%	Electronic lower position limit	0%
Maximum damper position	0…100%	Electronic upper position limit	100%
Override position 1	0...100%	Damper position which can be triggered by the corresponding group object (with override priority)	0%
Override position 2	0…100%	Damper position which can be triggered by the corresponding group object (with override priority)	100%

KNX Group Objects

No.	Name in ETS	Object function	Flags					Data point type KNX				Range
			C	R	W	T	U	ID	DPT_Name	Format	Unit	
1	Fault information	Transmit	1	1	0	1	0	219.001	_AlarmInfo	6 Byte	---	cf. Description below
2	Fault state	Transmit	1	1	0	1	0	1.005	_Alarm	1 bit	---	0 = No alarm 1 = Alarm
3	Fault transmission	Receive	1	0	1	0	1	1.003	_Enable	1 bit	---	0 = Disable 1 = Enable
4	Setpoint	Receive	1	1	1	0	1	5.001	_Scaling	1 Byte	%	0…100%
5	Damper position	Transmit	1	1	0	1	0	5.001	_ Scaling	1 Byte	%	0...100%
9	Overridden	Transmit	1	1	0	1	0	1.002	_Bool	1 bit	---	0 = False 1 = True
10	Override position 1	Receive	1	1	1	0	1	1.003	_Enable	1 bit	---	0 = Disable 1 = Enable
11	Override position 2	Receive	1	1	1	0	1	1.003	_Enable	1 bit	---	0 = Disable 1 = Enable
12	Opening direction	Read-only	1	1	0	0	0	1.012	_Invert	1 bit	---	0 = Not Inverted 1 = Inverted

Description of Group Objects

1 Fault information

If group object #3 ”fault transmission” is set to “on”, the following faults can be transmitted if they occur. In that case, group object #2 value changes to “alarm”.

Error	Group obj. #1	Description	Resolution
Device jammed	XX 00 0A 03 0C 05	Target position cannot be reached due to mechanical blockage.	Remove blockage (visual inspection required). Or invert Opening direction, if it is set wrongly. Or switch on adaptive positioning, if mechanical limits are intended.
Backup mode entered	XX 01 01 02 0C 05	Actuator is in backup mode (cf. respective parameter setting)	Actuator leaves Backup mode when receiving a setpoint.
Operating hours notification	XX 01 0A 04 0C 05	Appears after a cumulated motor running time of 365 days	Check device status and control loop sensitivity

2 Fault state

Indicates whether the actuator is in fault state. If yes, read out group object #1.

3 Fault transmission

Enabling/ disabling the fault transmission. Fault transmission is disabled by default → no faults are transmitted from the actuator over the KNX bus.

4 Setpoint

Setpoint 0…100% for volume flow or position, depending on the operating mode.

5 Damper position

Relative damper position 0…100%. An opening range less than 0…90° can be normalized to 0...100% if adaptive positioning is set to “on”.

8 Fault state

Identical with group object #2, used for compatibility reasons.

9 Overridden

Indicates whether the VAV controller is in override control either by a programming tool connected to the HMI or by objects #10 / #11.

10 Override position 1

When the object is triggered, the actuator drives to the override position 1 defined by the respective ETS parameter.

11 Override position 2

When the object is triggered, the actuator drives to the override position 2 defined by the respective ETS parameter.

12 Opening direction

Opening direction of the air damper.

Technical data

Power supply		
Operating voltage	G..B111.1E/..	AC 24 V ± 20 % (SELV) or AC 24 V class 2 (US)
Frequency		50/60 Hz
Power consumption	at 50 Hz	
	Actuator holds	1 VA / 0.5 W
	Actuator rotates	3 VA / 2.5 W

Function data		
Positioning time for nominal rotation angle	G..B111.1E/..	150 s (50 Hz) 125 s (60 Hz)
Nominal torque	GDB..	5 Nm
	GLB..	10 Nm
Maximum torque	GDB..	< 7 Nm
	GLB..	< 14 Nm
Nominal / maximum rotation angle		90° / 95° ± 2°
Direction of rotation	Adjustable by tool or over bus	Clockwise (CW) / Counter-clockwise (CCW)

Connection cables		
Cable length		0.9 m
Power supply	Number of cores and cross-sectional area	2 x 0.75 mm^2
Communication	Number of cores and cross-sectional area	2 x 0.75 mm^2

Communication		
Communication protocol	Connection type	KNX-TP (galvanically isolated)
	Bus load	5 mA

Degree of protection		
Degree of protection	Degree of protection acc. to EN 60529 (see mounting instruction)	IP54
Safety class	Safety class acc. to EN 60730	III

Environmental conditions		
Applicable standard		IEC 60721-3-x
Operation	Climatic conditions	Class 3K5
	Mounting location	Indoors
	Temperature general	0…50 °C
	Humidity (non condensing)	5…95 % r. F.
Transport	Climatic conditions	Class 2K3
	Temperature	-25…70 °C
	Humidity	5...95 % r. h.
Storage	Climatic conditions	Class 1K3
	Temperature	-5…45 °C
	Humidity	5...95 % r. h.

Directives and Standards			
Product standard		EN60730-x	
Electromagnetic compatibility (Application)		For residential, commercial and industrial environments	
		GDB111.1E/KN	**GLB111.1E/KN**
EU Conformity (CE)		A5W00003842 [1]	A5W00000176 [1]
RCM Conformity		A5W00003843 [1]	A5W00000177 [1]
UL, cUL	AC 24 V	UL 873 http://ul.com/database	

Environmental compatibility		
	The product environmental declaration A6V10209938 [1] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	

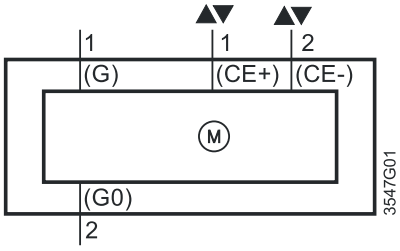
Dimensions / Weight		
Weight	Without packaging	0.6 kg
Dimensions		71 x 137 x 61 mm
Suitable drive shafts	Round shaft (with centering element)	8...16 mm (8...10 mm)
	Square shaft	6...12.8 mm
	Min. drive shaft length	30 mm
	Max. shaft hardness	<300 HV

[1] The documents can be downloaded from http://siemens.com/bt/download

Diagrams

Internal diagrams

The damper actuator is supplied with two prewired cables.



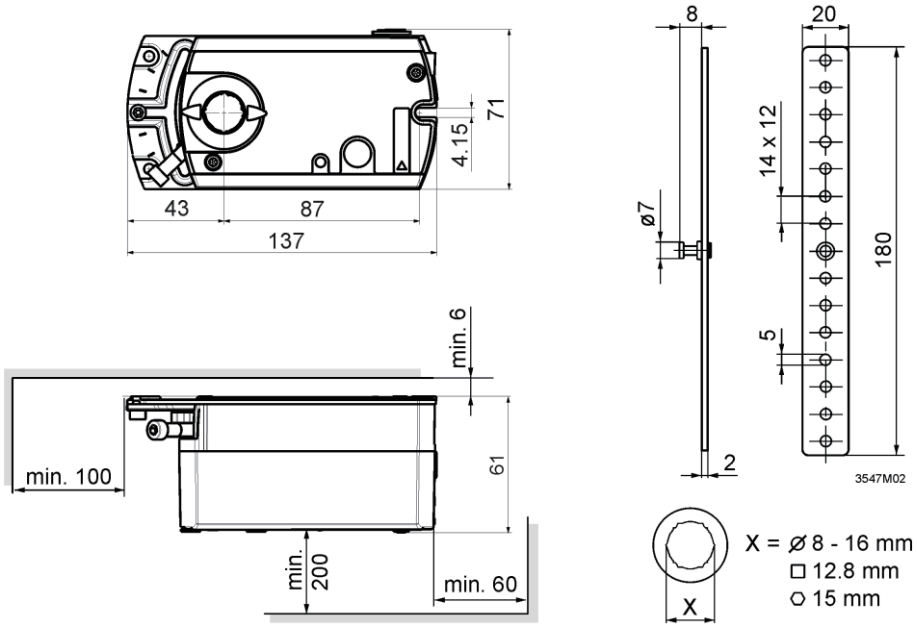
Power supply and communication cables

Core designation	Core color	Terminal code	Description
Cable 1: Power / black sheathing			
1	red (RD)	G	System voltage AC 24 V
2	black (BK)	G0	System neutral AC 24 V
Cable 2: Communication / green sheathing			
1	red (RD)	CE+	KNX CE+
2	black (BK)	CE-	KNX CE+

The operating voltage at terminals G and G0 must comply with the requirements under SELV or PELV.

Safety transformers with twofold insulation as per EN 61558 required; they must be designed to be on 100 % of the time.

Dimensions



Measurements in mm

SIEMENS

OpenAir™

Fast running actuators for air dampers GAP19..

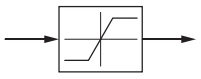
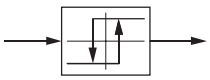
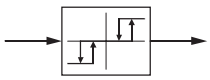
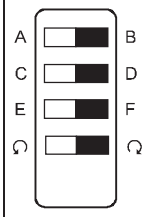
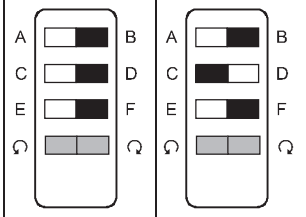
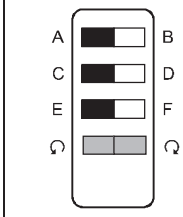
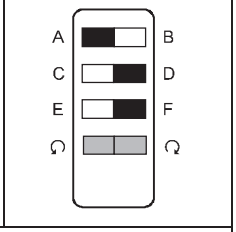
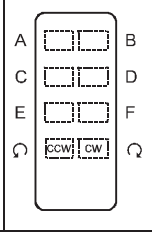
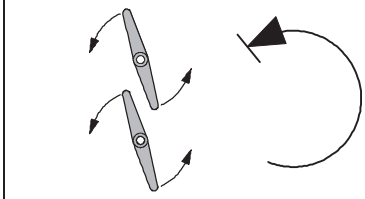
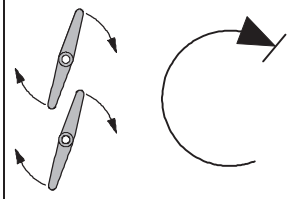
Fast runner rotary version, AC/DC 24 V

- Electromotoric actuator for 2-position, 3-position, or modulating control
- Nominal torque 6 Nm at 2 s running time
- Self-centering shaft adapter
- Range mechanically adjustable between 0…90°
- Prewired with 0.9 m long standard connection cables
- GAP196.1E with adjustable auxiliary switches for auxiliary functions

Use

- For damper areas up to ca. 1 m^2, friction dependent
- For laboratory fume hoods, etc.
- Suitable for use with continuous, 2-position, or 3-position controllers

Functions

DIL switch setting		A DIL switch is used to set the actuator's functionality.				
		Modulating control			2-position control	3-position control
	Factory setting					
		DC 0…10 V	**DC 2…10 V**	**0…20 mA**	**2-Pt**	**3-Pt**
						
						
Position indication						
	Mechanical	Rotary angle position				
	Electrical	Output voltage U = DC 0...10 V is generated proportional to rotary angle. U depends on the DIL switch's rotary direction position.				
Rotary angle limitation		The rotary angle of the shaft adapter can be limited mechanically to 5° increments.				
GAP196.1E auxiliary switch		The switching points for auxiliary switches A and B can be set mutually independent in 5° increments from 0...90°.				

Type summary

Type	Power	Auxiliary switch	Torque	Holding torque	Damper size	Runtime
GAP191.1E	AC/DC 24 V	No	6 Nm	Reduced	Ca. 1 m^2	2 s
GAP196.1E		Yes				

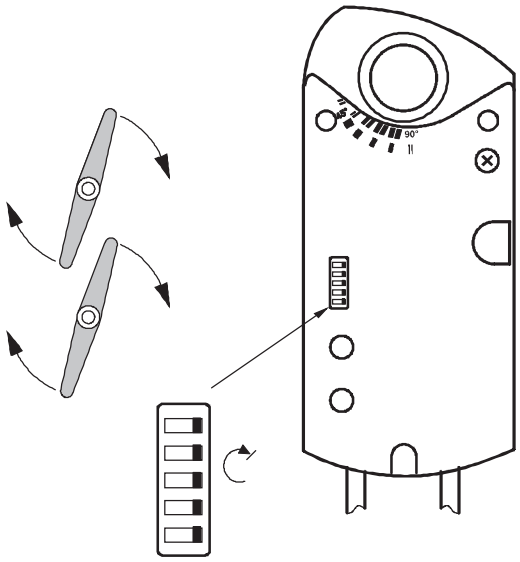
The GAP19..1E actuator has a reduced holding torque when **no electrical power** is applied.
For applications requiring a holding torque, the actuator must not be decoupled from the power supply.

Alternative: **GAP191.1E/IHT / S55499-D369**
GAP191.1E/IHT guarantees a holding torque of min. 6 Nm even in currentless state.

Factory setting

The actuator is preset at the factory to:

- 0...10 V
- Clockwise rotary movement



Scope of delivery

Individual parts such as shaft adapter with position indication and other mounting materials for the actuator are delivered **unassembled**.

Acessories / Spare parts

Various accessories are available to extend the actuators' functionality; e.g. rotary/linear mounting kit, external auxiliary switch (1 or 2 switches) and weather shield; see data sheet **N4697**.

Product documentation

Content	Title	Document ID
Mounting instructions	Drehantrieb GAP19..1E, GNP19..1E	M4608
Data sheet	Accessories and spare parts for air damper actuators	N4697

Related documents such as the environmental declarations, CE declarations, etc., can be downloaded from the following Internet address:
https://siemens.com/bt/download

Notes

Safety

⚠ 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.

Disposal

The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU 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.

Technical data

Power		
Operating voltage (SELV/PELV)		AC/DC 24 V ± 20 %
Frequency		50 Hz / 60 Hz
Power consumption	Running	30 VA / 22 W
	Holding	5 W

Functional data		
Torque	Nominal torque	6 Nm
	Maximum torque (when blocked)	18 Nm
Rotary angle	Nominal rotary angle	90°
	Maximum rotary angle	95° ± 2°
Runtime for 90° rotary angle		2 s
Sound power level		45 dB(A)

Inputs		
Positioning signal Y/Y1		
	Input voltage Y/Y1+ (wires 8-2)	DC 0 (2)...10 V / 0 (4)...20 mA or AC/DC 0 V, AC/DC 24 V "open"
	Positioning resolution DC 0 (2)...1 V / 0 (4)...20 m A	250 steps for 90°
	Maximum permissible input voltage	AC/DC 24 V ± 20 %
Positioning signal Y2		
	Input voltage Y2+ (wires 7-2)	AC/DC 0 V, AC/DC 24 V "close"
	Maximum permissible input voltage	AC/DC 24 V ± 20 %

Outputs		
Position indicator		
	Output voltage U (wires 9-2)	DC 0 (2)...10 V
	Maximum output current	DC ± 1 mA

Auxiliary switch (GAP196.1E)	
Contact loading	6 A resistive, 2 A inductive
Voltage (no mixed operation AC 24 V / AC 230 V)	AC 24...230 V
Switching range for auxiliary switches	5°…90°
Setting increments	5°

Connection cable	
Cable length	0.9 m
Cross-sectional area	0.75 mm^2

Housing type and protection class		
Insulation class		EN 60730
	AC 230 V, auxiliary switch	II
Housing protection class		IP54 as per EN 60529 (observe mounting notes)

Environmental conditions		
Operation		IEC 60721-3-3
	Temperature	-32…50 °C
	Humidity (non-condensing)	<95 % r.h.
Transportation		IEC 60721-3-2
	Temperature	-32…70 °C
	Humidity (non-condensing)	<95 % r.h.

Norms and directives	
Product safety:	EN 60730-2-14 Automatic electronic controls for household and similar use (Type 1)
Electromagnetic compatibility (Application)	For residential, commercial and industrial environments
EU Conformity (CE)	A5W00004380 [1)]
RCM Conformity	A5W00004381 [1)]

Environmental compatibility
The product environmental declaration CE1E4608en [1)] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

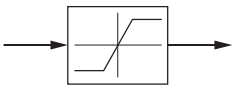
Dimensions		
Actuator B x H x T		81 x 192 x 63 mm (see Dimensions [▶ 10])
Damper shaft	Round	6.4...20.5 mm
	square	6.4...13 mm
	Minimum shaft length	20 mm
Weight	Excluding packaging	1.260 kg

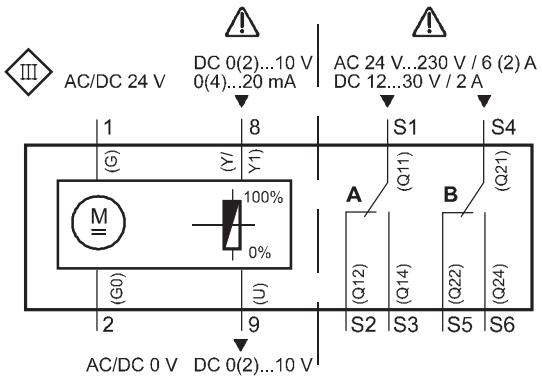
[1] The documents can be downloaded at http://siemens.com/bt/download.

Connection diagrams

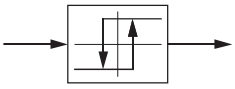
Interna diagrams

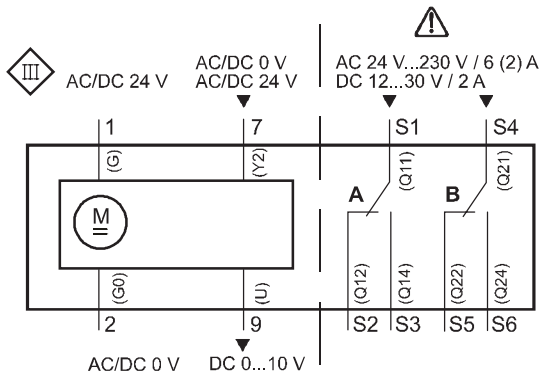
Modulating control



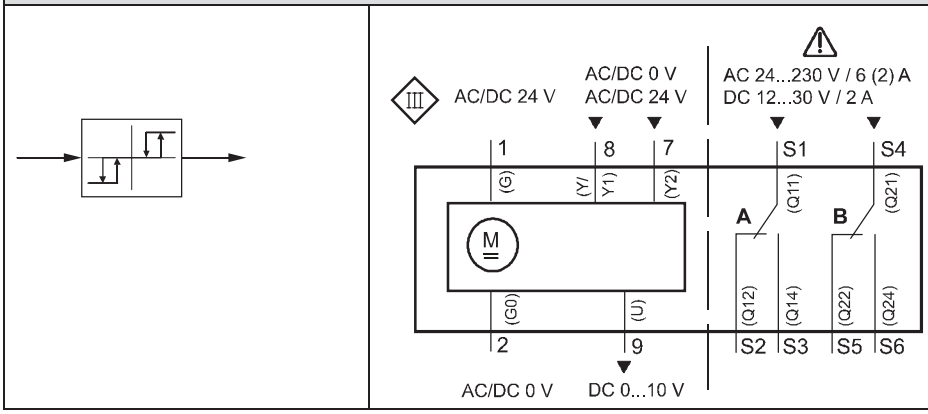


2-position control



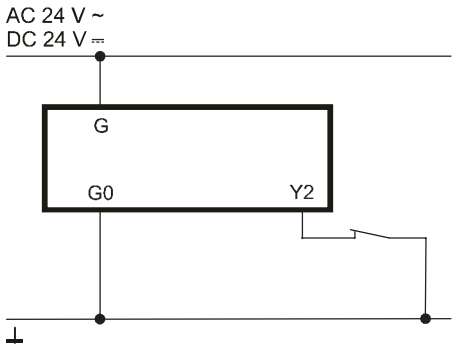


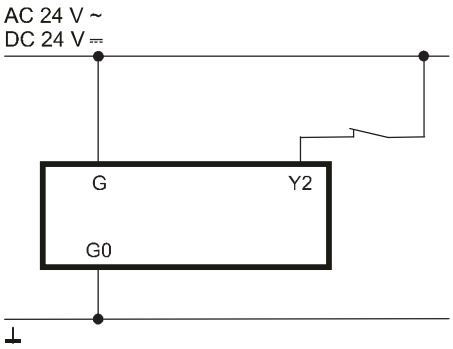
3-position control



Connection diagrams

2-position control
Single pole single throw (SPST)

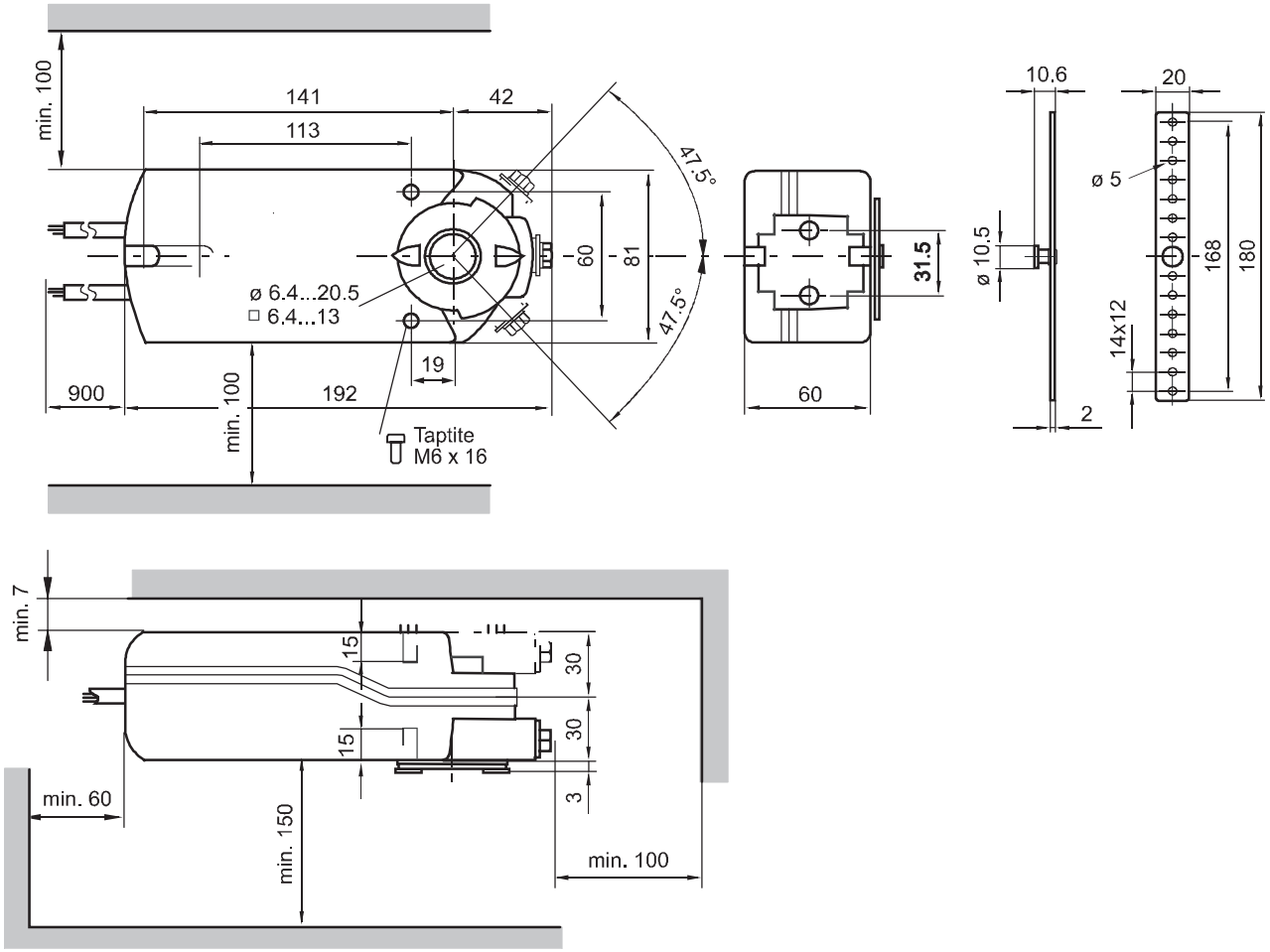




Cable designations

Pin	Cable				Meaning
	Code	No.	Color	Abbreviation	
Actuators AC/DC 24 V	G	1	Red	RD	System potential AC/DC 24 V
	G0	2	Black	BK	System neutral
	Y2	7	Orange	OG	Positioning signal AC/DC 0 V, AC/DC 24 V "close"
	Y/Y1	8	Gray	GY	Positioning signal DC 0 (2)...10 V 0 (4)...20 mA or Positioning signal AC/DC 0 V, AC/DC 24 V "open"
	U	9	Pink	PK	Position indication DC 0 (2)...10 V
Auxiliary switch	Q11	S1	Gray/red	GYRD	Switch A input
	Q12	S2	Gray/blue	GYBU	Switch A Normally closed contact
	Q14	S3	Gray/pink	GYPK	Switch A Normally open contact
	Q21	S4	Black/red	BKRD	Switch B input
	Q22	S5	Black/blue	BKBU	Switch B Normally closed contact
	Q24	S6	Black/pink	BKPK	Schalter B Normally open contact

Dimensions



Dimensions in mm

OpenAir™

Air damper actuators

GBB..1
GIB..1

Rotary version, AC 24 V / AC 230 V

Electronic motor driven actuators for three-position and modulating control, nominal torque 25 Nm (GBB) or 35 Nm (GIB), self-centering shaft adapter, mechanically adjustable span between 0...90°, pre-wired with 0.9 m long connection cables.
Type-specific variations with adjustable offset and span for the positioning signal, position indicator, feedback potentiometer and adjustable auxiliary switches for supplementary functions.

Remarks

This data sheet provides a brief overview of these actuators. Please refer to the Technical Basics in document Z4626en for a detailed description as well as information on safety, engineering notes, mounting and commissioning.

Use

- For damper areas up to 4 m^2 (GBB) or 6 m^2 (GIB), friction-dependent
- Suitable for modulating controllers (DC 0...10 V) or three-position controllers (e.g. for outside air dampers).
- For dampers having two actuators on the same damper shaft (tandem-mounted actuators or powerpack).
- It is recommended to switch off the power during **two-position control** when the actuator has reached the open or close position, in order to enhance life span and reduce power consumption.

Type summary

GBB../GIB..	131.1E	135.1E	136.1E	331.1E	335.1E	336.1E	161.1E	163.1E	164.1E	166.1E
Control type	Three-position control (see “Use”, above)						Modulating control			
Operating voltage AC 24 V	X	X	X				X	X	X	X
Operating voltage AC 230 V				X	X	X				
Positioning signal Y DC 0...10 V							X			X
DC 0...35 V with characteristic function Uo, ΔU								X	X	
Position indicator U = DC 0...10 V							X	X	X	X
Feedback potentiometer 1 kΩ		X			X					
Auxiliary switches (two)		X	X		X	X			X	X
Rotary direction switch							X	X	X	X
Powerpack (two actuators, tandem-mounted)	X	X	X	X	X	X	X	X	X	X

Functions

Type	GBB.3..1 / GIB.3..1	GBB/GIB16..1
Control type	Three-position control (see “Use”)	Modulating control
Positioning signal with adjustable characteristic function		DC 0...35 V at Offset Uo = 0...5 V and Span ΔU = 2...30 V
Rotary direction	Clockwise or counter-clockwise direction depends...	
	…the type of control. With no power applied, the actuator remains in the respective position.	... the setting of the rotary direction switch clockwise / counter-clockwise
Position indication: Mechanical	Rotary angle position indication by using a position indicator.	
Position indication: Electrical	The feedback potentiometer can be connected to external voltage to indicate the position.	Position indicator: Output voltage U = DC 0...10 V is generated proportional to the rotary angle. U depends on the rotary direction of the switch setting.
Auxiliary switch	The switching points for auxiliary switches A and B can be set independent of each other in increments of 5° within 0° to 90°.	
Powerpack	Mounting two of the same actuator types on the same damper shaft results in a double torque (with accessories ASK73.1).	Mounting two of the same actuator types on the same damper shaft results in a double torque (with accessories ASK73.2).
Rotary angle limitation	The rotary angle of the shaft adapter can be limited mechanically at increments of 5°.	

Ordering

Note

Potentiometer **cannot be added in the field**. For this reason, order the type that includes the required options.

Delivery

Individual parts such as position indicator and other mounting materials for the actuator are **not mounted** on delivery.

Accessories, spare parts

Accessories to functionally extend the actuators are available, e.g., rotary/linear sets, auxiliary switches (1 or 2 switches) and weather protection cover; see data sheet **N4699**.

Technical data

⚠ AC 24 V supply (SELV/PELV)	Operating voltage / Frequency			AC 24 V ± 20 % / 50/60 Hz
	Power consumption	GBB/GIB13..1	Running	7 VA, 7 W
		GBB/GIB16..1	Running	8 VA, 8 W
		GBB/GIB16..1	Holding	1.1 W
⚠ AC 230 V supply	Operating voltage / Frequency			AC 230 V ± 10 % / 50/60 Hz
	Power consumption	GBB/GIB33..1		5 VA, 5 W
Function data	Nominal torque			25 Nm GBB 35 Nm GIB
	Maximum torque (blocked)			50 Nm GBB 75 Nm GIB
	Nominal rotary angle / Max. rotary angle			90° / max. 95° ± 2°
	Runtime for 90° rotary angle			150 s (50 Hz) / 125 s (60 Hz)
Positioning signal *for GBB/GIB16..1*	Input voltage Y (wires 8-2)			DC 0...10 V
	Max. permissible input voltage			DC 35 V
Characteristic functions *for GBB/GIB161.1, 166.1 for GBB/GIB163.1, 164.1*	Input voltage Y (wires 8-2)			DC 0...35 V
	Non-adjustable characteristic function			DC 0...10 V
	Adjustable characteristic function		Offset Uo	DC 0...5 V
			Span ΔU	DC 2...30 V
Position indicator *for GBB/GIB16..1*	Output voltage U (wires 9-2)			DC 0...10 V
	Max. output current			DC ± 1 mA
Feedback potentiometer *for GBB/GIB135.1, 335.1*	Change of resistance (wires P1-P2)			0...1000 Ω
	Load			< 1 W
⚠ Auxiliary switches *for GBB/GIB..4.1/..5.1/..6.1*	Contact rating			6 A resistive, 2 A inductive
	Voltage (no mixed operation AC 24 V / AC 230 V)			AC 24...230 V
	Switching range for auxiliary switches			5°...90°
	Setting increments			5°
Connection cables	Cross-section			0.75 mm^2
	Standard length			0.9 m
Degree of protection of housing	Degree of protection as per EN 60 529 (note mounting instructions)			IP 54
Protection class	Insulation class			EN 60 730
	AC 24 V, feedback potentiometer			III
	AC 230 V, auxiliary switch			II
Environmental conditions	Operation / Transport			IEC 721-3-3 / IEC 721-3-2
	Temperature			–32...+55 °C / –32...+70 °C
	Humidity (non-condensing)			< 95% r. F. / < 95% r. F.
Norms and directives	Product safety: Automatic electrical controls for household and similar use			EN 60 730-2-14 (Type 1)
	Electromagnetic compatibility (Application)			For residential, commercial and industrial environments
			GBB..1:	GIB..1:
	EU Conformity (CE)		A5W00004366 [1]	A5W00004368 [1]
			GBB..1:	GIB..1:
	RCM Conformity		A5W00004367 [1]	A5W00004369 [1]
	Product environmental declaration [2]		CE1E4626en [1]	
Dimensions	Actuator W x H x D (see "Dimensions")			100 x 300 x 67.5 mm
	Damper shaft:	round		8...25.6 mm
		Square		6...18 mm
		Min. shaft length		20 mm
Weight	Without packaging			2 kg

[1] The documents can be downloaded from http://siemens.com/bt/download

[2] The product environmental declaration contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

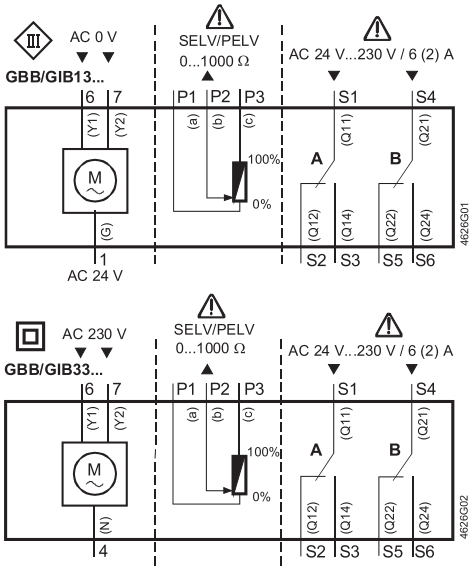
Disposal

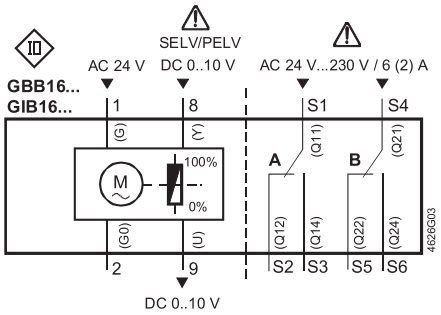
The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

Internal diagrams

GBB/GIB13..1 / GBB/GIB33..1	GBB/GIB16..1
Three-position control	Modulating control
	DC 0...10 V / 0...35 V

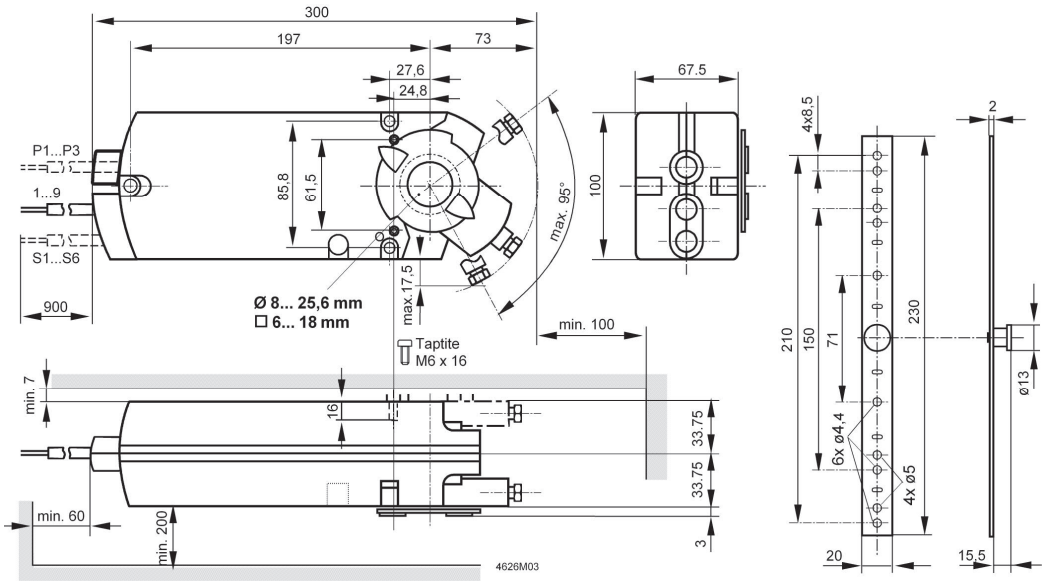




Cable labeling

Pin	Cable				Meaning
	Code	No.	Color	Abbreviation	
Actuators AC 24 V	G	1	red	RD	System potential AC 24 V
	G0	2	black	BK	System neutral
	Y1	6	purple	VT	Position signal AC 0 V, clockwise
	Y2	7	orange	OG	Position signal AC 0 V, counter-clockwise
	Y	8	grey	GY	Position signal DC 0...10 V, 0...35 V
	U	9	pink	PK	Position indication DC 0...10 V
Actuators AC 230V	N	4	blue	BU	Neutral conductor
	Y1	6	black	BK	Control signal AC 230 V, clockwise
	Y2	7	white	WH	Control signal AC 230 V, counter-clockwise
Auxiliary switch	Q11	S1	grey/red	GY RD	Switch A Input
	Q12	S2	grey/blue	GY BU	Switch A Normally closed contact
	Q14	S3	grey/pink	GY PK	Switch A Normally open contact
	Q21	S4	black/red	BK RD	Switch B Input
	Q22	S5	black /blue	BK BU	Switch B Normally closed contact
	Q24	S6	black /pink	BK PK	Switch B Normally open contact
Feedback potentiometer	a	P1	white/red	WH RD	Potentiometer 0...100 % (P1-P2)
	b	P2	white/blue	WH BU	Potentiometer pick-off
	c	P3	white/pink	WH PK	Potentiometer 100...0 % (P3-P2)

Dimensions



Dimensions in mm

SIEMENS

OpenAir™

Air damper actuators GDB..1E

Electronic motor driven actuators for open-close, three-position and modulating control

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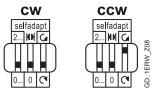
- Nominal torque 5 Nm
- Operating voltage AC 24 V ~ / DC 24…48 V ⎓ or AC 100…240 V ~
- Mechanically adjustable span between 0...90°
- Pre-wired with 0.9 m long connection cables
- Type-specific variations with adjustable offset and span for the positioning signal
- Position indication: mechanical and electrical
- Feedback potentiometer
- Self-adaption of rotational angle range and adjustable auxiliary switches for supplementary functions

Use

The rotary actuators are used in ventilation and air conditioning plants to regulate and shut off air dampers:

- For damper areas up to 0.8 m^2 (guideline, always observe damper manufacturer's data).
- Suitable for use with modulating controllers (DC 0/2...10 V), open-close or three-position controllers for air dampers or air throttles.
- We recommend a minimum pulse length of 500 ms on rotary actuators operated with 3-point control to ensure continuous and accurate operation.

Functions

GDB..	AC 24 V ~ / DC 24…48 V ⎓	141.1E / 142.1E / 146.1E	161.1E / 163.1E / 164.1E / 166.1E
	AC 100…240 V ~	341.1E / 346.1E	361.1E
Control type		Open-close / three-position	Modulating control (0/2…10 V)
Rotary direction		Clockwise or counter-clockwise direction depends …	
		… on the type of control … on the setting of the rotary direction switch.  With no power applied, the actuator remains in the respective position.	… on the setting of the rotary direction DIL switch  … on the positioning signal. The actuator remains in the achieved position: … if the control signal is maintained at a constant value … for loss of operating voltage.
Position indication: Mechanical		Rotary angle position indication by using a position indicator.	
Position indication: Electrical		The feedback potentiometer can be connected to external voltage to indicate the position.	Output voltage U = DC 0/2...10 V is generated proportional to the rotary angle. U depends on the rotary direction of the DIL switch setting.
Auxiliary switch		The switching points for auxiliary switches A and B can be set independent of each other in increments of 5° within 0° to 90°.	
Self-adaptation of linear span			When self-adaptation is active, the actuator automatically determines the mechanical end positions of the linear span and maps the characteristic function (Uo, ΔU) to the calculated linear span.
Manual adjustment		The actuator can be manually adjusted by pressing the gear train disengagement button.	
Rotary angle limitation		The rotary angle of the shaft adapter can be limited mechanically with a set screw.	

Technical design

Housing

The housing consists essentially of flame retardant, non brominated, non chlorinated glass fibre reinforced plastic.

Actuator motor / Gears

- Brushless, robust DC motors ensure reliable operation regardless of load. The damper actuators do not require an end position switch, are overload proof, and remain in place upon reaching the end stop.
- The gears are maintenance free and low noise.

Type summary

Type	Stock no.	Control	Operating voltage	Positioning signal Y	Position indicator U = DC 0…10 V ⎓	Feedback potentio-meter 5 kΩ	Self-adaption of rotational angle range	Aux. switches	Rotary direction switch
GDB141.1E	S55499-D377	Open-close or three-position	AC 24 V ~ / DC 24…48 V ⎓	–	–	–	–	–	yes
GDB142.1E	S55499-D378					yes			
GDB146.1E	S55499-D379					–		2	
GDB341.1E	S55499-D380		AC 100…240 V ~					–	
GDB346.1E	S55499-D381							2	
GDB161.1E	S55499-D393	Modu-lating	AC 24 V ~ / DC 24…48 V ⎓	DC 0/2...10 V ⎓	yes	–	yes	–	yes
GDB163.1E	S55499-D394			DC 0...35 V ⎓	yes		yes		
GDB164.1E	S55499-D395			DC 0...35 V ⎓	yes		yes	2	
GDB166.1E	S55499-D396			DC 0/2...10 V ⎓	yes		yes		
GDB361.1E	S55499-D382		AC 100…240 V ~	DC 0/2...10 V ⎓	yes		yes	–	

Nominal torque:

Accessories See data sheet N4698

Product documentation

Topic	Title	Document ID
Data sheet	Air damper actuators	A6V10636149_enAP_c
Technical basics	Rotary damper actuators without spring return GD..E	A6V10636139_en--_a
Mounting instructions	GDB..1E, GLB..1E	A6V10636143_----_a

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:
http://siemens.com/bt/download

Notes

Safety

⚠ 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.
- Use only properly trained technicians for mounting, commissioning, and servicing.

Engineering

Potentiometer and auxiliary switches

Potentiometer and auxiliary switches cannot be added in the field

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers

Risk of fire and injury due to short-circuits

- Adapt the line diameters as per local regulations to the rated value of the installed fuse.

Maintenance

The actuators GDB..1E are maintenance - free.

Disposal

The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU 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..

Technical data

Power supply (GDB1..1E)		
Operating voltage (SELV/PELV) / Frequency		AC 24 V ~ ±20 % (19.2…28.8 V ~) / 50/60 Hz DC 24…48 V ⎓ ±20 % (19.2…57.6 V ⎓) [1)]
Power consumption running	GDB14..1E, GDB16..1E	2 VA / 1 W 2.1 VA / 1.2 W
Power consumption holding	GDB14..1E, GDB16..1E	0.5 W 0.7 W

Power supply (GDB3..1E)		
Operating voltage / Frequency		AC 100…240 V ~ ±10 % (90…264 V ~) / 50/60 Hz
Power consumption running	GDB34..1E, GDB36..1E	5 VA / 1.6 W 3.3 VA / 1.2 W
Power consumption holding	GDB34..1E, GDB36..1E	0.9 W 0.5 W

Function data	
Nominal torque Maximum torque (blocked) Minimum holding torque	5 Nm 10 Nm 5 Nm
Nominal rotary angle (with position indication) Maximum rotary angle (mechanic limitation)	90° 95° ± 2°
Runtime for 90° rotary angle	150 s
Actuator sound power level	28 dB(A)

[1)] C-UL: Permitted only to DC 30 V ⎓

Inputs		
Positioning signal for GDB14..1E Operating voltage AC 24 V ~ / DC 24…48 V ⎓	 (wires 1-6/G-Y1) (wires 1-7/G-Y2)	 clockwise counterclockwise
Positioning signal for GDB34..1E Operating voltage AC 100…240 V ~	 (wires 4-6/N-Y1) (wires 4-7/N-Y2)	 clockwise counterclockwise
Positioning signal for GDB16..1.E Input voltage Current consumption Input resistance Max. permissible input voltage Protected against faulty wiring	 (wires 8-2/Y-G0)	 DC 0/2…10 V ⎓ 0.1 mA >100 kΩ DC 35 V ⎓ limited to DC 10 V ⎓ max. AC 24 V ~ / DC 24…48 V ⎓
Hysteresis for non-adjustable characteristic function for adjustable characteristic function		 60 mV 0.6 % of ΔU
Adjustable characteristic function (GDB163.1E, GDB164.1E) Adjustable with 2 potentiometers: Max. input voltage Protected against faulty wiring	 Offset Uo Span ΔU	 DC 0…5 V ⎓ DC 2…30 V ⎓ DC 35 V ⎓ max. AC 24 V ~ / DC 24…48 V ⎓

Outputs		
Position indicator Output signal (GDB16..1E) Output signal (GDB36..1E) Output voltage U Max. output current Protected against faulty wiring	 (wires 9-2/U-G0) (wires 9-2/U-G-)	 DC 0...10 V ⎓ DC ±1 mA max. AC 24 V ~ / DC 24…48 V ⎓
Aux. power supply (G- / G+) GDB36..		 DC 24 V ⎓ ±20 %, max. 10 mA
Feedback potentiometer (for GDB142.1E) Change of resistance Load Max. sliding contact current Permissible voltage at potentiometer (SELV/PELV) Insulation resistance between potentiometer and housing	 (wires P1-P2)	 0…5000 Ω <0.25 W <10 mA AC 24 V ~ / DC 24…48 V ⎓ AC 500 V ~

Auxiliary switches (GDB146.1E, GDB166.1E, GDB346.1E)		
Switching voltage Contact rating Electric strength auxiliary switch against housing Switching range for auxiliary switches / setting increments Factory switch setting:	 Switch A Switch B	AC 24…250 V ~ / DC 12…30 V ⎓ 6 A resistive, 2 A inductive, min. 10 mA @ AC 4 A resistive, 2 A inductive, min. 10 mA @ DC 30 V ⎓ 0.8 A res., 0.5 A inductive, min. 10 mA @ DC 60 V ⎓ AC 4 kV 5°…90° / 5° 5° 85°

Connection cables	
Cable length	0.9 m
Cross section of prewired connection cables	0.75 mm^2
Permissible length for signal lines	300 m

Degree of protection	
Insulation class AC 24 V ~ / DC 24…48 V ⎓, feedback potentiometer AC 100…240 V ~, auxiliary switches	As per EN 60730 III II
Housing protection	IP 54 as per EN 60529

Environmental conditions	
Operation Climatic conditions Mounting location Temperature extended Humidity (non-condensing)	IEC 60721-3-3 Class 3K5 interior, weather-protected -32…+55 °C <95 % r.F.
Transport Climatic conditions Temperature extended Humidity (non-condensing)	IEC 60721-3-2 Class 2K3 -32…+70 °C <95 % r.F.
Storage Climatic conditions Temperature extended Humidity (non-condensing)	IEC 60721-3-1 Class 1K3 -32…+50 °C <95 % r.F.
Mechanical conditions	Class 2M2

Standards, directives and approvals	
Product standard	EN 60730 Part 2-14 / Particular requirements for electric actuators
Electromagnetic compatibility (Applications)	For use in residential, commercial, light-industrial and industrial environments
EU Conformity (CE)	A5W00003842 [2)]
RCM Conformity	A5W00003843 [2)]
EAC Conformity	Eurasian conformity
UL	UL as per UL 60730 http://ul.com/database cUL as per CSA-C22.2 No. 24-93

Environmental compatibility
The product environmental declaration A5W00026066 [2)] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions	
Actuator W x H x D	see „Dimensions“, p. 9
Damper shaft round round Square Min. shaft length Shaft hardness	 8…16 mm 8…10 mm (with centering element) 6…12.8 mm 20 mm <300 HV

Weight	
Without packaging	Max. 0.49 kg, without switches Max. 0.63 kg, with switches

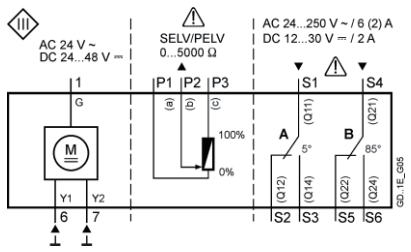
[2)] The documents can be downloaded from http://siemens.com/bt/download.

Diagrams

Internal Diagrams

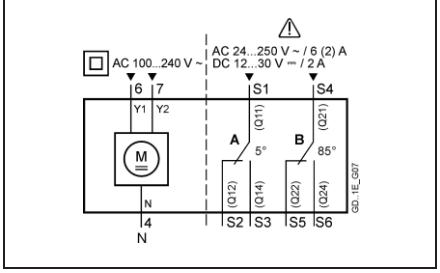
GDB14..1E (open-close, three-p.)

AC 24 V ~ / DC 24…48 V ⎓



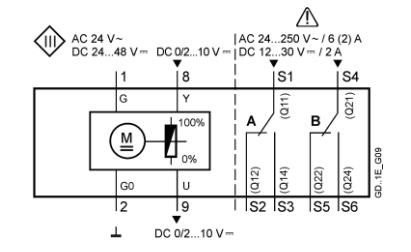
GDB34..1E (open-close, three-p.)

AC 100…240 V ~



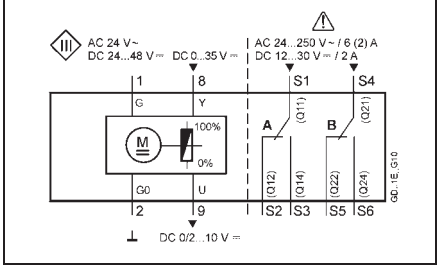
GDB16..1E (modulating, Y= DC 0/2…10 V ⎓)

AC 24 V ~ / DC 24…48 V ⎓



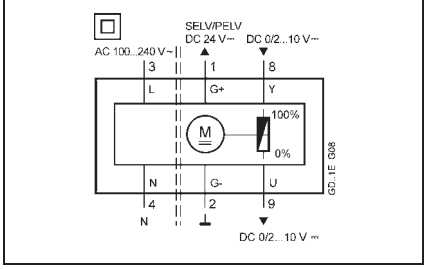
GDB16..1E (modulating, Y= DC 0…35 V ⎓)

AC 24 V ~ / DC 24…48 V ⎓



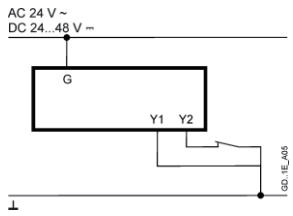
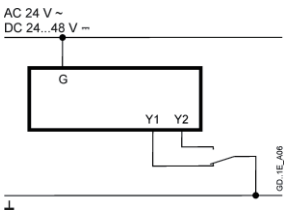
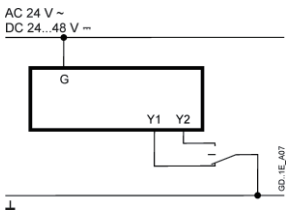
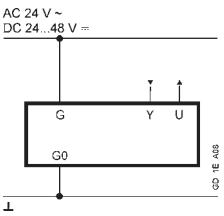
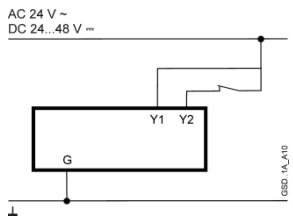
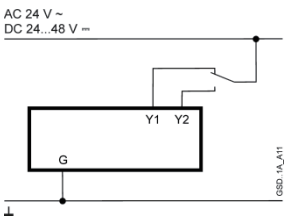
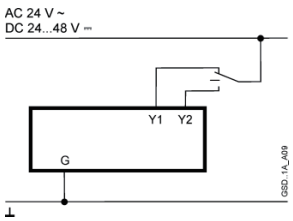
GDB361.1E (modulating control)

AC 100…240 V ~

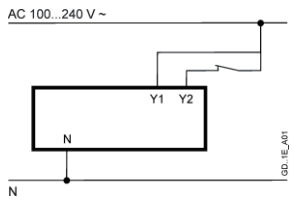
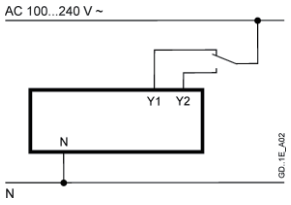
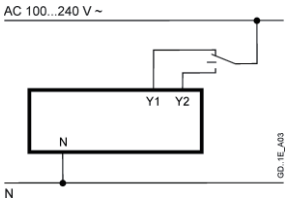
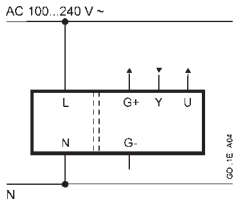


Connection diagrams

GDB1..1E (AC 24 V ~ / DC 24…48 V ⎓)

Open-close, single wire control Single Pole Single Throw (SPST)	Open-close, two wire control Single Pole Double Throw (SPDT)	Three-position control	Modulating control
			
			

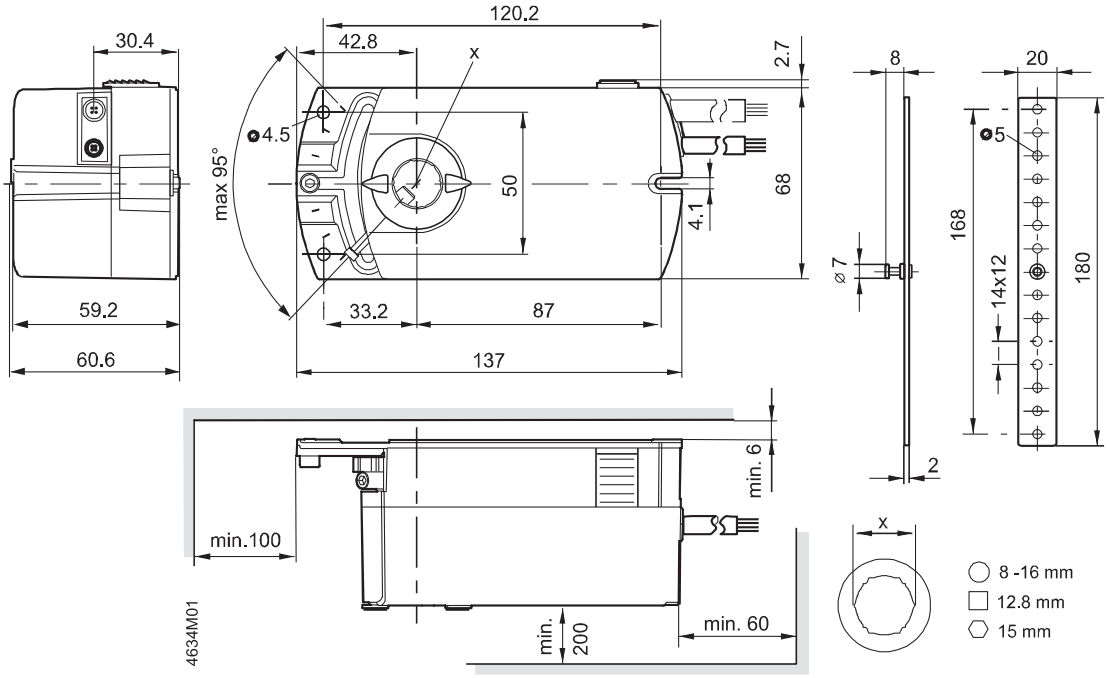
GDB3.. 1E (AC 100…240 V ~)

Open-close, single wire control Single Pole Single Throw (SPST)	Open-close, two wire control Single Pole Double Throw (SPDT)	Three-position control	Modulating control
			

Cable labeling

Connection	Code	No	Color	Abbreviation	Meaning
Actuators	G	1	red	RD	System potential AC 24 V ~ / DC 24…48 V ⎓
AC 24 V ~	G0	2	black	BK	System neutral
DC 24…48 V ⎓	Y1	6	purple	VT	Positioning signal AC/DC 0 V, “clockwise” (GDB14..1E)
	Y2	7	orange	OG	Positioning signal AC/DC 0 V, “counter-clockwise” (GDB14..1E)
	Y	8	grey	GY	Signal in (GDB16..1E)
	U	9	pink	PK	Signal out (GDB16..1E)
Actuators	L	3	brown	BR	Line AC 100…240 V ~
AC 100…240 V ~	N	4	light blue	BU	Neutral conductor
	Y1	6	black	BK	Positioning signal AC 100…240 V ~, “clockwise” (GDB34..1E)
	Y2	7	white	WH	Positioning signal AC 100…240 V ~, “counter-clockwise” (GDB34..1E)
	G+	1	red	RD	System potential DC 24 V ⎓ (aux. power supply) (GDB361.1E)
	G-	2	black	BK	System neutral (aux. power supply) (GDB361.1E)
	Y	8	grey	GY	Signal in (GDB361.1E)
	U	9	pink	PK	Signal out (GDB361.1E)
Feedback	a	P1	white/red	WH RD	Potentiometer 0…100 % (P1-P2)
potentiometer	b	P2	white/blue	WH BU	Potentiometer pick-off
	c	P3	white/pink	WH PK	Potentiometer 100…0 % (P3-P2)
Auxiliary switch	Q11	S1	grey/red	GY RD	Switch A input
	Q12	S2	grey/blue	GY BU	Switch A normally closed contact
	Q14	S3	grey/pink	GY PK	Switch A normally open contact
	Q21	S4	black/red	BK RD	Switch B input
	Q22	S5	black/blue	BK BU	Switch B normally closed contact
	Q24	S6	black/pink	BK PK	Switch B normally open contact

Dimensions



Dimensions in mm

Revision numbers

Type	Valid from rev. no.	Type	Valid from rev. no.
GDB141.1E	..C	GDB164.1E	..A
GDB142.1E	..C	GDB166.1E	..C
GDB146.1E	..C	GDB361.1E	..C
GDB161.1E	..C	GDB341.1E	..C
GDB163.1E	..A	GDB346.1E	..C

SIEMENS

ACVATIX™

Air damper actuators GEB..1E

Electronic rotary actuators for 2-position, 3-position, and modulating control

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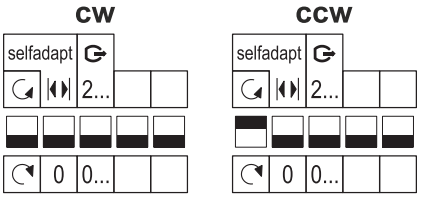
- Nominal torque 20 Nm
- Operating voltage AC 24 V ~ / DC 24…48 V ⎓ or AC 100…240 V ~
- Mechanically adjustable span between 0…90°
- Pre-wired with standard 0.9 m connection cables
- Type-specific variations with adjustable offset and span for the positioning signal
- Position indication: Mechanical and electrical
- Feedback potentiometer
- Self-adaption of the rotation angle range and adjustable auxiliary switches for supplemental functions

Use

Rotary actuators are used in ventilation and air conditioning plants to regulate and shut off air dampers:

- For damper areas up to approximately 4 m^2 (Guideline: Always comply with the damper manufacturer's specifications).
- Suitable for use with 2-position and 3-position controllers as well as modulating controllers (DC 0/2…10 V) to control air dampers.
- We recommend a minimum pulse length of 500 ms on rotary actuators operated with 3-point control to ensure continuous and accurate operation.

Functions

GEB..	AC 24 V ~ / DC 24…48 V ⎓	141.1E / 142.1E / 146.1E	161.1E / 163.1E / 164.1E / 166.1E
	AC 100…240 V ~	341.1E / 346.1E	361.1E
Control type		2-position / 3-position	Modulating control (0/2…10 V)
Rotary movement, rotary direction		Clockwise or counterclockwise direction depends …	
		… on the type of control … on the setting of the rotary direction switch.  The actuator remains in the respective position with no power applied. cw = Clockwise ccw = Counterclockwise	… on the setting on the DIL switch clockwise / counterclockwise  … on the positioning signal. The actuator remains in the deployed position: …if the positioning signal is maintained at a constant value …in the event of power loss
Position indication Mechanical		Rotation angle position indication using a position indicator.	
Position indication Electric		By connecting the feedback potentiometer to external voltage, output voltage is generated proportional to rotation angle.	Position indicator: Output voltage U = DC 0/2…10 V is generated proportional to rotation angle. The direction of rotation (inverted or non-inverted) for output voltage U is based on the DIL switch position.
Auxiliary switch		The switching points for auxiliary switches A and B can be set independently in increments of 5° from 0 to 90°.	
Self-adaptation of the rotation angle range		-	The actuator automatically determines the mechanical end positions of the rotation angle range. The characteristic function (Uo, ΔU) is mapped to the calculated rotation angle range. Power must be connected to DIL switch 2 (self-adaptation) for the function to operate.
Manual adjustment		The actuator can be manually adjusted by pressing the gear train disengagement button.	
Rotation angle limitation		A set screw can limit the rotation angle to between 0° and 90°.	

Technical design

Housing

- Robust and light cast aluminum housing. The housing guarantees long life, even under harsh ambient conditions.

Actuator / gears

- Brushless, robust DC motors ensure reliable operation regardless of load. The damper actuators do not require an end position switch, are overload proof, and remain in place upon reaching the end stop.
- The gears are maintenance free and low noise.

Type summary

<table>
<tr><th>Type</th><th>Stock number</th><th>Open-loop control</th><th>Operating voltage</th><th>Positioning signal input Y</th><th>Position indicator U = DC 0…10 V ⎓</th><th>Feedback potentio-meter 5 kΩ</th><th>Self-adapting rotation angle ranges</th><th>Auxili-ary switch</th><th>Rotation direction switch</th></tr>
<tr><td>GEB141.1E</td><td>S55499-D329</td><td rowspan="5">2- or 3-position</td><td rowspan="3">AC 24 V ~ / DC 24…48 V ⎓</td><td rowspan="5">-</td><td rowspan="5">-</td><td>-</td><td rowspan="5">-</td><td rowspan="2">-</td><td rowspan="5">Yes</td></tr>
<tr><td>GEB142.1E</td><td>S55499-D330</td><td>Yes</td></tr>
<tr><td>GEB146.1E</td><td>S55499-D331</td><td rowspan="3">-</td><td>2</td></tr>
<tr><td>GEB341.1E</td><td>S55499-D336</td><td rowspan="2">AC 100…240 V ~</td><td>-</td></tr>
<tr><td>GEB346.1E</td><td>S55499-D337</td><td>2</td></tr>
<tr><td>GEB161.1E</td><td>S55499-D332</td><td rowspan="5">Modulating</td><td rowspan="4">AC 24 V ~ / DC 24…48 V ⎓</td><td>DC 0/2…10 V ⎓</td><td rowspan="5">Yes</td><td rowspan="5">-</td><td rowspan="5">Yes</td><td rowspan="2">-</td><td rowspan="5">Yes</td></tr>
<tr><td>GEB163.1E</td><td>S55499-D333</td><td>DC 0…35 V ⎓</td></tr>
<tr><td>GEB164.1E</td><td>S55499-D334</td><td rowspan="3">DC 0/2…10 V ⎓</td><td rowspan="2">2</td></tr>
<tr><td>GEB166.1E</td><td>S55499-D335</td></tr>
<tr><td>GEB361.1E</td><td>S55499-D338</td><td>AC 100…240 V ~</td><td>-</td></tr>
</table>

Accessories/ spare parts See data sheet N4697

Product documentation

Topic	Title	Document ID
Data sheet	Air damper actuators	A6V11449860
Technical principles	Non-spring rotary actuators GEB…1	Z4621
Mounting Instructions	GEB..1E	A6V11476940
Data sheet	Accessory and spare parts for air damper actuators	N4697

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

http://siemens.com/bt/download

Notes

Safety

⚠ CAUTION

National safety regulations

Failure to comply with national safety regulations may result in personal injury and property damage.

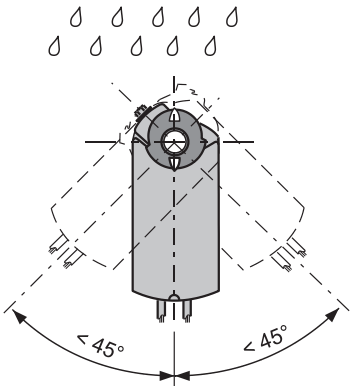
- Observe national provisions and comply with the appropriate safety regulations.
- Mounting, commissioning, and service by properly trained personnel only.

Engineering

Auxiliary switch and potentiometer

Cannot be integrated after the fact.

Mounting



See Mounting instructions M4621

Shaft connection

When mounting, comply with the notes on shaft diameters and damper surface areas in Technical data (page 8) and use only quality materials typical to the sector for the damper shaft.

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value

Maintenance

The GEB..1E actuators are maintenance-free.

Disposal

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.

Technical data

Power supply (GEB1..1E)			
Operating voltage (SELV/PELV)			AC 24 V ~ ± 20 % (19.2…28.8 V ~) DC 24…48 V ⎓ ± 20 % (19.2…57.6 V ⎓) [1]
Frequency			50/60 Hz
Power consumption:	During operation	GEB14..1E GEB16..1E	2.3 VA / 1,1 W 2.5 VA / 1.2 W
	Holding	GEB14..1E GEB16..1E	0.5 W 0.65 W

Power supply (GEB3..1E)			
Operating voltage (SELV/PELV)			AC 100…240 V ~ ± 10 % (90…264 V ~)
Frequency			50/60 Hz
Power consumption:	During operation	GEB34..1E GEB36..1E	4 VA / 1.6 W 3.4 VA / 1.3 W
	Holding	GEB34..1E GEB36..1E	0.9 W 0.6 W

Function data	
Nominal torque	20 Nm
Maximum torque (when blocked) Minimum holding torque	35 Nm [2] 20 Nm
Nominal rotation angle (with position indication)	90°
Maximum rotation angle (mechanically limited)	95° ± 2°
Runtime at nominal rotation angle 90°	150 s
Actuator sound power level (at a positioning time of 150 s)	<35 dB(A)

Inputs		
Positioning signal for GEB14..1E		
Operating voltage AC 24 V ~ / DC 24…48 V ⎓	(wires 1-6/G-Y1) (wires 1-7/G-Y2)	Clockwise Counterclockwise
Positioning signal for GEB34..1E		
Operating voltage AC 100…240 V ~	(wires 1-6/G-Y1) (wires 1-7/G-Y2)	Clockwise Counterclockwise
Positioning signal for GEB16..1E		
Input voltage Power consumption Input resistance	(wires 8-2/Y-G0)	DC 0/2…10 V ⎓ 0.1 mA >100 kΩ
Max. permissible input voltage		DC 35 V ⎓ limited internally to DC 10 V ⎓
Protected against faulty wiring		Max. AC 24 V ~/ DC 24…48 V ⎓
Hysteresis for non-adjustable characteristic function for adjustable characteristic function		60 mV 0.6 % of ΔU
Adjustable characteristic (GEB163.1E, GEB164.1E)		
Adjustable with 2 potentiometers:	Offset Uo Span ΔU	DC 0…5 V ⎓ DC 2…30 V ⎓
Max. input voltage Protected against faulty wiring		DC 35 V ⎓ Max. AC 24 V ~ / DC 24…48 V ⎓

[1] cUL: Only to DC 30 V ⎓ permissible

[2] See notes on page 4 and page 8

Outputs	
Position indicator Output signal (GEB16..1E) (wires 9-2/U-G0) Output signal (GEB36..1E) (wires 9-2/U-G-) Output voltage U Max. output current	 DC 0…10 V ⎓ DC ± 1 mA
Protected against faulty wiring	Max. AC 24 V ~/ DC 24…48 V ⎓
Aux. power supply (G-/G+) GEB36..	 DC 24 V ⎓ ± 20 %, max. 10 mA
Feedback potentiometer (for GEB142.1E)	
Change in resistance (wires P1-P2)	0…5000 Ω
Load	<0.25 W
Max. contact current	<0.1 mA
Permissible voltage at potentiometer (SELV/PELV)	AC 24 V ~ / DC 24…48 V ⎓
Insulation resistance between potentiometer and housing	AC 500 V ~

Auxiliary switches (GEB146.1E, GEB166.1E, GEB346.1E)		
Switching voltage		AC 24…250 V ~ / DC 12…30 V ⎓
Contact loading		6 A resistive, 2 A inductive, min. 10 mA @ AC 4 A resistive, 2 A inductive, min. 10 mA @ DC 30 V ⎓ 0.8 A resistive, 0.5 A inductive, min. 10 mA @ DC 60 V⎓
Electric strength auxiliary switch against housing		AC 4 kV
Switching range for auxiliary switches / setting increments		5°…90° / 5°
Factory switch setting:	Switch A Switch B	5° 85°

Connection cables	
Cable length	0.9 m
Cross-section	0.75 mm^2
Permissible length for signal wires	300 m

Safety class and degree of protection	
Protection class	EN 60730
AC 24 V ~ / DC 24…48 V ⎓, feedback potentiometer AC 100…240 V ~, auxiliary switches	III II
Degree of protection of housing	IP54 as per EN 60529 (see "Mounting", page 4, and Mounting instructions A6V11476940)

Environmental conditions	
Operation	IEC 60721-3-3
Climatic conditions Mounting location Temperature Humidity, non-condensing	Class 3K5 interior, weather-protected -32…55 °C <95 % r.h.
Transportation	IEC 60721-3-2
Climatic conditions Temperature Humidity, non-condensing	Class 2K3 -32…70 °C <95 % r.h.
Storage	IEC 60721-3-1
Climatic conditions Temperature Humidity, non-condensing	Class 1K3 -32…50 °C <95 % r.h.
Mechanical conditions	Class 2M2

Standards, directives and approvals	
Product standards	EN60730 Part 2-14: Particular requirements for electric actuators
Electromagnetic compatibility (field of use)	For residential, commercial, and industrial environments
EU conformity (CE)	A5W00051707 [3)]
RCM conformity	A5W00051708 [3)]
EAC compliance	Eurasian conformity
UL Federal Communications Commission	UL as per 60730 http://ul.com/databse cUL as per CSA-C22.2 No. 24-93

Environmental compatibility
The product environmental declaration A5W00055607 [3)] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions	
Actuator (W x H x D)	See "Dimensions" (page 11)
Damper shaft	
Round	8…20.5 mm
Square (diagonal)	8…14.5 mm
Min. length	20 mm
Max. shaft hardness	<300 HV

Weight	
Excl. packaging	Max. 1.1 kg, without auxiliary switches Max. 1.3 kg, with auxiliary switches

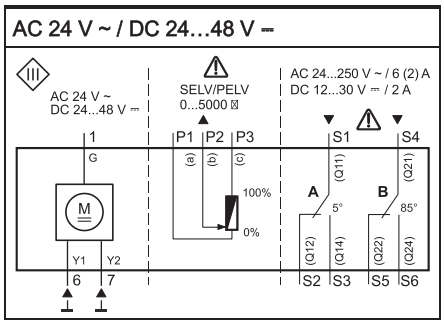
[3)] Documents can be downloaded at http://siemens.com/bt/download.

!	*NOTICE*
	Shaft connection – Important notes for the manufacturer / installer Use of unsuitable damper shafts may damage the damper or damper shaft. ● Use only damper shafts with diameters suitable for the damper surface. ● Use only quality materials typical for the sector for damper shafts/rods.

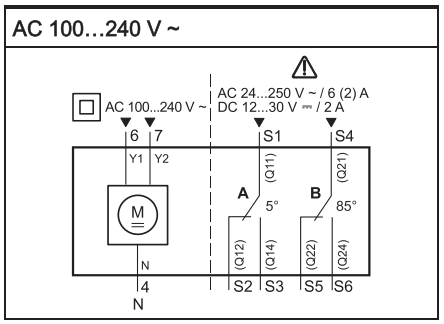
Connection diagrams

Internal Diagrams

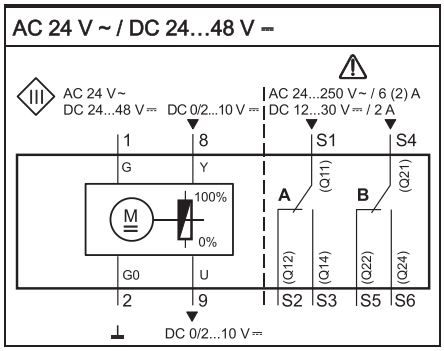
GEB14..1E
(open-close, 3-position control)



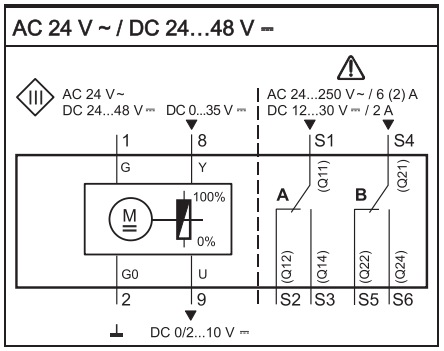
GEB34..1E
(open-close, 3-position control)



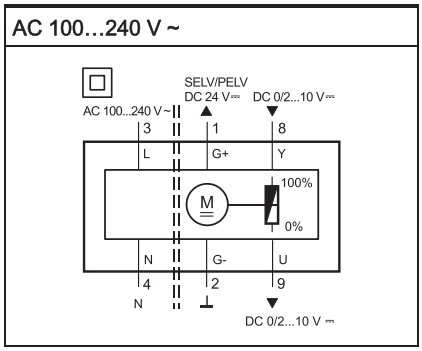
GEB16..1E
(modulating, Y = DC 0/2…10 V ⎓)



GEB16..1E
(modulating, Y = DC 0…35 V ⎓)

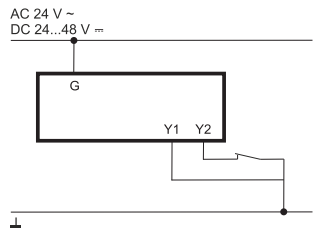
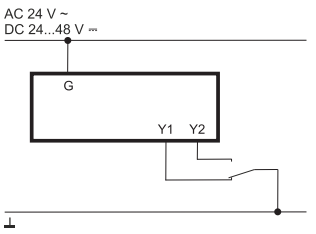
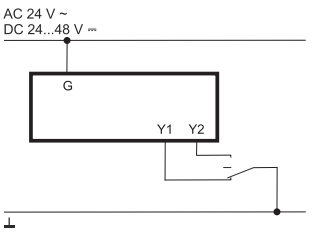
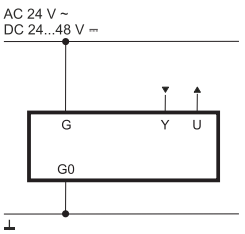
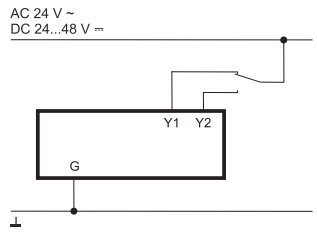
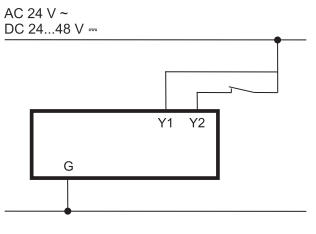
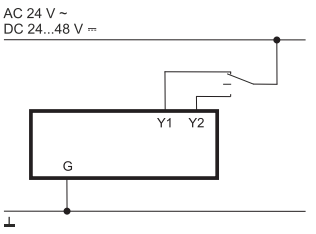


GEB361.1E
(modulating, Y = DC 0/2…10 V ⎓)

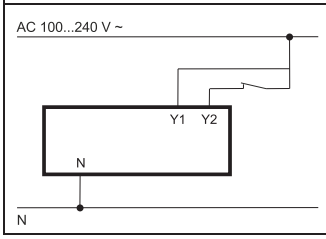
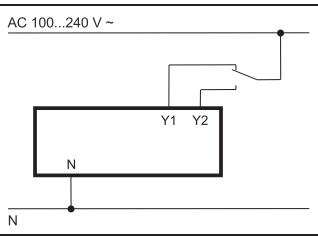
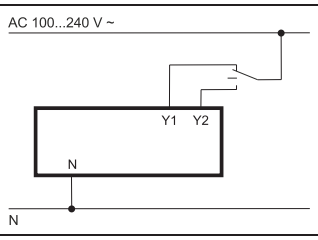
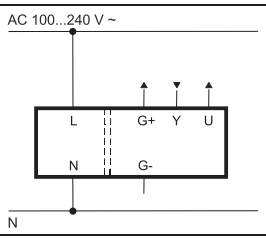


Connection diagrams

Control on GEB1..1E (AC 24 V ~ / DC 24…48 V ⎓)

Open-close, single wire control Single pole single throw (SPST)	Open-close, double wire control Single pole double throw (SPDT)	3-position control	Modulating control
			
			

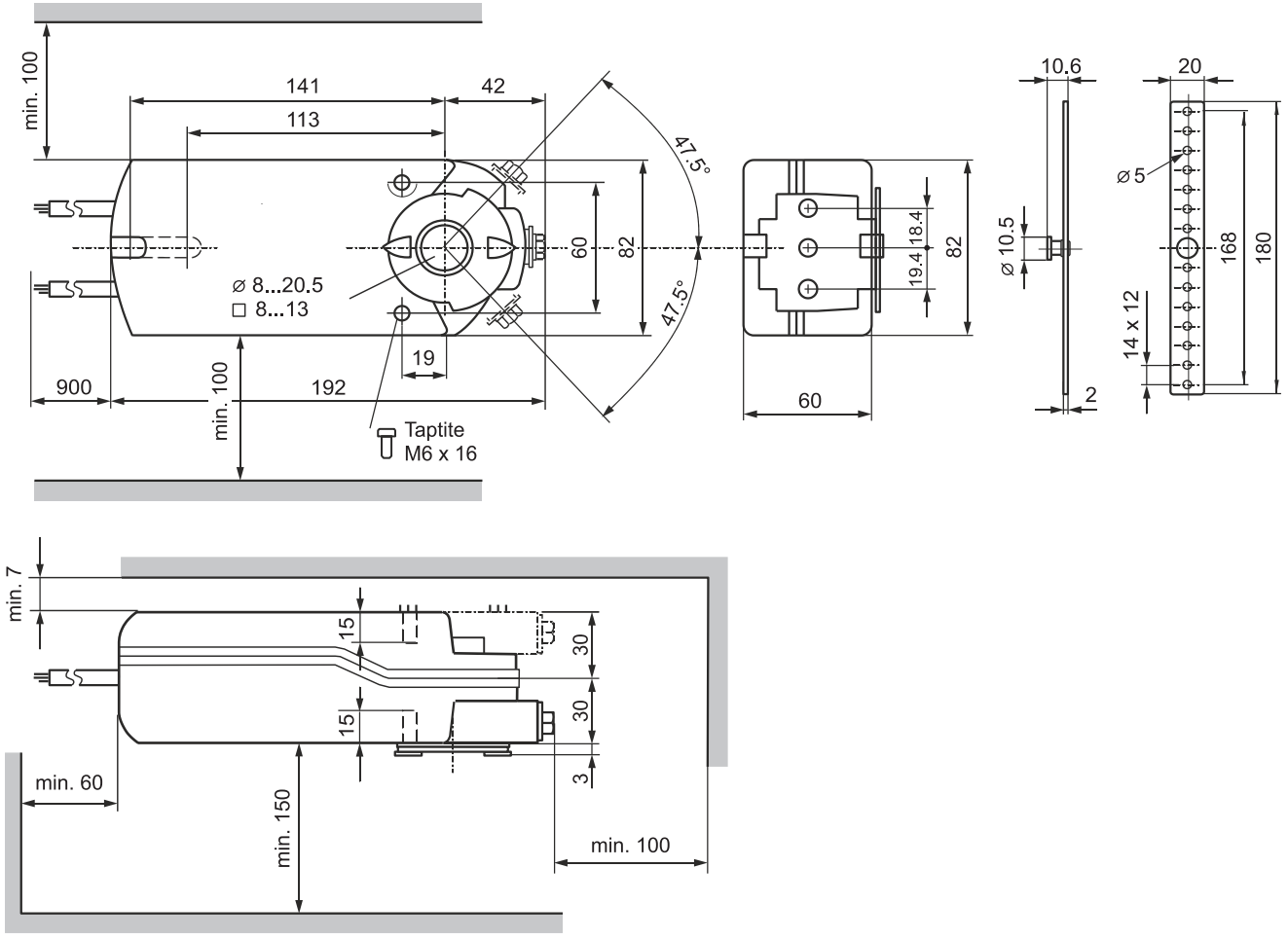
Control on GEB3..1E (AC 100…240 V ~)

Open-close, single wire control Single pole single throw (SPST)	Open-close, double wire control Single pole double throw (SPDT)	3-position control	Modulating control
			

Cable designations

Connecting thread	Code	No.	Color	Abbreviation	Meaning
Actuators AC 24 V ~ / DC 24…48 V ⎓	G	1	red	RD	System potential AC 24 V ~ / DC 24…48 V ⎓
	G0	2	black	BK	System zero
	Y1	6	violet	VT	Positioning signal AC/DC 0 V, clockwise (GEB14..1E)
	Y2	7	orange	OG	Positioning signal AC/DC 0 V, counterclockwise (GEB14..1E)
	Y	8	gray	GY	Signal input (GEB16..1E)
	U	9	pink	PC	Signal output (GEB16..1E)
Actuators AC 100…240 V ~	L	3	brown	BR	Phase, AC 100…240 V ~
	N	4	light blue	BU	Neutral conductor
	Y1	6	black	BK	Positioning signal AC 100…240 V ~, clockwise (GEB34..1E)
	Y2	7	white	WH	Positioning signal AC 100…240 V ~, counterclockwise (GEB34..1E)
	G+	1	red	RD	System potential DC 24 V (auxiliary power) (GEB361.1E)
	G-	2	black	BK	System neutral (auxiliary power) (GEB361.1E)
	Y	8	gray	GY	Signal input (GEB361.1E)
	U	9	pink	PK	Signal output (GEB361.1E)
Feedback potentiometer	a	P1	white/red	WH RD	Potentiometer 0…100 % (P1-P2)
	b	P2	white/blue	WH BU	Potentiometer pick-off
	c	P3	white/pink	WH PK	Potentiometer 100…0 % (P3-P2)
Auxiliary switch	Q11	S1	gray/red	GY RD	Switch A input
	Q12	S2	gray/blue	GY BU	Switch A NC contact
	Q14	S3	gray/pink	GY PK	Switch A NO contact
	Q21	S4	black/red	BK RD	Switch B input
	Q22	S5	black/blue	BK BU	Switch B Normally closed contact
	Q24	S6	black/pink	BK PK	Switch B NO contact

Dimensions



Dimensions in mm

Revision numbers

Type	Valid from rev. no.	Type	Valid from rev. no.
GEB141.1E S55499-D329	..A	GEB164.1E S55499-D334	..A
GEB142.1E S55499-D330	..A	GEB166.1E S55499-D335	..A
GEB146.1E S55499-D331	..A	GEB341.1E S55499-D336	..A
GEB161.1E S55499-D332	..A	GEB346.1E S55499-D337	..A
GEB163.1E S55499-D333	..A	GEB361.1E S55499-D338	..A

SIEMENS

OpenAir™

Air damper actuators GLB..1E

Electronic motor driven actuators for open-close, three-position and modulating control

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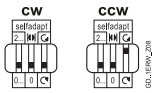
- Nominal torque 10 Nm
- Operating voltage AC 24 V ~ / DC 24…48 V ☒ or AC 100…240 V ~
- Mechanically adjustable span between 0...90°
- Pre-wired with 0.9 m long connection cables
- Type-specific variations with adjustable offset and span for the positioning signal
- Position indication: mechanical and electrical
- Feedback potentiometer
- Self-adaption of rotational angle range and adjustable auxiliary switches for supplementary functions

Use

The rotary actuators are used in ventilation and air conditioning plants to regulate and shut off air dampers:

- For damper areas up to 1.6 m^2 (guideline, always observe damper manufacturer's data).
- Suitable for use with modulating controllers (DC 0/2...10 V), open-close or three-position controllers for air dampers or air throttles.
- We recommend a minimum pulse length of 500 ms on rotary actuators operated with 3-point control to ensure continuous and accurate operation.

Functions

GLB..	AC 24 V ~ / DC 24…48 V ⎓	141.1E / 142.1E / 146.1E	161.1E / 163.1E / 164.1E / 166.1E
	AC 100…240 V ~	341.1E / 346.1E	361.1E
Control type		Open-close / three-position	Modulating control (0/2…10 V)
Rotary direction		Clockwise or counter-clockwise direction depends …	
		… on the type of control … on the setting of the rotary direction switch.  With no power applied, the actuator remains in the respective position.	… on the setting of the rotary direction DIL switch  … on the positioning signal. The actuator remains in the achieved position: … if the control signal is maintained at a constant value … for loss of operating voltage.
Position indication: Mechanical		Rotary angle position indication by using a position indicator.	
Position indication: Electrical		The feedback potentiometer can be connected to external voltage to indicate the position.	Output voltage U = DC 0...10 V is generated proportional to the rotary angle. U depends on the rotary direction of the DIL switch setting.
Auxiliary switch		The switching points for auxiliary switches A and B can be set independent of each other in increments of 5° within 0° to 90°.	
Self-adaptation of linear span			When self-adaptation is active, the actuator automatically determines the mechanical end positions of the linear span and maps the characteristic function (Uo, ΔU) to the calculated linear span.
Manual adjustment		The actuator can be manually adjusted by pressing the gear train disengagement button.	
Rotary angle limitation		The rotary angle of the shaft adapter can be limited mechanically with a set screw.	

Technical design

Components

The housing consists essentially of flame retardant, non brominated, non chlorinated glass fibre reinforced plastic.

Actuator motor / Gears

- Brushless, robust DC motors ensure reliable operation regardless of load. The damper actuators do not require an end position switch, are overload proof, and remain in place upon reaching the end stop.
- The gears are maintenance free and low noise.

Type summary

Type	Stock no.	Control	Operating voltage	Positioning signal Y	Position indicator U = DC 0…10 V ⎓	Feedback potentio-meter 5 kΩ	Self-adaption of rotational angle range	Aux. switches	Rotary direction switch
GLB141.1E	S55499-D385	Open-close or three-position	AC 24 V ~ / DC 24…48 V ⎓	–	–	–	–	–	yes
GLB142.1E	S55499-D386					yes			
GLB146.1E	S55499-D387					–		2	
GLB341.1E	S55499-D388		AC 100…240 V ~					–	
GLB346.1E	S55499-D389							2	
GLB161.1E	S55499-D398	Modu-lating	AC 24 V ~ / DC 24…48 V ⎓	DC 0/2...10 V ⎓	yes	–	yes	–	yes
GLB163.1E	S55499-D399			DC 0...35 V ⎓	yes		yes		
GLB164.1E	S55499-D400			DC 0...35 V ⎓	yes		yes	2	
GLB166.1E	S55499-D401			DC 0/2...10 V ⎓	yes		yes		
GLB361.1E	S55499-D390		AC 100…240 V ~	DC 0/2...10 V ⎓	yes		yes	–	

Nominal torque: 10 Nm (applies to all GLB..1E actuators)

Accessories

See data sheet N4698

Product documentation

Topic	Title	Document ID
Data sheet	Air damper actuators	A6V10636202_enAP_c
Technical basics	Rotary damper actuators without spring return GL..E	A6V10636196_en--_a
Mounting instructions	GDB..1E, GLB..1E	A6V10636143_----_a

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

http://siemens.com/bt/download

Notes

Safety

⚠ 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.
- Use only properly trained technicians for mounting, commissioning, and servicing.

Engineering

Potentiometer and auxiliary switches

Potentiometer and auxiliary switches cannot be added in the field.

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers

Risk of fire and injury due to short-circuits

- Adapt the line diameters as per local regulations to the rated value of the installed fuse.

Maintenance

The actuators GLB..1E are maintenance-free.

Disposal

The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU 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..

Technical data

Power supply (GLB1..1E)		
Operating voltage (SELV/PELV) / Frequency		AC 24 V ~ ±20 % (19.2…28.8 V ~) / 50/60 Hz DC 24…48 V ⎓ ±20 % (19.2…57.6 V ⎓) [1]
Power consumption running	GLB14..1E, GLB16..1E	2.2 VA / 1.3 W 2.5 VA / 1.5 W
Power consumption holding	GLB14..1E, GLB16..1E	0.5 W 0.7 W

Power supply (GLB3..1E)		
Operating voltage / Frequency		AC 100…240 V ~ ±10 % (90…264 V ~) / 50/60 Hz
Power consumption running	GLB34..1E, GLB36..1E	6 VA / 2 W 4 VA / 1.5 W
Power consumption holding	GLB34..1E, GLB36..1E	0.9 W 0.6 W

Function data	
Nominal torque Maximum torque (blocked) Minimum holding torque	10 Nm 16 Nm 10 Nm
Nominal rotary angle (with position indication) Maximum rotary angle (mechanic limitation)	90° 95° ± 2°
Runtime for 90° rotary angle	150 s
Actuator sound power level	28 dB(A)

[1] C-UL: Permitted only to DC 30 V ⎓

Inputs		
Positioning signal for GLB14..1E		
Operating voltage AC/DC 24 V	(wires 1-6/G-Y1)	clockwise
AC 24 V ~ / DC 24…48 V ⎓	(wires 1-7/G-Y2)	counterclockwise
Positioning signal for GLB34..1E		
Operating voltage	(wires 4-6/N-Y1)	clockwise
AC 100…240 V ~	(wires 4-7/N-Y2)	counterclockwise
Positioning signal for GLB16..1.E		
Input voltage	(wires 8-2/Y-G0)	DC 0/2…10 V ⎓
Current consumption		0.1 mA
Input resistance		>100 kΩ
Max. permissible input voltage		DC 35 V ⎓ limited to DC 10 V ⎓
Protected against faulty wiring		max. AC 24 V ~ / DC 24…48 V ⎓
Hysteresis	for non-adjustable characteristic function	60 mV
	for adjustable characteristic function	0.6 % of ΔU
Adjustable characteristic function (GLB163.1E, GLB164.1E)		
Adjustable with 2 potentiometers:	Offset Uo	DC 0…5 V ⎓
	Span ΔU	DC 2…30 V ⎓
Max. input voltage		DC 35 V ⎓
Protected against faulty wiring		max. AC 24 V ~ / DC 24…48 V ⎓

Outputs		
Position indicator		
Output signal (GLB16..1E)	(wires 9-2/U-G0)	
Output signal (GLB36..1E)	(wires 9-2/U-G-)	
Output voltage U		DC 0...10 V ⎓
Max. output current		DC ±1 mA
Protected against faulty wiring		max. AC 24 V ~ / DC 24…48 V ⎓
Aux. power supply (G- / G+)		
GLB36..		DC 24 V ⎓ ±20 %, max. 10 mA
Feedback potentiometer (for GLB142.1E)		
Change of resistance	(wires P1-P2)	0…5000 Ω
Load		<0.25 W
Max. sliding contact current		<10 mA
Permissible voltage at potentiometer (SELV/PELV)		AC 24 V ~ / DC 24…48 V ⎓
Insulation resistance between potentiometer and housing		AC 500 V ~

Auxiliary switches (GLB146.1E, GLB166.1E, GLB346.1E)		
Switching voltage		AC 24…250 V ~ / DC 12…30 V ⎓
Contact rating		6 A resistive, 2 A inductive, min. 10 mA @ AC
		4 A resistive, 2 A inductive, min. 10 mA @ DC 30 V ⎓
		0.8 A res., 0.5 A inductive, min. 10 mA @ DC 60 V ⎓
Electric strength auxiliary switch against housing		AC 4 kV
Switching range for auxiliary switches / setting increments		5°…90° / 5°
Factory switch setting:	Switch A	5°
	Switch B	85°

Connection cables	
Cable length	0.9 m
Cross section of prewired connection cables	0.75 mm^2
Permissible length for signal lines	300 m

Degree of protection	
Insulation class	As per EN 60730
AC 24 V ~ / DC 24…48 V ⎓, feedback potentiometer	III
AC 100…240 V ~, auxiliary switches	II
Housing protection	IP 54 as per EN 60529

Environmental conditions	
Operation Climatic conditions Mounting location Temperature extended Humidity (non-condensing)	IEC 60721-3-3 Class 3K5 interior, weather-protected -32…+55 °C <95 % r.F.
Transport Climatic conditions Temperature extended Humidity (non-condensing)	IEC 60721-3-2 Class 2K3 -32…+70 °C <95 % r.F.
Storage Climatic conditions Temperature extended Humidity (non-condensing)	IEC 60721-3-1 Class 1K3 -32…+50 °C <95 % r.F.
Mechanical conditions	Class 2M2

Standards, directives and approvals	
Product standard	EN 60730 Part 2-14 / Particular requirements for electric actuators
Electromagnetic compatibility (Applications)	For use in residential, commercial, light-industrial and industrial environments
EU Conformity (CE)	A5W00000176 [2)]
RCM Conformity	A5W00000177 [2)]
EAC Conformity	Eurasian conformity
UL	UL as per UL 60730 http://ul.com/database cUL as per CSA-C22.2 No. 24-93

Environmental compatibility
The product environmental declaration A5W00026066 [2)] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions	
Actuator W x H x D	see „Dimensions“, p. 9
Damper shaft round round Square Min. shaft length Shaft hardness	 8…16 mm 8…10 mm (with centering element) 6…12.8 mm 20 mm <300 HV

Weight	
Without packaging	Max. 0.49 kg, without switches Max. 0.63 kg, with switches

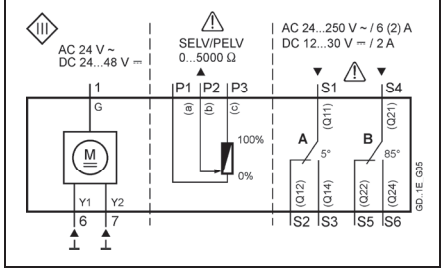
[2)] The documents can be downloaded from http://siemens.com/bt/download.

Diagrams

Internal Diagrams

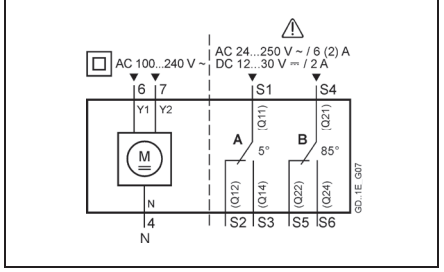
GLB14..1E (open-close, three-p.)

AC 24 V ~ / DC 24…48 V ⎓



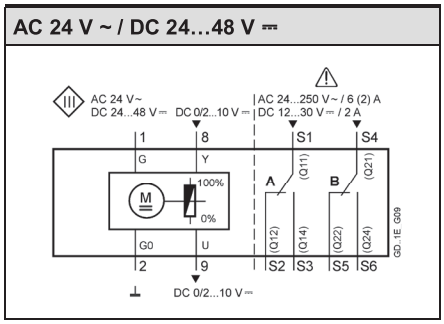
GLB34..1E (open-close, three-p.)

AC 100…240 V ~



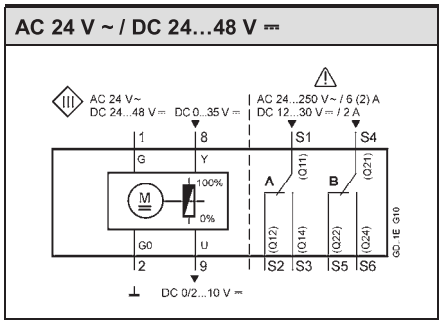
GLB16..1E (modulating, Y= DC 0/2…10 V ⎓)

AC 24 V ~ / DC 24…48 V ⎓



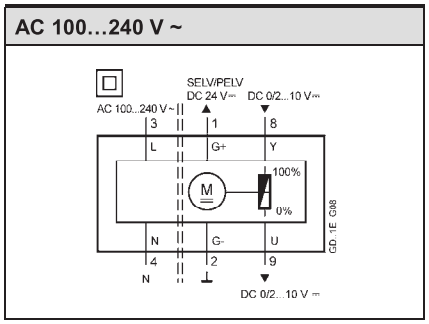
GLB16..1E (modulating, Y= DC 0…35 V ⎓)

AC 24 V ~ / DC 24…48 V ⎓



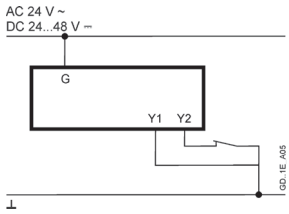
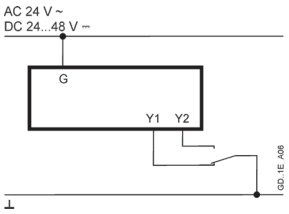
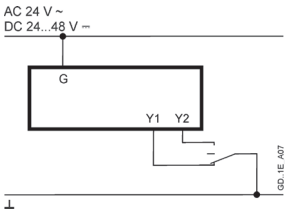
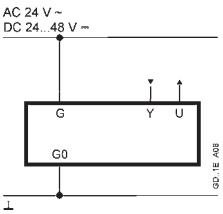
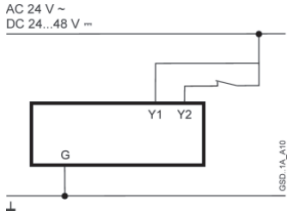
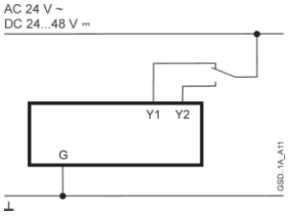
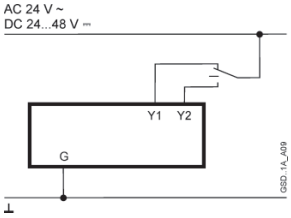
GLB361.1E (modulating control)

AC 100…240 V ~

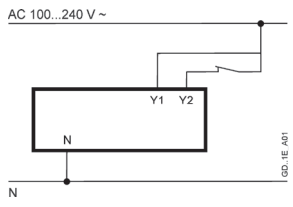
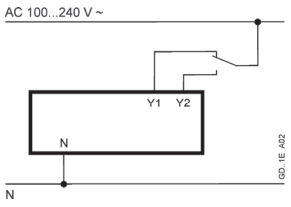
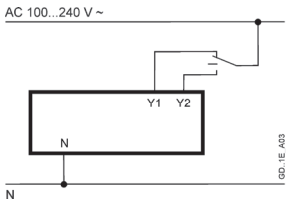
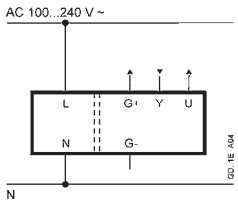


Connection diagrams

GLB1.. 1E (AC 24 V ~ / DC 24…48 V ⎓)

Open-close, single wire control Single Pole Single Throw (SPST)	Open-close, two wire control Single Pole Double Throw (SPDT)	Three-position control	Modulating control
			
			

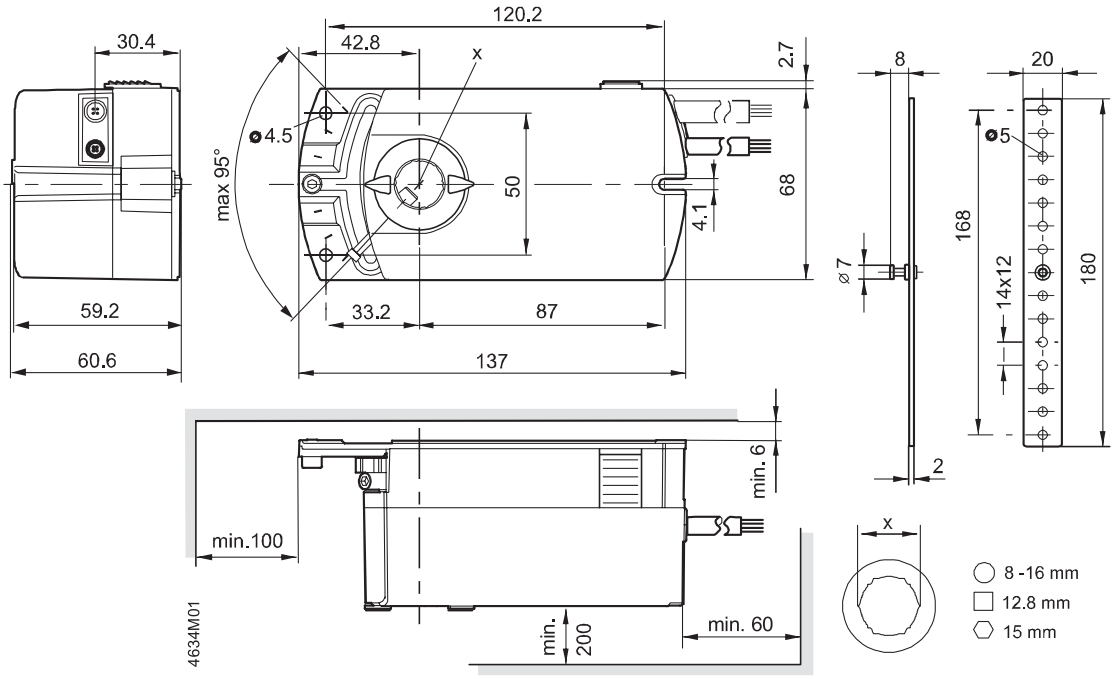
GLB3.. 1E (AC 100…240 V ~)

Open-close, single wire control Single Pole Single Throw (SPST)	Open-close, two wire control Single Pole Double Throw (SPDT)	Three-position control	Modulating control
			

Cable labeling

Connection	Code	No	Color	Abbreviation	Meaning
Actuators	G	1	red	RD	System potential AC 24 V ~ / DC 24…48 V ⎓
AC 24 V ~	G0	2	black	BK	System neutral
DC 24…48 V ⎓	Y1	6	purple	VT	Positioning signal AC/DC 0 V, “clockwise” (GLB14..1E)
	Y2	7	orange	OG	Positioning signal AC/DC 0 V, “counter-clockwise” (GLB14..1E)
	Y	8	grey	GY	Signal in (GLB16..1E)
	U	9	pink	PK	Signal out (GLB16..1E)
Actuators	L	3	brown	BR	Line AC 100…240 V ~
AC 100…240 V ~	N	4	light blue	BU	Neutral conductor
	Y1	6	black	BK	Positioning signal AC 100…240 V ~, “clockwise” (GLB34..1E)
	Y2	7	white	WH	Pos. signal AC 100…240 V ~, “counter-clockwise” (GLB34..1E)
	G+	1	red	RD	System potential DC 24 V ⎓ (aux. power supply) (GLB361.1E)
	G-	2	black	BK	System neutral (aux. power supply) (GLB361.1E)
	Y	8	grey	GY	Signal in (GLB361.1E)
	U	9	pink	PK	Signal out (GLB361.1E)
Feedback	a	P1	white/red	WH RD	Potentiometer 0…100 % (P1-P2)
potentiometer	b	P2	white/blue	WH BU	Potentiometer pick-off
	c	P3	white/pink	WH PK	Potentiometer 100…0 % (P3-P2)
Auxiliary switch	Q11	S1	grey/red	GY RD	Switch A input
	Q12	S2	grey/blue	GY BU	Switch A normally closed contact
	Q14	S3	grey/pink	GY PK	Switch A normally open contact
	Q21	S4	black/red	BK RD	Switch B input
	Q22	S5	black/blue	BK BU	Switch B normally closed contact
	Q24	S6	black/pink	BK PK	Switch B normally open contact

Dimensions



Dimensions in mm

Revision numbers

Type	Valid from rev. no.	Type	Valid from rev. no.
GLB141.1E	..C	GLB164.1E	..A
GLB142.1E	..C	GLB166.1E	..C
GLB146.1E	..C	GLB361.1E	..C
GLB161.1E	..C	GLB341.1E	..C
GLB163.1E	..A	GLB346.1E	..C

SIEMENS

ACVATIX™

Air damper actuators GSD...1A

Electric motor-driven rotary actuators for open-close, three-position and modulating control

---

- 2 Nm nominal torque
- Operating voltage AC 24 V ~ / DC 24…48 V ⎓ or AC 100…240 V ~
- Prewired with 0.9 m connecting cable
- Gear train disengagement button for manual adjustment
- Position indication
- Auxiliary switches for auxiliary functions

Features

The rotary actuator drives the damper to the desired operating position after connecting the operating voltage.

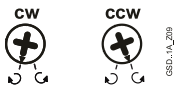
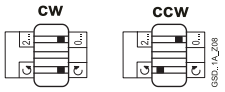
- Brushless, robust DC motors ensure reliable operation regardless of load.
- The rotary actuators do not require an end position switch, are overload proof, and remain in place upon reaching the end stop.
- The gears are maintenance free and low noise.
- Simple and reliable shaft integration.
- Mounting bracket included.

Use

Non-spring return rotary actuators. Application in ventilation and air conditioning plants to operate air dampers and air throttles.

- For damper areas up to 0.3 m^2, friction dependent.
- Suitable for use with modulating controllers (DC 0/2...10 V), open-close or three-position controllers.
- For directly driven zone dampers to control air flow in air ducts.
- We recommend a minimum pulse length of 500 ms on rotary actuators operated with 3-point control to ensure continuous and accurate operation.

Functions

<table>
<tr><th rowspan="2">Type</th><th>AC 24 V ~ / DC 24…48 V ⎓</th><th>GSD14..1A</th><th>GSD16..1A</th></tr>
<tr><th>AC 100…240 V ~</th><th>GSD34..1A</th><th>GSD361.1A</th></tr>
<tr><td colspan="2">Control type</td><td>Open-close / three-position</td><td>Modulating control</td></tr>
<tr><td colspan="2" rowspan="2">Rotary direction</td><td colspan="2">Clockwise (cw) or counter-clockwise (ccw) direction depends …</td></tr>
<tr><td>… on the type of control.
… on the setting of the rotary direction switch.
 
With no power applied, the actuator remains in the respective position.</td><td>… on the setting of the rotary direction DIL switch
 
… on the positioning signal.
The actuator remains in the achieved position:
… if the control signal is maintained at a constant value
… for loss of operating voltage</td></tr>
<tr><td colspan="2">Position indication: Mechanical</td><td colspan="2">Rotary angle position indication by a position indicator/hand lever.</td></tr>
<tr><td colspan="2">Position indication: Electrical</td><td></td><td>• Output voltage U = DC 0/2...10 V is generated proportional to the rotary angle.
• U depends on the rotary direction of the DIL switch setting.</td></tr>
<tr><td colspan="2">Auxiliary switches</td><td colspan="2">Fixed position 5° / 85°</td></tr>
<tr><td colspan="2">Manual adjustment</td><td colspan="2">The actuator can be manually adjusted by pressing the gear train disengagement button.</td></tr>
</table>

Technical design/mechanical design

Housing

The housing consists essentially of flame retardant, non brominated, non chlorinated glass fibre reinforced plastic.

Type summary

Type	Stock number	Control	Operating voltage	Positioning signal Y	Position indicator U = DC 0/2...10 V ⎓	Aux. switches	Rotary direction switch	Aux. power supply
GSD141.1A	S55499-D281	Open-close or three-position	AC 24 V ~ / DC 24…48 V ⎓	–	–	–	yes	–
GSD146.1A	S55499-D227					2		
GSD341.1A	S55499-D282		AC 100…240 V ~			–		
GSD346.1A	S55499-D230					2		
GSD161.1A	S55499-D228	Modulating	AC 24 V ~ / DC 24…48 V ⎓	DC 0/2...10 V ⎓	yes	–	yes	–
GSD166.1A	S55499-D229				yes	2		
GSD361.1A	S55499-D231		AC 100…240 V ~		yes	–		yes

Product documentation

Topic	Title	Document ID
Data sheet	Air damper actuators GSD..1A	A6V10636055_en--
Mounting instructions	Rotary-type actuator GSD..1A	A6V10636060_----

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

http://siemens.com/bt/download

Notes

Safety

⚠ 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.
- Use only properly trained technicians for mounting, commissioning, and servicing.

Engineering

Auxiliary switches

Auxiliary switches cannot be added in the field.

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers

Risk of fire and injury due to short-circuits

- Adapt the line diameters as per local regulations to the rated value of the installed fuse.

Maintenance

The actuators GSD..1A are maintenance-free.

Disposal

The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive 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.

Technical data

Power supply GSD14..1A / GSD16..1A		
Operating voltage (SELV/PELV) / Frequency		AC 24 V ~ ±20 % (19.2…28.8 V ~) / 50/60 Hz DC 24…48 V ⎓ ±20 % (19.2…57.6 V ⎓) [1)]
Power consumption running	GSD14..1A GSD16..1A	2.2 VA / 1.2 W 2.4 VA / 1.4 W
Power consumption holding	GSD14..1A GSD16..1A	1 VA / 0.5 W 1.2 VA / 0.7 W

Power supply GSD34..1A / GSD361.1A		
Operating voltage / Frequency		AC 100…240 V ~ ±10 % (90…264 V ~) / 50/60 Hz
Power consumption running	GSD34..1A GSD361.1A	4.5 VA / 1.8 W 3.7 VA / 1.4 W
Power consumption holding	GSD34..1A GSD361.1A	2.4 VA / 0.9 W 1.6 VA / 0.5 W

Functional data	
Nominal torque Maximum torque	2 Nm 5 Nm
Nominal rotational angle Maximum rotational angle (mechanically limited)	90° 95° ± 2°
Runtime at nominal rotational angle 90°	30 s
Duty cycle	100 %
Direction of rotation	Clockwise / counterclockwise
Mechanical life	100 000 cycles
Actuator sound power level	35 dB(A)

Inputs		
Positioning signal for GSD14..1A Operating voltage AC 24 V ~ / DC 24…48 V ⎓	 (wires 1-6/G-Y1) (wires 1-7/G-Y2)	 clockwise counterclockwise
Positioning signal for GSD34..1A Operating voltage AC 100…240 V ~	 (wires 4-6/N-Y1) (wires 4-7/N-Y2)	 clockwise counterclockwise
Positioning signal for GSD16..1.A Input voltage Current consumption Input resistance	 (wires 8-2/Y-G0)	 DC 0/2…10 V ⎓ 0.1 mA >100 kΩ

Outputs		
Position indicator Output signal (GSD16..1.A) Output signal (GSD361.1.A) Output voltage U Max. output current Protected against faulty wiring Aux. power supply (GSD361.1A)	 (wires 9-2/U-G0) (wires 9-2/U-G-) (wires 1-2/G+-G-)	 DC 0...10 V ⎓ DC ±1 mA max. AC 24 V ~ / DC 24…48 V ⎓ DC 24 V ⎓ ±20 %, max. 10 mA

Auxiliary switches		
Switching voltage Contact rating Electric strength auxiliary switches against housing Factory switches setting:	 Switch A / Switch B	AC 24…250 V ~ / DC 12…30 V ⎓ 6 A resistive, 2 A inductive, min. 10 mA @ AC 4 A resistive, 2 A inductive, min. 10 mA @ DC 30 V ⎓ 0.8 A res., 0.5 A inductive, min. 10 mA @ DC 60 V ⎓ AC 4 kV 5° / 85° (fixed position)

Connection cables	
Cable length	0.9 m
Cross-section	0.75 mm^2

Degree of protection	
Insulation protective class AC 24 V ~ / DC 24…48 V ⎓ AC 100…240 V ~	As per EN 60730 III II
Housing protection	IP54 as per EN 60529

Environmental conditions	
Operation – Climatic conditions – Mounting location – Temperature (extended) – Humidity, non-condensing	IEC 60721-3-3 Class 3K5 Interior, weather-protected -32...+55 °C <95 % r.F.
Transportation – Climatic conditions – Temperature (extended) – Humidity, non-condensing	IEC 60721-3-2 Class 2K3 -32...+70 °C <95 % r.F.
Storage – Climatic conditions – Temperature (extended) – Humidity, non-condensing	IEC 60721-3-1 Class 1K3 -32...+50 °C <95 % r.F.
Mechanical conditions	Class 2M2

Standards, directives and approvals	
Product standard	EN 60730 Part 2-14 / Particular requirements for electric actuators
Electromagnetic compatibility (Applications)	For use in residential, commerce, light-industrial and industrial environments
EU Conformity (CE)	A5W00004362 [2]
RCM Conformity	A5W00004363 [2]
EAC Conformity	Eurasian conformity
UL	UL as per UL 60730 http://ul.com/database cUL [1] as per CSA-C22.2 No. 24-93

Environmental compatibility
The product environmental declaration A5W00030346-A [2] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions	
Actuator W x H x D	See "Dimensions” p. 9
Damper shaft round Square Min. shaft length Shaft hardness	 8…15 mm 6…11 mm 20 mm <300 HV

Weight	
Excl. packaging	Max. 0.55 kg, without switches Max. 0.7 kg, with switches

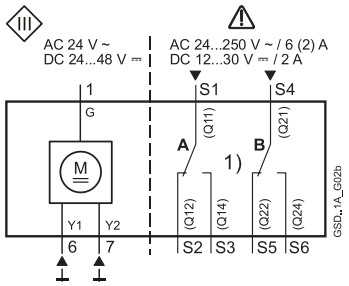
[1] Permitted only to DC 30 V ⎓

[2] The documents can be downloaded from http://siemens.com/bt/download.

Internal Diagrams

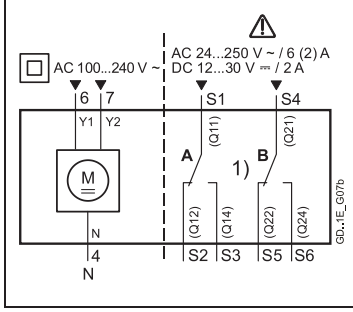
GSD14..1A (Open-close, three-p.)

AC 24 V ~ / DC 24…48 V ⎓



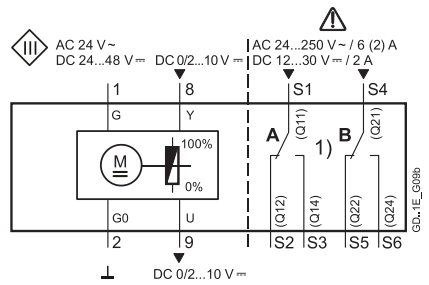
GSD34..1A (Open-close, three-p.)

AC 100…240 V ~



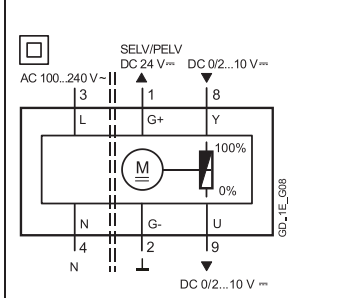
GSD16..1A (Modulating control)

AC 24 V ~ / DC 24…48 V ⎓

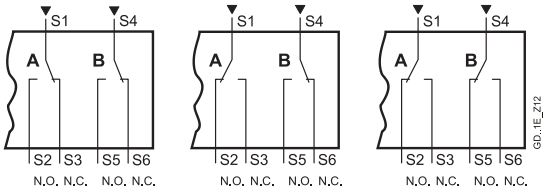


GSD361.1A (Modulating control)

AC 100…240 V ~



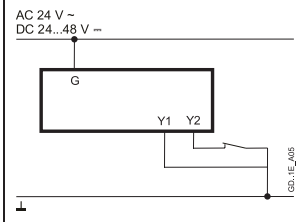
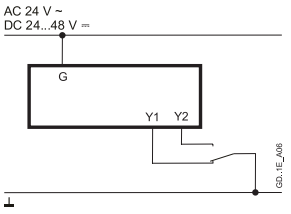
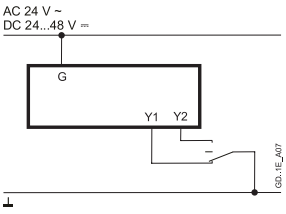
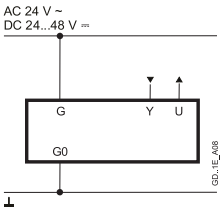
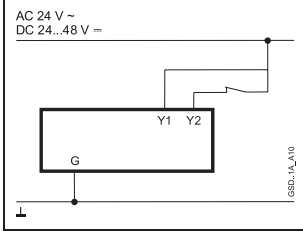
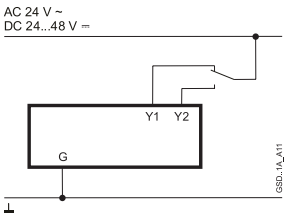
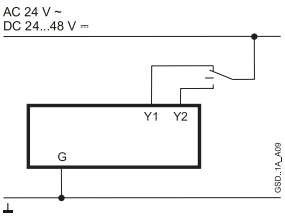
1) 0°... 5° 5°... 85° 85°... 90°



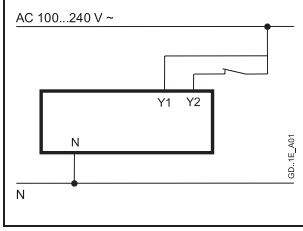
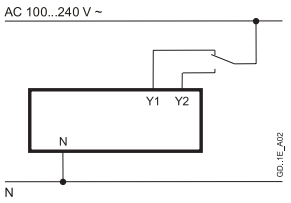
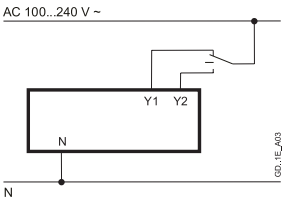
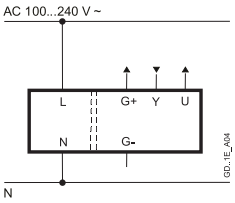
Actuator Position	**Switch A** Common S1 connected to	**Switch B** Common S4 connected to
0°…5°	S3	S6
5°…85°	S2	S6
85°…90°	S2	S5

Connection diagrams

GSD1..1A (AC 24 V ~ / DC 24…48 V ⎓)

Open-close, single wire control Single Pole Single Throw (SPST)	Open-close, two wire control Single Pole Double Throw (SPDT)	Three-position control	Modulating control
			
			

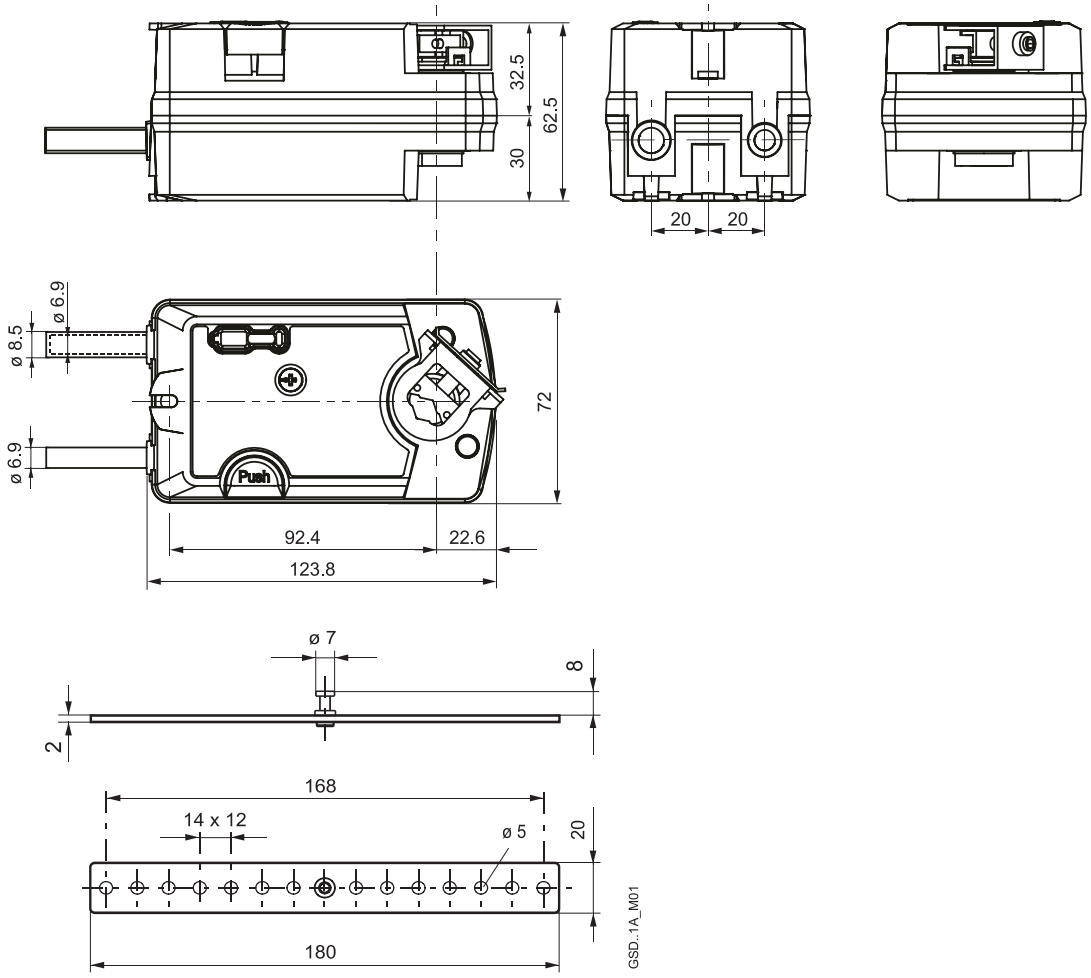
GSD3..1A (AC 100…240 V ~)

Open-close, single wire control Single Pole Single Throw (SPST)	Open-close, two wire control Single Pole Double Throw (SPDT)	Three-position control	Modulating control
			

Cable labeling

Connection	Code	No	Color	Abbreviation	Meaning
Actuators AC 24 V ~ DC 24…48 V ⎓	G	1	red	RD	System potential AC 24 V ~ / DC 24…48 V ⎓
	G0	2	black	BK	System neutral
	Y1	6	purple	VT	Positioning signal AC/DC 0 V, “clockwise” (GSD14..1A)
	Y2	7	orange	OG	Positioning signal AC/DC 0 V, “counterclockwise” (GSD14..1A)
	Y	8	grey	GY	Signal in (GSD16..1A)
	U	9	pink	PK	Signal out (GSD16..1A)
Actuators AC 100…240 V ~	L	3	brown	BR	Line AC 100…240 V ~
	N	4	light blue	BU	Neutral conductor
	Y1	6	black	BK	Positioning signal AC 100…240 V ~, “clockwise” (GSD34..1A)
	Y2	7	white	WH	Positioning signal AC 100…240 V ~, “counterclockwise” (GSD34..1A)
	G+	1	red	RD	System potential DC 24 V ⎓ (GSD361.1A)
	G-	2	black	BK	System neutral (GSD361.1A)
	Y	8	grey	GY	Signal in (GSD361.1A)
	U	9	pink	PK	Signal out (GSD361.1A)
Auxiliary switch	Q11	S1	grey/red	GY RD	Switch A input
	Q12	S2	grey/blue	GY BU	Switch A normally open contact
	Q14	S3	grey/pink	GY PK	Switch A normally closed contact
	Q21	S4	black/red	BK RD	Switch B input
	Q22	S5	black/blue	BK BU	Switch B normally open contact
	Q24	S6	black/pink	BK PK	Switch B normally closed contact

Dimensions



Dimensions in mm

OpenAir™

Actuators for Fire and Smoke Protection Dampers

GGA126.1E/..
GGA326.1E/..

- **Electric motor driven actuators for 2-position control, nominal torque 18 Nm, with spring return to failsafe position, mechanically adjustable span between 0...90°, prewired with 0.9 m long connecting cables**
- **Operating voltage AC 24 V / DC 24…48 V or AC 230 V**
- **Optional temperature monitoring unit with 3 thermal cutouts (72 °C) and test button.**
- **Fixed auxiliary switches for switching points 5° and 80°**
- **Rigid connection between actuator and damper shaft.**

Use

For the control of fire and smoke protection dampers.

- Nominal torque of 18 Nm for damper surfaces up to about 2.5 m^2 (friction-dependent)
- In fire protection sections of plant where, in the event the thermal fuse cuts out at a duct or ambient temperature of 72 °C, or in case of a power failure, the actuator must travel to the failsafe position (zero position)

Functions

Basic functions

Rotary movement	• Direction of rotation (clockwise or counterclockwise) determined by the way the actuator is mounted on the damper shaft • When operating voltage is applied, the actuator travels toward the 90° position
Failsafe function	• If the thermal fuse cuts out at a duct or ambient temperature of 72 °C (Optional: 95 °C), the return spring drives the actuator to the failsafe position (0°) • In the event of a power failure or if the operating voltage is turned off, the return spring drives the actuator to the failsafe position (0°)
Behavior in the event the damper is blocked	The actuator is equipped with an automatic switch-off mechanism.
Position indication	The position indicator located on the shaft adapter shows the rotational angle position of the damper blade.
Manual adjustment when actuator is dead	• When dead, the actuator can be driven to any angular position using a hex wrench and can then be secured with a screwdriver • The actuator returns to its zero position when mechanically delocked with a hex wrench (turning toward "90° - opening") or by applying power for a short moment
Rigid connection	Square shafts 10 x 10 or 12 x 12 mm

Type summary

Operating voltage	Auxiliary switches	With temperature monitoring unit	Without temperature monitoring unit
AC 24 V DC 24…48 V	Fixed switching points at 5° and 80°	**GGA126.1E/T10** **GGA126.1E/T12**	**GGA126.1E/10** **GGA126.1E/12**
AC 230 V	Fixed switching points at 5° and 80°	**GGA326.1E/T10** **GGA326.1E/T12**	**GGA326.1E/10** **GGA326.1E/12**

Delivery

Due to the mounting choices depending on the direction of rotation and the shaft length, shaft adapter with position indicator and other mounting accessories are shipped unassembled together with the actuator.

Connecting cables

The actuators come with 0.9 m long prewired connecting cables.
The cable length to the ready fitted temperature monitoring unit is 0.9 m.

Accessories

Designation	Type reference	Data sheet / mounting instruction
Duct tip to temperature monotoring unit	**ASK79.4 / 72 °C** **ASK79.5 / 95 °C**	N4617 / M4610
Shaft adapter 8 x 8 mm	**7471800300**	N4699
Shaft adapter 15 x 15 mm	**7471800270**	N4699

Equipment combinations

The damper actuators can be used with all types of controllers having a 2-position output and delivering a switching voltage of AC 24 V / DC24…48 V or AC 230 V.

Technical design

Drive motor	The brushless DC motor ensures accurate speed control, torque monitoring for protecting the actuator and the air damper, and provides a reliable failsafe function.
Spring return mechanism in the event of power failure	Mechanical spring ensure the failsafe function.

Mechanical design

Basic components

Housing	Robust, lightweight all metal housing made from die-cast aluminium which guarantees long service life even under extreme environmental conditions.
Gear train	Maintenance- and noise-free gear train with stall and overload protection for the life of the actuator.
Spring preload	The spring has a factory-set preload of 5° to ensure tight shutoff for the fire and smoke protection dampers.
Manual adjustment	A hole with a screw in the center of the actuator allows manual setting of the gears. A hex wrench is supplied.
Mounting bracket	A perforated bracket with pin available, depending on the way the actuator is fixed.
Electrical connection	All actuators come with prewired 0.9 m long connecting cables.
Note	The actuator can be mounted on either side depending on the required direction of rotation. All setting and operating elements are available on both sides of the actuator.
Auxiliary switches	Fixed switching points at 5° and 80°.

Temperature monitoring unit

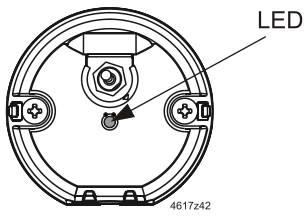
Use

The temperature monitoring unit is ready connected to the actuator and is used for forced control of motorized fire and smoke protection dampers should excessive temperatures occur.

Mode of operation

The temperature monitoring unit contains 3 thermal fuses, two for monitoring the duct temperature and one for the ambient temperature. If the temperature at any of these fuses exceeds the level of 72 °C (Optional: 95 °C), the power supply will be irreversibly cut. As a result, the return spring will drive the actuator to the failsafe position. A test button is integrated for making functional checks. When pressed, the current path will be cut.

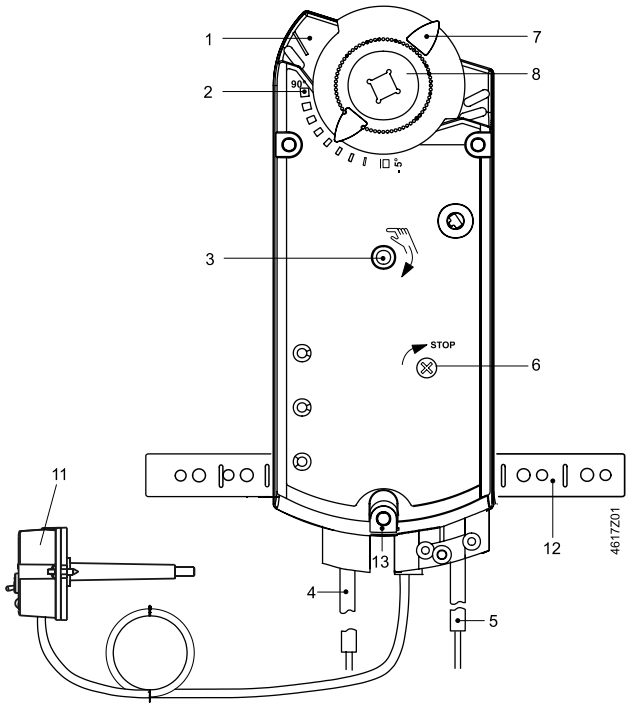
LED functions



- ○ Red = Operating voltage OK. Thermo sensor defect
- ○ Green = Operating voltage OK Thermo sensor OK
- ● Dark = No operating voltage

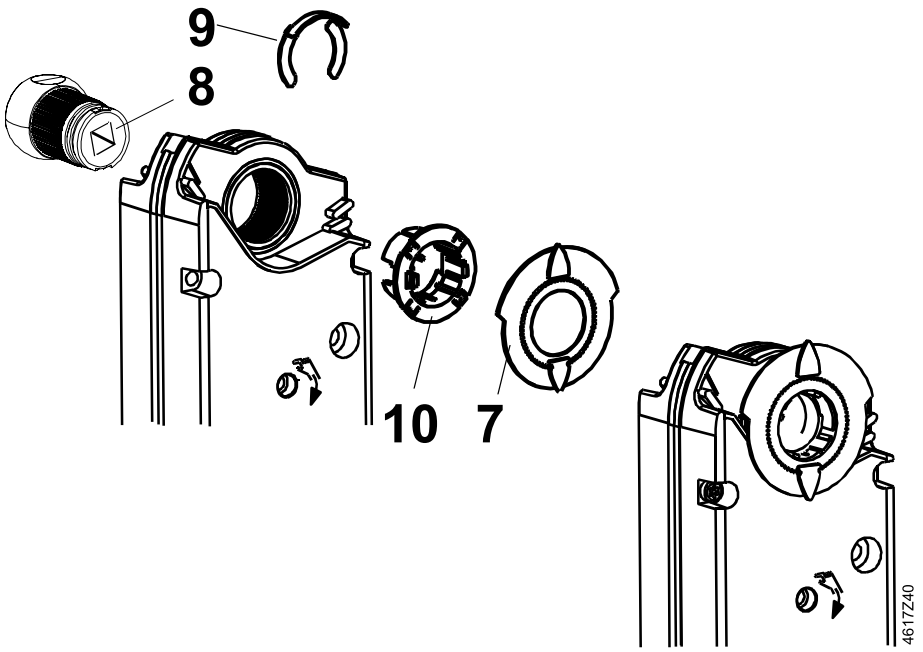
Setting and operating elements

Refer to "Technical design" and "Commissioning notes" in this data sheet.



1	Housing
2	Angle of rotation scale 0°...90°
3	Screw for manual override
4	Connecting cable for power supply
5	Connecting cable for auxiliary switches
6	Stop shaft for geartrain
7	Position indicator
8	Shaft adapter
9	Locking ring for shaft adapter
10	Adapter for position indicator
11	Temperature monitoring unit
12	Mounting bracket
13	Pin

Arrangement for shaft adapters



Engineering notes

The basic system data for the control systems in use contain all engineering notes. Read all the engineering notes before mounting, wiring and commissioning the damper actuator and pay special attention to all safety instructions.

Correct use

These damper actuators must be used on applications as described in the basic system data documents for the relevant control systems. Additionally, all actuator-specific features and rules must be observed as described in the brief description on the front page of this Data Sheet (bold print) and in "Use", "Engineering notes", and "Technical data".

All paragraphs marked with the special warning triangle as illustrated on the left contain additional safety instructions and limitations that must be observed under any circumstances to avoid physical injuries or damage to equipment.

Power supply
AC 24 V
DC 24…48 V

These actuators must be used with **safety extra low-voltage (SELV**) or **protection by extra low-voltage (PELV)** in accordance with HD 384.

Power supply
AC 230 V

The actuators are double-insulated and do not provide a connection for protective ground.

Auxiliary switches
“A”, “B”

Use **either mains voltage or safety extra low-voltage** for auxiliary switches “A” and “B”. Do not mix the 2 for operation. Operation with different phases is **not** permitted.

Warning,
maintenance

Do not open the actuator!
The actuator is maintenance-free. Maintenance work may only be carried out by the manufacturer.

Parallel connection of actuators

Electric parallel connection of the same types of actuator is permitted provided operating voltage is within the required tolerance. Voltage drops on the supply lines must be taken into consideration

Sizing transformers for AC 24 V

- Use safety isolating transformers with double insulation conforming to EN 60 742. The transformers must be suited for 100 % duty
- Observe all local safety rules and regulations relating to the sizing and protection of transformers
- Determine the transformer’s size by adding up the power consumption in VA of all actuators used

Wiring and commissioning

Refer to "Commissioning notes" and "Internal diagram" as well as to the plant diagram.

Mounting notes

Mounting instructions

For detailed information on the correct preparation of the actuator, refer to Mounting Instructions GGA…1E/.. M4617. The actuator must be fitted to the fire and smoke protection damper as specified by the OEM. Shaft adapter and other accessory items come unassembled, since their assembly depends on the direction of rotation and the length of the shaft (refer to “Technical design“).

Housing protection

In order to comply with the requirements of IP54 (temperature monitoring unit has IP54), the following mounting conditions must be satisfied:

- Always mount the actuator vertically (cable entry at the bottom) in the case of air dampers with horizontal shafts
- When the actuator is mounted directly on the damper shaft, the mounting angle may be a maximum of +/–45°

Mounting bracket / pin

If the actuator is mounted directly on the damper shaft, the mounting bracket / pin must be used. The insertion depth for the shaft into the housing must be sufficient.

Damper shafts	For information on minimum length and diameter of the damper shaft, refer to "Technical data".
Spring preload	The actuator is supplied with a 5° spring preload to ensure a certain closing pressure for the air damper.
Mechanical limitation of the rotational angle	If required, the angle of rotation can be limited in increments of 5° for the entire correcting span by placing the shaft adapter in the respective position.
Temperature monitoring unit	The temperature monitoring unit is to be fitted to the duct wall or the damper housing using 2 self-tapping screws of 3.5 mm diameter. The enclosed drilling template facilitates mounting. When mounting, it must be ensured that the thermal fuse is fully exposed to the airflow.

Commissioning notes

References	All information required for commissioning is contained in the following pieces of documentation: • The present Data Sheet N4617 • Mounting Instructions M4617 • Plant diagram
Environmental conditions	• Check to ensure that all permissible values as specified in "Technical data" are observed
Mechanical check	• Check for proper mounting to ensure that all mechanical settings are in accordance with plant-specific requirements. In addition, ensure that the air dampers are shut tight when in the fully closed position • Fasten the actuator securely to avoid side load • Check the direction of rotation by turning the gearing with a hex wrench in accordance with the Mounting Instructions
Electrical check	• Check to ensure that the cables are connected in accordance with the plant wiring diagram • Operating voltage AC 24 V / DC 24…48 V (SELV / PELV) or AC 230 V must be within the tolerance • Auxiliary switches "A" and "B" change over when the actuator reaches the respective positions
Temperature monitoring unit ⚠	Functional check on site: Press the button to simulate overtemperature. This simulates the response of the fuse, enabling you to check the proper functioning of the actuator. In plant equipped with a fire alarm device BAM, fire alarm will be triggered. Appropriate measures must be taken before the functional check is made.

Disposal

The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU 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.

Technical data

⚠ Power supply AC 24 V DC 24...48 V (SELV/PELV)	Operating voltage AC / frequency	AC 24 V ±20 % / 50/60 Hz
	Operating voltage (DC)	DC 24...48 V ±20 %
	Power consumption GGA126.1: when running	AC: 7 VA / 5 W
	when running	DC: 4 W
	when holding	AC: 5 VA / 3 W
	when holding	DC: 3 W
	Safety class	III to EN 60 730
⚠ Power supply AC 230 V	Operating voltage / frequency	AC 230 V ±15 % 50/60 Hz
	Power consumption GGA326.1: when running	8 VA / 6 W
	when holding	6 VA / 4 W
	Safety class	II to EN 60 730
Mechanical data	Nominal torque	18 Nm
	Maximum torque (blocked)	50 Nm
	Nominal angle of rotation / maximum angle of rotation	90° / 95° ± 2°
	Running time for nominal angle of rotation 90° (motor operation)	90 s
	Closing with spring return (on power failure)	15 s
⚠ Auxiliary switches	AC power supply	
	Switching voltage	AC 24...230 V
	Nominal current res./ind.	AC 6 A / 2 A
	Life: 6 A res., 2 A ind.	10^4 cycles
	without load	10^6 cycles
	DC power supply	
	Switching voltage	DC 12..30 V
	Nominal current	DC 2 A
	Electric strength auxiliary switch against housing	AC 4 kV
	Switching hysteresis	2°
	Factory switch setting	
	Switch A	5°
	Switch B	80°
Connecting cables (halogen free)	Power supply line AC 24 V (wires 1-2)	2 x 0.75 mm²
	AC 230 V (wires 3-4)	2 x 0.75 mm²
	Auxiliary switch cable (wires S1…S6)	6 x 0.75 mm²
	Standard length	0.9 m
Degree of protection	Housing (actuator only)	IP54 to EN 60 529
Environmental conditions	Operation / transport	IEC 721-3-3 / IEC 721-3-2
	Temperature	–32...+50 °C / –32...+50 °C
	Humidity (non-condensing)	< 95 % r.h. / < 95 % r.h.
Standards and directives	Product safety:	
	automatic electrical controls for household and similar use	EN 60 730-2-14 (mode of action type 1)
	Electromagnetic compatibility (Application)	For residential, commercial and industrial environments
	EU Conformity (CE)	A5W00004372 [1]
	RCM Conformity	A5W00004373 [1]
	Product environmental declaration [2]	CE1E4617en [1]
Dimensions	Actuator W x H x D (see "Dimensions")	100 x 264 x 71 mm
	Damper shaft: square	10x10, 12x12 mm

	min. shaft length		20 mm
Weight	Without packaging:	GGA126.1E/T...	2.4 kg
		GGA326.1E/T…	2.5 kg
		GGA126.1E/..	2.3 kg
		GGA326.1E/..	2.4 kg
Temperature monitoring unit (ready connected to actuator GGA..26.1E/T..)	Connecting cable (halogen free)		0.9 m long (2 x 0.5 mm^2)
	Switching temperature for sizing		Tf1: outside the duct 72 °C Tf2: inside the duct 72 °C Tf3: inside the duct 72 °C
	Temperatur tolerance Tf1, Tf2, Tf3		72 °C +0 °C/–2 °C
	Safety class		III (safety extra-low voltage)
	Degree of protection		IP54
	Ambient temperature / storage temperature		–20…+50 °C / –20…+50 °C
	Ambient humidity		KL D to DIN 40040
	Maintenance		maintenance-free
	Weight		0.1 kg

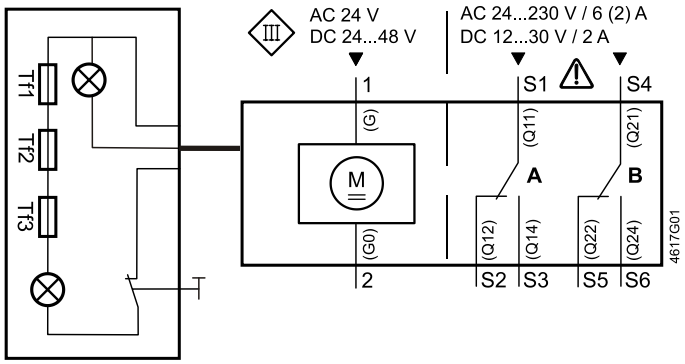
[1] The documents can be downloaded from http://siemens.com/bt/download

[2] The product environmental declaration contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Diagrams

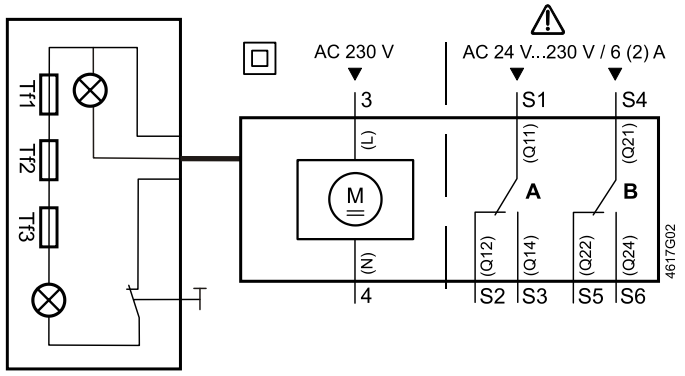
Internal diagrams

GGA126.1E/T..



AC 24 V
DC 24…48 V
(SELV/PELV)

GGA326.1E/T..



AC 230 V

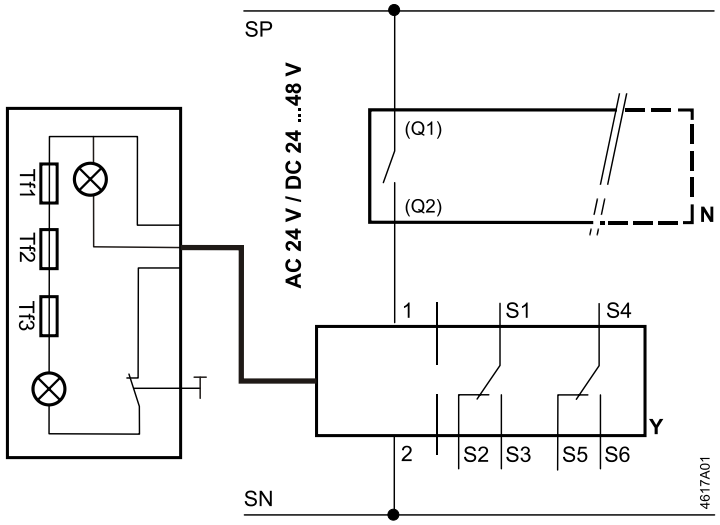
Wire designations

All wires are color-coded and labeled.

Connection	Cable				Meaning
	Code	No.	Color	Abbreviation	
Actuators AC 24 V DC 24…48 V	G G0	1 2	red black	RD BK	System potential AC 24 V / DC 24…48 V System neutral
Actuators AC 230 V	L N	3 4	brown blue	BN BU	Line AC 230 V Neutral
Auxiliary switch	Q11 Q12 Q14 Q21 Q22 Q24	S1 S2 S3 S4 S5 S6	grey/red grey/blue grey/pink black/red black/blue black/pink	GYRD GYBU GYPK BKRD BKBU BKPK	Switch A input Switch A normally-closed contact Switch A normally-open contact Switch B input Switch B normally-closed contact Switch B normally-open contact

Connection diagram

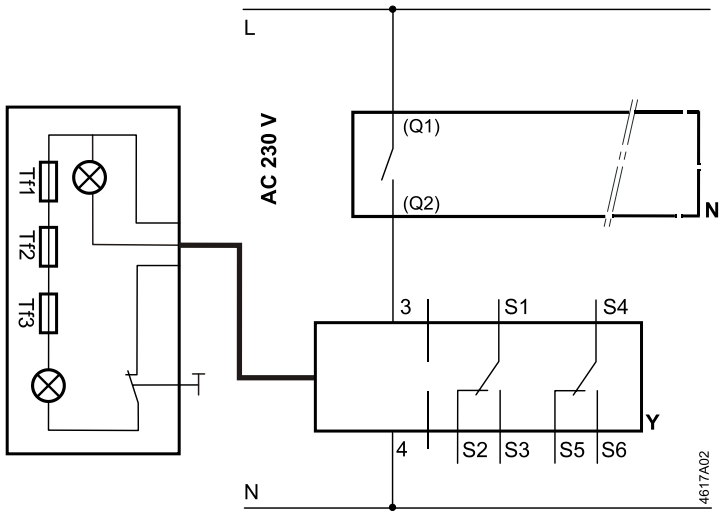
GGA126.1E/T..



AC 24 V
DC 24…48 V
(SELV/PELV)

N Controller
Y 2-position actuator
SP System potential
SN System neutral

GGA326.1E/T..

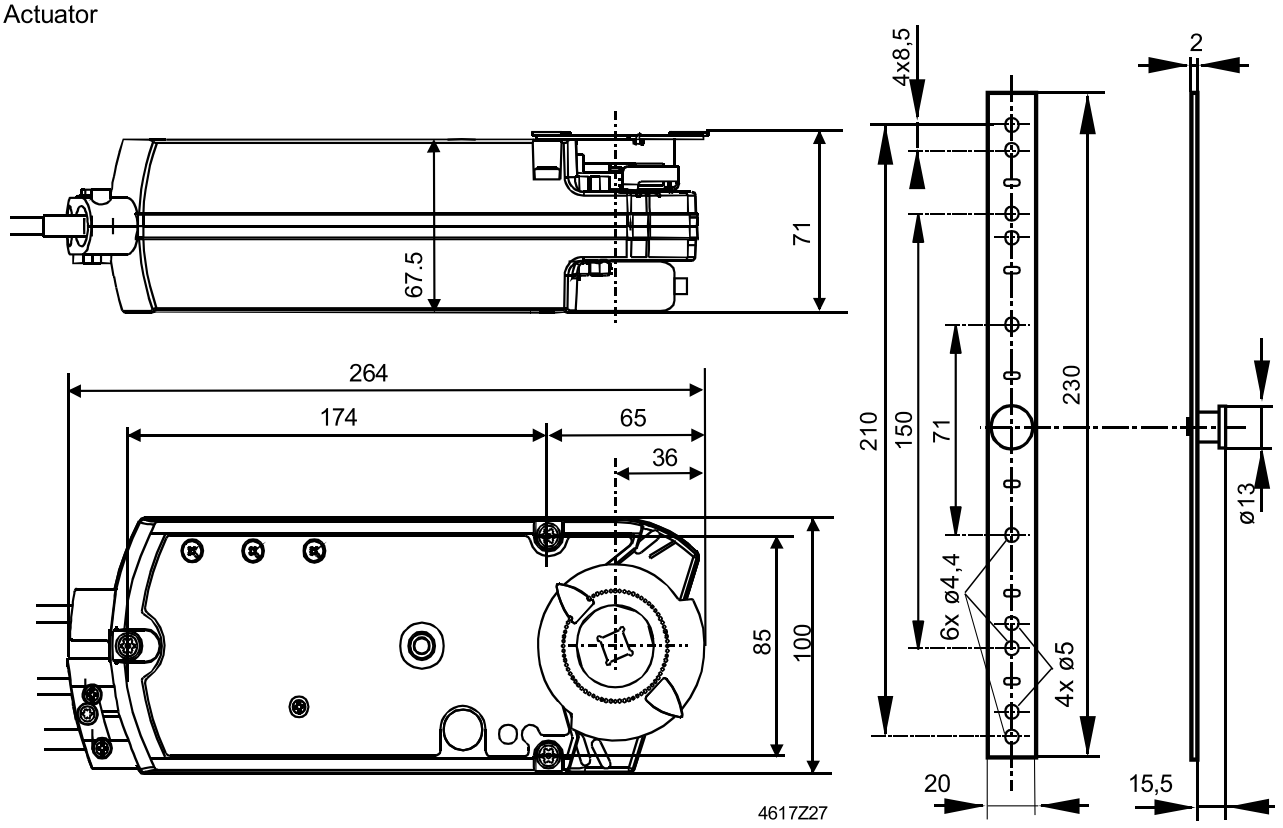


AC 230 V

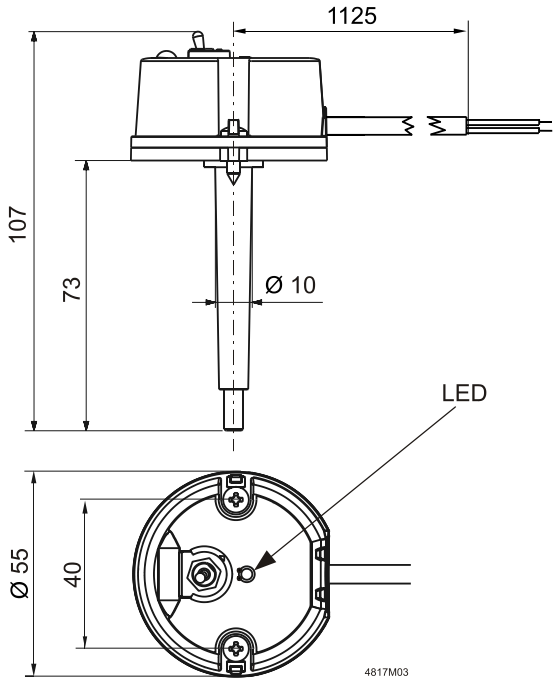
N Controller
Y 2-position actuator
L Live
N Neutral conductor

Dimensions

Actuator



Temperature monitoring unit



LED function

- O Red = Operating voltage OK
  Thermo sensor defect
- O Green = Operating voltage OK
  Thermo sensor OK
- ● Dark = No operating voltage

Dimensions in mm

OpenAir™

Actuators for Fire and Smoke Protection Dampers

GNA126.1E/...
GNA326.1E/...

- **Electric motor driven actuators for 2-position control, nominal torque 9 Nm, with spring return to failsafe position, mechanically adjustable span between 0...90°, prewired with 0.9 m long connecting cables**
- **Operating voltage AC 24 V / DC 24…48 V or AC 230 V**
- **Optional temperature monitoring unit with 3 thermal cutouts (72 °C) and test button**
- **Fixed auxiliary switches for switching points 5° and 80°**
- **Rigid connection between actuator and damper shaft**

Use

For the control of fire and smoke protection dampers.

- Nominal torque of 9 Nm for damper surfaces up to about 1.0 m^2 (friction-dependent)
- In fire protection sections of plant where, in the event the thermal fuse cuts out at a duct or ambient temperature of 72 °C, or in case of a power failure, the actuator must travel to the failsafe position (zero position)

Functions

Basic functions

Rotary movement

- Direction of rotation (clockwise or counterclockwise) determined by the way the actuator is mounted on the damper shaft
- When operating voltage is applied, the actuator travels toward the 90° position

Failsafe function

- If the thermal fuse cuts out at a duct or ambient temperature of 72 °C (Optional: 95 °C), the return spring drives the actuator to the failsafe position (0°)
- In the event of a power failure or if the operating voltage is turned off, the return spring drives the actuator to the failsafe position (0°)

Behavior in the event the damper is blocked

The actuator is equipped with an automatic switch-off mechanism.

Position indication

The position indicator located on the shaft adapter shows the rotational angle position of the damper blade.

Manual adjustment when actuator is dead

- When dead, the actuator can be driven to any angular position using a hex wrench and can then be secured with a screwdriver
- The actuator returns to its zero position when mechanically delocked with a hex wrench (turning toward "90° - opening") or by applying power for a short moment

Rigid connection

Square shafts 10 x 10 or 12 x 12 mm.

Type summary

Operating voltage	Auxiliary switches	With temperature monitoring unit	Without temperature monitoring unit
AC 24 V DC 24…48 V	Fixed switching points at 5° and 80°	**GNA126.1E/T10** **GNA126.1E/T12**	**GNA126.1E/10** **GNA126.1E/12**
AC 230 V	Fixed switching points at 5° and 80°	**GNA326.1E/T10** **GNA326.1E/T12**	**GNA326.1E/10** **GNA326.1E/12**

Delivery

Due to the mounting choices depending on the direction of rotation and the shaft length, shaft adapter with position indicator and other mounting accessories are shipped unassembled together with the actuator.

Connecting cables

The actuators come with 0.9 m long prewired connecting cables.
The cable length to the ready fitted temperature monitoring unit is 0.9 m.

Accessories

Designation	Type reference	Data sheet / mounting instruction
Duct tip to temperature monotoring unit	**ASK79.4 / 72 °C** **ASK79.5 / 95 °C**	N4620 / M4610

Equipment combinations

The damper actuators can be used with all types of controllers having a 2-position output and delivering a switching voltage of AC 24 V / DC 24…48 V or AC 230 V.

Technical design

Drive motor	The brushless DC motor ensures accurate speed control, torque monitoring for protecting the actuator and the air damper, and provides a reliable failsafe function.
Spring return mechanism in the event of power failure	Mechanical spring ensure the failsafe function.

Mechanical design

Basic components

Housing	Robust, lightweight all metal housing made from die-cast aluminium which guarantees a long service life even under extreme environmental conditions.
Gear train	Maintenance- and noise-free gear train with stall and overload protection for the life of the actuator.
Spring preload	The spring has a factory-set preload of 5° to ensure tight shutoff for the fire and smoke protection dampers.
Manual adjustment	A hole with a screw in the center of the actuator allows manual setting of the gears. A hex wrench is supplied.
Mounting bracket	A perforated bracket with pin available, depending on the way the actuator is fixed.
Electrical connection	All actuators come with prewired 0.9 m long connecting cables.
Note	The actuators can be mounted on either side depending on the required direction of rotation. All setting and operating elements are available on both sides of the actuator.
Auxiliary switches	Fixed switching points at 5° and 80°.

Temperature monitoring unit

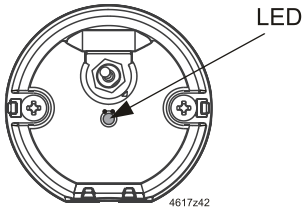
Use

The temperature monitoring unit is ready connected to the actuator and is used for forced control of motorized fire and smoke protection dampers should excessive temperatures occur.

Mode of operation

The temperature monitoring unit contains 3 thermal fuses, two for monitoring the duct temperature and 1 for the ambient temperature. If the temperature at any of these fuses exceeds the level of 72 °C (Optional: 95 °C), the power supply will be irreversibly cut. As a result, the return spring will drive the actuator to the failsafe position. A test button is integrated for making functional checks. When pressed, the current path will be cut.

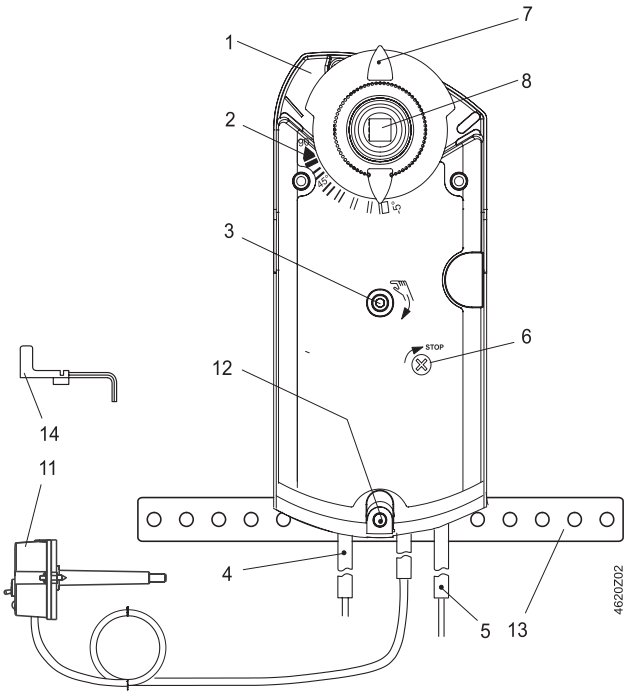
LED functions



- O Red = Operating voltage OK. Thermo sensor defect
- O Green = Operating voltage OK Thermo sensor OK
- ● Dark = No operating voltage

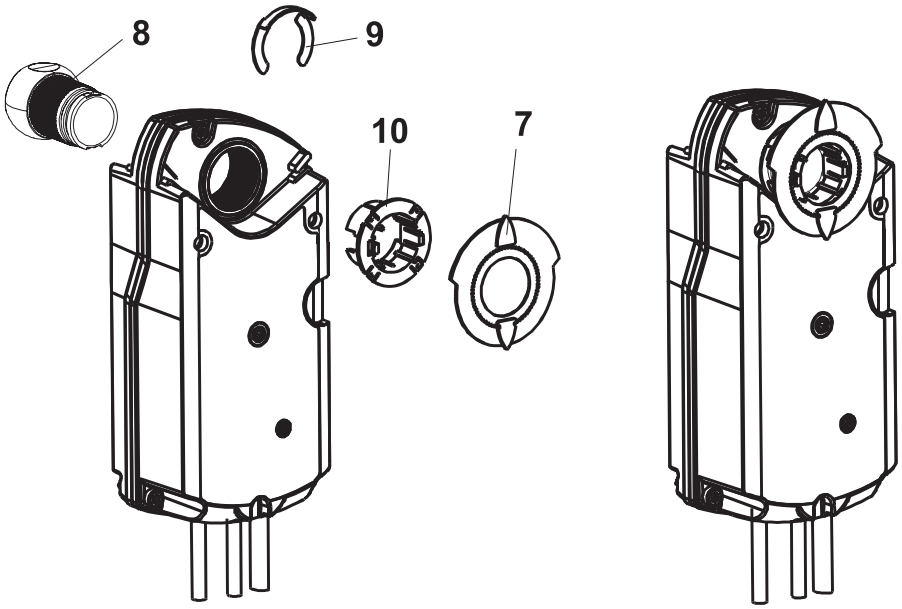
Setting and operating elements

Refer to "Technical design" and "Commissioning notes" in this Data Sheet.



1	Housing
2	Angle of rotation scale 0°...90°
3	Hexagon socket for manual override
4	Connecting cable for power supply
5	Connecting cable for auxiliary switches
6	Stop shaft for gear train
7	Position indicator
8	Shaft adapter
9	Locking ring for shaft adapter
10	Adapter for position indicator
11	Temperature monitoring unit
12	Pin
13	Mounting bracket
14	Hex wrench for manual override

Arrangement for shaft adapters



Engineering notes

The basic system data for the control systems in use contain all engineering notes. Read all the engineering notes before mounting, wiring and commissioning the damper actuator and pay special attention to all safety instructions.

Correct use

These damper actuators must be used on applications as described in the basic system data documents for the relevant control systems. Additionally, all actuator-specific features and rules must be observed as described in the brief description on the front page of this Data Sheet (bold print) and in "Use", "Engineering notes", and "Technical data".

All paragraphs marked with the special warning triangle as illustrated on the left contain additional safety instructions and limitations that must be observed under any circumstances to avoid physical injuries or damage to equipment.

Power supply
AC 24 V
DC 24…48 V

These actuators must be used with **safety extra low-voltage (SELV**) or **protection by extra low-voltage (PELV)** in accordance with HD 384.

Power supply
AC 230 V

The actuators are double-insulated and do not provide a connection for protective ground.

Auxiliary switches
“A”, “B”

Use **either mains voltage or safety extra low-voltage** for auxiliary switches “A” and “B”. Do not mix the 2 for operation. Operation with different phases is **not** permitted.

Warning,
maintenance

Do not open the actuator!
The actuator is maintenance-free. Maintenance work may only be carried out by the manufacturer.

Parallel connection of actuators

Electric parallel connection of the same types of actuator is permitted provided operating voltage is within the required tolerance. Voltage drops on the supply lines must be taken into consideration

Sizing transformers for AC 24 V

- Use safety isolating transformers with double insulation conforming to EN 60 742. The transformers must be suited for 100 % duty
- Observe all local safety rules and regulations relating to the sizing and protection of transformers
- Determine the transformer’s size by adding up the power consumption in VA of all actuators used

Wiring and commissioning

Refer to "Commissioning notes" and "Internal diagram" as well as to the plant diagram.

Mounting notes

Mounting instructions

For detailed information on the correct preparation of the actuator, refer to Mounting Instructions GNA…1E/.. M4620. The actuator must be fitted to the fire and smoke protection damper as specified by the OEM. Shaft adapter and other accessory items come unassembled, since their assembly depends on the direction of rotation and the length of the shaft (refer to “Technical design“).

Housing protection

In order to comply with the requirements of IP54 (temperature monitoring unit has IP54), the following mounting conditions must be satisfied:

- Always mount the actuator vertically (cable entry at the bottom) in the case of air dampers with horizontal shafts
- When the actuator is mounted directly on the damper shaft, the mounting angle may be a maximum of +/–45°

Mounting bracket / pin

If the actuator is mounted directly on the damper shaft, the mounting bracket / pin must be used. The insertion depth for the shaft into the housing must be sufficient.

Damper shafts	For information on minimum length and diameter of the damper shaft, refer to "Technical data".
Spring preload	The actuator is supplied with a 5° spring preload to ensure a certain closing pressure for the air damper.
Mechanical limitation of the rotational angle	If required, the angle of rotation can be limited in increments of 5° for the entire correcting span by placing the shaft adapter in the respective position.
Temperature monitoring unit	The temperature monitoring unit is to be fitted to the duct wall or the damper housing using 2 self-tapping screws of 3.5 mm diameter. The enclosed drilling template facilitates mounting. When mounting, it must be ensured that the thermal fuse is fully exposed to the airflow.

Commissioning notes

References	All information required for commissioning is contained in the following pieces of documentation: • The present Data Sheet N4620 • Mounting Instructions M4620 • Plant diagram
Environmental conditions	• Check to ensure that all permissible values as specified in "Technical data" are observed
Mechanical check	• Check for proper mounting to ensure that all mechanical settings are in accordance with plant-specific requirements. In addition, ensure that the air dampers are shut tight when in the fully closed position • Fasten the actuator securely to avoid side load • Check the direction of rotation by turning the gearing with a hex wrench in accordance with the Mounting Instructions
Electrical check	• Check to ensure that the cables are connected in accordance with the plant wiring diagram • Operating voltage AC 24 V / DC 24…48 V (SELV / PELV) or AC 230 V must be within the tolerance • Auxiliary switches "A" and "B" change over when the actuator reaches the respective positions
Temperature monitoring unit ⚠	Functional check on site: Press the button to simulate overtemperature. This simulates the response of the fuse, enabling you to check the proper functioning of the actuator. In plant equipped with a fire alarm device BAM, fire alarm will be triggered. Appropriate measures must be taken before the functional check is made.

Disposal

The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU 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.

Technical data

⚠ Power supply AC 24 V DC 24...48 V (SELV/PELV)	Operating voltage AC / frequency		AC 24 V ±20 % / 50/60 Hz
	Operating voltage (DC)		DC 24...48 V ±20 %
	Power consumption GNA126.1: when running		AC: 5 VA / 3.5 W / DC: 3.5 W
		when holding	AC/DC: 2 W
	Safety class		III to EN 60 730
⚠ Power supply AC 230	Operating voltage / frequency		AC 230 V ±15 % 50/60 Hz
	Power consumption GNA326.1: when running		7 VA / 4.5 W
		when holding	3.5 W
	Safety class		II to EN 60 730
Mechanical data	Nominal torque	Motor	9 Nm
		Spring return	7 Nm
	Maximum torque (blocked)		21 Nm
	Nominal angle of rotation / maximum angle of rotation		90° / 95° ± 2°
	Running time for nominal angle of rotation 90° (motor operation)		90 s
	Closing with spring return (on power failure)		15 s
⚠ Auxiliary switches	AC power supply		
	Switching voltage		AC 24...230 V
	Nominal current res./ind.		6 A / 2 A
	Life: 6 A res., 2 A ind.		10^4 cycles
	without load		10^6 cycles
	DC power supply		
	Switching voltage		DC 12..30 V
	Nominal current		DC 2 A
	Electric strength auxiliary switch against housing		AC 4 kV
	Switching hysteresis		2°
	Factory switch setting		
	Switch A		5°
	Switch B		80°
Connecting cables (halogen free)	Power supply line	AC 24 V (wires 1-2)	2 x 0.75 mm2
		AC 230 V (wires 3-4)	2 x 0.75 mm2
	Auxiliary switch cable (wires S1…S6)		6 x 0.75 mm2
	Standard length		0.9 m
Degree of protection	Housing (actuator only)		IP54 to EN 60 529
Environmental conditions	Operation / transport		IEC 721-3-3 / IEC 721-3-2
	Temperature		–32...+50 °C / –32...+50 °C
	Humidity (non-condensing)		< 95 % r.h. / < 95 % r.h.
Standards and directives	Product safety:		
	automatic electrical controls for household and similar use		EN 60 730-2-14 (mode of action type 1)
	Electromagnetic compatibility (Application)		For residential, commercial and industrial environments
	EU Conformity (CE)		A5W00004378 [1]
	RCM Conformity		A5W00004379 [1]
	Product environmental declaration [2]		CE1E4620en [1]
Dimensions	Actuator W x H x D (see "Dimensions")		81 x 178 x 63 mm
	Damper shaft: square		10x10, 12x12 mm
	min. shaft length		20 mm
Weight	Without packaging:	GNA126.1E/T...	1.3 kg
		GNA326.1E/T…	1.4 kg
		GNA126.1E/....	1.2 kg
		GNA326.1E/....	1.3 kg

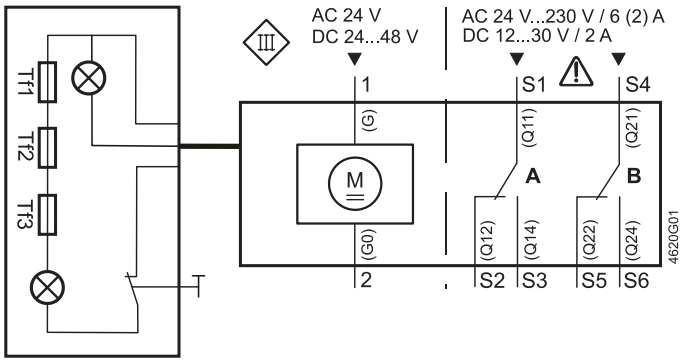
[1] The documents can be downloaded from http://siemens.com/bt/download

[2] The product environmental declaration contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Temperature monitoring unit (ready connected to actuator GNA..26.1E/T..)	Connecting cable (halogen free)	0.9 m long (2 x 0.5 mm^2)
	Switching temperature for sizing	Tf1: outside the duct 72 °C Tf2: inside the duct 72 °C Tf3: inside the duct 72 °C
	Temperatur tolerance Tf1, Tf2, Tf3	72 °C +0 °C/–2 °C
	Safety class	III (safety extra-low voltage)
	Degree of protection	IP54
	Ambient temperature / storage temperature	–20…+50 °C/–20…+50 °C
	Ambient humidity	KL D to DIN 40040
	Maintenance	maintenance-free
	Weight	0.1 kg

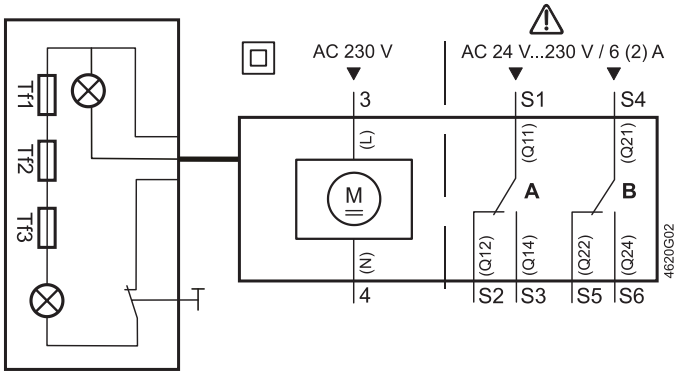
Diagrams

Internal diagram GNA126.1E/T..



AC 24 V
DC 24…48 V
(SELV/PELV)

GNA326.1E/T..



AC 230 V

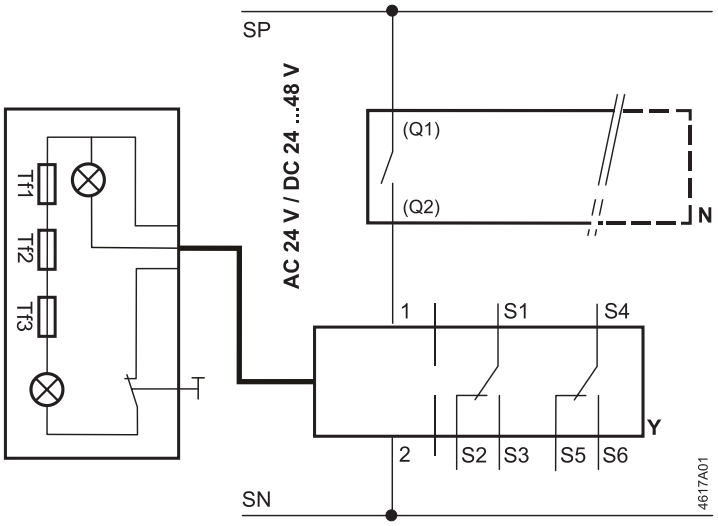
Wire designations

All wires are color-coded and labeled

Connection	Cable				Meaning
	Code	No.	Color	Abbreviation	
Actuators AC 24 V DC 24…48 V	G	1	red	RD	System potential AC 24 V / DC 24…48 V
	G0	2	black	BK	System neutral
Actuators AC 230 V	L	3	brown	BN	Line AC 230 V
	N	4	blue	BU	Neutral
Auxiliary switch	Q11	S1	grey/red	GYRD	Switch A input
	Q12	S2	grey/blue	GYBU	Switch A normally-closed contact
	Q14	S3	grey/pink	GYPK	Switch A normally-open contact
	Q21	S4	black/red	BKRD	Switch B input
	Q22	S5	black/blue	BKBU	Switch B normally-closed contact
	Q24	S6	black/pink	BKPK	Switch B normally-open contact

Connection diagram

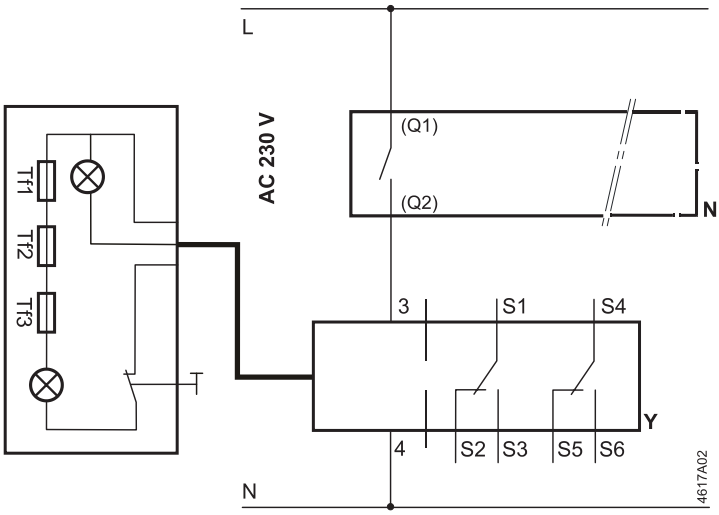
GNA126.1E/T..



AC 24 V
DC 24…48 V
(SELV/PELV)

N Controller
Y 2-position actuator
SP System potential
SN System neutral

GNA326.1E/T..

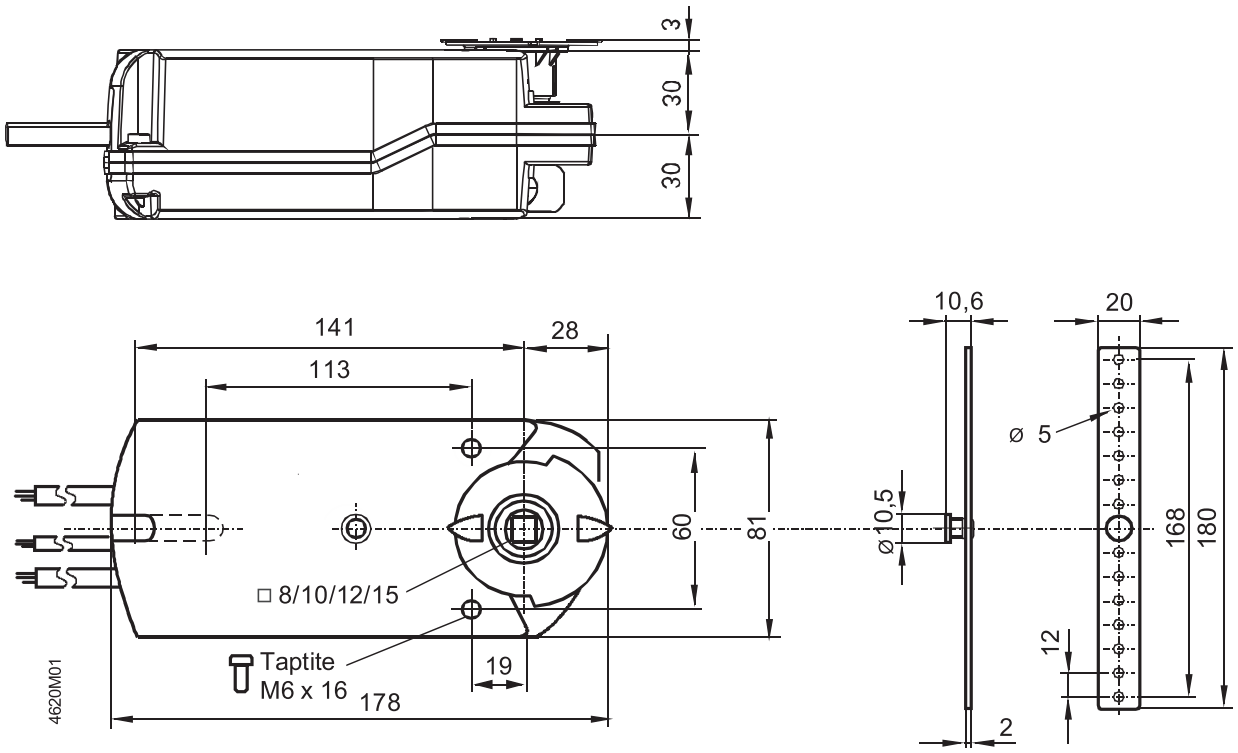


AC 230 V

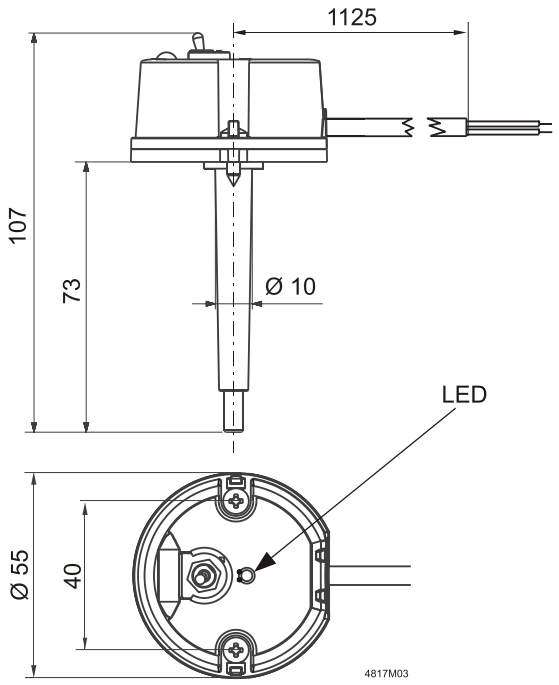
N Controller
Y 2-position actuator
L Live
N Neutral conductor

Dimensions

Actuator



Temperature monitoring unit



LED function

- O Red = Operating voltage OK
  Thermo sensor defect
- O Green = Operating voltage OK
  Thermo sensor OK
- ● Dark = No operating voltage

Dimensions in mm

SIEMENS

OpenAir™

Actuators for Fire and Smoke Protection Dampers

GRA126.1E/...
GRA326.1E/...

- **Electric motor driven actuators for 2-position control, nominal torque 4 Nm, with spring return to failsafe position, mechanically adjustable span between 0...90°, prewired with 0.9 m long connecting cables**
- **Operating voltage AC 24 V / DC 24…48 V or AC 230 V**
- **Optional temperature monitoring unit with 3 thermal cutouts (72 °C) and test button**
- **Fixed auxiliary switches for switching points 5° and 80°**
- **Rigid connection between actuator and damper shaft**

Use

For the control of fire and smoke protection dampers.

- Nominal torque of 4 Nm for damper surfaces up to about 0.6 m^2 (friction-dependent)
- In fire protection sections of plant where, in the event the thermal fuse cuts out at a duct or ambient temperature of 72 °C, or in case of a power failure, the actuator must travel to the failsafe position (zero position)

Functions

Basic functions

Rotary movement	• Direction of rotation (clockwise or counterclockwise) determined by the way the actuator is mounted on the damper shaft • When operating voltage is applied, the actuator travels toward the 90° position
Failsafe function	• If the thermal fuse cuts out at a duct or ambient temperature of 72 °C (Optional: 95 °C), the return spring drives the actuator to the failsafe position (0°) • In the event of a power failure or if the operating voltage is turned off, the return spring drives the actuator to the failsafe position (0°)
Behavior in the event the damper is blocked	The actuator is equipped with an automatic switch-off mechanism.
Position indication	The position indicator located on the shaft adapter shows the rotational angle position of the damper blade.
Manual adjustment when actuator is dead	• When dead, the actuator can be driven to any angular position using a hex wrench and can then be secured with a screwdriver • The actuator returns to its zero position when mechanically delocked with a hex wrench (turning toward "90° - opening") or by applying power for a short moment
Rigid connection	Square shafts 10 x 10 or 12 x 12 mm.

Type summary

Operating voltage	Auxiliary switches	With temperature monitoring unit	Without temperature monitoring unit
AC 24 V DC 24…48 V	Fixed switching points at 5° and 80°	**GRA126.1E/T10** **GRA126.1E/T12**	**GRA126.1E/10** **GRA126.1E/12**
AC 230 V	Fixed switching points at 5° and 80°	**GRA326.1E/T10** **GRA326.1E/T12**	**GRA326.1E/10** **GRA326.1E/12**

Delivery

Due to the mounting choices depending on the direction of rotation and the shaft length, shaft adapter with position indicator and other mounting accessories are shipped unassembled together with the actuator.

Connecting cables

The actuators come with 0.9 m long prewired connecting cables.
The cable length to the ready fitted temperature monitoring unit is 0.9 m.

Accessories

Designation	Type reference	Data sheet / mounting instruction
Duct tip to temperature monotoring unit	**ASK79.4 / 72 °C** **ASK79.5 / 95 °C**	A6V10890425 / M4610

Equipment combinations

The damper actuators can be used with all types of controllers having a 2-position output and delivering a switching voltage of AC 24 V / DC 24…48 V or AC 230 V.

Technical design

Drive motor	The brushless DC motor ensures accurate speed control, torque monitoring for protecting the actuator and the air damper, and provides a reliable failsafe function.
Spring return mechanism in the event of power failure	Mechanical spring ensure the failsafe function.

Mechanical design

Basic components

Housing	Robust, lightweight all metal housing made from die-cast aluminium which guarantees a long service life even under extreme environmental conditions.
Gear train	Maintenance- and noise-free gear train with stall and overload protection for the life of the actuator.
Spring preload	The spring has a factory-set preload of 5° to ensure tight shutoff for the fire and smoke protection dampers.
Manual adjustment	A hole with a screw in the center of the actuator allows manual setting of the gears. A hex wrench is supplied.
Mounting bracket	A perforated bracket with pin available, depending on the way the actuator is fixed.
Electrical connection	All actuators come with prewired 0.9 m long connecting cables.
Note	The actuators can be mounted on either side depending on the required direction of rotation. All setting and operating elements are available on both sides of the actuator.
Auxiliary switches	Fixed switching points at 5° and 80°.

Temperature monitoring unit

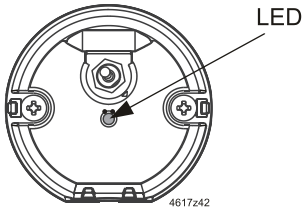
Use

The temperature monitoring unit is ready connected to the actuator and is used for forced control of motorized fire and smoke protection dampers should excessive temperatures occur.

Mode of operation

The temperature monitoring unit contains 3 thermal fuses, two for monitoring the duct temperature and 1 for the ambient temperature. If the temperature at any of these fuses exceeds the level of 72 °C (Optional: 95 °C), the power supply will be irreversibly cut. As a result, the return spring will drive the actuator to the failsafe position. A test button is integrated for making functional checks. When pressed, the current path will be cut.

LED functions



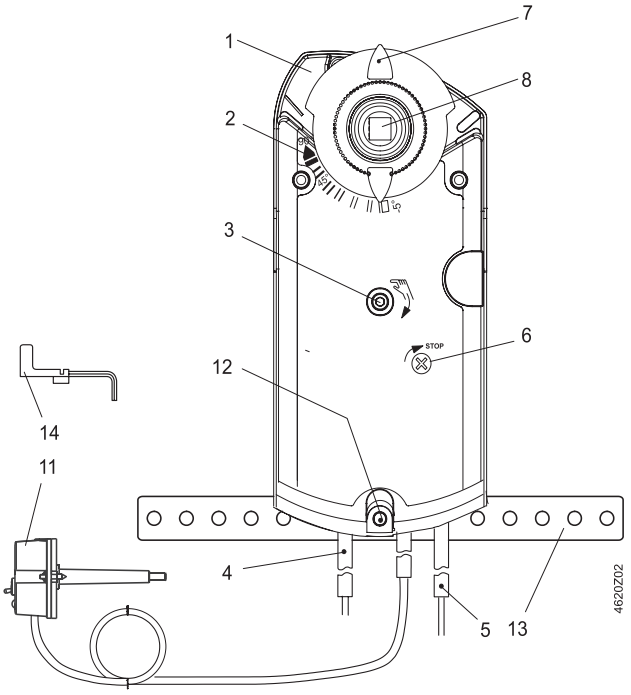
O Red = Operating voltage OK.
Thermo sensor defect

O Green = Operating voltage OK
Thermo sensor OK

● Dark = No operating voltage

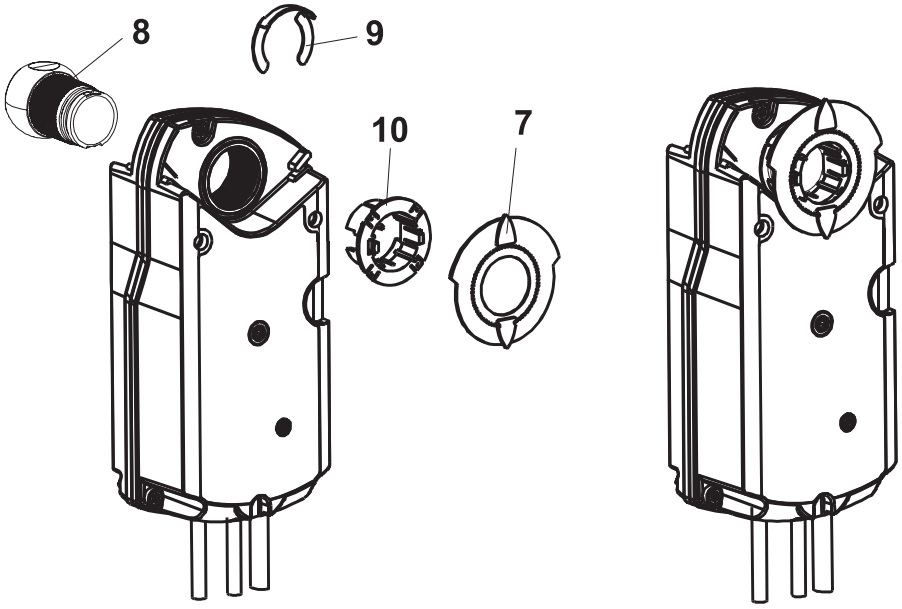
Refer to "Technical design" and "Commissioning notes" in this Data Sheet.

Setting and operating elements



1 Housing
2 Angle of rotation scale 0°...90°
3 Hexagon socket for manual override
4 Connecting cable for power supply
5 Connecting cable for auxiliary switches
6 Stop shaft for gear train
7 Position indicator
8 Shaft adapter
9 Locking ring for shaft adapter
10 Adapter for position indicator
11 Temperature monitoring unit
12 Pin
13 Mounting bracket
14 Hex wrench for manual override

Arrangement for shaft adapters



Engineering notes

The basic system data for the control systems in use contain all engineering notes. Read all the engineering notes before mounting, wiring and commissioning the damper actuator and pay special attention to all safety instructions.

Correct use

These damper actuators must be used on applications as described in the basic system data documents for the relevant control systems. Additionally, all actuator-specific features and rules must be observed as described in the brief description on the front page of this Data Sheet (bold print) and in "Use", "Engineering notes", and "Technical data".

All paragraphs marked with the special warning triangle as illustrated on the left contain additional safety instructions and limitations that must be observed under any circumstances to avoid physical injuries or damage to equipment.

Power supply
AC 24 V
DC 24…48 V

These actuators must be used with **safety extra low-voltage (SELV**) or **protection by extra low-voltage (PELV)** in accordance with HD 384.

Power supply
AC 230 V

The actuators are double-insulated and do not provide a connection for protective ground.

Auxiliary switches
“A”, “B”

Use **either mains voltage or safety extra low-voltage** for auxiliary switches “A” and “B”. Do not mix the 2 for operation. Operation with different phases is **not** permitted.

Warning,
maintenance

Do not open the actuator!
The actuator is maintenance-free. Maintenance work may only be carried out by the manufacturer.

Parallel connection of actuators

Electric parallel connection of the same types of actuator is permitted provided operating voltage is within the required tolerance. Voltage drops on the supply lines must be taken into consideration

Sizing transformers for AC 24 V

- Use safety isolating transformers with double insulation conforming to EN 60 742. The transformers must be suited for 100 % duty
- Observe all local safety rules and regulations relating to the sizing and protection of transformers
- Determine the transformer’s size by adding up the power consumption in VA of all actuators used

Wiring and commissioning

Refer to "Commissioning notes" and "Internal diagram" as well as to the plant diagram.

Mounting notes

Mounting instructions

For detailed information on the correct preparation of the actuator, refer to Mounting Instructions GRA…1E/.. A6V10890425. The actuator must be fitted to the fire and smoke protection damper as specified by the OEM. Shaft adapter and other accessory items come unassembled, since their assembly depends on the direction of rotation and the length of the shaft (refer to “Technical design“).

Housing protection

In order to comply with the requirements of IP54 (temperature monitoring unit has IP54), the following mounting conditions must be satisfied:

- Always mount the actuator vertically (cable entry at the bottom) in the case of air dampers with horizontal shafts
- When the actuator is mounted directly on the damper shaft, the mounting angle may be a maximum of +/–45°

Mounting bracket / pin

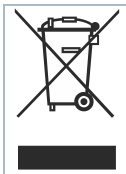
If the actuator is mounted directly on the damper shaft, the mounting bracket / pin must be used. The insertion depth for the shaft into the housing must be sufficient.

Damper shafts	For information on minimum length and diameter of the damper shaft, refer to "Technical data".
Spring preload	The actuator is supplied with a 5° spring preload to ensure a certain closing pressure for the air damper.
Mechanical limitation of the rotational angle	If required, the angle of rotation can be limited in increments of 5° for the entire correcting span by placing the shaft adapter in the respective position.
Temperature monitoring unit	The temperature monitoring unit is to be fitted to the duct wall or the damper housing using 2 self-tapping screws of 3.5 mm diameter. The enclosed drilling template facilitates mounting. When mounting, it must be ensured that the thermal fuse is fully exposed to the airflow.

Commissioning notes

References	All information required for commissioning is contained in the following pieces of documentation: • The present Data Sheet A6V10888424 • Mounting Instructions A6V10890425 • Plant diagram
Environmental conditions	• Check to ensure that all permissible values as specified in "Technical data" are observed
Mechanical check	• Check for proper mounting to ensure that all mechanical settings are in accordance with plant-specific requirements. In addition, ensure that the air dampers are shut tight when in the fully closed position • Fasten the actuator securely to avoid side load • Check the direction of rotation by turning the gearing with a hex wrench in accordance with the Mounting Instructions
Electrical check	• Check to ensure that the cables are connected in accordance with the plant wiring diagram • Operating voltage AC 24 V / DC 24…48 V (SELV / PELV) or AC 230 V must be within the tolerance • Auxiliary switches "A" and "B" change over when the actuator reaches the respective positions
Temperature monitoring unit ⚠	Functional check on site: Press the button to simulate overtemperature. This simulates the response of the fuse, enabling you to check the proper functioning of the actuator. In plant equipped with a fire alarm device BAM, fire alarm will be triggered. Appropriate measures must be taken before the functional check is made.

Disposal



The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU 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.

Technical data

⚠ Power supply AC 24 V DC 24...48 V (SELV/PELV)	Operating voltage AC / frequency	AC 24 V ±20 % / 50/60 Hz
	Operating voltage (DC)	DC 24...48 V ±20 %
	Power consumption GRA126.1: when running	AC: 5 VA / 3.5 W / DC: 3.5 W
	when holding	AC/DC: 2 W
	Safety class	III to EN 60 730
⚠ Power supply AC 230 V	Operating voltage / frequency	AC 230 V ±15 % 50/60 Hz
	Power consumption GRA326.1: when running	7 VA / 4.5 W
	when holding	3.5 W
	Safety class	II to EN 60 730
Mechanical data	Nominal torque	4 Nm
	Nominal angle of rotation / maximum angle of rotation	90° / 95° ± 2°
	Running time for nominal angle of rotation 90° (motor operation)	90 s
	Closing with spring return (on power failure)	15 s
⚠ Auxiliary switches	AC power supply	
	Switching voltage	AC 24...230 V
	Nominal current res./ind.	6 A / 2 A
	Life: 6 A res., 2 A ind.	10^4 cycles
	without load	10^6 cycles
	DC power supply	
	Switching voltage	DC 12..30 V
	Nominal current	DC 2 A
	Electric strength auxiliary switch against housing	AC 4 kV
	Switching hysteresis	2°
	Factory switch setting	
	Switch A	5°
	Switch B	80°
Connecting cables (halogen free)	Power supply line AC 24 V (wires 1-2)	2 x 0.75 mm2
	AC 230 V (wires 3-4)	2 x 0.75 mm2
	Auxiliary switch cable (wires S1…S6)	6 x 0.75 mm2
	Standard length	0.9 m
Degree of protection	Housing (actuator only)	IP54 to EN 60 529
Environmental conditions	Operation / transport	IEC 721-3-3 / IEC 721-3-2
	Temperature	–32...+50 °C / –32...+50 °C
	Humidity (non-condensing)	< 95 % r.h. / < 95 % r.h.
Standards and directives	Product safety:	
	automatic electrical controls for household and similar use	EN 60 730-2-14 (mode of action type 1)
	Electromagnetic compatibility (Application)	For residential, commercial and industrial environments
	EU Conformity (CE)	A5W00008649 [1]
	RCM Conformity	A5W00008650 [1]
	EAC Conformity	Eurasia Conformity for all GRA..
Environmental compatibility	The environmental declaration contains data on environmental compatible product design and assessment (RoHS compliance, compositions, packaging, environmental benefits and disposal).	
Dimensions	Actuator W x H x D (see "Dimensions")	81 x 178 x 63 mm
	Damper shaft: square	10x10, 12x12 mm
	min. shaft length	20 mm
Weight	Without packaging: GRA126.1E/T..	1.3 kg
	GRA326.1E/T..	1.4 kg
	GRA126.1E/…	1.2 kg
	GRA326.1E/…	1.3 kg

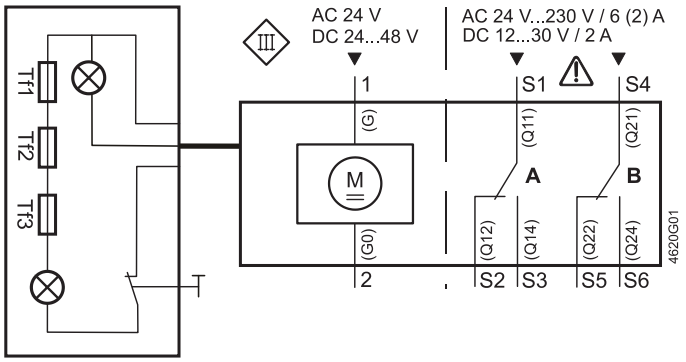
[1] The documents can be downloaded from http://siemens.com/bt/download

Temperature monitoring unit (ready connected to actuator GRA..26.1E/T..)	Connecting cable (halogen free)	0.9 m long (2 x 0.5 mm^2)
	Switching temperature for sizing	Tf1: outside the duct 72 °C Tf2: inside the duct 72 °C Tf3: inside the duct 72 °C
	Temperatur tolerance Tf1, Tf2, Tf3	72 °C +0 °C/–2 °C
	Safety class	III (safety extra-low voltage)
	Degree of protection	IP54
	Ambient temperature / storage temperature	–20…+50 °C/–20…+50 °C
	Ambient humidity	KL D to DIN 40040
	Maintenance	maintenance-free
	Weight	0.1 kg

Diagrams

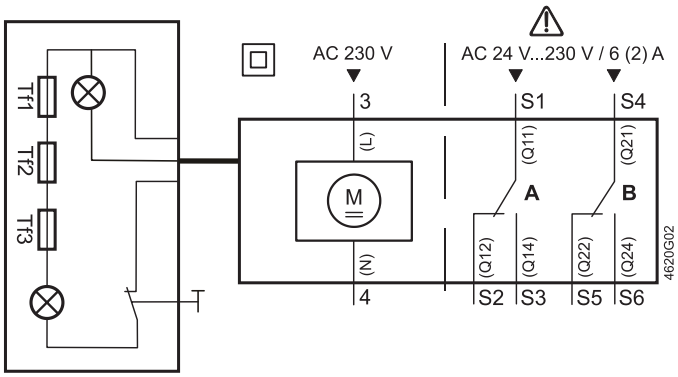
Internal diagram GRA126.1E/..

AC 24 V DC 24…48 V (SELV/PELV)



GRA326.1E/..

AC 230 V



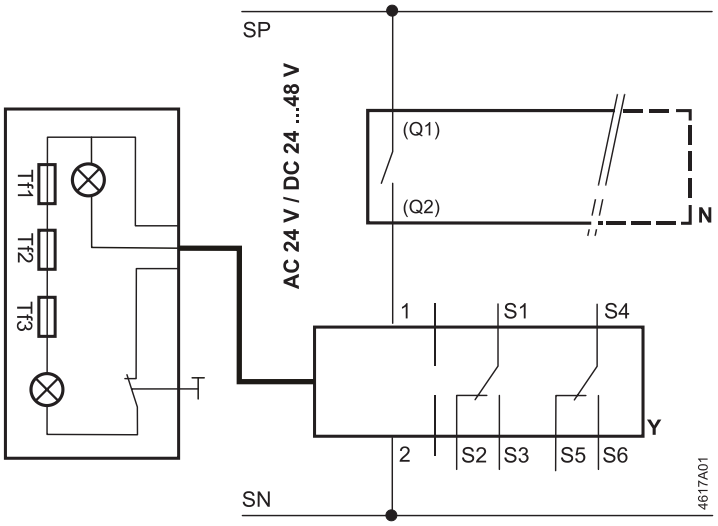
Wire designations

All wires are color-coded and labeled

Connection	Cable				Meaning
	Code	No.	Color	Abbreviation	
Actuators AC 24 V DC 24…48 V	G	1	red	RD	System potential AC 24 V / DC 24…48 V
	G0	2	black	BK	System neutral
Actuators AC 230 V	L	3	brown	BN	Line AC 230 V
	N	4	blue	BU	Neutral
Auxiliary switch	Q11	S1	grey/red	GYRD	Switch A input
	Q12	S2	grey/blue	GYBU	Switch A normally-closed contact
	Q14	S3	grey/pink	GYPK	Switch A normally-open contact
	Q21	S4	black/red	BKRD	Switch B input
	Q22	S5	black/blue	BKBU	Switch B normally-closed contact
	Q24	S6	black/pink	BKPK	Switch B normally-open contact

Connection diagram

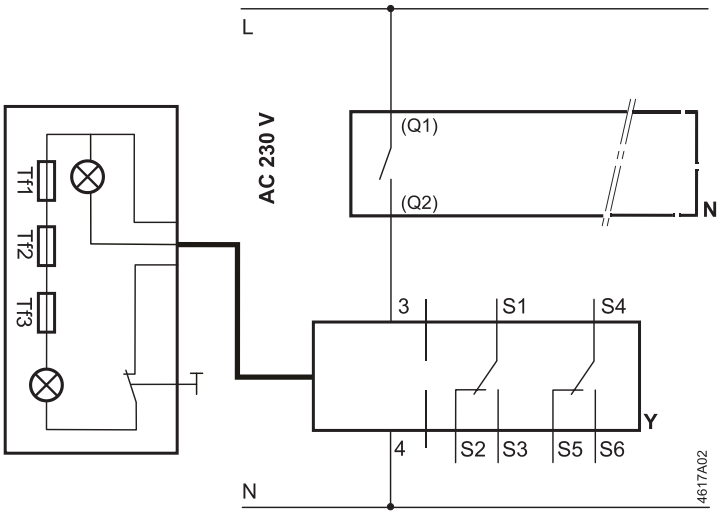
GRA126.1E/..



AC 24 V
DC 24…48 V
(SELV/PELV)

N Controller
Y 2-position actuator
SP System potential
SN System neutral

GRA326.1E/..

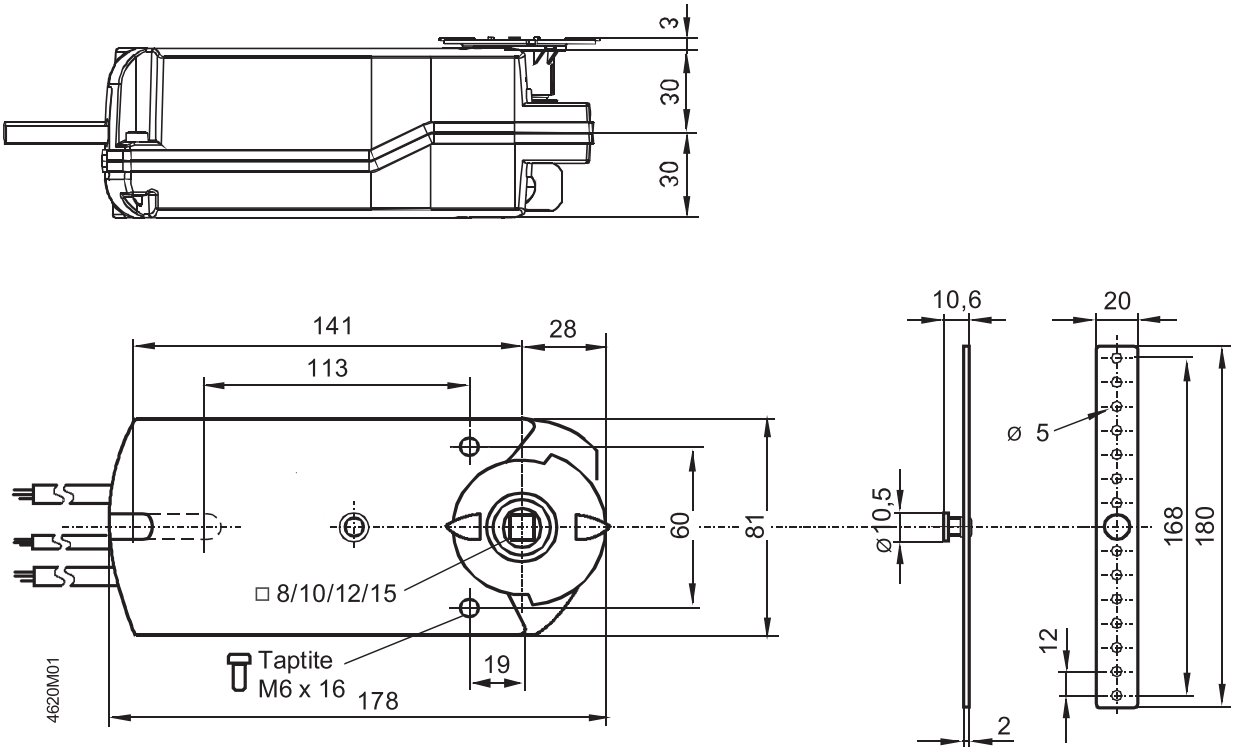


AC 230 V

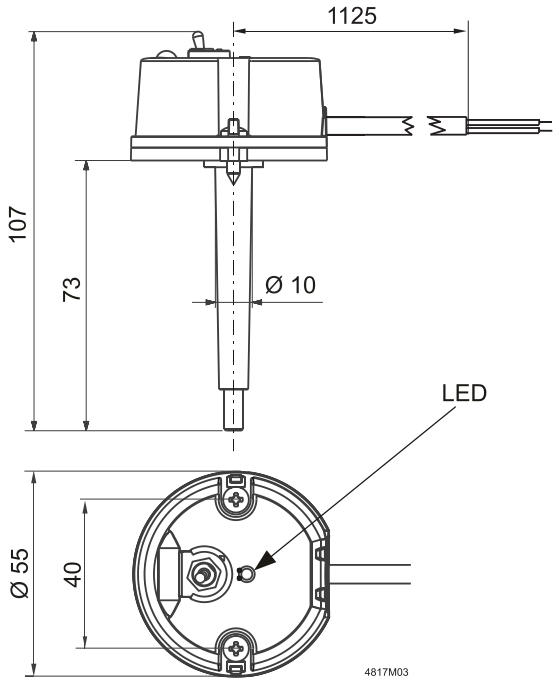
N Controller
Y 2-position actuator
L Live
N Neutral conductor

Dimensions

Actuator



Temperature monitoring unit



LED function

- O Red = Operating voltage OK
  Thermo sensor defect
- O Green = Operating voltage OK
  Thermo sensor OK
- ● Dark = No operating voltage

Dimensions in mm

SIEMENS

OpenAir™

Air damper actuators for railway vehicles GD..14..1E/RW

Electronic motor driven actuators for open-close and three-position control

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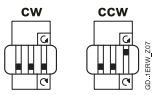
- Nominal torque 5 Nm
- Runtime 30 s / 90 s
- Rotary angle 0…90°
- Connection cables railway specific
- Feedback potentiometer
- Adjustable auxiliary switches
- Degree of protection IP54
- Printed circuit board, coated

Air damper actuators in difficult operational conditions; they meet the main requirements for:

- EN 50155 (Railway applications - Electronic equipment used on rolling stock)
- EN 45545 (Railway applications - Fire protection on railway vehicles)
- EN 61373 (Railway applications - Rolling stock equipment - Shock and vibration tests).

The damper actuators are expressly suitable for air conditioning units and air distribution systems for railway vehicles.

- For damper areas up to 0.8 m^2
- Suitable for use with open-close- or three-position controllers.
- We recommend a minimum pulse length of 500 ms on rotary actuators operated with 3-point control to ensure continuous and accurate operation.

Function	Description
Control type	Open-close-(SPST / SPDT) or three-position
Rotary direction	Clockwise / counter-clockwise, selectable with switch. With no power applied, the actuator remains in the respective position. 
Position indication: Mechanical	Rotary angle position indication by using a position indicator.
Position indication: Electrical	The feedback potentiometer can be connected to external voltage to indicate the position.
Auxiliary switch	The switching points for auxiliary switches A and B can be set independent of each other in increments of 5° within 0° to 90°.
Manual adjustment	The actuator can be manually adjusted by pressing the gear train disengagement button.
Rotary angle limitation	The rotary angle of the shaft adapter can be limited mechanically with a set screw.

Housing

The housing consists essentially of flame retardant, non brominated, non chlorinated glass fibre reinforced plastic.

Actuator motor / Gears

Brushless, robust DC motors ensure reliable operation regardless of load. The damper actuators do not require an end position switch, are overload proof, and remain in place up on reaching the end stop.

The gears are maintenance free and low noise.

Type	Stock no.	Operating voltage	Runtime [s]	Feedback potentiometer 5 kΩ	Auxiliary switch (adjustable)	Weight [g]	Cable length [m]	Rotary direction switch
GDD141.1E/RW	S55499-D403	DC 24 V ⎓	30	–	–	570	0.9	yes
GDD142.1E/RW	S55499-D405		30	yes	–	640		
GDD146.1E/RW	S55499-D404		30	–	2	750		
GDD146.1G/RW	S55499-D274		30	–	2	1100	3.0	
GDA141.1E/RW	S55499-D212		90	–	–	570	0.9	
GDA142.1E/RW	S55499-D214		90	yes	–	640		
GDA146.1E/RW	S55499-D213		90	–	2	750		

Accessories

Type	Description	Use
ASK78.6	Centering insert, square profile 8 mm	To center a shaft with square profile 8 x 8 mm in the coupling bushing of the actuator.
ASK78.7	Centering insert, square profile 10 mm	To center a shaft with square profile 10 x 10 mm in the coupling bushing of the actuator.
ASK78.9	Centering insert, round 10 mm	To center a shaft with round dia. 10 mm in the coupling bushing of the actuator.
ASK78.10	Centering insert, round 12 mm	To center a shaft with dia. 12 mm in the coupling bushing of the actuator.

Topic	Title	Document ID
Data sheet	Air damper actuators for railway vehicles	A6V10636280_enAP_b
Technical basics	Rotary damper actuators without spring return GD..E	A6V10636139_en--_a
Mounting instructions	GD..1E/RW, GD..1G/RW, GL..1E/RW	A6V10636275_----_a

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:
http://siemens.com/bt/download

Safety

⚠ 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.
- Use only properly trained technicians for mounting, commissioning, and servicing.

Engineering

Potentiometer and auxiliary switches

Potentiometer and auxiliary switches cannot be added in the field. For this reason, order the type that includes the required options.

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers

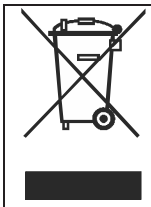
Risk of fire and injury due to short-circuits

- Adapt the line diameters as per local regulations to the rated value of the installed fuse.

Maintenance

The actuators GD..14..1E/RW are maintenance-free.

Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive 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..

Power supply		GDD1..1E/RW	GDA1..1E/RW
Operating voltage		DC 24…45 V ⎓ +25 % / -30 % (16.8…56.3 V ⎓) [1]	
Power consumption	Running	1.5 W	1.0 W
	Holding	0.5 W	0.5 W

Functional data	GDD1..1E/RW	GDA1..1E/RW
Nominal torque Maximum torque (blocked)	5 Nm 7 Nm	
Nominal rotary angle Max. rotary angle	90° 95° ± 2°	
Runtime for 90° rotary angle	30 s	90 s
Actuator sound power level	32 dB(A)	30 dB(A)
Feedback potentiometer Change of resistance (wires P1-P2) Load	GD..142.1E/RW (only): 0…5000 Ω <0,25 W	

Auxiliary switches (GD..146.1E/RW only)	
Contact rating	4 A resistive, 2 A inductive, min. 10 mA @ DC 30 V ⎓ 0.8 A resistive, 0.5 A inductive, min. 10 mA @ DC 60 V ⎓
Switching voltage	DC 12…60 V ⎓
Switching range for auxiliary switches	5°…90°
Setting increments	5°

[1] C-UL: Permitted only to DC 30 V ⎓

Wiring connections (specific for railway vehicles)	
Cable length	0.9 m (GDD146.1G/RW: 3.0 m)
Cross-section	0.75 mm^2

Degree of protection	
Insulation class GD..142.1E/RW (Feedback potentiometer) GD..146.1E/RW (Auxiliary switches)	As per EN 60730 III III
Housing protection	IP 54 as per EN 60529

Environmental conditions	
Temperature	-40...+70 °C
Overtemperature (max.10 min / 15 °C)	...+85 °C
Humidity	<95 % r.F.
Condensation	permitted

Standards, directives and approvals	
Product standard	EN60730 Part 2-14 / Particular requirements for electric actuators
Railway applications	EN 50155 Railway applications - Electronic equipment used on rolling stock EN 61373 Shock and vibration EN 45545-2 Fire prevention in railway vehicles
Electromagnetic compatibility (Application area)	For railway applications Residential, commercial, light-industrial and industrial environments
EU Conformity (CE) GDD1..1E/RW GDA1..1E/RW	 A5W00026942 [2)] A5W00026943 [2)]
RCM Conformity GDD1..1E/RW GDA1..1E/RW	 A5W00026946 [2)] A5W00026947 [2)]
EAC Conformity	Eurasian conformity
UL	UL as per UL 60730 http://ul.com/database cUL as per CSA-C22.2 No. 24-93

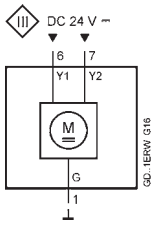
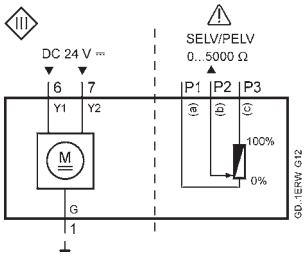
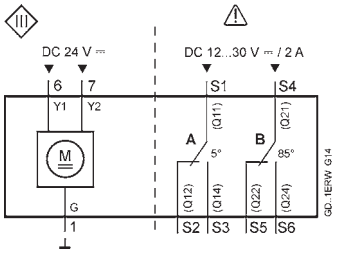
Environmental compatibility
The product environmental declaration A5W00026066 [2)] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions	
Actuator W x H x D	see „Dimensions", p. 7
Damper shaft: – square Min. shaft length Shaft hardness – round Min. shaft length Shaft hardness	 6…12.8 mm 20 mm 300 HV 8…16 mm 30 mm 300 HV

Weight	
Without packaging	see „Type summary", p. 3

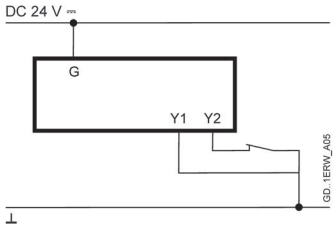
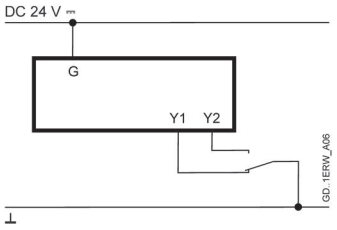
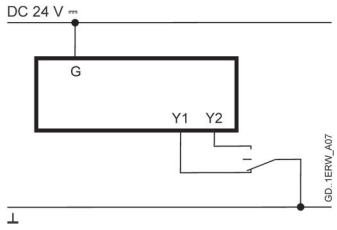
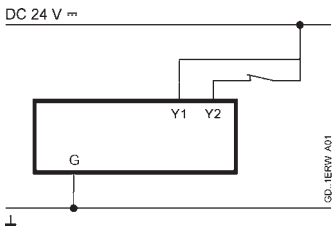
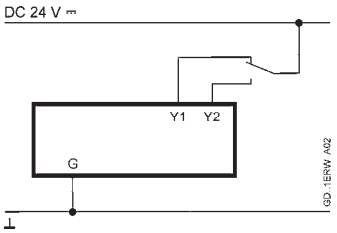
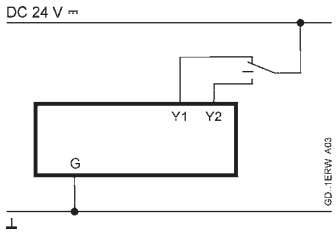
[2)] The documents can be downloaded from http://siemens.com/bt/download.

Internal Diagrams

GD..141E/RW	GD..142E/RW	GD..146E/RW (GDD146.1G/RW)
		

Connection diagrams

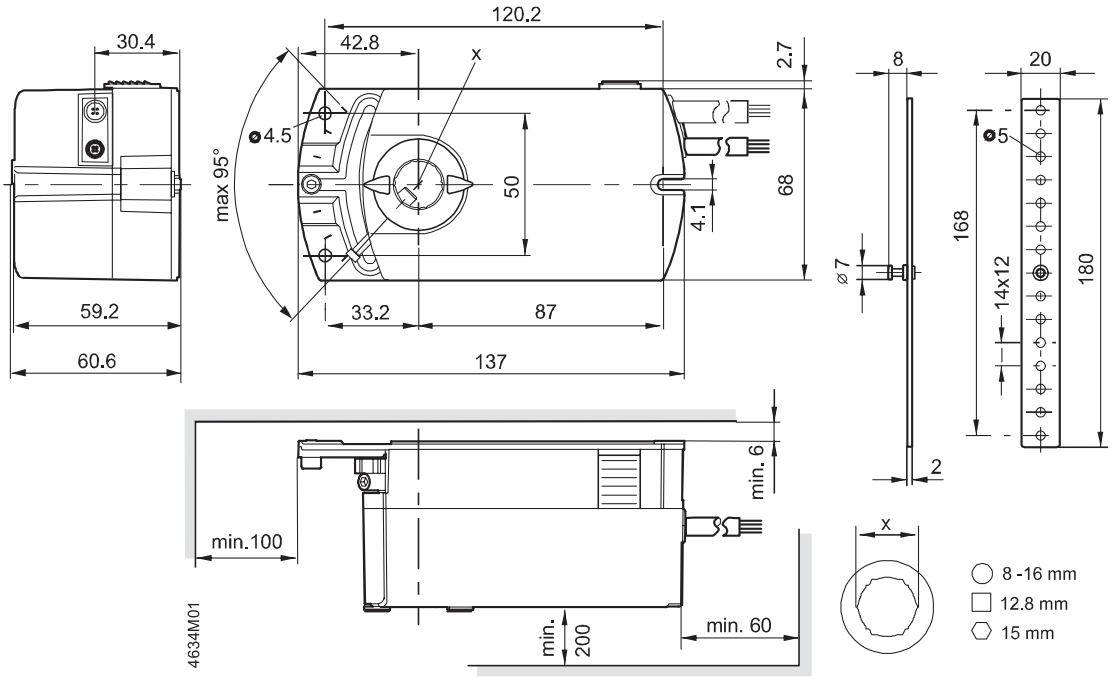
Control

Single pole single throw * (SPST)	Single pole double throw (SPDT)	Three-position control
		
		

* Forced control (Y1+Y2 are permanently under current → Actuator drives to the 0 position)

Cable labeling

Connection	Code	No	Color	Abbreviation	Meaning
DC 24 V ⎓	G	1	red	RD	System potential DC 24 V ⎓
Actuators	Y1	6	purple	VT	Positioning signal DC 24 V, “clockwise”
	Y2	7	orange	OG	Positioning signal DC 24 V, “counter-clockwise”
Feedback	a	P1	white/red	WHRD	Potentiometer 0…100 % (P1-P2)
potentiometer	b	P2	white/blue	WHBU	Potentiometer pick-off
	c	P3	white/pink	WHPK	Potentiometer 100…0 % (P3-P2)
Auxiliary switch	Q11	S1	grey/red	GYRD	Switch A input
	Q12	S2	grey/blue	GYBU	Switch A normally closed contact
	Q14	S3	grey/pink	GYPK	Switch A normally open contact
	Q21	S4	black/red	BKRD	Switch B input
	Q22	S5	black/blue	BKBU	Switch B normally closed contact
	Q24	S6	black/pink	BKPK	Switch B normally open contact



Dimensions in mm

SIEMENS

ACVATIX™

Air damper actuators for railway vehicles GD..161.1E/RW

Electronic motor driven actuators for modulating control

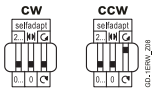
- Nominal torque 5 Nm
- Runtime 30 s / 90 s
- Rotary angle 0…90°
- Connection cables railway specific
- Degree of protection IP54
- Printed circuit board, coated

Air damper actuators in difficult operational conditions; they meet the main requirements for:

- EN 50155 (Railway applications - Electronic equipment used on rolling stock)
- EN 45545 (Railway applications - Fire protection on railway vehicles)
- EN 61373 (Railway applications - Rolling stock equipment - Shock and vibration tests).

The damper actuators are expressly suitable for air conditioning units and air distribution systems for railway vehicles.

- For damper areas up to 0.8 m^2
- Suitable for use with modulating controllers (DC 0/2…10 V).

Function	Description
Control type	Modulating control (DC 0/2…10 V)
Rotary direction	Clockwise / counter-clockwise, selectable with switch. With no power applied, the actuator remains in the respective position. 
Position indication: Mechanical	Rotary angle position indication by using a position indicator.
Position indication: Electrical	Position indicator: Output voltage U = DC 0/2...10 V is generated proportional to the rotary angle. U depends on the rotary direction of the DIL switch setting.
Manual adjustment	The actuator can be manually adjusted by pressing the gear train disengagement button.
Rotary angle limitation	The rotary angle of the shaft adapter can be limited mechanically with a set screw.

Housing

The housing consists essentially of flame retardant, non brominated, non chlorinated glass fibre reinforced plastic.

Actuator motor / Gears

Brushless, robust DC motors ensure reliable operation regardless of load. The damper actuators do not require an end position switch, are overload proof, and remain in place up on reaching the end stop.

The gears are maintenance free and low noise.

Type	Stock no.	Operating voltage	Runtime [s]	Nominal torque [Nm]	Auxiliary switch	Rotary direction switch
GDD161.1E/RW	S55499-D211	DC 24 V ⎓	30	5	–	yes
GDA161.1E/RW	S55499-D215		90	5	–	

Accessories

Type	Description	Use
ASK78.6	Centering insert, square profile 8 mm	To center a shaft with square profile 8 x 8 mm in the coupling bushing of the actuator.
ASK78.7	Centering insert, square profile 10 mm	To center a shaft with square profile 10 x 10 mm in the coupling bushing of the actuator.
ASK78.9	Centering insert, round 10 mm	To center a shaft with round dia. 10 mm in the coupling bushing of the actuator.
ASK78.10	Centering insert, round 12 mm	To center a shaft with dia. 12 mm in the coupling bushing of the actuator.

Topic	Title	Document ID
Data sheet	Air damper actuators for railway vehicles	A6V10636293_en--_a
Technical basics	Rotary damper actuators without spring return GD..E	A6V10636139_en--_a
Mounting instructions	GD..1E/RW, GD..1G/RW, GL..1E/RW	A6V10636275_----_a

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:
http://siemens.com/bt/download

Safety

⚠ 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.
- Use only properly trained technicians for mounting, commissioning, and servicing.

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers

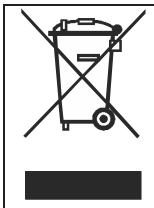
Risk of fire and injury due to short-circuits

- Adapt the line diameters as per local regulations to the rated value of the installed fuse.

Maintenance

The actuators GD..161.1E/RW are maintenance-free.

Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive 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..

Power supply		GDD161.1E/RW	GDA161.1E/RW
Operating voltage		DC 24…45 V ⎓ +25 % / -30 % (16.8…56.3 V ⎓) [1]	
Power consumption	Running	1.5 W	1.3 W
	Holding	0.5 W	0.5 W

Functional data	GDD161.1E/RW	GDA161.1E/RW
Nominal torque Maximum torque (blocked)	5 Nm 7 Nm	
Nominal rotary angle Max. rotary angle	90° 95° ± 2°	
Runtime for 90° rotary angle	30 s	90 s
Actuator sound power level	32 dB(A)	30 dB(A)

Wiring connections (specific for railway vehicles)	
Cable length	0.9 m
Cross-section	0.75 mm^2

Degree of protection	
Insulation class	III as per EN 60730
Housing protection	IP 54 as per EN 60529

Environmental conditions	
Temperature	-40...+70 °C
Overtemperature (max.10 min / 15 °C)	...+85 °C
Humidity	<95 % r.F.
Condensation	permitted

Standards, directives and approvals	
Product standard	EN60730-2-14 Part 2-14 / Particular requirements for electric actuators
Railway applications	EN 50155 Railway applications - Electronic equipment used on rolling stock EN 61373 Shock and vibration EN 45545-2 Fire prevention in railway vehicles
Electromagnetic compatibility (Application area)	For railway applications Residential, commercial, light-industrial and industrial environments
EU Conformity (CE) GDD161.1E/RW GDA161.1E/RW	 A5W00026942 [2] A5W00026943 [2]
RCM Conformity GDD161.1E/RW GDA161.1E/RW	 A5W00026946 [2] A5W00026947 [2]

Standards, directives and approvals	
EAC Conformity	Eurasian conformity
UL	UL as per UL 60730 http://ul.com/database cUL as per CSA-C22.2 No. 24-93

Environmental compatibility
The product environmental declaration A5W00026066 [2] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions	
Actuator W x H x D	see „Dimensions", p. 7
Damper shaft: – square Min. shaft length Shaft hardness – round Min. shaft length Shaft hardness	 6…12.8 mm 20 mm 300 HV 8…16 mm 30 mm 300 HV

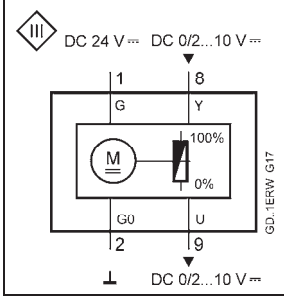
Weight	
Without packaging	465 g

[1] C-UL: Permitted only to DC 30 V ⎓

[2] The documents can be downloaded from http://siemens.com/bt/download.

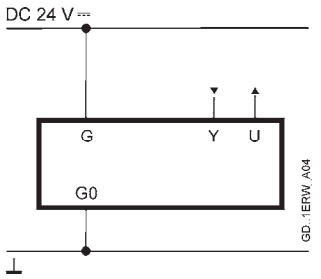
Internal Diagram

GD..161.1E/RW



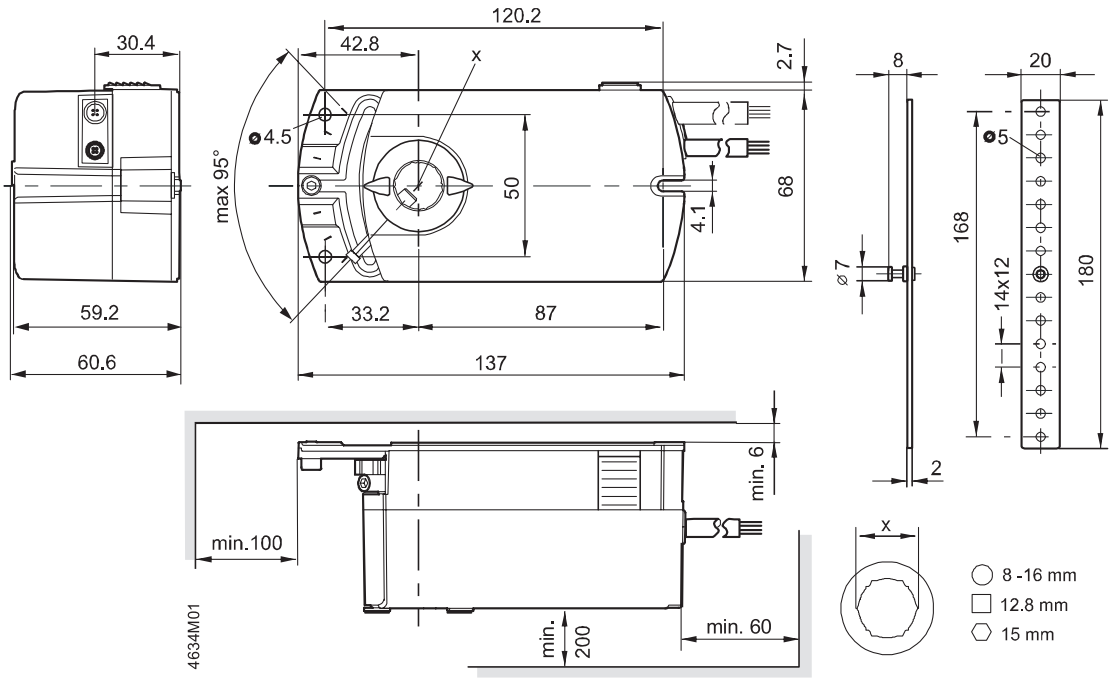
Connection diagram

GD..161.1E/RW



Cable labeling

Connection	Code	No	Color	Abbreviation	Meaning
DC 24 V ⎓	G	1	red	RD	System potential DC 24 V ⎓
Actuators	G0	2	black	BK	System neutral
	Y	8	grey	GY	Signal in
	U	9	pink	PK	Signal out



Dimensions in mm

SIEMENS

OpenAir™

Air damper actuators for railway vehicles GL..14..1E/RW

Electronic motor driven actuators for open-close and three-position control

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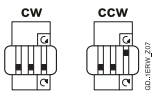
- Nominal torque 8 Nm / 10 Nm
- Runtime 30 s / 90 s
- Rotary angle 0…90°
- Connection cables railway specific
- Feedback potentiometer
- Adjustable auxiliary switches
- Degree of protection IP54
- Printed circuit board, coated

Air damper actuators in difficult operational conditions; they meet the main requirements for:

- EN 50155 (Railway applications – Electronic equipment used on rolling stock)
- EN 45545 (Railway applications – Fire protection on railway vehicles)
- EN 61373 (Railway applications – Rolling stock equipment - Shock and vibration tests).

The damper actuators are expressly suitable for air conditioning units and air distribution systems for railway vehicles.

- For damper areas up to 1.6 m^2
- Suitable for use with open-close- or three-position controllers.
- We recommend a minimum pulse length of 500 ms on rotary actuators operated with 3-point control to ensure continuous and accurate operation.

Function	Description
Control type	Open-close-(SPST / SPDT) or three-position
Rotary direction	Clockwise / counter-clockwise, selectable with switch. With no power applied, the actuator remains in the respective position. 
Position indication: Mechanical	Rotary angle position indication by using a position indicator.
Position indication: Electrical	The feedback potentiometer can be connected to external voltage to indicate the position.
Auxiliary switch	The switching points for auxiliary switches A and B can be set independent of each other in increments of 5° within 0° to 90°.
Manual adjustment	The actuator can be manually adjusted by pressing the gear train disengagement button.
Rotary angle limitation	The rotary angle of the shaft adapter can be limited mechanically with a set screw.

Housing

The housing consists essentially of flame retardant, non brominated, non chlorinated glass fibre reinforced plastic.

Actuator motor / Gears

Brushless, robust DC motors ensure reliable operation regardless of load. The damper actuators do not require an end position switch, are overload proof, and remain in place up on reaching the end stop.

The gears are maintenance free and low noise.

Type	Stock no.	Operating voltage	Runtime [s]	Nominal torque [Nm]	Feedback potentiometer 5 kΩ	Auxiliary switch (adjustable)	Weight [g]	Rotary direction switch
GLD141.1E/RW	S55499-D216	DC 24 V ⎓	30	8	–	–	570	yes
GLD142.1E/RW	S55499-D218		30	8	yes	–	640	
GLD146.1E/RW	S55499-D217		30	8	–	2	750	
GLA141.1E/RW	S55499-D220		90	10	–	–	570	
GLA142.1E/RW	S55499-D222		90	10	yes	–	640	
GLA146.1E/RW	S55499-D221		90	10	–	2	750	

Accessories

Type	Description	Use
ASK78.6	Centering insert, square profile 8 mm	To center a shaft with square profile 8 x 8 mm in the coupling bushing of the actuator.
ASK78.7	Centering insert, square profile 10 mm	To center a shaft with square profile 10 x 10 mm in the coupling bushing of the actuator.
ASK78.9	Centering insert, round 10 mm	To center a shaft with round dia. 10 mm in the coupling bushing of the actuator.
ASK78.10	Centering insert, round 12 mm	To center a shaft with dia. 12 mm in the coupling bushing of the actuator.

Topic	Title	Document ID
Data sheet	Air damper actuators for railway vehicles	A6V10636286_en--_a
Technical basics	Rotary damper actuators without spring return GL..E	A6V10636196_en--_a
Mounting instructions	GD..1E/RW, GD..1G/RW, GL..1E/RW	A6V10636285_----_a

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

http://siemens.com/bt/download

Safety

⚠ 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.
- Use only properly trained technicians for mounting, commissioning, and servicing.

Engineering

Potentiometer and auxiliary switches

Potentiometer and auxiliary switches cannot be added in the field. For this reason, order the type that includes the required options.

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers

Risk of fire and injury due to short-circuits

- Adapt the line diameters as per local regulations to the rated value of the installed fuse.

Maintenance

The actuators GL..14..1E/RW are maintenance-free.

Disposal

The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive 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 regu lations.

Power supply		**GLD1..1E/RW**	**GLA1..1E/RW**
Operating voltage		DC 24 V ⎓ +25 % / -30 % (16.8…56.3 V ⎓) [1]	
Power consumption	Running	1.8 W	1.3 W
	Holding	0.5 W	0. 5 W

Functional data	**GLD1..1E/RW**	**GLA1..1E/RW**
Nominal torque Maximum torque (blocked)	8 Nm 16 Nm	10 Nm 16 Nm
Nominal rotary angle Max. rotary angle	90° 95° ± 2°	
Runtime for 90° rotary angle	30 s	90 s
Actuator sound power level	32 dB(A)	30 dB(A)
Feedback potentiometer (GL..142.1E/RW only) Change of resistance (wires P1-P2) Load	 0…5000 Ω <0,25 W	

Auxiliary switches (GL..146.1E/RW only)	
Contact rating	4 A resistive, 2 A inductive, min. 10 mA @ DC 30 V ⎓ 0.8 A resistive, 0.5 A inductive, min. 10 mA @ DC 60 V ⎓
Switching voltage	DC 12…60 V ⎓
Switching range for auxiliary switches	5°…90°
Setting increments	5°

[1] C-UL: Permitted only to DC 30 V ⎓

Wiring connections (specific for railway vehicles)	
Cable length	0.9 m
Cross-section	0.75 mm^2

Degree of protection	
Insulation class GL..142.1E/RW (Feedback potentiometer) GL..146.1E/RW (Auxiliary switches)	As per EN 60730 III III
Gehäuseschutzgrad	IP 54 as per EN 60529

Environmental conditions	
Temperature	-40...+70 °C
Overtemperature (max.10 min / 15 °C)	...+85 °C
Humidity	<95 % r.F.
Condensation	permitted

Standards, directives and approvals	
Product standard	EN60730-2-14 Part 2-14 / Particular requirements for electric actuators
Railway applications	EN 50155 Railway applications - Electronic equipment used on rolling stock EN 61373 Shock and vibration EN 45545-2 Fire prevention in railway vehicles
Electromagnetic compatibility (Application area)	For railway applications Residential, commercial, light-industrial and industrial environments
EU Conformity (CE) GLD161.1E/RW GLA161.1E/RW	 A5W00026944 [2)] A5W00026945 [2)]
RCM Conformity GLD161.1E/RW GLA161.1E/RW	 A5W00026948 [2)] A5W00026949 [2)]
EAC Conformity	Eurasian conformity
UL	UL as per UL 60730 http://ul.com/database cUL as per CSA-C22.2 No. 24-93

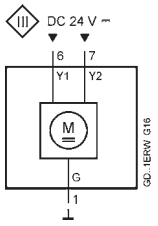
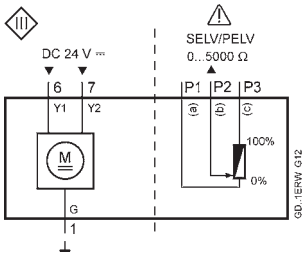
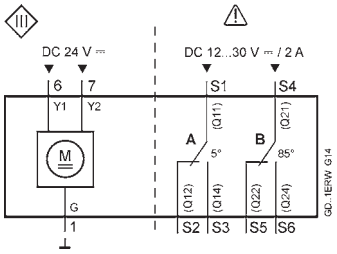
Environmental compatibility
The product environmental declaration A5W00026066 [2)] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions	
Actuator W x H x D	see „Dimensions", p. 7
Damper shaft: – square Min. shaft length Shaft hardness – round Min. shaft length Shaft hardness	 6…12.8 mm 20 mm 300 HV 8…16 mm 30 mm 300 HV

Weight	
Without packaging	see „Type summary", p. 3

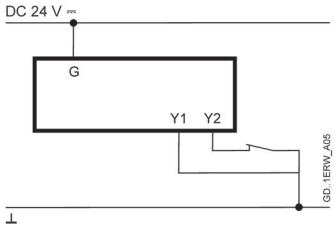
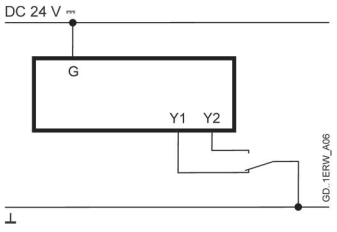
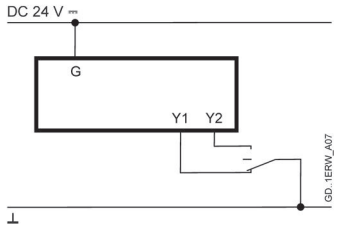
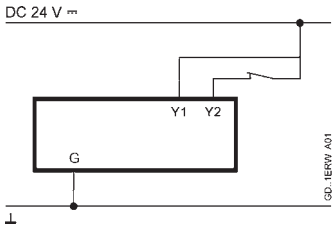
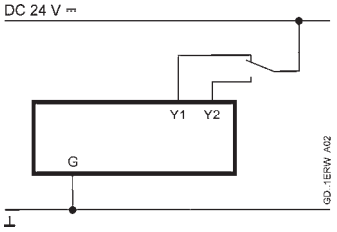
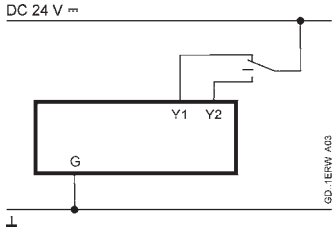
[2)] The documents can be downloaded from http://siemens.com/bt/download.

Internal Diagrams

GL..141.1E/RW	GL..142.1E/RW	GL..146.1E/RW
		

Connection diagrams

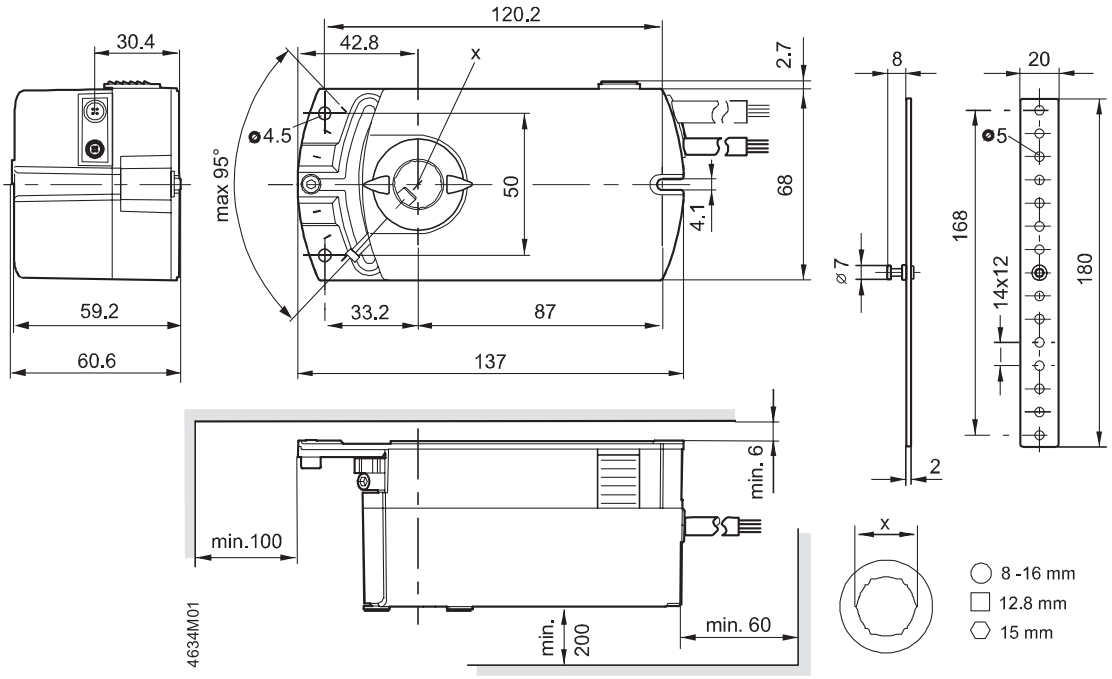
Control

Single pole single throw * (SPST)	Single pole double throw (SPDT)	Three-position control
		
		

* Forced control (Y1+Y2 are permanently under current → Actuator drives to the 0 position)

Cable labeling

Connection	Code	No	Color	Abbreviation	Meaning
DC 24 V ⎓	G	1	red	RD	System potential DC 24 V ⎓
Actuators	Y1	6	purple	VT	Positioning signal DC 24 V, “clockwise”
	Y2	7	orange	OG	Positioning signal DC 24 V, “counter-clockwise”
Feedback	a	P1	white/red	WHRD	Potentiometer 0…100 % (P1-P2)
potentiometer	b	P2	white/blue	WHBU	Potentiometer pick-off
	c	P3	white/pink	WHPK	Potentiometer 100…0 % (P3-P2)
Auxiliary switch	Q11	S1	grey/red	GYRD	Switch A input
	Q12	S2	grey/blue	GYBU	Switch A normally closed contact
	Q14	S3	grey/pink	GYPK	Switch A normally open contact
	Q21	S4	black/red	BKRD	Switch B input
	Q22	S5	black/blue	BKBU	Switch B normally closed contact
	Q24	S6	black/pink	BKPK	Switch B normally open contact



Dimensions in mm

SIEMENS

OpenAir™

Air damper actuators for railway vehicles GL..161.1../RW

Electronic motor driven actuators for modulating control

- Nominal torque 8 Nm / 10 Nm
- Runtime 30 s / 90 s
- Rotary angle 0…90°
- Connection cables railway specific
- Degree of protection IP54
- Printed circuit board, coated

Features

Air damper actuators in difficult operational conditions; they meet the main requirements for:

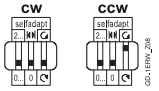
- EN 50155 (Railway applications - Electronic equipment used on rolling stock)
- EN 45545 (Railway applications - Fire protection on railway vehicles)
- EN 61373 (Railway applications - Rolling stock equipment - Shock and vibration tests).

Use

The damper actuators are expressly suitable for air conditioning units and air distribution systems for railway vehicles.

- For damper areas up to 1.6 m^2
- Suitable for use with modulating controllers (DC 0/2…10 V).

Functions

Function	Description
Control type	Modulating control (DC 0/2…10 V)
Rotary direction	Clockwise / counter-clockwise, selectable with switch. With no power applied, the actuator remains in the respective position. 
Position indication: Mechanical	Rotary angle position indication by using a position indicator.
Position indication: Electrical	Position indicator: Output voltage U = DC 0/2...10 V is generated proportional to the rotary angle. U depends on the rotary direction of the DIL switch setting.
Manual adjustment	The actuator can be manually adjusted by pressing the gear train disengagement button.
Rotary angle limitation	The rotary angle of the shaft adapter can be limited mechanically with a set screw.

Technical design

Housing

The housing consists essentially of flame retardant, non brominated, non chlorinated glass fibre reinforced plastic.

Actuator motor / Gears

Brushless, robust DC motors ensure reliable operation regardless of load. The damper actuators do not require an end position switch, are overload proof, and remain in place up on reaching the end stop.

The gears are maintenance free and low noise.

Type summary

Type	Stock no.	Operating voltage	Runtime [s]	Nominal torque [Nm]	Auxiliary switch	Rotary direction switch	Cabel length
GLD161.1E/RW	S55499-D219	DC 24 V ⎓	30	8	–	Yes	0.9 m
GLA161.1E/RW	S55499-D223		90	10	–		0.9 m
GLD161.1G/RW	S55499-D570	DC 24 V ⎓	30	8	–	Yes	2.5 m

Accessories

Type	Description	Use
ASK78.6	Centering insert, square profile 8 mm	To center a shaft with square profile 8 x 8 mm in the coupling bushing of the actuator.
ASK78.7	Centering insert, square profile 10 mm	To center a shaft with square profile 10 x 10 mm in the coupling bushing of the actuator.
ASK78.9	Centering insert, round 10 mm	To center a shaft with round dia. 10 mm in the coupling bushing of the actuator.
ASK78.10	Centering insert, round 12 mm	To center a shaft with dia. 12 mm in the coupling bushing of the actuator.

Product documentation

Topic	Title	Document ID
Data sheet	Air damper actuators for railway vehicles	A6V10636299_en--_a
Technical basics	Rotary damper actuators without spring return GL..E	A6V10636196_en--_a
Mounting instructions	GD..1E/RW, GD..1G/RW, GL..1E/RW	A6V10636275_----_a

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:
http://siemens.com/bt/download

Notes

Safety

⚠ 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.
- Use only properly trained technicians for mounting, commissioning, and servicing.

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers

Risk of fire and injury due to short-circuits

- Adapt the line diameters as per local regulations to the rated value of the installed fuse.

Maintenance

The actuators GL..161.1../RW are maintenance-free.

Disposal

The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive 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.

Technical data

Power supply		GLD161.1../RW	GLA161.1E/RW
Operating voltage		DC 24…45 V ⎓ +25 % / -30 % (16.8…56.3 V ⎓) [1]	
Power consumption	Running	1.9 W	1.3 W
	Holding	0.5 W	0.5 W

Functional data	GLD161.1../RW	GLA161.1E/RW
Nominal torque Maximum torque (blocked)	8 Nm 16 Nm	10 Nm 16 Nm
Nominal rotary angle Max. rotary angle	90° 95° ± 2°	
Runtime for 90° rotary angle	30 s	90 s
Actuator sound power level	32 dB(A)	30 dB(A)

Wiring connections (specific for railway vehicles)		
Cable length	GLD161.1E/RW	0.9 m
	GLA161.1E/RW	0.9 m
	GLD161.1G/RW	2.5 m
Cross-section		0.75 mm^2

Degree of protection	
Insulation class	III as per EN 60730
Housing protection	IP 54 as per EN 60529

Environmental conditions	
Temperature	-40...+70 °C
Overtemperature (max.10 min / 15 °C)	...+85 °C
Humidity	<95 % r.F.
Condensation	permitted

Standards, directives and approvals	
Product standard	EN60730-2-14 Part 2-14 / Particular requirements for electric actuators
Railway applications	EN 50155 Railway applications - Electronic equipment used on rolling stock EN 61373 Shock and vibration EN 45545-2 Fire prevention in railway vehicles
Electromagnetic compatibility (Application area)	For railway applications Residential, commercial, light-industrial and industrial environments
EU Conformity (CE)) GLD161.1../RW GLA161.1E/RW	 A5W00026944 [2] A5W00026945 [2]
RCM Conformity) GLD161.1../RW GLA161.1E/RW	 A5W00026948 [2] A5W00026949 [2]
EAC Conformity	Eurasian conformity
UL	UL as per UL 60730 http://ul.com/database cUL as per CSA-C22.2 No. 24-93

Environmental compatibility
The product environmental declaration A5W00026066 [2] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions	
Actuator W x H x D	see "Dimensions", p. 7
Damper shaft:	
– square	6…12.8 mm
Min. shaft length	20 mm
Shaft hardness	300 HV
– round	8…16 mm
Min. shaft length	30 mm
Shaft hardness	300 HV

Weight	
Without packaging	465 g

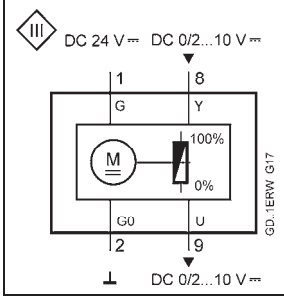
[1] C-UL: Permitted only to DC 30 V ⎓

[2] The documents can be downloaded from http://siemens.com/bt/download.

Diagrams

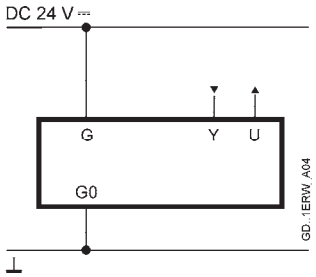
Internal Diagram

GL..161.1../RW



Connection diagram

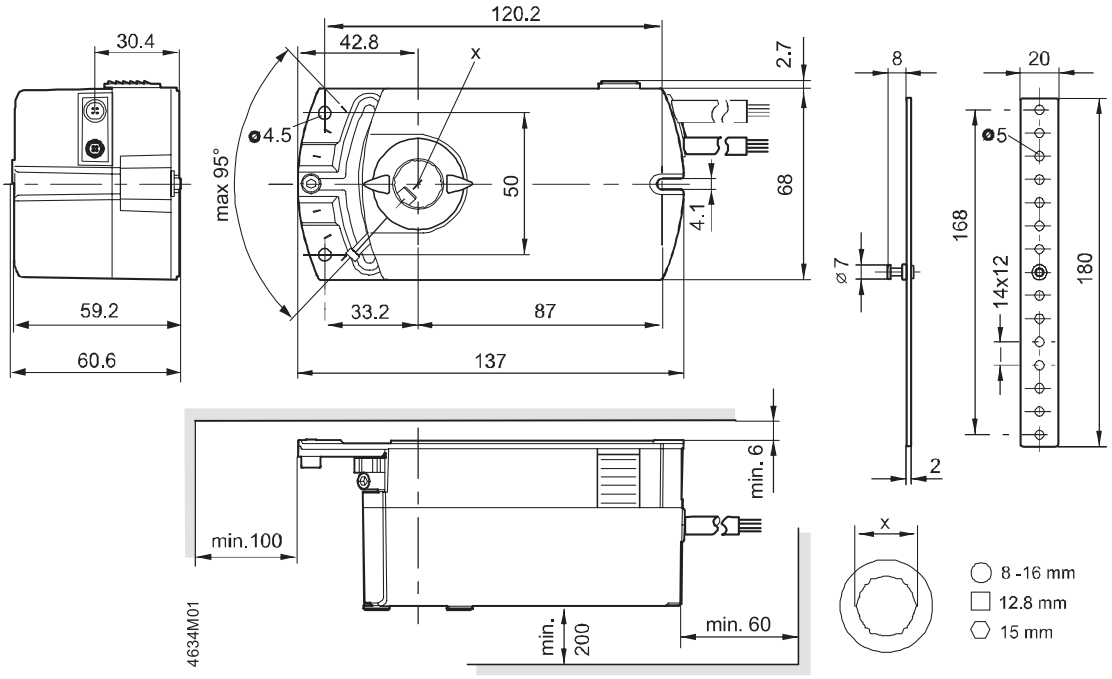
GL..161.1../RW



Cable labeling

Connection	Code	No	Color	Abbreviation	Meaning
DC 24 V ⎓	G	1	red	RD	System potential DC 24 V ⎓
Actuators	G0	2	black	BK	System neutral
	Y	8	grey	GY	Signal in
	U	9	pink	PK	Signal out

Dimensions



Dimensions in mm

지멘스㈜
스마트 인프라
03155 서울특별시 종로구 종로3길 17 디타워 10층
Tel: 02) 3450-7302
Fax: 02) 3459-7359
www.siemens.co.kr/si

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