SIEMENS

OpenAir™

Air damper actuators

GLB..1E

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

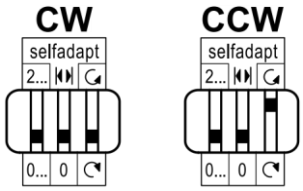
- Nominal torque 10 Nm
- Operating voltage AC 24 V ~ / DC 24...48 V ⎓
- Mechanically adjustable span between 0. 90°
- Pre-wired with standard 0.9 m connection cables
- Type-specific variations with adjustable offset and span for the positioning signal
- Position indication: Mechanical and electrical
- Feedback potentiometer
- Self-adaption of the rotation angle range and adjustable auxiliary switches for supplemental functions

Application

Rotary actuators are used in ventilation and air conditioning plants to regulate air dampers and throttle air flow:

- For damper areas up to ca. 1.6 m^2, friction-dependent.
- Suitable for use with 2-position and 3-position controllers as well as modulating controllers (DC 0/2...10 V) to control 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		2-position/3-position	Modulating control (0/2...10 V)
Rotary direction		Clockwise or counterclockwise direction depends...	
		• … on the type of control; • ... on the rotation direction switch:  The actuator remains in the respective position with no power applied.	• ... On the DIL switch setting 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.	
	electrical	Connecting the feedback potentiometer to an external voltage source results in voltage supply proportional to the rotation angle.	Position indicator: Output voltage U = DC 0/2…10 V is generated proportional to rotation angle. The direction of action (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 mutually independent in 5° increments from 0 to 90°.	
The rotation angle range is self-adapting		-	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.
Manual adjustment		The actuator can be manually adjusted by pressing the gear train disengagement button.	
Rotation angle limitation		A set screw can limit the rotary angle to between 0° and 90°.	

Technical design

Housing

The housing is made of fiberglass reinforced plastic:

- Flame retardant
- Non-brominated
- Non-chlorinated.

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

Type	Stock number	Control	Operating voltage	Positioning signal input Y	Position indicator U = DC 0...10 V ⎓	Feedback potentiometer 5kΩ	Self-adapting Rotational angle area	Auxiliary switch	Rotation switch
GLB141.1E	S55499-D192	2 or 3-position	AC 24 V ~ / DC 24...48 V ⎓	-	-	-	-	-	yes
GLB142.1E	S55499-D193					yes			
GLB146.1E	S55499-D194					-		2	
GLB341.1E	S55499-D195		AC 100...240 V ~					-	
GLB346.1E	S55499-D196							2	
GLB161.1E	S55499-D270	Modulating	AC 24 V ~ / DC 24...48 V ⎓	DC 0/2...10 V ⎓	yes	-	yes	-	yes
GLB163.1E	S55499-D271			DC 0...35 V ⎓					
GLB164.1E	S55499-D272							2	
GLB166.1E	S55499-D273			DC 0/2...10 V ⎓					
GLB361.1E	S55499-D197		AC 100...240 V ~					-	
Nominal torque	10 Nm (applies to all)								

Accessories / spare parts

See data sheet N4698:

https://sid.siemens.com/v/u/A6V10405972

Product documentation

Topic	Title	Document ID
Data sheet	Air damper actuators	A6V10636202
Mounting instructions	GDB..1E, GLB..1E	A5W00005997

Related documents such as the environmental declarations, declarations of conformity, etc., can be downloaded from the following Internet address:

www.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.

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers

Risk of fire and injury due to short-circuits!

- Adapt the wire cross sections as per local regulations to the rated value of the installed fuse.

Maintenance

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.

- Use only designated channels for disposing the devices.
- Comply with all local and currently applicable laws and regulations.

Technical data

Supply voltage GLB1..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	Operation	GLB14..1E	1,3 VA / 0,8 W
		GLB16..1E	1,5 VA / 1,0 W
	Hold	GLB14..1E	0,7 VA / 0,4 W
		GLB16..1E	0,9 VA / 0,6 W

Supply voltage GLB3..1E			
Operating voltage (SELV/PELV)			AC 100...240 V ~ ±10 % (90...264 V ~)
Frequency			50/60 Hz
Power consumption	Operation	GLB34..1E	6,0 VA / 2,0 W
		GLB36..1E	4,0 VA / 1,5 W
	Hold	GLB34..1E	0,9 W
		GLB36..1E	0,6 W

Operating data		
Nominal torque		10 Nm
	Maximum torque (when blocked)	16 Nm
	Maximum holding torque	10 Nm
Nominal rotation angle (with position indication)		90°
	Maximum rotation angle (mechanically limited)	95° ±2°
Runtime at nominal rotation angle 90°		150 s
Sound pressure level: Actuator		28 dB(A)

Inputs			
Positioning signal for GLB14..1E			
	Operating voltage AC 24 V ~ / DC 24...48 V ⎓	wires 1-6/G-Y1	Clockwise
		wires 1-7/G-Y2	Counterclockwise
Positioning signal for GLB34..1E			
	Operating voltage AC 100...240 V~	wires 4-6/N-Y1	Clockwise
		wires 4-7/N-Y2	Counterclockwise
Positioning signal for GLB16..1E			
	Input voltage	wires 8-2/Y-G0	DC 0/2...10 V ⎓
	Power consumption		0.1mA
	Input resistance		≥100 kΩ
Max. permissible input voltage			DC 35 V ⎓ limited internally to DC 10 V ⎓
	Protected against incorrect wiring		max. AC 24 V ~/ DC 24...48 ⎓
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 ⎓
		Workspace ΔU	DC 2...30 V ⎓
	Max. input voltage		DC 35 V ⎓
	Protected against incorrect 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 incorrect wiring		max. AC 24 V ~ / DC 24...48 V ⎓
Aux. power supply (G-/G+)		GLB36..1E	DC 24 V ⎓ ±20 %, max. 10 mA
Feedback potentiometer (for GLB142.1E)			
	Change in resistance	wires P1-P2	0...5000 Ω
	Load		<0.25 W
	Max. loop 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 ~

Mechanical life	
Full cycles	100'000
Partial cycles	5'000'000

Auxiliary switches (GLB146.1E, GLB166.1E, GLB346.1E)		
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		5...90°
	Setting increments	5°
Factory setting	Switch A	5°
	Switch B	85°

Connection cable	
Cable length	0,9 m
Cable cross-section	0,75 mm2
Permissible length for signal wires	300 m

Safety class and degree of protection		
Protection class		EN 60730
	AC 24 V / DC 24...48, feedback potentiometer	III
	AC 100...240 V, auxiliary switch	II
Degree of protection of housing		IP54 per EN 60529

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

Standards, directives and approvals	
Product standards	EN 60730 Part 2-14: Particular requirements for electric actuators
Electromagnetic compatibility (field of use)	For residential, commercial, and industrial environments
EU conformity (CE)	A5W00000176 [2)]
UK conformity (UKCA)	A5W00198019A [2)]
RCM Conformity	A5W00000177 [2)]
EAC compliance	Eurasian conformity
UL certification	UL per UL 60730 http://ul.com/database cUL as per CSA-C22.2 No. 24-93

Environmental compatibility
Environmental Declaration A5W00026066 [2)] contains data on environmental-compatible product design and assessment (RoHS compliance, compositions, packaging, environmental benefits and disposal).

Dimensions and weight			
Actuator (W x H x D)			See Dimensions [▶ 12]
Damper shaft			
	Round		8...16 mm
	Round		8...10 mm (with insert)
	Square		6...12.8 mm
	Min. length		20 mm
	Max. shaft hardness		<300 AV
Weight (excluding packaging)		Without switch	Max. 0.49 kg
		With switch	Max. 0.63 kg

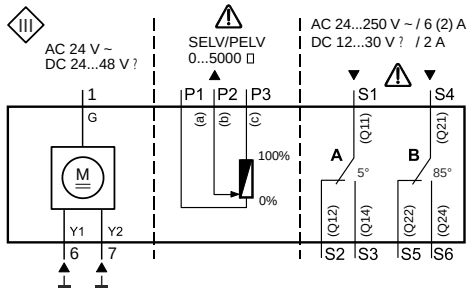
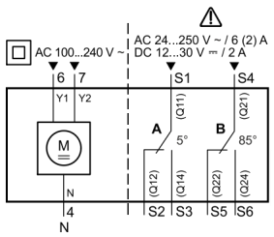
1) C-UL: Permissible only to DC 30 V ⎓

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

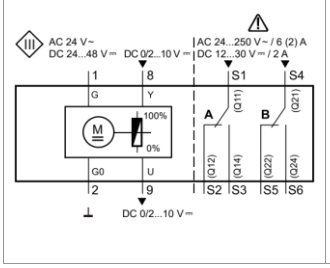
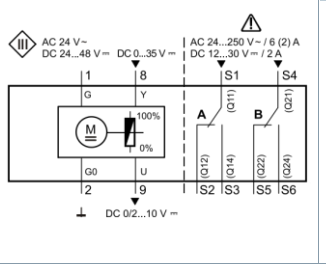
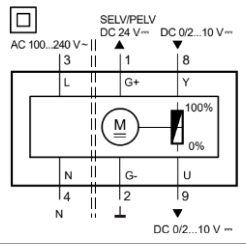
Connection diagrams

Internal diagrams

GLB14..1E, GLB34..1E: Open / close, 3-position control

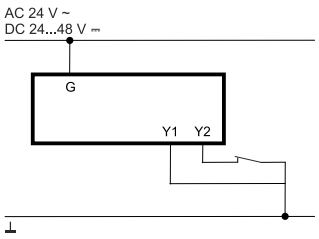
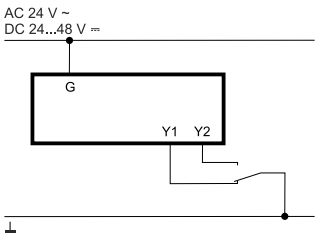
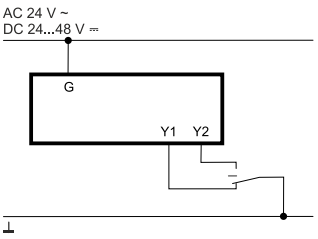
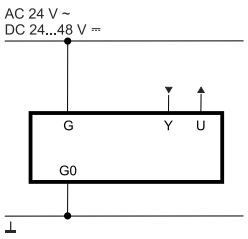
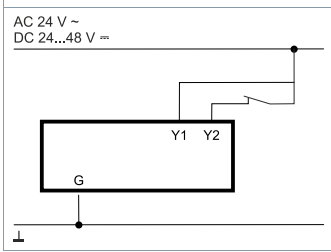
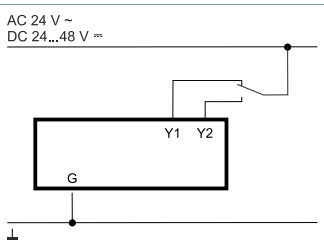
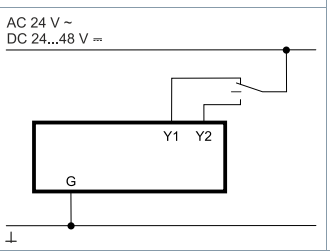
AC 24 V ~ / DC 24...48 V ⎓	AC 100...240 V ~
	

GLB16..1E, GLB36..1E: Modulating control

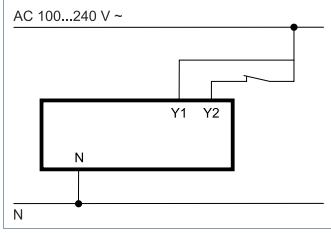
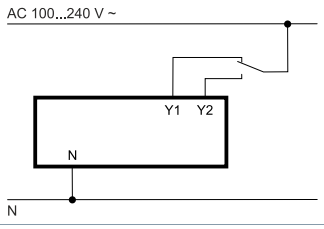
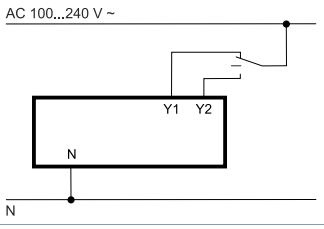
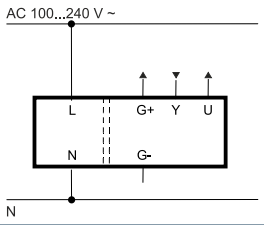
AC 24 V ~ / DC 24...48 V ⎓		AC 100...240 V ~
Y = DC 0/2...48 V ⎓	Y = DC 0...35 V ⎓	
		

Connection diagrams

Control on 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)	**3-position control**	**Modulating control**
			
			

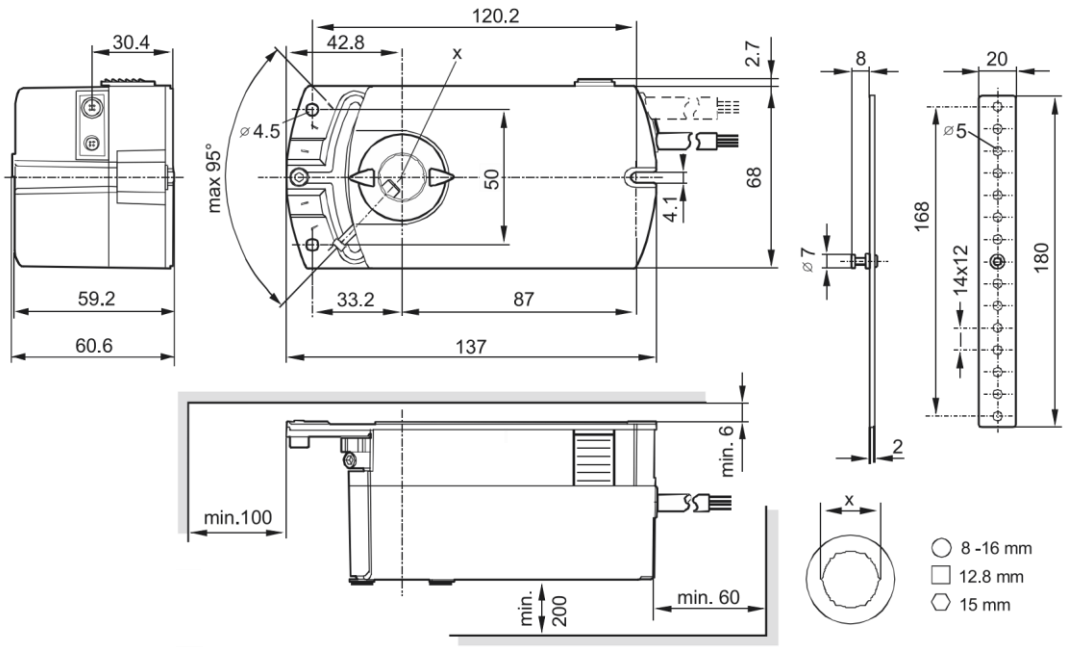
Control on GLB3..1E (AC 100...240 V ~)

Open / close, single wire control Single pole single throw (SPST)	**Open / close, two-wire control** Single pole double throw (SPDT)	**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 neutral
	Y1	6	violet	VT	Positioning signal AC/DC 0 V "clockwise” GLB14..1E)
	Y2	7	orange	OG	Positioning signal AC/DC 0 V "counterclockwise” GLB14..1E)
	Y	8	Gray	GY	Signal input (GLB16..1E)
	U	9	pink	PK	Signal output (GLB16..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” GLB34..1E)
	Y2	7	white	WH	Positioning signal AC 100...240 V ~ "counterclockwise"GLB34..1E)
	G+	1	red	RD	System potential DC 24 V ⎓ (auxiliary power) (GLB36..1E)
	G-	2	Black	BK	System neutral (auxiliary power) (GLB36..1E)
	Y	8	Gray	GY	Signal input (GLB36..1E)
	U	9	pink	PK	Signal output (GLB36..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 Normally closed contact
	Q14	S3	gray/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 S55499-D192	..B		GLB164.1E S55499-D272	..B
GLB142.1E S55499-D193	..B		GLB166.1E S55499-D273	..B
GLB146.1E S55499-D194	..B		GLB341.1E S55499-D195	..B
GLB161.1E S55499-D270	..B		GLB346.1E S55499-D196	..B
GLB163.1E S55499-D271	..B		GLB361.1E S55499-D197	..B

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