SIEMENS

OpenAir™

# Air damper actuators

## GLB..1E

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

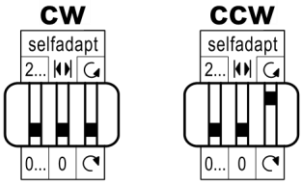
- Nominal torque 10 Nm
- Operating voltage AC 24 V ~ / DC 24...48 V ⎓
- Mechanically adjustable span between 0...90°
- Pre-wired with 0.9 m long connection cables
- Type-specific variations with adjustable offset and span for the positioning signal
- Position indication: mechanical and electrical
- Feedback potentiometer
- Self-adaptation of rotary 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 three-position 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;<br>• ...the setting of the rotary direction switch:<br>  <br><br>With no power applied, the actuator remains in the reached position. | • ...the setting of the rotary direction DIL switch:<br>  <br><br>• ...the positioning signal.<br><br>The actuator remains in the reached position if...:<br>• ...the control signal is maintained at a constant value;<br>• ...operating voltage is lost. |
| Position indication | mechanical | Rotary angle position indication using a position indicator. | |
| | 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.<br>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...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 within 0...90° with a set screw. | |

## Technical design

### Housing

The housing consists essentially of glass fiber reinforced plastic:

- flame retardant
- non-brominated
- non-chlorinated.

### 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

<table>
<tr><th>Type</th><th>Stock no.</th><th>Control</th><th>Operating voltage</th><th>Positioning signal Y</th><th>Position indicator U = DC 0...10 V ⎓</th><th>Feedback potentio-meter 5kΩ</th><th>Self-adap. of rotary angle range</th><th>Aux. switches</th><th>Rotary direction switch</th></tr>
<tr><td>GLB141.1E</td><td>S55499-D192</td><td rowspan="5">Open-close or three-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>GLB142.1E</td><td>S55499-D193</td><td>yes</td></tr>
<tr><td>GLB146.1E</td><td>S55499-D194</td><td rowspan="3">-</td><td>2</td></tr>
<tr><td>GLB341.1E</td><td>S55499-D195</td><td rowspan="2">AC 100...240 V ~</td><td>-</td></tr>
<tr><td>GLB346.1E</td><td>S55499-D196</td><td>2</td></tr>
<tr><td colspan="10"></td></tr>
<tr><td>GLB161.1E</td><td>S55499-D270</td><td rowspan="5">Modu-lating</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>-</td><td rowspan="5">yes</td></tr>
<tr><td>GLB163.1E</td><td>S55499-D271</td><td>DC 0...35 V ⎓</td><td rowspan="2">2</td></tr>
<tr><td>GLB164.1E</td><td>S55499-D272</td><td rowspan="3">DC 0/2...10 V ⎓</td></tr>
<tr><td>GLB166.1E</td><td>S55499-D273</td></tr>
<tr><td>GLB361.1E</td><td>S55499-D197</td><td>AC 100...240 V ~</td><td>-</td></tr>
<tr><td colspan="10"></td></tr>
<tr><td>Nominal torque</td><td colspan="9">10 Nm (applies to all)</td></tr>
</table>

## Acessories / Spare parts

See data sheet N4698:

https://sid.siemens.com/v/u/A6V10405973

## 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, CE declarations, 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.
- Use only properly trained technicians for mounting, commissioning, and servicing.

### Engineering

**Auxiliary switches and potentiometer**

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) | | | AC 24 V ~ ±20 % (19.2...28.8 V ~)<br>DC 24...48 V ⎓ ±20 % (19.2...57.6 V ⎓) [1)] |
| Frequency | | | 50/60 Hz |
| Power consumption | running | GLB14..1E | 1.3 VA / 0.8 W |
| | | GLB16..1E | 1.5 VA / 1.0 W |
| | holding | GLB14..1E | 0.7 VA / 0.4 W |
| | | GLB16..1E | 0.9 VA / 0.6 W |

| **Power supply GLB3..1E** | | | |
|---|---|---|---|
| Operating voltage (SELV/PELV) | | | AC 100...240 V ~ ±10 % (90...264 V ~) |
| Frequency | | | 50/60 Hz |
| Power supply | running | GLB34..1E | 6.0 VA / 2.0 W |
| | | GLB36..1E | 4.0 VA / 1.5 W |
| | holding | GLB34..1E | 0.9 W |
| | | GLB36..1E | 0.6 W |

| **Functional data** | | |
|---|---|---|
| Nominal torque | | 10 Nm |
| | Maximum torque (blocked) | 16 Nm |
| | Minimum holding torque | 10 Nm |
| Nominal rotary angle (with position indication) | | 90° |
| | Maximum rotary angle (mechanic limitation) | 95° ±2° |
| Runtime for 90° rotary angle | | 150 s |
| Actuator sound power level | | 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 | Counter-clockwise |
| Positioning signal for GLB34..1E | | | |
| | Operating voltage AC 100...240 V ~ | wires 4-6/N-Y1 | Clockwise |
| | | wires 4-7/N-Y2 | Counter-clockwise |
| Positioning signal for GLB16..1E | | | |
| | 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 ⎓ internally limited to DC 10 V ⎓ |
| | Protected against faulty wiring | | max. AC 24 V ~ / DC 24...48 V ⎓ |
| Hysteresis | for non-adjustable characteristic | | 60 mV |
| | for adjustable characteristic | | 0.6 % of ΔU |
| Adjustable characteristic (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..1E | 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<br>4 A resistive, 2 A inductive, min. 10 mA @ DC 30 V ⎓<br>0.8 A resistive, 0.5 A inductive, min. 10 mA @ DC 60 V ⎓ |
| Electric strength aux. switch against housing | | AC 4 kV |
| Switching range for aux. switches | | 5...90° |
| | Setting increments | 5° |
| Factory setting | Switch A | 5° |
| | Switch B | 85° |

| Connection cables | |
|---|---|
| Cable length | 0.9 m |
| Cross section of pre-wired connection cables | 0.75 mm2 |
| 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, aux. switches | II |
| Housing protection | | IP54 as 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. |
| Transport | | 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 standard | EN 60730<br>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)] |
| UK conformity (UKCA) | A5W00198019A [2)] |
| RCM conformity | A5W00000177 [2)] |
| EAC conformity | Eurasian conformity |
| UL certification | UL as per UL 60730 http://ul.com/database<br>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 and weight | | | |
|---|---|---|---|
| Actuator W x H x D | | | See Dimensions [▶ 11] |
| Damper shaft | | | |
| | Round | | 8...16 mm |
| | Round | | 8...10 mm (with centering element) |
| | Square | | 6...12.8 mm |
| | Min. shaft length | | 20 mm |
| | Max. hardness | | 300 AV |
| Weight (without packaging) | | without switches | Max. 0.49 kg |
| | | with switches | Max. 0.63 kg |

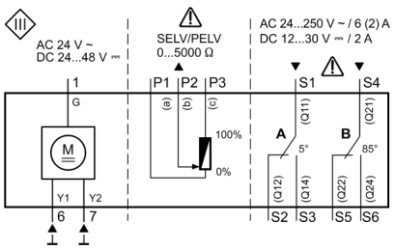
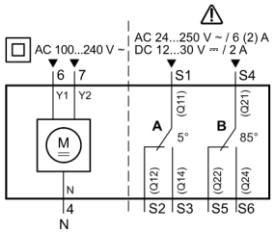
1) C-UL: permitted only to DC 30 V ⎓

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

## Diagrams

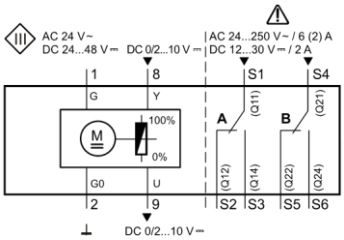
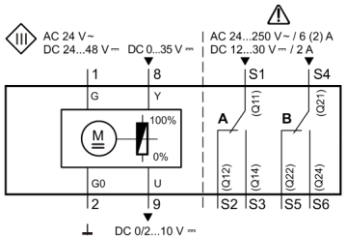
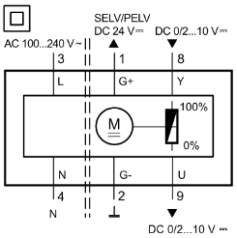
### Internal diagrams

#### GLB14..1E, GLB34..1E: open-close, three-position control

| AC 24 V ~ / DC 24...48 V – | | AC 100...240 V ~ | |
|---|---|---|---|
|  | |  | |



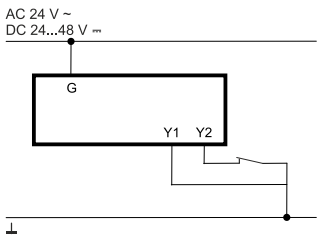
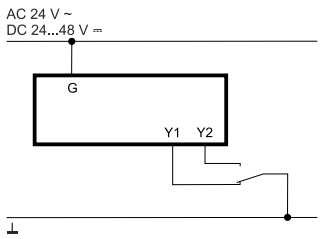
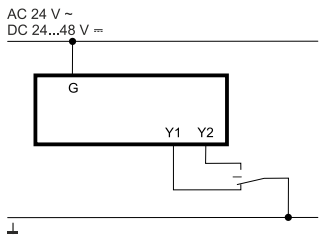
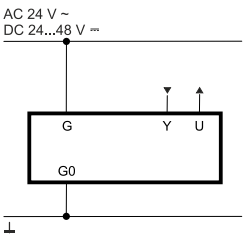
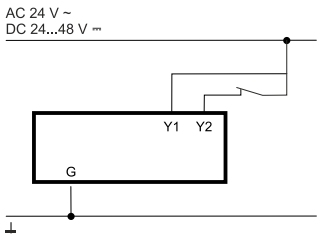
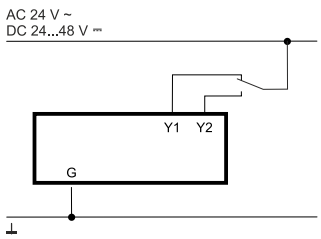
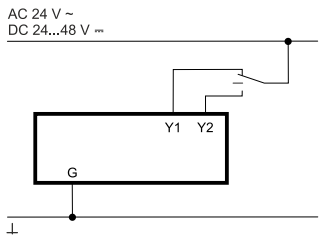
#### GLB16..1E, GLB36..1E: modulating control

| AC 24 V ~ / DC 24...48 V – | | AC 100...240 V ~ |
|---|---|---|
| Y = DC 0/2...48 V – | Y = DC 0...35 V – | |
|  |  |  |

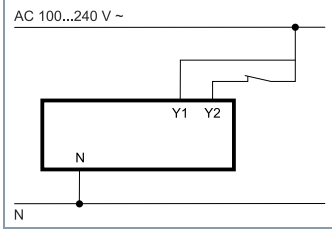
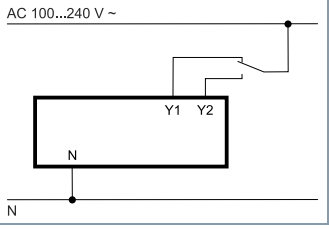
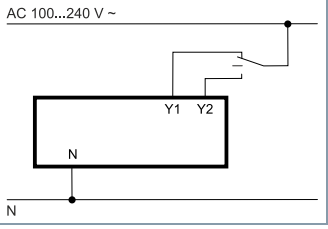
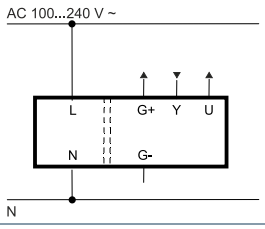


### Connection diagrams

#### 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** |
|---|---|---|---|
|  |  |  |  |
|  |  |  | |

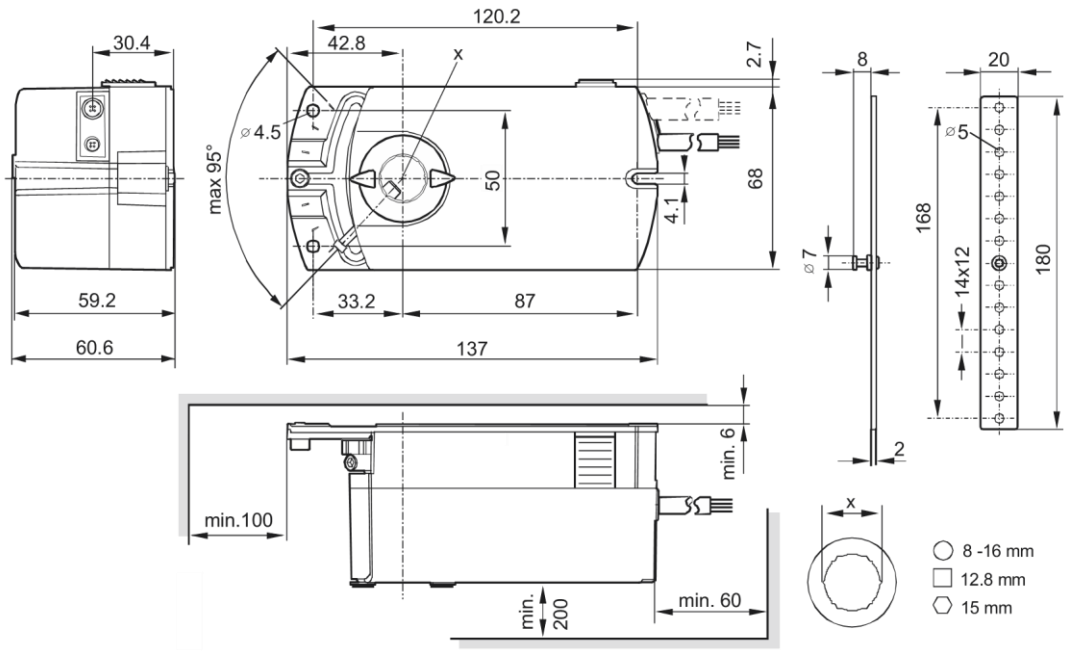
### GLB3..1E (AC 100...240 V ~)

| **Open-close, single wire control**<br>single pole single throw (SPST) | **Open-close, two wire control**<br>single pole double throw (SPDT) | **Three-position control** | **Modulating control** |
|---|---|---|---|
|  |  |  |  |

## Cable labeling

| Connection | Code | No. | Color | Abbreviation | Meaning |
|---|---|---|---|---|---|
| Actuators<br>AC 24 V ~<br>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" (GLB14..1E) |
| | Y2 | 7 | orange | OG | Positioning signal AC/DC 0 V "counter-clockwise" (GLB14..1E) |
| | Y | 8 | gray | GY | Signal in (GLB16..1E) |
| | U | 9 | pink | PK | Signal out (GLB16..1E) |
| | | | | | |
| Actuators<br>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" (GLB34..1E) |
| | Y2 | 7 | white | WH | Positioning signal AC 100...240 V ~ "counter-clockwise" (GLB34..1E) |
| | G+ | 1 | red | RD | System potential DC 24 V ⎓ (aux. power supply) (GLB36..1E) |
| | G- | 2 | black | BK | System neutral (aux. power supply) (GLB36..1E) |
| | Y | 8 | gray | GY | Signal in (GLB36..1E) |
| | U | 9 | pink | PK | Signal out (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 switches | 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<br>S55499-D192 | ..B | | GLB164.1E<br>S55499-D272 | ..B |
| GLB142.1E<br>S55499-D193 | ..B | | GLB166.1E<br>S55499-D273 | ..B |
| GLB146.1E<br>S55499-D194 | ..B | | GLB341.1E<br>S55499-D195 | ..B |
| GLB161.1E<br>S55499-D270 | ..B | | GLB346.1E<br>S55499-D196 | ..B |
| GLB163.1E<br>S55499-D271 | ..B | | GLB361.1E<br>S55499-D197 | ..B |

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Siemens Switzerland Ltd
Smart Infrastructure
Global Headquarters
Theilerstrasse 1a
CH-6300 Zug
+41 58 724 2424
www.siemens.com/buildingtechnologies



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