

OpenAir™

## Air damper actuators, running time 90 s

GDA..1E, GLA..1E



### Electronic motor driven actuators for open-close, 3-position and modulating control

- Nominal torque: 5 Nm / 10 Nm
- Operating voltage: AC 24 V ~ / DC 24...48 V =
- Running time for 90° rotary angle: 90 s
- Mechanically adjustable span: 0...90°
- Position indication: mechanical and electrical
- Pre-wired with 0.9 m long connection cables
- Self-adaption of rotational angle range and adjustable auxiliary switches for supplementary functions

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

- GDA...1E for damper areas up to 0.8 m<sup>2</sup>  
GLA...1E for damper areas up to 1.5 m<sup>2</sup>  
(These are guidelines; always observe damper manufacturer's data.)
- Suitable for use with modulating controllers (DC 0/2...10 V), open-close or 3-position controllers for air dampers or air throttles.
- We recommend a minimum pulse length of 500 ms on rotary actuators operated with 3-position control to ensure continuous and accurate operation.

## Functions

| GDA..., GLA...          |            | 141.1E<br>146.1E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 161.1E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply            |            | AC 24 V ~ / DC 24...48 –                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Control type            |            | Open-close<br>3-position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Modulating control (0/2...10 V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Rotary direction        |            | Clockwise or counter-clockwise direction depending...                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                         |            | <ul style="list-style-type: none"> <li>• ...on the type of control;</li> <li>• ...on the setting of the rotary direction switch.</li> </ul> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <b>CW</b><br/>  </div> <div style="text-align: center;"> <b>CCW</b><br/>  </div> </div> | <ul style="list-style-type: none"> <li>• ...on the position signal;</li> <li>• ...on the setting of the rotary direction DIL switch.</li> </ul> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <b>CW</b><br/>  </div> <div style="text-align: center;"> <b>CCW</b><br/>  </div> </div> |
|                         |            | With no power applied, the actuator remains in the respective position.                                                                                                                                                                                                                                                                                                                                                                                                                                                     | The actuator remains in the achieved position... <ul style="list-style-type: none"> <li>• ...if the control signal is maintained at a constant value;</li> <li>• ...in the event of a loss of operating voltage.</li> </ul>                                                                                                                                                                                                                                                                                                        |
| Position indication:    | Mechanical | Rotary angle position indication by using a position indicator.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                         | Electrical | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Output voltage U = DC 0/2...10 V is generated proportionally 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 independently of each other in increments of 5° within 0...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 fiber 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.   | Nom. torque | Control                  | Operating voltage          | Positioning signal Y | Position indicator U = DC 0...10 V | Self-adaption of rot. angle range | Aux. switch | Rotary direct. switch |
|-----------|-------------|-------------|--------------------------|----------------------------|----------------------|------------------------------------|-----------------------------------|-------------|-----------------------|
| GDA141.1E | S55499-D688 | 5 Nm        | Open-close or 3-position | AC 24 V ~ / DC 24...48 V = | -                    | -                                  | -                                 | -           | yes                   |
| GDA146.1E | S55499-D689 |             |                          |                            |                      |                                    |                                   | 2           |                       |
| GDA161.1E | S55499-D690 |             | Modulating               |                            | DC 0/2...10 V =      | yes                                | yes                               | -           | yes                   |
| GLA141.1E | S55499-D691 | 10 Nm       | Open-close or 3-position | AC 24 V ~ / DC 24...48 V = | -                    | -                                  | -                                 | -           | yes                   |
| GLA146.1E | S55499-D692 |             |                          |                            |                      |                                    |                                   | 2           |                       |
| GLA161.1E | S55499-D693 |             | Modulating               |                            | DC 0/2...10 V =      | yes                                | yes                               | -           | yes                   |

## Accessories

See data sheet N4698.

## Product documentation

| Topic                 | Title                                                      | Document ID: |
|-----------------------|------------------------------------------------------------|--------------|
| Mounting instructions | Fast running air damper actuators GDx..1E, GLx..1E         | A6V11684392  |
| Data sheet            | Accessories and spare parts for air damper actuators ASK.. | CM2N4698     |

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

[www.siemens.com/bt/download](http://www.siemens.com/bt/download)

## Security

|  <b>CAUTION</b> |                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | <p><b>National safety regulations</b></p> <p>Failure to comply with national safety regulations may result in personal injury and property damage.</p> <ul style="list-style-type: none"><li>• Observe national provisions and comply with the appropriate safety regulations.</li><li>• Only qualified personnel may mount, commission, and service the device.</li></ul> |

## Engineering

### Potentiometer and auxiliary

Potentiometer and auxiliary switches cannot be added in the field.

## Installation

|  <b>WARNING</b> |                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | <p><b>No internal line protection for supply lines to external consumers</b></p> <p>Risk of fire and injury due to short-circuits</p> <ul style="list-style-type: none"><li>• Adapt the line diameters as per local regulations to the rated value of the installed fuse.</li></ul> |

## Maintenance

The actuators G..A..1E are maintenance-free.

## Disposal

|                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br> | <p>The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.</p> <ul style="list-style-type: none"><li>• Use only designated channels for disposing the devices.</li><li>• Comply with all local and currently applicable laws and regulations.</li></ul> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Technical data

| Power supply      |         |            | GDA..1E                                                                                        | GLA..1E        |
|-------------------|---------|------------|------------------------------------------------------------------------------------------------|----------------|
| Operating voltage |         |            | AC 24 V ~ ± 20 % (19.2...28.2 V ~)<br>DC 24...48 V = ± 20 % (19.2...57.6 V =)<br>(SELV / PELV) |                |
| Frequency         |         |            | 50/60 Hz                                                                                       |                |
| Power consumption | Running | G..A14..1E | 0.7 W / 1.1 VA                                                                                 | 1.0 W / 1.5 VA |
|                   |         | G..A16..1E | 0.9 W / 1.3 VA                                                                                 | 1.2 W / 1.7 VA |
|                   | Holding | G..A14..1E | 0.4 W / 0.7 VA                                                                                 | 0.4 W / 0.7 VA |
|                   |         | G..A16..1E | 0.6 W / 1.0 VA                                                                                 | 0.6 W / 0.9 VA |

| Function data                                   |                                            | GDA..1E   | GLA..1E |
|-------------------------------------------------|--------------------------------------------|-----------|---------|
| Nominal torque                                  |                                            | 5 Nm      | 10 Nm   |
|                                                 | Maximum torque (blocked)                   | 10 Nm     | 16 Nm   |
|                                                 | Minimum holding torque                     | 5 Nm      | 10 Nm   |
| Nominal rotary angle (with position indication) |                                            | 90°       |         |
|                                                 | Maximum rotary angle (mechanic limitation) | 95° ± 2°  |         |
| Runtime for 90° rotary angle                    |                                            | 90 s      |         |
| Actuator sound power level                      |                                            | 30 dB (A) |         |

| Inputs                                                |                                 |                    |                                  |
|-------------------------------------------------------|---------------------------------|--------------------|----------------------------------|
| Positioning signal for G..A14..1E                     |                                 |                    |                                  |
|                                                       | Operating voltage               | (wires 1-6 / G-Y1) | Clockwise                        |
|                                                       | AC 24 V ~ / DC 24...48 V ==     | (wires 1-7 / G-Y2) | Counter-clockwise                |
| Positioning signal for G..A16..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 == 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                            |

| Outputs                    |                                 |                               |
|----------------------------|---------------------------------|-------------------------------|
| Position indicator         |                                 |                               |
| Output signal (G..A16..1E) | (wires 9-2 / U-G0)              |                               |
|                            | Output voltage U                | DC 0...10 V =                 |
|                            | Max. output current             | DC $\pm 1$ mA                 |
|                            | Protected against faulty wiring | Max. AC 24 V ~ / DC 24...48 = |

## GLA..1E

| Mechanical life |           |
|-----------------|-----------|
| Full cycles     | 60'000    |
| Partial cycles  | 5'000'000 |

## GDA..1E

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

| Auxiliary switches (G..A146.1E)                             |                                                                                                                                                                         |     |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Switching voltage                                           | AC 24...250 V ~ / DC 12...30 =                                                                                                                                          |     |
| Contact rating                                              | 6 A resistive, 2 A inductive, min. 10 mA at AC<br>4 A resistive, 2 A inductive, min. 10 mA at DC 30 V =<br>0.8 A resistive, 0.5 A inductive, min.<br>10 mA at DC 60 V = |     |
| Electric strength auxiliary switch against housing          | AC 4 kV                                                                                                                                                                 |     |
| Switching range for auxiliary switches / setting increments | 5...90° / 5°                                                                                                                                                            |     |
| Factory setting                                             | Switch A                                                                                                                                                                | 5°  |
|                                                             | Switch B                                                                                                                                                                | 85° |

| Connection cables                           |                      |
|---------------------------------------------|----------------------|
| Cable length                                | 0.9 m                |
| Cross section of prewired connection cables | 0.75 mm <sup>2</sup> |
| Permissible length for signal lines         | 300 m                |

| Degree of protection |                          |                       |
|----------------------|--------------------------|-----------------------|
| Insulation class     |                          | As per EN 60730       |
|                      | AC 24 V ~ / DC 24...48 V | III                   |
|                      | Auxiliary switches       | II                    |
| Housing protection   |                          | IP 54 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 / Part 2-14 / Particular requirements for electric actuators            |
| Electromagnetic compatibility (Applications) |         | For use in residential, commercial, light-industrial and industrial environments |
| EU Conformity (CE)                           |         |                                                                                  |
|                                              | GDA..1E | A5W00026943 <sup>1)</sup>                                                        |
|                                              | GLA..1E | A5W00026945 <sup>1)</sup>                                                        |
| UK Conformity (UKCA)                         |         |                                                                                  |
|                                              | GDA..1E | A5W00244318A <sup>1)</sup>                                                       |
|                                              | GLA..1E | A5W00221282A <sup>1)</sup>                                                       |
| RCM                                          |         |                                                                                  |
|                                              | GDA..1E | A5W00026947 <sup>1)</sup>                                                        |
|                                              | GLA..1E | A5W00026949 <sup>1)</sup>                                                        |
| EAC                                          |         | Eurasian conformity                                                              |

### Environmental compatibility

The product environmental declaration A5W00026066 <sup>1)</sup> 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 [ ► 11]           |
| Suitable drive shafts | Round shaft                          | 8...16 mm                        |
|                       | Round shaft (with centering element) | 8...10 mm                        |
|                       | Square shaft                         | 8...12.8 mm                      |
|                       | Hexagon                              | 8...14 mm<br>15 mm <sup>2)</sup> |
|                       | Min. drive shaft length              | 30 mm                            |
|                       | Max. shaft hardness                  | <300 HV                          |

### Weight

|                   |                  |              |
|-------------------|------------------|--------------|
| Without packaging | Without switches | Max. 0.49 kg |
|                   | With switches    | Max. 0.63 kg |

<sup>1)</sup> The documents can be downloaded from <http://siemens.com/bt/download>.

<sup>2)</sup> This value only works with the form fit function

## Diagrams

### Internal Diagrams

| G..A14..1E<br>(open-close, 3-position)                                                                                                                                                                        | G..A16..1E<br>(modulating, Y = DC 0/2...10 V →)                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| AC 24 V ~ / DC 24...48 V –                                                                                                                                                                                    |                                                                                                                        |
| <p>AC 24 V ~<br/>DC 24...48 V –</p> <p>AC 24...250 V ~ / 6 (2) A<br/>DC 12...30 V – / 2 A</p> <p>1 G<br/>2 S2<br/>3 S1 (Q11)<br/>4 S4 (Q21)<br/>5 S3 (Q12)<br/>6 S6 (Q22)<br/>7 Y2<br/>8 Y1</p> <p>5° 85°</p> | <p>AC 24 V ~<br/>DC 24...48 V – DC 0/2...10 V –</p> <p>1 G<br/>2 G0<br/>3 Y<br/>4 U<br/>5 8<br/>6 9</p> <p>100% 0%</p> |

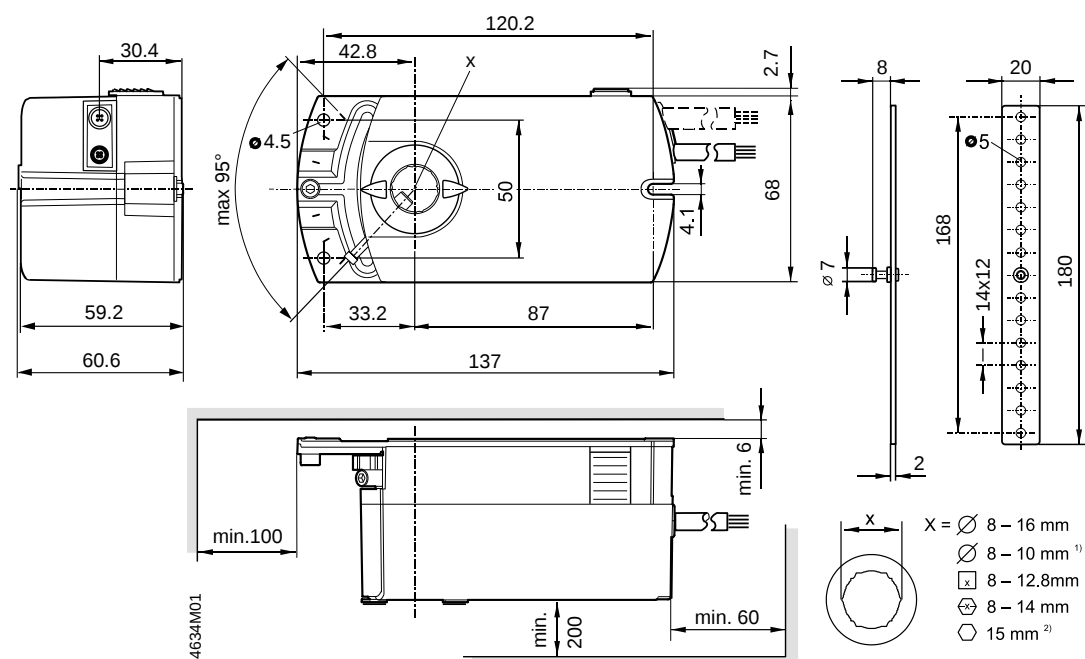
### Connection diagrams

| AC 24 V ~ / DC 24...48 V –                                                   |                                                                           |                                                                           |                                                                         |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Open-close,<br>single wire control<br><i>Single Pole Single Throw (SPST)</i> | Open-close,<br>two wire control<br><i>Single Pole Double Throw (SPDT)</i> | 3-position control                                                        | Modulating control                                                      |
| <p>AC 24 V ~<br/>DC 24...48 V –</p> <p>1 G<br/>2 Y1<br/>3 Y2<br/>4 G0</p>    | <p>AC 24 V ~<br/>DC 24...48 V –</p> <p>1 G<br/>2 Y1<br/>3 Y2<br/>4 G0</p> | <p>AC 24 V ~<br/>DC 24...48 V –</p> <p>1 G<br/>2 Y1<br/>3 Y2<br/>4 G0</p> | <p>AC 24 V ~<br/>DC 24...48 V –</p> <p>1 G<br/>2 G0<br/>3 Y<br/>4 U</p> |

## 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"<br>(G..A14..1E)         |
|                                          | Y2   | 7   | orange     | OG           | Positioning signal AC/DC 0 V, "counter-clockwise"<br>(G..A14..1E) |
|                                          | Y    | 8   | grey       | GY           | Signal in (G..A16..1E)                                            |
|                                          | U    | 9   | pink       | PK           | Signal out (G..A16..1E)                                           |
| 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 RD        | Switch B normally closed contact                                  |
|                                          | Q24  | S6  | black/pink | BK PK        | Switch B normally open contact                                    |

## Dimensions



<sup>1)</sup> With centering element

<sup>2)</sup> This value only works with the form fit function

Dimensions in mm

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