

OpenAir™

## Air damper actuators

GIB..1E



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

- Nominal torque 35 Nm
- Operating voltage : AC 24 V ~ / DC 24 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 ca. 6 m<sup>2</sup> (Reference value; comply with data from the damper manufacturer).
- 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

| GIB..                                  | AC 24 V ~ /<br>DC 24 V –  | 141.1E / 145.1E / 146.1E  | 161.1E / 163.1E / 164.1E / 166.1E  |
|--|---|---|--|
|  | AC 100...240 V ~  | 341.1E / 345.1E / 346.1E  | -  |
| Control type                           | 2-position/3-position   |   | Modulating control (0/2...10 V)  |
| Rotary movement,<br>rotation direction | Clockwise or counterclockwise direction depends ...   |   |  |
|  | <ul style="list-style-type: none"> <li>• ... on the type of control.</li> </ul>                                 | <ul style="list-style-type: none"> <li>• ... on the setting on the DIL switch clockwise / counterclockwise;</li> </ul> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>CW</b></p> </div> <div style="text-align: center;"> <p><b>CCW</b></p> </div> </div> <ul style="list-style-type: none"> <li>• ... on the positioning signal.</li> </ul> |  |
|  | The actuator remains in the respective position with no power applied.  | The actuator remains in the deployed position:  |  |
|  |   | <ul style="list-style-type: none"> <li>• ... if the positioning signal is maintained at a constant value;</li> <li>• ...in the event of power loss</li> </ul>   |  |
| Position indication                    | mechanical  | Rotation angle position indication using a position indicator.  |  |
|  | electrical  | By connecting the feedback potentiometer to external voltage, output voltage is generated proportionally to rotation angle.   | Position indicator: Output voltage U = DC 0/2...10 V is generated proportional to rotation angle.<br>The rotation direction (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 rotation range      |   |   | The actuator automatically determines the mechanical end positions of the rotation angle range.<br>The characteristic function (U <sub>0</sub> , ΔU) is mapped to the calculated rotation angle range.<br>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              | The rotation angle of the shaft adapter can be limited mechanically to 5° increments.                           |   |  |

## Technical design

### Housing

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

### Actuator / gears

- Brushless, robust DC motors ensure reliable operation regardless of load. The valve 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 input Y | Position indicator U = DC 0...10 V – | Feedback potentiometer 5 kΩ | Self-adapt. rotation angle range | Aux. switch | Rotation direction switch |
|-----------|-------------|------------------|-----------------------|----------------------------|--------------------------------------|-----------------------------|----------------------------------|-------------|---------------------------|
| GIB141.1E | S55499-D339 | 2- or 3-position | AC 24 V ~ / DC 24 V = | -                          | -                                    | -                           | -                                | 0           | -                         |
| GIB145.1E | S55499-D812 |                  |                       |                            |                                      | ✓                           |                                  | 2           |                           |
| GIB146.1E | S55499-D341 |                  |                       |                            |                                      | -                           |                                  | 0           |                           |
| GIB341.1E | S55499-D346 |                  | AC 100...240 V ~      |                            |                                      | ✓                           |                                  | 2           |                           |
| GIB345.1E | S55499-D347 |                  |                       |                            |                                      | -                           |                                  | 0           |                           |
| GIB346.1E | S55499-D348 |                  |                       |                            |                                      | -                           |                                  | 2           |                           |
| GIB161.1E | S55499-D342 | Modulating       | AC 24 V ~ / DC 24 V = | DC 0/2...10 V =            | ✓                                    | -                           | ✓                                | 0           | ✓                         |
| GIB163.1E | S55499-D343 |                  |                       | DC 0...35 V =              |                                      |                             |                                  | 2           |                           |
| GIB164.1E | S55499-D344 |                  |                       | DC 0/2...10 V =            |                                      |                             |                                  | 0           |                           |
| GIB166.1E | S55499-D345 |                  |                       | DC 0/2...10 V =            |                                      |                             |                                  | 2           |                           |

## Accessories / spare parts

See data sheet N4699.

## Product documentation

| Topic                 | Title   | Document ID |
|-----------------------|---|-------------|
| Data sheet            | Air damper actuators  | A6V14255636 |
| Technical principles  | Rotary actuators without spring return GBB/GIB..1                   | Z4626       |
| Mounting instructions | Rotary-type actuator GBB..1E, GIB..1E                               | A6V14196968 |
| Data sheet            | Accessories and spare parts for air damper actuators - ASC.., ASK.. | N4699       |

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.

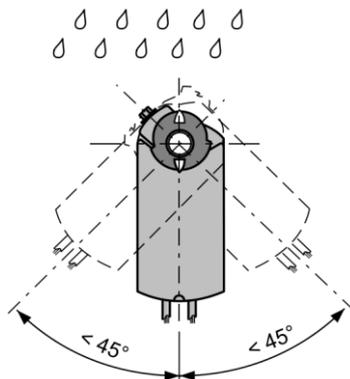
- Observe national provisions and comply with the appropriate safety regulations.
- Mounting, commissioning, and service by properly trained personnel only.

## Engineering

**Auxiliary switch and potentiometer**

Cannot be integrated after the fact.

## Mounting



See A6V14196968.

**Shaft connection**

Comply with the specifications on shaft diameter and damper surface area during installation ("Use [▶ 2]", "Technical data [▶ 8]") and use only industry-standard quality materials for damper shafts.

## 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 GIB..1E are maintenance free.

## Disposal



This symbol or any other national label indicate that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation.

For additional details, refer to [Siemens information on disposal](#).

## Technical data

| Power supply (GIB1..1E)       |         |  |                |
|-------------------------------|---------|--|----------------|
| Operating voltage (SELV/PELV) |         | AC 24 V ~ ± 20 % (19.2...28.8 V ~)<br>DC 24 V = ± 20 % (19.2...28.8 V =) <sup>1)</sup> |                |
| Frequency                     |         | 50/60 Hz   |                |
| Power consumption             | Running | GIB14..1E  | 2.6 VA / 1.8 W |
|                               |         | GIB16..1E  | 2.7 VA / 1.9 W |
|                               | Holding | GIB14..1E  | 0.8 VA / 0.5 W |
|                               |         | GIB16..1E  | 0.9 VA / 0.6 W |

| Power supply(GIB3..1E)        |         |  |                |
|-------------------------------|---------|--|----------------|
| Operating voltage (SELV/PELV) |         | AC 100...240 V ~ ± 10 % (90...264 V ~) |                |
| Frequency                     |         | 50/60 Hz                               |                |
| Power consumption             | Running | GIB34..1E                              | 4.2 VA / 2.4 W |
|                               | Holding | GIB34..1E                              | 1.5 VA / 1.0 W |

| Operating data  |                                   |                     |
|---|-----------------------------------|---------------------|
| Torque  | Nominal                           | 35 Nm               |
|   | Maximum (blocked)                 | 53 Nm <sup>2)</sup> |
|   | Minimum (hold state)              | 35 Nm               |
| Rotation angle  | Nominal (with position indicator) | 90°                 |
|   | Maximum (mechanically limited)    | 95° ± 2°            |
| Runtime at nominal rotation angle 90°                       |                                   | 150 s               |
| Actuator sound power level (at a positioning time of 150 s) |                                   | <45 dB(A)           |

| Inputs  |  |                       |   |
|---|--|-----------------------|---|
| Positioning signal for GIB14..1E                          | Operating voltage<br>AC 24 V ~ / DC 24 V = | (wires 1-6/G-Y1)      | Clockwise                                 |
|   |  | (wires 1-7/G-Y2)      | Counterclockwise                          |
| Positioning signal for GIB34..1E                          | Operating voltage<br>AC 100...240 V ~      | (wires 4-6/N-Y1)      | Clockwise                                 |
|   |  | (wires 4-7/N-Y2)      | Counterclockwise                          |
| Positioning signal for GIB16..1E                          | Input voltage                              | (wires 8-2/Y-G0)      | DC 0/2...10 V =                           |
|   | Power consumption                          |                       | 0.1 mA                                    |
|   | 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 V =                |
| Hysteresis  | for non-adjustable characteristic function |                       | 60 mV                                     |
|   | for adjustable characteristic function     |                       | 0.6 % of ΔU                               |
| Adjustable characteristic function (GIB163.1E, GIB164.1E) |  |                       |   |
|   | Adjustable with 2 potentiometers           | Offset U <sub>0</sub> | 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 V =                |

| Outputs  |   |                  |                            |
|--|---|------------------|----------------------------|
| Position indicator                                   | Output signal<br>GIB16..1E                              | (Wires 9-2/Y-G0) |                            |
|  | Output voltage U  |                  | DC 0...10 V =              |
|  | Max. output current                                     |                  | DC ± 1 mA                  |
|  | Protected against incorrect wiring                      |                  | Max. AC 24 V ~ / DC 24 V = |
| Feedback potentiometer<br>(for GIB145.1E, GIB345.1E) | Change in resistance                                    | (wires P1-P2)    | 0...5000 Ω                 |
|  | Load  |                  | <0.25 W                    |
|  | Max. sliding contact current                            |                  | <0.1 mA                    |
|  | Permissible voltage at potentiometer (SELV/PELV)        |                  | AC 24 V ~ / DC 24 V =      |
|  | Insulation resistance between potentiometer and housing |                  | AC 500 V ~                 |

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

| Auxiliary switches (GIB146.1E, GIB164.1E, GIB166.1E, GIB346.1E) |          |   |
|---|----------|---|
| Switching voltage   |          | AC 24...250 V ~ / DC 12...30 V =  |
| Contact loading   |          | 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 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 cable                    |                      |
|-------------------------------------|----------------------|
| Cable length                        | 0.9 m                |
| Cable cross-section                 | 0.75 mm <sup>2</sup> |
| Permissible length for signal wires | 300 m                |

| Safety class and degree of protection |   |   |
|---------------------------------------|---|---|
| Protection class                      |   | EN 60730  |
|                                       | AC 24 V ~ / DC 24 V =, feedback potentiometer | III   |
|                                       | AC 100...240 V ~, auxiliary switch            | II  |
| Degree of protection of housing       |   | IP54 as per EN 60529 (see "Mounting [▶ 4]" and A6V14196968) |

| Environmental conditions |                          |                             |
|--------------------------|--------------------------|-----------------------------|
| Operation                |                          | IEC 60721-3-3               |
|                          | Climatic conditions      | Class 3K23                  |
|                          | Mounting location        | Interior, weather-protected |
|                          | Temperature              | -32...55 °C                 |
|                          | Humidity, non-condensing | <95 % r.h.                  |
| Transportation           |                          | IEC 60721-3-2               |
|                          | Climatic conditions      | Class 2K12                  |
|                          | Temperature              | -32...70 °C                 |
|                          | Humidity, non-condensing | <95 % r.h.                  |
| Storage                  |                          | IEC 60721-3-1               |
|                          | Climatic conditions      | Class 1K22                  |
|                          | Temperature              | -32...50 °C                 |
|                          | Humidity, non-condensing | <95 % r.h.                  |
| Mechanical conditions    |                          | IEC 60721-3-2 / class 2M4   |

| Standards, directives and approvals                 |   |
|---|---|
| Product standards                                   | EN60730<br>Part 2-14: Particular requirements for electric actuators  |
| Electromagnetic compatibility (field of use)        | For residential, commercial, and industrial environments  |
| EU conformity (CE)                                  | A5W00004368 <sup>3)</sup>   |
| RCM conformity                                      | A5W00004369 <sup>3)</sup>   |
| EAC compliance                                      | Eurasian conformity   |
| UKCA conformity                                     | A5W001998153A <sup>3)</sup>   |
| UL approbation<br>Federal Communications Commission | UL as per 60730 <a href="http://ul.com/databse">http://ul.com/databse</a><br>cUL as per CSA-C22.2 No. 24-93 |

| Environmental compatibility   |
|---|
| Environmental Declaration A5W00712474A <sup>3)</sup> 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 [► 11]" |
| Damper shaft         | Round               | 8...25.6 mm             |
|                      | Square (diagonal)   | 6...18 mm               |
|                      | Min. length         | 20 mm                   |
|                      | Max. shaft hardness | <300 HV                 |

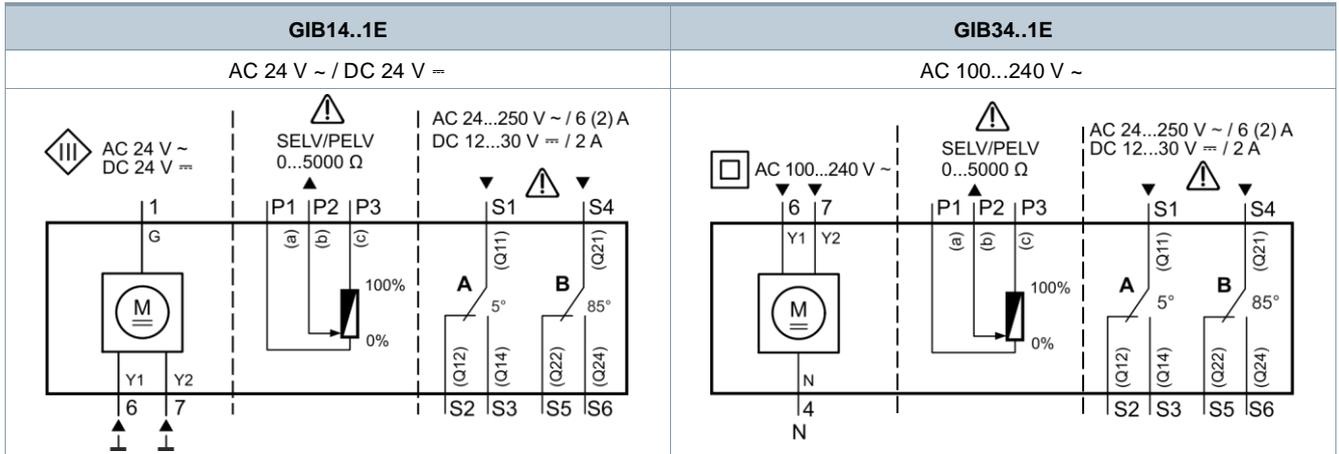
| Weight            |                            |              |
|-------------------|----------------------------|--------------|
| Without packaging | Excluding auxiliary switch | Max. 2.2 kg  |
|                   | Including auxiliary switch | Max. 2.35 kg |

- 1) cUL: Only to DC 30 V = Permissible
- 2) See notes under "Use [► 2]" and notice below ("Technical data [► 8]").
- 3) The documents can be downloaded at <http://siemens.com/bt/download>.

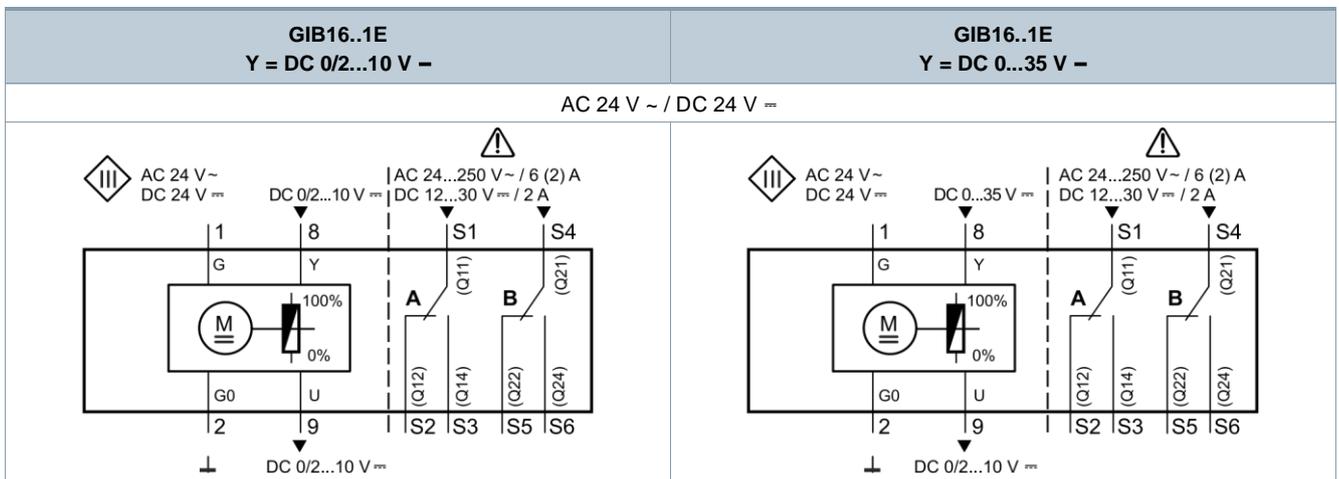
| <b>NOTICE</b> |   |
|---------------|---|
| <b>!</b>      | <p><b>Shaft connection – Important notes for the manufacturer / installer</b></p> <p>Use of unsuitable damper shafts may damage the damper or damper shaft.</p> <ul style="list-style-type: none"> <li>● Use only damper shafts with diameters suitable for the damper surface.</li> <li>● Use only quality materials typical for the sector for damper shafts/rods.</li> </ul> |

Internal diagrams

Open / close, 3-position control

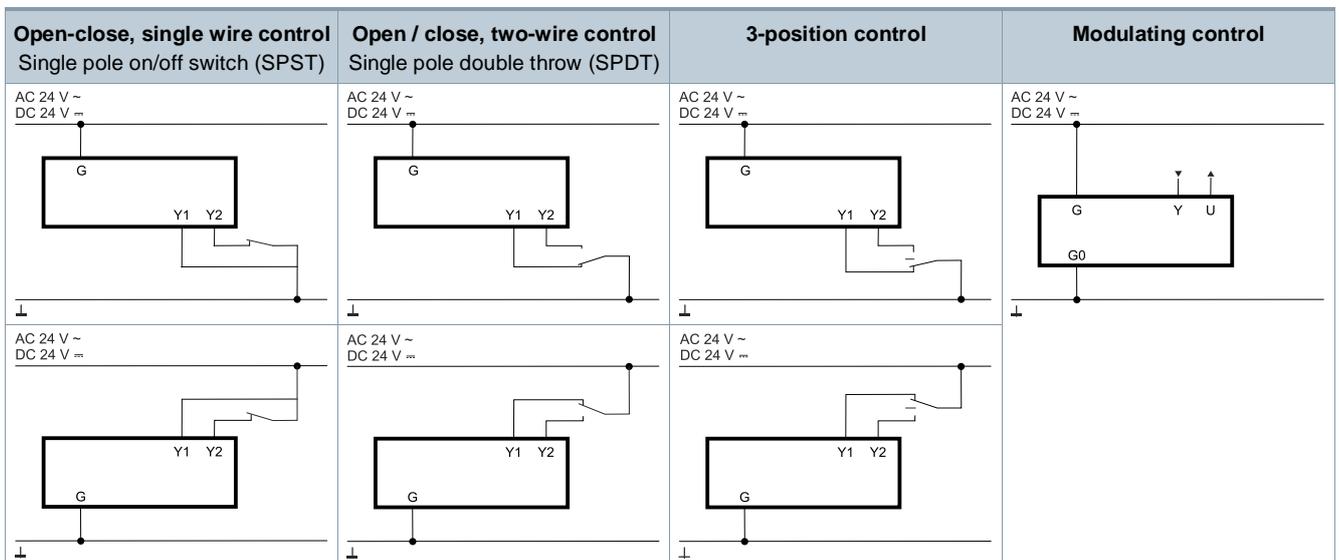


Modulating control

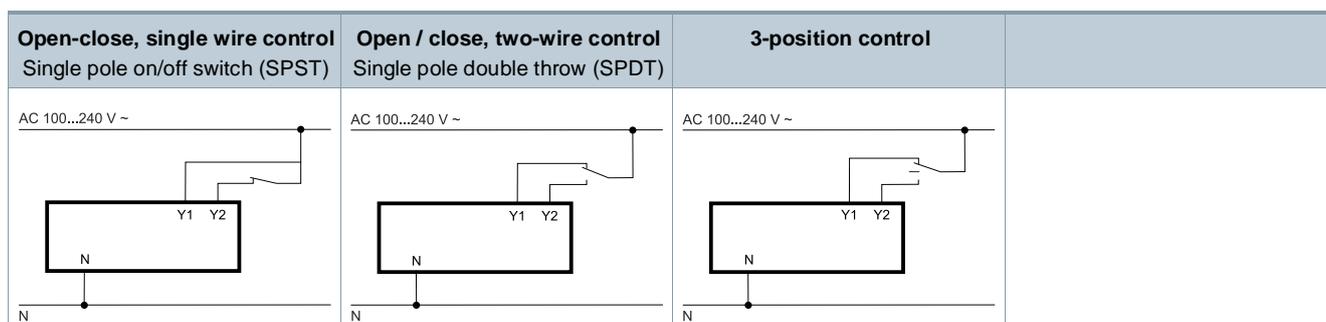


Connection diagrams

Control on GIB1..1E (AC 24 V ~ / DC 24 V –)



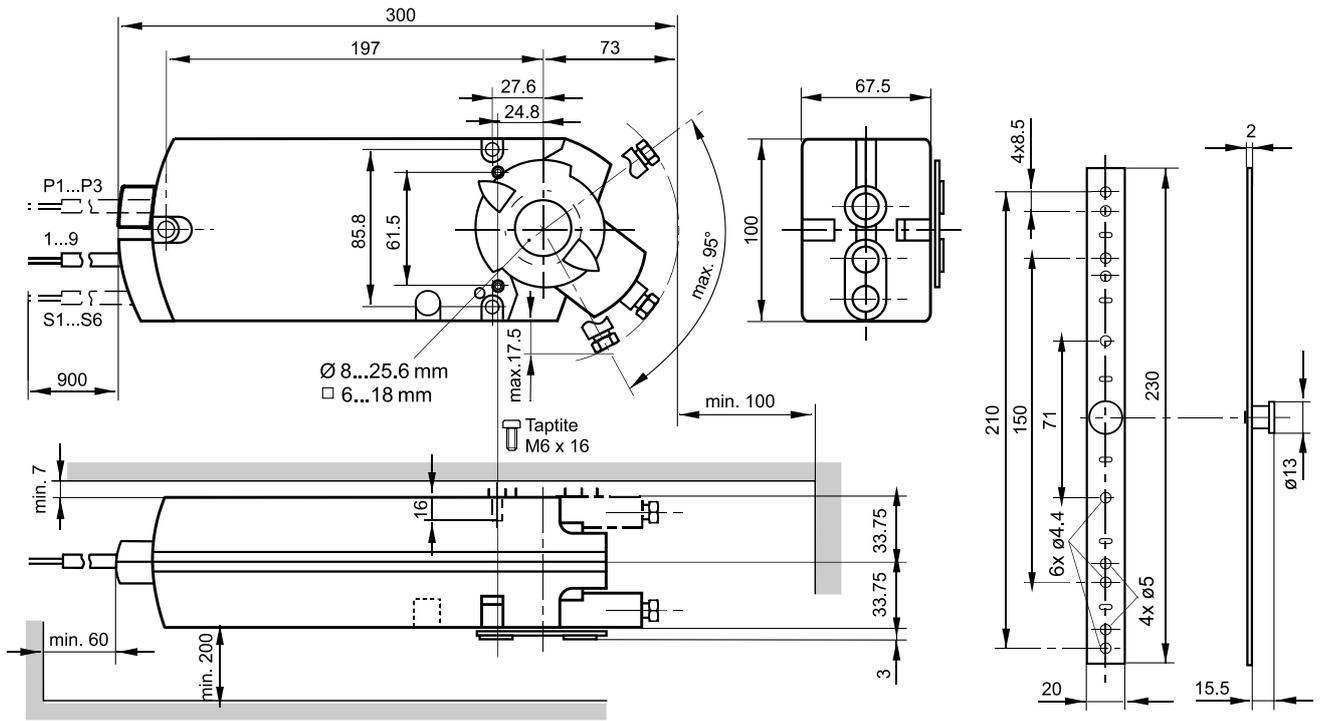
## Open / closed, two-wire control on GIB3..1E (AC 100...240 V ~)



### Cable designations

| Pin                                | Code | No. | Color      | Abbreviation | Meaning   |
|------------------------------------|------|-----|------------|--------------|---|
| Actuators<br>AC 24 V ~ / DC 24 V = | G    | 1   | red        | RD           | System potential AC 24 V ~ / DC 24 V =                      |
|                                    | G0   | 2   | Black      | BK           | System neutral  |
|                                    | Y1   | 6   | violet     | VT           | Positioning signal AC/DC 0 V "clockwise" (GIB14..1E)        |
|                                    | Y2   | 7   | orange     | OG           | Positioning signal AC/DC 0 V "counterclockwise" (GIB14..1E) |
|                                    | Y    | 8   | gray       | GY           | Signal input (GIB16..1E)                                    |
|                                    | U    | 9   | pink       | PK           | Signal output (GIB16..1E)                                   |
| Actuators<br>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"             |
|                                    | Y2   | 7   | white      | WH           | Positioning signal AC 100...240 V ~ "counterclockwise"      |
| 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. |
|--------------------------|---------------------|--------------------------|---------------------|
| GIB141.1E<br>S55499-D339 | ..A                 | GIB164.1E<br>S55499-D344 | ..A                 |
| GIB145.1E<br>S55499-D812 | ..A                 | GIB166.1E<br>S55499-D345 | ..A                 |
| GIB146.1E<br>S55499-D341 | ..A                 | GIB341.1E<br>S55499-D346 | ..A                 |
| GIB161.1E<br>S55499-D342 | ..A                 | GIB345.1E<br>S55499-D347 | ..A                 |
| GIB163.1E<br>S55499-D343 | ..A                 | GIB346.1E<br>S55499-D348 | ..A                 |

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