



OpenAir™

## Air damper actuators

## GEB...1

Rotary version, AC 24 V / AC 230 V

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**Electronic motor driven actuators for three-position and modulating control, nominal torque 15 Nm, self-centering shaft adapter, mechanically adjustable span between 0...90°, prewired with 0.9 m long connection cables. Type-specific variations with adjustable offset and span for the positioning signal, position indicator, feedback potentiometer, self-adaptation of the rotary angle range, and adjustable auxiliary switches for supplementary functions.**

### Remarks

This data sheet provides a brief overview of these actuators. Please refer to the technical basics in Z4621en for a detailed description as well as information on safety, engineering notes, mounting and commissioning.

### Use

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- For damper areas up to 3 m<sup>2</sup>, friction-dependent.
  - Suitable for modulating controllers (DC 0...10 V) or three-position controllers (e.g. for outside air dampers).
  - For dampers having two actuators on the same damper shaft (tandem-mounted actuators or Powerpack).

## Type summary

| GEB....   | 131.1E                 | 132.1E | 136.1E | 331.1E | 332.1E | 336.1E | 161.1E             | 163.1E | 164.1E | 166.1E |
|---|------------------------|--------|--------|--------|--------|--------|--------------------|--------|--------|--------|
| Control type  | Three-position control |        |        |        |        |        | Modulating control |        |        |        |
| Operating voltage<br>AC 24 V                                | X                      | X      | X      |        |        |        | X                  | X      | X      | X      |
| Operating voltage<br>AC 230 V                               |                        |        |        | X      | X      | X      |                    |        |        |        |
| Positioning signal Y<br>DC 0...10 V                         |                        |        |        |        |        |        | X                  | X      | X      | X      |
| DC 2...10 V   |                        |        |        |        |        |        | X                  |        |        | X      |
| DC 0...35 V with characteristic<br>function $U_o, \Delta U$ |                        |        |        |        |        |        |                    | X      | X      |        |
| Position indicator<br>$U = DC 0...10 V$                     |                        |        |        |        |        |        | X                  | X      | X      | X      |
| Feedback potentiometer 1k $\Omega$                          |                        | X      |        |        | X      |        |                    |        |        |        |
| Self-adaptation of<br>rotary angle range                    |                        |        |        |        |        |        | X                  | X      | X      | X      |
| Auxiliary switches (two)                                    |                        |        | X      |        |        | X      |                    |        | X      | X      |
| Rotary direction switch                                     |                        |        |        |        |        |        | X                  | X      | X      | X      |
| Powerpack (two actuators,<br>tandem-mounted)                | X                      | X      | X      | X      | X      | X      |                    |        |        |        |

## Functions

| Type  | GEB13..1 / GEB33...1  | GEB16..1  |
|---|---|---|
| Control type  | Three-position control  | Modulating control  |
| Positioning signal with adjustable<br>characteristic function |   | DC 0...35 V with<br>Offset $U_o = 0...5 V$ and<br>span $\Delta U = 2...30 V$  |
| Rotary direction  | Clockwise or counter-clockwise direction depends...<br>...the type of control. With no power applied, the<br>actuator remains in the respective position. |   |
| Position indication: Mechanical                               | Rotary angle position indication by using a position indicator.   |   |
| Position indication: Electrical                               | The feedback potentiometer can be<br>connected to external voltage to indicate<br>the position.   | Position indicator:<br>Output voltage $U = DC 0...10 V$ is generated<br>proportional to the rotary angle. $U$ depends on the<br>rotary direction of the DIL switch.   |
| Auxiliary switch  | The switching points for auxiliary switches A and B can be set independent of each other<br>in increments of 5° within 0° to 90°.                         |   |
| Self-adaptation of<br>rotary angle range                      |   | When self-adaptation is active, the actuator<br>automatically determines the mechanical end<br>positions of the rotary angle range and maps the<br>characteristic function ( $U_o, \Delta U$ ) to the calculated<br>rotary angle range. |
| Powerpack   | Mounting two of the same actuator types on the<br>same damper shaft may result in a double torque.  | Not permitted.  |
| Rotary angle limitation                                       | The rotary angle of the shaft adapter can be limited mechanically at increments of 5°.  |   |

## Ordering

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

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

Accessories, spare parts

Accessories to functionally extend the actuators are available, e.g., rotary/linear sets, auxiliary switches (1 or 2 switches) and weather protection cover; see data sheet **N4697**.

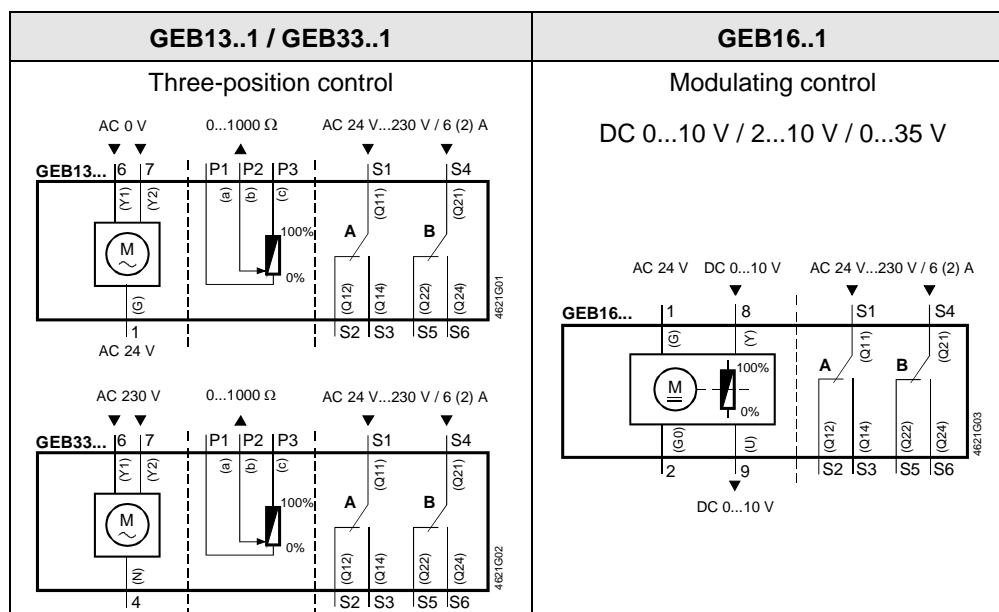
## Technical data

|  |   |                                       |                               |                  |
|--|---|---------------------------------------|-------------------------------|------------------|
| ⚠ AC 24 V supply (SELV/PELV)   | Operating voltage / Frequency   |                                       | AC 24 V ± 20 % / 50/60 Hz     |                  |
|  | Power consumption   | GEB13..1: Running                     | 4 VA / 3.5 W                  |                  |
|  |   | GEB16..1: Running                     | 6 VA / 5.5 W                  |                  |
|  | Holding   |                                       | 1.5 W                         |                  |
| ⚠ AC 230 V supply  | Operating voltage / Frequency   |                                       | AC 230 V ± 10 % / 50/60 Hz    |                  |
|  | Power consumption GEB33..1  |                                       | 3 VA / 3 W                    |                  |
| Function data  | Nominal torque  |                                       | 15 Nm                         |                  |
|  | Maximum torque (blocked)  |                                       | 30 Nm                         |                  |
|  | Nominal rotary angle / Max. rotary angle                                    |                                       | 90° / max. 95° ± 2°           |                  |
|  | Runtime for 90° rotary angle  |                                       | 150 s (50 Hz) / 125 s (60 Hz) |                  |
| Positioning signal for GEB16..1  | Input voltage Y (wires 8-2)   |                                       | DC 0...10 V / DC 2...10 V     |                  |
|  | Max. permissible input voltage  |                                       | DC 35 V                       |                  |
| Characteristic functions for GEB161.1, GEB166.1 for GEB163.1, GEB164.1 | Input voltage Y (wires 8-2)   |                                       | DC 0...35 V                   |                  |
|  | Non-adjustable characteristic function                                      |                                       | DC 0...10 V / DC 2...10 V     |                  |
|  | Adjustable characteristic function  | Offset U <sub>o</sub>                 | DC 0...5 V                    |                  |
| Span ΔU  |   | DC 2...30 V                           |                               |                  |
| Position indicator for GEB16...1                                       | Output voltage U (cores 9-2)  |                                       | DC 0...10 V                   |                  |
|  | Max. output current   |                                       | DC ± 1 mA                     |                  |
| Feedback potentiometer for GEB132.1 / GEB332.1                         | Change of resistance (wires P1-P2)  |                                       | 0...1000 Ω                    |                  |
|  | Load  |                                       | < 1 W                         |                  |
| ⚠ Auxiliary switches for GEB..6.1 / GEB164.1                           | Contact rating  |                                       | 6 A resistive, 2 A inductive  |                  |
|  | Voltage (no mixed operation AC 24 V / AC 230 V)                             |                                       | AC 24...230 V                 |                  |
|  | Switching range for auxiliary switches                                      |                                       | 5°...90°                      |                  |
|  | Setting increments  |                                       | 5°                            |                  |
| Connection cables  | Cross-section   |                                       | 0.75 mm <sup>2</sup>          |                  |
|  | Standard length   |                                       | 0.9 m                         |                  |
| Degree of protection of housing  | Degree of protection as per EN 60 529 (note mounting instructions)          |                                       | IP 54                         |                  |
|  | Protection class  | Insulation class                      |                               | EN 60 730        |
| AC 24 V, feedback potentiometer  |   | III                                   |                               |                  |
|  | AC 230 V, auxiliary switch  |                                       | II                            |                  |
| Environmental conditions   | Operation / Transport   |                                       | IEC 721-3-3 / IEC 721-3-2     |                  |
|  | Temperature   |                                       | -32...+55 °C / -32...+70 °C   |                  |
|  | Humidity (non-condensing)   |                                       | < 95% r. h. / < 95% r. h.     |                  |
| Standards and directives   | Product safety: Automatic electrical controls for household and similar use |                                       | EN 60 730-2-14 (Type 1)       |                  |
|  | Electromagnetic compatibility (EMC):  |                                       |                               |                  |
|  | Immunity for all models, except GEB132.1x; GEB332.1x                        |                                       | IEC/EN 61 000-6-2             |                  |
|  | Immunity for GEB132.1x; GEB332.1x   |                                       | IEC/EN 61 000-6-1             |                  |
|  | Emissions for all models  |                                       | IEC/EN 61 000-6-3             |                  |
|  | Ⓒ Conformity:   | Electromagnetic compatibility         |                               | 89/336/EEC       |
|  |   | Low voltage directive                 |                               | 73/23/EEC        |
|  |   | Ⓒ Conformity:                         | Australian EMC Framework      |                  |
|  | Radio Interference Emission Standard  |                                       | AS/NZS 3548                   |                  |
|  | Dimensions  | Actuator W x H x D (see "Dimensions") |                               | 81 x 192 x 63 mm |
| Damper shaft:  |   | Round                                 | 6.4...20.5 mm                 |                  |
|  |   | Square                                | 6.4...13 mm                   |                  |
| Min. shaft length  |   | 20 mm                                 |                               |                  |
| Weight   | Without packaging: GEB1...1   |                                       | 1 kg                          |                  |
|  | GEB33..1  |                                       | 1.1 kg                        |                  |

## Disposal

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

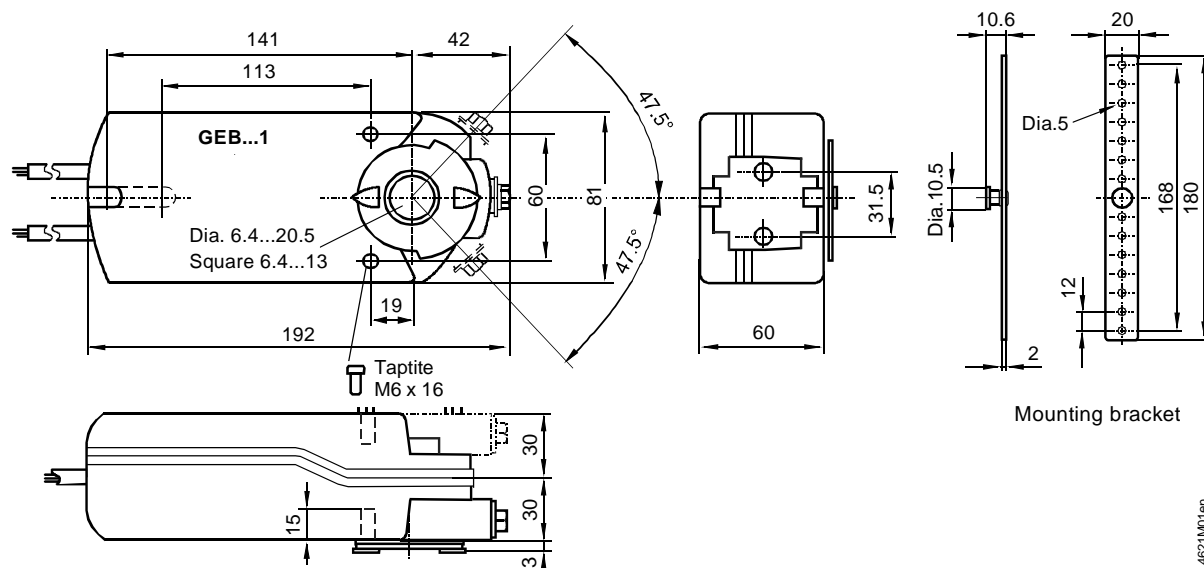
## Internal diagrams



## Cable labeling

| Pin               | Cable |     | Color<br>Abbreviation | Meaning |   |
|-------------------|-------|-----|-----------------------|---------|---|
|                   | Code  | No. |                       |         |   |
| Actuators AC 24V  | G     | 1   | red                   | RD      | System potential AC 24 V                    |
|                   | G0    | 2   | black                 | BK      | System neutral                              |
|                   | Y1    | 6   | purple                | VT      | Control signal AC 0 V, clockwise            |
|                   | Y2    | 7   | orange                | OG      | Control signal AC 0 V, counter-clockwise    |
|                   | Y     | 8   | gray                  | GY      | Pos. signal DC 0...10 V, 2...10 V, 0...35 V |
|                   | U     | 9   | pink                  | PK      | Position indication DC 0...10 V             |
| Actuators AC 230V | N     | 4   | blue                  | BU      | Neutral conductor                           |
|                   | Y1    | 6   | black                 | BK      | Control signal AC 230 V, clockwise          |
|                   | Y2    | 7   | white                 | WH      | Control signal AC 230 V, counter-clockwise  |
| Auxiliary switch  | Q11   | S1  | 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              |
| Positioner        | a     | P1  | white/red             | WH RD   | Potentiometer 0...100 % (P1-P2)             |
|                   | b     | P2  | white/blue            | WH BU   | Potentiometer pick-off                      |
|                   | c     | P3  | white/pink            | WH PK   | Potentiometer 100...0 % (P3-P2)             |

## Dimensions



Mounting bracket

4621M01en

Dimensions in mm

Subject to alteration