OpenAir™

Air damper actuators

Rotary version, AC/DC 24 V and AC 230 V

GSD...1

- Electric motor-driven rotary actuators for open-close control (1-wire SPST)
- 2 Nm nominal torque
- AC/DC 24 V or AC 230 V rated voltage
- Prewired with 0.9 m connecting cable
- Slider for manual adjustment
- Auxiliary switch for auxiliary functions
**Use**

- For damper areas up to 0.3 m², friction dependent.
- For directly driven zone dampers to control air flow in air ducts.

**Accessories / Spare parts**

- Rotation Limiter Kit ASK74.11

**Type summary**

<table>
<thead>
<tr>
<th>Non-spring return rotary actuators GSD</th>
<th>Type</th>
<th>Operating voltage</th>
<th>Control signal</th>
<th>Cable length</th>
<th>Shaft diameter</th>
<th>Auxiliary switch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GSD121.1A</td>
<td>AC/DC 24 V</td>
<td>Open-close</td>
<td>0.9 m</td>
<td>8…15 mm</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>GSD126.1A</td>
<td>AC/DC 24 V</td>
<td>Open-close</td>
<td>0.9 m</td>
<td>8…15 mm</td>
<td>yes</td>
</tr>
<tr>
<td></td>
<td>GSD321.1A</td>
<td>AC 230 V</td>
<td>Open-close</td>
<td>0.9 m</td>
<td>8…15 mm</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>GSD326.1A</td>
<td>AC 230 V</td>
<td>Open-close</td>
<td>0.9 m</td>
<td>8…15 mm</td>
<td>yes</td>
</tr>
</tbody>
</table>

* 1-wire, SPST: Single-pole, single-throw

Refer to „Internal Diagrams“, page 6.

**Functions**

<table>
<thead>
<tr>
<th>Type</th>
<th>GSD121.1A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control type</td>
<td>Open-close</td>
</tr>
<tr>
<td>Rotary direction</td>
<td>Clockwise or counter-clockwise movement depends on the actuator’s mounting position on the damper shaft...</td>
</tr>
<tr>
<td>Slider</td>
<td>Pressing the slider allows for manual actuator adjustment.</td>
</tr>
<tr>
<td>Auxiliary switch</td>
<td>GSD...6.1A: Set switching points at 5° or 85°.</td>
</tr>
</tbody>
</table>

* 1-wire, SPST: Single-pole, single-throw

**Technical data**

⚠️ **Power supply AC/DC 24 V**

- Operating voltage AC / frequency: AC 24 V ± 20%; 50 / 60 Hz
- Operating voltage DC: DC 24 V ± 15%
- Power consumption:
  - GSD121.1A / GSD126.1A: (running) 2 VA / 1.5 W (holding) 1 VA / 0.5 W

⚠️ **Supply voltage AC 230 V**

- Operating voltage / Frequency: AC 230 V ± 15%; 50/60 Hz
- Fuse for incoming supply line (fast): 2 A.
- Power consumption:
  - GSD321.1A / GSD326.1A: (running) 12 VA / 2 W (holding) 12 VA / 2 W

<table>
<thead>
<tr>
<th>Functional data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal torque</td>
</tr>
<tr>
<td>Maximum torque</td>
</tr>
<tr>
<td>Nominal rotational angle</td>
</tr>
<tr>
<td>Maximum rotational angle</td>
</tr>
<tr>
<td>Nominal rotational angle (mechanically limited)</td>
</tr>
<tr>
<td>Runtime at nominal rotational angle 90°</td>
</tr>
<tr>
<td>Duty cycle</td>
</tr>
<tr>
<td>Direction of rotation</td>
</tr>
<tr>
<td>Mechanical life</td>
</tr>
</tbody>
</table>
**Auxiliary switch**

AC – Power
- Switching voltage: AC 24...230 V
- Rated voltage resistive / inductive: 6 A / 2 A
- No mixed operation AC 24 V / 230 V

DC – Power
- Switching voltage: DC 12...30 V
- Rated current: DC 2 A
- Factory switch setting:
  - Switch A (set): 5°
  - Switch B (set): 85°

**Connection cables**
- Cable length: 0.9 m
- Cross-section: 0.75 mm²

**Housing type**
- Protection as per EN 60 529: IP40

**Protection class**
- Insulation protective class: EN 60 730
  - AC 230 V
  - AC/DC 24 V

**Environmental conditions**
- Operation: IEC 721-3-3
  - Climatic conditions: Class 3K5
  - Mounting location: Interior, weather-protected
  - Temperature (extended): -32...+55 °C
  - Humidity, non-condensing: < 95% r.h.
- Transportation: IEC 721-3-2
  - Climatic conditions: Class 2K3
  - Temperature (extended): -32...+70 °C
  - Humidity, non-condensing: < 95% r.h.
- Storage: IEC 721-3-1
  - Climatic conditions: Class 1K3
  - Temperature (extended): -32...+50 °C
  - Humidity, non-condensing: < 95% r.h.
- Mechanical conditions: Class 2M2

**Standards**
- Product safety: Automatic electrical controls for household and similar use (Type 1) IEC/EN 60 730-2-14
- Electromagnetic compatibility
  - Immunity: IEC/EN 61 000-6-2
  - Emissions: IEC/EN 61 000-6-3
- C-tick conformity as per Australian EMC Framework Radio communication act 1992
- AS/NZS 3548 conformity as per EMC directive 2004/108/EEC
- Low voltage directive 2006/95/EEC

**Dimensions**
- Actuator: W × H × D
- Damper shaft
  - Rectangular: 6...11 mm
    - Min. length: 20 mm
    - Max. shaft hardness: 300 HV
  - Round: 8...15 mm
    - Min. length: 20 mm
    - Max. shaft hardness: 300 HV

**Weight**
- Excl. packaging
  - GSD..21.1A: 0.440 kg
  - GSD..26.1A: 0.560 kg
Mechanical design

Basic components

Housing
Fiberglass-reinforced plastic

Gear train
Maintenance-free, noise-free

Engineering notes

STOP
This section explains general and system-specific regulations for mains and operating voltages. It also contains important information on your own safety and that of your plant.

Intended use
Use these actuators as described in the basic system documentation for the applied control systems. In addition, take account of all actuator-specific features and conditions as described in the brief description on the front page of this data sheet (bold print) as well as the sections "Use", "Engineering notes", and "Technical data".

⚠ Sections flagged with the warning symbol to the left contain safety-related requirements and restrictions that must be adhered to at all times to prevent physical injury and equipment damage.

⚠ AC/DC 24 V supply
Operate the actuators only on safety extra-low voltage (SELV) or protective extra-low voltage (PELV) as per HD 384.

⚠ AC 230 V supply
The actuators are double-insulated and there is no connection for the protective ground.

⚠ Auxiliary switch
Apply only mains voltage or protective extra-low voltage to the switching outputs of the auxiliary switch. Mixed operation is not allowed. Operation at various phases is not allowed.

CAUTION
Do not open the actuators!
- The actuators are maintenance-free.
- Only the manufacturer may carry out repair work.
- Opening the actuator will void the warranty.

Electric, parallel connection of actuators
Up to 10 actuators of the same type can be electrically wired in parallel; cable length and cable cross-sections must be observed.

Required actuator type
Selection of the actuator depends on several torque factors. After obtaining the damper torque rating (Nm/m²) from the manufacturer and determining the damper area, calculate the total torque required to move the damper as follows:

Non-spring return damper actuators:

<table>
<thead>
<tr>
<th>IF total torque (SF¹):</th>
<th>Use type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 2 Nm</td>
<td>GSD…1.1A / GSD…6.1A (2 Nm)</td>
</tr>
<tr>
<td></td>
<td>GXD…1 (1.5 Nm)</td>
</tr>
<tr>
<td>≤ 5 Nm</td>
<td>GDB…1 (5 Nm)</td>
</tr>
<tr>
<td>≤ 10 Nm</td>
<td>GLB…1 (10 Nm)</td>
</tr>
<tr>
<td>≤ 15 Nm</td>
<td>GEB…1 (15 Nm)</td>
</tr>
<tr>
<td>≤ 25 Nm</td>
<td>GBB…1 (25 Nm)</td>
</tr>
<tr>
<td>≤ 35 Nm</td>
<td>GIB…1 (35 Nm)</td>
</tr>
</tbody>
</table>

¹ Safety factor SF: When calculating the required torque, non-definable variables such as slight misalignment, damper age, etc. must be included as a safety factor. We recommend a safety factor of 0.8 (or 80 % of the torque characteristic).
Transformer sizing for AC 24 V

Use safety insulating transformers as per EN 61 558 with double insulation designed for 100 % duty to supply SELV or PELV circuits.

Observe all local safety rules and regulations pertaining to the sizing and protection of transformers.

Determine the transformer power consumption by adding up the power consumption in VA for all actuators used.

Wiring and commissioning

Refer to the sections “Commissioning notes” and “Wiring diagrams” in this data sheet as well as to the HVAC job drawings.

Mounting notes

Mounting instructions
All information and steps to properly prepare and mount the actuator are listed in the mounting instructions supplied with the actuator.

Mounting position
Mount the actuator in a position which ensures easy access to the cables and to the shaft adapter. See “Dimensions”.

Damper shafts
Information on minimum length and diameter for the damper shaft is available in the “Technical data” section.

Manual adjustment
Pressing the eject button allows you to manually adjust the actuator.

Commissioning notes

Reference
For commissioning, the following reference documentation must be available:

- This data sheet.
- HVAC job diagram.

Environmental conditions
Check to ensure that all permissible values as contained in the section “Technical data” have been observed.

Mechanical check
- Check for proper mounting and ensure that all mechanical settings correspond to the plant-specific requirements. Additionally, ensure that the dampers are tightly closed when in the closed position.
- Check the direction of rotation.
- Fasten the actuator securely to avoid twisting and blocking of the actuator.

Electrical check
- Check to ensure that the cables are connected in accordance with the plant wiring diagram (see “Wiring diagrams”).
- The operating voltage AC/DC 24 V (SELV/PELV) or AC 230 V must be within the tolerance values.
Functional check

GSD121.1A
- Power supply AC/DC 24 V wires red (1), black (2)
- Positioning signal AC/DC 0 V
  - Wire orange (7) ON: Actuator turns counter-clockwise
  - Wire orange (7) OFF: Actuator turns clockwise

GSD126.1A
- Power supply AC 230 V wires brown (3), blue (4)
- Positioning signal AC 230 V
  - Wire white (7) ON: Actuator turns counter-clockwise
  - Wire white (7) OFF: Actuator turns clockwise

Internal Diagrams

Wiring diagrams
## Cable labeling

<table>
<thead>
<tr>
<th>Connection</th>
<th>Code</th>
<th>Cable No.</th>
<th>Cable Color</th>
<th>Abbr.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSD121.1A</td>
<td>G</td>
<td>1</td>
<td>red</td>
<td>RD</td>
<td>System potential AC/DC 24 V</td>
</tr>
<tr>
<td>GSD126.1A</td>
<td>G0</td>
<td>2</td>
<td>black</td>
<td>BK</td>
<td>System neutral</td>
</tr>
<tr>
<td>AC/DC 24 V</td>
<td>Y</td>
<td>7</td>
<td>orange</td>
<td>OG</td>
<td>Positioning signal counter-clockwise AC/DC 0 V</td>
</tr>
<tr>
<td>GSD321.1A</td>
<td>L</td>
<td>3</td>
<td>brown</td>
<td>BN</td>
<td>Phase AC 230 V</td>
</tr>
<tr>
<td>GSD326.1A</td>
<td>N</td>
<td>4</td>
<td>blue</td>
<td>BU</td>
<td>Neutral conductor</td>
</tr>
<tr>
<td>AC 230 V</td>
<td>Y</td>
<td>7</td>
<td>white</td>
<td>WH</td>
<td>Positioning signal counter-clockwise AC 230 V</td>
</tr>
<tr>
<td>Auxiliary switch</td>
<td>Q11</td>
<td>S1</td>
<td>gray/red</td>
<td>GYRD</td>
<td>Switch A input</td>
</tr>
<tr>
<td></td>
<td>Q12</td>
<td>S2</td>
<td>gray/blue</td>
<td>GYBU</td>
<td>Switch A NC contact</td>
</tr>
<tr>
<td></td>
<td>Q14</td>
<td>S3</td>
<td>gray/pink</td>
<td>GYPK</td>
<td>Switch A NO contact</td>
</tr>
<tr>
<td></td>
<td>Q21</td>
<td>S4</td>
<td>black/red</td>
<td>BKRD</td>
<td>Switch B input</td>
</tr>
<tr>
<td></td>
<td>Q22</td>
<td>S5</td>
<td>black/blue</td>
<td>BKBU</td>
<td>Switch B NC contact</td>
</tr>
<tr>
<td></td>
<td>Q24</td>
<td>S6</td>
<td>black/pink</td>
<td>BKPK</td>
<td>Switch B NO contact</td>
</tr>
</tbody>
</table>

## Dimensions

![Dimensions Diagram](image_url)