2. SM-4
Product Information
Damper actuators
The complete range of damper actuators for general use in HVAC systems

<table>
<thead>
<tr>
<th>Type</th>
<th>LM</th>
<th>NM</th>
<th>SM</th>
<th>AM</th>
<th>GM</th>
<th>LF</th>
<th>AF(R)</th>
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</thead>
<tbody>
<tr>
<td>Torque</td>
<td>4 Nm</td>
<td>8 Nm</td>
<td>15 Nm</td>
<td>18 Nm</td>
<td>30 Nm</td>
<td>4 Nm</td>
<td>15 Nm</td>
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<tr>
<td>Spring return function</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>coil</td>
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<tr>
<td>For dampers up to approx.</td>
<td>0.8 m²</td>
<td>1.5 m²</td>
<td>3 m²</td>
<td>3.6 m²</td>
<td>6 m²</td>
<td>0.8 m²</td>
<td>3 m²</td>
</tr>
</tbody>
</table>

For more information, please contact your Belimo Representative or order any brochures you need by fax.

Fax to: BELIMO (address overleaf)

Please send us product brochures on the following damper actuators:
- LM...
- NM...
- AM...
- GM...
- LF...
- AF...
- AFR...
- Electrical accessories

Please also send information on:
- Motorized fire and smoke dampers
- Variable air-volume control (VAV-Control)
- Rotary-motion actuators and valves
- Linear-motion actuators and valves

☐ Please call us back

Sender

Company: 

Name: 

Address: 

Post Code: Country: 

Tel.: Fax: 

E-Mail: Date: 

03/6905
## Selection table

<table>
<thead>
<tr>
<th>Torque</th>
<th>15 Nm</th>
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<tbody>
<tr>
<td>Nominal voltage</td>
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</tr>
<tr>
<td>AC 24 V</td>
<td>✔</td>
</tr>
<tr>
<td>DC 24 V</td>
<td>✔</td>
</tr>
<tr>
<td>AC 230 V</td>
<td>✔</td>
</tr>
<tr>
<td>Running time</td>
<td></td>
</tr>
<tr>
<td>≈ 80 s</td>
<td>✔</td>
</tr>
<tr>
<td>80...150 s</td>
<td>✔</td>
</tr>
<tr>
<td>90...150 s</td>
<td>✔</td>
</tr>
<tr>
<td>100...200 s</td>
<td>✔</td>
</tr>
<tr>
<td>Control</td>
<td>Open/Close</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Modulating</td>
<td>DC 0...10 V or 0...20 V phasecut</td>
</tr>
<tr>
<td>Control</td>
<td>L&amp;G Polygyr DC 0...10 V</td>
</tr>
<tr>
<td>Potentiometer</td>
<td>135...140 Ω</td>
</tr>
<tr>
<td>Positioner</td>
<td>Belimo SGA or SGF</td>
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<tr>
<td>Direction of rotation</td>
<td>reversible (right/left)</td>
</tr>
<tr>
<td>Manual operation by pushbutton</td>
<td>✔</td>
</tr>
<tr>
<td>Continuous position feedback</td>
<td>✔</td>
</tr>
<tr>
<td>Adjustable electrical working range</td>
<td>✔</td>
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</tbody>
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### Damper actuators, Open/Close
- SM24 4
- SM220, SM240 5
- SM230 6

### Damper actuators, modulating
- SM24-SR 7
- Control/monitoring functions SM24-SR 8
- SM24-SRP 9
- SM24-SR90 10
- SM24-SRS 11
- SM220-SR 12

### Electrical accessories
- S1, S2 Auxiliary switches 13
- SZS Mid-position switch 14
- P... Feedback potentiometer 15

### Mechanical accessories
- General mounting accessories 16
- Damper linkage kit 17
- Limit stop 17

### Mounting instructions 18

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**Note**

**Using BELIMO damper actuators**
The actuators listed in this catalogue are intended for the operation of air dampers in HVAC systems.

**Torque requirements**
When calculating the torque required to operate dampers, it is essential to take into account all the data supplied by the damper manufacturer concerning cross sectional area, design, mounting and air flow conditions.
SM24 Damper actuator 15 Nm

Dampers up to approx. 3 m²
Open/Close actuator (AC/DC 24 V)
2-wire control

Improved functional safety
The damper actuator has no limit switches and is overload-proof. It stops automatically when it reaches the damper or actuator end stop.

Easy functional check
A functional check of damper operation is simplicity itself: the gearing can be disengaged by simply pressing a pushbutton on top of the case. While the pushbutton remains depressed, the damper can be operated by hand.

Simple installation
The damper actuator is fitted with a universal spindle clamp for quick and easy mounting directly on the damper spindle. The actuator is supplied with an anti-rotation strap for fixing it in position.

Electrical accessories
S1, S2 Auxiliary switches, page 13
SZS Mid-position switch, page 14
P... Feedback potentiometer, page 15

Mechanical accessories
ZG-SM2 Damper linkage kit, page 17
ZDB Limit stop, page 17

Mounting instructions, page 18

Important
Read the notes about the use and torque requirements of the damper actuators on page 3.

Technical data SM24

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>Nominal voltage</td>
<td>AC 24 V, 50/60 Hz, DC 24 V</td>
</tr>
<tr>
<td>Nominal voltage range</td>
<td>AC 19.2...28.8 V, DC 21.6...26.4 V</td>
</tr>
<tr>
<td>For wire sizing</td>
<td>4 VA</td>
</tr>
<tr>
<td>Power consumption</td>
<td>1.8 W</td>
</tr>
<tr>
<td>Connecting cable</td>
<td>0.9 m, 3 × 0.75 mm²</td>
</tr>
<tr>
<td>Direction of rotation</td>
<td>reversible with switch A/B</td>
</tr>
<tr>
<td>Torque at rated voltage</td>
<td>min. 15 Nm</td>
</tr>
<tr>
<td>Angle of rotation</td>
<td>mechanically limited to 95°</td>
</tr>
<tr>
<td>Running time</td>
<td>90...150 s (0...15 Nm)</td>
</tr>
<tr>
<td>Sound power level</td>
<td>max. 45 dB (A)</td>
</tr>
<tr>
<td>Position indication</td>
<td>0...10 (0 = stop ) and reversible indicator</td>
</tr>
<tr>
<td>Protection class</td>
<td>(safety extra-low voltage)</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 54 (bottom cable entry)</td>
</tr>
<tr>
<td>Ambient temp. range</td>
<td>−30...+50 °C</td>
</tr>
<tr>
<td>Non-operating temp.</td>
<td>−40...+80 °C</td>
</tr>
<tr>
<td>Humidity test</td>
<td>to EN 60335-1</td>
</tr>
<tr>
<td>EMC</td>
<td>CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC</td>
</tr>
<tr>
<td>Maintenance</td>
<td>maintenance free</td>
</tr>
<tr>
<td>Weight</td>
<td>1400 g</td>
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</tbody>
</table>

Dimensions
SM220, SM240 Damper actuators 15 Nm

Dampers up to approx. 3 m²

Open/Close actuator (AC 230 V)

2-wire control

Improved functional safety
The damper actuator has no limit switches and is overload-proof. It stops automatically when it reaches the damper or actuator end stop.

Easy functional check
A functional check of damper operation is simplicity itself: the gearing can be disengaged by simply pressing a pushbutton on top of the case. While the pushbutton remains depressed, the damper can be operated by hand.

Simple installation
The damper actuator is fitted with a universal spindle clamp for quick and easy mounting directly on the damper spindle. The actuator is supplied with an anti-rotation strap for fixing it in position.

Electrical accessories
S1, S2  Auxiliary switches, page 13
SZS  Mid-position switch, page 14
P...  Feedback potentiometer, page 15

Mechanical accessories
ZG-SM2  Damper linkage kit, page 17
ZDB  Limit stop, page 17

Mounting instructions, page 18

Important
Read the notes about the use and torque requirements of the damper actuators on page 3.

Technical data

<table>
<thead>
<tr>
<th>SM220, SM240</th>
<th>Nominal voltage</th>
<th>AC 230 V, 50/60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage range</td>
<td>AC 198...264 V</td>
<td></td>
</tr>
<tr>
<td>For wire sizing</td>
<td>13 VA @ 50 Hz, 14 VA @ 60 Hz</td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>13 W @ 50 Hz, 14 W @ 60 Hz</td>
<td></td>
</tr>
<tr>
<td>Connecting cable</td>
<td>0.9 m, 4 × 0.75 mm²</td>
<td></td>
</tr>
<tr>
<td>Direction of rotation</td>
<td>reversible with switch A/B</td>
<td></td>
</tr>
<tr>
<td>Torque at rated voltage</td>
<td>min. 15 Nm @ 50 Hz, min. 10 Nm @ 60 Hz</td>
<td></td>
</tr>
<tr>
<td>Angle of rotation</td>
<td>mechanically limited to 95°</td>
<td></td>
</tr>
<tr>
<td>Running time</td>
<td>≈ 80 s</td>
<td></td>
</tr>
<tr>
<td>Sound power level</td>
<td>max. 45 dB (A)</td>
<td></td>
</tr>
<tr>
<td>Position indication</td>
<td>0...10 (0 = stop and reversible indicator)</td>
<td></td>
</tr>
<tr>
<td>Protection class</td>
<td>I (with PE conductor)</td>
<td></td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 54 (bottom cable entry)</td>
<td></td>
</tr>
<tr>
<td>Ambient temp. range</td>
<td>−30... +50 °C</td>
<td></td>
</tr>
<tr>
<td>Non-operating temp.</td>
<td>−40... +80 °C</td>
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<tr>
<td>Humidity test</td>
<td>to EN 60335-1</td>
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<td>EMC</td>
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<td>Maintenance</td>
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<tr>
<td>Weight</td>
<td>1600 g</td>
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</table>

Dimensions
SM230 Damper actuator 15 Nm

Dampers up to approx. 3 m²
Open/Close actuator (AC 230 V)
Control by single-pole contact (single-wire control)

Improved functional safety
The damper actuator has no limit switches and is overload-proof. It stops automatically when it reaches the damper or actuator end stop.

Easy functional check
A functional check of damper operation is simplicity itself: the gearing can be disengaged by simply pressing a pushbutton on top of the case. While the pushbutton remains depressed, the damper can be operated by hand.

Simple installation
The damper actuator is fitted with a universal spindle clamp for quick and easy mounting directly on the damper spindle. The actuator is supplied with an anti-rotation strap for fixing it in position.

Electrical accessories
S1, S2 Auxiliary switches, page 13
P... Feedback potentiometer, page 15

Mechanical accessories
ZG-SM2 Damper linkage kit, page 17
ZDB Limit stop, page 17

Mounting instructions, page 18

Important
Read the notes about the use and torque requirements of the damper actuators on page 3.

Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>AC 230 V 50/60 Hz</td>
</tr>
<tr>
<td>Nominal voltage range</td>
<td>AC 198...264 V</td>
</tr>
<tr>
<td>For wire sizing</td>
<td>17 VA @ 50 Hz, 20 VA @ 60 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>1.6 W @ 50 Hz, 2 W @ 60 Hz</td>
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<tr>
<td>Connecting cable</td>
<td>0.9 m long, 4×0.75 mm²</td>
</tr>
<tr>
<td>Direction of rotation</td>
<td>reversible with switch A/B</td>
</tr>
<tr>
<td>Torque</td>
<td>min. 15 Nm (at rated voltage)</td>
</tr>
<tr>
<td>Angle of rotation</td>
<td>mechanically limited to 95°</td>
</tr>
<tr>
<td>Running time</td>
<td>80...150 s (0...15 Nm)</td>
</tr>
<tr>
<td>Sound power level</td>
<td>max. 45 dB (A)</td>
</tr>
<tr>
<td>Position indication</td>
<td>0...10 (0 = stop ) and reversible indicator</td>
</tr>
<tr>
<td>Protection class</td>
<td>I (with PE conductor)</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 54 (bottom cable entry)</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>−30...+50 °C</td>
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<tr>
<td>Non-operating temperature</td>
<td>−40...+80 °C</td>
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<tr>
<td>Humidity test</td>
<td>to EN 60335-1</td>
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<td>Maintenance</td>
<td>maintenance free</td>
</tr>
<tr>
<td>Weight</td>
<td>1600 g</td>
</tr>
</tbody>
</table>

Dimensions

Parallel connection of several actuators with 1-wire control is possible. Power consumption must be observed.
SM24-SR Damper actuator 15 Nm

**Wiring diagram**

- AC 24 V
- DC 24 V
- Control signal Y1 DC 0...10 V @ input resistance 100 kΩ (0.1 mA)
- Control signal Y2 0...20 V phasecut @ input resistance 8 kΩ (50 mW)
- Measuring voltage U DC 2...10 V @ max. 0.5 mA (for 0...100% angle of rotation)

**Technical data**

- **Nominal voltage**: AC 24 V / 50/60 Hz, DC 24 V
- **Nominal voltage range**: AC 19.2...28.8 V, DC 21.6...28.8 V
- **For wire sizing**: 5 VA
- **Power consumption**: 3 W
- **Connecting cable**: 0.9 m long, 5x0.75 mm²
- **Control signal Y1**: DC 0...10 V @ input resistance 100 kΩ (0.1 mA)
- **Control signal Y2**: 0...20 V phasecut @ input resistance 8 kΩ (50 mW)
- **Operating range**: DC 2...10 V (at control signal Y1)
- **Measuring voltage U**: DC 2...10 V @ max. 0.5 mA (for 0...100% angle of rotation)

- **Synchronisation tolerance**: ± 5%
- **Direction of rotation**: reversible with switch A/B
- **Torque**: min. 15 Nm (at rated voltage)
- **Angle of rotation**: mechanically limited to 95°
- **Running time**: 100...200 s (0...15 Nm)
- **Sound power level**: max. 45 dB (A)
- **Position indication**: 0...10 (0 = stop) and reversible indicator
- **Protection class**: IP 54 (bottom cable entry)

**Dimensions**

- **Ambient temperature range**: –30...+50°C
- **Non-operating temperature**: –40...+80°C
- **Humidity test**: to EN 60335-1
- **EMC**: CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC
- **Maintenance**: maintenance free
- **Weight**: 1460 g

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**Dampers up to approx. 3 m²**

**Modulating damper actuator (AC/DC 24 V)**

- **Control DC 0...10 V or 0...20 V phasecut**
- **Position feedback DC 2...10 V**

**Versatility of control**

Combining two different methods of control in a single damper actuator ensures greater flexibility at the planning stage.

**Improved functional safety**

The damper actuator has no limit switches and is overload-proof. It stops automatically when it reaches the damper or actuator end stop.

**Easy functional check**

A functional check of damper operation is simplicity itself: the gearing can be disengaged by simply pressing a pushbutton on top of the case. While the pushbutton remains depressed, the damper can be operated by hand.

**Simple installation**

The damper actuator is fitted with a universal spindle clamp for quick and easy mounting directly on the damper spindle. The actuator is supplied with an anti-rotation strap for fixing it in position.

**Electrical accessories**

- S1, S2 Auxiliary switches, page 13
- P... Feedback potentiometer, page 15
- *SG...24 Positioners
- *ZAD24 Digital position indicator

**Mechanical accessories**

- ZG-SM2 Damper linkage kit, page 17
- ZDB Limit stop, page 17
- Control and monitoring functions, page 8
- Mounting instructions, page 18

**Important**

Read the notes about the use and torque requirements of the damper actuators on page 3.
Function monitoring

Procedure:
- AC 24 V at terminals 1 and 2.
- Disconnect terminal 3 and/or 4:
  - For direction of rotation "A": actuator runs
  - For direction of rotation "B": actuator runs
- link terminals 2 and 3 or 2 and 4:
  - actuator runs in the opposite direction

Remote control 0...100%

Minimum position

Override control

Position indication and/or master-slave control (depending on position)
SM24-SRP Damper actuator 15 Nm

Dampers up to approx. 3 m²

Modulating damper actuator (AC/DC 24 V)

Suitable for L & G Polygyr control DC 0…10 V

Position feedback DC 0.5…9.5 V

Versatility of control
Control is effected by a controller L & G Polygyr DC 0…10 V, or a positioner 0…1000 Ω.

Improved functional safety
The damper actuator has no limit switches and is overload-proof. It stops automatically when it reaches the damper or actuator end stop.

Easy functional check
A functional check of damper operation is simplicity itself: the gearing can be disengaged by simply pressing a pushbutton on top of the case. While the pushbutton remains depressed, the damper can be operated by hand.

Simple installation
The damper actuator is fitted with a universal spindle clamp for quick and easy mounting directly on the damper spindle. The actuator is supplied with an anti-rotation strap for fixing it in position.

Electrical accessories* (see Doc. 2. Z-…)
S1, S2 Auxiliary switches, page 13
P… Feedback potentiometer, page 15
*ZAD24 Digital position indicator

Mechanical accessories
ZG-SM2 Damper linkage kit, page 17
ZDB Limit stop, page 17

Mounting instructions, page 18

Important
Read the notes about the use and torque requirements of the damper actuators on page 3.

Technical data SM24-SRP

Nominal voltage AC 24 V  50/60 Hz, DC 24 V
Nominal voltage range AC 19.2…28.8 V, DC 21.6…28.8 V
For wire sizing 5 VA
Power consumption 3 W
Connecting cable 0.9 m long, 6 × 0.75 mm²
Control signal Y DC 0…10 V  @ from L & G Polygyr
Input resistance 100 kΩ (0.1 mA)
Operating range DC 0.5…9.5 V
Positioning signal R 0…1 kΩ from potentiom. positioner (bridge R/M removed)
Measuring voltage U DC 0.5…9.5 V @ max. 0.5 mA
Synchronisation tolerance ± 5%
Direction of rotation reversible with switch A/B
(at Y = 0 V) at switch position A resp. B
Torque min. 15 Nm (at rated voltage)
Angle of rotation mechanically limited to 95°
Running time 100…200 s (0…15 Nm)
Sound power level max. 45 dB (A)
Position indication 0…10 (0 = stop ( ) ) and reversible indicator ( )
Protection class (safety low voltage)
Degree of protection IP 54 (bottom cable entry)
Ambient temperature range – 30…+ 50°C
Non-operating temperature –40…+ 80°C
Humidity test to EN 60335-1
EMC CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC
Maintenance maintenance free
Weight 1460 g

Dimensions

[Dimensions diagram]

Wiring diagram

[Pin diagram]
SM24-SR90 Damper actuator 15 Nm

Dampers up to approx. 3 m²
Modulating damper actuator (AC/DC 24 V)
Suitable for 135...140 Ω potentiometric control

Versatility of control
Control is effected by a controller or a positioner with a 135...140 Ω potentiometer.

Improved functional safety
The damper actuator has no limit switches and is overload-proof. It stops automatically when it reaches the damper or motor end stop.

Easy functional check
A functional check of damper operation is simplicity itself: the gearing can be disengaged by simply pressing a pushbutton on top of the case. While the pushbutton remains depressed, the damper can be operated by hand.

Simple installation
The damper actuator is fitted with a universal spindle clamp for quick and easy mounting directly on the damper spindle. The actuator is supplied with an anti-rotation strap for fixing it in position.

Electrical accessories
S1, S2 Auxiliary switches, page 13
P... Feedback potentiometer, page 15

Mechanical accessories
ZG-SM2 Damper linkage kit, page 17
ZDB Limit stop, page 17

Mounting instructions, page 18

Important
Read the notes about the use and torque requirements of the damper actuators on page 3.

Technical data SM24-SR90
Nominal voltage AC 24 V
Nominal voltage range AC 19.2...28.8 V, DC 21.6...28.8 V
For wire sizing 6 VA
Power consumption 3.2 W
Connecting cable 0.9 m long, 5×0.75 mm²
Control signal Y Positioner
Synchronisation tolerance ± 5%
Direction of rotation reversible with switch A/B
Torque min. 15 Nm (at rated voltage)
Angle of rotation mechanically limited to 95°
Running time 100...200 s (0...15 Nm)
Sound power level max. 45 dB (A)
Position indication 0...10 (0 = stop •) and reversible indicator •
Protection class (safety low voltage)
Degree of protection IP 54 (bottom cable entry)
Ambient temperature range - 30...+ 50 °C
Non-operating temperature - 40...+ 80 °C
Humidity test to EN 60335-1
EMC CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC
Maintenance maintenance free
Weight 1600 g

Dimensions
Dampers up to approx. 3 m²

Modulating damper actuator (AC 24 V)

Control DC 0...10 V

Adjustable working range

Improved functional safety
The damper actuator has no limit switches and is overload-proof. It stops automatically when it reaches the damper or motor end stop.

Easy functional check
A functional check of damper operation is simplicity itself: the gearing can be disengaged by simply pressing a pushbutton on top of the case. While the pushbutton remains depressed, the damper can be operated by hand.

Simple installation
The damper actuator is fitted with a universal spindle clamp for quick and easy mounting directly on the damper spindle. The actuator is supplied with an anti-rotation strap for fixing it in position.

Electrical accessories
S1, S2 Auxiliary switches, page 13
P... Feedback potentiometer, page 15

Mechanical accessories
ZG-SM2 Damper linkage kit, page 17
ZDB Limit stop, page 17

Mounting instructions, page 18

Important
Read the notes about the use and torque requirements of the damper actuators on page 3.

Technical data

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<thead>
<tr>
<th>SM24-SRS</th>
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</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>AC 24 V 50/60 Hz</td>
</tr>
<tr>
<td>Nominal voltage range</td>
<td>AC 19.2...28.8 V</td>
</tr>
<tr>
<td>For wire sizing</td>
<td>5 VA</td>
</tr>
<tr>
<td>Power consumption</td>
<td>3 W</td>
</tr>
<tr>
<td>Connecting cable</td>
<td>0.9 m long, 3×0.75 mm²</td>
</tr>
<tr>
<td>Control signal</td>
<td>DC 0...10 V @ input resistance 100 kΩ (0.1 mA)</td>
</tr>
<tr>
<td>Starting point U₀</td>
<td>adjustable DC 2.0...8.4 V (scale 0...80%)</td>
</tr>
<tr>
<td>Span ΔU</td>
<td>adjustable DC 1.6...8.0 V (scale 20...100%)</td>
</tr>
<tr>
<td>Factory setting</td>
<td>U₀ = DC 2.0 V, ΔU = DC 8.0 V</td>
</tr>
<tr>
<td>Synchronisation tolerance</td>
<td>± 5%</td>
</tr>
<tr>
<td>Direction of rotation</td>
<td>reversible with switch A/B</td>
</tr>
<tr>
<td>(at Y = 0 V)</td>
<td>at switch position A resp. B</td>
</tr>
<tr>
<td>Torque</td>
<td>min. 15 Nm (at rated voltage)</td>
</tr>
<tr>
<td>Angle of rotation</td>
<td>mechanically limited to 95°</td>
</tr>
<tr>
<td>Running time</td>
<td>100...200 s (0...15 Nm)</td>
</tr>
<tr>
<td>Sound power level</td>
<td>max. 45 dB (A)</td>
</tr>
<tr>
<td>Position indication</td>
<td>0...10 (0 = stop ） and reversible indicator ＃</td>
</tr>
<tr>
<td>Protection class</td>
<td>(safety low voltage)</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 54 (bottom cable entry)</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-30... +50 °C</td>
</tr>
<tr>
<td>Non-operating temperature</td>
<td>-40... +80 °C</td>
</tr>
<tr>
<td>Humidity test</td>
<td>to EN 60335-1</td>
</tr>
<tr>
<td>EMC</td>
<td>CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC</td>
</tr>
<tr>
<td>Maintenance</td>
<td>maintenance free</td>
</tr>
<tr>
<td>Weight</td>
<td>1400 g</td>
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</tbody>
</table>
SM220-SR Damper actuator 15 Nm

Dampers up to approx. 3 m²

Modulating damper actuator (AC 230 V)

Control by BELIMO-positioner SGA or SGF

Improved functional safety
The damper actuator has no limit switches and is overload-proof. It stops automatically when it reaches the damper or actuator end stop.

Easy functional check
A functional check of damper operation is simplicity itself: the gearing can be disengaged by simply pressing a pushbutton on top of the case. While the pushbutton remains depressed, the damper can be operated by hand.

Simple installation
The damper actuator is fitted with a universal spindle clamp for quick and easy mounting directly on the damper spindle. The actuator is supplied with an anti-rotation strap for fixing it in position.

Electrical accessories* (see Doc. 2, Z-)
S1, S2 Auxiliary switches, page 13
P... Feedback potentiometer, page 15
*SFG Positioner
*SGA Positioner
*ZAD220 Digital position indicator

Mechanical accessories
ZG-SM2 Damper linkage kit, page 17
ZDB Limit stop, page 17

Mounting instructions, page 18

Important
Read the notes about the use and torque requirements of the damper actuators on page 3.

Dimensions
S1, S2 Auxiliary switches

Compatible with SM... and GM... damper actuators
(GM...: see documentation 2.GM...)

Application
The auxiliary switch units S1 and S2 are intended for the signalling of end positions or for performing switching functions at any angular position.

Easy switch setting
A spindle provides a positive drive to the switch mechanism from the rotary motion of the damper actuator. The switching points of the microswitches can be set anywhere in the range from 0 to 10 by means of a dial and are then locked with a screw. The switch position can be read off at any time.

Simple installation
The auxiliary switch units S1 and S2 are suitable for direct mounting on Type SM... damper actuators or on Type P... feedback potentiometers. (The stack-mounting of two auxiliary switch units or of one unit and a Type SZS mid-position switch unit is not possible.)

Four extra-long screws are supplied for mounting the unit on Type SM...SR... and P... equipment.

Switch setting
1. Turn the damper actuator by hand to position 0.
2. Loosen the locking screw in the centre of the setting dial.
3. Rotate the dial until the arrow is pointing at the required switching point on the scale (0...10).
4. Re-tighten the locking screw.
5. Check the switching points by manual operation of the actuator; the setting dial turns at the same time. The microswitches operate whenever the arrow passes position 0 or 10 (white lines). The symbols indicate the respective switch positions.

Note
The reversible indicator plate and the pointer must be removed when using an auxiliary switch unit S1, S2.

Technical data

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of switches</td>
<td>1×SPDT</td>
<td>2×SPDT</td>
</tr>
<tr>
<td>Switching capacity</td>
<td>6 A (2.5 A) AC 250 V</td>
<td></td>
</tr>
<tr>
<td>Connecting cable</td>
<td>0.9 m, 3×0.75 mm²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.9 m, 6×0.75 mm²</td>
<td></td>
</tr>
<tr>
<td>Switching point</td>
<td>Adjustable over full actuator rotation 0...10. Pre-setting by scale possible, settings lockable.</td>
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</tr>
<tr>
<td>Protection class</td>
<td>II (all-insulated)</td>
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<td>Degree of protection</td>
<td>IP 54</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>−30... +50 °C</td>
<td></td>
</tr>
<tr>
<td>Non-operating temperature</td>
<td>−40... +80 °C</td>
<td></td>
</tr>
<tr>
<td>Humidity test</td>
<td>to EN 60335-1</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>150 g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>210 g</td>
<td></td>
</tr>
</tbody>
</table>
**SZS Mid-position switch**

**Compatible with SM24, SM220, SM240 and GM24, GM220, GM240 damper actuators**

*(GM... see documentation 2.GM-...)*

**Application**
The SZS mid-position switch unit allows any required intermediate position to be preset.

**Easy switch setting**
A spindle provides a positive drive to the switch mechanism from the rotary motion of the damper actuator. The switching points of the microswitches can be set anywhere in the range from 0 to 10 by means of a dial and are then locked with a screw.

**Remote control**
As an alternative to using an SZS unit, it is better for many applications to be able to set the intermediate positions remotely, e.g. from the switchgear cubicle, instead of at the damper actuator itself. This arrangement requires the use of a positioner and a modulating damper actuator. Another advantage is that it allows several actuators to be connected in parallel.

**Simple installation**
The SZS mid-position switch unit is suitable for direct mounting on Type SM... damper actuators or on Type P... feedback potentiometers. (The stack-mounting of two SZS units or of one SZS unit and a Type S 1 or S 2 auxiliary switch unit is **not** possible.)

**Note**
The reversible indicator plate and the pointer must be removed when using a mid-position switch unit SZS.

---

**Technical data**

<table>
<thead>
<tr>
<th>SZS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connecting cable</strong></td>
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<tr>
<td><strong>Switching point</strong></td>
</tr>
<tr>
<td><strong>Setting accuracy</strong></td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
</tr>
<tr>
<td><strong>Ambient temperature range</strong></td>
</tr>
<tr>
<td><strong>Non-operating temperature</strong></td>
</tr>
<tr>
<td><strong>Humidity test</strong></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
</tr>
</tbody>
</table>
The feedback potentiometer P... is used for the modulating control of dampers in conjunction with proportional action controllers with rigid feedback. It can also be used in conjunction with normal commercially-available systems for damper positions indication or as a positioner for actuators operating in parallel.

No adjustment needed
A spindle transmits the rotary motion of the actuator to the potentiometer. It is a positive drive and no adjustment is needed. If necessary, two feedback potentiometers can be mounted on top of each other.

Simple installation
The Type P... feedback potentiometer can be mounted directly on Type SM... damper actuators or on top of a second feedback potentiometer unit. A unit can also be stack-mounted with a Type S1 or S2 auxiliary switch unit or a Type SZS mid-position switch unit.

Four extra-long screws are supplied for mounting the unit on Type SM...-SR... and P... equipment.

Types Resistance data

<table>
<thead>
<tr>
<th>Types</th>
<th>Resistance data</th>
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</thead>
<tbody>
<tr>
<td>P 140</td>
<td>Feedback potentiometer 140 Ω</td>
</tr>
<tr>
<td>P 200</td>
<td>Feedback potentiometer 200 Ω</td>
</tr>
<tr>
<td>P 500</td>
<td>Feedback potentiometer 500 Ω</td>
</tr>
<tr>
<td>P 1000</td>
<td>Feedback potentiometer 1000 Ω</td>
</tr>
<tr>
<td>P 2000</td>
<td>Feedback potentiometer 2000 Ω</td>
</tr>
<tr>
<td>P 2800</td>
<td>Feedback potentiometer 2800 Ω</td>
</tr>
</tbody>
</table>

Technical data

<table>
<thead>
<tr>
<th>Resistance data</th>
<th>as above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>± 5%</td>
</tr>
<tr>
<td>Rating</td>
<td>1 W</td>
</tr>
<tr>
<td>Linearity</td>
<td>± 2%</td>
</tr>
<tr>
<td>Resolution</td>
<td>1% min.</td>
</tr>
<tr>
<td>Residual resistance</td>
<td>max. 5% on both sides</td>
</tr>
<tr>
<td>Connecting cable</td>
<td>0.9 m, 3×0.75 mm²</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 54</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-30°...+50°C</td>
</tr>
<tr>
<td>Non-operating temperature</td>
<td>-40°...+80°C</td>
</tr>
<tr>
<td>Humidity test</td>
<td>to EN 60335-1</td>
</tr>
<tr>
<td>Weight</td>
<td>150 g</td>
</tr>
</tbody>
</table>
General mounting accessories

**KG8** Ball joint
Zinc-plated steel; suitable for use with KH8 universal crank arms and round steel rod 8 mm diameter.

**KG10** Ball joint
Zinc-plated steel; suitable for use with KH8 and KH6 universal crank arms and round steel rod 10 mm diameter.

**KG8** Ball joint
Zinc-plated steel; suitable for use with KH8 universal crank arms and round steel rod 8 mm diameter.

**KG6** Ball joint
Zinc-plated steel; suitable for use with KH6 universal crank arms and round steel rod 8 mm diameter.

**AV10–18** Universal spindle extension
approx. 240 mm long; for damper spindles 10...18 mm diameter or 10...14 mm².

**KH8** Universal crank arm
Zinc-plated steel; suitable for damper spindles 10...18 mm diameter or 10...14 mm², slot width 8.2 mm

**KH6** Universal crank arm
as Type KH8, but slot width 6.2 mm.

**KH8, KH6**

**KG10, KG6**

**AV10–18**
Mounting accessories for SM...

Damper linkage kit ZG-SM2

**Application**
Damper linkage kit is employed when direct actuation of the damper is impossible and a linkage must be used.

**Kit specification**
1. Front mounting bracket
2. Rear mounting bracket
3. Crank arm
4. 2 ball joints KG8
   - 2 bolts M 6 x 16
   - 7 self-tapping screws

**Assembly**
- Screw the front 1 and rear 2 mounting brackets to the underside of the actuator baseplate
- Remove the V-bolt
- Bolt the crank arm 3 in position
- Mount the actuator in a suitable position on a secure base with 3 screws
- The 3-point fixing and the 10 mm clearance at the base ensure trouble-free mounting even when the mounting surface is irregular
- Adjust and tighten the damper linkage and ball joints

Universal crank arm: order separately, not included with the ZG-SM2 mounting accessory.

Limit stop ZDB

**Application**
Limit stop ZDB is used on damper actuators SM... when an angle of rotation of less than 90° needs to be limited mechanically but the damper does not have a fixed stop on its own. The limit can be set in 10° steps.

**Assembly**
- Remove the nuts from the V-bolt of the clamp
- Fit the limit stop and finger tighten the nuts
- Pull off the clamp, after first removing the circlip, turn it to the required angular position (the limit) and push it back on
- Replace the circlip
- Slip the actuator onto the damper spindle and assemble according to the instructions
Mounting instructions for damper spindles at least 45 mm long.

**Preparations**
- Place the actuator on the damper spindle
- Finger tighten the nuts on the V-bolt
- Bend the anti-rotation strap to fit, if necessary
- Fix the strap in position

**Mounting and adjustment**
- Move the damper to the closed position
- Disengage the gears by pressing the manual override pushbutton on the housing cover
- Turn the clamp to one division from the closed position and allow the gears to re-engage
- Align the actuator at 90° to the damper spindle
- Tighten the nuts on the V-bolt

Mounting instructions for damper spindles at least 20 mm long or when overlapping the damper frame.

**Mounting and adjustment**
- Disengage the gears by pressing the manual override pushbutton on the housing cover
- Turn the clamp to one division from the closed position and allow the gears to re-engage
- Remove the clip and take out the clamp
- Slip the clamp onto the damper spindle
- Move the damper to the closed position
- Fit the actuator onto the clamp
- Replace the clip
- Bend the anti-rotation strap to fit
- Fix the strap in position

**Notes on both methods of mounting**
- The universal spindle extension AV10–18 is available for use in special cases
- Select direction of rotation with switch A/B
- The indicator plate is reversible
Innovation, Quality and Consultancy: A partnership for motorizing HVAC actuators

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Standard actuators and spring-return actuators for air control dampers in HVAC systems.

Safety actuators for motorizing fire and smoke extraction dampers

VAV systems for individual room air control

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