

Rotary actuator fail-safe and extended functionalities in the IP66/67 protective housing for adjusting dampers in technical building installations

- Air damper size up to approx. 8 m<sup>2</sup>
- Torque motor 40 Nm
- Nominal voltage AC/DC 24 V
- Control Open/close
- Optimum weather protection for use outdoors (for use in ambient temperatures up to -40°C, there is a separate actuator available with built-in heater)



## Technical data

|                        |                                      |   |
|------------------------|--------------------------------------|---|
| <b>Electrical data</b> | Nominal voltage                      | AC/DC 24 V  |
|                        | Nominal voltage frequency            | 50/60 Hz  |
|                        | Nominal voltage range                | AC 19.2...28.8 V / DC 21.6...28.8 V   |
|                        | Power consumption in operation       | 11 W  |
|                        | Power consumption in rest position   | 3 W   |
|                        | Power consumption for wire sizing    | 21 VA   |
|                        | Connection supply / control          | Cable 1 m, 3x 0.75 mm <sup>2</sup> (halogen-free)   |
|                        | Parallel operation                   | Yes (note the performance data)   |
| <b>Functional data</b> | Torque motor                         | 40 Nm   |
|                        | Setting fail-safe position           | 0...100%, adjustable in increments of 10% (POP rotary knob on 0 corresponds to left end stop) |
|                        | Bridging time (PF)                   | 2 s   |
|                        | Direction of motion motor            | selectable with switch 0 (ccw rotation) / 1 (cw rotation)                                     |
|                        | Direction of motion fail-safe        | selectable with switch 0...100%   |
|                        | Manual override                      | with push-button (under protective housing)   |
|                        | Angle of rotation                    | Max. 95°  |
|                        | Angle of rotation note               | can be limited on both sides with adjustable mechanical end stops                             |
|                        | Running time motor                   | 150 s / 90°   |
|                        | Running time fail-safe               | 35 s / 90°  |
|                        | Sound power level, motor             | 52 dB(A)  |
|                        | Sound power level, fail-safe         | 61 dB(A)  |
|                        | Mechanical interface                 | Universal shaft clamp 14...26.7 mm  |
| Position indication    | Mechanical                           |   |
| <b>Safety data</b>     | Protection class IEC/EN              | III, Safety Extra-Low Voltage (SELV)  |
|                        | Power source UL                      | Class 2 Supply  |
|                        | Degree of protection IEC/EN          | IP66/67   |
|                        | Degree of protection NEMA/UL         | NEMA 4X   |
|                        | Enclosure                            | UL Enclosure Type 4X  |
|                        | EMC                                  | CE according to 2014/30/EU  |
| Certification IEC/EN   | IEC/EN 60730-1 and IEC/EN 60730-2-14 |   |

**Technical data**

|                    |  |   |
|--------------------|--|---|
| <b>Safety data</b> | UL Approval                            | cULus according to UL60730-1A, UL60730-2-14 and CAN/CSA E60730-1<br>The UL marking on the actuator depends on the production site, the device is UL-compliant in any case |
|                    | Type of action                         | Type 1.AA   |
|                    | Rated impulse voltage supply / control | 0.8 kV  |
|                    | Pollution degree                       | 4   |
|                    | Ambient humidity                       | Max. 100% RH  |
|                    | Ambient temperature                    | -30...50°C [-22...122°F]  |
|                    | Ambient temperature note               | -40...50°C for actuator with integrated heating   |
|                    | Storage temperature                    | -40...80°C [-40...176°F]  |
|                    | Servicing                              | maintenance-free  |
|                    | <b>Weight</b>                          | Weight  |
| <b>Terms</b>       | Abbreviations                          | POP = Power off position / fail-safe position<br>PF = Power fail delay time / bridging time   |

**Safety notes**


- This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.
- Junction boxes must at least correspond with enclosure IP degree of protection!
- The cover of the protective housing may be opened for adjustment and servicing. When it is closed afterwards, the housing must seal tight (see installation instructions).
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device installed in the interior.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section and the design, as well as the installation situation and the ventilation conditions must be observed.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- The device is not designed for applications where chemical influences (gases, fluids) are present or for utilisation in corrosive environments in general.
- The actuator may not be used in plenary applications (e.g. suspended ceilings or raised floors).
- The materials used may be subject to external influences (temperature, pressure, construction fastening, effect of chemical substances, etc.), which cannot be simulated in laboratory tests or field trials. In case of doubt, we definitely recommend that you carry out a test. This information does not imply any legal entitlement. Belimo will not be held liable and will provide no warranty.
- Flexible metallic cable conduits or threaded cable conduits of equal value are to be used for UL (NEMA) Type 4X applications.
- When used under high UV loads, e.g. extreme sunlight, the use of flexible metallic or equivalent cable conduits is recommended.

Product features

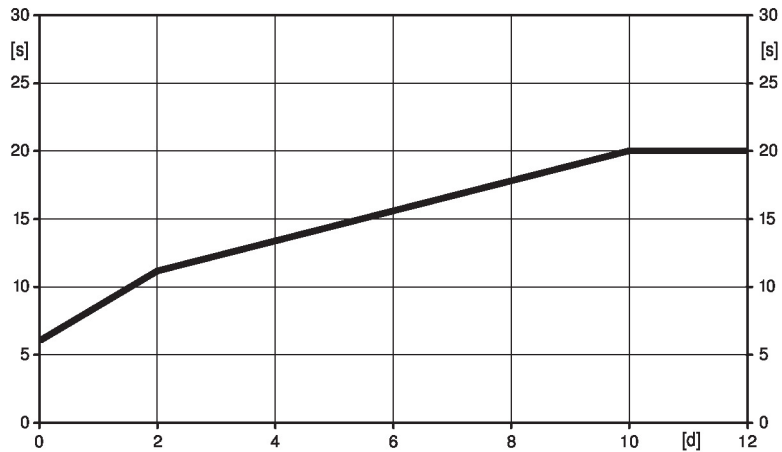
**Fields of application** The actuator is particularly suitable for utilisation in outdoor applications and is protected against the following weather conditions:

- UV radiation
- Rain / Snow
- Dirt / Dust
- Air humidity
- Alternating climate / frequent and severe temperature fluctuations (Recommendation: use the actuator with integrated factory-installed heating which can be ordered separately to prevent internal condensation)

**Operating mode** The actuator moves the damper to the desired operating position at the same time as the integrated capacitors are charged. Interrupting the supply voltage causes the damper to be rotated back into the fail-safe position by means of stored electrical energy.

**Pre-charging time (start up)** The capacitor actuators require a pre-charging time. This time is used for charging the capacitors up to a usable voltage level. This ensures that, in the event of a power failure, the actuator can move at any time from its current position into the preset fail-safe position. The duration of the pre-charging time depends mainly on how long the power was interrupted.

Typical pre-charging time



[d] = Power failure in days  
[s] = Pre-charging time in seconds

**Delivery condition (capacitors)** The actuator is completely discharged after delivery from the factory, which is why the actuator requires approximately 20 s pre-charging time before initial commissioning in order to bring the capacitors up to the required voltage level.

**Setting fail-safe position (POP)** The rotary knob fail-safe position can be used to adjust the desired fail-safe position. The setting range is always in reference to the maximum angle of rotation of the actuator. The rotary knob always refers to an angle-of-rotation range of 95° and does not take into account any retroactively adjusted end stops. In the event of a power failure, the actuator will move to the selected fail-safe position, taking into account the bridging time (PF) of 2 s set at the factory.

**Simple direct mounting** Simple direct mounting on the damper shaft with a universal shaft clamp, supplied with an anti-rotation device to prevent the actuator from rotating.

**Manual override** Manual control with push-button possible - temporary. The gear train is disengaged and the actuator decoupled for as long as the button is pressed. The housing cover must be removed for manual override.

**Product features**

- High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
- Home position** The shaft clamp of the actuator is set by default to 0°. After the supply voltage has been applied, the actuator moves into the position defined by the control signal.
- Setting direction of motion** When actuated, the direction of the rotation switch changes the running direction in normal operation. The direction of the rotation switch has no influence on the fail-safe position which has been set.

**Accessories**

| Electrical accessories | Description  | Type      |
|------------------------|--|-----------|
|                        | Auxiliary switch 2x SPDT add-on, grey                                      | S2A GR    |
|                        | Feedback potentiometer 140 Ω add-on  | P140A     |
|                        | Feedback potentiometer 1 kΩ add-on   | P1000A    |
|                        | Feedback potentiometer 10 kΩ add-on  | P10000A   |
|                        | Adapter for auxiliary switch and feedback potentiometer, Multipack 20 pcs. | Z-SPA     |
| Mechanical accessories | Description  | Type      |
|                        | Cable gland for cable diameter ø4...10 mm                                  | Z-KB-PG11 |
| Options ex works only  | Description  | Type      |
|                        | Heater, with adjustable thermostat   | HT24-MG   |
|                        | Heater, with mechanical humidistat   | HH24-MG   |

**Electrical installation**

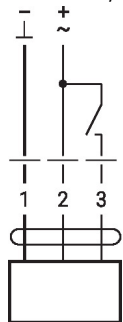

**Supply from isolating transformer.**  
**Parallel connection of other actuators possible. Observe the performance data.**

**Wire colours:**

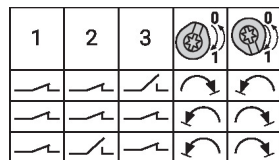
- 1 = black
- 2 = red
- 3 = white

**Wiring diagrams**

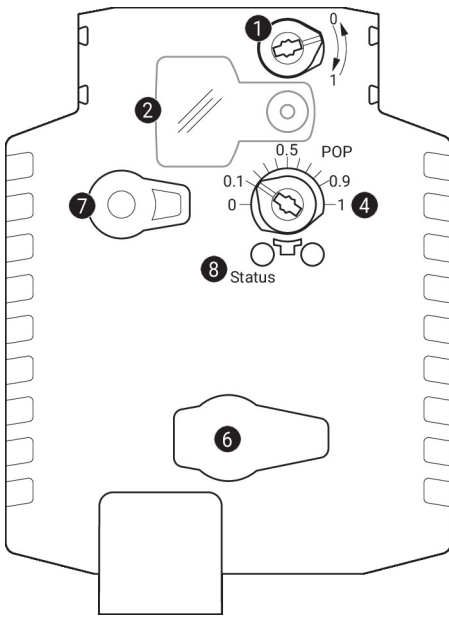
AC/DC 24 V, open/close



Auxiliary switch



Operating controls and indicators



**1** Direction of rotation switch

Switch over:                      Direction of rotation changes

**2** Cover, POP button

**3** POP button

**4** Scale for manual adjustment

**6** (no function)

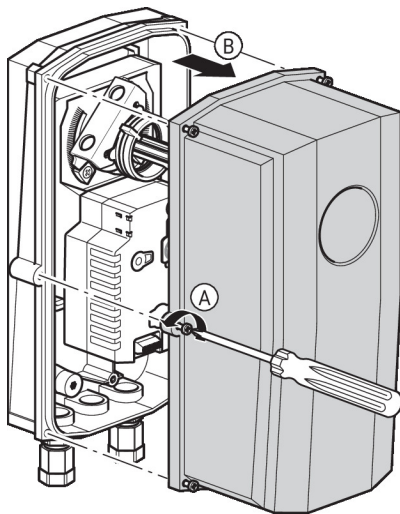
**7** Manual override button

Press button:      Gear train disengages, motor stops, manual override possible

Release button:    Gear train engages, standard mode

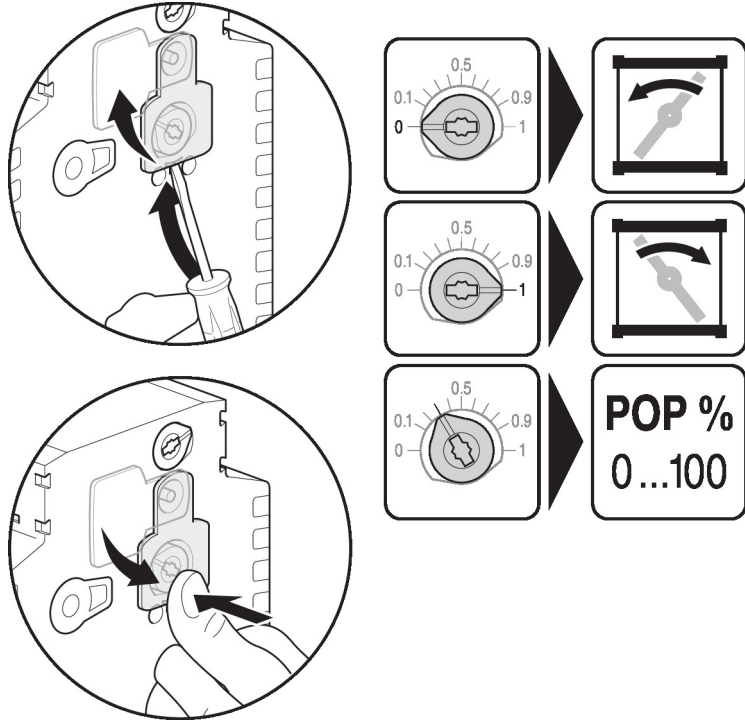
LED displays

| green <b>8</b> | Meaning / function   |
|----------------|--|
| On             | Operation OK   |
| Flashing       | POP function active  |
| Off            | - Not in operation<br>- Pre-charging time SuperCap<br>- Fault SuperCap |



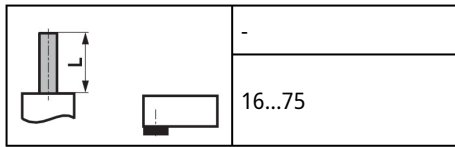
## Operating controls and indicators

## Setting emergency setting position (POP)



Dimensions

Spindle length



Clamping range damper shaft

