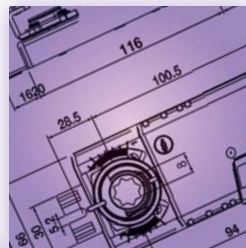


# Damper Actuators



## *Technical Databook*

Version 5.1



| Product naming                                                   |        |   |   |   |    |     |
|------------------------------------------------------------------|--------|---|---|---|----|-----|
|                                                                  | e.g.   | L | M | U | 24 | -SR |
|                                                                  |        |   |   |   |    |     |
| Torque                                                           |        |   |   |   |    |     |
| <u>General Damper Actuator</u>                                   |        |   |   |   |    |     |
| 40Nm                                                             | G      |   |   |   |    |     |
| 20Nm                                                             | S      |   |   |   |    |     |
| 10Nm                                                             | N      |   |   |   |    |     |
| 5Nm                                                              | L      |   |   |   |    |     |
| 2Nm                                                              | C      |   |   |   |    |     |
| <u>Mechanical Fail-Safe Damper Actuator</u>                      |        |   |   |   |    |     |
| 30Nm                                                             | E      |   |   |   |    |     |
| 20Nm                                                             | S      |   |   |   |    |     |
| 10Nm                                                             | N      |   |   |   |    |     |
| 4Nm                                                              | L      |   |   |   |    |     |
| 2.5Nm                                                            | T      |   |   |   |    |     |
| <u>Electronic Fail-Safe Damper Actuator</u>                      |        |   |   |   |    |     |
| 40Nm                                                             | G      |   |   |   |    |     |
| General Damper Actuator                                          | M      |   |   |   |    |     |
| Mechanical Fail-Safe Damper Actuator                             | F      |   |   |   |    |     |
| Electronic Fail-Safe Damper Actuator                             | K      |   |   |   |    |     |
|                                                                  |        |   |   |   |    |     |
| New Generation General Damper Actuator for Asia Pacific          |        |   |   |   |    |     |
|                                                                  |        |   |   |   |    |     |
| Power supply                                                     |        |   |   |   |    |     |
| AC/DC 24V                                                        | 24     |   |   |   |    |     |
| AC 100...240V (AC 230V for Mechanical Fail-Safe Damper Actuator) | 230    |   |   |   |    |     |
| Function                                                         |        |   |   |   |    |     |
| <u>General Damper Actuator</u>                                   |        |   |   |   |    |     |
| Open/Close, 3-point                                              | Blank  |   |   |   |    |     |
| Modulating DC (0)2...10V                                         | -SR    |   |   |   |    |     |
| Auxiliary switch                                                 | -S     |   |   |   |    |     |
| Form fit                                                         | -F     |   |   |   |    |     |
| Terminal connection                                              | -T     |   |   |   |    |     |
| <u>Mechanical Fail-Safe Damper Actuator</u>                      |        |   |   |   |    |     |
| Open/Close                                                       | Blank  |   |   |   |    |     |
| Modulating DC (0)2...10V                                         | -SR    |   |   |   |    |     |
| 3-point                                                          | -3     |   |   |   |    |     |
| Auxiliary switch                                                 | -S,-S2 |   |   |   |    |     |
| <u>Electronic Fail-Safe Damper Actuator</u>                      |        |   |   |   |    |     |
| 3-point                                                          | -MF    |   |   |   |    |     |

For customising types of damper actuators, please contact your nearest Belimo sales representative.


**Note:**
**Using Belimo Damper Actuators:**

- The actuators listed in this catalogue are intended for the operation of air dampers in HVAC systems.
- The damper actuator is not allowed to be used outside the specified field of application, especially in aircraft.
- The enclosure of the actuator equipment may only be opened by the manufacturer. It contains no components which the user can replace or repair.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

**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 condition.

|                                                                      |           |
|----------------------------------------------------------------------|-----------|
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|                                                                                                  | 2Nm                                                                        | 5Nm                             | 10Nm       | 20Nm         | 40Nm        |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------|------------|--------------|-------------|
| General Damper Actuator                                                                          | CMU..                                                                      | LMU..                           | NMU..      | SMU..        | GMU..       |
| Open/Close, 3-point<br>AC/DC 24V 50/60Hz                                                         | CMU24(-F8/-F10)(-T)                                                        | LMU24(-F/-T)                    | NMU24(-T)  | SMU24        | GMU24*      |
| Auxiliary switch built-in 1 SPDT                                                                 |                                                                            | LMU24-S                         | NMU24-S    | SMU24-S      |             |
| AC 100...240V 50/60Hz                                                                            | CMU230(-F8/-F10)                                                           | LMU230                          | NMU230     | SMU230       | GMU230*     |
| Auxiliary switch built-in 1 SPDT                                                                 |                                                                            | LMU230-S                        | NMU230-S   | SMU230-S     |             |
| Modulating<br>Control signal DC (0)2...10V, feedback DC 2...10V                                  |                                                                            |                                 |            |              |             |
| AC/DC 24V 50/60Hz                                                                                | CMU24-SR-R**                                                               | LMU24-SR                        | NMU24-SR   | SMU24-SR     | GMU24-SR    |
| AC 100...240V 50/60Hz                                                                            |                                                                            | LMU230SR                        | NMU230SR   | SMU230SR     |             |
| Running time                                                                                     | 75s                                                                        | 150s                            |            |              |             |
| Shaft diameter  | 6...12.7mm                                                                 | 6...20mm                        | 8...26.7mm | 10...20mm    | 12...25.2mm |
| Sound power level                                                                                | Max. 35dB(A)                                                               |                                 |            | Max. 45dB(A) |             |
| Manual override                                                                                  | Gear disengaging by magnet                                                 | Gear disengaging by push button |            |              |             |
| Electrical connection                                                                            | Cable 1m (-T: Terminal)                                                    |                                 |            |              |             |
| Direction of rotation                                                                            | Selected by switch                                                         |                                 |            |              |             |
| Angle of rotation                                                                                | Max. 95°, can be limited at both ends with mechanical adjustable end stops |                                 |            |              |             |
| Position indicator                                                                               | Mechanical, plug-on                                                        |                                 |            |              |             |
| Degree of protection                                                                             | IP54 (-T: IP20)                                                            |                                 |            |              |             |
| EMC                                                                                              | CE according to 89/336/EEC                                                 |                                 |            |              |             |
| LVD***                                                                                           | CE according to 73/23/EEC                                                  |                                 |            |              |             |
| Ambient temperature                                                                              | -30...+50°C                                                                |                                 |            |              |             |
| Non-operation temperature                                                                        | -40...+80°C                                                                |                                 |            |              |             |
| Humidity                                                                                         | 5...95% RH, non-condensing                                                 |                                 |            |              |             |

\* Only Open/Close, no 3-point.

\*\* CMU24-SR-R: Control signal (0)2V at the right side, and the left side is available on request.

\*\*\* For 230V models.

|                                                                 | 4Nm                                                                        | 8Nm           | 16Nm          |               |
|-----------------------------------------------------------------|----------------------------------------------------------------------------|---------------|---------------|---------------|
| <b>General Damper Actuator</b>                                  | <b>LMQU..</b>                                                              | <b>NMQU..</b> | <b>SMQU..</b> | <b>SMDU..</b> |
| Open/Close                                                      |                                                                            |               |               |               |
| AC 24V 50/60Hz, DC 24V                                          | LMQU24                                                                     | NMQU24        | SMQU24        |               |
| AC 100...240V 50/60Hz                                           |                                                                            |               |               | SMDU230       |
| Modulating<br>Control signal DC (0)2...10V, feedback DC 2...10V |                                                                            |               |               |               |
| AC 24V 50/60Hz, DC 24V                                          | LMQU24-SR                                                                  | NMQU24-SR     | SMQU24-SR     |               |
| Running time                                                    | 2.5s                                                                       | 4s            | 7s            | 20s           |
| Shaft diameter                                                  | 8...26.7mm                                                                 |               | 12...25.2mm   | 10...20mm     |
| Sound power level                                               | Max. 52dB(A)                                                               |               |               | Max. 55dB(A)  |
| Manual override                                                 | Disengaging the gearing latch by means of a push button, self-resetting    |               |               |               |
| Electrical connection                                           | Cable 1m                                                                   |               |               |               |
| Direction of rotation                                           | Selected by switch                                                         |               |               |               |
| Angle of rotation                                               | Max. 95°, can be limited at both ends with mechanical adjustable end stops |               |               |               |
| Position indicator                                              | Mechanical, plug-on                                                        |               |               |               |
| Degree of protection                                            | IP54                                                                       |               |               |               |
| EMC                                                             | CE according to 2004/108/EC                                                |               |               |               |
| LVD*                                                            | CE according to 2006/95/EC                                                 |               |               |               |
| Ambient temperature                                             | -30...+40°C (without restrictions); +40...+50°C (with restrictions)        |               |               |               |
| Non-operation temperature                                       | -40...+80°C                                                                |               |               |               |
| Humidity                                                        | 5...95% RH, non-condensing                                                 |               |               |               |

\* For 230V models.

|                                                                 | 2.5Nm                                                          | 4Nm                                                            |
|-----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|
| <b>Mechanical Fail-Safe Damper Actuator</b>                     | <b>TF..</b>                                                    | <b>LF..</b>                                                    |
| Open/Close                                                      |                                                                |                                                                |
| AC/DC 24V 50/60Hz                                               | TF24                                                           | LF24                                                           |
| Auxiliary switch built-in 1 SPDT                                | TF24-S                                                         | LF24-S                                                         |
| AC 230V 50/60Hz                                                 | TF230**                                                        | LF230                                                          |
| Auxiliary switch built-in 1 SPDT                                | TF230-S                                                        | LF230-S                                                        |
| 3-point                                                         |                                                                |                                                                |
| AC/DC 24V 50/60Hz                                               | TF24-3**                                                       | LF24-3                                                         |
| Modulating<br>Control signal DC (0)2...10V, feedback DC 2...10V |                                                                |                                                                |
| AC/DC 24V 50/60Hz                                               | TF24-SR                                                        | LF24-SR                                                        |
| Running time -Motor<br>-Spring return                           | <75s*<br><25s                                                  | 40-75s*<br><20s                                                |
| Shaft diameter                                                  | 6...12mm                                                       | 8...16mm                                                       |
| Sound power level -Motor<br><br>-Spring                         | Open/Close max. 50dB(A)<br>Modulating and 3-point max. 35dB(A) | Open/Close max. 50dB(A)<br>Modulating and 3-point max. 30dB(A) |
| Electrical connection                                           | Cable 1m                                                       |                                                                |
| Direction of rotation                                           | Selected by mounting L/R                                       |                                                                |
| Angle of rotation                                               | Max. 95°                                                       |                                                                |
| Mechanical end stops                                            | Yes                                                            |                                                                |
| Position indicator                                              | Yes                                                            |                                                                |
| Degree of protection                                            | IP42                                                           | IP54                                                           |
| EMC                                                             | CE according to 89/336/EEC                                     |                                                                |
| LVD***                                                          | CE according to 73/23/EEC                                      |                                                                |
| Ambient temperature                                             | -30...+50°C                                                    |                                                                |
| Non-operation temperature                                       | -40...+80°C                                                    |                                                                |
| Humidity                                                        | 5...95% RH, non-condensing                                     |                                                                |

\* LF24-3 and all -SR types are 150s.

\*\* TF24-3 nominal voltage is AC 24V, TF230 nominal voltage is AC 100...240V.

\*\*\* For 230V models.

|                                                                 | 10Nm                                                                     | 20Nm         | 30Nm                                                                     |
|-----------------------------------------------------------------|--------------------------------------------------------------------------|--------------|--------------------------------------------------------------------------|
| <b>Mechanical Fail-Safe Damper Actuator</b>                     | <b>NFU..</b>                                                             | <b>SFU..</b> | <b>EFU..</b>                                                             |
| Open/Close                                                      | NFU                                                                      | SFU          | -                                                                        |
| AC 24...240V / DC 24...125V                                     | NFU                                                                      | SFU          | -                                                                        |
| Auxiliary switch built-in 2 SPDT                                | NFU-S2                                                                   | SFU-S2       | -                                                                        |
| AC/DC 24V 50/60Hz                                               |                                                                          |              |                                                                          |
| Auxiliary switch built-in 2 SPDT                                | -                                                                        | -            | EFU24-S2                                                                 |
| AC 230V 50/60Hz                                                 |                                                                          |              |                                                                          |
| Auxiliary switch built-in 2 SPDT                                | -                                                                        | -            | EFU230-S2                                                                |
| Modulating<br>Control signal DC (0)2...10V, feedback DC 2...10V |                                                                          |              |                                                                          |
| AC/DC 24V 50/60Hz                                               | NFU24-SR                                                                 | SFU24-SR     | EFU24-SR                                                                 |
| Running time -Motor<br>-Spring return                           | Open/Close 75s; modulating 150s<br>20s @ -20 ...+50°C / max. 60s @ -30°C |              | Open/Close 60s; modulating 150s<br>20s @ -20 ...+50°C / max. 60s @ -30°C |
| Shaft diameter                                                  | 10...25.4mm / 14...25.4mm                                                |              | 12...26.7mm / 12...25.2mm                                                |
| Sound power level -Motor<br>-Spring return                      | Open/Close max. 45dB(A)<br>Modulating max. 40dB(A)<br>max. 62dB(A)       |              | Open/Close max. 55dB(A)<br>Modulating max. 45dB(A)<br>max. 71dB(A)       |
| Electrical connection                                           | Cable 1m                                                                 |              |                                                                          |
| Direction of rotation                                           | Selected by mounting L/R                                                 |              |                                                                          |
| Angle of rotation                                               | Max. 95°                                                                 |              |                                                                          |
| Mechanical end stops                                            | Yes                                                                      |              |                                                                          |
| Position indicator                                              | Yes                                                                      |              |                                                                          |
| Degree of protection                                            | IP54                                                                     |              |                                                                          |
| EMC                                                             | CE according to 89/336/EEC                                               |              |                                                                          |
| LVD*                                                            | CE according to 2006/95/EC                                               |              |                                                                          |
| Ambient temperature                                             | -30...+50°C                                                              |              |                                                                          |
| Non-operation temperature                                       | -40...+80°C                                                              |              |                                                                          |
| Humidity                                                        | 5...95% RH, non-condensing                                               |              |                                                                          |

\* For 230V only.

|                                                                           | 40Nm                         |
|---------------------------------------------------------------------------|------------------------------|
| <b>Electronic Fail-Safe Damper Actuator</b>                               | <b>GKU..</b>                 |
| Open/Close                                                                |                              |
| AC/DC 24V 50/60Hz                                                         | GKU24                        |
| Modulating / 3-point<br>Control signal DC (0)2...10V, feedback DC 2...10V |                              |
| AC/DC 24V 50/60Hz                                                         | -                            |
| Running time -Standard<br>-Power off position                             | 150s<br>35s                  |
| Shaft diameter                                                            | 12...26.7mm / 12...25.2mm    |
| Sound power level -Standard<br>-Power off position                        | Max. 53dB(A)<br>Max. 61dB(A) |
| Electrical connection                                                     | Cable 1m                     |
| Direction of rotation                                                     | Selected by mounting L/R     |
| Angle of rotation                                                         | Max. 95°                     |
| Mechanical end stops                                                      | Yes                          |
| Position indicator                                                        | Yes                          |
| Degree of protection                                                      | IP54                         |
| EMC                                                                       | CE according to 2004/108/EC  |
| Ambient temperature                                                       | -30...+50°C                  |
| Non-operation temperature                                                 | -40...+80°C                  |
| Humidity                                                                  | 5...95% RH, non-condensing   |

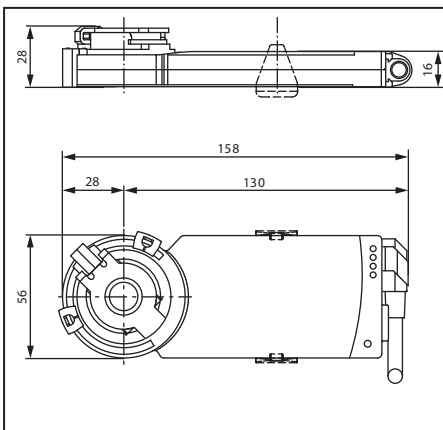
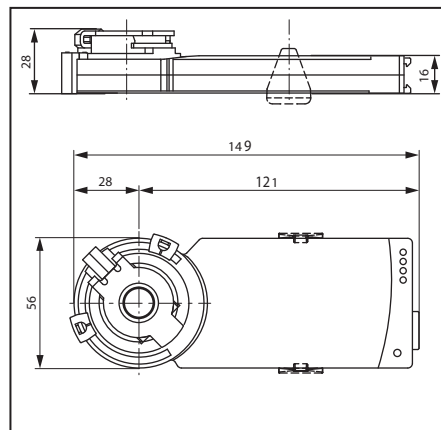
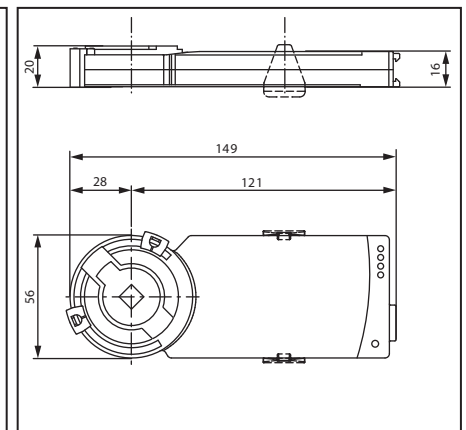
- For operation of air control dampers in HVAC system
- Torque: 2Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close or 3-point



## Technical data

|                            |                                             |                                                                                                            |
|----------------------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                             | AC 24V 50/60Hz, DC 24V                                                                                     |
|                            | Nominal voltage range                       | AC/DC 19.2...28.8V                                                                                         |
|                            | Power consumption                           | 0.5W @ nominal torque / 0.2W @ holding                                                                     |
|                            | For transformer sizing                      | 1VA                                                                                                        |
| <b>Functional data</b>     | Connection (-T) cable                       | Terminals for 3x1.5mm <sup>2</sup> CU wire or 3x1.0mm <sup>2</sup> CU litz wires 1m, 3x0.75mm <sup>2</sup> |
|                            | Torque                                      | 2Nm @ nominal voltage                                                                                      |
|                            | Direction of rotation                       | Depends on electrical installation                                                                         |
|                            | Manual override                             | Gear disengagement by magnet                                                                               |
| <b>Working conditions</b>  | Angle of rotation no limiters with limiters | Endless<br>Fixed 315° or 0... 287.5° with mechanical end stops, can be adjusted in 2.5° increments         |
|                            | Running time                                | 75s                                                                                                        |
|                            | Sound power level                           | Max. 35dB(A)                                                                                               |
|                            | Position indicator                          | Mechanical, pluggable with integrated magnet for gear disengagement                                        |
| <b>Dimensions / weight</b> | Protection class                            | III (safety extra-low voltage)                                                                             |
|                            | Degree of protection (-T) cable             | IP20<br>IP54                                                                                               |
|                            | EMC                                         | CE according to 89/336/EEC                                                                                 |
|                            | Mode of operation                           | Type 1 (EN 60730-1)                                                                                        |
|                            | Ambient temp.                               | -30...+50°C                                                                                                |
|                            | Non-operation temp.                         | -40...+80°C                                                                                                |
|                            | Humidity                                    | 5...95% RH, non-condensing                                                                                 |
|                            | Maintenance                                 | Maintenance-free                                                                                           |
|                            | Dimensions (LxWxH)                          | See "Dimensions"                                                                                           |
|                            | Shaft                                       | 6...12.7mm                                                                                                 |
|                            | Form fit (-F8)                              | 8x8mm                                                                                                      |
|                            | (-F10)                                      | 10x10mm                                                                                                    |
|                            | Weight                                      | 0.13...0.22kg                                                                                              |

## Dimensions [mm]

**CMU24**

**CMU24-T**

**CMU24-F8-T**


- For operation of air control dampers in HVAC system
- Torque: 2Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V

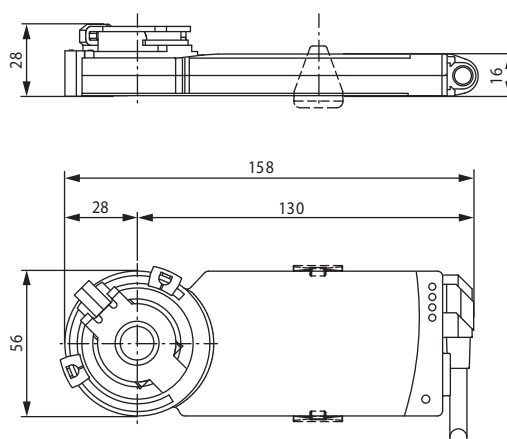


## Technical data

|                            |                            |                                                                        |
|----------------------------|----------------------------|------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage            | AC 24V 50/60Hz, DC 24V                                                 |
|                            | Nominal voltage range      | AC/DC 19.2...28.8V                                                     |
|                            | Power consumption          | 1W @ nominal torque / 0.5W @ holding                                   |
|                            | For transformer sizing     | 2VA                                                                    |
| <b>Functional data</b>     | Connecting cable           | Cable 1m, 4x0.75mm <sup>2</sup>                                        |
|                            | Torque                     | 2Nm @ nominal voltage                                                  |
|                            | Control signal Y           | DC(0)2...10V @ input impedance 100kΩ                                   |
|                            | Position feedback signal U | DC 2...10V @ max. 1mA                                                  |
|                            | Position accuracy          | ±5%                                                                    |
|                            | Direction of rotation      | Y=0V at right end stop position                                        |
|                            | Manual override            | Gear disengagement by magnet                                           |
|                            | Angle of rotation          | Max. 95°, adjustable by mechanical stops                               |
|                            | Running time               | 75s                                                                    |
|                            | Sound power level          | Max. 35dB(A)                                                           |
| <b>Working conditions</b>  | Position indicator         | Mechanical, pluggable<br>with integrated magnet for gear disengagement |
|                            | Protection class           | III (safety extra-low voltage)                                         |
|                            | Degree of protection       | IP54                                                                   |
|                            | EMC                        | CE according to 89/336/EEC                                             |
|                            | Mode of operation          | Type 1 (EN 60730-1)                                                    |
|                            | Ambient temp.              | -30...+50°C                                                            |
|                            | Non-operation temp.        | -40...+80°C                                                            |
|                            | Humidity                   | 5...95% RH, non-condensing                                             |
| <b>Dimensions / weight</b> | Maintenance                | Maintenance-free                                                       |
|                            | Dimensions (LxWxH)         | See "Dimensions"                                                       |
|                            | Shaft                      | ⌀I◇ 6...12.7mm                                                         |
|                            | Weight                     | 0.22kg                                                                 |

\* -R: Control signal (0)2V at right side

## Dimensions [mm]



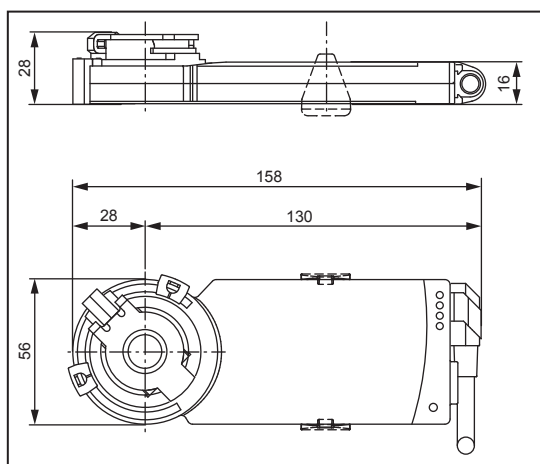
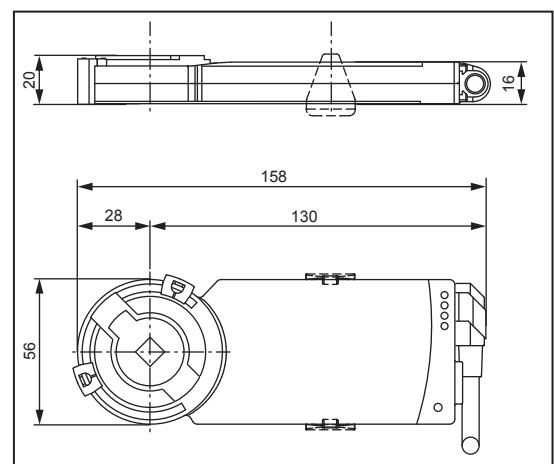
- For operation of air control dampers in HVAC system
- Torque: 2Nm
- Nominal voltage: AC 100...240V
- Control: Open/Close or 3-point



## Technical data

|                            |                        |                                                                                                    |
|----------------------------|------------------------|----------------------------------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage        | AC 100...240V 50/60Hz                                                                              |
|                            | Nominal voltage range  | AC 85...265V                                                                                       |
|                            | Power consumption      | 1.5W @ nominal torque / 1W @ holding                                                               |
|                            | For transformer sizing | 3VA                                                                                                |
|                            | Connecting cable       | Cable 1m, 3x0.75mm <sup>2</sup>                                                                    |
| <b>Functional data</b>     | Torque                 | 2Nm @ nominal voltage                                                                              |
|                            | Direction of rotation  | Depends on electrical installation                                                                 |
|                            | Manual override        | Gear disengagement by magnet                                                                       |
|                            | Angle of rotation      | no limiters<br>with limiters                                                                       |
|                            |                        | Endless<br>Fixed 315° or 0... 287.5° with mechanical end stops, can be adjusted in 2.5° increments |
| <b>Working conditions</b>  | Running time           | 75s                                                                                                |
|                            | Sound power level      | Max. 35dB(A)                                                                                       |
|                            | Position indicator     | Mechanical, pluggable with integrated magnet for gear disengagement                                |
|                            | Protection class       | II (Totally insulated)                                                                             |
|                            | Degree of protection   | IP54                                                                                               |
|                            | EMC                    | CE according to 2004/108/EC                                                                        |
|                            | Low voltage directive  | CE according to 2006/95/EC                                                                         |
|                            | Mode of operation      | Type 1 (EN 60730-1)                                                                                |
|                            | Ambient temp.          | -30...+50°C                                                                                        |
|                            | Non-operation temp.    | -40...+80°C                                                                                        |
| <b>Dimensions / weight</b> | Humidity               | 5...95% RH, non-condensing                                                                         |
|                            | Maintenance            | Maintenance-free                                                                                   |
|                            | Dimensions (LxWxH)     | See "Dimensions"                                                                                   |
|                            | Shaft                  | 6...12.7mm                                                                                         |
|                            | Form fit (-F8)         | 8x8mm                                                                                              |
|                            | (-F10)                 | 10x10mm                                                                                            |
|                            | Weight                 | 0.22kg                                                                                             |

## Dimensions [mm]

**CMU230**

**CMU230-F8**


- For operation of air control dampers in HVAC system
- Torque: 5Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close or 3-point

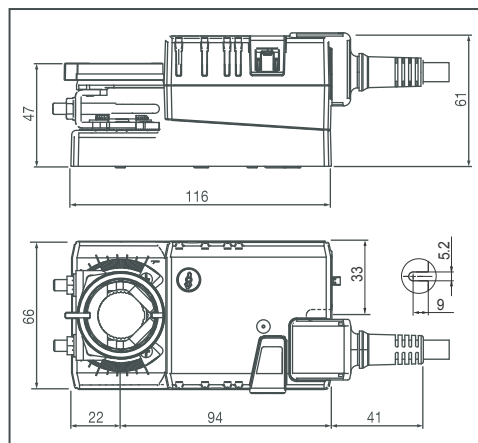


## Technical data

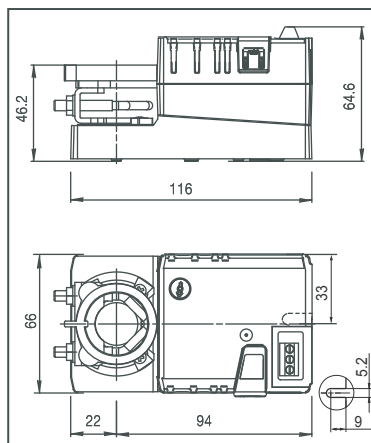
|                            |                                      |                                                                                                                            |
|----------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                      | AC 24V 50/60Hz, DC 24V                                                                                                     |
|                            | Nominal voltage range                | AC/DC 19.2...28.8V                                                                                                         |
|                            | Power consumption                    | 1W @ nominal torque / 0.2W @ holding                                                                                       |
|                            | For transformer sizing               | 1.5VA                                                                                                                      |
|                            | Auxiliary switch (-S)                | 1 SPDT, 1mA...3(0.5)A, AC 250V, adjustable                                                                                 |
| <b>Functional data</b>     | Connection                           | -motor<br>-auxiliary switch (-S)<br>-terminals (-T)                                                                        |
|                            |                                      | Cable 1m, 3x0.75mm <sup>2</sup><br>Cable 1m, 3x0.75mm <sup>2</sup><br>Max. 3x1.5mm <sup>2</sup>                            |
|                            | Torque                               | 5Nm @ nominal voltage                                                                                                      |
|                            | Direction of rotation                | Selectable by switch                                                                                                       |
|                            | Manual override                      | Gearing latch disengaged by push button, self-resetting                                                                    |
| <b>Working conditions</b>  | Angle of rotation                    | Max. 95°, adjustable by mechanical stops                                                                                   |
|                            | Running time                         | 150s                                                                                                                       |
|                            | Sound power level                    | Max. 35dB(A)                                                                                                               |
|                            | Position indicator                   | Mechanical, remote visible                                                                                                 |
|                            | Protection class                     | III (safety extra-low voltage)                                                                                             |
| <b>Dimensions / weight</b> | Degree of protection                 | LMU24(-S/-F) IP54<br>LMU24-T IP20                                                                                          |
|                            | EMC                                  | CE according to 89/336/EEC                                                                                                 |
|                            | Mode of operation                    | Type 1 (EN 60730-1)                                                                                                        |
|                            | Ambient temp.<br>Non-operation temp. | -30...+50°C<br>-40...+80°C                                                                                                 |
|                            | Humidity                             | 5...95% RH, non-condensing                                                                                                 |
|                            | Maintenance                          | Maintenance-free                                                                                                           |
|                            | Dimensions (LxWxH)                   | See "Dimensions"                                                                                                           |
|                            | Shaft length                         | Min. 37mm                                                                                                                  |
|                            | Shaft                                | LMU24(-S/-T)  6...20mm<br>LMU24-F 8x8mm |
|                            | Weight                               | 0.5kg                                                                                                                      |

## Dimensions [mm]

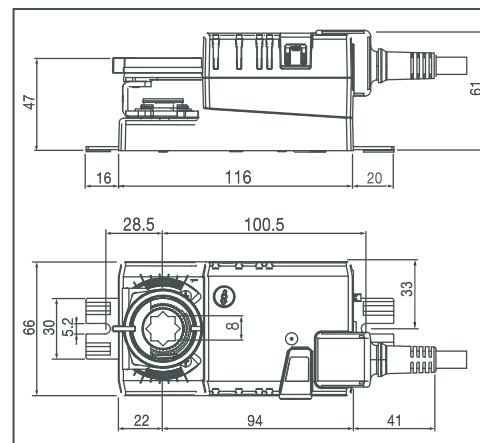
LMU24(-S)



LMU24-T



LMU24-F



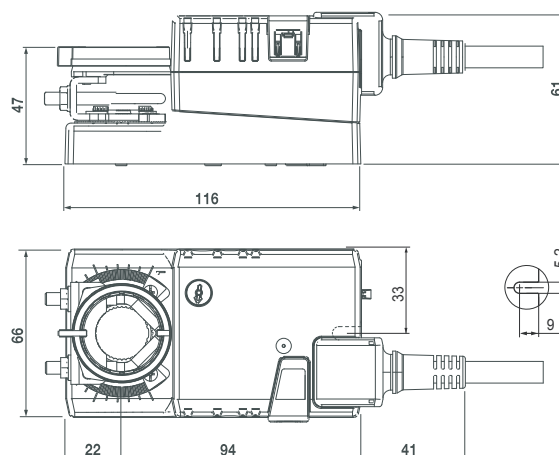
- For operation of air control dampers in HVAC system
- Torque: 5Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

|                            |                                      |                                                         |
|----------------------------|--------------------------------------|---------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                      | AC 24V 50/60Hz, DC 24V                                  |
|                            | Nominal voltage range                | AC/DC 19.2...28.8V                                      |
|                            | Power consumption                    | 1W @ nominal torque / 0.4W @ holding                    |
|                            | For transformer sizing               | 2VA                                                     |
| <b>Functional data</b>     | Connecting cable                     | Cable 1m, 4x0.75mm <sup>2</sup>                         |
|                            | Torque                               | 5Nm @ nominal voltage                                   |
|                            | Control signal Y                     | DC (0)2...10V @ input impedance 100kΩ                   |
|                            | Position feedback signal U           | DC 2...10V @ max. 1mA                                   |
|                            | Position accuracy                    | ±5%                                                     |
|                            | Direction of rotation                | Selectable by switch                                    |
|                            | Manual override                      | Gearing latch disengaged by push button, self-resetting |
|                            | Angle of rotation                    | Max. 95°, adjustable by mechanical stops                |
|                            | Running time                         | 150s                                                    |
|                            | Sound power level                    | Max. 35dB(A)                                            |
| <b>Working conditions</b>  | Position indicator                   | Mechanical, remote visible                              |
|                            | Protection class                     | III (safety extra-low voltage)                          |
|                            | Degree of protection                 | IP54                                                    |
|                            | EMC                                  | CE according to 89/336/EEC                              |
|                            | Mode of operation                    | Type 1 (EN 60730-1)                                     |
|                            | Ambient temp.<br>Non-operation temp. | -30...+50°C<br>-40...+80°C                              |
|                            | Humidity                             | 5...95% RH, non-condensing                              |
| <b>Dimensions / weight</b> | Maintenance                          | Maintenance-free                                        |
|                            | Dimensions (LxWxH)                   | See "Dimensions"                                        |
|                            | Shaft                                | 6...20mm                                                |
|                            | Weight                               | 0.5kg                                                   |

## Dimensions [mm]



- For operation of air control dampers in HVAC system
- Torque: 5Nm
- Nominal voltage: AC 100...240V
- Control: Open/Close or 3-point

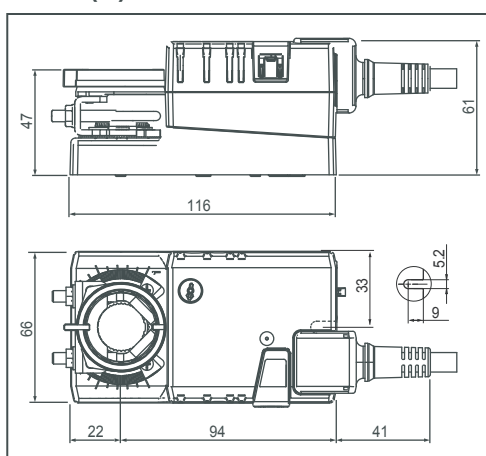


## Technical data

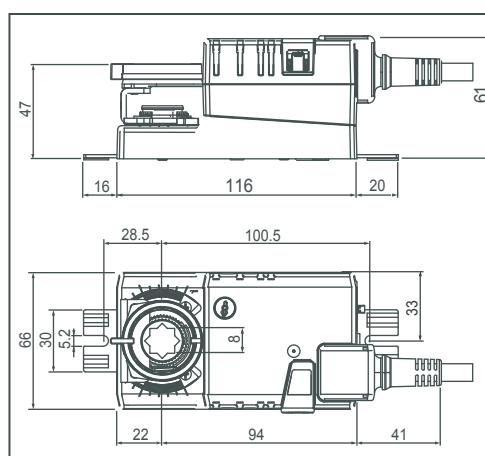
|                            |                        |                                                                                                                           |
|----------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage        | AC 100...240V 50/60Hz                                                                                                     |
|                            | Nominal voltage range  | AC 85...265V                                                                                                              |
|                            | Power consumption      | 1.5W @ nominal torque / 0.5W @ holding                                                                                    |
|                            | For transformer sizing | 3.5VA                                                                                                                     |
|                            | Auxiliary switch (-S)  | 1 SPDT, 1mA...3(0.5)A, AC 250V, adjustable                                                                                |
|                            | Connection             | -motor Cable 1m, 3x0.75mm <sup>2</sup><br>-auxiliary switch (-S) Cable 1m, 3x0.75mm <sup>2</sup>                          |
| <b>Functional data</b>     | Torque                 | 5Nm @ nominal voltage                                                                                                     |
|                            | Direction of rotation  | Selectable by switch                                                                                                      |
|                            | Manual override        | Gearing latch disengaged by push button, self-resetting                                                                   |
|                            | Angle of rotation      | Max. 95°, adjustable by mechanical stops                                                                                  |
|                            | Running time           | 150s                                                                                                                      |
|                            | Sound power level      | Max. 35dB(A)                                                                                                              |
| <b>Working conditions</b>  | Position indicator     | Mechanical, remote visible                                                                                                |
|                            | Protection class       | II (Totally insulated)                                                                                                    |
|                            | Degree of protection   | IP54                                                                                                                      |
|                            | EMC                    | CE according to 89/336/EEC                                                                                                |
|                            | Low voltage directive  | CE according to 73/23/EEC                                                                                                 |
|                            | Mode of operation      | Type 1 (EN 60730-1)                                                                                                       |
| <b>Dimensions / weight</b> | Ambient temp.          | -30...+50°C                                                                                                               |
|                            | Non-operation temp.    | -40...+80°C                                                                                                               |
|                            | Humidity               | 5...95% RH, non-condensing                                                                                                |
|                            | Maintenance            | Maintenance-free                                                                                                          |
|                            | Dimensions (LxWxH)     | See "Dimensions"                                                                                                          |
|                            | Shaft length           | Min. 37mm                                                                                                                 |
|                            | Shaft                  | LMU230(-S)  6...20mm<br>LMU230-F 8x8mm |
|                            | Weight                 | 0.55kg                                                                                                                    |

## Dimensions [mm]

LMU230(-S)



LMU230-F



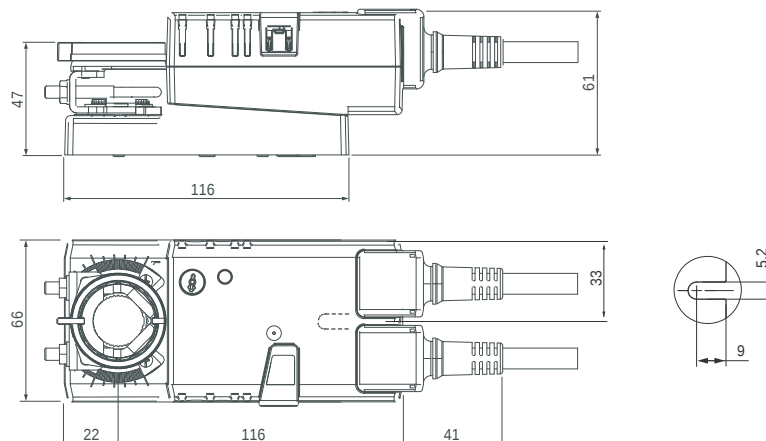
- For operation of air control dampers in HVAC system
- Torque: 5Nm
- Nominal voltage: AC 100...240V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

|                            |                                |                                                         |
|----------------------------|--------------------------------|---------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                | AC 100...240V 50/60Hz                                   |
|                            | Nominal voltage range          | AC 85...265V                                            |
|                            | Power consumption              | 2W @ nominal torque / 1W @ holding                      |
|                            | For transformer sizing         | 4VA                                                     |
| <b>Functional data</b>     | Connecting cable -power supply | Cable 1m, 2x0.75mm <sup>2</sup>                         |
|                            | -signal                        | Cable 1m, 4x0.75mm <sup>2</sup>                         |
|                            | Torque                         | 5Nm @ nominal voltage                                   |
|                            | Control signal Y               | DC (0)2...10V @ input impedance 100kΩ                   |
|                            | Position feedback signal U     | DC 2...10V @ max. 1mA                                   |
|                            | Position accuracy              | ±5%                                                     |
|                            | Direction of rotation          | Selectable by switch                                    |
|                            | Manual override                | Gearing latch disengaged by push button, self-resetting |
|                            | Angle of rotation              | Max. 95°, adjustable by mechanical stops                |
|                            | Running time                   | 150s                                                    |
|                            | Sound power level              | Max. 35dB(A)                                            |
|                            | Position indicator             | Mechanical, remote visible                              |
| <b>Working conditions</b>  | Protection class               | II (Totally insulated)                                  |
|                            | Degree of protection           | IP54                                                    |
|                            | EMC                            | CE according to 89/336/EEC                              |
|                            | Low voltage directive          | CE according to 73/23/EEC                               |
| <b>Dimensions / weight</b> | Mode of operation              | Type 1 (EN 60730-1)                                     |
|                            | Ambient temp.                  | -30...+50°C                                             |
|                            | Non-operation temp.            | -40...+80°C                                             |
|                            | Humidity                       | 5...95% RH, non-condensing                              |
|                            | Maintenance                    | Maintenance-free                                        |
|                            | Dimensions (LxWxH)             | See "Dimensions"                                        |
|                            | Shaft                          | 6...20mm                                                |
|                            | Weight                         | 0.7kg                                                   |

## Dimensions [mm]



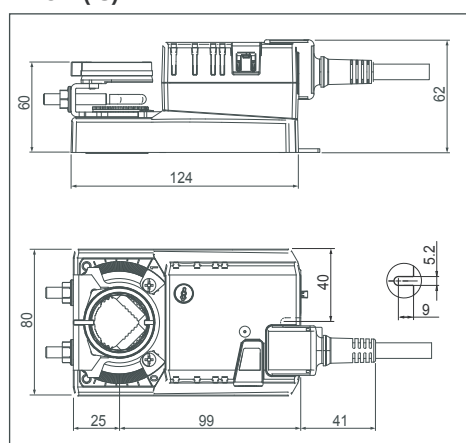
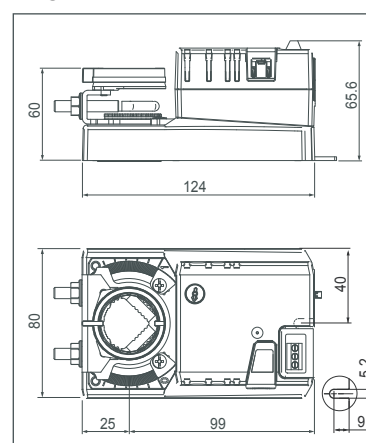
- For operation of air control dampers in HVAC system
- Torque: 10Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close or 3-point



## Technical data

|                            |                        |                                                                                                                                               |
|----------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage        | AC 24V 50/60Hz, DC 24V                                                                                                                        |
|                            | Nominal voltage range  | AC/DC 19.2...28.8V                                                                                                                            |
|                            | Power consumption      | 1.5W @ nominal torque / 0.2W @ holding                                                                                                        |
|                            | For transformer sizing | 3.5VA                                                                                                                                         |
| <b>Functional data</b>     | Auxiliary switch (-S)  | 1 SPDT, 1mA...3(0.5)A, AC 250V, adjustable                                                                                                    |
|                            | Connection             | -motor Cable 1m, 3x0.75mm <sup>2</sup><br>-auxiliary switch (-S) Cable 1m, 3x0.75mm <sup>2</sup><br>-terminals (-T) Max. 3x1.5mm <sup>2</sup> |
|                            | Torque                 | 10Nm @ nominal voltage                                                                                                                        |
|                            | Direction of rotation  | Selectable by switch                                                                                                                          |
| <b>Working conditions</b>  | Manual override        | Gearing latch disengaged by push button, self-resetting                                                                                       |
|                            | Angle of rotation      | Max. 95°, adjustable by mechanical stops                                                                                                      |
|                            | Running time           | 150s                                                                                                                                          |
|                            | Sound power level      | Max. 35dB(A)                                                                                                                                  |
| <b>Dimensions / weight</b> | Position indicator     | Mechanical, remote visible                                                                                                                    |
|                            | Protection class       | III (safety extra-low voltage)                                                                                                                |
|                            | Degree of protection   | NMU24(-S) IP54<br>NMU24-T IP20                                                                                                                |
|                            | EMC                    | CE according to 89/336/EEC                                                                                                                    |
|                            | Mode of operation      | Type 1 (EN 60730-1)                                                                                                                           |
|                            | Ambient temp.          | -30...+50°C                                                                                                                                   |
|                            | Non-operation temp.    | -40...+80°C                                                                                                                                   |
|                            | Humidity               | 5...95% RH, non-condensing                                                                                                                    |
|                            | Maintenance            | Maintenance-free                                                                                                                              |
|                            | Dimensions (LxWxH)     | See "Dimensions"                                                                                                                              |
|                            | Shaft length           | Min. 40mm (20mm with K-NA for reverse mounting-optional)                                                                                      |
|                            | Shaft                  | 8...26.7mm (8...20mm with K-NA)                                                                                                               |
|                            | Weight                 | 0.75kg                                                                                                                                        |

## Dimensions [mm]

**NMU24(-S)**

**NMU24-T**


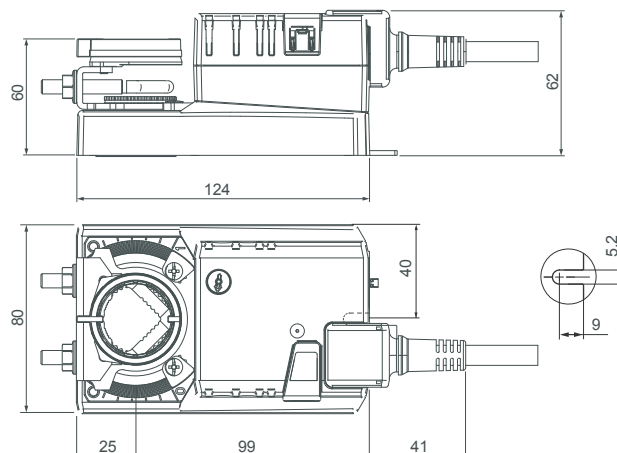
- For operation of air control dampers in HVAC system
- Torque: 10Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

|                            |                                      |                                                         |
|----------------------------|--------------------------------------|---------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                      | AC 24V 50/60Hz, DC 24V                                  |
|                            | Nominal voltage range                | AC/DC 19.2...28.8V                                      |
|                            | Power consumption                    | 2W @ nominal torque / 0.4W @ holding                    |
|                            | For transformer sizing               | 4VA                                                     |
| <b>Functional data</b>     | Connecting cable                     | Cable 1m, 4x0.75mm <sup>2</sup>                         |
|                            | Torque                               | 10Nm @ nominal voltage                                  |
|                            | Control signal Y                     | DC (0)2...10V @ input impedance 100kΩ                   |
|                            | Position feedback signal U           | DC 2...10V @ max. 1mA                                   |
| <b>Working conditions</b>  | Position accuracy                    | ±5%                                                     |
|                            | Direction of rotation                | Selectable by switch                                    |
|                            | Manual override                      | Gearing latch disengaged by push button, self-resetting |
|                            | Angle of rotation                    | Max. 95°, adjustable by mechanical stops                |
|                            | Running time                         | 150s                                                    |
|                            | Sound power level                    | Max. 35dB(A)                                            |
|                            | Position indicator                   | Mechanical, remote visible                              |
|                            | Protection class                     | III (safety extra-low voltage)                          |
|                            | Degree of protection                 | IP54                                                    |
|                            | EMC                                  | CE according to 89/336/EEC                              |
|                            | Mode of operation                    | Type 1 (EN 60730-1)                                     |
|                            | Ambient temp.<br>Non-operation temp. | -30...+50°C<br>-40...+80°C                              |
| <b>Dimensions / weight</b> | Humidity                             | 5...95% RH, non-condensing                              |
|                            | Maintenance                          | Maintenance-free                                        |
|                            | Dimensions (LxWxH)                   | See "Dimensions"                                        |
|                            | Shaft                                | 8...26.7mm (8...20mm with K-NA)                         |
|                            | Weight                               | 0.8kg                                                   |

## Dimensions [mm]



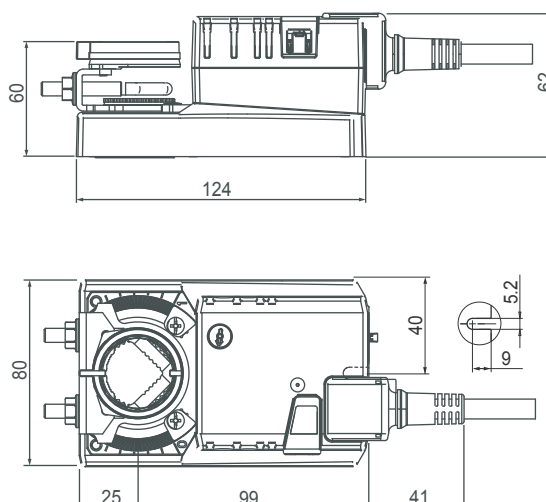
- For operation of air control dampers in HVAC system
- Torque: 10Nm
- Nominal voltage: AC 100...240V
- Control: Open/Close or 3-point



## Technical data

|                            |                                             |                                                                    |
|----------------------------|---------------------------------------------|--------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                             | AC 100...240V 50/60Hz                                              |
|                            | Nominal voltage range                       | AC 85...265V                                                       |
|                            | Power consumption                           | 2.5W @ nominal torque / 0.6W @ holding                             |
|                            | For transformer sizing                      | 5.5VA                                                              |
|                            | Auxiliary switch (-S)                       | 1 SPDT, 1mA...3(0.5)A, AC 250V, adjustable                         |
|                            | Connection -motor<br>-auxiliary switch (-S) | Cable 1m, 3x0.75mm <sup>2</sup><br>Cable 1m, 3x0.75mm <sup>2</sup> |
| <b>Functional data</b>     | Torque                                      | 10Nm @ nominal voltage                                             |
|                            | Direction of rotation                       | Selectable by switch                                               |
|                            | Manual override                             | Gearing latch disengaged by push button, self-resetting            |
|                            | Angle of rotation                           | Max. 95°, adjustable by mechanical stops                           |
|                            | Running time                                | 150s                                                               |
|                            | Sound power level                           | Max. 35dB(A)                                                       |
| <b>Working conditions</b>  | Position indicator                          | Mechanical, remote visible                                         |
|                            | Protection class                            | II (Totally insulated)                                             |
|                            | Degree of protection                        | IP54                                                               |
|                            | EMC                                         | CE according to 89/336/EEC                                         |
|                            | Low voltage directive                       | CE according to 73/23/EEC                                          |
|                            | Mode of operation                           | Type 1 (EN 60730-1)                                                |
| <b>Dimensions / weight</b> | Ambient temp.                               | -30...+50°C                                                        |
|                            | Non-operation temp.                         | -40...+80°C                                                        |
|                            | Humidity                                    | 5...95% RH, non-condensing                                         |
|                            | Maintenance                                 | Maintenance-free                                                   |
|                            | Dimensions (LxWxH)                          | See "Dimensions"                                                   |
|                            | Shaft length                                | Min. 40mm (20mm with K-NA for reverse mounting-optional)           |
|                            | Shaft                                       | 8...26.7mm (8...20mm with K-NA)                                    |
|                            | Weight                                      | 0.8kg                                                              |

## Dimensions [mm]



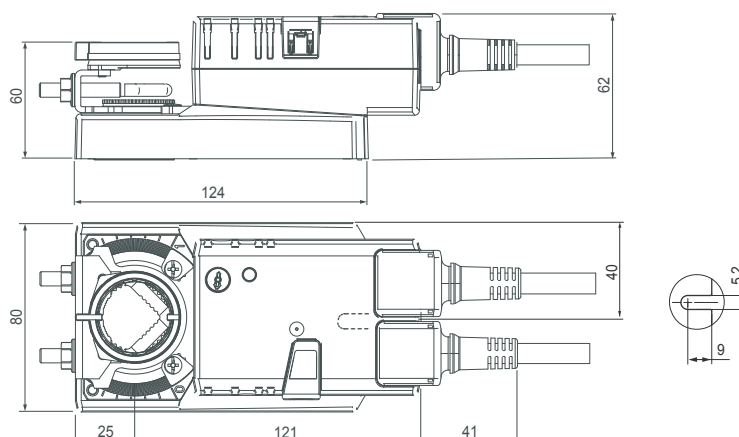
- For operation of air control dampers in HVAC system
- Torque: 10Nm
- Nominal voltage: AC 100...240V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

|                            |                            |                                                                    |
|----------------------------|----------------------------|--------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage            | AC 100...240V 50/60Hz                                              |
|                            | Nominal voltage range      | AC 85...265V                                                       |
|                            | Power consumption          | 3.5W @ nominal torque / 1W @ holding                               |
|                            | For transformer sizing     | 6.5VA                                                              |
|                            | Connection                 | -power supply<br>-signal                                           |
| <b>Functional data</b>     |                            | Cable 1m, 2x0.75mm <sup>2</sup><br>Cable 1m, 4x0.75mm <sup>2</sup> |
|                            | Torque                     | 10Nm @ nominal voltage                                             |
|                            | Control signal Y           | DC (0)2...10V @ input impedance 100kΩ                              |
|                            | Position feedback signal U | DC 2...10V @ max. 1mA                                              |
|                            | Position accuracy          | ±5%                                                                |
|                            | Direction of rotation      | Selectable by switch                                               |
|                            | Manual override            | Gearing latch disengaged by push button, self-resetting            |
|                            | Angle of rotation          | Max. 95°, adjustable by mechanical stops                           |
|                            | Running time               | 150s                                                               |
|                            | Sound power level          | Max. 35dB(A)                                                       |
|                            | Position indicator         | Mechanical, remote visible                                         |
| <b>Working conditions</b>  | Protection class           | II (Totally insulated)                                             |
|                            | Degree of protection       | IP54                                                               |
|                            | EMC                        | CE according to 89/336/EEC                                         |
|                            | Low voltage directive      | CE according to 73/23/EEC                                          |
|                            | Mode of operation          | Type 1 (EN 60730-1)                                                |
|                            | Ambient temp.              | -30...+50°C                                                        |
|                            | Non-operation temp.        | -40...+80°C                                                        |
|                            | Humidity                   | 5...95% RH, non-condensing                                         |
|                            | Maintenance                | Maintenance-free                                                   |
| <b>Dimensions / weight</b> | Dimensions (LxWxH)         | See "Dimensions"                                                   |
|                            | Shaft length               | Min. 40mm (20mm with K-NA for reverse mounting-optional)           |
|                            | Shaft                      | 8...26.7mm (8...20mm with K-NA)                                    |
|                            | Weight                     | 0.95kg                                                             |

## Dimensions [mm]



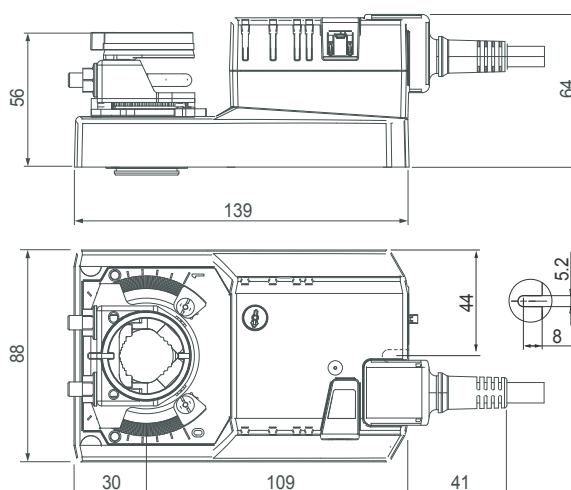
- For operation of air control dampers in HVAC system
- Torque: 20Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close or 3-point



## Technical data

|                            |                                             |                                                                    |
|----------------------------|---------------------------------------------|--------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                             | AC 24V 50/60Hz, DC 24V                                             |
|                            | Nominal voltage range                       | AC/DC 19.2...28.8V                                                 |
|                            | Power consumption                           | 2W @ nominal torque / 0.2W @ holding                               |
|                            | For transformer sizing                      | 4VA                                                                |
|                            | Auxiliary switch (-S)                       | 1 SPDT, 1mA...3(0.5)A, AC 250V, adjustable                         |
|                            | Connection -motor<br>-auxiliary switch (-S) | Cable 1m, 3x0.75mm <sup>2</sup><br>Cable 1m, 3x0.75mm <sup>2</sup> |
| <b>Functional data</b>     | Torque                                      | 20Nm @ nominal voltage                                             |
|                            | Direction of rotation                       | Selectable by switch                                               |
|                            | Manual override                             | Gearing latch disengaged by push button, self-resetting            |
|                            | Angle of rotation                           | Max. 95°, adjustable by mechanical stops                           |
|                            | Running time                                | 150s                                                               |
|                            | Sound power level                           | Max. 45dB(A)                                                       |
| <b>Working conditions</b>  | Position indicator                          | Mechanical, remote visible                                         |
|                            | Protection class                            | III (safety extra-low voltage)                                     |
|                            | Degree of protection                        | IP54                                                               |
|                            | EMC                                         | CE according to 89/336/EEC                                         |
|                            | Mode of operation                           | Type 1 (EN 60730-1)                                                |
|                            | Ambient temp.<br>Non-operation temp.        | -30...+50°C<br>-40...+80°C                                         |
| <b>Dimensions / weight</b> | Humidity                                    | 5...95% RH, non-condensing                                         |
|                            | Maintenance                                 | Maintenance-free                                                   |
|                            | Dimensions (LxWxH)                          | See "Dimensions"                                                   |
|                            | Shaft length                                | Min. 42mm (20mm for reverse mounting)                              |
|                            | Shaft                                       | 10..20mm (10...26.7mm with K-ENSA - optional)                      |
|                            | Weight                                      | 1.05kg                                                             |

## Dimensions [mm]



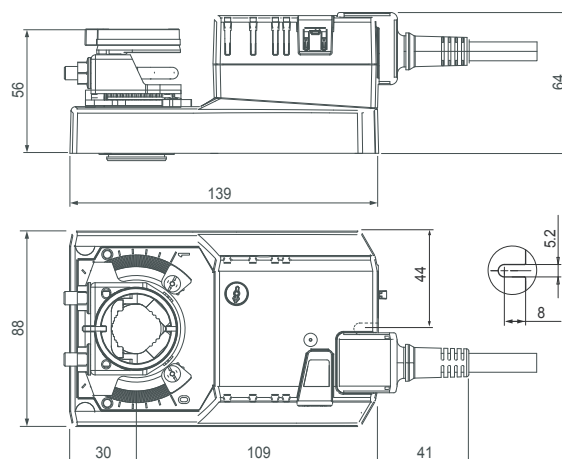
- For operation of air control dampers in HVAC system
- Torque: 20Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

|                            |                                      |                                                         |
|----------------------------|--------------------------------------|---------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                      | AC 24V 50/60Hz, DC 24V                                  |
|                            | Nominal voltage range                | AC/DC 19.2...28.8V                                      |
|                            | Power consumption                    | 2W @ nominal torque / 0.4W @ holding                    |
|                            | For transformer sizing               | 4VA                                                     |
| <b>Functional data</b>     | Connecting cable                     | Cable 1m, 4x0.75mm <sup>2</sup>                         |
|                            | Torque                               | 20Nm @ nominal voltage                                  |
|                            | Control signal Y                     | DC (0)2...10V @ input impedance 100kΩ                   |
|                            | Position feedback signal U           | DC 2...10V @ max. 1mA                                   |
| <b>Working conditions</b>  | Position accuracy                    | ±5%                                                     |
|                            | Direction of rotation                | Selectable by switch                                    |
|                            | Manual override                      | Gearing latch disengaged by push button, self-resetting |
|                            | Angle of rotation                    | Max. 95°, adjustable by mechanical stops                |
| <b>Dimensions / weight</b> | Running time                         | 150s                                                    |
|                            | Sound power level                    | Max. 45dB(A)                                            |
|                            | Position indicator                   | Mechanical, remote visible                              |
|                            | Protection class                     | III (safety extra-low voltage)                          |
|                            | Degree of protection                 | IP54                                                    |
|                            | EMC                                  | CE according to 89/336/EEC                              |
|                            | Mode of operation                    | Type 1 (EN 60730-1)                                     |
|                            | Ambient temp.<br>Non-operation temp. | -30...+50°C<br>-40...+80°C                              |
|                            | Humidity                             | 5...95% RH, non-condensing                              |
|                            | Maintenance                          | Maintenance-free                                        |
|                            | Dimensions (LxWxH)                   | See "Dimensions"                                        |
|                            | Shaft length                         | Min. 42mm (20mm for reverse mounting)                   |
|                            | Shaft                                | ⌀10...20mm (10...26.7mm with K-ENSA - optional)         |
|                            | Weight                               | 1.05kg                                                  |

## Dimensions [mm]



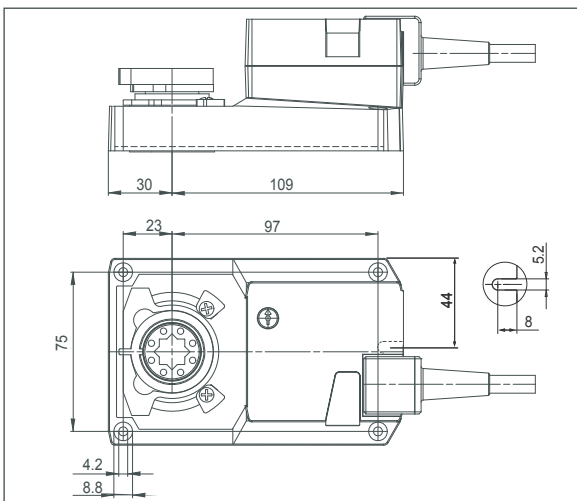
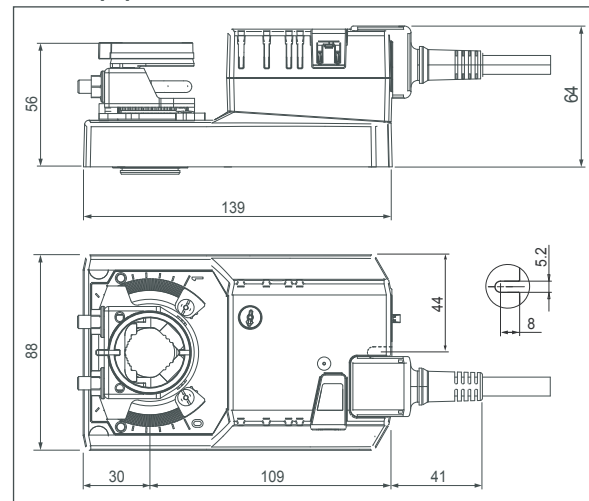
- For operation of air control dampers in HVAC system
- Torque: 20Nm
- Nominal voltage: AC 100...240V
- Control: Open/Close or 3-point



## Technical data

|                            |                        |                                                                             |
|----------------------------|------------------------|-----------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage        | AC 100...240V 50/60Hz                                                       |
|                            | Nominal voltage range  | AC 85...265V                                                                |
|                            | Power consumption      | 2.5W @ nominal torque / 0.6W @ holding                                      |
|                            | For transformer sizing | 6VA                                                                         |
|                            | Auxiliary switch (-S)  | 1 SPDT, 1mA...3(0.5)A, AC 250V, adjustable                                  |
| <b>Functional data</b>     | Connection -motor      | Cable 1m, 3x0.75mm <sup>2</sup>                                             |
|                            | -auxiliary switch (-S) | Cable 1m, 3x0.75mm <sup>2</sup>                                             |
|                            | Torque                 | 20Nm @ nominal voltage                                                      |
|                            | Direction of rotation  | Selectable by switch                                                        |
|                            | Manual override        | Gearing latch disengaged by push button, self-resetting                     |
| <b>Working conditions</b>  | Angle of rotation      | Max. 95°, adjustable by mechanical stops                                    |
|                            | Running time           | 150s                                                                        |
|                            | Sound power level      | Max. 45dB(A)                                                                |
|                            | Position indicator     | Mechanical, remote visible                                                  |
|                            | Protection class       | II (Totally insulated)                                                      |
| <b>Dimensions / weight</b> | Degree of protection   | IP54                                                                        |
|                            | EMC                    | CE according to 89/336/EEC                                                  |
|                            | Low voltage directive  | CE according to 73/23/EEC                                                   |
|                            | Mode of operation      | Type 1 (EN 60730-1)                                                         |
|                            | Ambient temp.          | -30...+50°C                                                                 |
|                            | Non-operation temp.    | -40...+80°C                                                                 |
|                            | Humidity               | 5...95% RH, non-condensing                                                  |
|                            | Maintenance            | Maintenance-free                                                            |
|                            | Dimensions (LxWxH)     | See "Dimensions"                                                            |
|                            | Shaft length           | Min. 42mm (20mm for reverse mounting)                                       |
|                            | Shaft                  | SMU230(-S) 10...20mm (10...26.7mm with K-ENSA-optional)<br>SMU230-F 12x12mm |
|                            | Weight                 | 1.05kg                                                                      |

## Dimensions [mm]

**SMU230-F**

**SMU230(-S)**


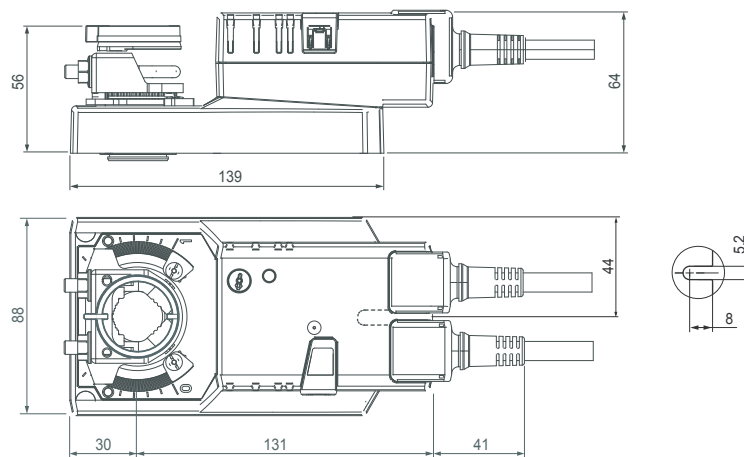
- For operation of air control dampers in HVAC system
- Torque: 20Nm
- Nominal voltage: AC 100...240V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

|                            |                            |                                                         |
|----------------------------|----------------------------|---------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage            | AC 100...240V 50/60Hz                                   |
|                            | Nominal voltage range      | AC 85...265V                                            |
|                            | Power consumption          | 3.5W @ nominal torque / 1W @ holding                    |
|                            | For transformer sizing     | 6.5VA                                                   |
| <b>Functional data</b>     | Connection -power supply   | Cable 1m, 2x0.75mm <sup>2</sup>                         |
|                            | -signal                    | Cable 1m, 4x0.75mm <sup>2</sup>                         |
|                            | Torque                     | 20Nm @ nominal voltage                                  |
|                            | Control signal Y           | DC (0)2...10V @ input impedance 100kΩ                   |
|                            | Position feedback signal U | DC 2...10V @ max. 1mA                                   |
|                            | Position accuracy          | ±5%                                                     |
|                            | Direction of rotation      | Selectable by switch                                    |
|                            | Manual override            | Gearing latch disengaged by push button, self-resetting |
|                            | Angle of rotation          | Max. 95°, adjustable by mechanical stops                |
|                            | Running time               | 150s                                                    |
|                            | Sound power level          | Max. 45dB(A)                                            |
|                            | Position indicator         | Mechanical, remote visible                              |
| <b>Working conditions</b>  | Protection class           | II (Totally insulated)                                  |
|                            | Degree of protection       | IP54                                                    |
|                            | EMC                        | CE according to 89/336/EEC                              |
|                            | Low voltage directive      | CE according to 73/23/EEC                               |
|                            | Mode of operation          | Type 1 (EN 60730-1)                                     |
|                            | Ambient temp.              | -30...+50°C                                             |
| <b>Dimensions / weight</b> | Non-operation temp.        | -40...+80°C                                             |
|                            | Humidity                   | 5...95% RH, non-condensing                              |
|                            | Maintenance                | Maintenance-free                                        |
|                            | Dimensions (LxWxH)         | See "Dimensions"                                        |
|                            | Shaft length               | Min. 42mm (20mm for reverse mounting)                   |
|                            | Shaft                      | ⌀I◇ 10..20mm (10...26.7mm with K-ENSA-optional)         |
|                            | Weight                     | 1.2kg                                                   |

## Dimensions [mm]



- For operation of air control dampers in HVAC system
- Torque: 40Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close



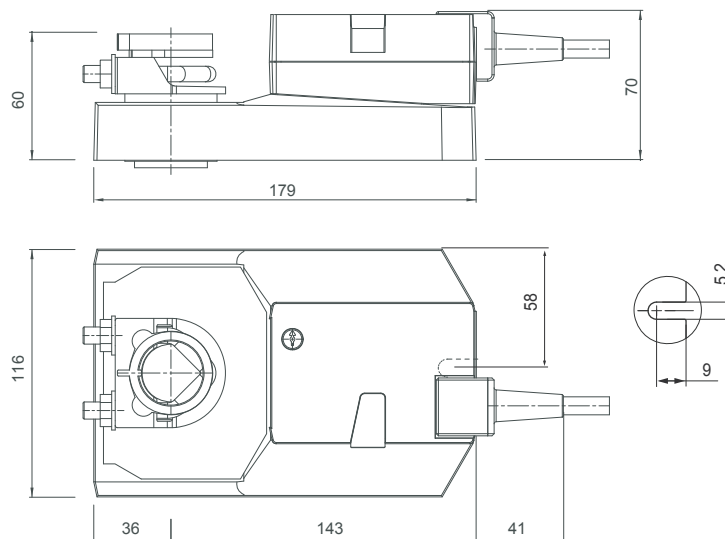
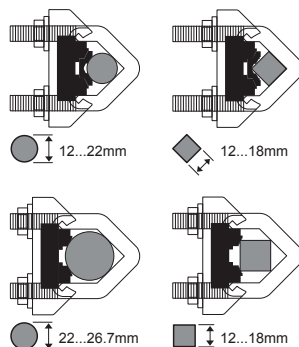
## Technical data

|                            |                        |                                                         |
|----------------------------|------------------------|---------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage        | AC 24V 50/60Hz, DC 24V                                  |
|                            | Nominal voltage range  | AC/DC 19.2...28.8V                                      |
|                            | Power consumption      | 4W @ nominal torque / 2W @ holding                      |
|                            | For transformer sizing | 6VA                                                     |
| <b>Functional data</b>     | Connecting cable       | Cable 1m, 3x0.75mm <sup>2</sup>                         |
|                            | Torque                 | 40Nm @ nominal voltage                                  |
|                            | Direction of rotation  | Selectable by switch                                    |
|                            | Manual override        | Gearing latch disengaged by push button, self-resetting |
| <b>Working conditions</b>  | Angle of rotation      | Max. 95°, adjustable by mechanical stops                |
|                            | Running time           | 150s                                                    |
|                            | Sound power level      | Max. 45dB(A)                                            |
|                            | Position indicator     | Mechanical, remote visible                              |
| <b>Dimensions / weight</b> | Protection class       | III (safety extra-low voltage)                          |
|                            | Degree of protection   | IP54                                                    |
|                            | EMC                    | CE according to 89/336/EEC                              |
|                            | Mode of operation      | Type 1 (EN 60730-1)                                     |
|                            | Ambient temp.          | -30...+50°C                                             |
|                            | Non-operation temp.    | -40...+80°C                                             |
|                            | Humidity               | 5...95% RH, non-condensing                              |
|                            | Maintenance            | Maintenance-free                                        |
|                            | Dimensions (LxWxH)     | See "Dimensions"                                        |
|                            | Shaft length           | Min. 52mm (20mm for reverse mounting)                   |
|                            | Shaft                  | 12...26.7mm / 12...25.2mm                               |
|                            | Weight                 | 1.7kg                                                   |

## Dimensions [mm]

Standard :

| Damper spindle                                                                      | Length | 12...26.7 | 12...25.2 |
|-------------------------------------------------------------------------------------|--------|-----------|-----------|
|  | >52    | 12...26.7 | >12 <25.2 |
|  | >20    | 12...26.7 | >12 <25.2 |



- For operation of air control dampers in HVAC system
- Torque: 40Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

### Electrical data

|                        |                                      |
|------------------------|--------------------------------------|
| Nominal voltage        | AC 24V 50/60Hz, DC 24V               |
| Nominal voltage range  | AC/DC 19.2...28.8V                   |
| Power consumption      | 4.5W @ nominal torque / 2W @ holding |
| For transformer sizing | 6.5VA                                |
| Connecting cable       | Cable 1m, 4x0.75mm <sup>2</sup>      |

### Functional data

|                            |                                                         |
|----------------------------|---------------------------------------------------------|
| Torque                     | 40Nm @ nominal voltage                                  |
| Control signal Y           | DC (0)2...10V @ input impedance 100kΩ                   |
| Position feedback signal U | DC 2...10V @ max. 1mA                                   |
| Position accuracy          | ±5%                                                     |
| Direction of rotation      | Selectable by switch                                    |
| Manual override            | Gearing latch disengaged by push button, self-resetting |
| Angle of rotation          | Max. 95°, adjustable by mechanical stops                |
| Running time               | 150s                                                    |
| Sound power level          | Max. 45dB(A)                                            |
| Position indicator         | Mechanical, remote visible                              |

### Working conditions

|                      |                                |
|----------------------|--------------------------------|
| Protection class     | III (safety extra-low voltage) |
| Degree of protection | IP54                           |
| EMC                  | CE according to 89/336/EEC     |
| Mode of operation    | Type 1 (EN 60730-1)            |
| Ambient temp.        | -30...+50°C                    |
| Non-operation temp.  | -40...+80°C                    |
| Humidity             | 5...95% RH, non-condensing     |

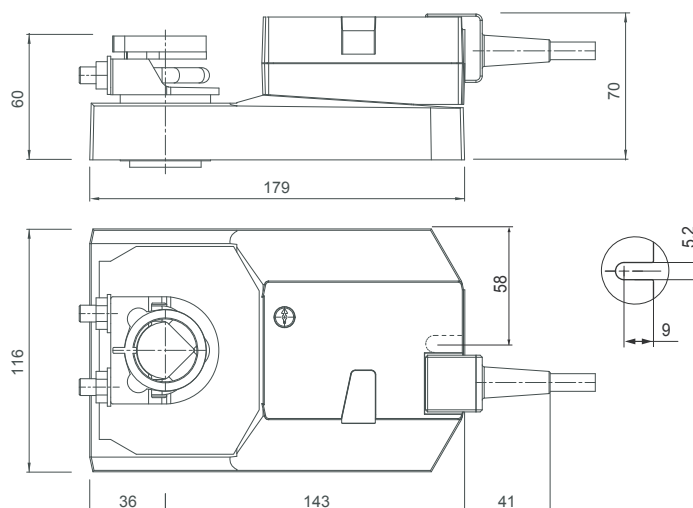
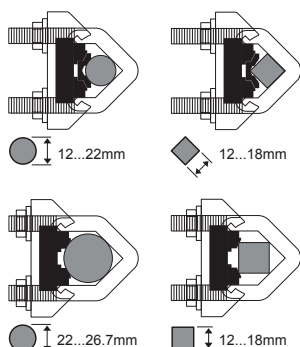
### Dimensions / weight

|                    |                                       |
|--------------------|---------------------------------------|
| Maintenance        | Maintenance-free                      |
| Dimensions (LxWxH) | See "Dimensions"                      |
| Shaft length       | Min. 52mm (20mm for reverse mounting) |
| Shaft              | ⌀12...26.7mm / 12...25.2mm            |
| Weight             | 1.7kg                                 |

## Dimensions [mm]

Standard :

| Damper spindle                                                                      | Length | ⌀12       | ⌀12.7 | ⌀12.7 | ⌀12.7 |
|-------------------------------------------------------------------------------------|--------|-----------|-------|-------|-------|
|  | >52    | 12...26.7 | >12   | <25.2 |       |
|  | >20    | 12...26.7 | >12   | <25.2 |       |



- For operation of air control dampers in HVAC system
- Torque: 40Nm
- Nominal voltage: AC 100...240V
- Control: Open/Close



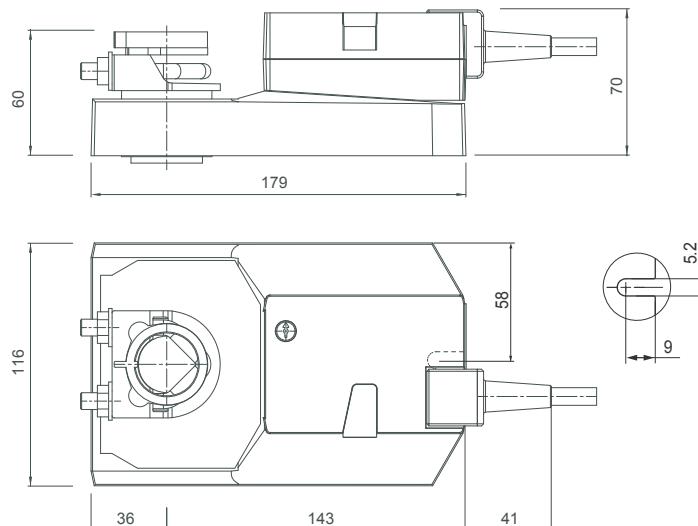
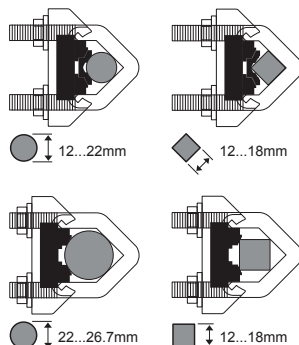
## Technical data

|                            |                           |                                                         |
|----------------------------|---------------------------|---------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage           | AC 100...240V 50/60Hz                                   |
|                            | Nominal voltage range     | AC 85...265V                                            |
|                            | Power consumption         | 5W @ nominal torque / 2W @ holding                      |
|                            | For transformer sizing    | 9VA                                                     |
|                            | Connecting cable          | Cable 1m, 3x0.75mm <sup>2</sup>                         |
| <b>Functional data</b>     | Torque                    | 40Nm @ nominal voltage                                  |
|                            | Direction of rotation     | Selectable by switch                                    |
|                            | Manual override           | Gearing latch disengaged by push button, self-resetting |
|                            | Angle of rotation         | Max. 95°, adjustable by mechanical stops                |
|                            | Running time              | 150s                                                    |
| <b>Working conditions</b>  | Sound power level         | Max. 45dB(A)                                            |
|                            | Position indicator        | Mechanical, remote visible                              |
|                            | Protection class          | II (Totally insulated)                                  |
|                            | Degree of protection      | IP54                                                    |
|                            | EMC Low voltage directive | CE according to 89/336/EEC<br>CE according to 73/23/EEC |
| <b>Dimensions / weight</b> | Mode of operation         | Type 1 (EN 60730-1)                                     |
|                            | Ambient temp.             | -30...+50°C                                             |
|                            | Non-operation temp.       | -40...+80°C                                             |
|                            | Humidity                  | 5...95% RH, non-condensing                              |
|                            | Maintenance               | Maintenance-free                                        |
|                            | Dimensions (LxWxH)        | See "Dimensions"                                        |
|                            | Shaft length              | Min. 52mm (20mm for reverse mounting)                   |
|                            | Shaft                     | ⌀ 12...26.7mm / 12...25.2mm                             |
|                            | Weight                    | 1.7kg                                                   |

## Dimensions [mm]

Standard :

| Damper spindle | Length | ⌀ 12      | ⌀ 16 | ⌀ 20  |
|----------------|--------|-----------|------|-------|
|                | >52    | 12...26.7 | >12  | <25.2 |
|                | >20    | 12...26.7 | >12  | <25.2 |



- For operation of air control dampers in HVAC system
- Torque: 4Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close (not made for 3-point applications)



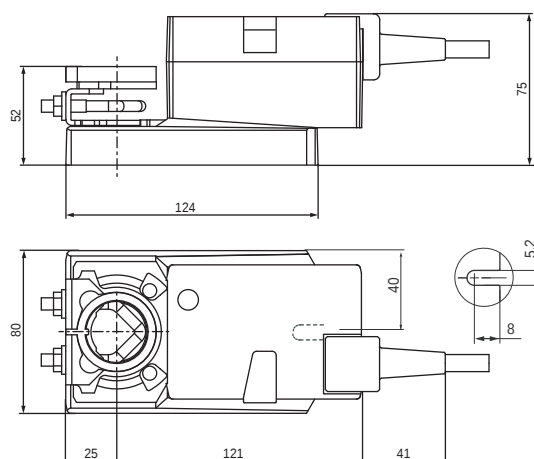
## Technical data

|                            |                                                                                   |                                                                         |
|----------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                                                                   | AC 24V 50/60Hz, DC 24V                                                  |
|                            | Nominal voltage range                                                             | AC 19.2...28.8V / DC 21.6...28.8V                                       |
|                            | Power consumption                                                                 | 13W @ nominal torque / 1.5W @ holding                                   |
|                            | For transformer sizing                                                            | 23VA (I <sub>max</sub> . 20A @ 5ms)                                     |
|                            | Connecting cable                                                                  | Cable 1m, 3x0.75mm <sup>2</sup>                                         |
| <b>Functional data</b>     | Torque                                                                            | 4Nm @ nominal voltage                                                   |
|                            | Direction of rotation                                                             | Reversible with switch 0 ↺ or 1 ↻                                       |
|                            | Manual override                                                                   | Gearing latch disengaged by push button, self-resetting                 |
|                            | Angle of rotation                                                                 | Max. 95°, adjustable by mechanical stops                                |
|                            | Running time                                                                      | 2.5s                                                                    |
|                            | Automatic adjustment of operating range to match the mechanical angle of rotation | Manual triggering of the adaption by pressing the «Adaption» button     |
|                            | Sound power level                                                                 | Max. 52dB(A)                                                            |
|                            | Position indicator                                                                | Mechanical, remote visible                                              |
|                            | Negative torque                                                                   | ⚠ ≤ 50% from nominal torque (with restrictions)                         |
|                            | Protection class                                                                  | III (safety extra-low voltage)                                          |
| <b>Working conditions</b>  | Degree of protection                                                              | IP54                                                                    |
|                            | EMC                                                                               | CE according to 2004/108/EC                                             |
|                            | Mode of operation                                                                 | Type 1 (EN 60730-1)                                                     |
|                            | Ambient temp.                                                                     | -30...+40°C (without restrictions)<br>⚠ +40...+50°C (with restrictions) |
|                            | Non-operation temp.                                                               | -40...+80°C                                                             |
|                            | Humidity                                                                          | 5...95% RH, non-condensing                                              |
|                            | Maintenance                                                                       | Maintenance-free                                                        |
|                            | Dimensions (LxWxH)                                                                | See "Dimensions"                                                        |
|                            | Weight                                                                            | 0.85kg                                                                  |
|                            |                                                                                   |                                                                         |
| <b>Dimensions / weight</b> |                                                                                   |                                                                         |
|                            |                                                                                   |                                                                         |

## Dimensions [mm]

| Damper spindle | Length | ⊙        | ■  | ◆     |
|----------------|--------|----------|----|-------|
|                | ≥40    | 8...26.7 | ≥8 | ≤26.7 |
| *              | ≥20    | 8...20   | ≥8 | ≤20   |

\* Option (accessory K-NA)



- For operation of air control dampers in HVAC system
- Torque: 4Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



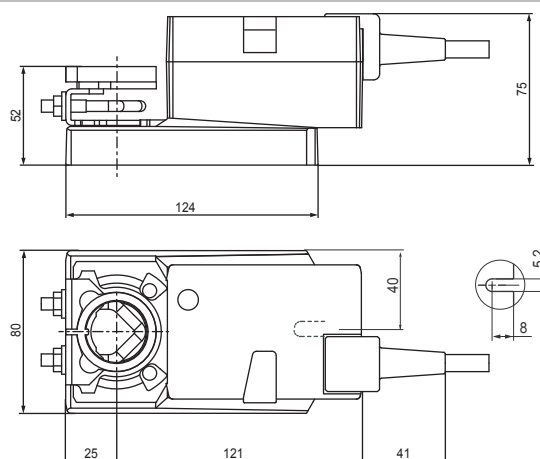
## Technical data

|                            |                                                                                                          |                                                                         |
|----------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                                                                                          | AC 24V 50/60Hz, DC 24V                                                  |
|                            | Nominal voltage range                                                                                    | AC 19.2...28.8V / DC 21.6...28.8V                                       |
|                            | Power consumption                                                                                        | 13W @ nominal torque / 1.5W @ holding                                   |
|                            | For transformer sizing                                                                                   | 23VA (Imax. 20A @ 5ms)                                                  |
|                            | Connecting cable                                                                                         | Cable 1m, 4x0.75mm <sup>2</sup>                                         |
| <b>Functional data</b>     | Torque                                                                                                   | 4Nm @ nominal voltage                                                   |
|                            | Control signal Y                                                                                         | DC (0)2...10V @ input impedance 100kΩ                                   |
|                            | Position feedback signal U                                                                               | DC 2...10V @ max. 0.5mA                                                 |
|                            | Position accuracy                                                                                        | ±5%                                                                     |
|                            | Direction of rotation                                                                                    | Reversible with switch 0 or 1                                           |
|                            | Direction of motion at Y=0V                                                                              | At switch position 0 ↺ resp. 1 ↻                                        |
|                            | Manual override                                                                                          | Gearing latch disengaged by push button, self-resetting                 |
|                            | Angle of rotation                                                                                        | Max. 95°, adjustable by mechanical stops                                |
|                            | Running time                                                                                             | 2.5s                                                                    |
|                            | Automatic adjustment of operating range and measuring signal U to match the mechanical angle of rotation | Manual triggering of the adaption by pressing the «Adaption» button     |
|                            | Sound power level                                                                                        | Max. 52dB(A)                                                            |
|                            | Position indicator                                                                                       | Mechanical, remote visible                                              |
|                            | Negative torque                                                                                          | ⚠ ≤ 50% from nominal torque (with restrictions)                         |
|                            | Protection class                                                                                         | III (safety extra-low voltage)                                          |
|                            | Degree of protection                                                                                     | IP54                                                                    |
| <b>Working conditions</b>  | EMC                                                                                                      | CE according to 2004/108/EC                                             |
|                            | Mode of operation                                                                                        | Type 1 (EN 60730-1)                                                     |
|                            | Ambient temp.                                                                                            | -30...+40°C (without restrictions)<br>⚠ +40...+50°C (with restrictions) |
|                            | Non-operation temp.                                                                                      | -40...+80°C                                                             |
|                            | Humidity                                                                                                 | 5...95% RH, non-condensing                                              |
|                            | Maintenance                                                                                              | Maintenance-free                                                        |
|                            | Dimensions (LxWxH)                                                                                       | See "Dimensions"                                                        |
|                            | Weight                                                                                                   | 0.85kg                                                                  |
|                            |                                                                                                          |                                                                         |
|                            |                                                                                                          |                                                                         |
| <b>Dimensions / weight</b> |                                                                                                          |                                                                         |
|                            |                                                                                                          |                                                                         |

## Dimensions [mm]

| Damper spindle                                                                        | Length | ● I      | ■ I | ◆ I   |
|---------------------------------------------------------------------------------------|--------|----------|-----|-------|
|    | ≥40    | 8...26.7 | ≥8  | ≤26.7 |
|  * | ≥20    | 8...20   | ≥8  | ≤20   |

\* Option (accessory K-NA)



- For operation of air control dampers in HVAC system
- Torque: 8Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close (not made for 3-point applications)



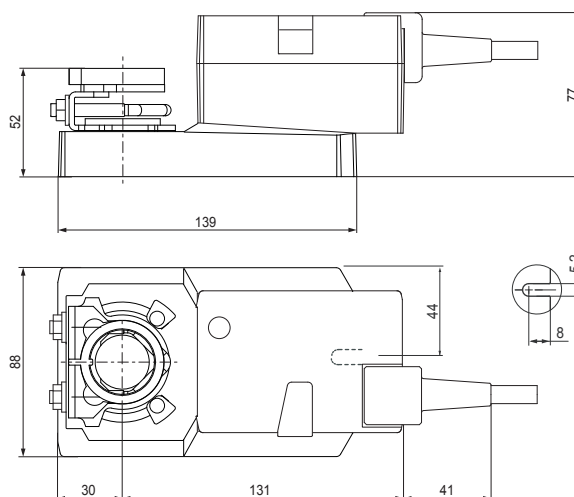
## Technical data

|                            |                                                                                   |                                                                         |
|----------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                                                                   | AC 24V 50/60Hz, DC 24V                                                  |
|                            | Nominal voltage range                                                             | AC 19.2...28.8V / DC 21.6...28.8V                                       |
|                            | Power consumption                                                                 | 13W @ nominal torque / 1.5W @ holding                                   |
|                            | For transformer sizing                                                            | 23VA (I <sub>max</sub> . 20A @ 5ms)                                     |
|                            | Connecting cable                                                                  | Cable 1m, 3x0.75mm <sup>2</sup>                                         |
| <b>Functional data</b>     | Torque                                                                            | 8Nm @ nominal voltage                                                   |
|                            | Direction of rotation                                                             | Reversible with switch 0 ↺ or 1 ↻                                       |
|                            | Manual override                                                                   | Gearing latch disengaged by push button, self-resetting                 |
|                            | Angle of rotation                                                                 | Max. 95°, adjustable by mechanical stops                                |
|                            | Running time                                                                      | 4s                                                                      |
|                            | Automatic adjustment of operating range to match the mechanical angle of rotation | Manual triggering of the adaption by pressing the «Adaption» button     |
|                            | Sound power level                                                                 | Max. 52dB(A)                                                            |
|                            | Position indicator                                                                | Mechanical, remote visible                                              |
|                            | Negative torque                                                                   | ⚠ ≤ 50% from nominal torque (with restrictions)                         |
|                            | Protection class                                                                  | III (safety extra-low voltage)                                          |
| <b>Working conditions</b>  | Degree of protection                                                              | IP54                                                                    |
|                            | EMC                                                                               | CE according to 2004/108/EC                                             |
|                            | Mode of operation                                                                 | Type 1 (EN 60730-1)                                                     |
|                            | Ambient temp.                                                                     | -30...+40°C (without restrictions)<br>⚠ +40...+50°C (with restrictions) |
|                            | Non-operation temp.                                                               | -40...+80°C                                                             |
|                            | Humidity                                                                          | 5...95% RH, non-condensing                                              |
|                            | Maintenance                                                                       | Maintenance-free                                                        |
|                            | Dimensions (LxWxH)                                                                | See "Dimensions"                                                        |
|                            | Weight                                                                            | 0.97kg                                                                  |
|                            |                                                                                   |                                                                         |
| <b>Dimensions / weight</b> |                                                                                   |                                                                         |
|                            |                                                                                   |                                                                         |

## Dimensions [mm]

| Damper spindle | Length | ● I      | ■ I | ◆ I   |
|----------------|--------|----------|-----|-------|
|                | ≥42    | 8...26.7 | ≥8  | ≤26.7 |
| *              | ≥20    | 8...20   | ≥8  | ≤20   |

\* Option (accessory K-SA)



- For operation of air control dampers in HVAC system
- Torque: 8Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



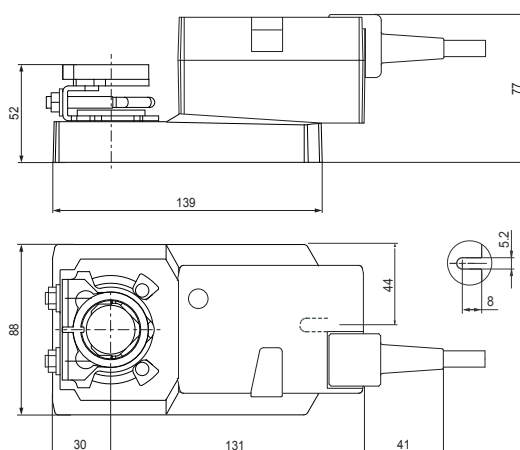
## Technical data

|                            |                                                                                                          |                                                                         |
|----------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                                                                                          | AC 24V 50/60Hz, DC 24V                                                  |
|                            | Nominal voltage range                                                                                    | AC 19.2...28.8V / DC 21.6...28.8V                                       |
|                            | Power consumption                                                                                        | 13W @ nominal torque / 1.5W @ holding                                   |
|                            | For transformer sizing                                                                                   | 23VA (I <sub>max</sub> . 20A @ 5ms)                                     |
| <b>Functional data</b>     | Connecting cable                                                                                         | Cable 1m, 4x0.75mm <sup>2</sup>                                         |
|                            | Torque                                                                                                   | 8Nm @ nominal voltage                                                   |
|                            | Control signal Y                                                                                         | DC (0)2...10V @ input impedance 100kΩ                                   |
|                            | Position feedback signal U                                                                               | DC 2...10V @ max. 0.5mA                                                 |
|                            | Position accuracy                                                                                        | ±5%                                                                     |
|                            | Direction of rotation                                                                                    | Reversible with switch 0 or 1                                           |
|                            | Direction of motion at Y=0V                                                                              | At switch position 0 ↺ resp. 1 ↻                                        |
|                            | Manual override                                                                                          | Gearing latch disengaged by push button, self-resetting                 |
|                            | Angle of rotation                                                                                        | Max. 95°, adjustable by mechanical stops                                |
|                            | Running time                                                                                             | 4s                                                                      |
|                            | Automatic adjustment of operating range and measuring signal U to match the mechanical angle of rotation | Manual triggering of the adaption by pressing the «Adaption» button     |
|                            | Sound power level                                                                                        | Max. 52dB(A)                                                            |
|                            | Position indicator                                                                                       | Mechanical, remote visible                                              |
| <b>Working conditions</b>  | Negative torque                                                                                          | ⚠ ≤ 50% from nominal torque (with restrictions)                         |
|                            | Protection class                                                                                         | III (safety extra-low voltage)                                          |
|                            | Degree of protection                                                                                     | IP54                                                                    |
|                            | EMC                                                                                                      | CE according to 2004/108/EC                                             |
|                            | Mode of operation                                                                                        | Type 1 (EN 60730-1)                                                     |
|                            | Ambient temp.                                                                                            | -30...+40°C (without restrictions)<br>⚠ +40...+50°C (with restrictions) |
|                            | Non-operation temp.                                                                                      | -40...+80°C                                                             |
|                            | Humidity                                                                                                 | 5...95% RH, non-condensing                                              |
|                            | Maintenance                                                                                              | Maintenance-free                                                        |
| <b>Dimensions / weight</b> | Dimensions (LxWxH)                                                                                       | See "Dimensions"                                                        |
|                            | Weight                                                                                                   | 0.95kg                                                                  |

## Dimensions [mm]

| Damper spindle                                                                        | Length | ● I      | ■ I | ◆ I   |
|---------------------------------------------------------------------------------------|--------|----------|-----|-------|
|    | ≥42    | 8...26.7 | ≥8  | ≤26.7 |
|  * | ≥20    | 8...20   | ≥8  | ≤20   |

\* Option (accessory K-SA)



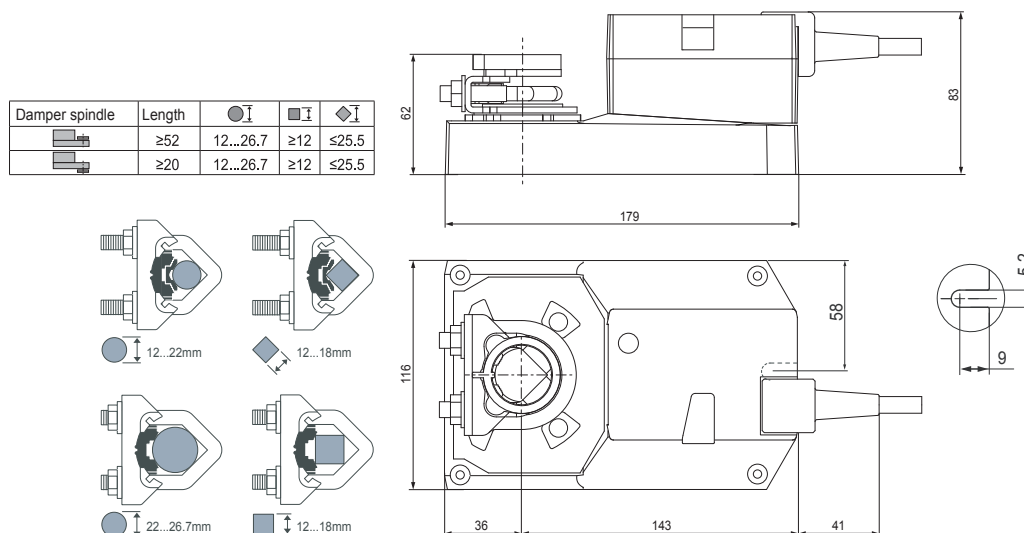
- For operation of air control dampers in HVAC system
- Torque: 16Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close (not made for 3-point applications)



## Technical data

|                            |                                                                                   |                                                                         |
|----------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                                                                   | AC 24V 50/60Hz, DC 24V                                                  |
|                            | Nominal voltage range                                                             | AC/DC 21.6...26.4V                                                      |
|                            | Power consumption                                                                 | 15W @ nominal torque / 1.5W @ holding                                   |
|                            | For transformer sizing                                                            | 26VA (Imax. 20A @ 5ms)                                                  |
|                            | Connecting cable                                                                  | Cable 1m, 3x0.75mm <sup>2</sup>                                         |
| <b>Functional data</b>     | Torque                                                                            | 16Nm @ nominal voltage                                                  |
|                            | Direction of rotation                                                             | Reversible with switch 0 ↺ or 1 ↻                                       |
|                            | Manual override                                                                   | Gearing latch disengaged by push button, self-resetting                 |
|                            | Angle of rotation                                                                 | Max. 95°, adjustable by mechanical stops                                |
|                            | Running time                                                                      | 7s                                                                      |
|                            | Automatic adjustment of operating range to match the mechanical angle of rotation | Manual triggering of the adaption by pressing the «Adaption» button     |
|                            | Sound power level                                                                 | Max. 52dB(A)                                                            |
|                            | Position indicator                                                                | Mechanical, remote visible                                              |
|                            | Negative torque                                                                   | ⚠ ≤ 50% from nominal torque (with restrictions)                         |
|                            | Protection class                                                                  | III (safety extra-low voltage)                                          |
| <b>Working conditions</b>  | Degree of protection                                                              | IP54                                                                    |
|                            | EMC                                                                               | CE according to 2004/108/EC                                             |
|                            | Mode of operation                                                                 | Type 1 (EN 60730-1)                                                     |
|                            | Ambient temp.                                                                     | -30...+40°C (without restrictions)<br>⚠ +40...+50°C (with restrictions) |
|                            | Non-operation temp.                                                               | -40...+80°C                                                             |
|                            | Humidity                                                                          | 5...95% RH, non-condensing                                              |
|                            | Maintenance                                                                       | Maintenance-free                                                        |
|                            | Dimensions (LxWxH)                                                                | See "Dimensions"                                                        |
|                            | Weight                                                                            | 1.7kg                                                                   |
|                            |                                                                                   |                                                                         |
| <b>Dimensions / weight</b> |                                                                                   |                                                                         |
|                            |                                                                                   |                                                                         |

## Dimensions [mm]



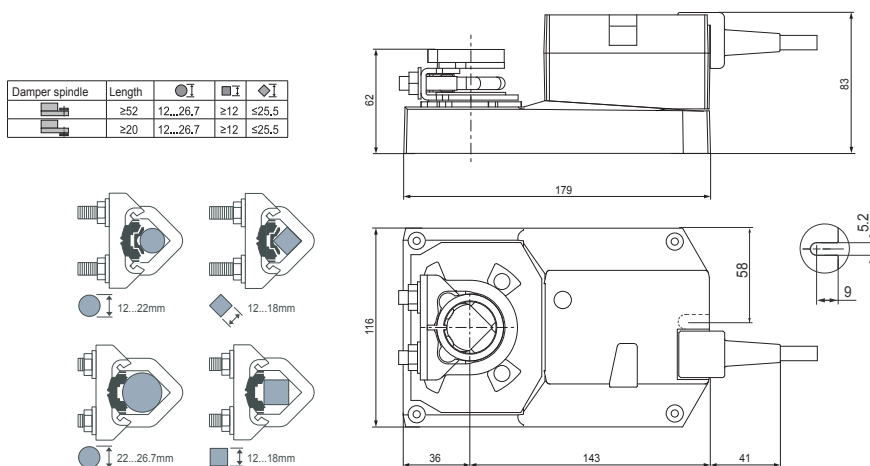
- For operation of air control dampers in HVAC system
- Torque: 16Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

|                            |                                                                                                          |                                                                         |
|----------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                                                                                          | AC 24V 50/60Hz, DC 24V                                                  |
|                            | Nominal voltage range                                                                                    | AC/DC 21.6...26.4V                                                      |
|                            | Power consumption                                                                                        | 15W @ nominal torque / 1.5W @ holding                                   |
|                            | For transformer sizing                                                                                   | 26VA (I <sub>max</sub> . 20A @ 5ms)                                     |
|                            | Connecting cable                                                                                         | Cable 1m, 4x0.75mm <sup>2</sup>                                         |
| <b>Functional data</b>     | Torque                                                                                                   | 16Nm @ nominal voltage                                                  |
|                            | Control signal Y                                                                                         | DC (0)2...10V @ input impedance 100kΩ                                   |
|                            | Position feedback signal U                                                                               | DC 2...10V @ max. 0.5mA                                                 |
|                            | Position accuracy                                                                                        | ±5%                                                                     |
|                            | Direction of rotation                                                                                    | Reversible with switch 0 or 1                                           |
|                            | Direction of motion at Y=0V                                                                              | At switch position 0 ↺ resp. 1 ↻                                        |
|                            | Manual override                                                                                          | Gearing latch disengaged by push button, self-resetting                 |
|                            | Angle of rotation                                                                                        | Max. 95°, adjustable by mechanical stops                                |
|                            | Running time                                                                                             | 7s                                                                      |
|                            | Automatic adjustment of operating range and measuring signal U to match the mechanical angle of rotation | Manual triggering of the adaption by pressing the «Adaption» button     |
| <b>Working conditions</b>  | Sound power level                                                                                        | Max. 52dB(A)                                                            |
|                            | Position indicator                                                                                       | Mechanical, remote visible                                              |
|                            | Negative torque                                                                                          | ⚠ ≤ 50% from nominal torque (with restrictions)                         |
|                            | Protection class                                                                                         | III (safety extra-low voltage)                                          |
|                            | Degree of protection                                                                                     | IP54                                                                    |
|                            | EMC                                                                                                      | CE according to 2004/108/EC                                             |
|                            | Mode of operation                                                                                        | Type 1 (EN 60730-1)                                                     |
|                            | Ambient temp.                                                                                            | -30...+40°C (without restrictions)<br>⚠ +40...+50°C (with restrictions) |
|                            | Non-operation temp.                                                                                      | -40...+80°C                                                             |
|                            | Humidity                                                                                                 | 5...95% RH, non-condensing                                              |
| <b>Dimensions / weight</b> | Maintenance                                                                                              | Maintenance-free                                                        |
|                            | Dimensions (LxWxH)                                                                                       | See "Dimensions"                                                        |
|                            | Weight                                                                                                   | 1.7kg                                                                   |

## Dimensions [mm]



- For operation of air control dampers in HVAC system
- Torque: 16Nm
- Running time 20s
- Nominal voltage: AC 100...240V
- Control: Open/Close or 3-point



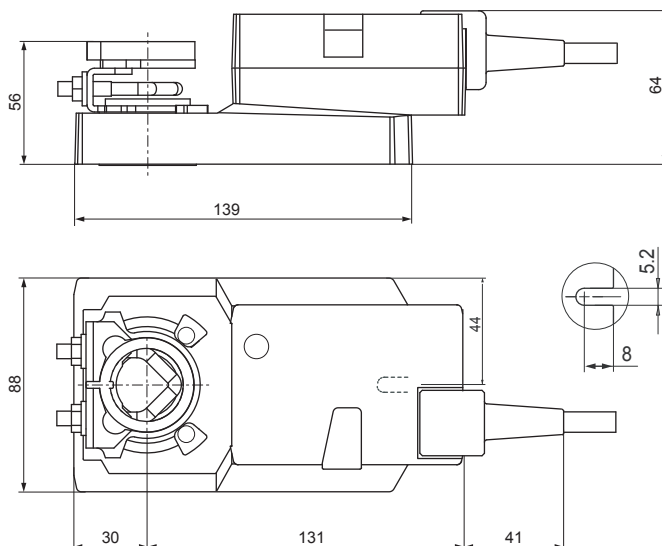
## Technical data

|                            |                          |                                                               |
|----------------------------|--------------------------|---------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage          | AC 100...240V 50/60Hz                                         |
|                            | Nominal voltage range    | AC 85...265V                                                  |
|                            | Power consumption        | 4.5W @ nominal torque / 1W @ holding                          |
|                            | For transformer sizing   | 8VA                                                           |
|                            | Connecting cable         | Cable 1m, 3x0.75mm <sup>2</sup>                               |
| <b>Functional data</b>     | Torque                   | 16Nm @ nominal voltage                                        |
|                            | Direction of rotation    | Reversible with switch 0 ↺ resp. 1 ↻                          |
|                            | Manual override          | Gearing disengaged by pressing the push button, can be locked |
|                            | Angle of rotation        | Max. 95°, can be limited with adjustable mechanical end stops |
|                            | Running time             | 20s                                                           |
| <b>Working conditions</b>  | Sound power level        | Max. 55dB(A)                                                  |
|                            | Position indicator       | Mechanical, remote visible                                    |
|                            | Protection class         | II (Totally insulated)                                        |
|                            | Degree of protection     | IP54                                                          |
|                            | EMC                      | CE according to 2004/108/EC                                   |
| <b>Dimensions / weight</b> | Low voltage directive    | CE according to 2006/95/EC                                    |
|                            | Mode of operation        | Type 1 (EN60730-1)                                            |
|                            | Rated impulse voltage    | 4kV                                                           |
|                            | Control pollution degree | 3                                                             |
|                            | Ambient temp.            | -30...+50°C                                                   |
|                            | Non-operation temp.      | -40...+80°C                                                   |
|                            | Humidity                 | 5...95% RH, non-condensing                                    |
|                            | Maintenance              | Maintenance-free                                              |
|                            | Dimensions (LxWxH)       | See "Dimensions"                                              |
|                            | Weight                   | 1kg                                                           |

## Dimensions [mm]

| Damper spindle | Length | ● I                     | ■ I | ◆ I |
|----------------|--------|-------------------------|-----|-----|
|                | ≥48    | 10 ... 20 <sup>1)</sup> | ≥10 | ≤20 |
|                | ≥20    | 10 ... 20 <sup>1)</sup> | ≥10 | ≤20 |

<sup>1)</sup> CrNi (INOX) 12 ... 20



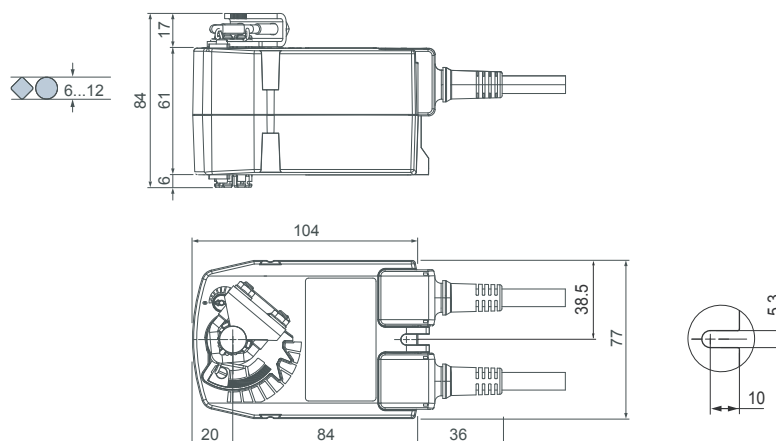
- For operation of air control dampers that perform safety function
- Torque: 2.5Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close
- Integrated auxiliary switch (TF24-S)



## Technical data

|                            |                                                   |                                                                    |
|----------------------------|---------------------------------------------------|--------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                                   | AC 24V 50/60Hz, DC 24V                                             |
|                            | Nominal voltage range                             | AC 19.2...28.8V / DC 21.6...28.8V                                  |
|                            | Power consumption                                 | 2.5W @ nominal torque / 1.5W @ holding                             |
|                            | For transformer sizing                            | 5VA                                                                |
|                            | Auxiliary switch (-S)                             | 1 SPDT, 1mA...3(0.5)A, AC 250V, adjustable                         |
|                            | Connecting cable -motor<br>-auxiliary switch (-S) | Cable 1m, 2x0.75mm <sup>2</sup><br>Cable 1m, 3x0.75mm <sup>2</sup> |
| <b>Functional data</b>     | Torque                                            | 2.5Nm @ nominal voltage                                            |
|                            | Direction of rotation                             | Selectable by mounting L/R                                         |
|                            | Angle of rotation                                 | Max. 95°, 37...100% adjustable by mechanical stops                 |
|                            | Running time -motor<br>-spring return             | 75s<br>25s @ -20...+50°C / max. 60s @ -30°C                        |
|                            | Sound power level -motor<br>-spring return        | Max. 50dB(A)<br>Max. 62dB(A)                                       |
|                            | Position indicator                                | Mechanical                                                         |
| <b>Working conditions</b>  | Protection class                                  | III (safety extra-low voltage)                                     |
|                            | Degree of protection                              | IP42                                                               |
|                            | EMC                                               | CE according to 89/336/EEC                                         |
|                            | Mode of operation                                 | Type 1.AA (EN 60730-1)                                             |
|                            | Ambient temp.<br>Non-operation temp.              | -30...+50°C<br>-40...+80°C                                         |
|                            | Humidity                                          | 5...95% RH, non-condensing                                         |
| <b>Dimensions / weight</b> | Maintenance                                       | Maintenance-free                                                   |
|                            | Dimensions (LxWxH)                                | See "Dimensions"                                                   |
|                            | Shaft length<br>Clamp up<br>Clamp down            | Min. 84mm<br>Min. 20mm                                             |
|                            | Shaft                                             | 6...12mm                                                           |
|                            | Weight                                            | 0.6kg                                                              |

## Dimensions [mm]



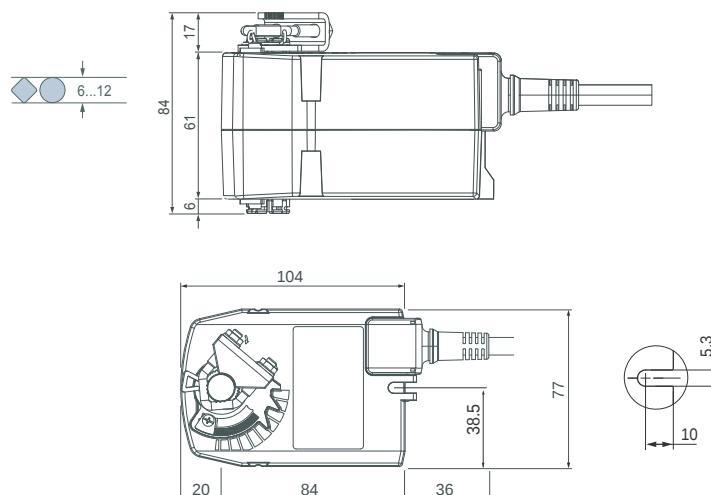
- For operation of air control dampers that perform safety function
- Torque: 2.5Nm
- Nominal voltage: AC 24V
- Control: 3-point



## Technical data

|                            |                          |                                                    |
|----------------------------|--------------------------|----------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage          | AC 24V 50/60Hz                                     |
|                            | Nominal voltage range    | AC 19.2...28.8V                                    |
|                            | Power consumption        | 2.5W @ nominal torque / 1W @ holding               |
|                            | For transformer sizing   | 4VA                                                |
| <b>Functional data</b>     | Connecting cable         | Cable 1m, 4x0.75mm <sup>2</sup>                    |
|                            | Torque                   | 2.5Nm @ nominal voltage                            |
|                            | Direction of rotation    | Selectable by mounting L/R                         |
|                            | Angle of rotation        | Max. 95°, 37...100% adjustable by mechanical stops |
| <b>Working conditions</b>  | Running time -motor      | 150s                                               |
|                            | -spring return           | 25s @ -20...+50°C / max. 60s @ -30°C               |
|                            | Sound power level -motor | Max. 35dB(A)                                       |
|                            | -spring return           | Max. 62dB(A)                                       |
| <b>Dimensions / weight</b> | Position indicator       | Mechanical                                         |
|                            | Protection class         | III (safety extra-low voltage)                     |
|                            | Degree of protection     | IP42                                               |
|                            | EMC                      | CE according to 89/336/EEC                         |
|                            | Mode of operation        | Type 1.AA (EN 60730-1)                             |
|                            | Ambient temp.            | -30...+50°C                                        |
|                            | Non-operation temp.      | -40...+80°C                                        |
|                            | Humidity                 | 5...95% RH, non-condensing                         |
|                            | Maintenance              | Maintenance-free                                   |
|                            | Dimensions (LxWxH)       | See "Dimensions"                                   |
|                            | Shaft length             | Clamp up Min. 84mm<br>Clamp down Min. 20mm         |
|                            | Shaft                    | 6...12mm                                           |
|                            | Weight                   | 0.6kg                                              |

## Dimensions [mm]



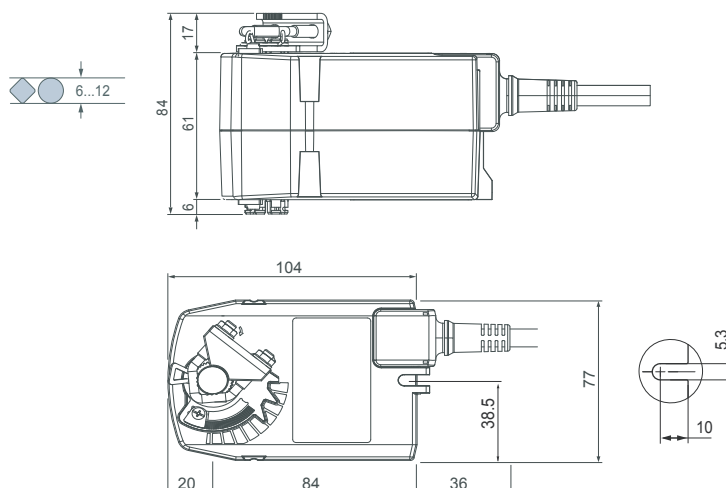
- For operation of air control dampers that perform safety function
- Torque: 2.5Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

|                            |                            |                                                    |
|----------------------------|----------------------------|----------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage            | AC 24V 50/60Hz, DC 24V                             |
|                            | Nominal voltage range      | AC 19.2...28.8V / DC 21.6...28.8V                  |
|                            | Power consumption          | 2.5W @ nominal torque / 1W @ holding               |
|                            | For transformer sizing     | 4VA                                                |
| <b>Functional data</b>     | Connecting cable           | Cable 1m, 4x0.75mm <sup>2</sup>                    |
|                            | Torque                     | 2.5Nm @ nominal voltage                            |
|                            | Control signal Y           | DC (0)2...10V @ input impedance 100kΩ              |
|                            | Position feedback signal U | DC 2...10V @ max. 0.5mA                            |
| <b>Working conditions</b>  | Direction of rotation      | Selectable by mounting L/R                         |
|                            | Angle of rotation          | Max. 95°, 37...100% adjustable by mechanical stops |
|                            | Running time -motor        | 150s                                               |
|                            | -spring return             | 25s @ -20...+50°C / max. 60s @ -30°C               |
|                            | Sound power level -motor   | Max. 35dB(A)                                       |
|                            | -spring return             | Max. 62dB(A)                                       |
|                            | Position indicator         | Mechanical                                         |
|                            | Protection class           | III (safety extra-low voltage)                     |
|                            | Degree of protection       | IP42                                               |
|                            | EMC                        | CE according to 89/336/EEC                         |
|                            | Mode of operation          | Type 1.AA (EN 60730-1)                             |
|                            | Ambient temp.              | -30...+50°C                                        |
| <b>Dimensions / weight</b> | Non-operation temp.        | -40...+80°C                                        |
|                            | Humidity                   | 5...95% RH, non-condensing                         |
|                            | Maintenance                | Maintenance-free                                   |
|                            | Dimensions (LxWxH)         | See "Dimensions"                                   |
|                            | Shaft length               | Clamp up Min. 84mm                                 |
|                            | Clamp down                 | Min. 20mm                                          |
|                            | Shaft                      | 6...12mm                                           |
|                            | Weight                     | 0.6kg                                              |

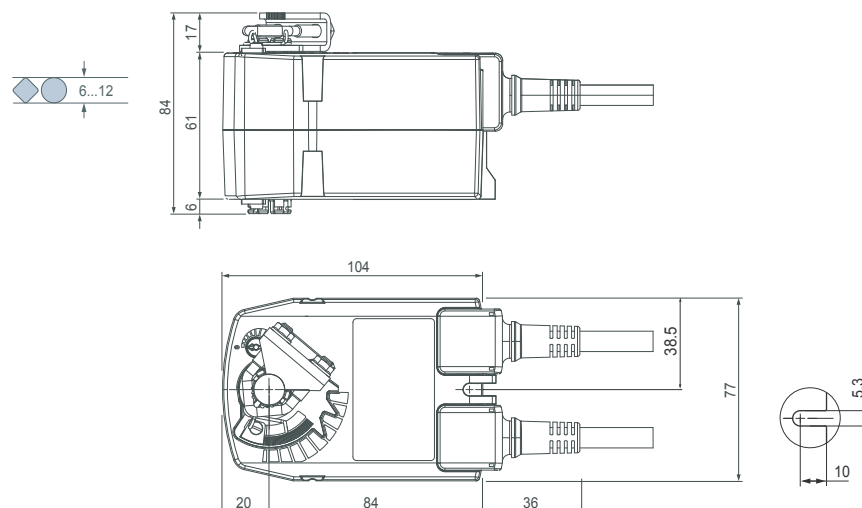
## Dimensions [mm]



- For operation of air control dampers that perform safety function
- Torque: 2.5Nm
- Nominal voltage: AC 100...240V
- Control: Open/Close
- Integrated auxiliary switch (TF230-S)


**Technical data**

|                            |                                                   |                                                                    |
|----------------------------|---------------------------------------------------|--------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                                   | AC 100...240V 50/60Hz                                              |
|                            | Nominal voltage range                             | AC 85...265V                                                       |
|                            | Power consumption                                 | 2.5W @ nominal torque / 1.5W @ holding                             |
|                            | For transformer sizing                            | 5VA                                                                |
|                            | Auxiliary switch (-S)                             | 1 SPDT, 1mA...3(0.5)A, AC 250V, adjustable                         |
|                            | Connecting cable -motor<br>-auxiliary switch (-S) | Cable 1m, 2x0.75mm <sup>2</sup><br>Cable 1m, 3x0.75mm <sup>2</sup> |
| <b>Functional data</b>     | Torque                                            | 2.5Nm @ nominal voltage                                            |
|                            | Direction of rotation                             | Selectable by mounting L/R                                         |
|                            | Angle of rotation                                 | Max. 95°, 37...100% adjustable by mechanical stops                 |
|                            | Running time -motor<br>-spring return             | 75s<br>25s @ -20...+50°C / max. 60s @ -30°C                        |
|                            | Sound power level -motor<br>-spring return        | Max. 50dB(A)<br>Max. 62dB(A)                                       |
|                            | Position indicator                                | Mechanical                                                         |
| <b>Working conditions</b>  | Protection class                                  | II (Totally insulated)                                             |
|                            | Degree of protection                              | IP42                                                               |
|                            | EMC                                               | CE according to 89/336/EEC                                         |
|                            | Low voltage directive                             | CE according to 73/23/EEC                                          |
|                            | Mode of operation                                 | Type 1.AA (EN 60730-1)                                             |
|                            | Ambient temp.<br>Non-operation temp.              | -30...+50°C<br>-40...+80°C                                         |
| <b>Dimensions / weight</b> | Humidity                                          | 5...95% RH, non-condensing                                         |
|                            | Maintenance                                       | Maintenance-free                                                   |
|                            | Dimensions (LxWxH)                                | See "Dimensions"                                                   |
|                            | Shaft length    Clamp up<br>Clamp down            | Min. 84mm<br>Min. 20mm                                             |
|                            | Shaft                                             | 6...12mm                                                           |
|                            | Weight                                            | 0.6kg                                                              |

**Dimensions [mm]**


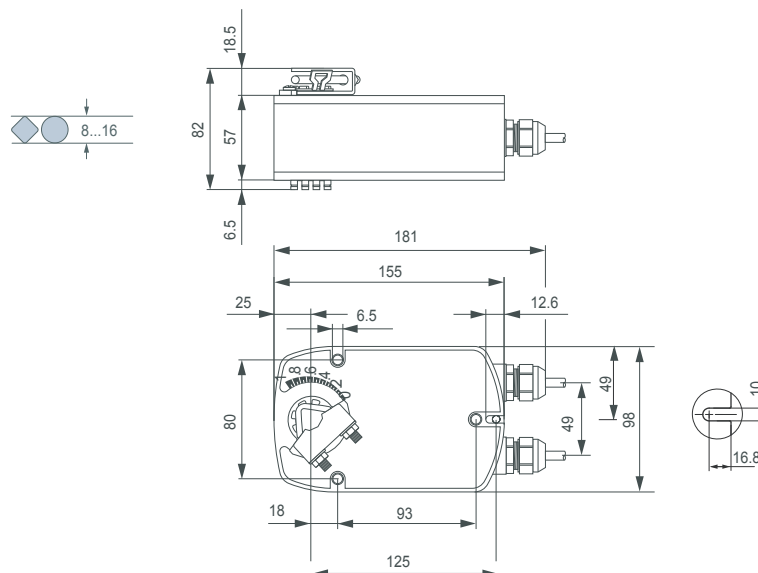
- For operation of air control dampers that perform safety function
- Torque: 4Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close
- Integrated auxiliary switch (LF24-S)



## Technical data

|                            |                                                   |                                                                    |
|----------------------------|---------------------------------------------------|--------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                                   | AC 24V 50/60Hz, DC 24V                                             |
|                            | Nominal voltage range                             | AC 19.2...28.8V / DC 21.6...28.8V                                  |
|                            | Power consumption                                 | 5W @ nominal torque / 2.5W @ holding                               |
|                            | For transformer sizing                            | 7VA                                                                |
|                            | Auxiliary switch (-S)                             | 1 SPDT, 1mA...3(0.5)A, AC 250V, adjustable                         |
|                            | Connecting cable -motor<br>-auxiliary switch (-S) | Cable 1m, 2x0.75mm <sup>2</sup><br>Cable 1m, 3x0.75mm <sup>2</sup> |
| <b>Functional data</b>     | Torque                                            | 4Nm @ nominal voltage                                              |
|                            | Direction of rotation                             | Selectable by mounting L/R                                         |
|                            | Angle of rotation                                 | Max. 95°, 37...100% adjustable by mechanical stops                 |
|                            | Running time -motor<br>-spring return             | 40...75s<br>20s @ -20...+50°C / max. 60s @ -30°C                   |
|                            | Sound power level -motor<br>-spring return        | Max. 50dB(A)<br>Max. 62dB(A)                                       |
|                            | Position indicator                                | Mechanical                                                         |
| <b>Working conditions</b>  | Protection class                                  | III (safety extra-low voltage)                                     |
|                            | Degree of protection                              | IP54                                                               |
|                            | EMC                                               | CE according to 2004/108/EC                                        |
|                            | Ambient temp.<br>Non-operation temp.              | -30...+50°C<br>-40...+80°C                                         |
|                            | Humidity                                          | 5...95% RH, non-condensing                                         |
|                            | Maintenance                                       | Maintenance-free                                                   |
| <b>Dimensions / weight</b> | Dimensions (LxWxH)                                | See "Dimensions"                                                   |
|                            | Shaft length<br>Clamp up<br>Clamp down            | Min. 84mm<br>Min. 20mm                                             |
|                            | Shaft                                             | 8...16mm                                                           |
|                            | Weight                                            | 1.4kg                                                              |

## Dimensions [mm]



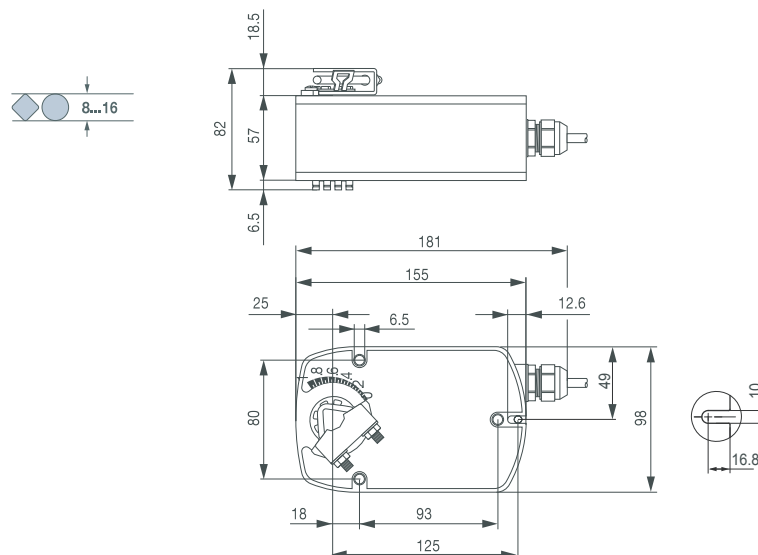
- For operation of air control dampers that perform safety function
- Torque: 4Nm
- Nominal voltage: AC/DC 24V
- Control: 3-point



## Technical data

|                            |                          |                                                    |
|----------------------------|--------------------------|----------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage          | AC 24V 50/60Hz, DC 24V                             |
|                            | Nominal voltage range    | AC 19.2...28.8V / DC 21.6...28.8V                  |
|                            | Power consumption        | 2.5W @ nominal torque / 1W @ holding               |
|                            | For transformer sizing   | 5VA                                                |
| <b>Functional data</b>     | Connecting cable         | Cable 1m, 4x0.75mm <sup>2</sup>                    |
|                            | Torque                   | 4Nm @ nominal voltage                              |
|                            | Direction of rotation    | Selectable by mounting L/R                         |
|                            | Angle of rotation        | Max. 95°, 37...100% adjustable by mechanical stops |
| <b>Working conditions</b>  | Running time -motor      | 150s                                               |
|                            | -spring return           | 20s @ -20...+50°C / max. 60s @ -30°C               |
|                            | Sound power level -motor | Max. 30dB(A)                                       |
|                            | -spring return           | Max. 62dB(A)                                       |
| <b>Dimensions / weight</b> | Position indicator       | Mechanical                                         |
|                            | Protection class         | III (safety extra-low voltage)                     |
|                            | Degree of protection     | IP54                                               |
|                            | EMC                      | CE according to 2004/108/EC                        |
|                            | Ambient temp.            | -30...+50°C                                        |
|                            | Non-operation temp.      | -40...+80°C                                        |
|                            | Humidity                 | 5...95% RH, non-condensing                         |
|                            | Maintenance              | Maintenance-free                                   |
|                            | Dimensions (LxWxH)       | See "Dimensions"                                   |
|                            | Shaft length             | Min. 84mm                                          |
|                            | Clamp up                 | Min. 20mm                                          |
|                            | Clamp down               | Min. 20mm                                          |
|                            | Shaft                    | 8...16mm                                           |
|                            | Weight                   | 1.4kg                                              |

## Dimensions [mm]



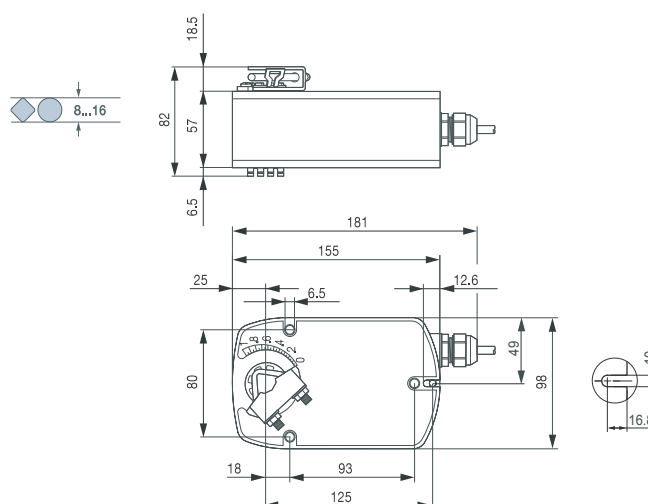
- For operation of air control dampers that perform safety function
- Torque: 4Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

|                      |                            |                                |                                                                                              |
|----------------------|----------------------------|--------------------------------|----------------------------------------------------------------------------------------------|
| Electrical data      | Nominal voltage            |                                | AC 24V 50/60Hz, DC 24V                                                                       |
|                      | Nominal voltage range      |                                | AC 19.2...28.8V / DC 21.6...28.8V                                                            |
|                      | Power consumption          |                                | 2.5W @ nominal torque / 1W @ holding                                                         |
|                      | For transformer sizing     |                                | 5VA                                                                                          |
|                      | Connecting cable           |                                | Cable 1m, 4x0.75mm <sup>2</sup>                                                              |
| Functional data      | Torque                     |                                | 4Nm @ nominal voltage                                                                        |
|                      | Control signal Y           |                                | DC (0)2...10V @ input impedance 100kΩ                                                        |
|                      | Position feedback signal U |                                | DC 2...10V @ max. 0.7mA                                                                      |
|                      | Direction of rotation      |                                | Selectable by L/R switch<br>Selectable by L/R mounting                                       |
|                      | Angle of rotation          |                                | Max. 95°, 37...100% adjustable by mechanical stops                                           |
|                      | Running time               | -motor                         | 150s                                                                                         |
|                      |                            | -spring return                 | 20s @ -20...+50°C / max. 60s @ -30°C                                                         |
|                      | Sound power level          | -motor                         | Max. 30dB(A)                                                                                 |
|                      |                            | -spring return                 | Max. 62dB(A)                                                                                 |
|                      | Working conditions         | Position indicator             |                                                                                              |
| Protection class     |                            | III (safety extra-low voltage) |                                                                                              |
| Degree of protection |                            | IP54                           |                                                                                              |
| EMC                  |                            | CE according to 2004/108/EC    |                                                                                              |
| Mode of operation    |                            | Type 1.AA (EN 60730-1)         |                                                                                              |
| Ambient temp.        |                            | -30...+50°C                    |                                                                                              |
| Non-operation temp.  |                            | -40...+80°C                    |                                                                                              |
| Humidity             |                            | 5...95% RH, non-condensing     |                                                                                              |
| Maintenance          |                            | Maintenance-free               |                                                                                              |
| Dimensions / weight  |                            | Dimensions (LxWxH)             |                                                                                              |
|                      | Shaft length               | Clamp up                       | Min. 84mm                                                                                    |
|                      |                            | Clamp down                     | Min. 20mm                                                                                    |
|                      | Shaft                      |                                |  8...16mm |
|                      | Weight                     |                                | 1.4kg                                                                                        |

### Dimensions [mm]



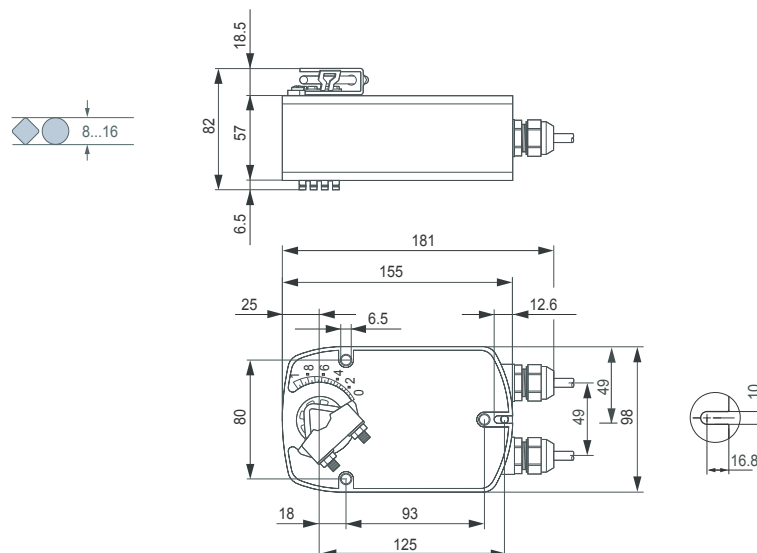
- For operation of air control dampers that perform safety function
- Torque: 4Nm
- Nominal voltage: AC 230V
- Control: Open/Close
- Integrated auxiliary switch (LF230-S)



### Technical data

|                            |                                                   |                                                                    |
|----------------------------|---------------------------------------------------|--------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage                                   | AC 230V 50/60Hz                                                    |
|                            | Nominal voltage range                             | AC 198...264V                                                      |
|                            | Power consumption                                 | 5W @ nominal torque / 3W @ holding                                 |
|                            | For transformer sizing                            | 7VA                                                                |
|                            | Auxiliary switch (-S)                             | 1 SPDT, 1mA...3(0.5)A, AC 250V, adjustable                         |
|                            | Connecting cable -motor<br>-auxiliary switch (-S) | Cable 1m, 2x0.75mm <sup>2</sup><br>Cable 1m, 3x0.75mm <sup>2</sup> |
| <b>Functional data</b>     | Torque                                            | 4Nm @ nominal voltage                                              |
|                            | Direction of rotation                             | Selectable by mounting L/R                                         |
|                            | Angle of rotation                                 | Max. 95°, 37...100% adjustable by mechanical stops                 |
|                            | Running time -motor<br>-spring return             | 40...75s<br>20s @ -20...+50°C / max. 60s @ -30°C                   |
|                            | Sound power level -motor<br>-spring return        | Max. 50dB(A)<br>Max. 62dB(A)                                       |
|                            | Position indicator                                | Mechanical                                                         |
| <b>Working conditions</b>  | Protection class                                  | II (Totally insulated)                                             |
|                            | Degree of protection                              | IP54                                                               |
|                            | EMC                                               | CE according to 2004/108/EC                                        |
|                            | Low voltage directive                             | CE according to 2006/95/EC                                         |
|                            | Ambient temp.<br>Non-operation temp.              | -30...+50°C<br>-40...+80°C                                         |
|                            | Humidity                                          | 5...95% RH, non-condensing                                         |
| <b>Dimensions / weight</b> | Maintenance                                       | Maintenance-free                                                   |
|                            | Dimensions (LxWxH)                                | See "Dimensions"                                                   |
|                            | Shaft length      Clamp up<br>Clamp down          | Min. 84mm<br>Min. 20mm                                             |
|                            | Shaft                                             | 8...16mm                                                           |
|                            | Weight                                            | 1.55kg                                                             |

### Dimensions [mm]



Damper actuator for operating air control dampers in ventilation and air-conditioning systems for building services installations

- Torque: 10Nm
- Nominal voltage: AC 24...240V / DC 24...125V
- Control: Open/Close



## Technical data

|                            |                        |                                                                   |
|----------------------------|------------------------|-------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage        | AC 24...240V 50/60Hz, DC 24...125V                                |
|                            | Nominal voltage range  | AC 19.2...264V / DC 21.6...137.5V                                 |
|                            | Power consumption      | 6W @ nominal torque / 2.5W @ holding                              |
|                            | For transformer sizing | 6VA @ AC 24V; 6.5VA @ AC 120V; 9.5VA @ AC 240V                    |
|                            | Connecting cable       | Cable 1m, 2x0.75mm <sup>2</sup>                                   |
| <b>Functional data</b>     | Torque                 | 10Nm @ nominal voltage                                            |
|                            | Direction of rotation  | Selectable by mounting L/R                                        |
|                            | Manual override        | By manual override key                                            |
|                            | Angle of rotation      | Max. 95°, adjustable by mechanical stops                          |
|                            | Running time           | -motor 75s<br>-spring return 20s @ -20...+50°C / max. 60s @ -30°C |
| <b>Working conditions</b>  | Sound power level      | -motor Max. 45dB(A)<br>-spring return Max. 62dB(A)                |
|                            | Position indicator     | Mechanical                                                        |
|                            | Protection class       | II (Totally insulated)                                            |
|                            | Degree of protection   | IP54                                                              |
|                            | EMC                    | CE according to 2004/108/EC                                       |
|                            | Low voltage directive  | CE according to 2006/95/EC                                        |
|                            | Mode of operation      | Type 1.AA (EN 60730-1)                                            |
|                            | Ambient temp.          | -30...+50°C                                                       |
|                            | Non-operation temp.    | -40...+80°C                                                       |
|                            | Humidity               | 5...95% RH, non-condensing                                        |
| <b>Dimensions / weight</b> | Maintenance            | Maintenance-free                                                  |
|                            | Dimensions (LxWxH)     | See "Dimensions"                                                  |
|                            | Weight                 | 2kg                                                               |

## Dimensions [mm]

Standard :  
¾"-clamp (with insert)

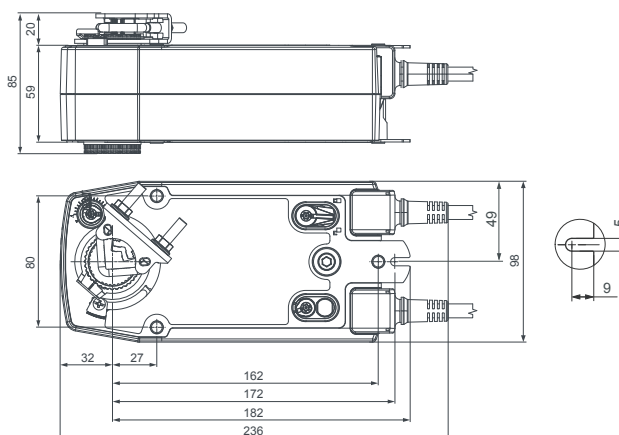
| Damper shaft | Length | ● I     | ■ I | ◆ I       |
|--------------|--------|---------|-----|-----------|
|              | ≥85    | 10...22 | 10  | 14...25.4 |
|              | ≥15    | 10...22 | 10  | 14...25.4 |

Optional 1:  
1"-clamp (without insert)

| Damper shaft | Length | ● I       | ■ I     |
|--------------|--------|-----------|---------|
|              | ≥85    | 19...25.4 | 12...18 |
|              | ≥15    | 19...25.4 | 12...18 |

Optional 2:  
½"-clamp (optional via configuration)

| Damper shaft | Length | ● I     | ■ I | ◆ I     |
|--------------|--------|---------|-----|---------|
|              | ≥85    | 10...19 | —   | 14...20 |
|              | ≥15    | 10...19 | —   | 14...20 |



Damper actuator for operating air control dampers in ventilation and air-conditioning systems for building services installations

- Torque: 10Nm
- Nominal voltage: AC 24...240V / DC 24...125V
- Control: Open/Close
- 2xSPDT auxiliary switches



## Technical data

### Electrical data

|                         |                                                                             |
|-------------------------|-----------------------------------------------------------------------------|
| Nominal voltage         | AC 24...240V 50/60Hz, DC 24...125V                                          |
| Nominal voltage range   | AC 19.2...264V / DC 21.6...137.5V                                           |
| Power consumption       | 6W @ nominal torque / 2.5W @ holding                                        |
| For transformer sizing  | 6VA @ AC 24V; 6.5VA @ AC 120V; 9.5VA @ AC 240V                              |
| Auxiliary switch (-S2)  | 2 SPDT, 1mA...3(0.5)A, AC 250V<br>one fixed at 10%, one adjustable 10...90% |
| Connecting cable -motor | Cable 1m, 2x0.75mm <sup>2</sup>                                             |
| -auxiliary switch (-S2) | Cable 1m, 6x0.75mm <sup>2</sup>                                             |

### Functional data

|                          |                                          |
|--------------------------|------------------------------------------|
| Torque                   | 10Nm @ nominal voltage                   |
| Direction of rotation    | Selectable by mounting L/R               |
| Manual override          | By manual override key                   |
| Angle of rotation        | Max. 95°, adjustable by mechanical stops |
| Running time -motor      | 75s                                      |
| -spring return           | 20s @ -20...+50°C / max. 60s @ -30°C     |
| Sound power level -motor | Max. 45dB(A)                             |
| -spring return           | Max. 62dB(A)                             |

### Working conditions

|                       |                             |
|-----------------------|-----------------------------|
| Position indicator    | Mechanical                  |
| Protection class      | II (Totally insulated)      |
| Degree of protection  | IP54                        |
| EMC                   | CE according to 2004/108/EC |
| Low voltage directive | CE according to 2006/95/EC  |
| Mode of operation     | Type 1.AA.B (EN 60730-1)    |
| Ambient temp.         | -30...+50°C                 |
| Non-operation temp.   | -40...+80°C                 |
| Humidity              | 5...95% RH, non-condensing  |
| Maintenance           | Maintenance-free            |
| Dimensions (LxWxH)    | See "Dimensions"            |
| Weight                | 2.2kg                       |

### Dimensions / weight

## Dimensions [mm]

Standard :

¾"-clamp (with insert)

| Damper shaft | Length | ●       | ■  | ◆         |
|--------------|--------|---------|----|-----------|
|              | ≥85    | 10...22 | 10 | 14...25.4 |
|              | ≥15    | 10...22 | 10 | 14...25.4 |

Optional 1:

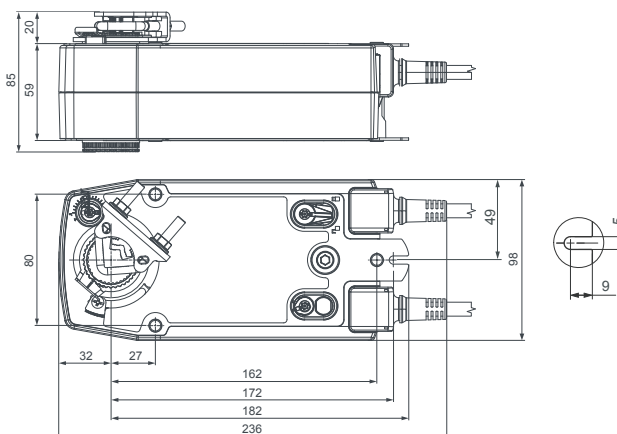
1"-clamp (without insert)

| Damper shaft | Length | ●         | ■       |
|--------------|--------|-----------|---------|
|              | ≥85    | 19...25.4 | 12...18 |
|              | ≥15    | 19...25.4 | 12...18 |

Optional 2:

½"-clamp (optional via configuration)

| Damper shaft | Length | ●       | ■ | ◆       |
|--------------|--------|---------|---|---------|
|              | ≥85    | 10...19 | — | 14...20 |
|              | ≥15    | 10...19 | — | 14...20 |



Damper actuator for operating air control dampers in ventilation and air-conditioning systems for building services installations

- Torque: 10Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

|                            |                            |                                                                    |
|----------------------------|----------------------------|--------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage            | AC 24V 50/60Hz, DC 24V                                             |
|                            | Nominal voltage range      | AC 19.2...28.8V / DC 21.6...28.8V                                  |
|                            | Power consumption          | 3.5W @ nominal torque / 2.5W @ holding                             |
|                            | For transformer sizing     | 6VA                                                                |
| <b>Functional data</b>     | Connecting cable           | Cable 1m, 4x0.75mm <sup>2</sup>                                    |
|                            | Torque                     | 10Nm @ nominal voltage                                             |
|                            | Control signal Y           | DC (0)2...10V @ input impedance 100kΩ                              |
|                            | Position feedback signal U | DC 2...10V @ max. 0.5mA                                            |
|                            | Position accuracy          | ±5%                                                                |
|                            | Direction of rotation      | Reversible with switch ↺ / ↻<br>Selectable by mounting L/R         |
|                            | Manual override            | By manual override key                                             |
|                            | Angle of rotation          | Max. 95°, adjustable by mechanical stops                           |
|                            | Running time               | -motor 150s<br>-spring return 20s @ -20...+50°C / max. 60s @ -30°C |
|                            | Sound power level          | -motor Max. 40dB(A)<br>-spring return Max. 62dB(A)                 |
| <b>Working conditions</b>  | Position indicator         | Mechanical                                                         |
|                            | Protection class           | III (safety extra-low voltage)                                     |
|                            | Degree of protection       | IP54                                                               |
|                            | EMC                        | CE according to 2004/108/EC                                        |
|                            | Mode of operation          | Type 1.AA (EN 60730-1)                                             |
|                            | Ambient temp.              | -30...+50°C                                                        |
|                            | Non-operation temp.        | -40...+80°C                                                        |
|                            | Humidity                   | 5...95% RH, non-condensing                                         |
| <b>Dimensions / weight</b> | Maintenance                | Maintenance-free                                                   |
|                            | Dimensions (LxWxH)         | See "Dimensions"                                                   |
|                            | Weight                     | 2kg                                                                |

## Dimensions [mm]

Standard :  
¾"-clamp (with insert)

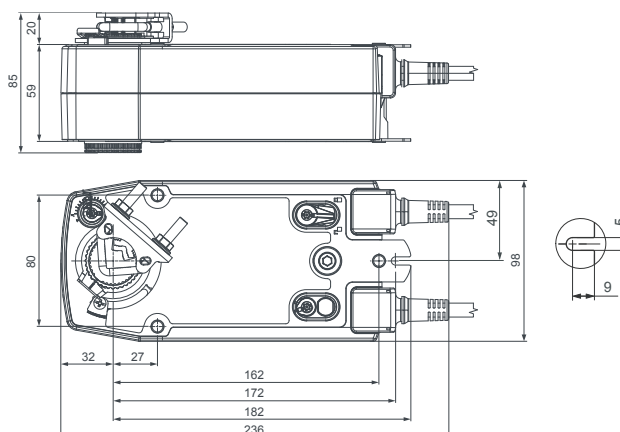
| Damper shaft | Length | ● I     | ■ I | ◆ I       |
|--------------|--------|---------|-----|-----------|
|              | ≥85    | 10...22 | 10  | 14...25.4 |
|              | ≥15    | 10...22 | 10  | 14...25.4 |

Optional 1:  
1"-clamp (without insert)

| Damper shaft | Length | ● I       | ■ I     |
|--------------|--------|-----------|---------|
|              | ≥85    | 19...25.4 | 12...18 |
|              | ≥15    | 19...25.4 | 12...18 |

Optional 2:  
½"-clamp (optional via configuration)

| Damper shaft | Length | ● I     | ■ I | ◆ I     |
|--------------|--------|---------|-----|---------|
|              | ≥85    | 10...19 | —   | 14...20 |
|              | ≥15    | 10...19 | —   | 14...20 |



Damper actuator for operating air control dampers in ventilation and air-conditioning systems for building services installations

- Torque: 20Nm
- Nominal voltage: AC 24...240V / DC 24...125V
- Control: Open/Close



## Technical data

### Electrical data

|                        |                                               |
|------------------------|-----------------------------------------------|
| Nominal voltage        | AC 24...240V 50/60Hz, DC 24...125V            |
| Nominal voltage range  | AC 19.2...264V / DC 21.6...137.5V             |
| Power consumption      | 7W @ nominal torque / 3.5W @ holding          |
| For transformer sizing | 7VA @ AC 24V; 8.5VA @ AC 120V; 18VA @ AC 240V |
| Connecting cable       | Cable 1m, 2x0.75mm <sup>2</sup>               |

### Functional data

|                       |                                                                   |
|-----------------------|-------------------------------------------------------------------|
| Torque                | 20Nm @ nominal voltage                                            |
| Direction of rotation | Selectable by mounting L/R                                        |
| Manual override       | By manual override key                                            |
| Angle of rotation     | Max. 95°, adjustable by mechanical stops                          |
| Running time          | -motor 75s<br>-spring return 20s @ -20...+50°C / max. 60s @ -30°C |
| Sound power level     | -motor Max. 45dB(A)<br>-spring return Max. 62dB(A)                |

### Working conditions

|                       |                             |
|-----------------------|-----------------------------|
| Position indicator    | Mechanical                  |
| Protection class      | II (Totally insulated)      |
| Degree of protection  | IP54                        |
| EMC                   | CE according to 2004/108/EC |
| Low voltage directive | CE according to 2006/95/EC  |
| Mode of operation     | Type 1.AA (EN 60730-1)      |
| Ambient temp.         | -30...+50°C                 |
| Non-operation temp.   | -40...+80°C                 |
| Humidity              | 5...95% RH, non-condensing  |
| Maintenance           | Maintenance-free            |

### Dimensions / weight

|                    |                  |
|--------------------|------------------|
| Dimensions (LxWxH) | See "Dimensions" |
| Weight             | 2.2kg            |

## Dimensions [mm]

Standard :  
¾"-clamp (with insert)

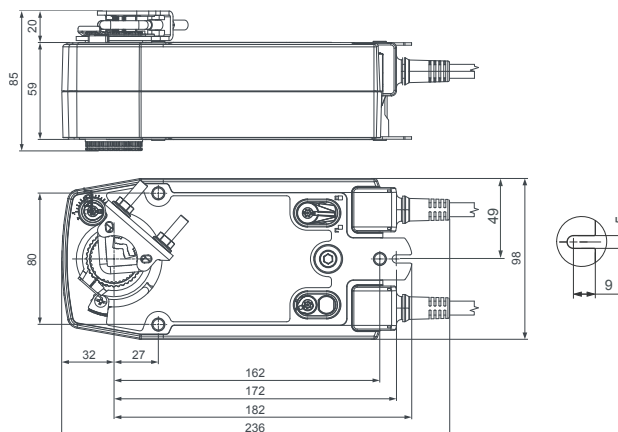
| Damper shaft | Length | ●       | ■  | ◆         |
|--------------|--------|---------|----|-----------|
|              | ≥85    | 10...22 | 10 | 14...25.4 |
|              | ≥15    | 10...22 | 10 | 14...25.4 |

Optional 1:  
1"-clamp (without insert)

| Damper shaft | Length | ●         | ■       |
|--------------|--------|-----------|---------|
|              | ≥85    | 19...25.4 | 12...18 |
|              | ≥15    | 19...25.4 | 12...18 |

Optional 2:  
½"-clamp (optional via configuration)

| Damper shaft | Length | ●       | ■ | ◆       |
|--------------|--------|---------|---|---------|
|              | ≥85    | 10...19 | — | 14...20 |
|              | ≥15    | 10...19 | — | 14...20 |



Damper actuator for operating air control dampers in ventilation and air-conditioning systems for building services installations

- Torque: 20Nm
- Nominal voltage: AC 24...240V / DC 24...125V
- Control: Open/Close
- 2xSPDT auxiliary switches



## Technical data

|                     |                          |                                                                             |
|---------------------|--------------------------|-----------------------------------------------------------------------------|
| Electrical data     | Nominal voltage          | AC 24...240V 50/60Hz, DC 24...125V                                          |
|                     | Nominal voltage range    | AC 19.2...264V / DC 21.6...137.5V                                           |
|                     | Power consumption        | 7W @ nominal torque / 3.5W @ holding                                        |
|                     | For transformer sizing   | 7VA @ AC 24V; 8.5VA @ AC 120V; 18VA @ AC 240V                               |
|                     | Auxiliary switch (-S2)   | 2 SPDT, 1mA...3(0.5)A, AC 250V<br>one fixed at 10%, one adjustable 10...90% |
| Functional data     | Connecting cable-motor   | Cable 1m, 2x0.75mm <sup>2</sup>                                             |
|                     | -auxiliary switch (-S2)  | Cable 1m, 6x0.75mm <sup>2</sup>                                             |
|                     | Torque                   | 20Nm @ nominal voltage                                                      |
|                     | Direction of rotation    | Selectable by mounting L/R                                                  |
|                     | Manual override          | By manual override key                                                      |
| Working conditions  | Angle of rotation        | Max. 95°, adjustable by mechanical stops                                    |
|                     | Running time -motor      | 75s                                                                         |
|                     | -spring return           | 20s @ -20...+50°C / max. 60s @ -30°C                                        |
|                     | Sound power level -motor | Max. 45dB(A)                                                                |
|                     | -spring return           | Max. 62dB(A)                                                                |
|                     | Position indicator       | Mechanical                                                                  |
|                     | Protection class         | II (Totally insulated)                                                      |
|                     | Degree of protection     | IP54                                                                        |
|                     | EMC                      | CE according to 2004/108/EC                                                 |
|                     | Low voltage directive    | CE according to 2006/95/EC                                                  |
| Dimensions / weight | Mode of operation        | Type 1.AA.B (EN 60730-1)                                                    |
|                     | Ambient temp.            | -30...+50°C                                                                 |
|                     | Non-operation temp.      | -40...+80°C                                                                 |
|                     | Humidity                 | 5...95% RH, non-condensing                                                  |
|                     | Maintenance              | Maintenance-free                                                            |
|                     | Dimensions (LxWxH)       | See "Dimensions"                                                            |
|                     | Weight                   | 2.4kg                                                                       |

## Dimensions [mm]

Standard :  
¾"-clamp (with insert)

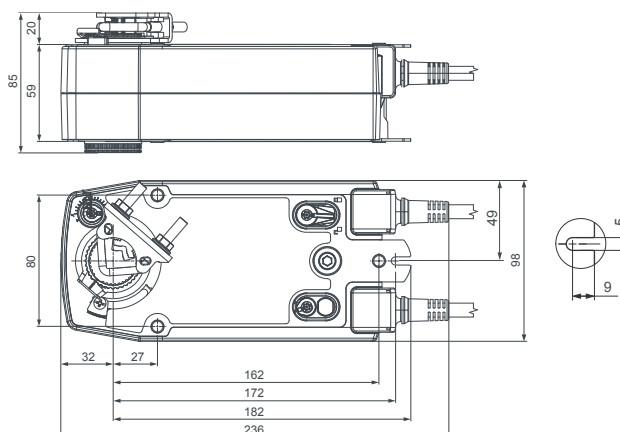
| Damper shaft | Length | ● I     | ■ I | ◆ I       |
|--------------|--------|---------|-----|-----------|
|              | ≥85    | 10...22 | 10  | 14...25.4 |
|              | ≥15    | 10...22 | 10  | 14...25.4 |

Optional 1:  
1"-clamp (without insert)

| Damper shaft | Length | ● I       | ■ I     |
|--------------|--------|-----------|---------|
|              | ≥85    | 19...25.4 | 12...18 |
|              | ≥15    | 19...25.4 | 12...18 |

Optional 2:  
½"-clamp (optional via configuration)

| Damper shaft | Length | ● I     | ■ I | ◆ I     |
|--------------|--------|---------|-----|---------|
|              | ≥85    | 10...19 | —   | 14...20 |
|              | ≥15    | 10...19 | —   | 14...20 |



Damper actuator for operating air control dampers in ventilation and air-conditioning systems for building services installations

- Torque: 20Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback: DC 2...10V



## Technical data

### Electrical data

|                        |                                      |
|------------------------|--------------------------------------|
| Nominal voltage        | AC 24V 50/60Hz, DC 24V               |
| Nominal voltage range  | AC 19.2...28.8V / DC 21.6...28.8V    |
| Power consumption      | 5W @ nominal torque / 3.5W @ holding |
| For transformer sizing | 7VA                                  |

### Functional data

|                            |                                                                                                                                                                                                                                |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connecting cable           | Cable 1m, 4x0.75mm <sup>2</sup>                                                                                                                                                                                                |
| Torque                     | 20Nm @ nominal voltage                                                                                                                                                                                                         |
| Control signal Y           | DC (0)2...10V @ input impedance 100kΩ                                                                                                                                                                                          |
| Position feedback signal U | DC 2...10V @ max. 0.5mA                                                                                                                                                                                                        |
| Position accuracy          | ±5%                                                                                                                                                                                                                            |
| Direction of rotation      | Reversible with switch  / <br>Selectable by mounting L/R |
| Manual override            | By manual override key                                                                                                                                                                                                         |
| Angle of rotation          | Max. 95°, adjustable by mechanical stops                                                                                                                                                                                       |
| Running time               | -motor 75s<br>-spring return 20s @ -20...+50°C / max. 60s @ -30°C                                                                                                                                                              |
| Sound power level          | -motor Max. 40dB(A)<br>-spring return Max. 62dB(A)                                                                                                                                                                             |

### Working conditions

|                      |                                |
|----------------------|--------------------------------|
| Position indicator   | Mechanical                     |
| Protection class     | III (safety extra-low voltage) |
| Degree of protection | IP54                           |
| EMC                  | CE according to 2004/108/EC    |
| Mode of operation    | Type 1.AA (EN 60730-1)         |
| Ambient temp.        | -30...+50°C                    |
| Non-operation temp.  | -40...+80°C                    |
| Humidity             | 5...95% RH, non-condensing     |
| Maintenance          | Maintenance-free               |
| Dimensions (LxWxH)   | See "Dimensions"               |
| Weight               | 2.2kg                          |

### Dimensions / weight

## Dimensions [mm]

Standard :

¾"-clamp (with insert)

| Damper shaft                                                                        | Length |  |  |  |
|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  | ≥85    | 10...22                                                                             | 10                                                                                  | 14...25.4                                                                           |
|  | ≥15    | 10...22                                                                             | 10                                                                                  | 14...25.4                                                                           |

Optional 1:

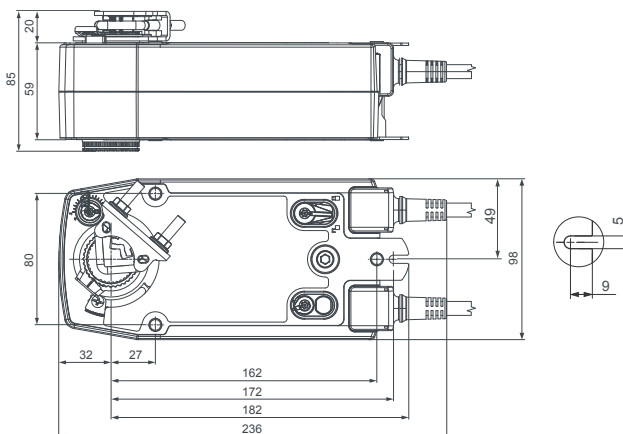
1"-clamp (without insert)

| Damper shaft                                                                        | Length |  |  |
|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  | ≥85    | 19...25.4                                                                           | 12...18                                                                             |
|  | ≥15    | 19...25.4                                                                           | 12...18                                                                             |

Optional 2:

½"-clamp (optional via configuration)

| Damper shaft                                                                        | Length |  |  |  |
|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  | ≥85    | 10...19                                                                             | —                                                                                   | 14...20                                                                             |
|  | ≥15    | 10...19                                                                             | —                                                                                   | 14...20                                                                             |



Mechanical Fail-Safe Actuator with emergency function for adjusting air dampers in ventilation and air conditioning systems in buildings.

- Torque: 30Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close
- 2xSPDT auxiliary switches

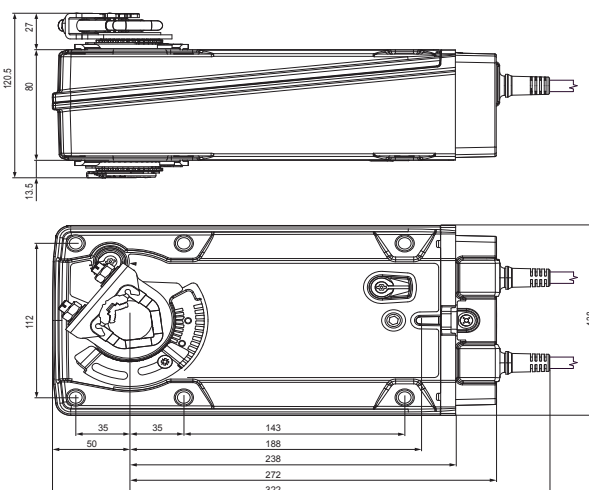
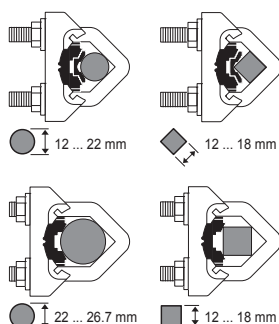


## Technical data

|                            |                          |                                                                             |
|----------------------------|--------------------------|-----------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage          | AC 24V 50/60Hz, DC 24V                                                      |
|                            | Nominal voltage range    | AC 19.2...28.8V / DC 21.6...28.8V                                           |
|                            | Power consumption        | 9.5W @ nominal torque / 4.5W @ holding                                      |
|                            | For transformer sizing   | 16VA                                                                        |
|                            | Auxiliary switch (-S2)   | 2xSPDT, 1mA...3(0.5)A, AC 250V<br>one fixed at 10%, one adjustable 10...90% |
| <b>Functional data</b>     | Connecting cable-motor   | Cable 1m, 2x0.75mm <sup>2</sup>                                             |
|                            | -auxiliary switch        | Cable 1m, 6x0.75mm <sup>2</sup>                                             |
|                            | Torque                   | 30Nm @ nominal voltage                                                      |
|                            | Position accuracy        | ±5%                                                                         |
|                            | Direction of rotation    | Selectable by mounting L/R                                                  |
|                            | Manual override          | With hand crank and interlocking switch                                     |
|                            | Angle of rotation        | Max. 95°, can be limited with adjustable mechanical end stops               |
|                            | Running time             | -motor 60s<br>-spring return 20s @ -20 ...+50°C / max. 60s @ -30°C          |
|                            | Sound power level -motor | Max. 55dB(A)                                                                |
|                            | -spring return           | Max. 71dB(A)                                                                |
| <b>Working conditions</b>  | Position indicator       | Mechanical                                                                  |
|                            | Protection class         | III (safety extra-low voltage)                                              |
|                            | Degree of protection     | IP54                                                                        |
|                            | EMC                      | CE according to 2004/108/EC                                                 |
|                            | Mode of operation        | Type 1.AA.B (EN60730-1)                                                     |
|                            | Ambient temp.            | -30...+50°C                                                                 |
|                            | Non-operation temp.      | -40...+80°C                                                                 |
|                            | Humidity                 | 5...95% RH, non-condensing                                                  |
|                            | Maintenance              | Maintenance-free                                                            |
|                            | Dimensions (LxWxH)       | See "Dimensions"                                                            |
| <b>Dimensions / weight</b> | Weight                   | 4.5kg                                                                       |

## Dimensions [mm]

| Damper spindle | Length | ● I         | ■ I | ◆ I   |
|----------------|--------|-------------|-----|-------|
|                | ≥117   | 12 ... 26.7 | >12 | <25.2 |
|                | ≥20    | 12 ... 26.7 | >12 | <25.2 |



Mechanical Fail-Safe Actuator with emergency function for adjusting air dampers in ventilation and air conditioning systems in buildings.

- Torque: 30Nm
- Nominal voltage: AC/DC 24V
- Control signal: DC (0)2...10V
- Position feedback signal: DC 2...10V

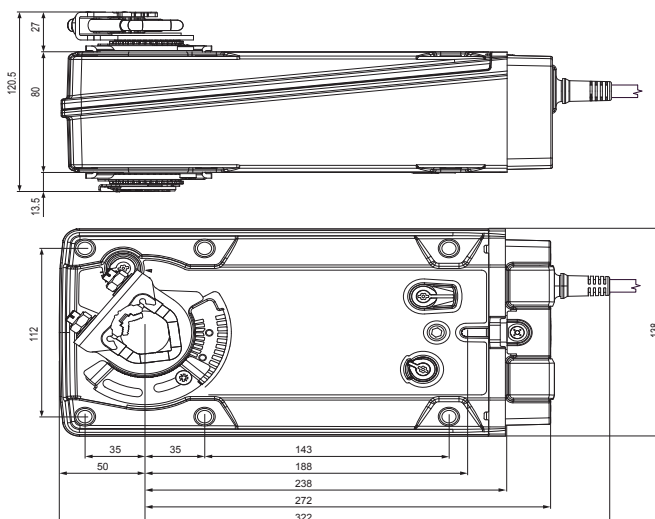
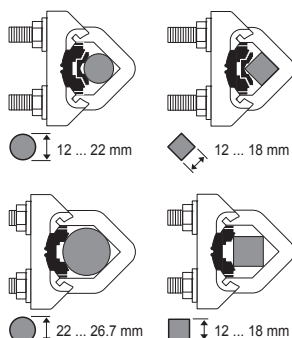


### Technical data

|                            |                            |                                                                        |
|----------------------------|----------------------------|------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage            | AC 24V 50/60Hz, DC 24V                                                 |
|                            | Nominal voltage range      | AC 19.2...28.8V / DC 21.6...28.8V                                      |
|                            | Power consumption          | 7W @ nominal torque / 4.5W @ holding                                   |
|                            | For transformer sizing     | 12VA                                                                   |
| <b>Functional data</b>     | Connecting cable           | Cable 1m, 4x0.75mm <sup>2</sup>                                        |
|                            | Torque                     | 30Nm @ nominal voltage                                                 |
|                            | Control signal Y           | DC (0)2...10V @ input impedance 100kΩ                                  |
|                            | Position feedback signal U | DC 2...10V @ max. 0.5mA                                                |
|                            | Position accuracy          | ±5%                                                                    |
|                            | Direction of rotation      | Reversible with switch ↺ / ↻<br>selectable by mounting L / R           |
|                            | Manual override            | With hand crank and interlocking switch                                |
|                            | Angle of rotation          | Max. 95°, can be limited with adjustable mechanical end stops          |
|                            | Running time               | -motor 150s<br>-spring return 20s @ -20 ...+50°C / max. 60s @ -30°C    |
|                            | Sound power level          | -motor Max. 45dB(A) @ 150s running time<br>-spring return Max. 71dB(A) |
| <b>Working conditions</b>  | Position indicator         | Mechanical                                                             |
|                            | Protection class           | III (safety extra-low voltage)                                         |
|                            | Degree of protection       | IP54                                                                   |
|                            | EMC                        | CE according to 2004/108/EC                                            |
|                            | Mode of operation          | Type 1.AA (EN60730-1)                                                  |
|                            | Ambient temp.              | -30...+50°C                                                            |
|                            | Non-operation temp.        | -40...+80°C                                                            |
|                            | Humidity                   | 5...95% RH, non-condensing                                             |
|                            | Maintenance                | Maintenance-free                                                       |
|                            | Dimensions (LxWxH)         | See "Dimensions"                                                       |
| <b>Dimensions / weight</b> | Weight                     | 4.3kg                                                                  |

### Dimensions [mm]

| Damper spindle | Length | ● I         | ■ I | ◆ I   |
|----------------|--------|-------------|-----|-------|
|                | ≥117   | 12 ... 26.7 | >12 | <25.2 |
|                | ≥20    | 12 ... 26.7 | >12 | <25.2 |



Mechanical Fail-Safe Actuator with emergency function for adjusting air dampers in ventilation and air conditioning systems in buildings.

- Torque: 30Nm
- Nominal voltage: AC 230V
- Control: Open/Close
- 2xSPDT auxiliary switches

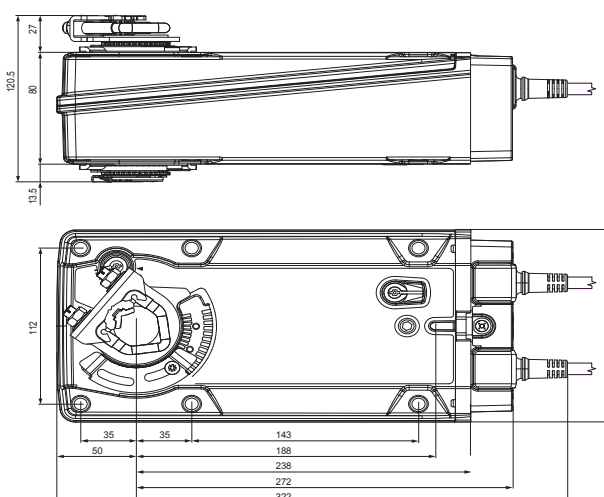
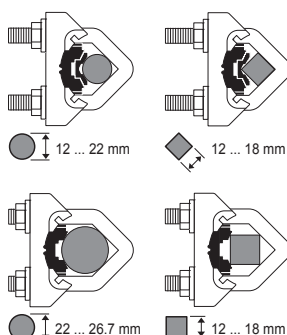


## Technical data

|                            |                           |                                                                             |
|----------------------------|---------------------------|-----------------------------------------------------------------------------|
| <b>Electrical data</b>     | Nominal voltage           | AC 230V 50/60Hz                                                             |
|                            | Nominal voltage range     | AC 198...264V                                                               |
|                            | Power consumption         | 9.5W @ nominal torque / 4.5W @ holding                                      |
|                            | For transformer sizing    | 22VA                                                                        |
| <b>Functional data</b>     | Auxiliary switch (-S2)    | 2xSPDT, 1mA...3(0.5)A, AC 250V<br>one fixed at 10%, one adjustable 10...90% |
|                            | Connecting cable -motor   | Cable 1m, 2x0.75mm <sup>2</sup>                                             |
|                            | -auxiliary switch         | Cable 1m, 6x0.75mm <sup>2</sup>                                             |
|                            | Torque                    | 30Nm @ nominal voltage                                                      |
|                            | Position accuracy         | ±5%                                                                         |
|                            | Direction of rotation     | Selectable by mounting L/R                                                  |
|                            | Manual override           | With hand crank and interlocking switch                                     |
|                            | Angle of rotation         | Max. 95°, can be limited with adjustable mechanical end stops               |
|                            | Running time -motor       | 60s                                                                         |
|                            | -spring return            | 20s @ -20 ...+50°C / max. 60s @ -30°C                                       |
| <b>Working conditions</b>  | Sound power level -motor  | Max. 55dB(A)                                                                |
|                            | -spring return            | Max. 71dB(A)                                                                |
|                            | Position indicator        | Mechanical                                                                  |
|                            | Protection class          | II (Totally insulated)                                                      |
|                            | Degree of protection      | IP54                                                                        |
|                            | EMC Low voltage directive | CE according to 2004/108/EC<br>CE according to 2006/95/EC                   |
|                            | Mode of operation         | Type 1.AA.B (EN60730-1)                                                     |
|                            | Ambient temp.             | -30...+50°C                                                                 |
|                            | Non-operation temp.       | -40...+80°C                                                                 |
|                            | Humidity                  | 5...95% RH, non-condensing                                                  |
| <b>Dimensions / weight</b> | Maintenance               | Maintenance-free                                                            |
|                            | Dimensions (LxWxH)        | See "Dimensions"                                                            |
|                            | Weight                    | 4.5kg                                                                       |

## Dimensions [mm]

| Damper spindle | Length | ● I         | ■ I | ◆ I   |
|----------------|--------|-------------|-----|-------|
|                | ≥117   | 12 ... 26.7 | >12 | <25.2 |
|                | ≥20    | 12 ... 26.7 | >12 | <25.2 |



Parameterisable damper actuator with capacitor technology for adjusting air dampers with emergency control function and extended functionalities in ventilation and air-conditioning systems for building services installations and in laboratories.

- Torque: 40Nm
- Nominal voltage: AC/DC 24V
- Control: Open/Close



## Technical data

### Electrical data

|                        |                                     |
|------------------------|-------------------------------------|
| Nominal voltage        | AC 24V 50/60Hz, DC 24V              |
| Nominal voltage range  | AC 19.2...28.8V / DC 21.6...28.8V   |
| Power consumption      | 12W @ nominal torque / 3W @ holding |
| For transformer sizing | 21VA                                |
| Connecting cable       | Cable 1m, 2x0.75mm <sup>2</sup>     |

### Functional data

|                                  |                                                                                                                                                                                                                                  |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Torque                           | 40Nm @ nominal voltage                                                                                                                                                                                                           |
| Emergency setting position (POP) | 0...100% adjustable                                                                                                                                                                                                              |
| Bridging time (PF)               | 2s                                                                                                                                                                                                                               |
| Position accuracy                | ±5%                                                                                                                                                                                                                              |
| Direction of rotation            | -motor<br>-POP                                                                                                                                                                                                                   |
|                                  | As an option with  / <br>Reversible with switch 0 ... 100% |
| Manual override                  | Gearing latch disengaged by push button                                                                                                                                                                                          |
| Angle of rotation                | Max. 95°, adjustable by mechanical stops                                                                                                                                                                                         |
| Running time                     | -standard 150s<br>-POP 35s @ 0...+50°C                                                                                                                                                                                           |
| Sound power level                | -standard Max. 52dB(A) @ 150s running time<br>-POP Max. 61dB(A)                                                                                                                                                                  |
| Position indicator               | Mechanical                                                                                                                                                                                                                       |

### Working conditions

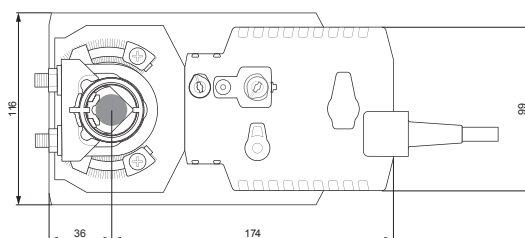
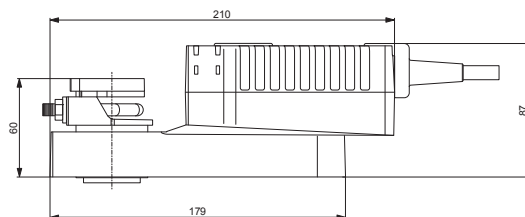
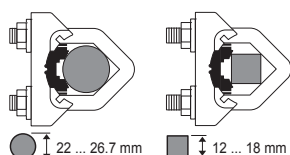
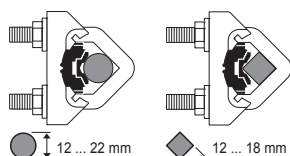
|                      |                                                   |
|----------------------|---------------------------------------------------|
| Protection class     | III (safety extra-low voltage)                    |
| Degree of protection | IP54                                              |
| EMC                  | CE according to 2004/108/EC                       |
| Certification        | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| Mode of operation    | Type 1.AA (EN 60730-1)                            |
| Ambient temp.        | -30...+50°C                                       |
| Non-operation temp.  | -40...+80°C                                       |
| Humidity             | 5...95% RH, non-condensing                        |
| Maintenance          | Maintenance-free                                  |

### Dimensions / weight

|                    |                  |
|--------------------|------------------|
| Dimensions (LxWxH) | See "Dimensions" |
| Weight             | 1.8kg            |

## Dimensions [mm]

| Damper spindle                                                                      | Length |  |  |  |
|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  | ≥52    | 12 ... 26.7                                                                         | >12                                                                                 | <25.5                                                                               |
|  | ≥20    | 12 ... 26.7                                                                         | >12                                                                                 | <25.5                                                                               |



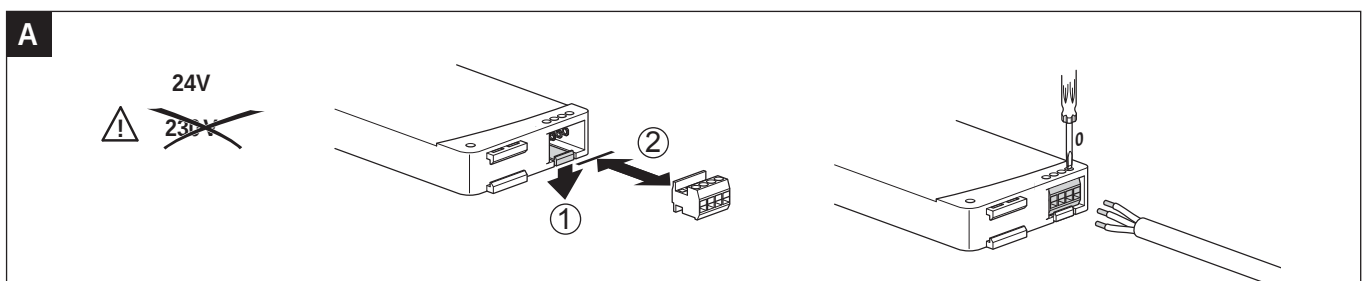
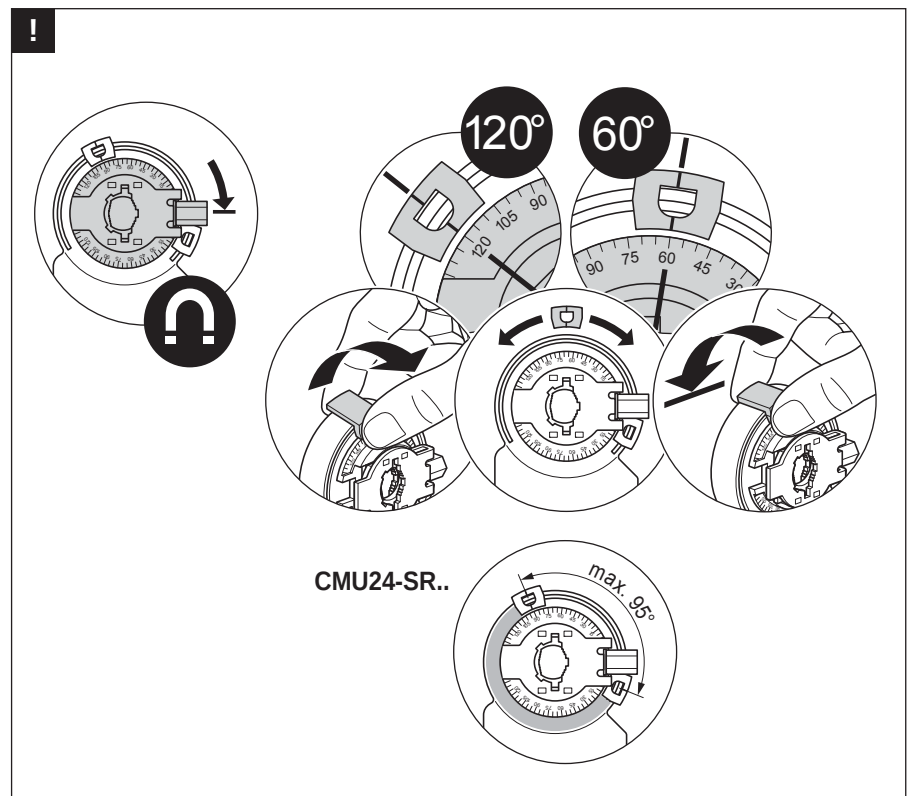
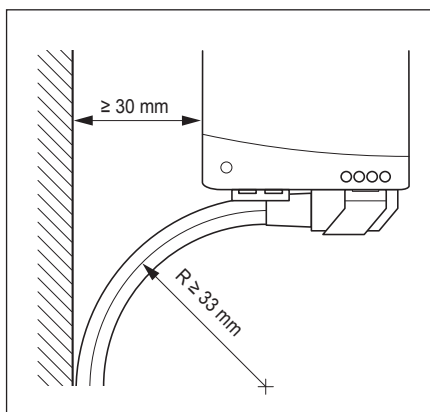
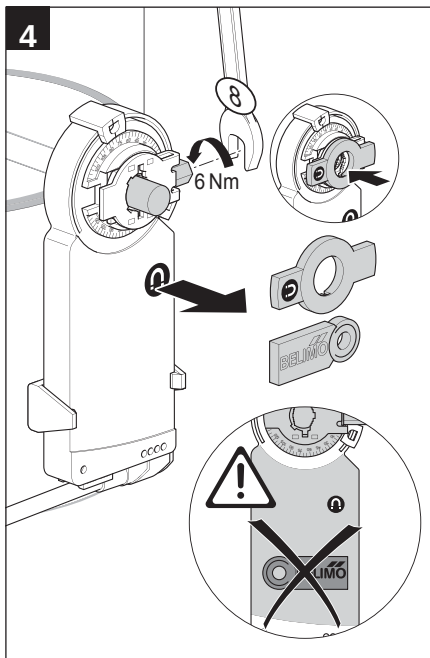
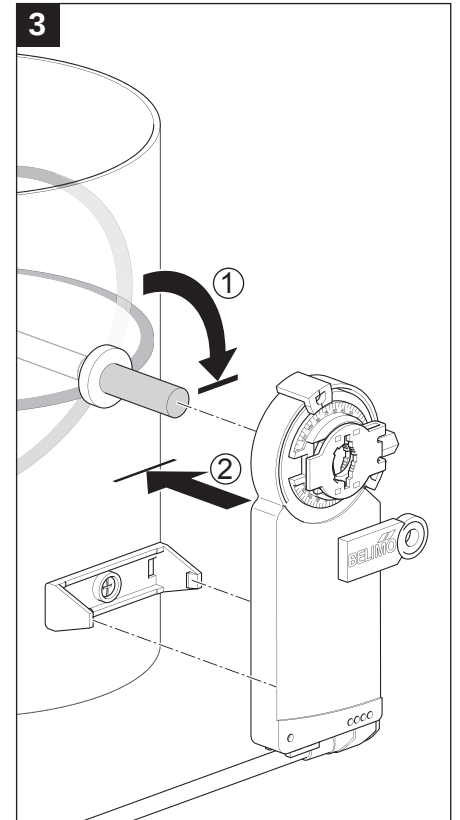
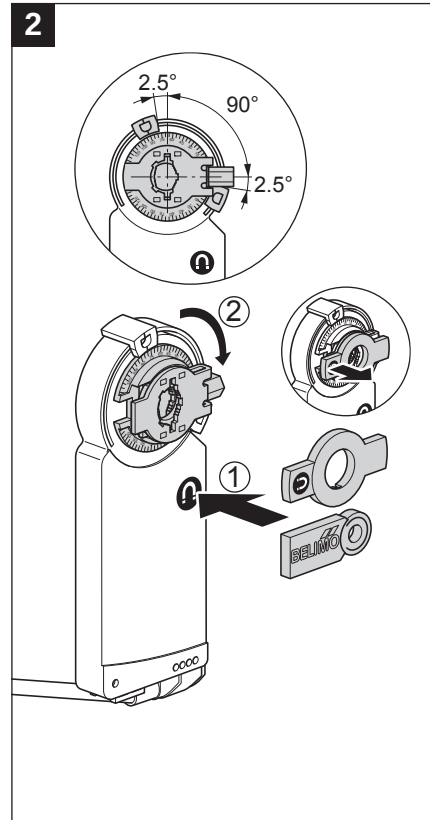
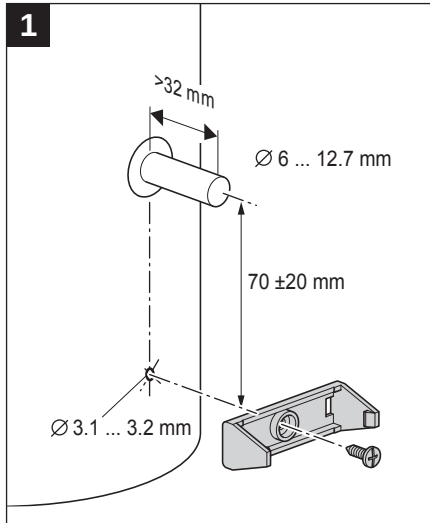
Parameterisable damper actuator with capacitor technology for adjusting air dampers with emergency control function and extended functionalities in ventilation and air-conditioning systems for building services installations and in laboratories.

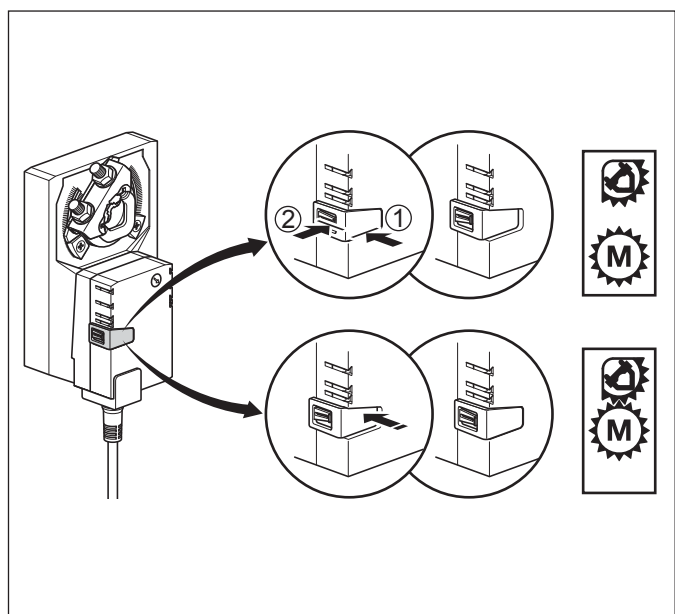
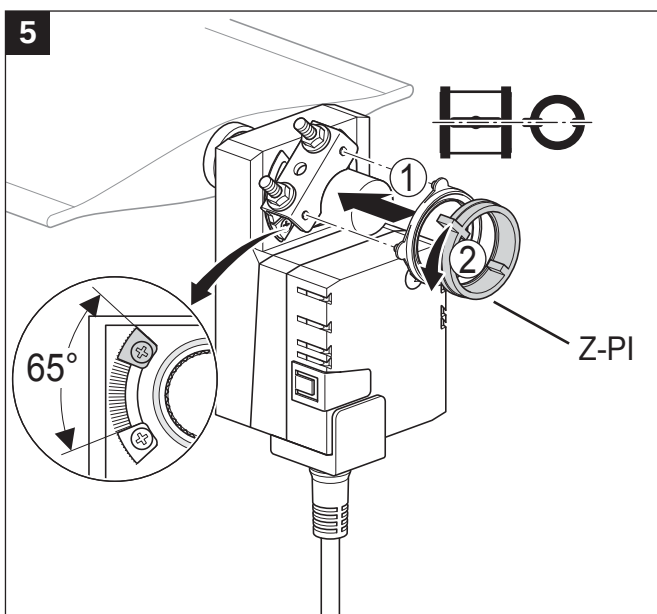
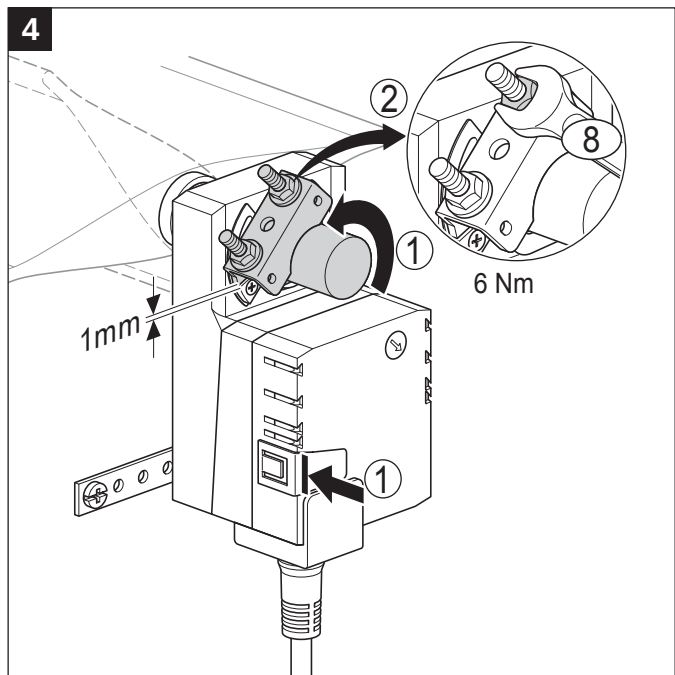
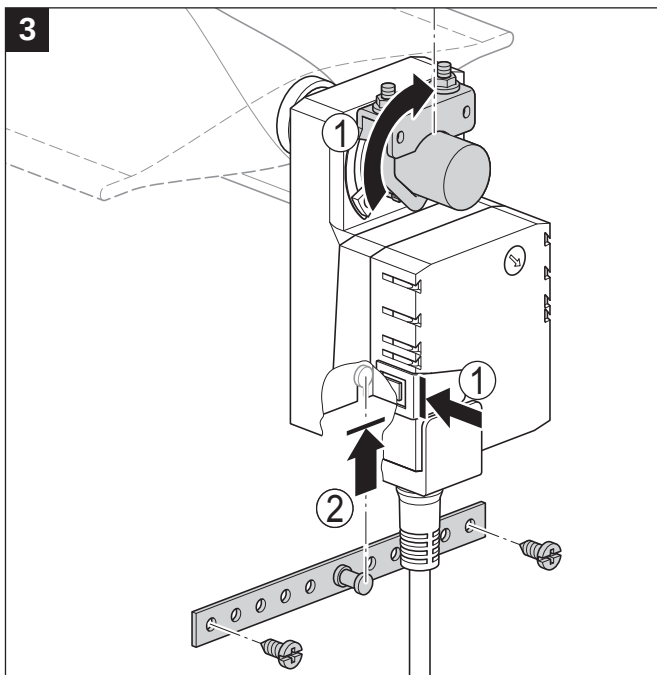
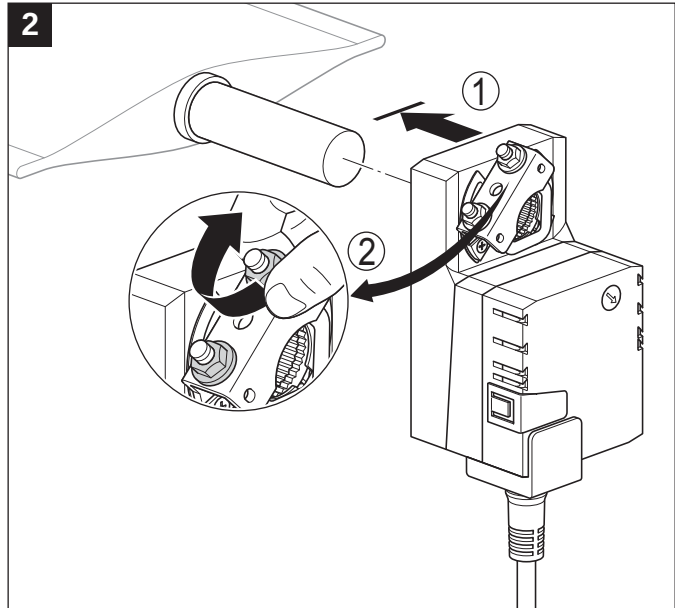
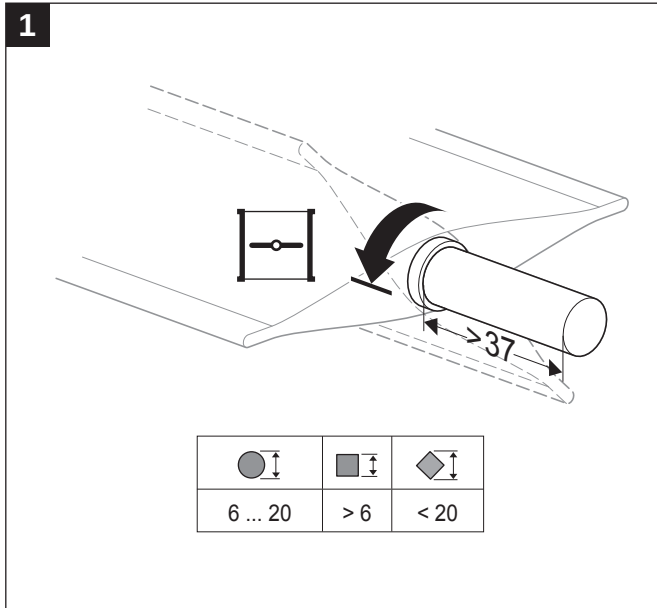
- Torque: 40Nm
- Nominal voltage: AC/DC 24V
- Control: DC (0)2...10V
- Position feedback signal U: DC (0)2...10V

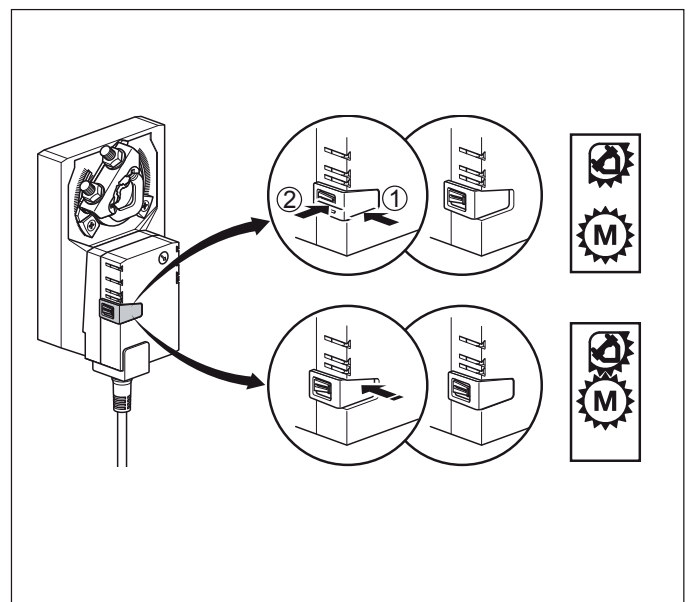
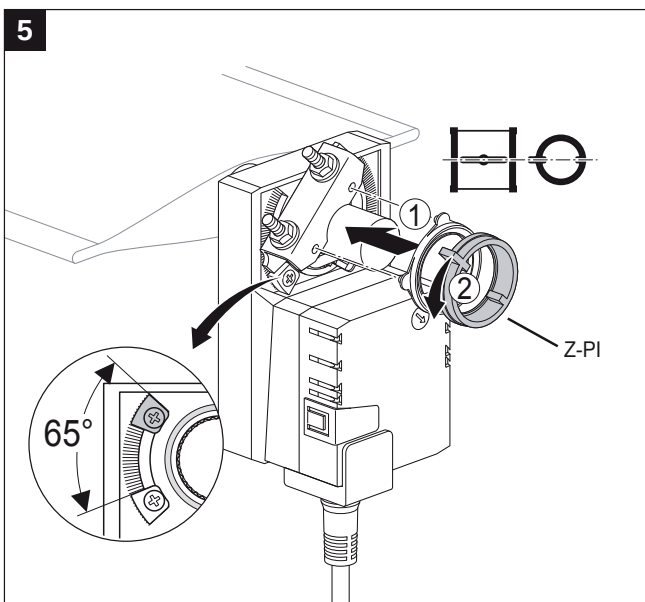
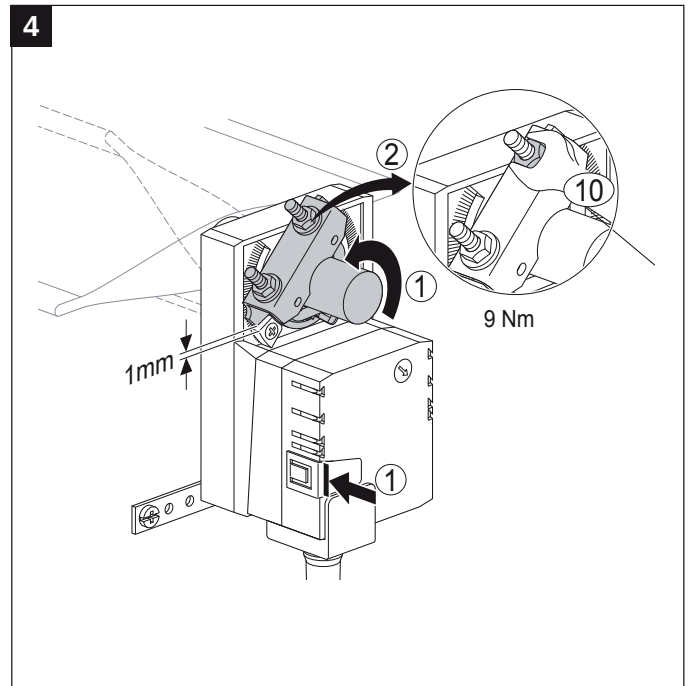
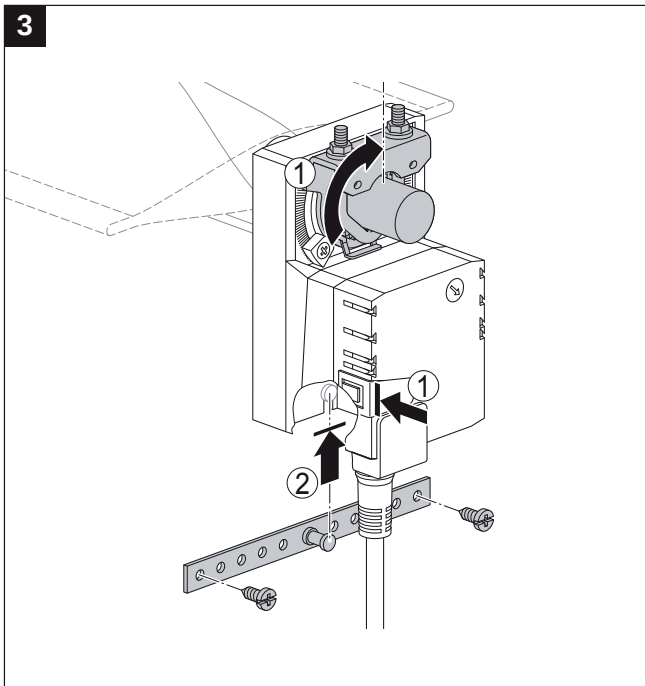
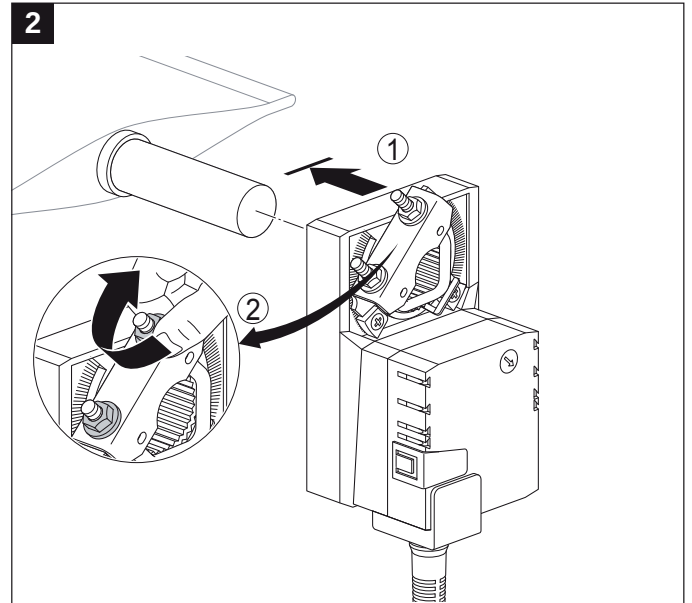
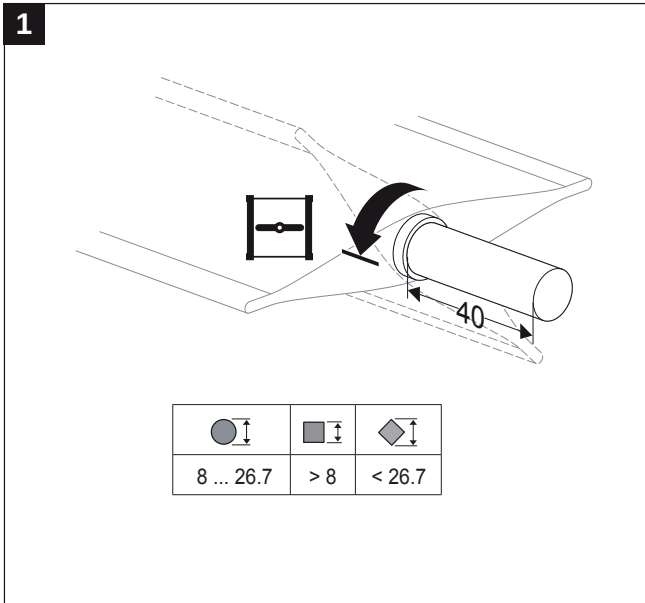


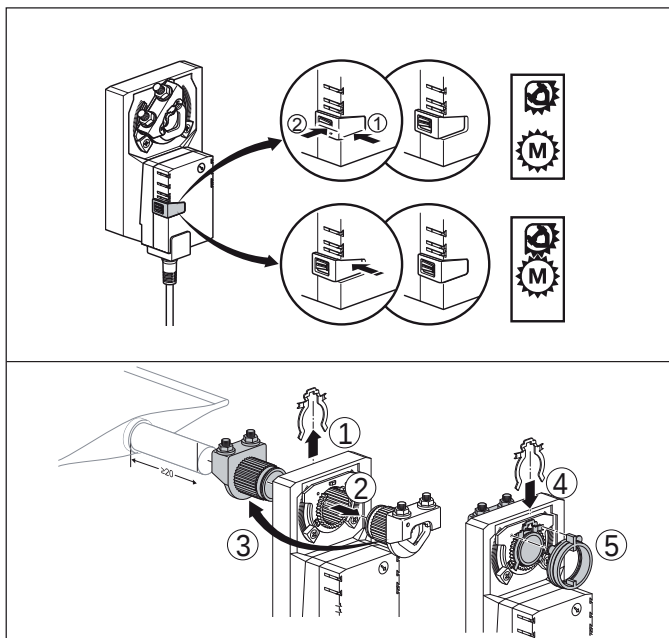
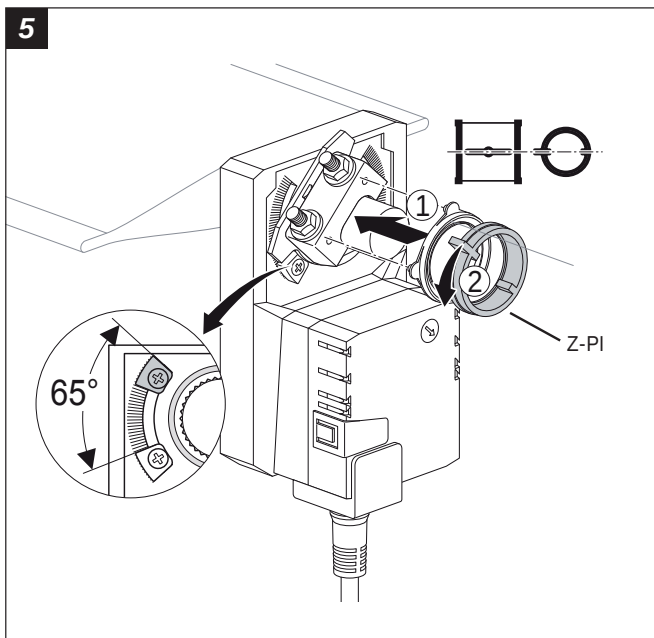
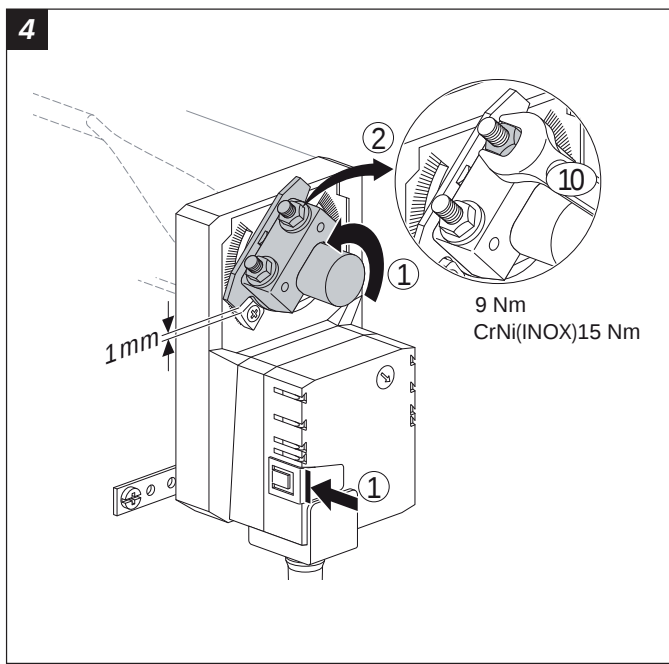
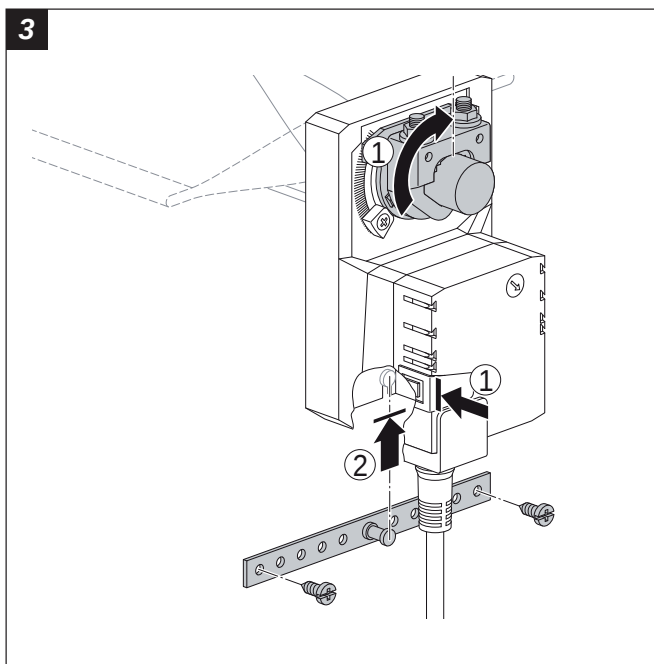
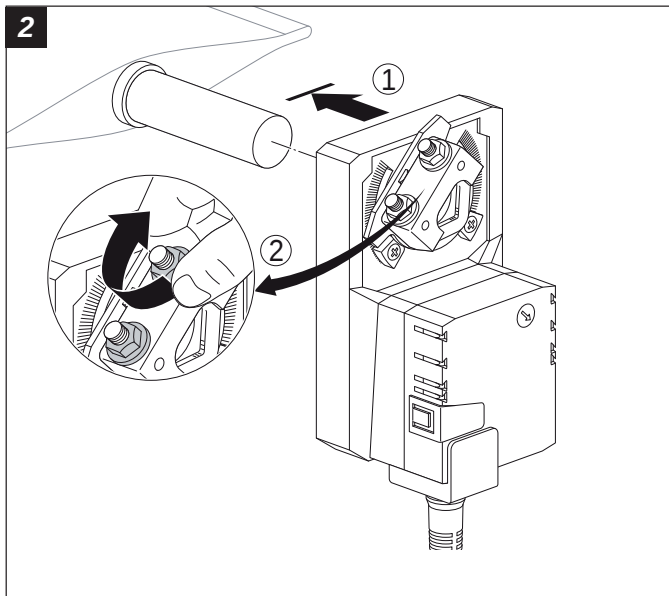
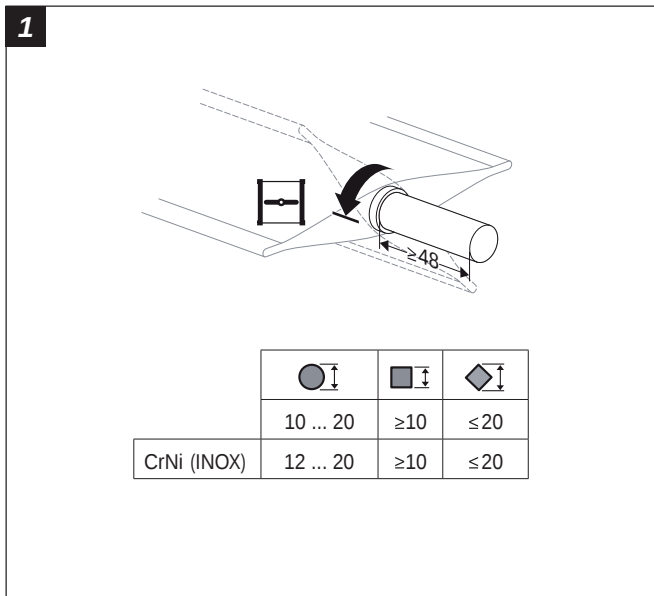
## Technical data

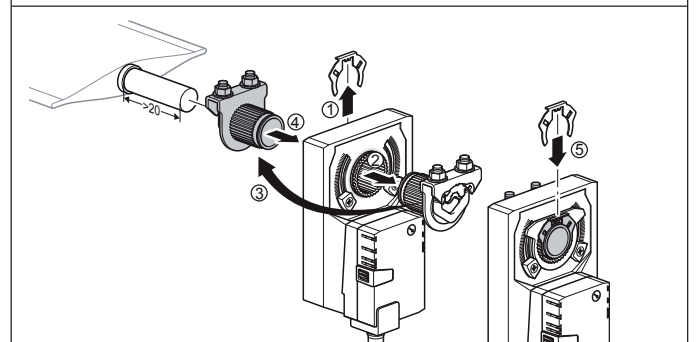
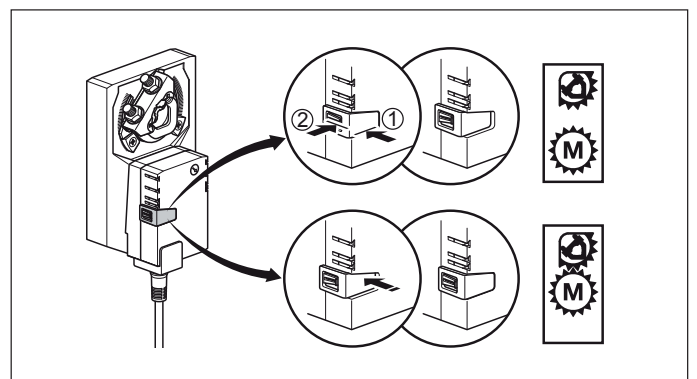
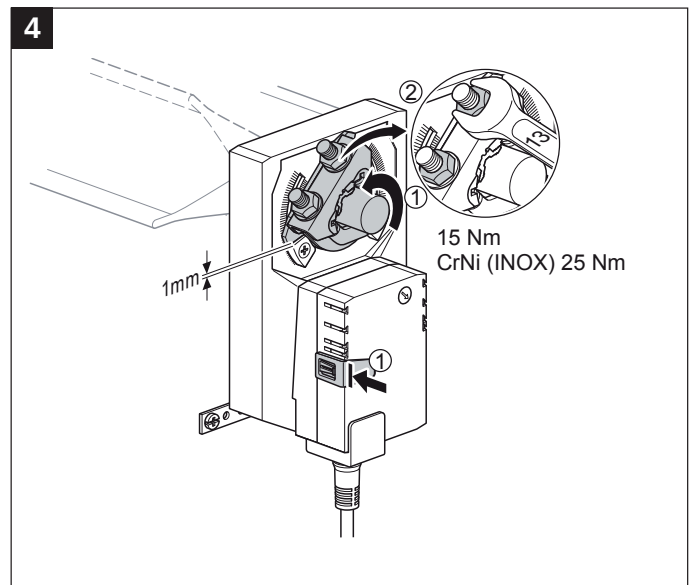
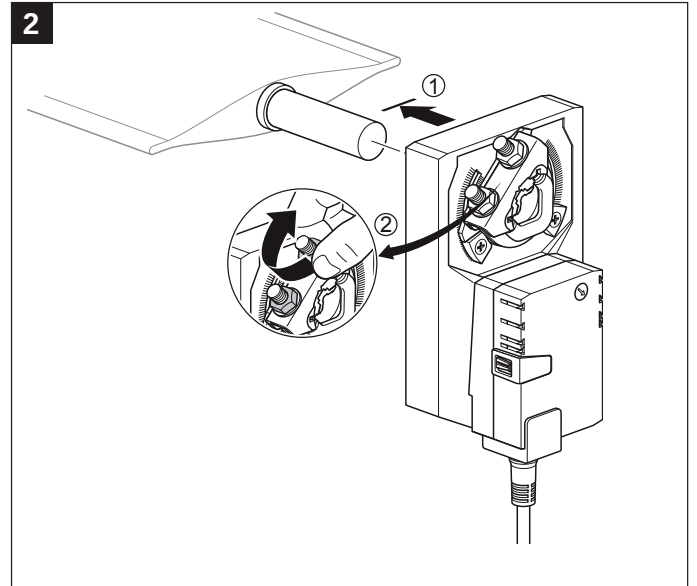
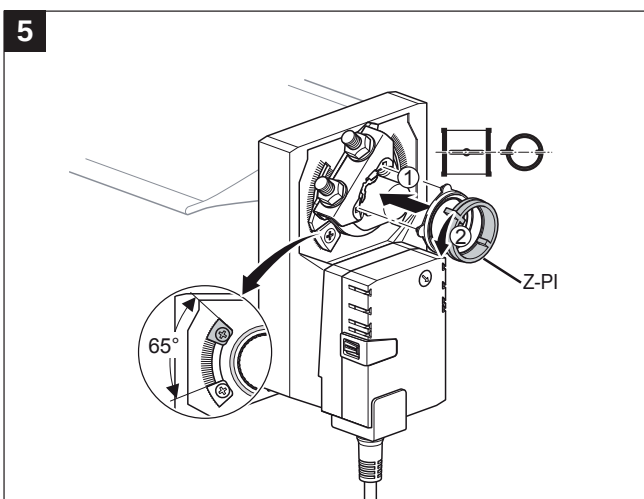
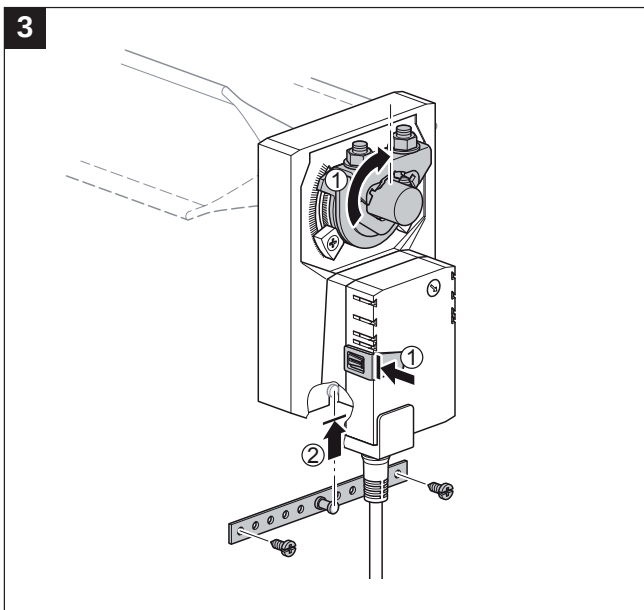
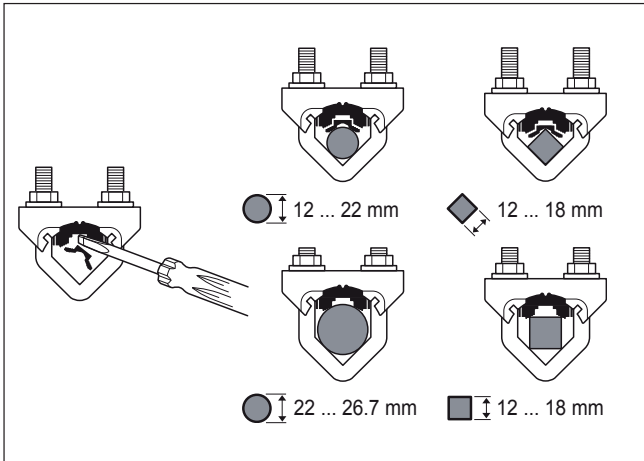
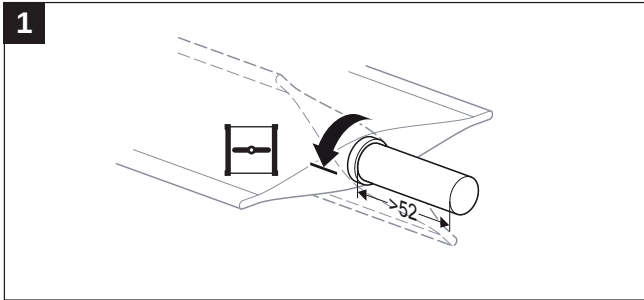
|                     |                                                                                                                        |                                                                                               |                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrical data     | Nominal voltage                                                                                                        | AC 24V 50/60Hz, DC 24V                                                                        |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Nominal voltage range                                                                                                  | AC 19.2...28.8V / DC 21.6...28.8V                                                             |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Power consumption                                                                                                      | 12W @ nominal torque / 3W @ holding                                                           |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | For transformer sizing                                                                                                 | 21VA (I <sub>max</sub> 20A @ 5ms)                                                             |                                                                                                                                                                                                                                                                                                                                                                     |
| Functional data     | Connecting cable                                                                                                       | Cable 1m, 5x0.75mm <sup>2</sup>                                                               |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Torque                                                                                                                 | 40Nm @ nominal voltage                                                                        |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Control signal Y                                                                                                       | DC (0)2...10V @ input impedance 100kΩ                                                         |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Position feedback signal U                                                                                             | DC 2...10V @ max. 0.5mA                                                                       |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Emergency setting position (POP)                                                                                       | 0...100% adjustable                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Bridging time (PF)                                                                                                     | 1...10s adjustable (factory setting 2s)                                                       |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Position accuracy                                                                                                      | ±5%                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Direction of rotation                                                                                                  | -motor<br>-POP<br>-Y=0V                                                                       | As an option with <br>Reversible with switch 0 ... 100%<br>At switch position 1  or 0  , respectively |
|                     | Manual override                                                                                                        | Gearing latch disengaged by push button                                                       |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Angle of rotation                                                                                                      | Max. 95°, adjustable by mechanical stops                                                      |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Running time                                                                                                           | -standard<br>-POP                                                                             | 90...150s adjustable (factory setting 150s/90°)<br>35s @ 0...+50°C                                                                                                                                                                                                                                                                                                  |
|                     | Automatic adjustment of running time, operating range and measuring signal U to match the mechanical angle of rotation | Manual triggering of the adaption by pressing the «Adaption» button                           |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Override control                                                                                                       | MAX (maximum position)<br>MIN (minimum position)<br>ZS (intermediate position, only AC) = 50% | = 100%<br>= 0%<br>ZS = MIN...MAX<br>MAX = (MIN + 32%)...100%<br>MIN = 0%...(MAX - 32%)                                                                                                                                                                                                                                                                              |
| Working conditions  | Sound power level                                                                                                      | -standard<br>-POP                                                                             | Max. 53dB(A) @ 90s running time<br>Max. 52dB(A) @ 150s running time<br>Max. 61dB(A)                                                                                                                                                                                                                                                                                 |
|                     | Position indicator                                                                                                     | Mechanical                                                                                    |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Protection class                                                                                                       | III (safety extra-low voltage)                                                                |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Degree of protection                                                                                                   | IP54                                                                                          |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | EMC                                                                                                                    | CE according to 2004/108/EC                                                                   |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Certification                                                                                                          | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14                                             |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Mode of operation                                                                                                      | Type 1.AA (EN 60730-1)                                                                        |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Ambient temp.                                                                                                          | -30...+50°C                                                                                   |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Non-operation temp.                                                                                                    | -40...+80°C                                                                                   |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Humidity                                                                                                               | 5...95% RH, non-condensing                                                                    |                                                                                                                                                                                                                                                                                                                                                                     |
| Dimensions / weight | Maintenance                                                                                                            | Maintenance-free                                                                              |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Dimensions (LxWxH)                                                                                                     | 210x116x87mm (same dimensions as GKU24)                                                       |                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Weight                                                                                                                 | 1.8kg                                                                                         |                                                                                                                                                                                                                                                                                                                                                                     |



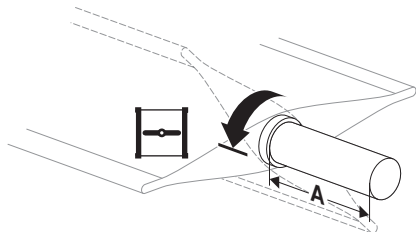






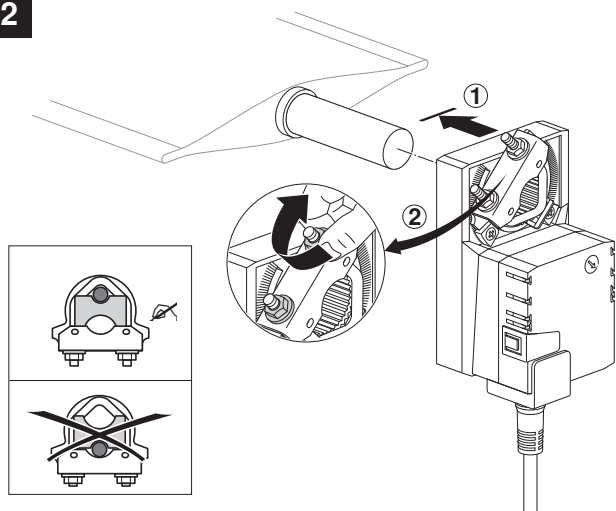


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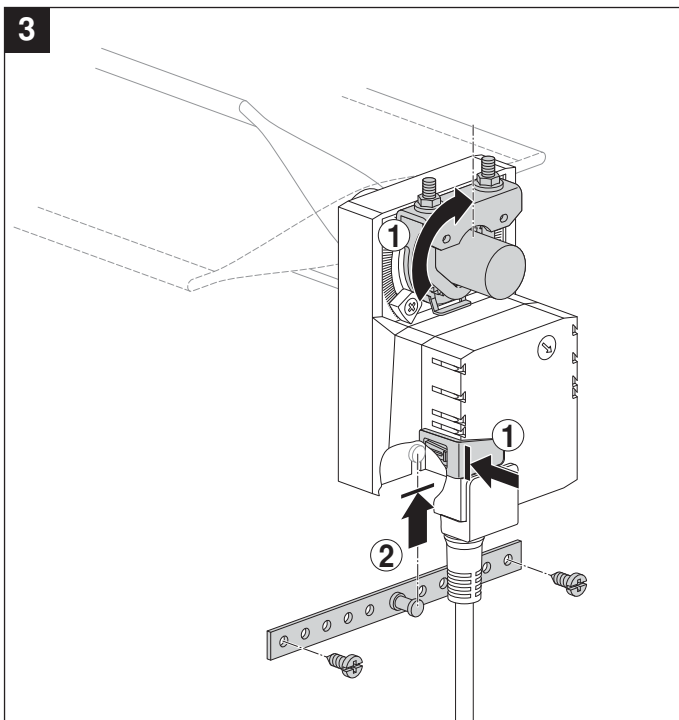


|          | A   |  |  |  |
|----------|-----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| LMQU24.. | ≥40 | 8 ... 26.7                                                                        | ≥ 8                                                                               | ≤ 26.7                                                                            |
| NMQU24.. | ≥42 | 8 ... 26.7                                                                        | ≥ 8                                                                               | ≤ 26.7                                                                            |

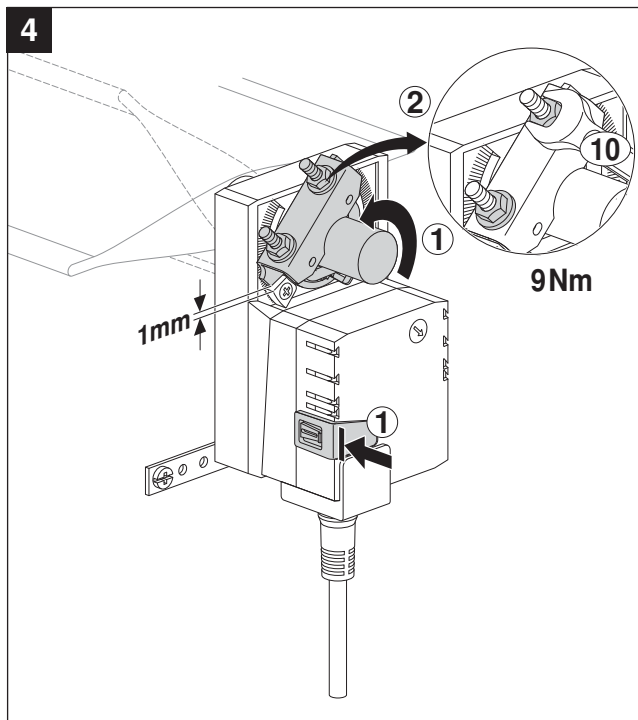
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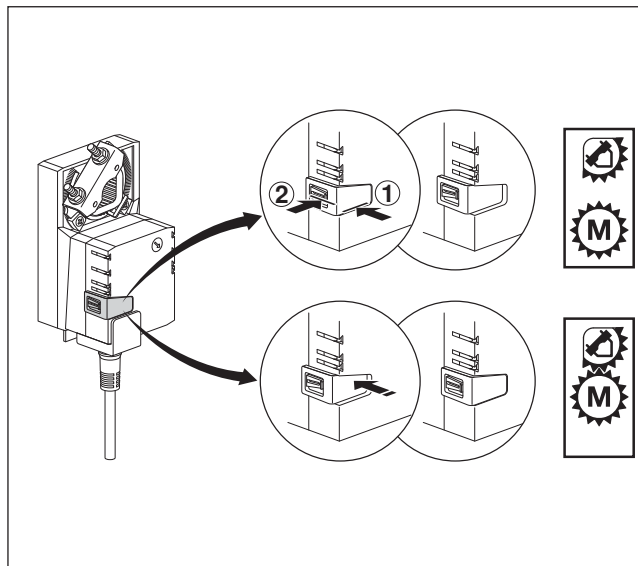
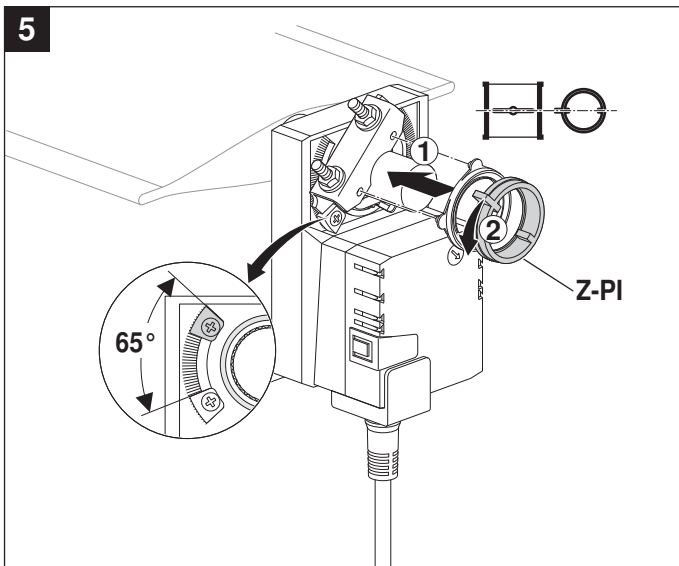
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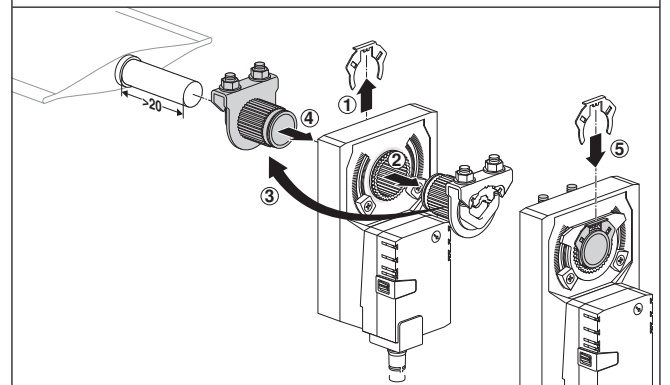
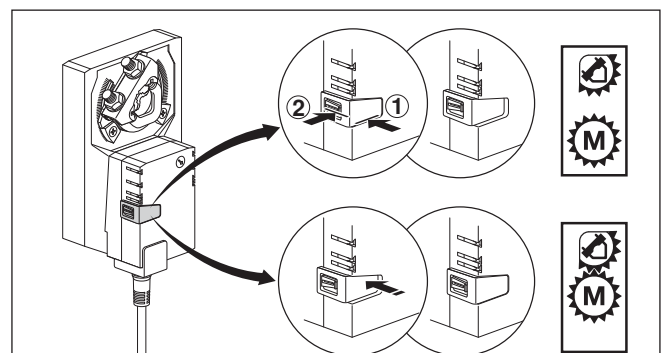
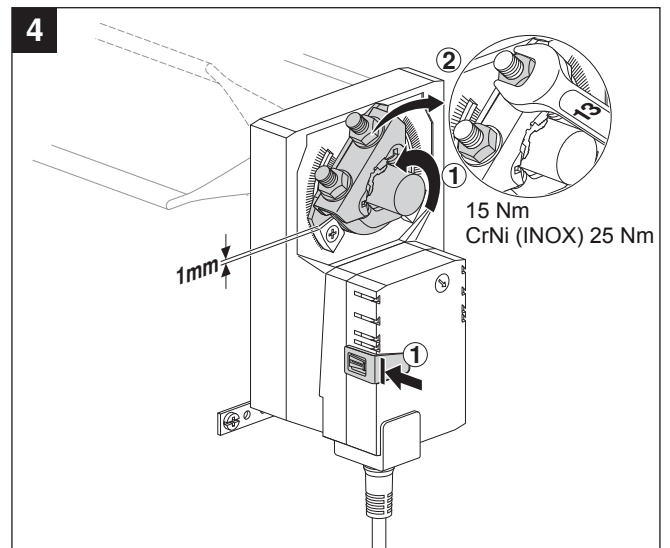
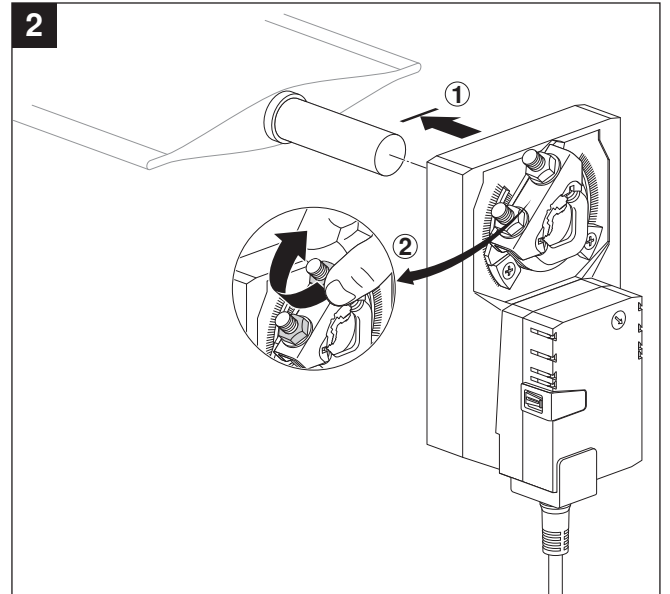
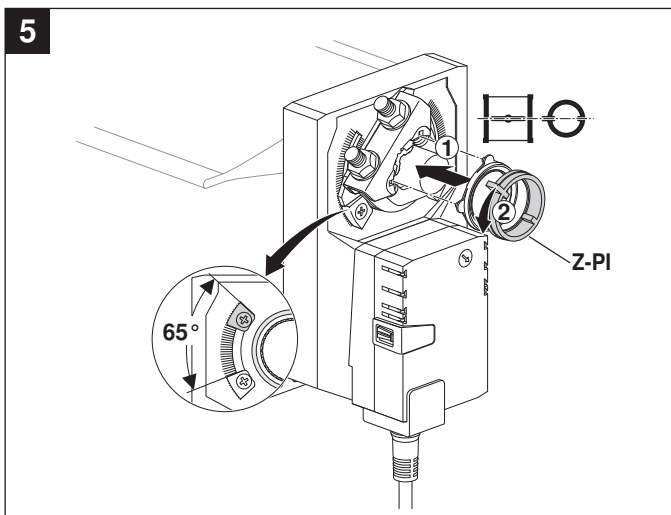
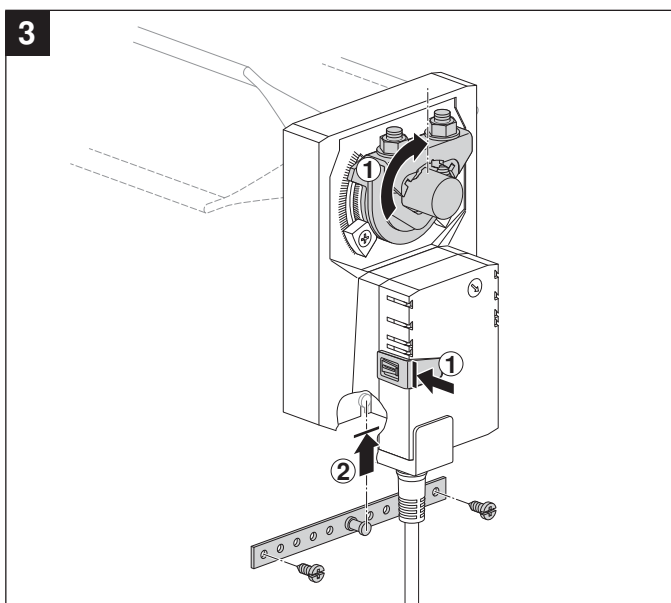
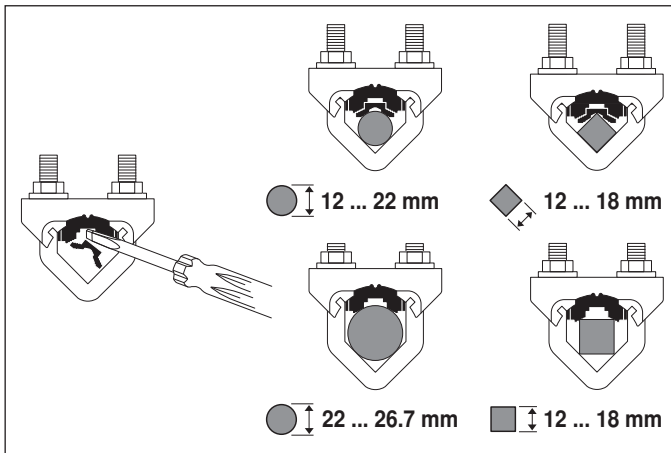
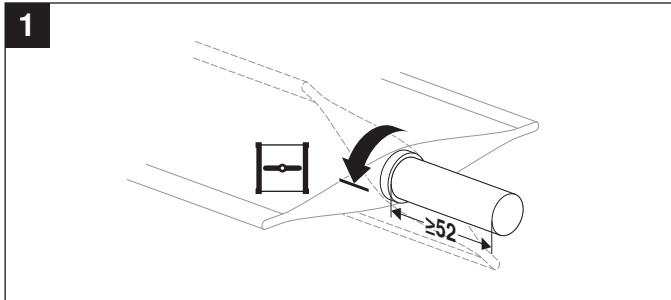


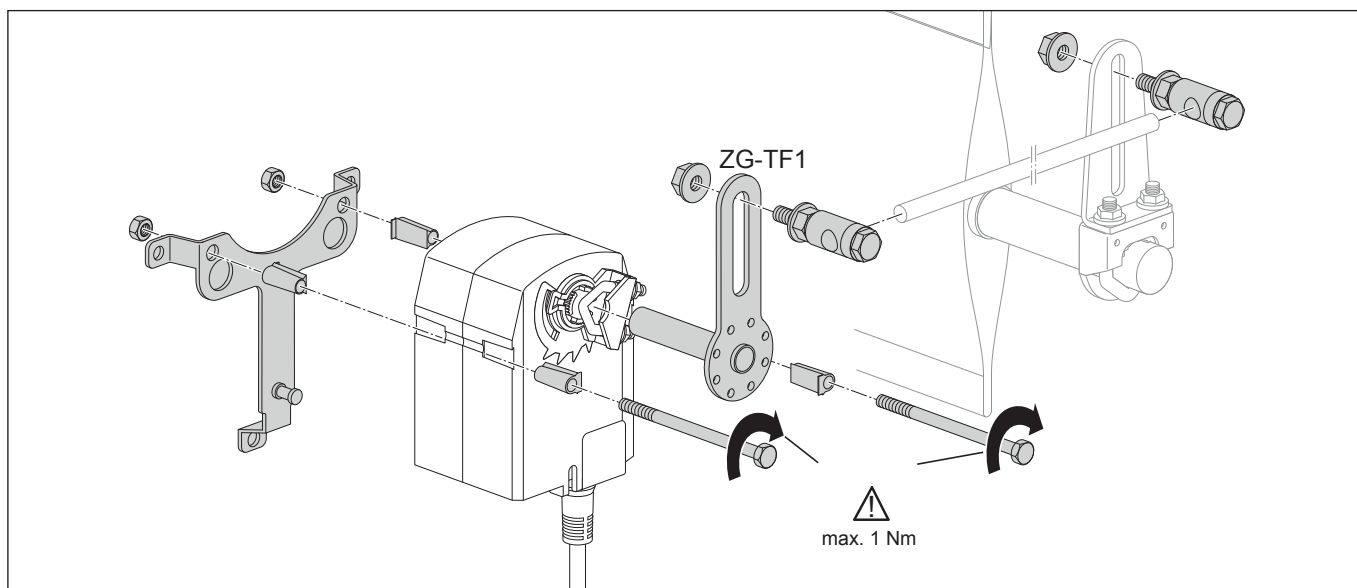
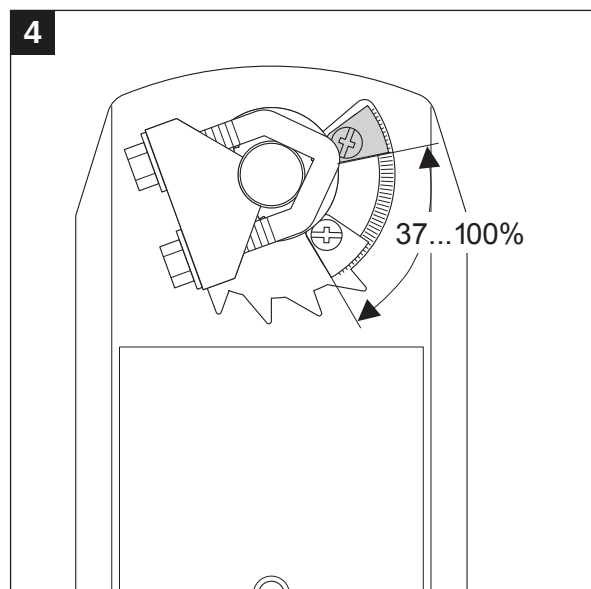
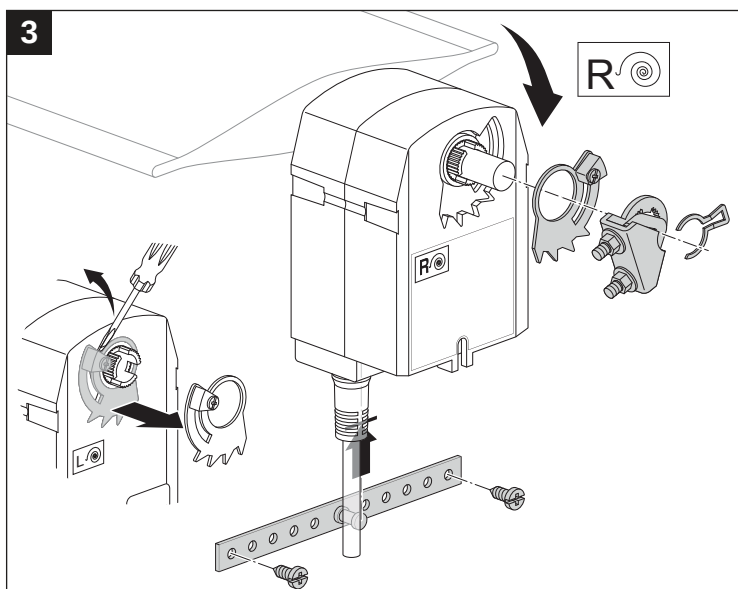
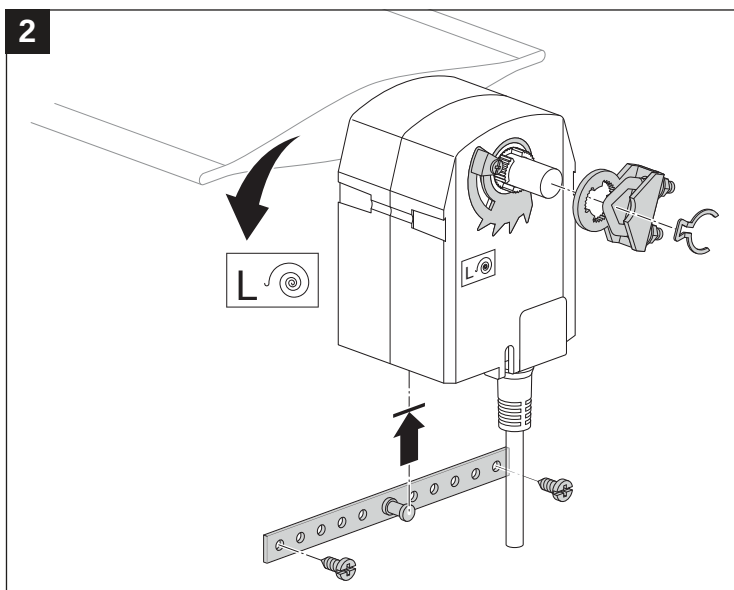
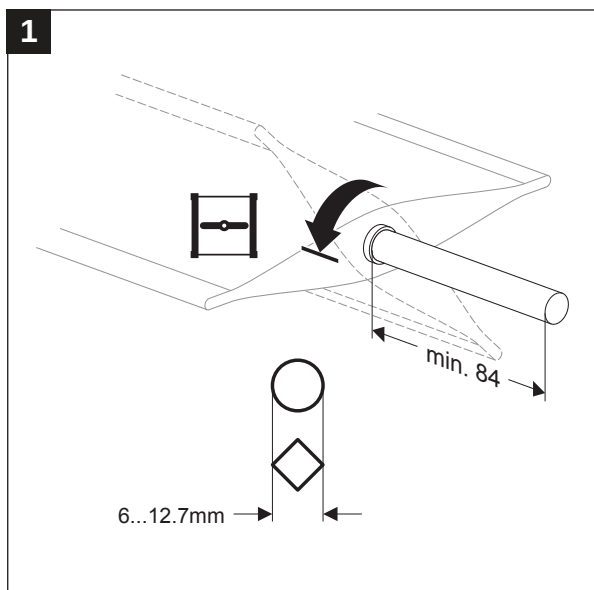
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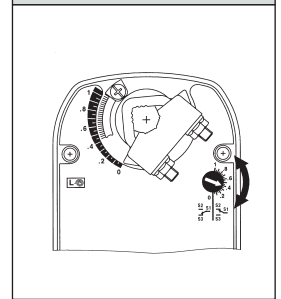
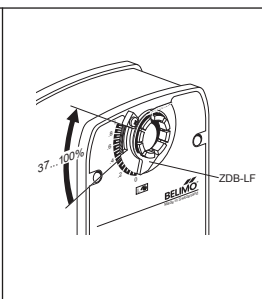
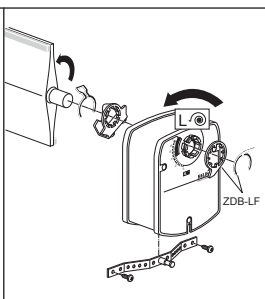
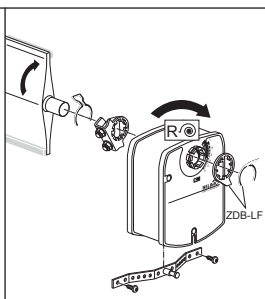
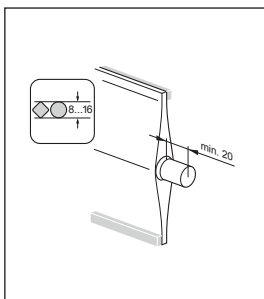
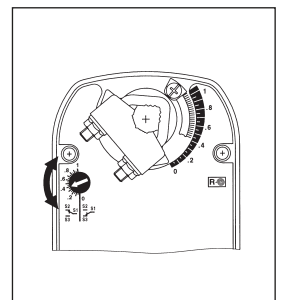
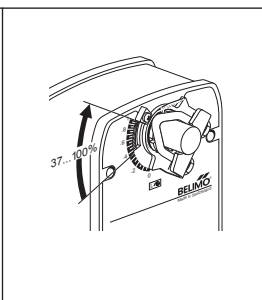
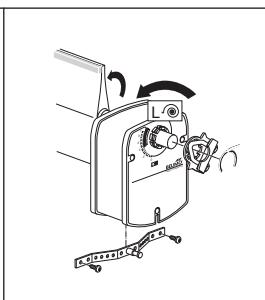
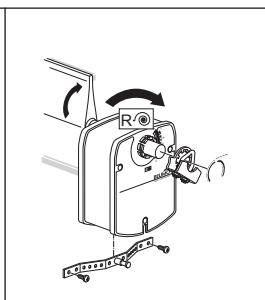
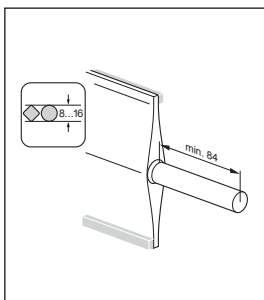
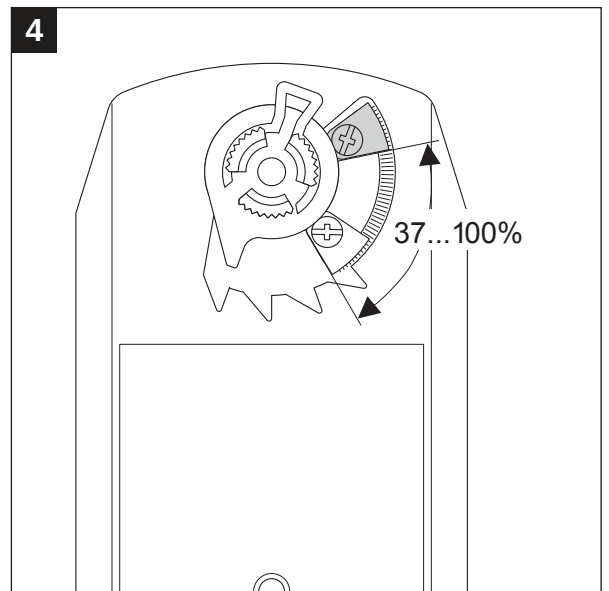
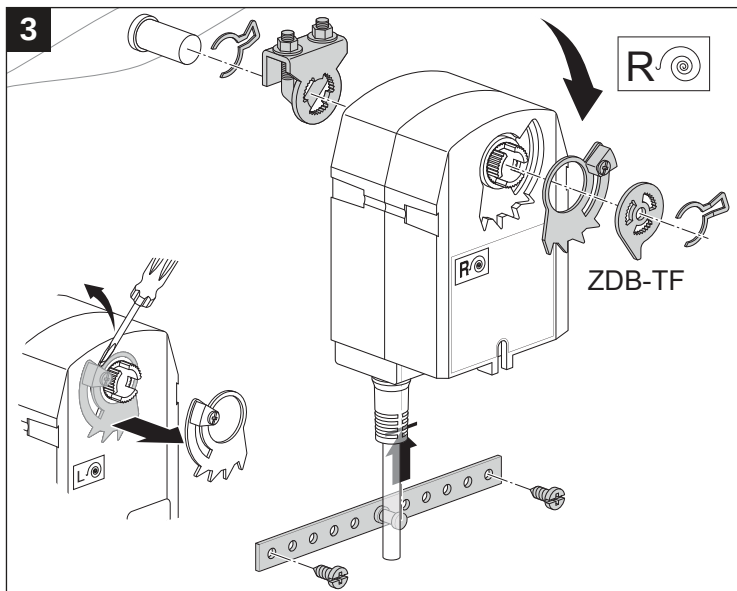
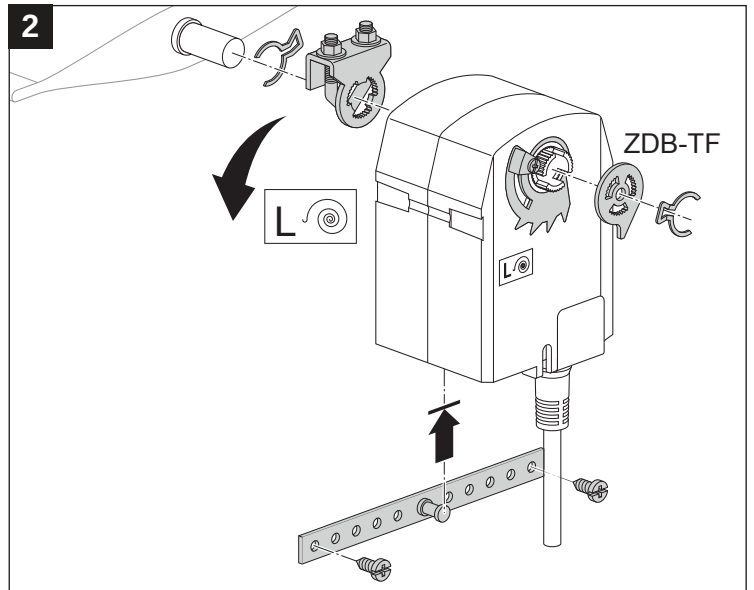
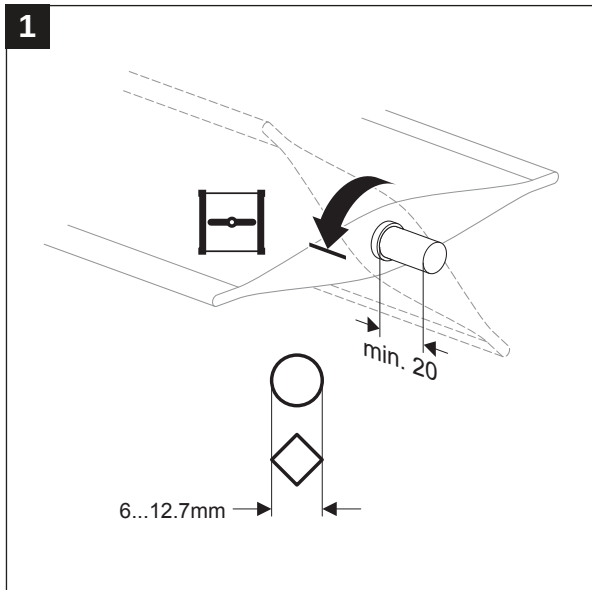


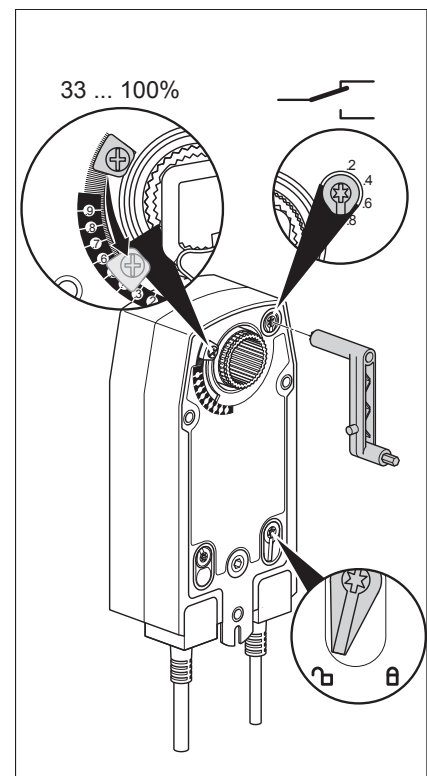
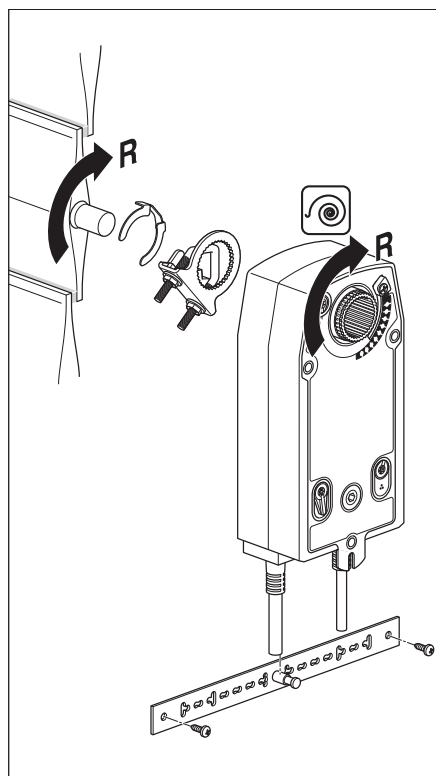
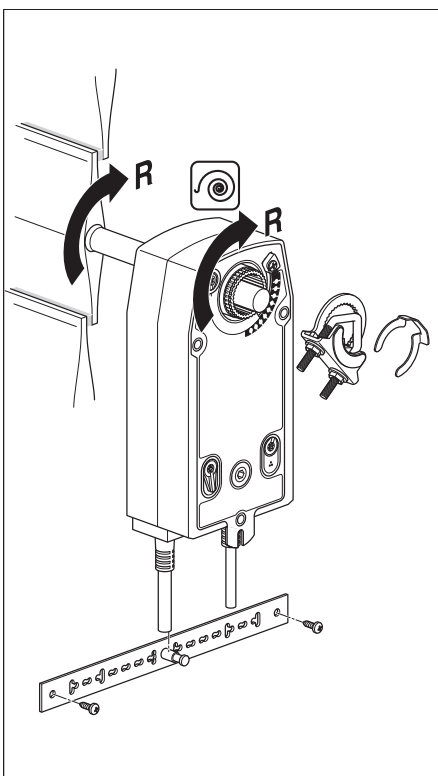
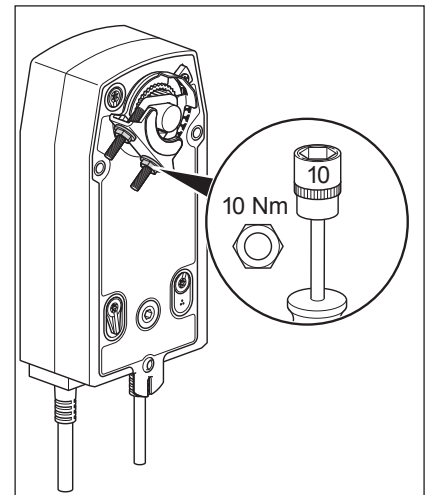
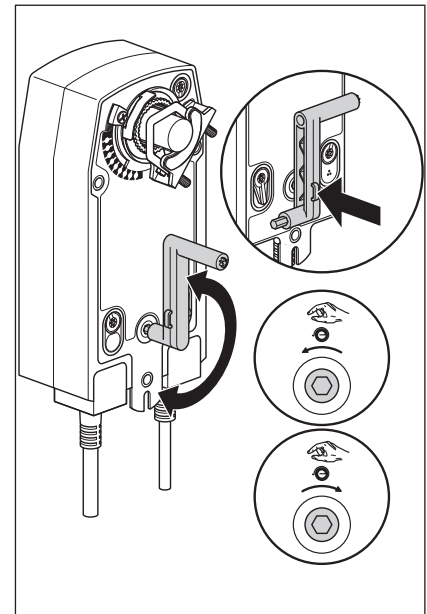
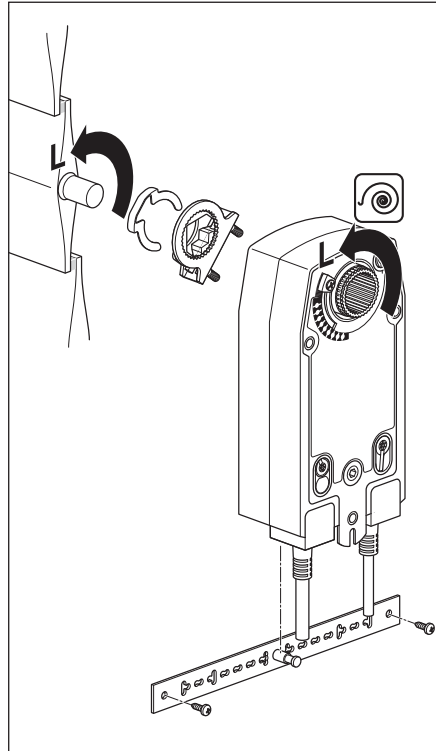
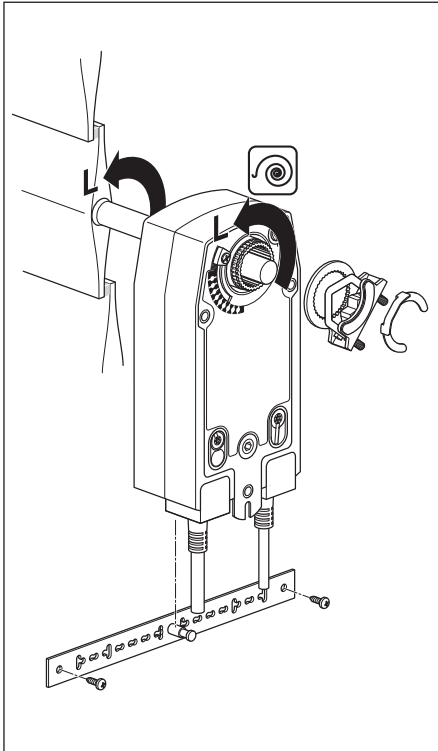
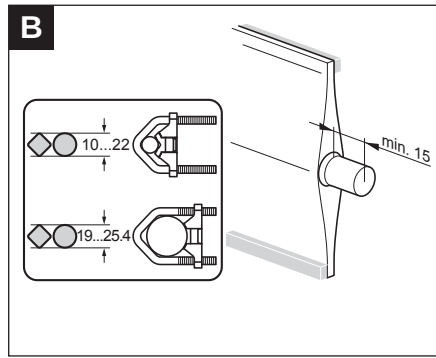
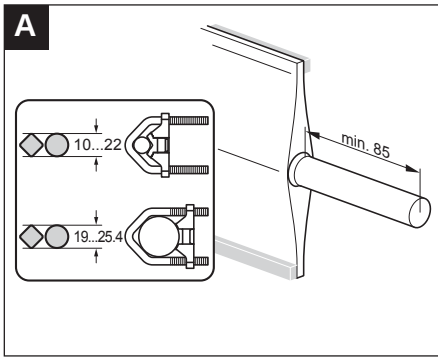
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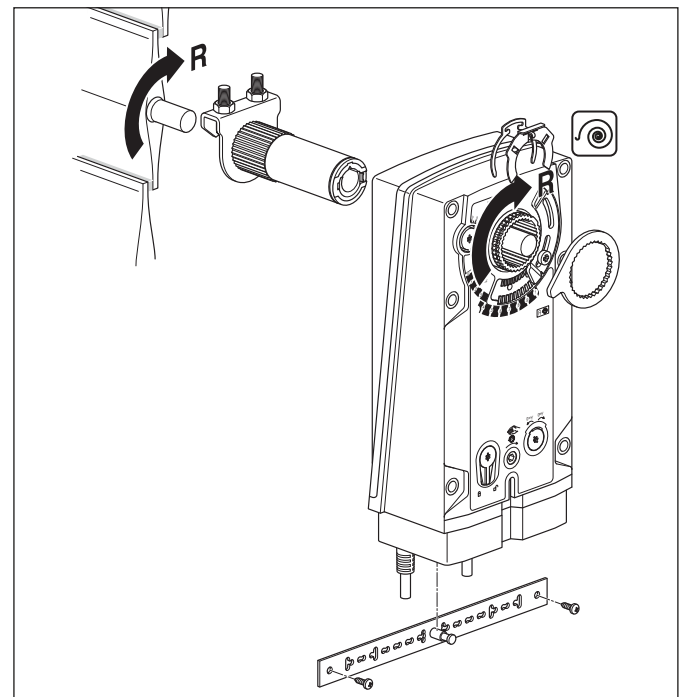
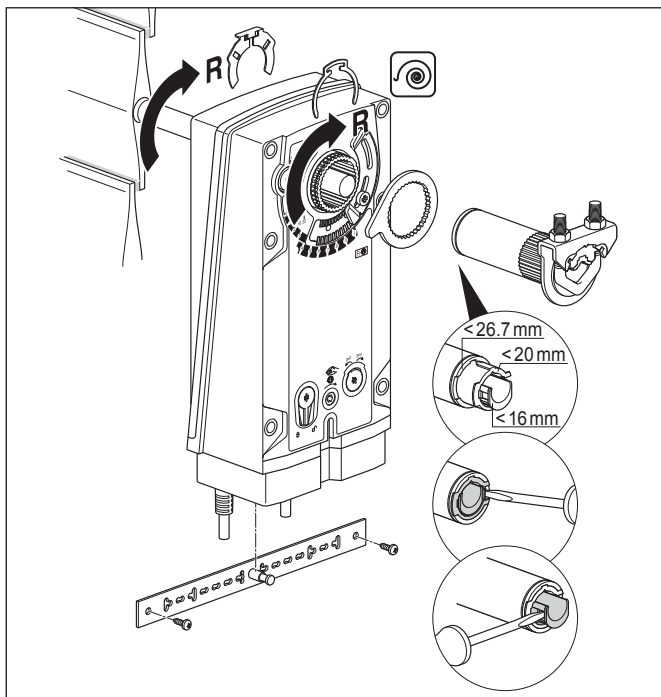
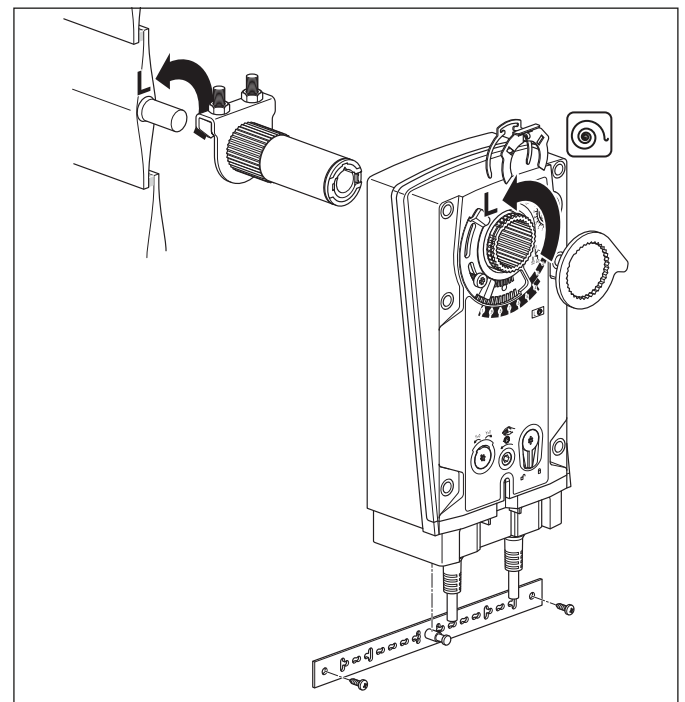
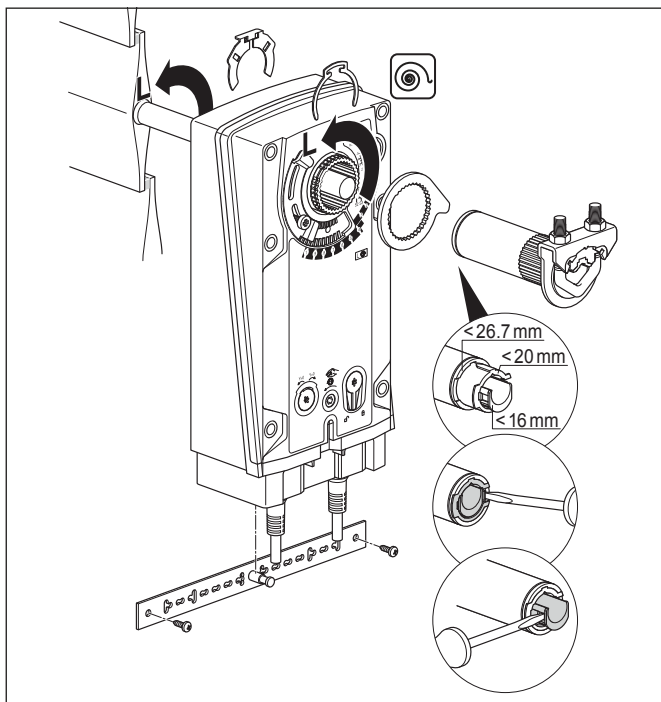
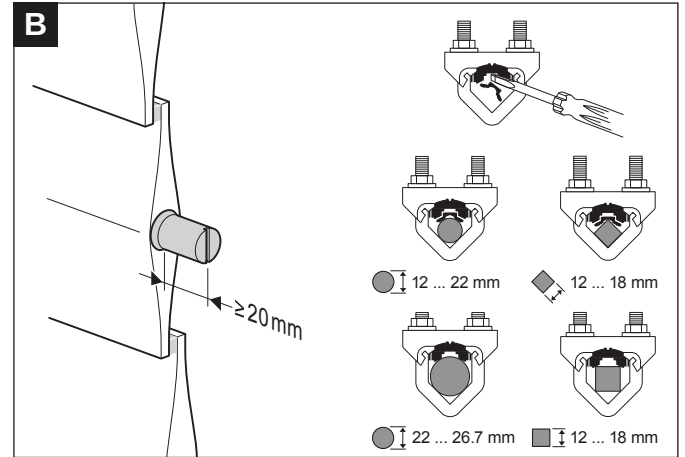
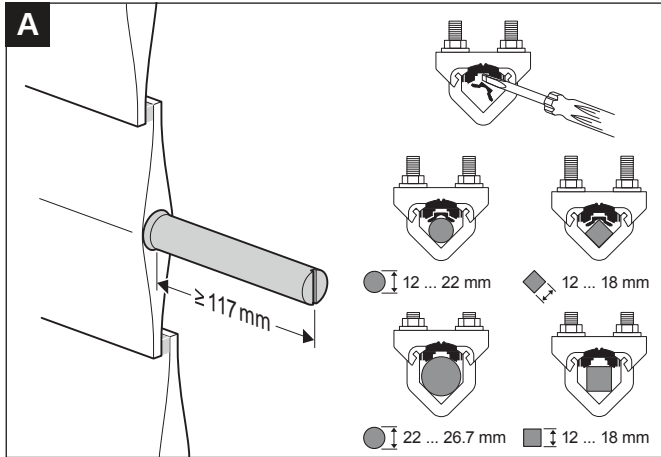


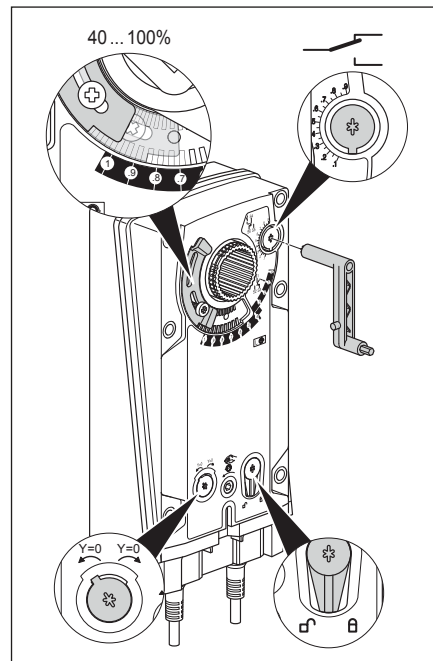
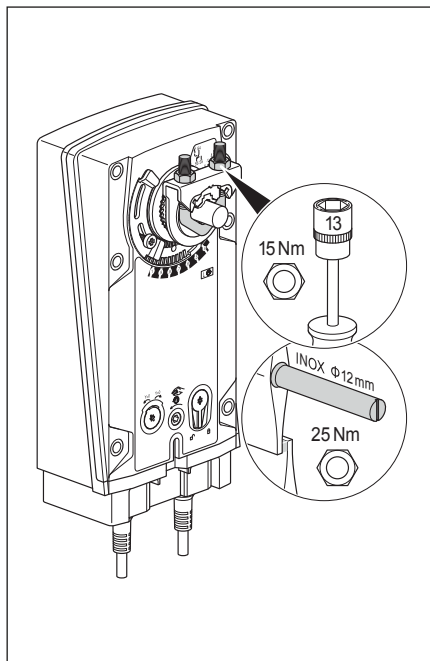
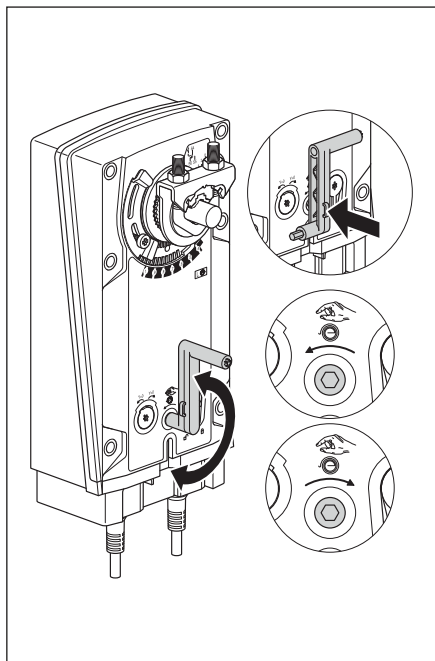


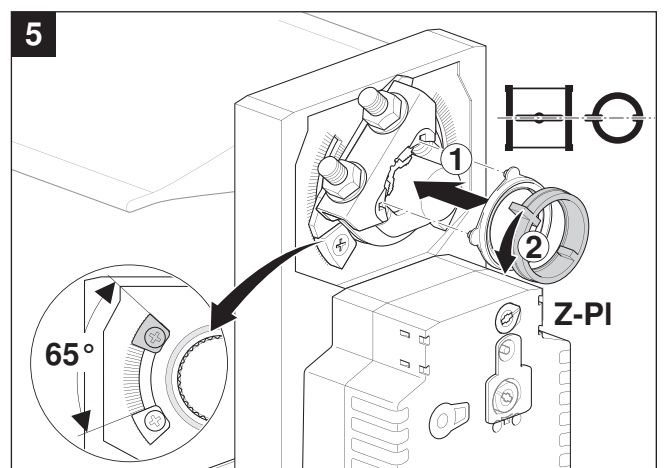
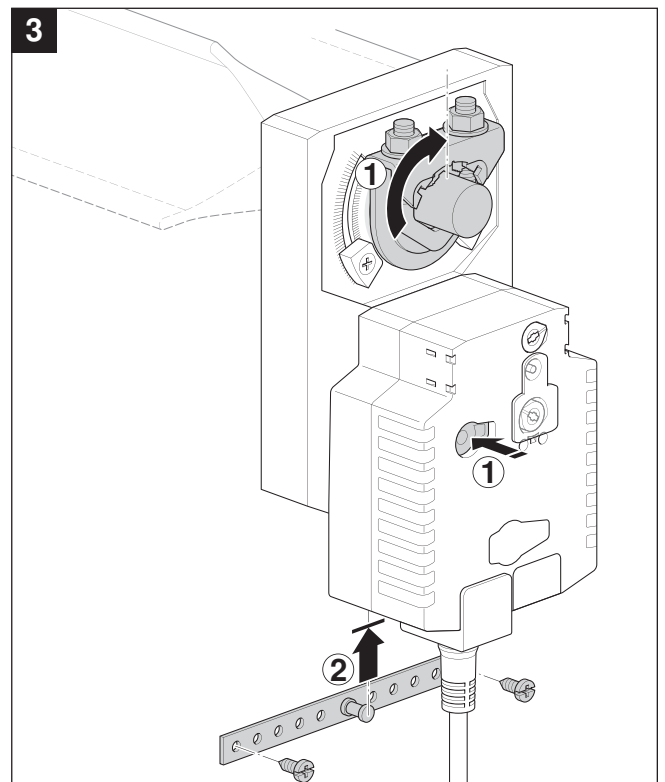
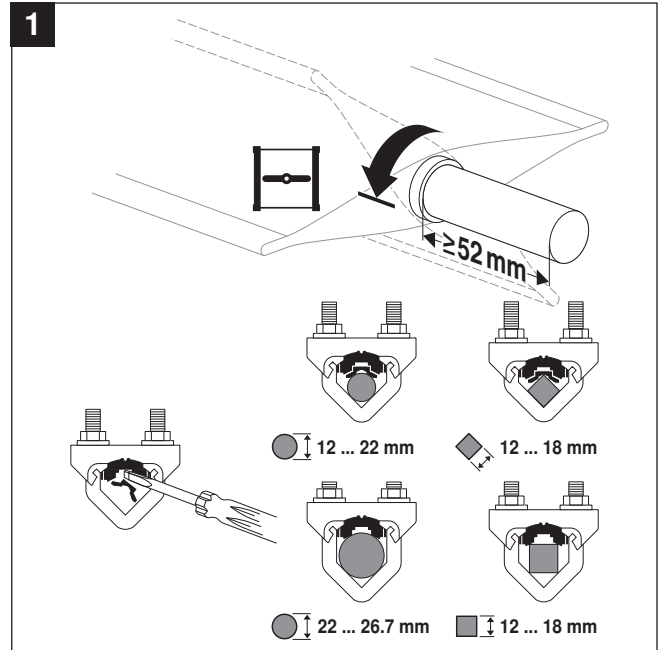
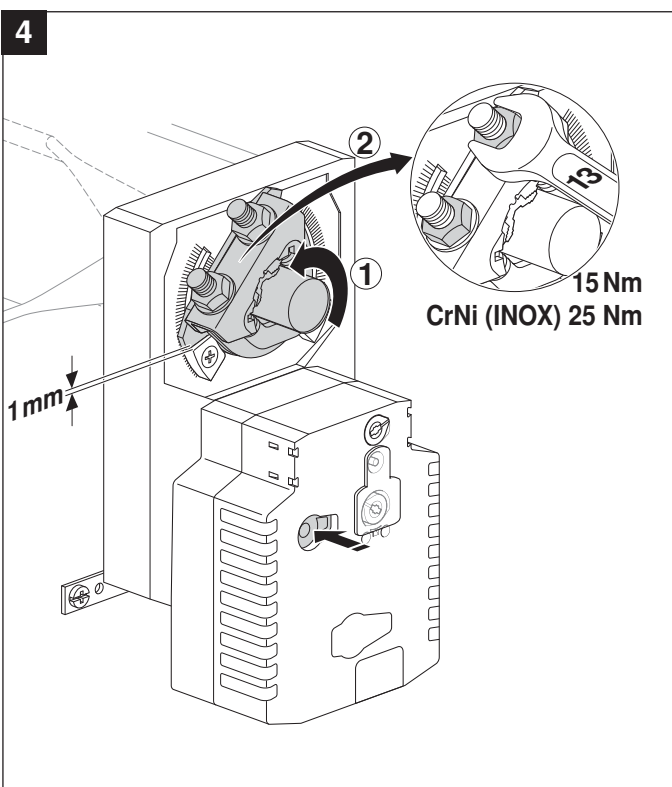
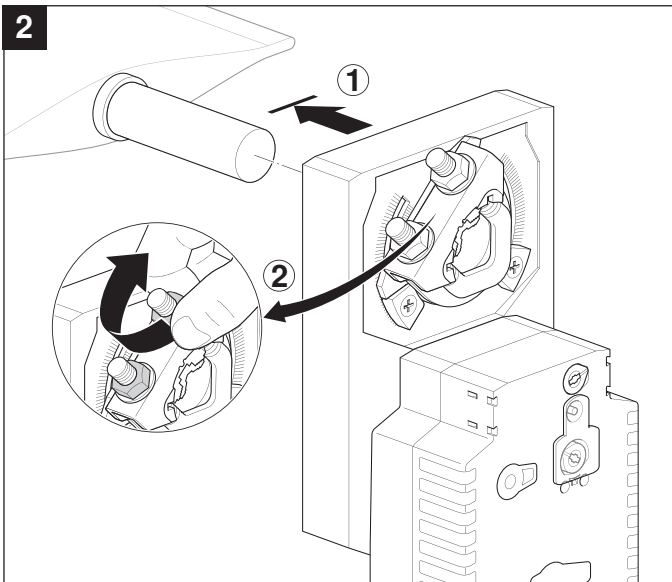
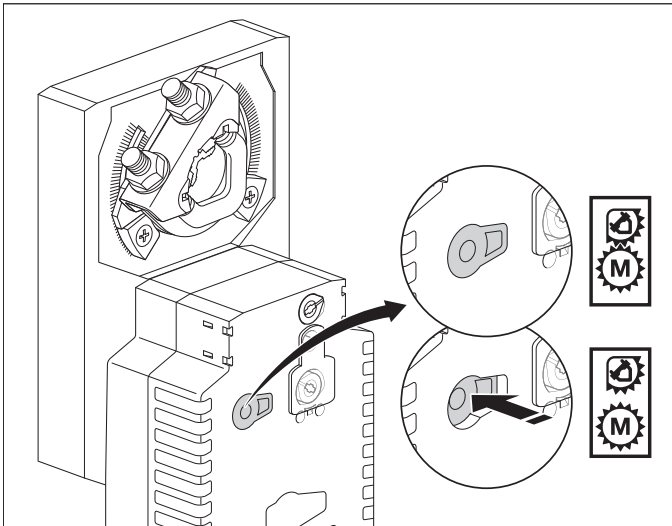


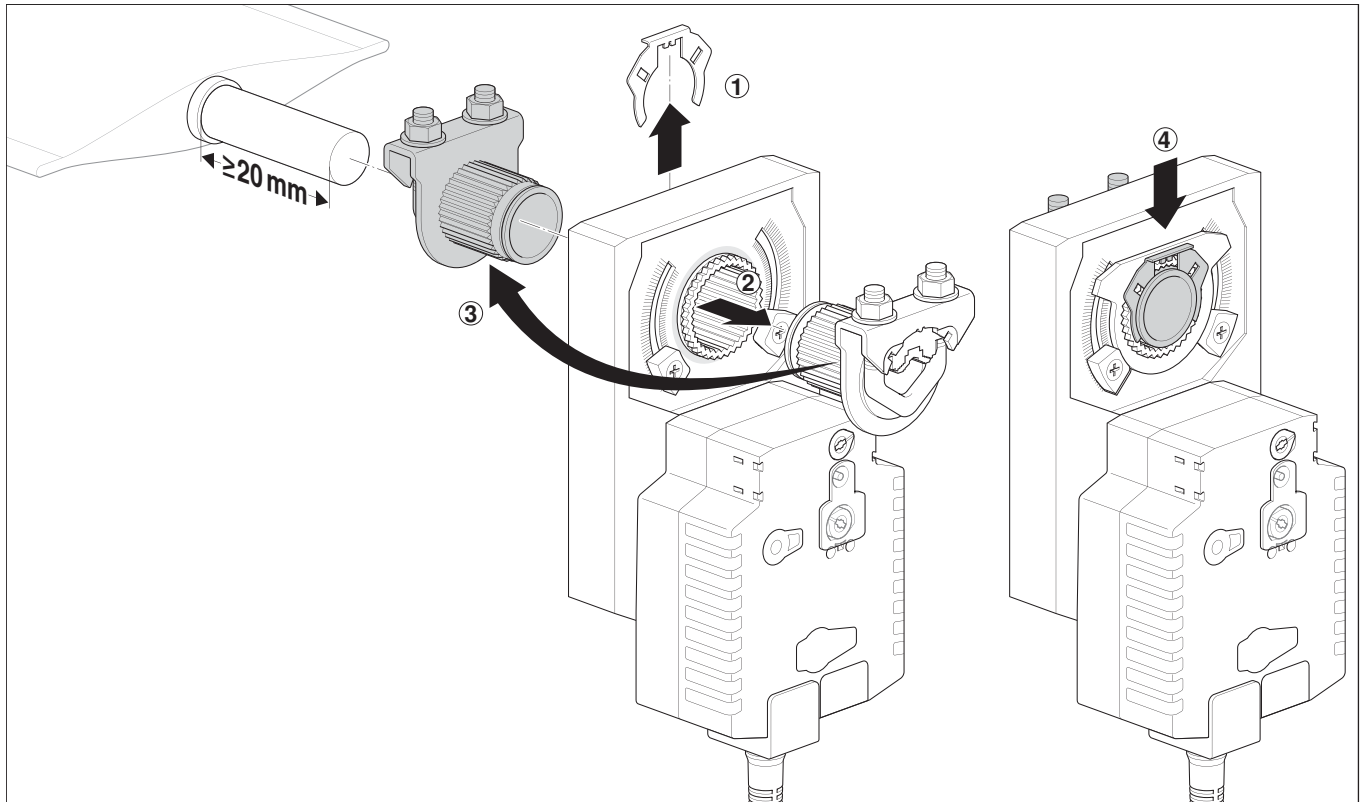






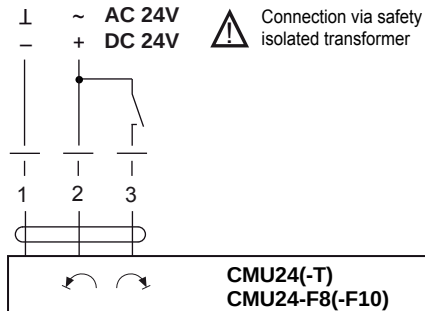
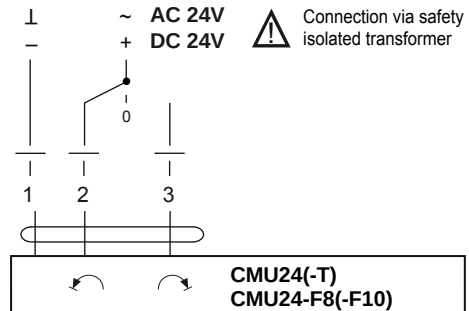
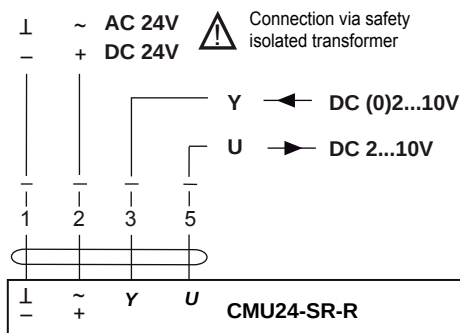
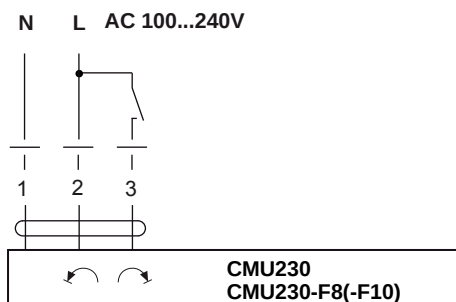
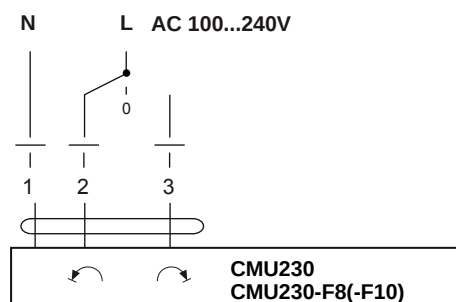






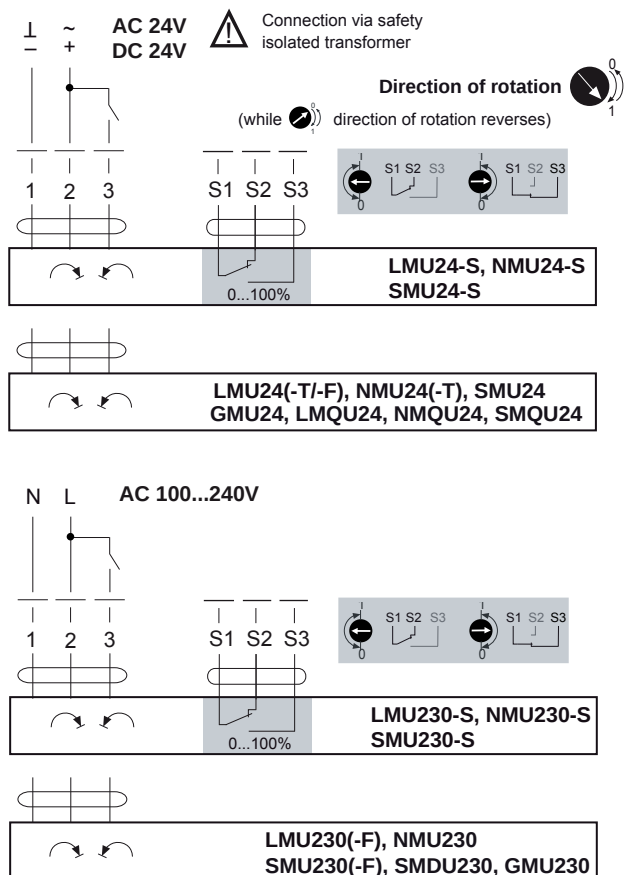
**Wiring diagrams: CMU.. series actuators**
**Notes:**

- Parallel connection of several actuators is possible.
- Power consumption must be observed.

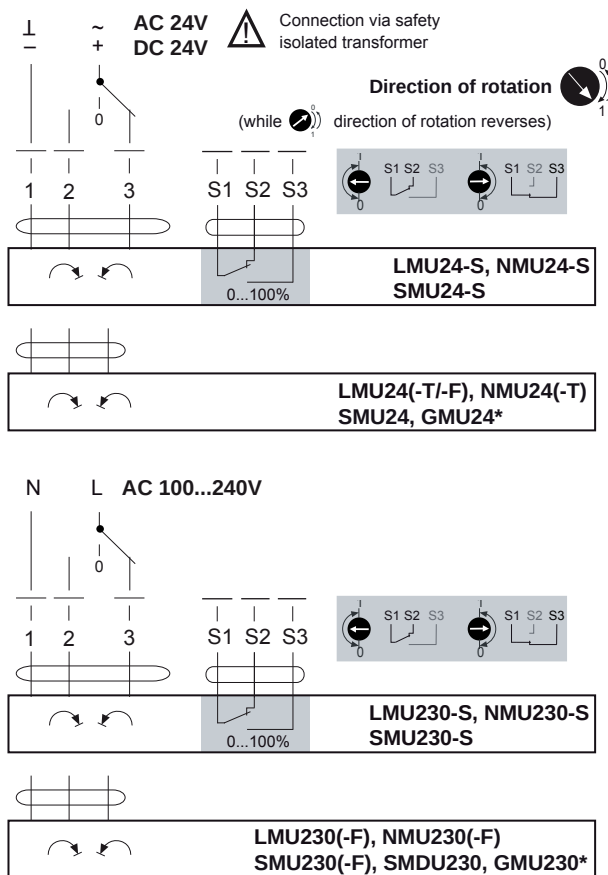
**Open/Close control**

**3-point control**

**Modulating control**

**Open/Close control**

**3-point control**


## Wiring diagrams: Open/Close actuators—parallel connection possible, please note the performance data.

### 1-wire control

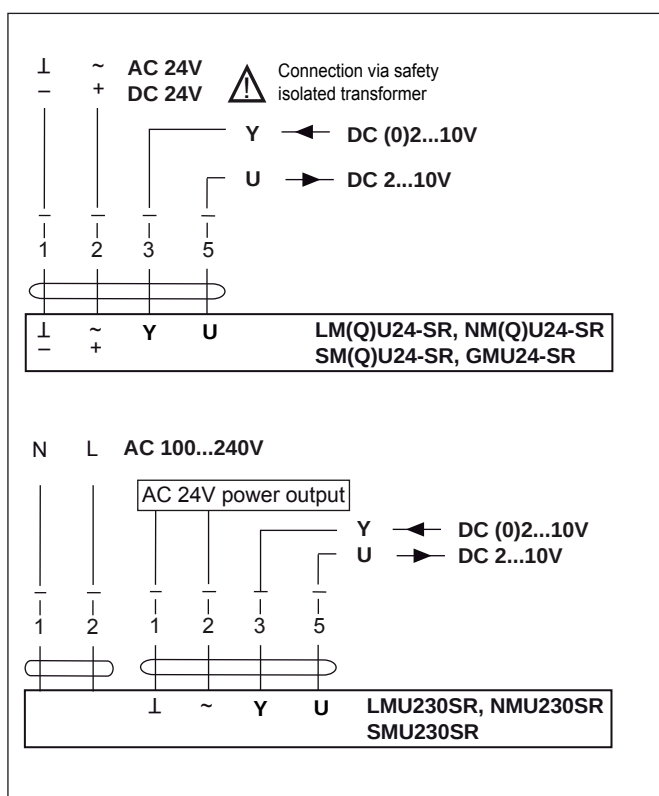


### 2-wire control

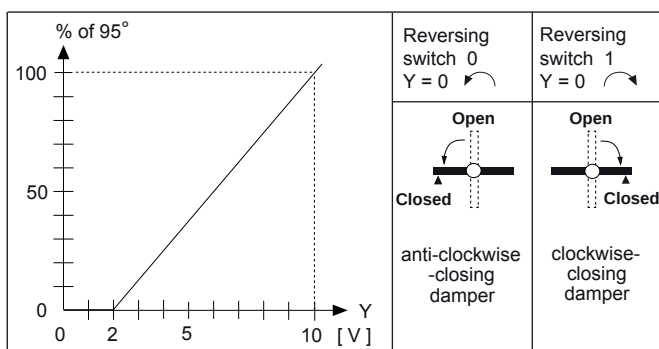


\*GMU.. only for Open/Close application.

## Wiring diagram: Modulating actuators—parallel connection possible, please note the performance data.



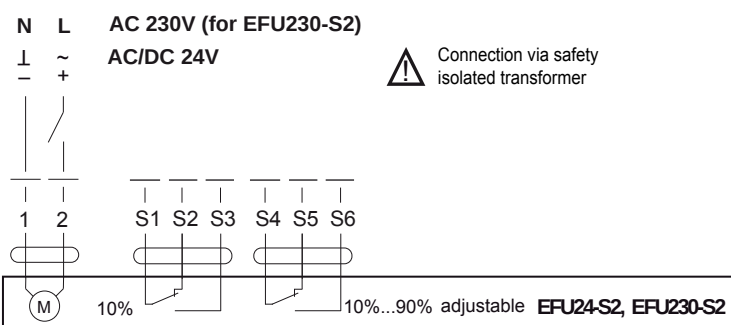
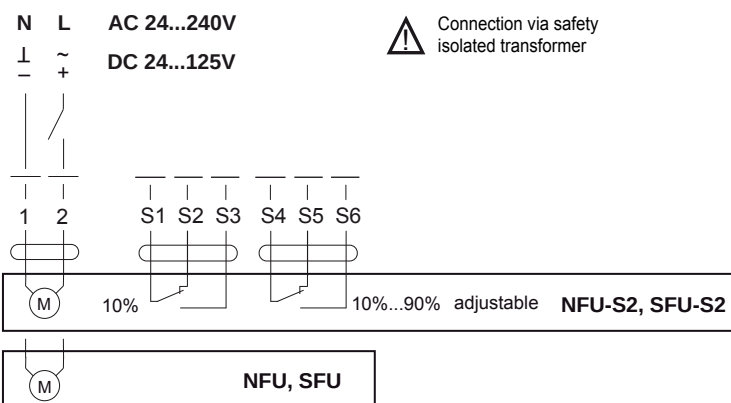
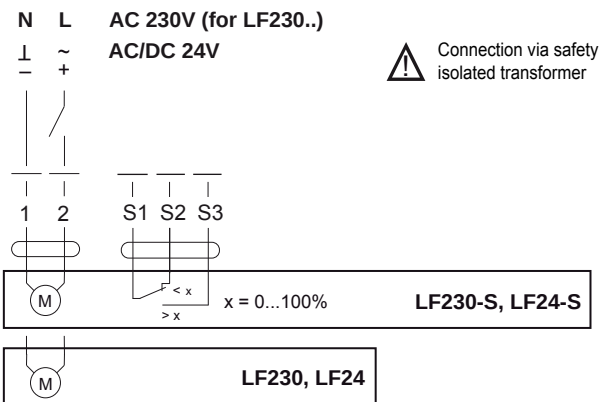
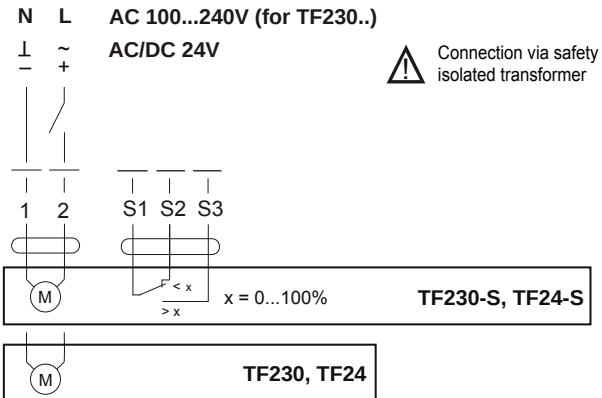
### Position - signal voltage



Direction of rotation

**Wiring diagrams: Open/Close actuators**
**Notes:**

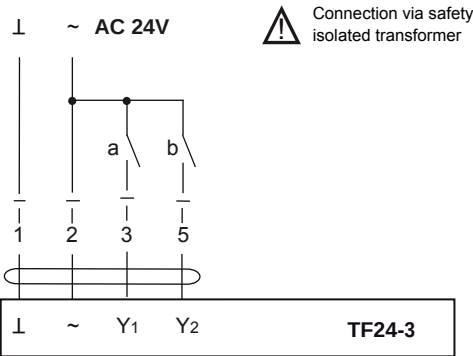
- Parallel connection of several actuators is possible.
- Power consumption must be observed.



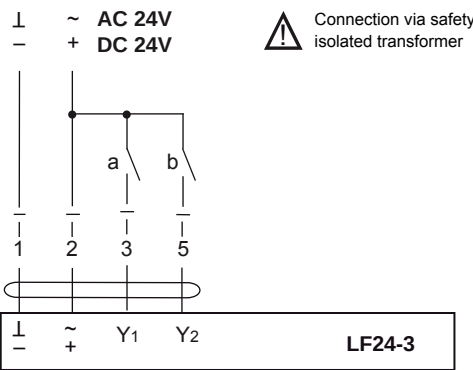
Wiring diagram: 3-point actuators

Notes:

- Connection via safety isolating transformer.
- Parallel connection of several actuators is possible.
- Power consumption must be observed.



|           |           | Mounting side    |  |  |  |
|-----------|-----------|------------------|--|--|--|
|           |           |                  |  |  |  |
|           |           | Reversing switch |  |  |  |
| a<br>(Y1) | b<br>(Y2) |                  |  |  |  |
|           |           |                  |  |  |  |
|           |           |                  |  |  |  |
|           |           |                  |  |  |  |
|           |           |                  |  |  |  |

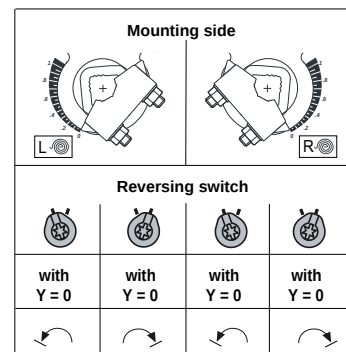
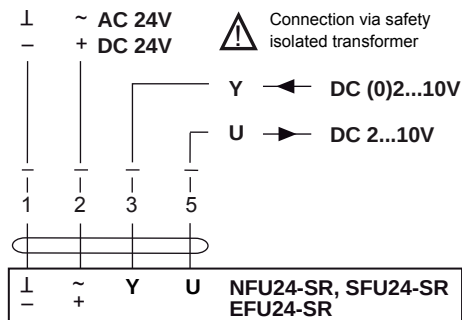
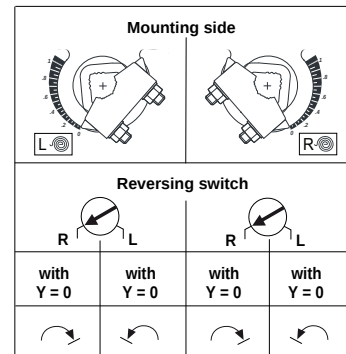
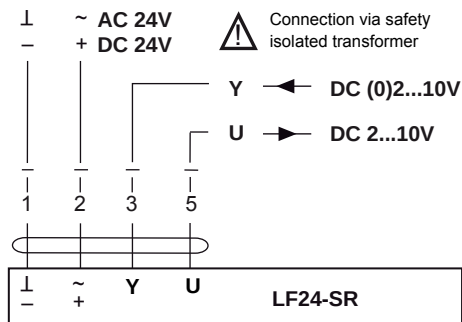
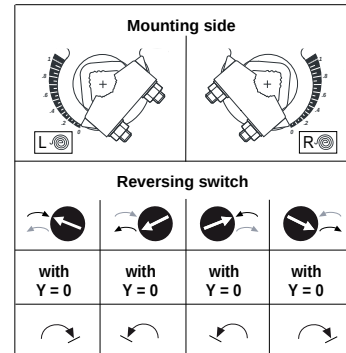
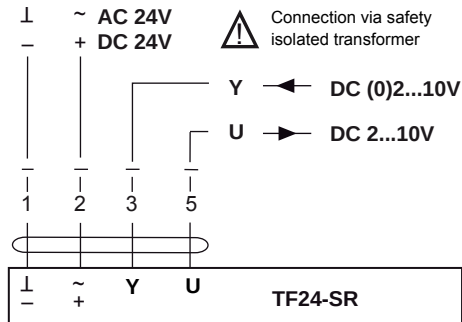


|           |           | Mounting side    |   |   |   |
|-----------|-----------|------------------|---|---|---|
|           |           |                  |   |   |   |
|           |           | Reversing switch |   |   |   |
| a<br>(Y1) | b<br>(Y2) | R                | L | R | L |
|           |           |                  |   |   |   |
|           |           |                  |   |   |   |
|           |           |                  |   |   |   |
|           |           |                  |   |   |   |

## Wiring diagram: modulating actuators

### Notes:

- Connection via safety isolating transformer.
- Parallel connection of several actuators is possible.
- Power consumption must be observed.



~ AC 24V  
+ DC 24V

⚠ Connection via safety isolated transformer

1 2 3 4 5

U → DC 2...10V

Y1 U

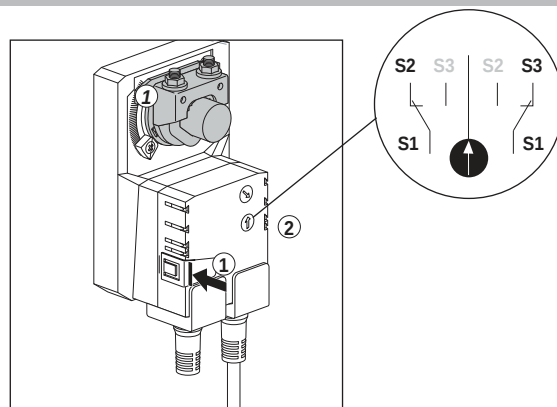
GKU24-MF

| a<br>(Y1)                                                                             | b<br>(Y2)                                                                             | Reversing switch                                                                      |                                                                                       |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                                                                       |                                                                                       |  |  |
|  |  |  |  |
|  |  | stop                                                                                  | stop                                                                                  |
|  |  |  |  |
|  |  |  |  |

### Auxiliary switch adjustment for General Damper Actuators

1. Press the pushbutton, manually operate the universal clamp to desired switch position.
2. Turn switch pointer to the middle line.
3. When actuator moves clockwise (counter clockwise) to switch position, switch indicator passes the middle line counter clockwise (clockwise), the contact between S1 and S3 is disconnected (connected) and the contact between S1 and S2 is connected (disconnected).

Note: The switching point should be about 5° from the mechanical end stops (1 short step on the scale).



### Auxiliary switch adjustment for Mechanical Fail-Safe Damper Actuators

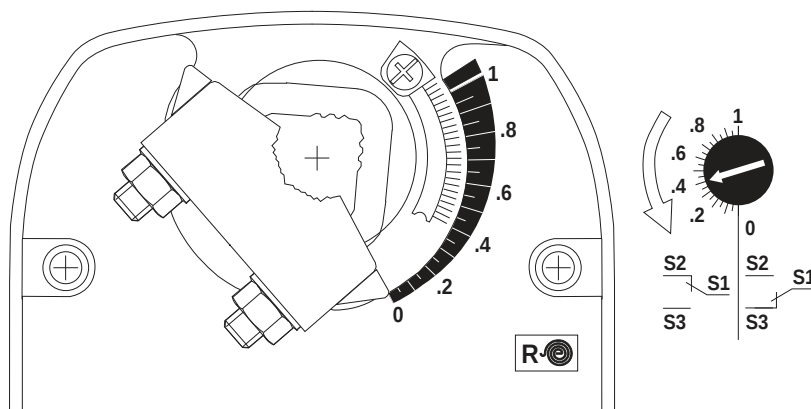
LF..-S (Mounting side R); NFU-S2, SFU-S2, EFU..-S2 (Mounting side L)

Starting point: Actuator in safe position

#### Procedure

Turn the knob of the auxiliary switch until the tip of the arrow is pointing to the required switching position (see right). Example: Switching point setting = 4 corresponds to 40% angle of rotation.

When the actuator runs to the operating position (ccw ↺), the switch knob will also rotate counter-clockwise (ccw ↺) and the auxiliary switch will operate as the tip of the arrow passes the scale zero (S1–S3 linked).



### Fast Running Q.. Actuators operating controls and indicators



- ① **Direction of rotation switch**  
Switching over: Direction of rotation changes
- ② **Pushbutton and green LED display**  
Off: No voltage supply or fault  
On: In operation  
Press button: Switches on angle of rotation adaption followed by standard operation
- ③ **Pushbutton and yellow LED display**  
Off: Standard operation  
On: Adaption or synchronising process active  
Press button: No function
- ④ **Gear disengagement switch**  
Press button: Gear disengaged, motor stops, manual override possible  
Release button: Gear engaged, synchronisation starts, followed by standard operation

#### Check voltage supply connection

- ② Off and ③ On } Check the supply connections.
- ② Blinking and ③ Blinking } Possibly  $\perp$  and  $\nabla$  are swapped over.

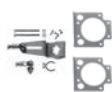
- ⑤ **No function**

|                                                                                    |                                                                    | Actuators |     |     |     |     |    |    |     |     |     |     |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------|-----|-----|-----|-----|----|----|-----|-----|-----|-----|
|                                                                                    |                                                                    | CMU       | LMU | NMU | SMU | GMU | TF | LF | NFU | SFU | EFU | GPU |
|    | <b>S..A..</b> Auxiliary switch, add on                             |           |     |     |     |     |    |    |     |     |     |     |
|                                                                                    | S1A 1xSPDT 3A(0.5A), AC 250V                                       |           | •   | •   | •   | •   |    |    |     |     |     | •   |
|                                                                                    | S2A 2xSPDT 3A(0.5A), AC 250V                                       |           | •   | •   | •   | •   |    |    |     |     |     | •   |
|                                                                                    | S2A -F 2xSPDT 3A(0.5A), AC 250V                                    |           |     |     |     |     |    | •  | •   | •   |     |     |
|    | <b>P..A..</b> Feedback potentiometer, add on                       |           |     |     |     |     |    |    |     |     |     |     |
|                                                                                    | P140A.. 140Ω                                                       |           | •   | •   | •   | •   |    |    |     |     |     | •   |
|                                                                                    | P500A.. 500Ω                                                       |           | •   | •   | •   | •   |    |    |     |     |     | •   |
|                                                                                    | P1000A.. 1000Ω                                                     |           | •   | •   | •   | •   |    |    |     |     |     | •   |
|                                                                                    | P2800A.. 2800Ω                                                     |           | •   | •   | •   | •   |    |    |     |     |     | •   |
|                                                                                    | P5000A.. 5000Ω                                                     |           | •   | •   | •   | •   |    |    |     |     |     | •   |
|                                                                                    | P10000A.. 10000Ω                                                   |           | •   | •   | •   | •   |    |    |     |     |     | •   |
|                                                                                    | P200A-F 200Ω                                                       |           |     |     |     |     |    | •  | •   | •   |     |     |
|    | <b>SGA24</b> Positioner for surface mounting                       | 1)        | 1)  | 1)  | 1)  | 1)  | 1) | 1) | 1)  | 1)  | 1)  | 2)  |
|                                                                                    | 0...100%<br>Reversible operating range DC 0...10V<br>or DC 2...10V |           |     |     |     |     |    |    |     |     |     |     |
|    | <b>SGE24</b> Positioner for rack mounting                          | 1)        | 1)  | 1)  | 1)  | 1)  | 1) | 1) | 1)  | 1)  | 1)  | 2)  |
|                                                                                    | 0...100%<br>Reversible operating range DC 0...10V<br>or DC 2...10V |           |     |     |     |     |    |    |     |     |     |     |
|  | <b>SGF24</b> Positioner for front-panel mounting                   | 1)        | 1)  | 1)  | 1)  | 1)  | 1) | 1) | 1)  | 1)  | 1)  | 2)  |
|                                                                                    | 0...100%<br>Reversible operating range DC 0...10V<br>or DC 2...10V |           |     |     |     |     |    |    |     |     |     |     |
|  | <b>ZDA24</b> Digital position indicator for front-panel mounting   | 1)        | 1)  | 1)  | 1)  | 1)  | 1) | 1) | 1)  | 1)  | 1)  | 2)  |
|                                                                                    | 0...99%<br>Front size 72x72mm<br>Operating range DC 2...10V        |           |     |     |     |     |    |    |     |     |     |     |

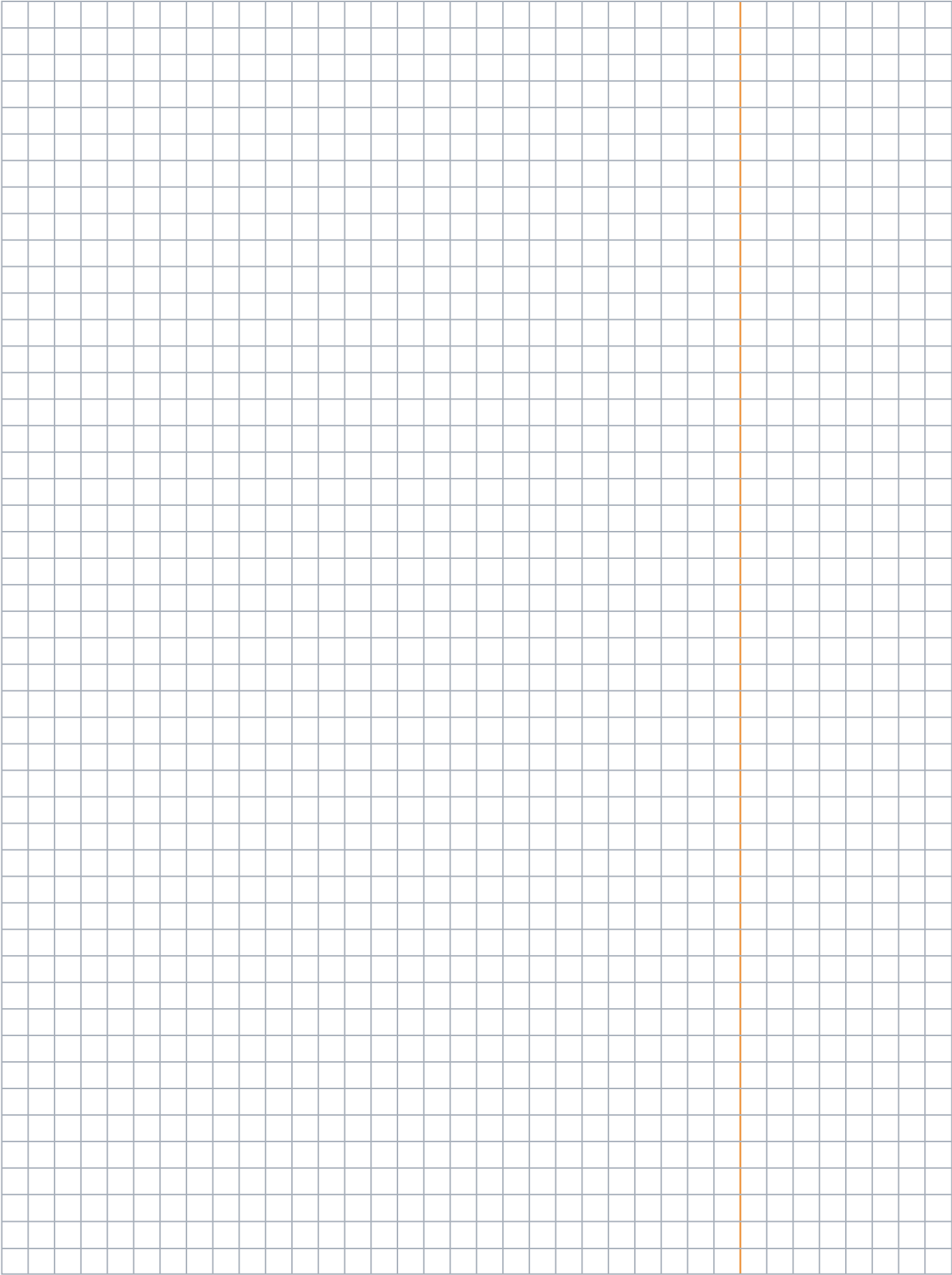
1) For ...SR

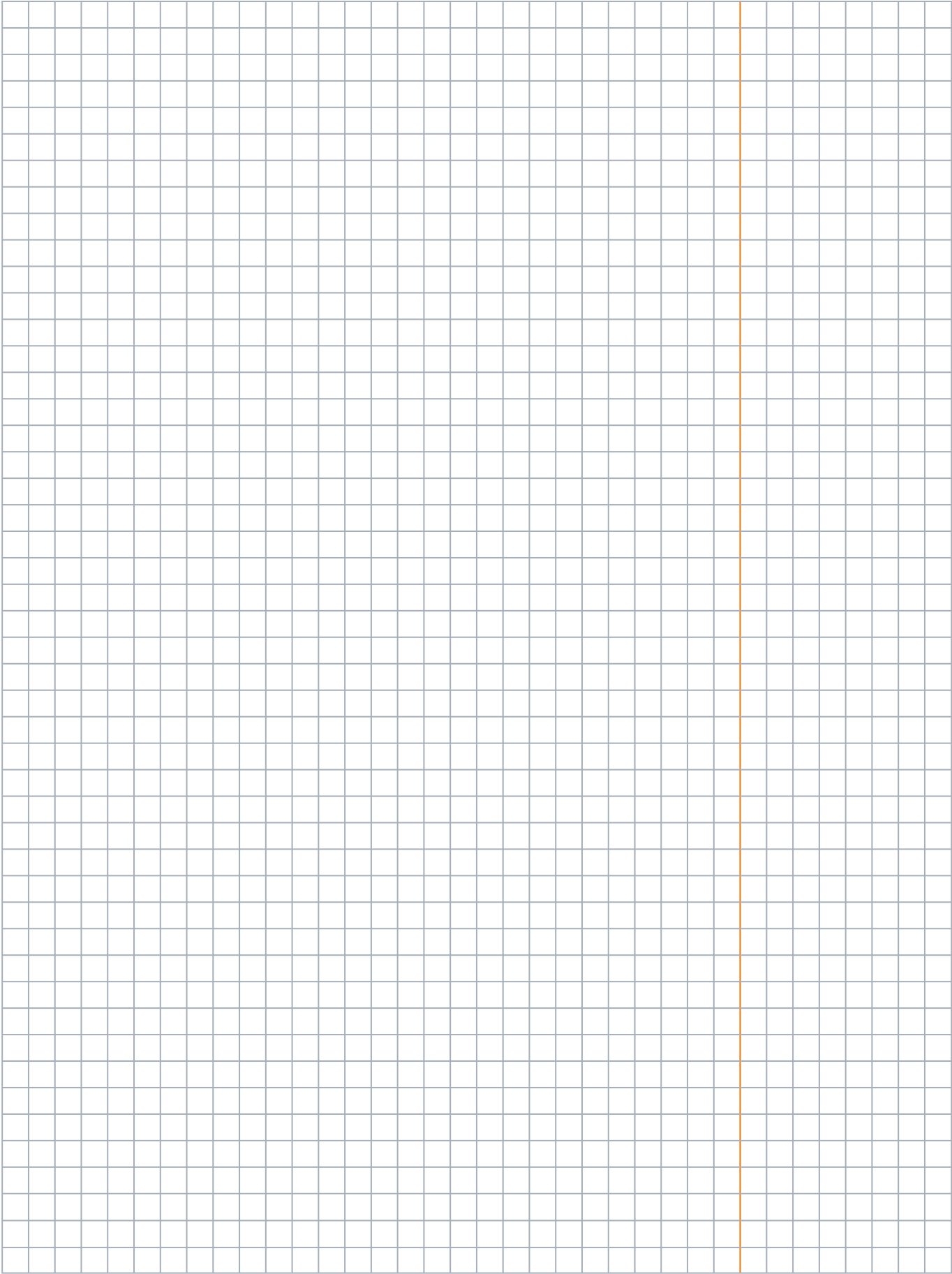
2) For ...MF

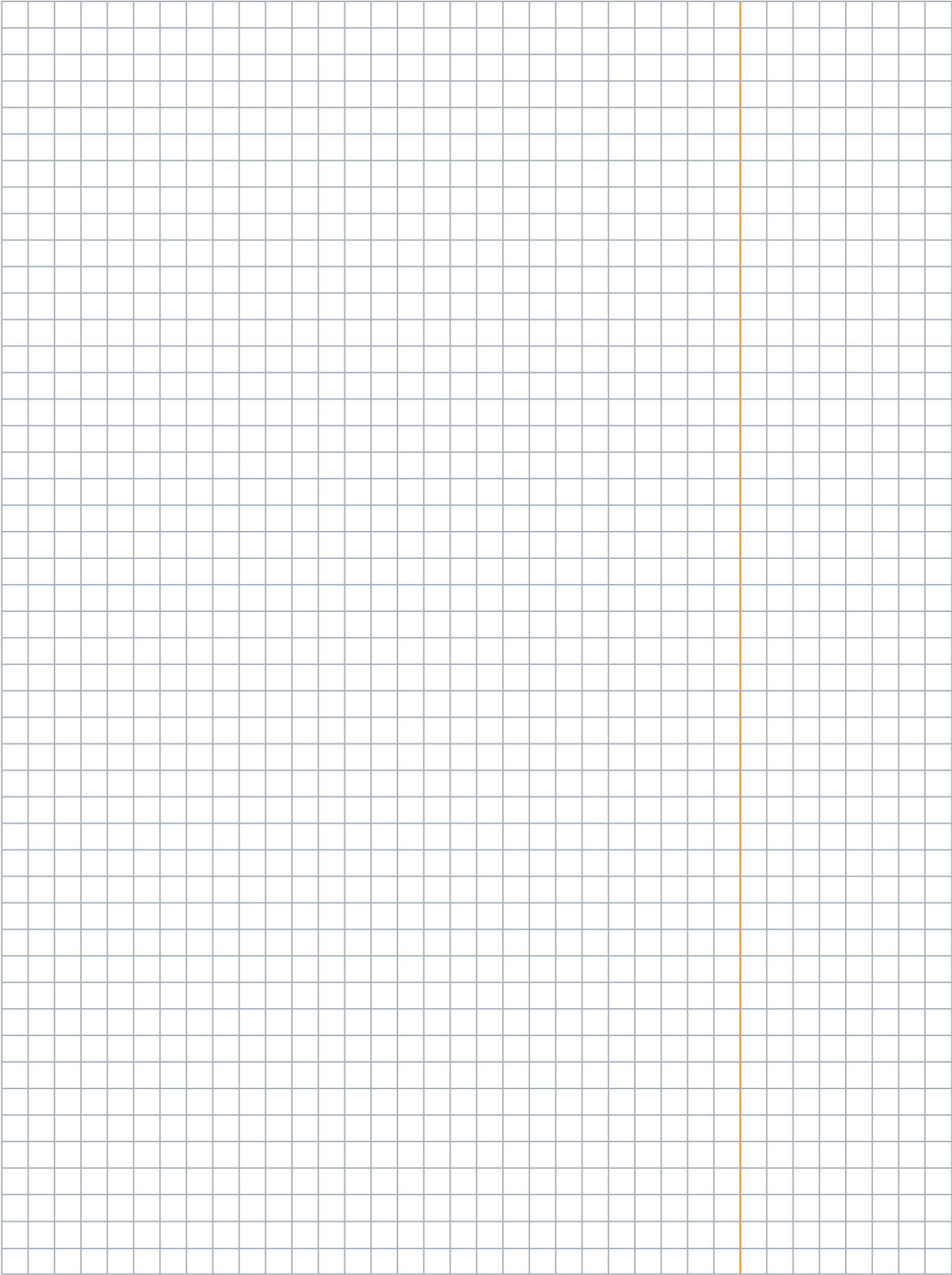
|                |                                                                                                                                                                                               | Actuators |                       |             |             |    |    |     |     |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-------------|-------------|----|----|-----|-----|
|                |                                                                                                                                                                                               | LMU       | NMU<br>LMQU<br>NMQU   | SMU<br>SMDU | GMU<br>SMQU | TF | LF | NFU | SFU |
| <b>AN-20</b>   | Actuator arm<br>                                                                                             |           | •                     | •           |             |    |    |     |     |
| <b>AH-25</b>   | Actuator arm<br>                                                                                             |           | •                     | •           |             |    |    |     |     |
| <b>AH-GMA</b>  | Actuator arm<br>                                                                                             |           |                       |             | •           |    |    |     |     |
| <b>AV6-20</b>  | Shaft extension<br>Length approximately 170mm<br>For damper spindles ø6...20mm<br>Extension ø10mm<br>        | •         |                       |             |             | •  | •  |     |     |
| <b>AV8-25</b>  | Shaft extension<br>Length approximately 250mm<br>For damper spindles ø8...25mm<br>Extension ø20mm<br>       |           | •                     | •           |             |    |    |     |     |
| <b>IND-AFB</b> | NFU/SFU.. position indicator<br>                                                                           |           |                       |             |             |    |    | •   | •   |
| <b>K6-1</b>    | Spindle clamp for LF..<br>For damper spindles ø16...20mm<br>                                               |           |                       |             |             |    | •  |     |     |
| <b>K7-2</b>    | NFU/SFU.. standard clamp<br>1/2", 3/4", 1.05"<br>                                                          |           |                       |             |             |    |    | •   | •   |
| <b>K-ENSA</b>  | Spindle clamp<br>For damper spindles ø8...20mm<br>                                                         |           | •                     | •           |             |    |    |     |     |
| <b>K-NA</b>    | Reversible spindle clamp<br>For damper spindles ø8...20mm<br>                                              |           | •<br>(except<br>NMQU) |             |             |    |    |     |     |
| <b>K-SA</b>    | Reversible spindle clamp<br>For damper spindles ø10...20mm<br>                                             |           |                       | •<br>(NMQU) |             |    |    |     |     |
| <b>KG8</b>     | Ball joint<br>Suitable for damper crank arm KH8<br>For round steel rod with ø8mm<br>Zinc-plated steel<br>  |           | •                     | •           |             | •  | •  | •   | •   |
| <b>KG10A</b>   | Ball joint<br>Suitable for damper crank arm KH8<br>For round steel rod with ø10mm<br>Zinc-plated steel<br> |           | •                     | •           | •           | •  | •  | •   | •   |

|                   |                                                                                                                                                          | Actuators |                     |             |             |    |    |     |     |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------|-------------|-------------|----|----|-----|-----|
|                   |                                                                                                                                                          | LMU       | NMU<br>LMQU<br>NMQU | SMU<br>SMDU | GMU<br>SMQU | TF | LF | NFU | SFU |
| <b>ZG-118</b>     | NFU/SFU.. mounting bracket<br>                                           |           |                     |             |             |    |    | •   | •   |
| <b>ZG-AFB</b>     | NFU/SFU.. crank arm adapter kit<br>                                      |           |                     |             |             |    |    | •   | •   |
| <b>ZG-AFB118</b>  | NFU/SFU.. crank arm adapter kit<br>                                      |           |                     |             |             |    |    | •   | •   |
| <b>ZG-GMA</b>     | Mounting kit<br>For flat and side mounting<br>                           |           |                     |             | •           |    |    |     |     |
| <b>ZG-LF1</b>     | Damper linkage kit<br>For side mounting (with 2 ball joint KG8)<br>     |           |                     |             |             |    | •  |     |     |
| <b>ZG-LF3</b>     | Damper linkage kit<br>For side mounting (with 2 ball joint KG8)<br>    |           |                     |             |             |    | •  |     |     |
| <b>ZG-NMA</b>     | Mounting kit<br>For flat and side mounting<br>                         |           | •                   |             |             |    |    |     |     |
| <b>ZG-SMA</b>     | Mounting kit<br>For flat and side mounting<br>                         |           |                     | •           |             |    |    |     |     |
| <b>ZG-TF1</b>     | Damper linkage<br>For flat mounting<br>                                |           |                     |             |             | •  |    |     |     |
| <b>Z-AF</b>       | Retrofit adapter for NG NFU/SFU.. while<br>replacing old NF/AF/AFR<br> |           |                     |             |             |    |    | •   | •   |
| <b>ZF10-NSA-F</b> | 10x10 formfit adapter<br>mutpack 20 pieces                                                                                                               |           |                     |             |             |    |    | •   | •   |
| <b>ZF12-NSA-F</b> | 12x12 formfit adapter<br>mutipack 20 pieces                                                                                                              |           |                     |             |             |    |    | •   | •   |
| <b>ZF16-NSA-F</b> | 16x16 formfit adapter<br>mutipack 20 pieces                                                                                                              |           |                     |             |             |    |    | •   | •   |

| Series       | Old models | New Generation | Description                              |
|--------------|------------|----------------|------------------------------------------|
| <b>NFU..</b> | NF24       | NFU            | Open/Close 10Nm                          |
|              | NF230      |                | Open/Close 10Nm                          |
|              | NF24-S     | NFU-S2         | Open/Close 10Nm, 2xSPDT auxiliary switch |
|              | NF230-S    |                | Open/Close 10Nm, 2xSPDT auxiliary switch |
|              | NF24-SR    | NFU24-SR       | Modulating 10Nm                          |
| <b>SFU..</b> | AF24       | SFU            | Open/Close 20Nm                          |
|              | AFR24      |                | Open/Close 20Nm                          |
|              | AF230      |                | Open/Close 20Nm                          |
|              | AFR230     |                | Open/Close 20Nm                          |
|              | AF24-S     | SFU-S2         | Open/Close 20Nm, 2xSPDT auxiliary switch |
|              | AFR24-S    |                | Open/Close 20Nm, 2xSPDT auxiliary switch |
|              | AF230-S    |                | Open/Close 20Nm, 2xSPDT auxiliary switch |
|              | AFR230-S   |                | Open/Close 20Nm, 2xSPDT auxiliary switch |
|              | AF24-SR    | SFU24-SR       | Modulating 20Nm                          |
|              | AFR24-SR   |                | Modulating 20Nm                          |







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