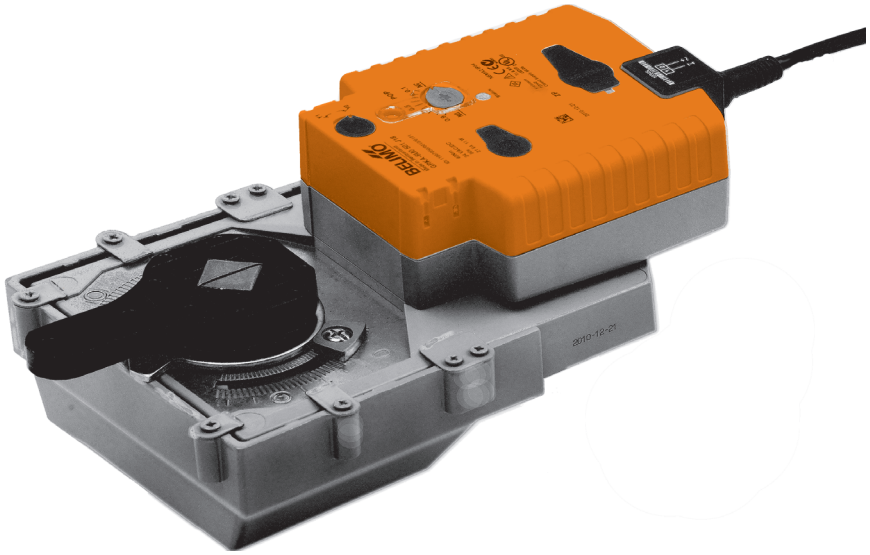
**Modulating SuperCap rotary actuator with emergency setting function and extended functionalities for butterfly valves and ball valves with mounting flange ISO 5211-F05**

- **Torque 40 Nm**
- **Nominal voltage AC/DC 24 V**
- **Control: modulating DC 0 ... 10 V**
- **Position feedback DC 2 ... 10 V**
- **Design life SuperCaps 15 years**



## Technical data

| | | | |
|---|---|---|---|
| **Electrical data** | Nominal voltage | | AC 24 V, 50/60 Hz / DC 24 V |
| | Nominal voltage range | | AC 19.2 ... 28.8 V / DC 21.6 ... 28.8 V |
| | Power consumption | In operation | 11 W @ nominal torque |
| | | At rest | 3 W |
| | | For wire sizing | 21 VA ($I_{max}$ 20 A @ 5 ms) |
| | Connection | | Cable 1 m, 4 x 0.75 mm² |
| | Parallel operation | | Yes (note the performance data) |
| **Functional data** | Torque | | ≥40 Nm |
| | Control | Control signal Y | DC 0 … 10 V, input impedance 100 kΩ |
| | | Operating range | DC 2 ... 10 V |
| | Position feedback (Measuring voltage U) | | DC 2 ... 10 V, max. 0.5 mA |
| | Emergency setting position (POP) | | NC / NO or adjustable 0...100% (POP rotary button) |
| | Bridging time with voltage interruption | | 2 s |
| | Position accuracy | | ±5% |
| | Direction of rotation | Emergency setting position | Reversible with switch 0 ... 100% (end stop ↶ 0%) |
| | Manual override | | Gearing latch disengaged with push button |
| | Running time | Motor | 150 s / 90° |
| | | Emergency setting function | 35 s @ 0 ... 50 °C |
| | Sound power level | Motor | ≤53 dB (A) @ 90 s running time<br>≤52 dB (A) @ 150 s running time |
| | | Emergency setting function | ≤61 dB (A) |
| | Position indication | | Mechanical, pluggable |
| **Safety** | Protection class | | **III** Safety extra-low voltage<br>UL Class 2 Supply |
| | Degree of protection | | IP54<br>NEMA 2, UL Enclosure Type 2 |
| | EMC | | CE according to 2004/108/EC |
| | Certification | | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14<br>cULus according to UL 60730-1A and UL 60730-2-14<br>and CAN/CSA E60730-1:02 |
| | Mode of operation | | Type 1.AA |
| | Rated impulse voltage | | 0.8 kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30 ... +50 °C |
| | Non-operating temperature | | –40 ... +80 °C |
| | Ambient humidity | | 95% r.h., non-condensing |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» on page 5 |
| | Weight | | Approx. 2.8 kg |

**Terms and abbreviations**

POP = Power off position / emergency setting position
PF = Power fail delay time / bridging time

## Safety notes

- **The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.**
- **It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.**
- **The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not in particular be reversed in a frost protection circuit.**
- **The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.**
- **The cable must not be removed from the device.**
- **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.**

## Product features

**Mode of operation**

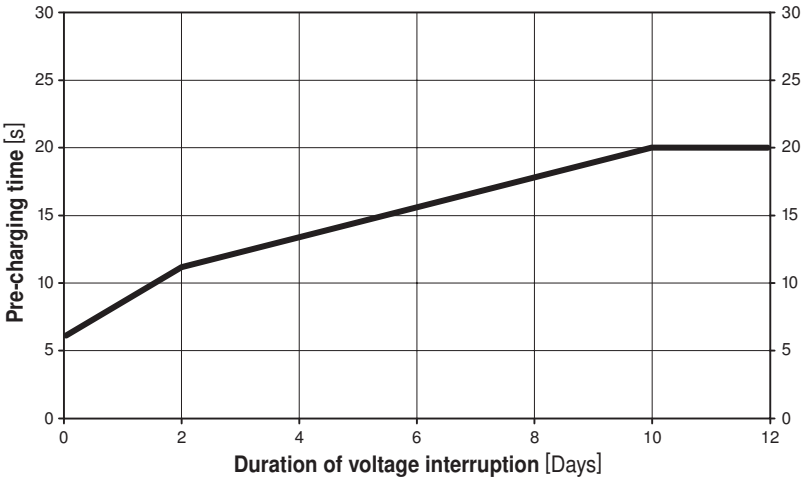
The actuator moves the valve to the desired operating position at the same time as the integrated capacitors are loaded. Interrupting the supply voltage causes the valve to be rotated back into the emergency setting position by means of stored electrical energy.
The actuator is connected with a standard modulating signal of DC 0 ... 10V and travels to the position defined by the positioning signal. The measuring voltage U serves for the electrical display of the ball position 0 ... 100%.

**Pre-charging time (start up)**

The capacitor actuators require a pre-charging time. This time is used for charging the capacitors up to a usable voltage level. This ensures that, in the event of an electricity interruption, the actuator can be moved at any time from its current position into the preset emergency setting position (POP).
The duration of the pre-charging time depends mainly on how long the power was interrupted.

Typical pre-charging times

| | Duration of voltage interruption [Days] | | | | |
|---|---|---|---|---|---|
| | **0** | **1** | **2** | **7** | **≥10** |
| **Pre-charging time** [s] | 6 | 9 | 11 | 16 | 20 |




**Delivery condition (capacitors)**

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

**Simple direct mounting**

Simple direct mounting on a valve with ISO 5211-F05 mounting flange.
The mounting orientation in relation to the valve can be selected in 90° steps.

**Manual override**

Manual override with push button possible (the gear is disengaged for as long as the button remains pressed down).

**High functional reliability**

The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.

## Product features

*(continued)*

**Direction of rotation switch**

When actuated, the direction of rotation switch changes the running direction in normal operation.
The direction of rotation switch has no influence on the emergency setting position (POP) which has been set.

**Emergency setting position (POP) rotary button**

The «Emergency setting position» rotary button can be used to adjust the desired emergency setting position (POP) between 0 and 100% in 10% increments.
The rotary button always refers to an angle of rotation of 90°∢ and does not take into account any retroactively adjusted end stops.
In the event of a voltage interruption, the actuator will move into the selected emergency setting position, taking into account the bridging time (PF) of 2 s which was set ex-works.

**Combination valve/actuator**

Für Ventile mit folgenden mechanischen Spezifikationen nach ISO 5211 - F05:
– Square stem head (14 mm) for form-fit attachment of the rotary actuator.
– Hole circle d = 50 mm for installation with the butterfly valve.

## Accessories

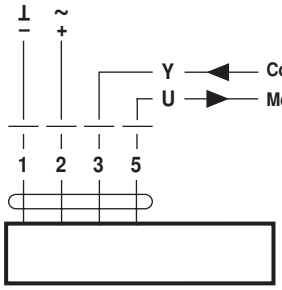
**Electrical accessories**

| Description | Data sheet |
|---|---|
| Auxiliary switch S..A.. | T2/T5 - S..A.. |
| Feedback potentiometer P..A.. | T2/T5 - P..A.. |
| Position sensor SGA24, SGE24 and SGF24 | T2 - SG..24 |
| Digital position indication ZAD24 | T2 - ZAD24 |
| Room temperature controller CR24.. | S4 - CR24-.. |

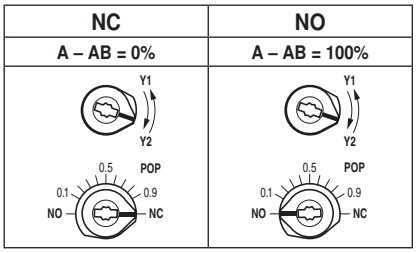
## Electrical installation

**Wiring diagram**

**Note**
- Connect via safety isolation transformer.
- Factory setting of the direction of rotation switch Y2

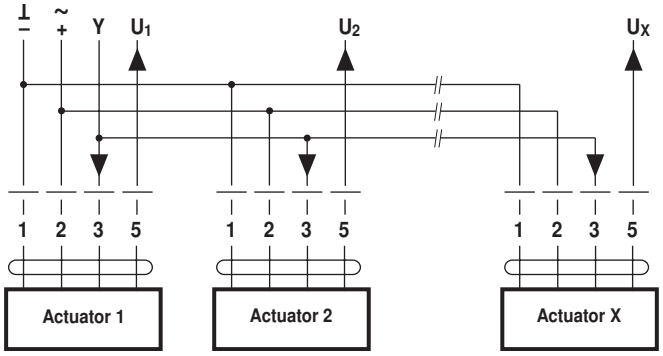



**Cable colours:**
1 = black
2 = red
3 = white
5 = orange



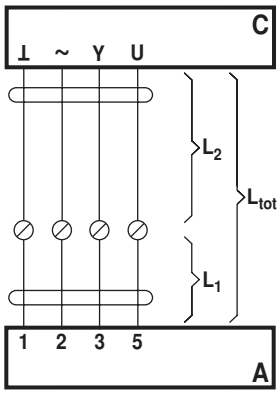

**Wiring diagram for parallel operation**

**Notes**
- A maximum of eight actuators can be connected in parallel.
- Parallel operation is permitted only on separated axes.
- It is imperative that the performance data be observed with parallel operation.



## Electrical installation *(continued)*

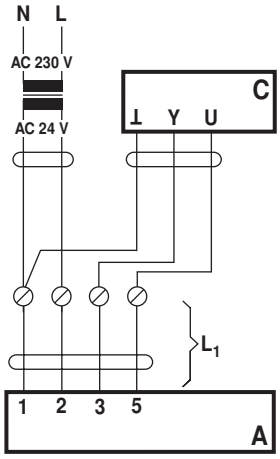
### Cable lengths




**A** = Actuator
**C** = Control unit
$L_1$ = Belimo connecting cable, 1 m (4 x 0.75 mm²)
$L_2$ = Customer cable
$L_{tot}$ = Maximum cable length

| Cross-section $L_2$ ⊥ / ~ | Max. cable length $L_{tot} = L_1 + L_2$ | | Example for DC |
|---|---|---|---|
| | AC | DC | |
| 0.75 mm² | ≤40 m | ≤20 m | 1 m ($L_1$) + 19 m ($L_2$) |
| 1.00 mm² | ≤50 m | ≤30 m | 1 m ($L_1$) + 29 m ($L_2$) |
| 1.50 mm² | ≤80 m | ≤45 m | 1 m ($L_1$) + 44 m ($L_2$) |
| 2.50 mm² | ≤130 m | ≤80 m | 1 m ($L_1$) + 79 m ($L_2$) |

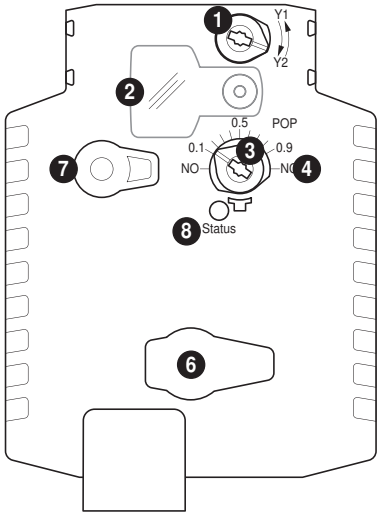
**Note**
When several actuators are connected in parallel, the maximum cable length must be divided by the number of actuators.




**A** = Actuator
**C** = Control unit
$L_1$ = Belimo connecting cable, 1 m (4 x 0.75 mm²)

**Note**
There are no special restrictions on installation if the supply and data cable are routed separately.

## Operating controls and indicators

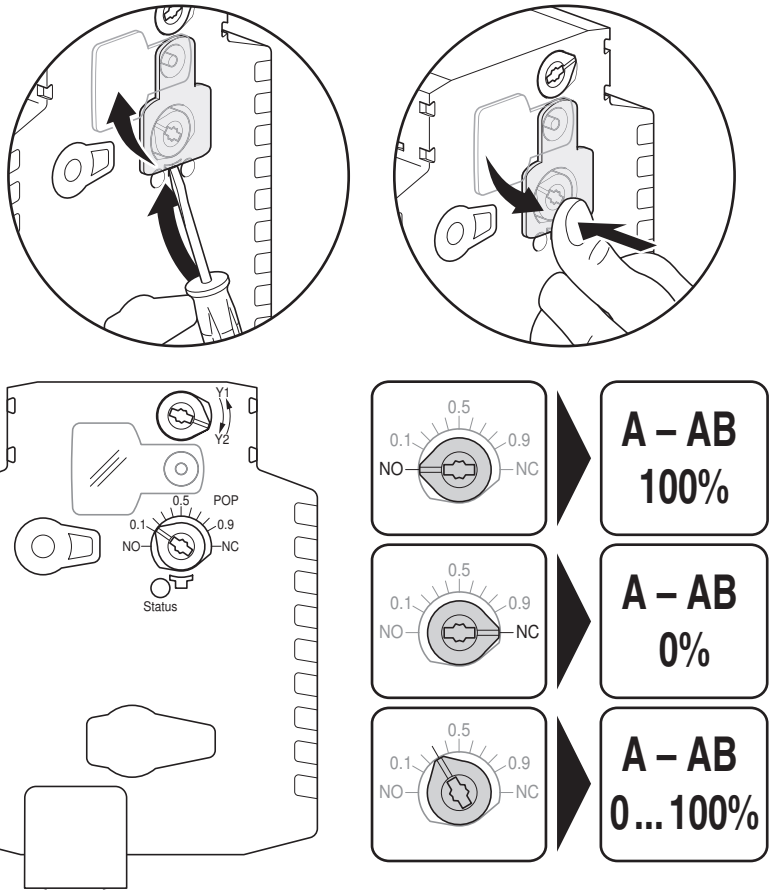



1. **Direction of rotation switch**
2. **Cover, POP button**
3. **POP button**
4. **Scale for manual adjustment**
6. (no function)
7. **Disengagement button**

| LED display 8 green | Meaning / function |
|---|---|
| Illuminated | Operation OK / without fault |
| Blinking | POP function active |
| Off | – Not in operation<br>– Pre-charging time SuperCap<br>– Fault SuperCap |

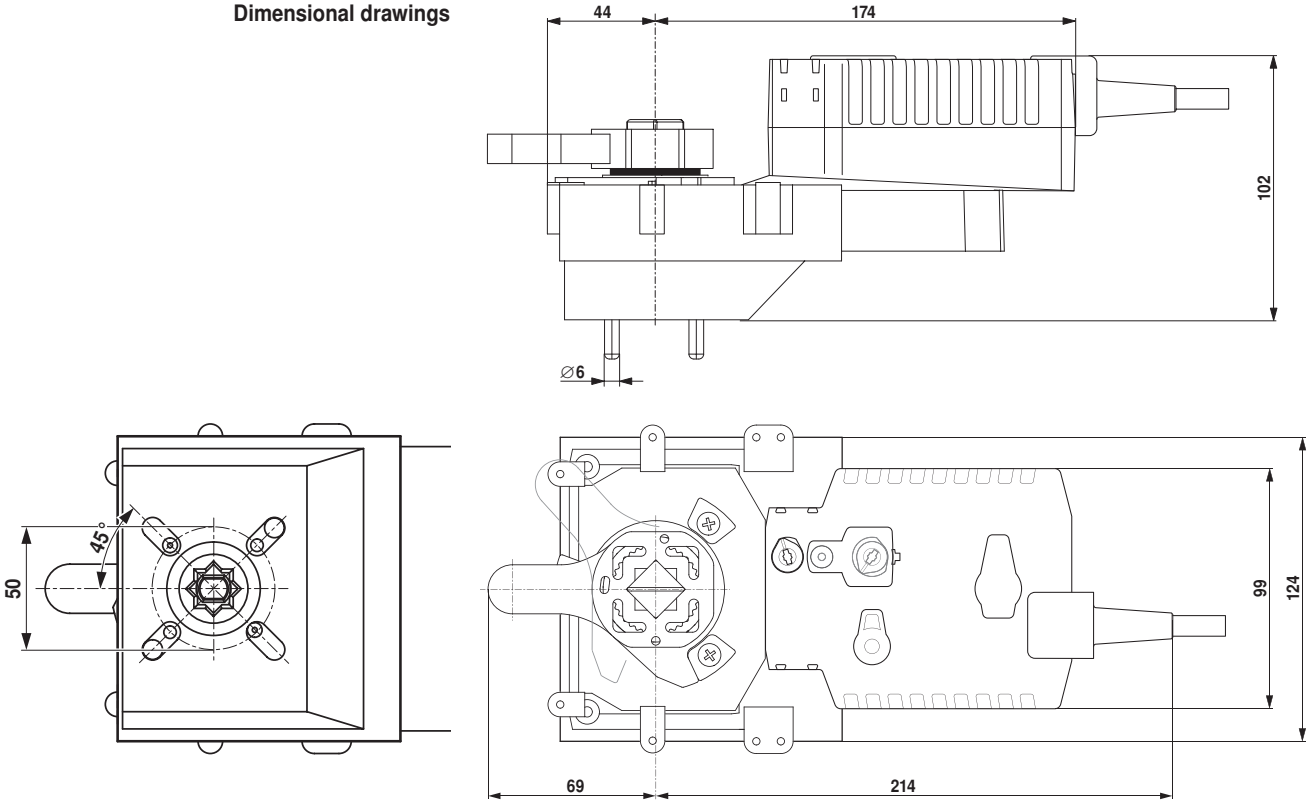
## Operating controls and indicators *(continued)*

### Setting the POP Power off position



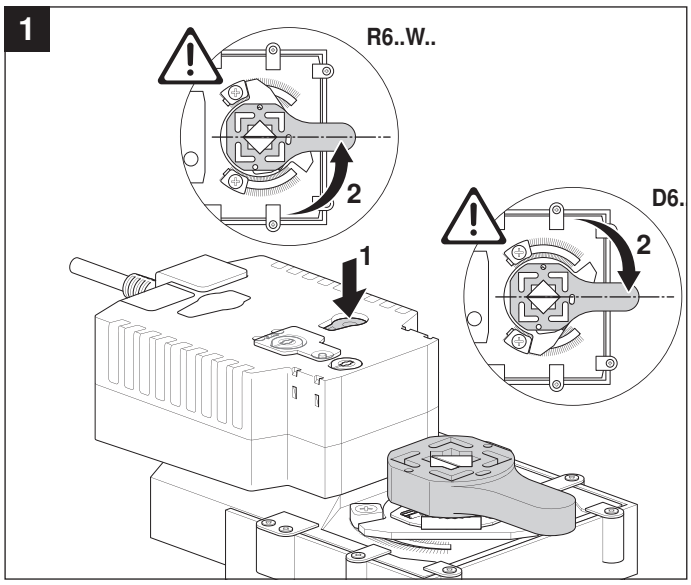

## Dimensions [mm]

### Dimensional drawings

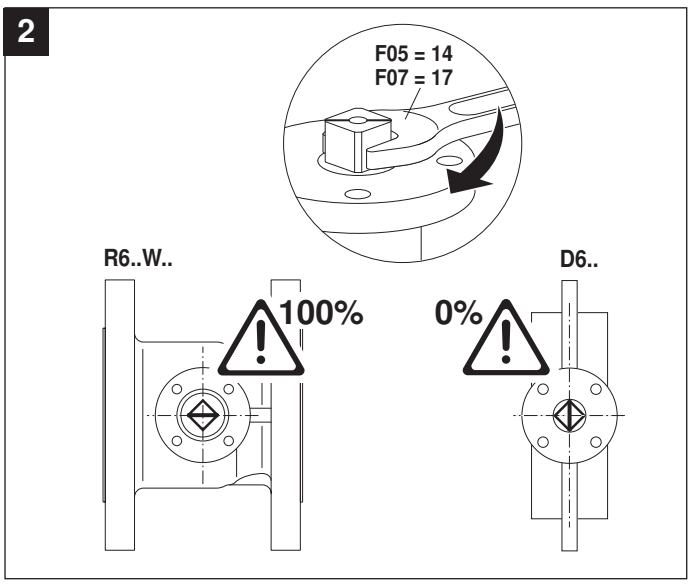


71261-00001.E

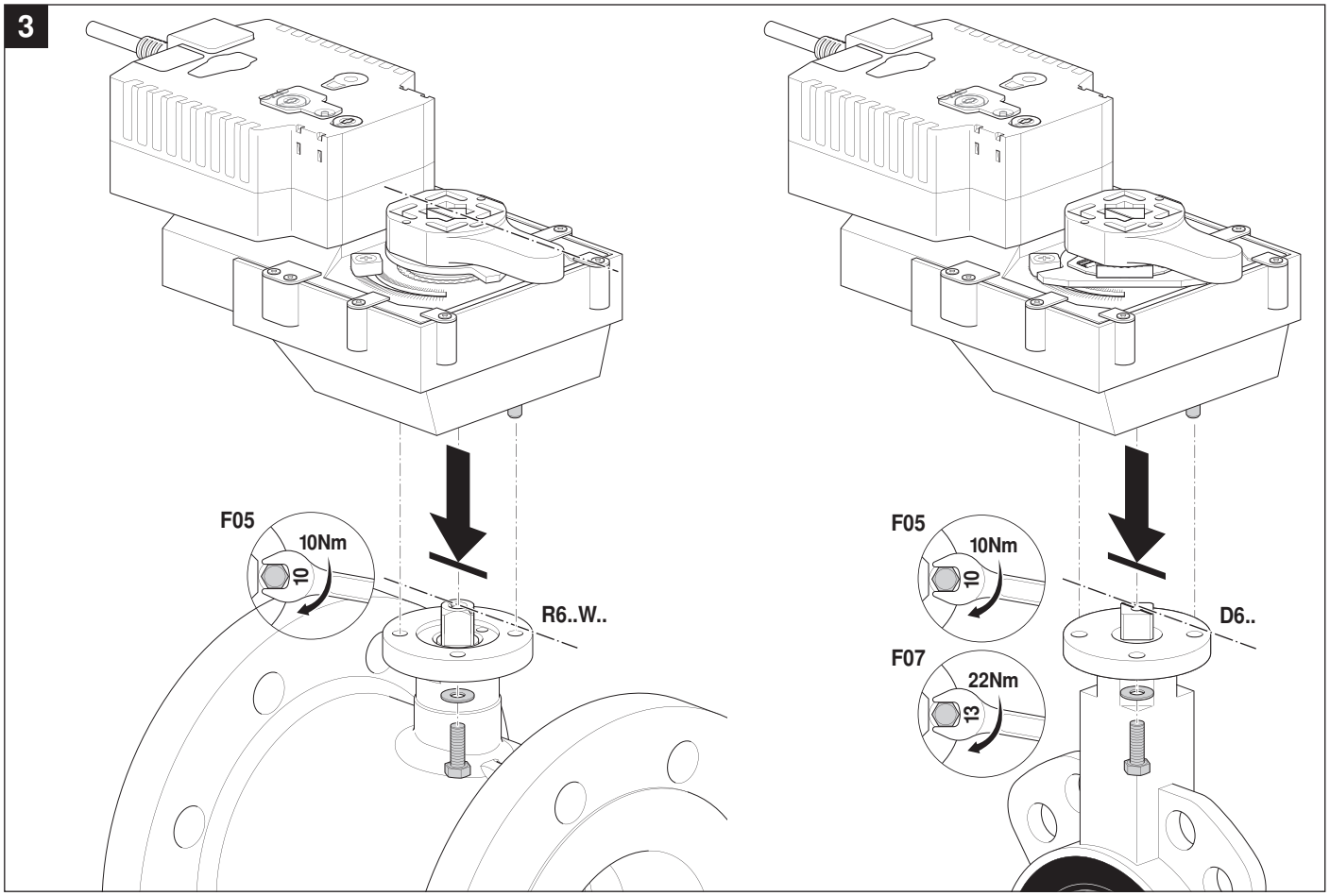
1



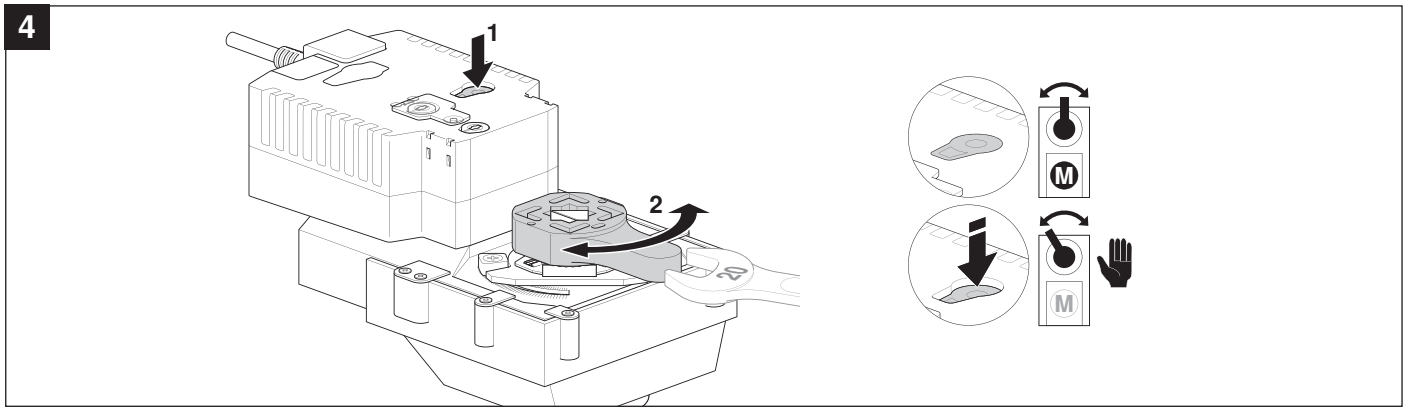

2

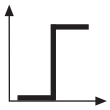



3

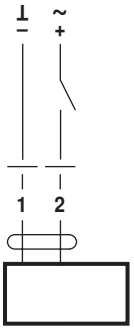



4

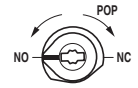




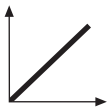
**AC 24 V / DC 24 V**



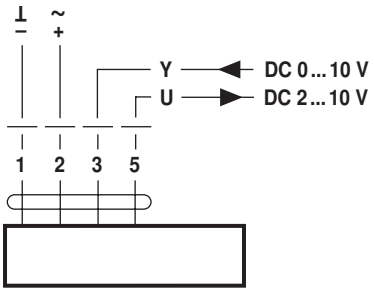

**GRK24A-5**
**GRK24A-7**

| NC | NO |
|---|---|
| A – AB = 0% | A – AB = 100% |
|  |  |

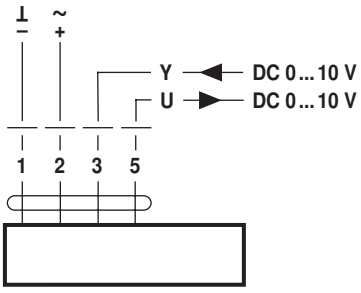




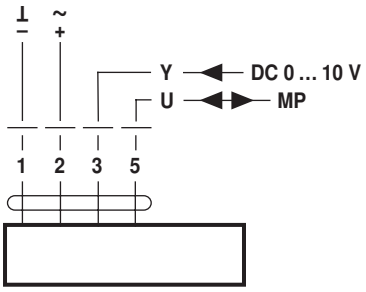
**AC 24 V / DC 24 V**



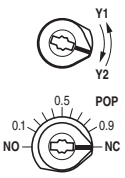
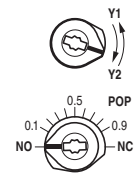

**GRK24A-SR-5**
**GRK24A-SR-7**



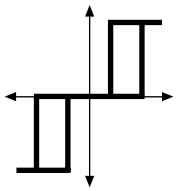

**GRK24A-SZ-5** **GRK24A-MF-5**
**GRK24A-SZ-7** **GRK24A-MF-7**



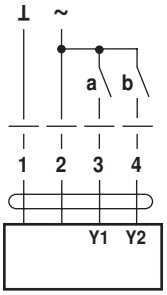

**GRK24A-MP-5**
**GRK24A-MP-7**

| NC | NO |
|---|---|
| A – AB = 0% | A – AB = 100% |
|  |  |





**AC 24 V**




**GRK24A-3-5**
**GRK24A-3-7**

| 3 a (Y1) | 4 b (Y2) | NC A – AB = 0% | NO A – AB = 100% |
|---|---|---|---|
|  |  |  |  |
|  |  | — | — |
|  |  |  |  |
|  |  |  |  |