# Characterised Control Valves with Actuators

## *Technical Databook*

Version 8.6

Belimo Asia Pacific

BELIMO

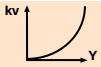
# Contents





**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Characterised Control Valves and Rotary Actuators for modulating control



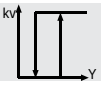

**Flow characteristics of Characterised Control Valves**
Characteristic: equal percentage

PN Designation: 3-way, PN40 (DN15...25), PN25 (DN32...50)
2-way, PN40 (DN15...25), PN25 (DN32...50)
PN16 (DN65...150)

| Connection | Internal thread | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Kvs**[m³/h] | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6.3 | 4 | 6.3 |
| **DN**[mm] | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 20 | 20 |
| 2-way | R2015-P25-S1 | R2015-P4-S1 | R2015-P63-S1 | R2015-1-S1 | R2015-1P6-S1 | R2015-2P5-S1 | R2015-4-S1 | R2015-6P3-S1 | R2020-4-S1 | R2020-6P3-S1 |
| **Modulating** | **DC (0)2...10V** | | | | | | | | | |
| | TR24-SR | | | | | | | | | |
| Fail-Safe | TRF24-SR | | | | | | | | | |
| Fast Running | LRQ24A-SR | | | | | | | | | |
| **3-point** | | | | | | | | | | |
| | TR24 | | | | | | | | | |
| | TR230-3 | | | | | | | | | |
| Fail-Safe | TRF24-2 | | | | | | | | | |

| Connection | Internal thread | | | | | | |
|---|---|---|---|---|---|---|---|
| **Kvs**[m³/h] | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 |
| **DN**[mm] | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| 3-way | R3015-P25-S1 | R3015-P4-S1 | R3015-P63-S1 | R3015-1-S1 | R3015-1P6-S1 | R3015-2P5-S1 | R3015-4-S1 |
| **Modulating** | **DC (0)2...10V** | | | | | | |
| | TR24-SR | | | | | | |
| Fail-Safe | TRF24-SR | | | | | | |
| Fast Running | LRQ24A-SR | | | | | | |
| **3-point** | | | | | | | |
| | TR24 | | | | | | |
| | TR230-3 | | | | | | |
| Fail-Safe | TRF24-2 | | | | | | |

## Open/Close Ball Valves and Rotary Actuators for shut-off or change-over functions




**Flow characteristics of Open/Close Ball Valves**

PN Designation: 3-way, PN40 (DN15...25), PN25 (DN32...50)
2-way, PN40 (DN15...25), PN25 (DN32...50)
PN16 (DN65...150)

| Connection | Internal thread | | | | | | |
|---|---|---|---|---|---|---|---|
| **Kvs**[m³/h] | 15 | 15 | 32 | 26 | 32 | 31 | 49 |
| **DN**[mm] | 15 | 20 | 20 | 25 | 32 | 40 | 50 |
| 2-way | R2015-S1 | R2020-S1 | R2020-S2 | R2025-S2 | R2032-S2** | R2040-S2** | R2050-S3 |
| **Open/Close** | | | | | | | |
| | TR24 | LR24A(-S) | | | | | NR24A(-S) |
| | TR230-3 | LR230A(-S) | | | | | NR230A(-S) |
| Fail-Safe | TRF24(-S) | LRF24(-S) | | | | | NRFA(-S2) |
| | TRF230(-S) | LRF230(-S) | | | | | NRFA(-S2) |
| Fast Running | LRQ24A | | | | | | SRQ24A |

| Connection | Internal thread | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Kvs**[m³/h] | 15 | 12 | 32 | 26 | 18 | 32 | 31 | 49 |
| **DN**[mm] | 15 | 20 | 20 | 25 | 32 | 32 | 40 | 50 |
| 3-way | R3015-S1 | R3020-S1 | R3020-S2 | R3025-S2 | R3032-S2 | R3032-S3 | R3040-S3 | R3050-S4 |
| **Open/Close** | | | | | | | | |
| | TR24 | LR24A(-S) | | | NR24A(-S) | | | SR24A(-S) |
| | TR230-3 | LR230A(-S) | | | NR230A(-S) | | | SR230A(-S) |
| Fail-Safe | TRF24(-S) | LRF24(-S) | | | NRFA(-S2) | | | SRFA(-S2) |
| | TRF230(-S) | LRF230(-S) | | | NRFA(-S2) | | | SRFA(-S2) |
| Fast Running | LRQ24A | | | | NRQ24A | | | SRQ24A |



**UL marked actuators is optional, please contact your local Sales Representative for details.**

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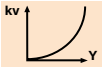
## Characterised Control Valves and Rotary Actuators for modulating control




**Flow characteristics of Characterised Control Valves**
Characteristic: equal percentage

PN Designation: 3-way, PN40 (DN15...25), PN25 (DN32...50)
2-way, PN40 (DN15...25), PN25 (DN32...50)
PN16 (DN65...150)

| Internal thread | | | | | | | | | Flange PN16 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.3 | 10 | 10 | 16 | 20 | 16 | 25 | 25 | 40 | 63 | 100 | 140 | 230 | 320 |
| 25 | 25 | 32 | 32 | 32 | 40 | 40 | 50 | 50 | 65 | 80 | 100 | 125 | 150 |
| R2025-6P3-S2 | R2025-10-S2 | R2032-10-S2 | R2032-16-S2** | R2032-20-S2 | R2040-16-S2** | R2040-25-S2** | R2050-25-S3 | R2050-40-S3 | R664AO | R679AO | R6099AO | R6124AO | R6149AO |

| | | | |
|---|---|---|---|
| LR24A-SR | NR24A-SR | SR24A-SR-5 | GR24A-SR-7 |
| LRF24-SR | NRF24A-SR | SRF24A-SR-5 | GRK24A-MF-7 |
| LRQ24A-SR | SRQ24A-SR | SRQS..-5* | |

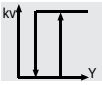
| | | | |
|---|---|---|---|
| LR24A(-S) | NR24A(-S) | SR24A(-S)-5 | GR24A-7 |
| LR230A(-S) | NR230A(-S) | SR230A(-S)-5 | GR230A-7 |
| LF24-3 | NRFS* | SRFS* | GRK24A-MF-7 |

| Internal thread | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 6.3 | 6.3 | 10 | 10 | 16 | 16 | 25 | 25 | 40 | 58 |
| 20 | 20 | 25 | 25 | 32 | 32 | 40 | 40 | 50 | 50 | 50 |
| R3020-4-S1 | R3020-6P3-S1 | R3025-6P3-S2 | R3025-10-S2 | R3032-10-S2 | R3032-16-S3 | R3040-16-S3 | R3040-25-S4 | R3050-25-S4 | R3050-40-S4 | R3050-58-S4 |

| | | | |
|---|---|---|---|
| TR24-SR | LR24A-SR | NR24A-SR | SR24A-SR |
| TRF24-SR | LRF24-SR | NRF24A-SR | SRF24A-SR |
| LRQ24A-SR | | NRQ24A-SR | SRQ24A-SR |

| | | | |
|---|---|---|---|
| TR24 | LR24A(-S) | NR24A(-S) | SR24A(-S) |
| TR230-3 | LR230A(-S) | NR230A(-S) | SR230A(-S) |
| TRF24-2 | LF24-3 | NRFS* | SRFS* |

## Open/Close Ball Valves and Rotary Actuators for shut-off or change-over functions




**Flow characteristics of Open/Close Ball Valves**

PN Designation: 3-way, PN40 (DN15...25), PN25 (DN32...50)
2-way, PN40 (DN15...25), PN25 (DN32...50)
PN16 (DN65...150)

| Flange PN16 | | | | |
|---|---|---|---|---|
| 120 | 180 | 230 | 390 | 570 |
| 65 | 80 | 100 | 125 | 150 |
| R665AO | R680AO | R6100AO | R6125AO | R6150AO |

| | |
|---|---|
| SR24A(-S)-5 | GR24A-7 |
| SR230A(-S)-5 | GR230A-7 |
| SRFA(-S2)-5 | GRK24A-7 |
| SRFA(-S2)-5 | |

* NRFS/SRFS/SRQS..-5 model for Customising.
** Non-spring return: using NR.. series actuator for application > 70°C.
Spring return: using NRF.. series actuator for application > 70°C.
Fast-running: using NRQ.. series actuator for application > 70°C.



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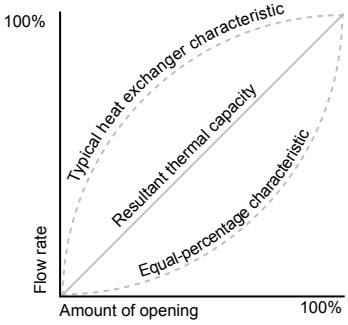
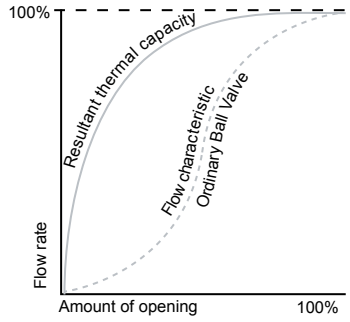
## An ordinary Ball Valve is unsuitable as a control device




*Characteristic of an ideal Control Valve*




*Characteristic of an ordinary Ball Valve*

In order to ensure good stability of control, a Control Valve must have a flow characteristic that complements the nonlinear characteristic of the heat exchanger in the HVAC system.

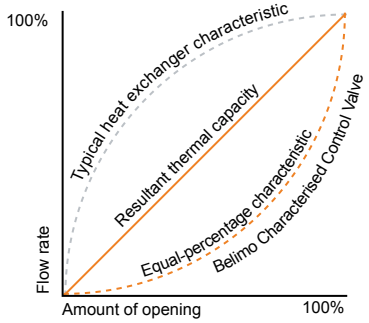
An equal-percentage valve characteristic is described in order to produce a linear relationship between the thermal output and the amount of opening of the control device. This means that the flow rate increases slowly as the valve begins to open. Characteristic in ordinary Ball Valves is severely distorted.

The reason for this is that an ordinary Ball Valve has an extremely high flow coefficient (Kvs value) compared with its nominal size, several times that of a comparable globe valve.

Therefore, an ordinary Ball Valve is not very suitable for performing control functions:

- Quick-opening flow characteristic
- Flow coefficient excessive due to the design
- Inadequate flow control in the part-load range

## Belimo has added “control” to the Ball Valve

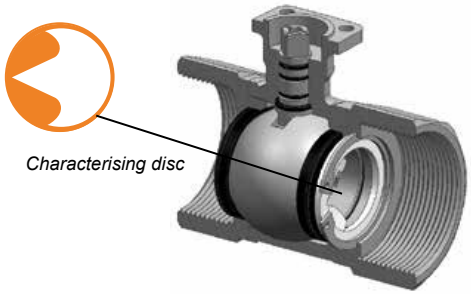



*Characteristic of the Belimo CCV*

Belimo has succeeded in solving the problem of the distorted flow characteristic of ordinary Ball Valves. A so-called “characterising disc” in the inlet of the Characterised Control Valve converts the valve’s characteristic to the equal-percentage kind. The side of the characterising disc facing the ball is concave and is in contact with the surface of the ball. Thus, the actual flow is regulated by the hole in the ball and by the V-shaped aperture in the characterising disc.

The Kvs value is reduced and corresponds approximately to that of a Globe Valve of comparable size. In order to avoid having to fit pipe reducers in the majority of cases, each valve size is also available with wide choices of different Kvs values.

## Advantages of the Belimo Characterised Control Valve




- Equal-percentage characteristic
- No initial jump in flow on opening
- Excellent stability of control thanks to the characterising disc
- Kvs values similar to those of Globe Valves of comparable size
- Fewer pipe reducers needed
- High rangeability
- High close-off pressure
- Tight-sealing



**UL marked actuators is optional, please contact your local Sales Representative for details.**

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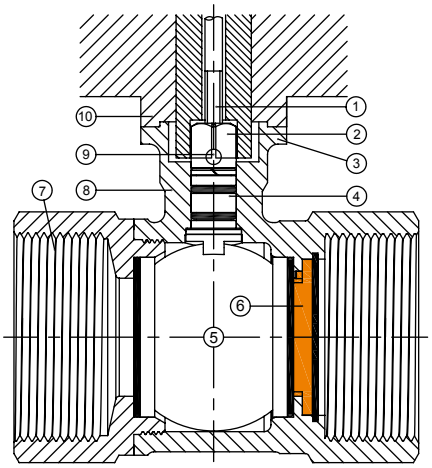
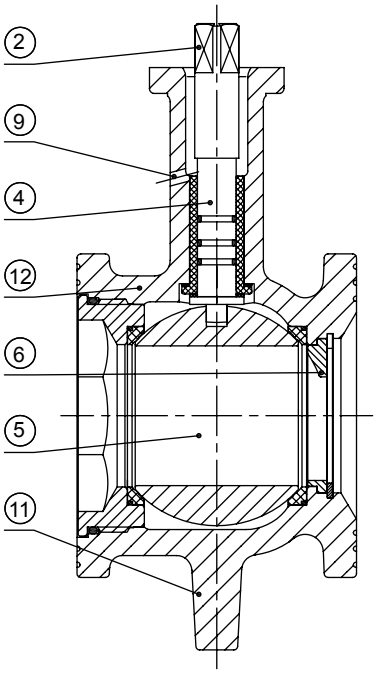
## The elements of the Characterised Control Valve

R2..xx-S..




1. Simple direct attachment with a central screw
2. Square spindle head for form-fit attachment of the Rotary Actuator
3. Identical mounting flange for all sizes
4. Spindle with O-rings for long service life
5. Ball and spindle made of stainless steel
6. Characterising disc produces equal-percentage flow characteristic
7. Internal screw connection (ISO 7/1)
8. Forged fitting, nickel-plated brass body
9. Vent part to prevent the accumulation of condensation
10. Thermal decoupling of actuator from valve
11. Flange (ISO 7005-2)
12. GG25, polyester coated body

R6..AO




## Optimum choice of Kvs values of identical size

- Better controllability
- Lower installation costs

The Belimo range of Characterised Control Valves includes 2-way and 3-way types that are available in a variety of sizes and with a choice of Kvs value. A Characterised Control Valve is normally supplied as a unit complete with a suitable Belimo Rotary Actuator.

## Notes

- The control devices described in this publication are intended for using in the closed water circuits of heating, ventilation and air-conditioning systems. Use of the control devices in conjunction with other liquid or gaseous fluids is on request.
- Select the Characterised Control Valve according to the valve sizing diagram.
- Please pay attention to the notes at operation, mounting, commissioning, maintenance and project design.

## Ordering

Ordering example* (with LR24A)

a) LR24A Rotary Actuator with R.. valve fitted**
   -Order code: R..+LR24A

b) LR24A Rotary Actuator and R.. valve supplied separately
   -Order code: R../LR24A

c) LR24A Rotary Actuator packed loose
   -Order code: LR24A

*An order for a R.. valve usually includes an actuator



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Sizing diagram for Characterised Control Valves

### Legend

——— △ $P_{max}$
Maximum permitted pressure difference for long service life across control path A-AB referred to the whole range of opening.

·—·—·— △$P_{max}$ for
low-noise operation

△$P_{v100}$
pressure difference with Ball Valve fully open

$\dot{V}_{100}$
Nominal flow rate at △$P_{v100}$

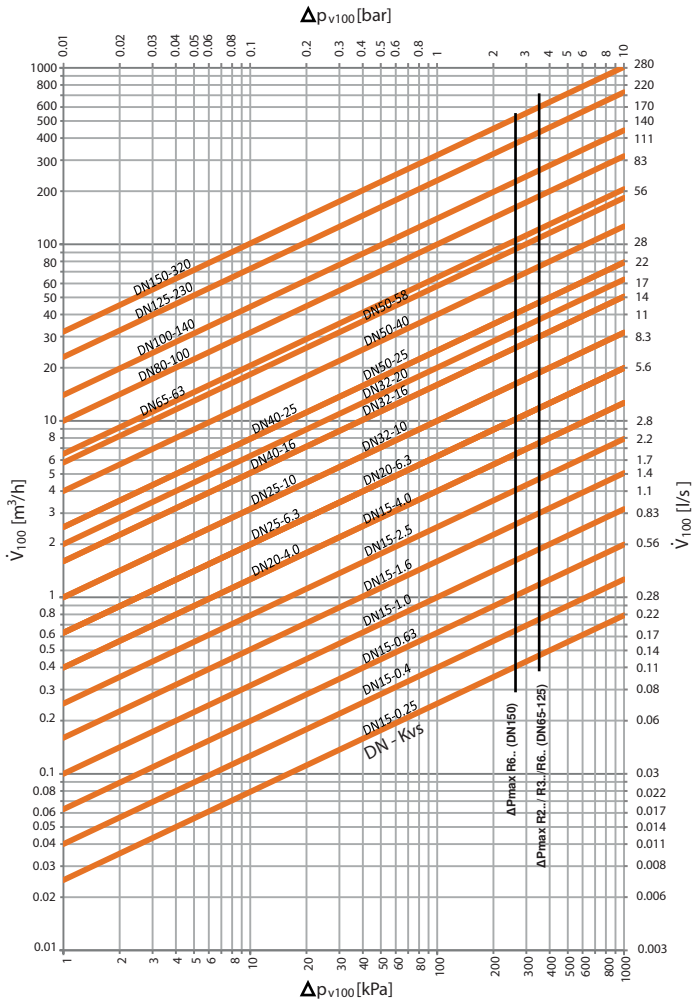
### Formula for Kvs

$$Kvs = \sqrt{\frac{\dot{V}_{100}}{\frac{\triangle P_{V100}}{100}}}$$

$\dot{V}100$ [m³/h]
△$P_{V100}$ [kPa]

### Definition of Close-off pressure △Ps

Differential pressure at which the actuator can still seal the valve tightly allowing for the appropriate leakage rate.




## Sizing table for Characterised Control Valves

| **Kvs**[m³/h] | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6.3 | 4 | 6.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| **DN**[mm] | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 20 | 20 |
| | R2015-P25-S1 | R2015-P4-S1 | R2015-P63-S1 | R2015-1-S1 | R2015-1P6-S1 | R2015-2P5-S1 | R2015-4-S1 | R2015-6P3-S1 | R2020-4-S1 | R2020-6P3-S1 |
| | R3015-P25-S1 | R3015-P4-S1 | R3015-P63-S1 | R3015-1-S1 | R3015-1P6-S1 | R3015-2P5-S1 | R3015-4-S1 | – | R3020-4-S1 | R3020-6P3-S1 |

| **Kvs**[m³/h] | 6.3 | 10 | 10 | 16 | 20 | 16 | 25 | 25 | 40 | 58 |
|---|---|---|---|---|---|---|---|---|---|---|
| **DN**[mm] | 25 | 25 | 32 | 32 | 32 | 40 | 40 | 50 | 50 | 50 |
| | R2025-6P3-S2 | R2025-10-S2 | R2032-10-S2 | – | R2032-20-S2 | R2040-16-S2 | R2040-25-S2 | R2050-25-S3 | R2050-40-S3 | – |
| | R3025-6P3-S2 | R3025-10-S2 | R3032-10-S2 | R3032-16-S3 | – | R3040-16-S3 | R3040-25-S4 | R3050-25-S4 | R3050-40-S4 | R3050-58-S4 |

| **Kvs**[m³/h] | 63 | 100 | 140 | 230 | 320 |
|---|---|---|---|---|---|
| **DN**[mm] | 65 | 80 | 100 | 125 | 150 |
| | R664AO | R679AO | R6099AO | R6124AO | R6149AO |



**UL marked actuators is optional, please contact your local Sales Representative for details.**

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## Sizing table for Open/Close Ball Valves

| Differential pressure $\triangle p_{v100}$ [kPa] / Flow $\dot{V}_{100}$ [m³/h] | 0.1 | 1 | 3 | 10 | **Kvs** [m³/h] | **DN** [mm] | **2-way** |
|---|---|---|---|---|---|---|---|
| | 0.47 | 1.50 | 2.60 | 4.74 | 15 | 15 | R2015-S1 |
| | 0.47 | 1.50 | 2.60 | 4.74 | 15 | 20 | R2020-S1 |
| | 1.01 | 3.20 | 5.54 | 10.12 | 32 | 20 | R2020-S2 |
| | 0.82 | 2.60 | 4.50 | 8.22 | 26 | 25 | R2025-S2 |
| | 1.01 | 3.20 | 5.54 | 10.12 | 32 | 32 | R2032-S2 |
| | 0.98 | 3.10 | 5.37 | 9.80 | 31 | 40 | R2040-S2 |
| | 1.55 | 4.90 | 8.49 | 15.50 | 49 | 50 | R2050-S3 |

| Differential pressure $\triangle p_{v100}$ [kPa] / Flow $\dot{V}_{100}$ [m³/h] | 0.1 | 1 | 3 | 10 | **Kvs** [m³/h] | **DN** [mm] | **3-way** |
|---|---|---|---|---|---|---|---|
| | 0.47 | 1.50 | 2.60 | 4.74 | 15 | 15 | R3015-S1 |
| | 0.38 | 1.20 | 2.08 | 3.79 | 12 | 20 | R3020-S1 |
| | 1.01 | 3.20 | 5.54 | 10.12 | 32 | 20 | R3020-S2 |
| | 0.82 | 2.60 | 4.50 | 8.22 | 26 | 25 | R3025-S2 |
| | 0.57 | 1.80 | 3.12 | 5.69 | 18 | 32 | R3032-S2 |
| | 1.01 | 3.20 | 5.54 | 10.12 | 32 | 32 | R3032-S3 |
| | 0.98 | 3.10 | 5.37 | 9.80 | 31 | 40 | R3040-S3 |
| | 1.55 | 4.90 | 8.49 | 15.50 | 49 | 50 | R3050-S4 |



**UL marked actuators is optional, please contact your local Sales Representative for details.**

**Characterised control valve, 2-way, Internal thread**
- **For open and closed cold and warm water systems**
- **For modulating water-side control of air handling units and heating systems**
- **Air bubble tight**

## Type overview

| Type | kvs [ m³/h] | DN [ ] | Rp [”] | PN [ ] | n(gl) [ ] | Sv min. [ ] |
|---|---|---|---|---|---|---|
| **R2015-P25-S1** | 0.25 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R2015-P4-S1** | 0.4 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R2015-P63-S1** | 0.63 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R2015-1-S1** | 1 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R2015-1P6-S1** | 1.6 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R2015-2P5-S1** | 2.5 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R2015-4-S1** | 4 | 15 | 1/2 | 40 | 3.2 | 100 |
| **R2015-6P3-S1** | 6.3 | 15 | 1/2 | 40 | 3.2 | 100 |
| **R2020-4-S1** | 4 | 20 | 3/4 | 40 | 3.2 | 100 |
| **R2020-6P3-S1** | 6.3 | 20 | 3/4 | 40 | 3.2 | 100 |
| **R2025-6P3-S2** | 6.3 | 25 | 1 | 40 | 3.2 | 100 |
| **R2025-10-S2** | 10 | 25 | 1 | 40 | 3.2 | 100 |
| **R2032-10-S2** | 10 | 32 | 1 1/4 | 25 | 3.2 | 100 |
| **R2032-20-S2** | 20 | 32 | 1 1/4 | 25 | 3.2 | 100 |
| **R2040-16-S2** | 16 | 40 | 1 1/2 | 25 | 3.2 | 100 |
| **R2040-25-S2** | 25 | 40 | 1 1/2 | 25 | 3.2 | 100 |
| **R2050-25-S3** | 25 | 50 | 2 | 25 | 3.2 | 100 |
| **R2050-40-S3** | 40 | 50 | 2 | 25 | 3.2 | 100 |

## Technical data

| | | |
|---|---|---|
| **Functional data** | Media | Cold and warm water, water with glycol up to max. 50% vol. |
| | Medium temperature | -10...120°C |
| | Medium temperature note | The allowed media temperature can be limited, depending on the type of actuator. Limitations can be found in the respective data sheets of the actuators. |
| | Closing pressure Δps | 1400kPa |
| | Differential pressure Δpmax | 350kPa |
| | Differential pressure note | 200kPa for low-noise operation |
| | Flow characteristic | Equal percentage (VDI/VDE 2178), optimised in the opening range |
| | Leakage rate | Leakage rate A, air-bubble-tight (EN 12266-1) |
| | Pipe connectors | Internal thread according to ISO 7-1 |
| | Angle of rotation | 90° (Operating range 15...90°) |
| | Installation position | Upright to horizontal (in relation to the stem) |
| | Maintenance | Maintenance-free |
| **Materials** | Housing | Brass body nickel-plated |
| | Closing element | Stainless steel |
| | Stem | Stainless steel |
| | Stem seal | O-ring EPDM |
| | Valve seat | PTFE, O-ring EPDM |
| | Characterising disc | TEFZEL<br>R2032-20-S2 has no characterising disc |



**UL marked actuators is optional, please contact your local Sales Representative for details.**

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## Safety notes

- The valve 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The valve does not contain any parts that can be replaced or repaired by the user.
- The valve may not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- When determining the flow rate characteristic of controlled devices, the recognised directives must be observed.

## Product features

**Mode of operation**
The characterised control valve is adjusted by a rotary actuator. The actuator is controlled by a commercially available modulating or 3-point control system and moves the ball of the valve – the throttling device – to the position dictated by the positioning signal. Open the characterised control valve counterclockwise and close it clockwise.

**Flow characteristic**
Equal percentage flow control is ensured by the integrated characterising disc.

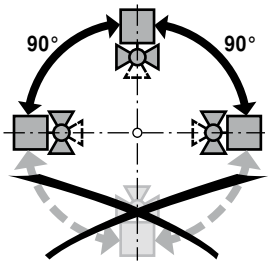
## Accessories

**Mechanical accessories**

| Description | Type |
|---|---|
| Pipe connector to ballvalves DN 15 Rp 1/2“ | ZR2315 |
| Pipe connector to ballvalves DN 20 Rp 3/4“ | ZR2320 |
| Pipe connector to ballvalves DN 25 Rp 1“ | ZR2325 |
| Pipe connector to ballvalves DN 32 Rp 1 1/4“ | ZR2332 |
| Pipe connector to ballvalves DN 40 Rp 1 1/2“ | ZR2340 |
| Pipe connector to ballvalves DN 50 Rp 2“ | ZR2350 |

## Installation notes

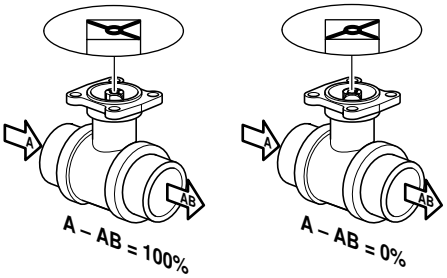
**Recommended installation positions**
The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the stem pointing downwards.




**Water quality requirements**
The water quality requirements specified in VDI 2035 must be adhered to.
Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work).
The installation of suitable strainer is recommended.

**Maintenance**
Ball valves and rotary actuators are maintenance-free.
Before any kind of service work is carried out on the actuator, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow everything to cool down first if necessary and reduce the system pressure to ambient pressure level).
The system must not be returned to service until the ball valve and the rotary actuator have been properly reassembled in accordance with the instructions and the pipeline has been refilled in the proper manner.

**Flow direction**
The direction of flow, specified by an arrow on the housing, is to be complied with, since otherwise the ball valve could become damaged. Please ensure that the ball is in the correct position (marking on the spindle).

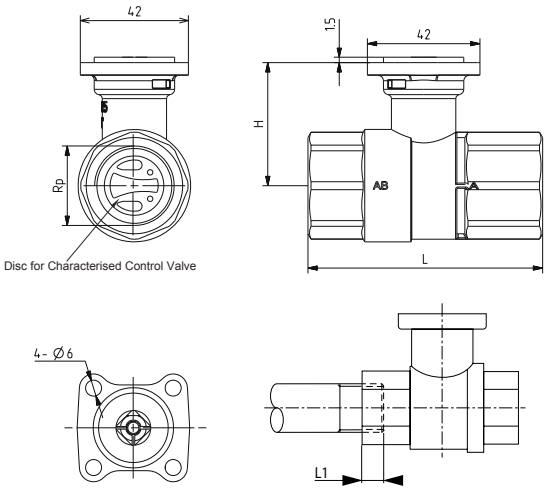





UL marked actuators is optional, please contact your local Sales Representative for details.

## Dimensions [mm]

### Dimensional drawings




L1: Maximum screwing depth.
The actuator dimensions can be found on the respective actuator data sheet.

| Type | DN [ ] | Rp ["] | L [ mm] | L1 [ mm] | H [ mm] | Weight approx. [ kg] |
|---|---|---|---|---|---|---|
| **R2015-P25-S1** | 15 | 1/2 | 67 | 13 | 35 | 0.24 |
| **R2015-P4-S1** | 15 | 1/2 | 67 | 13 | 35 | 0.24 |
| **R2015-P63-S1** | 15 | 1/2 | 67 | 13 | 35 | 0.24 |
| **R2015-1-S1** | 15 | 1/2 | 67 | 13 | 35 | 0.24 |
| **R2015-1P6-S1** | 15 | 1/2 | 67 | 13 | 35 | 0.24 |
| **R2015-2P5-S1** | 15 | 1/2 | 67 | 13 | 44 | 0.30 |
| **R2015-4-S1** | 15 | 1/2 | 67 | 13 | 44 | 0.30 |
| **R2015-6P3-S1** | 15 | 1/2 | 67 | 13 | 44 | 0.30 |
| **R2020-4-S1** | 20 | 3/4 | 79 | 14 | 44 | 0.37 |
| **R2020-6P3-S2** | 20 | 3/4 | 79 | 14 | 44 | 0.37 |
| **R2025-6P3-S2** | 25 | 1 | 87 | 16 | 46 | 0.55 |
| **R2025-10-S2** | 25 | 1 | 87 | 16 | 46 | 0.55 |
| **R2032-10-S2** | 32 | 1 1/4 | 105 | 19 | 46 | 0.7 |
| **R2032-20-S2** | 32 | 1 1/4 | 105 | 19 | 50.5 | 0.8 |
| **R2040-16-S2** | 40 | 1 1/2 | 111 | 19 | 50.5 | 0.95 |
| **R2040-25-S2** | 40 | 1 1/2 | 111 | 19 | 50.5 | 0.95 |
| **R2050-25-S3** | 50 | 2 | 125 | 22 | 56 | 1.5 |
| **R2050-40-S3** | 50 | 2 | 125 | 22 | 56 | 1.5 |

* R2032-20-S2 has no characterising disc



UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**2-way Characterised Control Valves DN65...150**
**Equal-percentage characteristics for modulating control of cold and hot water**

**Applications**

- **Water-side control of air handling units in air conditioning systems**
- **Water-side control in heating systems**

## Technical data

| | | |
|---|---|---|
| Flow medium | Cold and hot water, water with max. 50% volume of glycol | |
| Temp. of medium | -5...+100°C | |
| Rated pressure | 1600kPa | |
| Flow characteristic | Equal percentage | |
| Rangeability | Sv>100 | |
| Leakage rate | 0...0.01% Kvs (ANSI Class IV)<br>(No leakage when ex-factory) | |
| Pipe connector | Flanged ISO 7005-2 | |
| Differential pressure △Pmax | DN65...125 | 350kPa (200kPa for low-noise operation) |
| | DN150 | 250kPa |
| Close-off pressure △Ps | DN65...125 | 700kPa |
| | DN150 | 400kPa |
| Angle of rotation | 90° | |
| Installation position | Upright to horizontal (in relation to the stem) | |
| Maintenance | Maintenance-free | |
| **Valve Material** | | |
| Body | GG25, Polyester coated | |
| Ball | Stainless steel | |
| Seat | DN65...125 RPTFE | |
| | DN150 TFM1600 | |
| Shaft | Stainless steel | |
| O-ring | EPDM | |
| Characterising disc | Stainless steel | |

## Product features

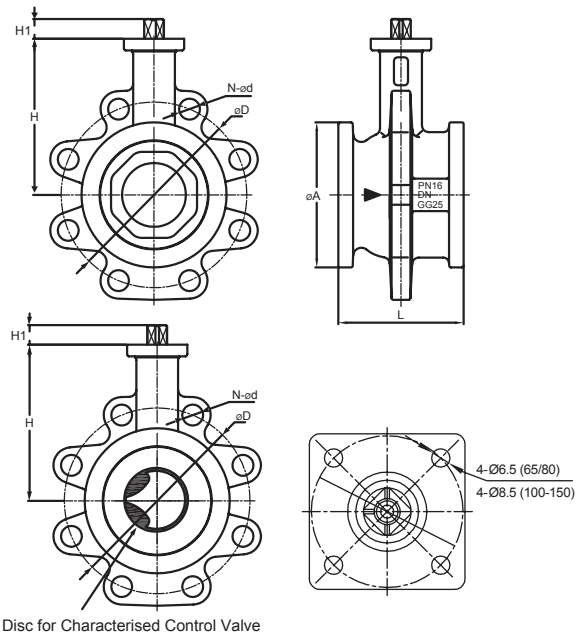
**Mode of Operation**
The Characterised Control Valve is operated by a Rotary Actuator. The actuator is controlled by a standard modulating or 3-point control system and drives the ball of the valve - the throttling device - to the opening position dictated by the control signal.

**Equal-percentage characteristic**
Equal-percentage characteristic of the flow rate ensured by the integral characterising disc.

## Dimensions [mm]

**Dimensional drawings**

| Valve type | DN | | Dimensions [mm] | | | | | | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|
| | mm | In | øA | øD | H | H1 | L | N-ød | |
| R664AO/R665AO | 65 | 2½" | 105 | 145 | 128.0 | 12.0 | 93.0 | 4-18 | 4.8 |
| R679AO/R680AO | 80 | 3" | 125 | 160 | 134.5 | 12.0 | 108.0 | 8-18 | 7.2 |
| R6099AO/R6100AO | 100 | 4" | 148 | 180 | 144.0 | 15.5 | 120.0 | 8-18 | 10.5 |
| R6124AO/R6125AO | 125 | 5" | 174 | 210 | 158.0 | 15.5 | 142.0 | 8-18 | 14 |
| R6149AO/R6150AO | 150 | 6" | 204 | 240 | 176.5 | 15.5 | 170.0 | 8-22 | 21 |




Disc for Characterised Control Valve



**UL marked actuators is optional, please contact your local Sales Representative for details.**

**Characterised control valve, 3-way, Internal thread**
- **For closed cold and warm water systems**
- **For modulating water-side control of air handling units and heating systems**
- **Air bubble-tight (control path A - AB)**

## Type overview

| Type | kvs [ m³/h] | DN [ ] | Rp ["] | PN [ ] | n(gl) [ ] | Sv min. [ ] |
|---|---|---|---|---|---|---|
| **R3015-P25-S1** | 0.25 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R3015-P4-S1** | 0.4 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R3015-P63-S1** | 0.63 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R3015-1-S1** | 1 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R3015-1P6-S1** | 1.6 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R3015-2P5-S1** | 2.5 | 15 | 1/2 | 40 | 3.2 | 50 |
| **R3015-4-S1** | 4 | 15 | 1/2 | 40 | 3.2 | 100 |
| **R3020-4-S1** | 4 | 20 | 3/4 | 40 | 3.2 | 100 |
| **R3020-6P3-S1** | 6.3 | 20 | 3/4 | 40 | 3.2 | 100 |
| **R3025-6P3-S2** | 6.3 | 25 | 1 | 40 | 3.2 | 100 |
| **R3025-10-S2** | 10 | 25 | 1 | 40 | 3.2 | 100 |
| **R3032-10-S2** | 10 | 32 | 1 1/4 | 25 | 3.2 | 100 |
| **R3032-16-S3** | 16 | 32 | 1 1/4 | 25 | 3.2 | 100 |
| **R3040-16-S3** | 16 | 40 | 1 1/2 | 25 | 3.2 | 100 |
| **R3040-25-S4** | 25 | 40 | 1 1/2 | 25 | 3.2 | 100 |
| **R3050-25-S4** | 25 | 50 | 2 | 25 | 3.2 | 100 |
| **R3050-40-S4** | 40 | 50 | 2 | 25 | 3.2 | 100 |
| **R3050-58-S4** | 58 | 50 | 2 | 25 | 3.2 | 100 |

## Technical data

| | | |
|---|---|---|
| **Functional data** | Media | Cold and warm water, water with glycol up to max. 50% vol. |
| | Medium temperature | -10...120°C |
| | Medium temperature note | The allowed media temperature can be limited, depending on the type of actuator. Limitations can be found in the respective data sheets of the actuators. |
| | Closing pressure Δps | 1400kPa |
| | Differential pressure Δpmax | 350kPa |
| | Differential pressure note | 200kPa for low-noise operation |
| | Flow rate | Bypass B – AB: 70% of kvs value |
| | Flow characteristic | Control path A – AB: equal percentage (VDI/VDE 2178), optimised in the opening range, Bypass B – AB: linear (VDI/VDE 2178) |
| | Leakage rate | Control path A - AB: Leakage rate A, air-bubble-tight (EN 12266-1), Bypass B - AB: Leakage class I (EN 1349 and EN 60534-4) approx. 1...2% of the kvs value, with respect to the largest value within the DN |
| | Pipe connectors | Internal thread according to ISO 7-1 |
| | Angle of rotation | 90° (Operating range control path A - AB 15...90°, Bypass B – AB 15...70°) |
| | Installation position | Upright to horizontal (in relation to the stem) |
| | Maintenance | Maintenance-free |
| **Materials** | Housing | Brass body nickel-plated |
| | Closing element | Stainless steel |
| | Stem | Stainless steel |
| | Stem seal | O-ring EPDM |
| | Valve seat | PTFE, O-ring EPDM |
| | Characterising disc | TEFZEL<br>R3040-25-S4, R3050-40-S4, R3050-58-S4: Stainless steel |



**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

## Safety notes

- The valve 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The valve does not contain any parts that can be replaced or repaired by the user.
- The valve may not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- When determining the flow rate characteristic of controlled devices, the recognised directives must be observed.

## Product features

**Mode of operation**
The characterised control valve is adjusted by a rotary actuator. The actuator is controlled by a commercially available modulating or 3-point control system and moves the ball of the valve – the throttling device – to the position dictated by the positioning signal. Open the characterised control valve counterclockwise and close it clockwise.

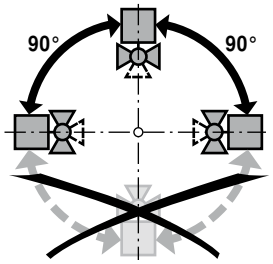
**Flow characteristic**
Equal percentage flow control is ensured by the integrated characterising disc.

## Accessories

| | Description | Type |
|---|---|---|
| **Mechanical accessories** | Pipe connector to ballvalves DN 15 Rp 1/2“ | ZR2315 |
| | Pipe connector to ballvalves DN 20 Rp 3/4“ | ZR2320 |
| | Pipe connector to ballvalves DN 25 Rp 1“ | ZR2325 |
| | Pipe connector to ballvalves DN 32 Rp 1 1/4“ | ZR2332 |
| | Pipe connector to ballvalves DN 40 Rp 1 1/2“ | ZR2340 |
| | Pipe connector to ballvalves DN 50 Rp 2“ | ZR2350 |

## Installation notes

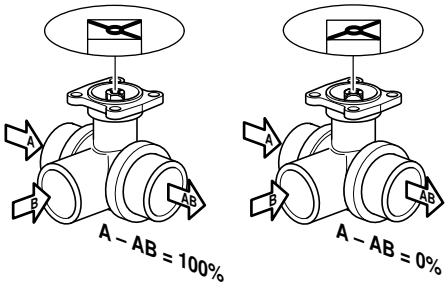
**Recommended installation positions**
The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the stem pointing downwards.




**Water quality requirements**
The water quality requirements specified in VDI 2035 must be adhered to.
Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work).
The installation of suitable strainer is recommended.

**Maintenance**
Ball valves and rotary actuators are maintenance-free.
Before any kind of service work is carried out on the actuator, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow everything to cool down first if necessary and reduce the system pressure to ambient pressure level).
The system must not be returned to service until the ball valve and the rotary actuator have been properly reassembled in accordance with the instructions and the pipeline has been refilled in the proper manner.

**Flow direction**
The direction of flow, specified by an arrow on the housing, is to be complied with, since otherwise the ball valve could become damaged. Please ensure that the ball is in the correct position (marking on the spindle).

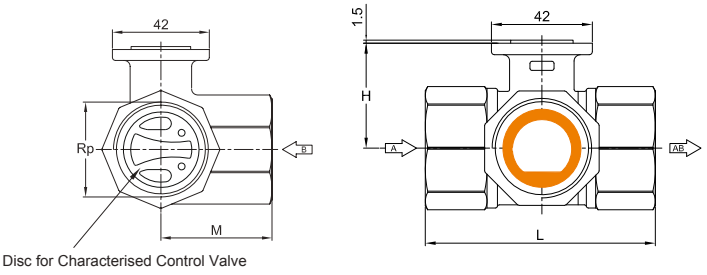




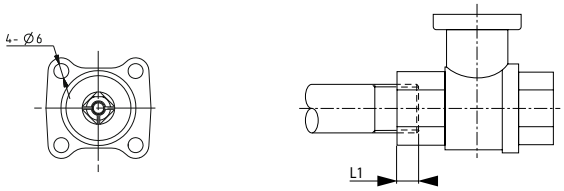

UL marked actuators is optional, please contact your local Sales Representative for details.

## Dimensions [mm]

### Dimensional drawings




Disc for Characterised Control Valve




L1: Maximum screwing depth.
The actuator dimensions can be found on the respective actuator data sheet.

| Type | DN [ ] | Rp ["] | L [ mm] | L1 [ mm] | M [ mm] | H [ mm] | Weight approx. [ kg] |
|---|---|---|---|---|---|---|---|
| **R3015-P25-S1** | 15 | 1/2 | 67 | 13 | 36 | 35 | 0.27 |
| **R3015-P4-S1** | 15 | 1/2 | 67 | 13 | 36 | 35 | 0.27 |
| **R3015-P63-S1** | 15 | 1/2 | 67 | 13 | 36 | 35 | 0.27 |
| **R3015-1-S1** | 15 | 1/2 | 67 | 13 | 36 | 35 | 0.27 |
| **R3015-1P6-S1** | 15 | 1/2 | 67 | 13 | 36 | 35 | 0.27 |
| **R3015-2P5-S1** | 15 | 1/2 | 67 | 13 | 36 | 44 | 0.37 |
| **R3015-4-S1** | 15 | 1/2 | 67 | 13 | 36 | 44 | 0.37 |
| **R3020-4-S1** | 20 | 3/4 | 79 | 14 | 41.5 | 46 | 0.45 |
| **R3020-6P3-S1** | 20 | 3/4 | 79 | 14 | 41.5 | 46 | 0.45 |
| **R3025-6P3-S2** | 25 | 1 | 87 | 16 | 45 | 46 | 0.65 |
| **R3025-10-S2** | 25 | 1 | 87 | 16 | 45 | 46 | 0.65 |
| **R3032-10-S2** | 32 | 1 1/4 | 105 | 19 | 55.5 | 46 | 0.97 |
| **R3032-16-S3** | 32 | 1 1/4 | 105 | 19 | 55.5 | 50.5 | 0.99 |
| **R3040-16-S3** | 40 | 1 1/2 | 111 | 19 | 56 | 50.5 | 1.15 |
| **R3040-25-S4** | 40 | 1 1/2 | 122 | 19 | 66.5 | 62 | 1.15 |
| **R3050-25-S4** | 50 | 2 | 125 | 22 | 68 | 56 | 1.9 |
| **R3050-40-S4** | 50 | 2 | 142 | 22 | 79 | 68 | 1.8 |
| **R3050-58-S4** | 50 | 2 | 142 | 22 | 79 | 68 | 1.8 |



UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**Open/close ball valve, 2-way, Internal thread**

- **For open and closed cold and warm water systems**
- **For shut-off functions on the water side and 2-point controls in air handling units and heating systems**
- **Air bubble tight**

## Type overview

| Type | kvs [ m³/h] | DN [ ] | Rp [”] | PN [ ] |
|---|---|---|---|---|
| **R2015-S1** | 15 | 15 | 1/2 | 40 |
| **R2020-S1** | 15 | 20 | 3/4 | 40 |
| **R2020-S2** | 32 | 20 | 3/4 | 40 |
| **R2025-S2** | 26 | 25 | 1 | 40 |
| **R2032-S2** | 32 | 32 | 1 1/4 | 25 |
| **R2040-S2** | 31 | 40 | 1 1/2 | 25 |
| **R2050-S3** | 49 | 50 | 2 | 25 |

## Technical data

| | | |
|---|---|---|
| **Functional data** | Media | Cold and warm water, water with glycol up to max. 50% vol. |
| | Medium temperature | -10...120°C |
| | Medium temperature note | The allowed media temperature can be limited, depending on the type of actuator. Limitations can be found in the respective data sheets of the actuators. |
| | Closing pressure Δps | 1400 kPa |
| | Differential pressure Δpmax | 1000 kPa |
| | Differential pressure note | 200 kPa for low-noise operation |
| | Leakage rate | Leakage rate A, air-bubble-tight (EN 12266-1) |
| | Pipe connectors | Internal thread according to ISO 7-1 |
| | Angle of rotation | 90° |
| | Installation position | Upright to horizontal (in relation to the stem) |
| | Maintenance | Maintenance-free |
| **Materials** | Housing | Brass body nickel-plated |
| | Closing element | Stainless steel |
| | Stem | Stainless steel |
| | Stem seal | O-ring EPDM |
| | Valve seat | PTFE, O-ring EPDM |

## Safety notes

- The valve 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The valve does not contain any parts that can be replaced or repaired by the user.
- The valve may not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- When determining the flow rate characteristic of controlled devices, the recognised directives must be observed.

## Product features

**Mode of operation**

The Open/Close ball valve is adjusted by a rotary actuator. The rotary actuator is connected by an Open/Close signal. Open the ball valve counterclockwise and close it clockwise.

## Accessories

| | Description | Type |
|---|---|---|
| **Mechanical accessories** | Pipe connector to ballvalves DN 15 Rp 1/2“ | ZR2315 |
| | Pipe connector to ballvalves DN 20 Rp 3/4“ | ZR2320 |
| | Pipe connector to ballvalves DN 25 Rp 1“ | ZR2325 |
| | Pipe connector to ballvalves DN 32 Rp 1 1/4“ | ZR2332 |
| | Pipe connector to ballvalves DN 40 Rp 1 1/2“ | ZR2340 |
| | Pipe connector to ballvalves DN 50 Rp 2“ | ZR2350 |

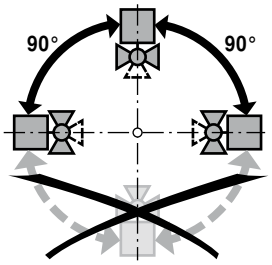


**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Installation notes

**Recommended installation positions**

The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the stem pointing downwards.




**Water quality requirements**

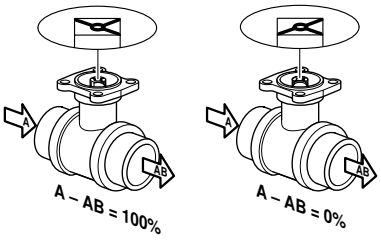
The water quality requirements specified in VDI 2035 must be adhered to.
Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work).
The installation of suitable strainer is recommended.

**Maintenance**

Ball valves and rotary actuators are maintenance-free.
Before any kind of service work is carried out on the actuator, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow everything to cool down first if necessary and reduce the system pressure to ambient pressure level).
The system must not be returned to service until the ball valve and the rotary actuator have been properly reassembled in accordance with the instructions and the pipeline has been refilled in the proper manner.

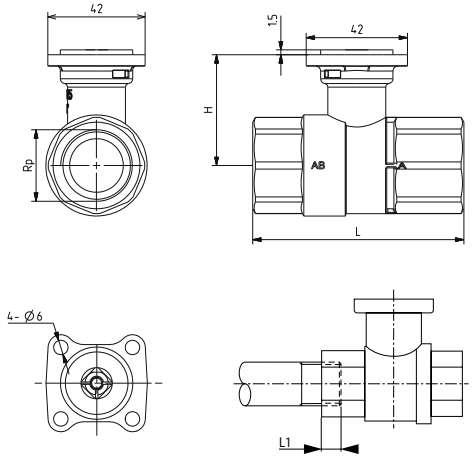
**Flow direction**

The direction of flow, specified by an arrow on the housing, is to be complied with, since otherwise the ball valve could become damaged. Please ensure that the ball is in the correct position (marking on the spindle).




## Dimensions [mm]

**Dimensional drawings**




L1: Maximum screwing depth.
The actuator dimensions can be found on the respective actuator data sheet.

| Type | DN [ ] | Rp ["] | L [ mm] | L1 [ mm] | H [ mm] | Weight approx. [ kg] |
|---|---|---|---|---|---|---|
| **R2015-S1** | 15 | 1/2 | 67 | 13 | 44 | 0.24 |
| **R2020-S1** | 20 | 3/4 | 79 | 14 | 44 | 0.37 |
| **R2020-S2** | 20 | 3/4 | 78 | 14 | 46 | 0.42 |
| **R2025-S2** | 25 | 1 | 87 | 16 | 46 | 0.50 |
| **R2032-S2** | 32 | 1 1/4 | 105 | 19 | 50.5 | 0.80 |
| **R2040-S2** | 40 | 1 1/2 | 111 | 19 | 50.5 | 0.91 |
| **R2050-S3** | 50 | 2 | 125 | 22 | 56 | 1.35 |



**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

**2-way Open/Close Ball Valves DN65...150**
**Open/Close control in cold and hot water circuits**

**Applications**

**For Open/Close cold and hot water circuits in heating and ventilation systems on the water side.**

## Technical data

| | | |
|---|---|---|
| Flow medium | Cold and hot water, water with max. 50% volume of glycol | |
| Temp. of medium | -5...+100°C | |
| Rated pressure | 1600kPa | |
| Leakage rate | 0...0.01% Kvs (ANSI Class IV)<br>(No leakage when ex-factory) | |
| Pipe connector | Flanged ISO 7005-2 | |
| Differential pressure △Pmax | DN65...125<br>DN150 | 350kPa (200kPa for low-noise operation)<br>250kPa |
| Close-off pressure △Ps | DN65...125<br>DN150 | 700kPa<br>400kPa |
| Angle of rotation | 90° | |
| Installation position | Upright to horizontal (in relation to the stem) | |
| Maintenance | Maintenance-free | |
| **Valve Material** | | |
| Body | GG25, Polyester coated | |
| Ball | Stainless steel | |
| Seat | DN65...125 RPTFE<br>DN150 TFM1600 | |
| Shaft | Stainless steel | |
| O-ring | EPDM | |

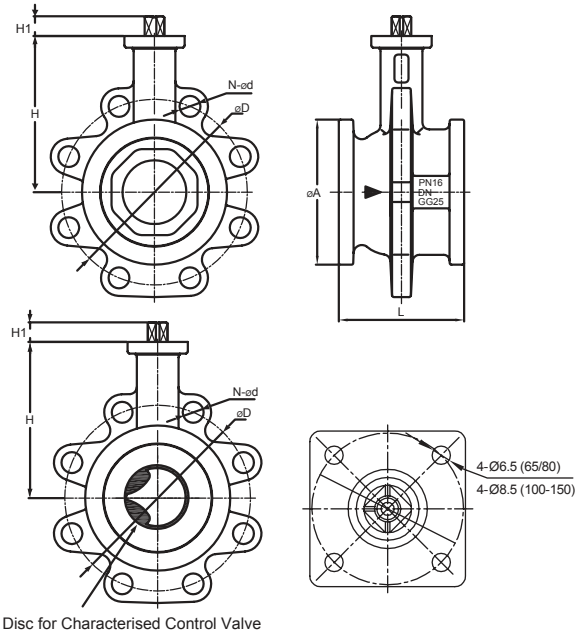
## Product features

**Mode of Operation** The Open/Close Ball Valve is operated by a Rotary Actuator. The Rotary Actuator is controlled by an Open/Close signal.

## Dimensions [mm]

**Dimensional drawings**

| Valve type | DN | | Dimensions[mm] | | | | | | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|
| | mm | In | øA | øD | H | H1 | L | N-Ød | |
| R664AO/R665AO | 65 | 2½" | 105 | 145 | 128.0 | 12.0 | 93.0 | 4-18 | 4.8 |
| R679AO/R680AO | 80 | 3" | 125 | 160 | 134.5 | 12.0 | 108.0 | 8-18 | 7.2 |
| R6099AO/R6100AO | 100 | 4" | 148 | 180 | 144.0 | 15.5 | 120.0 | 8-18 | 10.5 |
| R6124AO/R6125AO | 125 | 5" | 174 | 210 | 158.0 | 15.5 | 142.0 | 8-18 | 14 |
| R6149AO/R6150AO | 150 | 6" | 204 | 240 | 176.5 | 15.5 | 170.0 | 8-22 | 21 |




Disc for Characterised Control Valve



**UL marked actuators is optional, please contact your local Sales Representative for details.**

**Change-over ball valve, 3-way, Internal thread**
- **For closed cold and warm water systems**
- **For switching functions on the water side and 2-point controls in air handling units and heating systems**
- **Air bubble-tight (control path A - AB)**

## Type overview

| Type | kvs [ m³/h] | DN [ ] | Rp [“] | PN [ ] |
|---|---|---|---|---|
| **R3015-S1** | 15 | 15 | 1/2 | 40 |
| **R3020-S1** | 12 | 20 | 3/4 | 40 |
| **R3020-S2** | 32 | 20 | 3/4 | 40 |
| **R3025-S2** | 26 | 25 | 1 | 40 |
| **R3032-S2** | 18 | 32 | 1 1/4 | 25 |
| **R3032-S3** | 32 | 32 | 1 1/4 | 25 |
| **R3040-S3** | 31 | 40 | 1 1/2 | 25 |
| **R3050-S4** | 49 | 50 | 2 | 25 |

## Technical data

| | | |
|---|---|---|
| **Functional data** | Media | Cold and warm water, water with glycol up to max. 50% vol. |
| | Medium temperature | -10...120°C |
| | Medium temperature note | The allowed media temperature can be limited, depending on the type of actuator. Limitations can be found in the respective data sheets of the actuators. |
| | Closing pressure Δps | 1400kPa |
| | Differential pressure Δpmax | 1000kPa |
| | Differential pressure note | 200kPa for low-noise operation |
| | Flow rate | Bypass B – AB: Approx. 50% of kvs value |
| | Leakage rate | Port A - AB: Leakage rate A, air-bubble-tight (EN 12266-1), Bypass B - AB: Leakage class I (EN 1349 and EN 60534-4) max. 1% of the kvs value |
| | Pipe connectors | Internal thread according to ISO 7-1 |
| | Angle of rotation | 90° |
| | Installation position | Upright to horizontal (in relation to the stem) |
| | Maintenance | Maintenance-free |
| **Materials** | Housing | Brass body nickel-plated |
| | Closing element | Stainless steel |
| | Stem | Stainless steel |
| | Stem seal | O-ring EPDM |
| | Valve seat | PTFE, O-ring EPDM |

## Safety notes

- The valve 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The valve does not contain any parts that can be replaced or repaired by the user.
- The valve may not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- When determining the flow rate characteristic of controlled devices, the recognised directives must be observed.

## Product features

**Mode of operation**

The change-over ball valve is adjusted by a rotary actuator. The rotary actuator is connected by an Open/Close signal.

## Accessories

**Mechanical accessories**

| Description | Type |
|---|---|
| Pipe connector to ballvalves DN 15 Rp 1/2“ | ZR2315 |
| Pipe connector to ballvalves DN 20 Rp 3/4“ | ZR2320 |
| Pipe connector to ballvalves DN 25 Rp 1“ | ZR2325 |
| Pipe connector to ballvalves DN 32 Rp 1 1/4“ | ZR2332 |
| Pipe connector to ballvalves DN 40 Rp 1 1/2“ | ZR2340 |
| Pipe connector to ballvalves DN 50 Rp 2“ | ZR2350 |



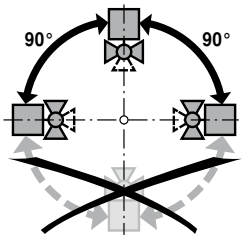
**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

## Installation notes

**Recommended installation positions**

The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the stem pointing downwards.




**Water quality requirements**

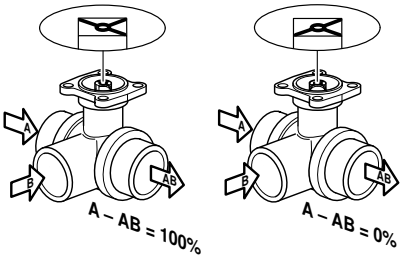
The water quality requirements specified in VDI 2035 must be adhered to.
Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work).
The installation of suitable strainer is recommended.

**Maintenance**

Ball valves and rotary actuators are maintenance-free.
Before any kind of service work is carried out on the actuator, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow everything to cool down first if necessary and reduce the system pressure to ambient pressure level).
The system must not be returned to service until the ball valve and the rotary actuator have been properly reassembled in accordance with the instructions and the pipeline has been refilled in the proper manner.

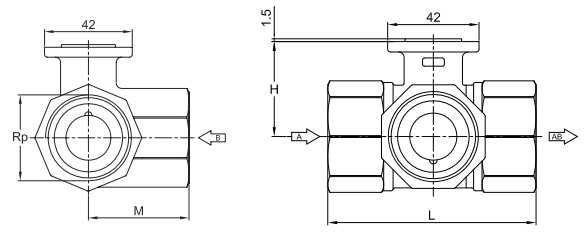
**Flow direction**

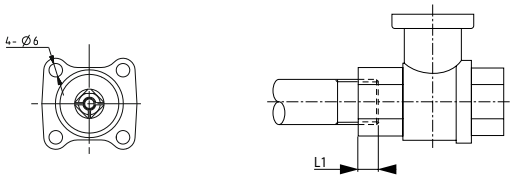
The direction of flow, specified by an arrow on the housing, is to be complied with, since otherwise the ball valve could become damaged. Please ensure that the ball is in the correct position (marking on the spindle).




## Dimensions [mm]

**Dimensional drawings**




L1: Maximum screwing depth.
The actuator dimensions can be found on the respective actuator data sheet.

| Type | DN [ ] | Rp ["] | L [ mm] | L1 [ mm] | M [ mm] | H [ mm] | Weight approx. [ kg] |
|---|---|---|---|---|---|---|---|
| **R3015-S1** | 15 | 1/2 | 67 | 13 | 36 | 44 | 0.27 |
| **R3020-S1** | 20 | 3/4 | 79 | 14 | 41.5 | 44 | 0.45 |
| **R3020-S2** | 20 | 3/4 | 78 | 14 | 41.5 | 46 | 0.46 |
| **R3025-S2** | 25 | 1 | 87 | 16 | 45 | 46 | 0.6 |
| **R3032-S2** | 32 | 1 1/4 | 105 | 19 | 55.5 | 50.5 | 0.97 |
| **R3032-S3** | 32 | 1 1/4 | 105 | 19 | 55.5 | 50.5 | 0.99 |
| **R3040-S3** | 40 | 1 1/2 | 111 | 19 | 56 | 50.5 | 1.2 |
| **R3050-S4** | 50 | 2 | 125 | 22 | 68 | 56 | 1.8 |



**UL marked actuators is optional, please contact your local Sales Representative for details.**

# TR24-SR

**Rotary actuator for ball valves**
- **Nominal torque 2Nm**
- **Nominal voltage AC/DC 24V**
- **Control modulating DC (0)2...10V**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 21.6...28.8V |
| | Power consumption in operation | 0.5W |
| | Power consumption for wire sizing | 1VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 2Nm |
| | Positioning signal Y | DC (0)2...10V |
| | Positioning signal Y note | Input impedance 100kΩ |
| | Operating range Y | DC 2...10V |
| | Control operating range Y note | for 0...100% (0...90°) |
| | Manual override | Gear disengagement with push-button |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanical |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Degree of protection IEC/EN | IP40 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | Control pollution degree | 3 |
| | Ambient temperature | -7...50°C |
| | Non-operating temperature | -40...80°C |
| | Ambient humidity | 95% r.h., non-condensing |
| | Maintenance | Maintenance-free |
| **Weight** | Weight | Approx. 0.4kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- 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 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.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation**
The actuator is connected with a standard modulating signal of DC (0)2...10V and travels to the position defined by the positioning signal.

**Simple direct mounting**
Simple direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° increments.

**Manual override**
Manual override possible with lever (the gearing is disengaged as long as the self-resetting lever is pressed).

**High functional reliability**
The actuator is overload protected and automatically stops when the end stop is reached. The actuator switches off for seven seconds in the case of blocking, then attempts to restart. If the blocked condition persists, the actuator attempts to restart once every two minutes a total of 15 times and subsequently only once every two hours.

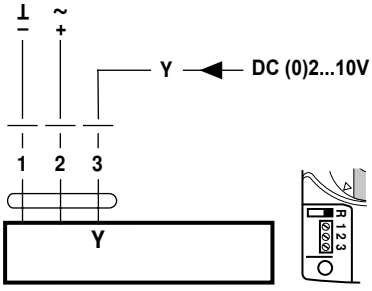
**Combination valve/actuator**
Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.

## Electrical installation

**Notes**
- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

### Wiring diagrams

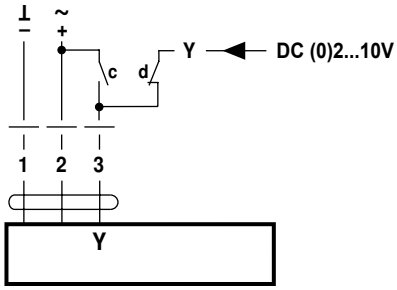
**AC/DC 24V, modulating**




Cable colours:
1 = black
2 = red
3 = white

Direction of rotation R (standard)
when switch set to right position

**AC/DC 24V, modulating, override control**

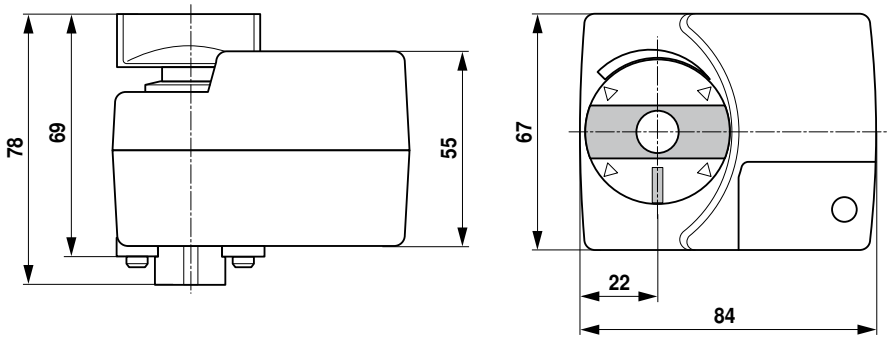



| c | d | Y | |
|---|---|---|---|
| ⊥ | ~ | 1 | A – AB = 100% |
| ~ | ~ | 0 | A – AB = 0% |

Cable colours:
1 = black
2 = red
3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# TR24

**Rotary actuator for ball valves**
- **Nominal torque 2Nm**
- **Nominal voltage AC/DC 24V**
- **Control Open/Close, 3-point**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 21.6...28.8V |
| | Power consumption in operation | 0.5W |
| | Power consumption for wire sizing | 0.5VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 2Nm |
| | Manual override | Gear disengagement with push-button |
| | Running time motor | 100s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanical |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Degree of protection IEC/EN | IP40 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | Control pollution degree | 3 |
| | Ambient temperature | -7...50°C |
| | Non-operating temperature | -40...80°C |
| | Ambient humidity | 95% r.h., non-condensing |
| | Maintenance | Maintenance-free |
| **Weight** | Weight | Approx. 0.4kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- 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 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

**Simple direct mounting**
Simple direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° increments.

**Manual override**
Manual override possible with lever (the gearing is disengaged as long as the self-resetting lever is pressed).

**Combination valve/actuator**
Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

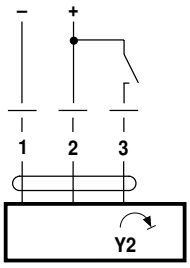
## Electrical installation

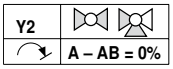
**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

### Wiring diagrams

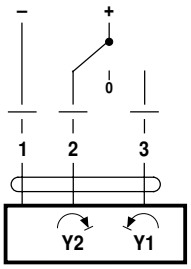
**AC/DC 24V, Open/Close**

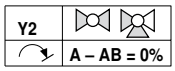



Cable colours:
1 = black
2 = red
3 = white

**AC/DC 24V, 3-point**




Cable colours:
1 = black
2 = red
3 = white

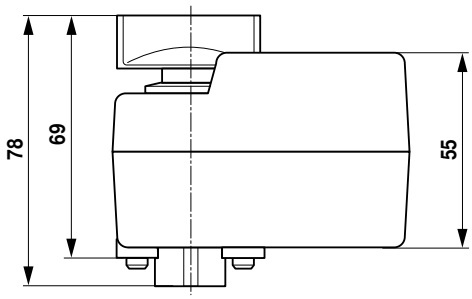
## General notes

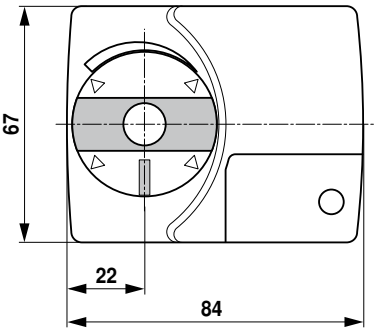
**Functional reliability**

Continuous pulsating into the end stop with pulsating 3-point control results in damage to the actuator. Steps must be taken to ensure that pulsating 3-point controllers stop in the end position.
The actuator switches off for seven seconds in the case of blocking, then attempts to restart. If the blocked condition persists, the actuator attempts to restart once every two minutes a total of 15 times and subsequently only once every two hours.
Actuators for 3-point control in parallel operation must be synchronised once every week (by setting the controller signal to 0 or 100%) in order to guarantee position accuracy.
Pulse duration ≥0.5s

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# TR230-3

**Rotary actuator for ball valves**
- **Nominal torque 2Nm**
- **Nominal voltage AC 230V**
- **Control 3-point**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC 230V |
| | Nominal voltage frequency | 50Hz |
| | Nominal voltage range | AC 207...253V |
| | Power consumption in operation | 1W |
| | Power consumption for wire sizing | 1VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | No |
| **Functional data** | Torque motor | Min. 2Nm |
| | Manual override | Gear disengagement with push-button |
| | Running time motor | 105s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanical |
| **Safety** | Protection class IEC/EN | II Protective insulated |
| | Degree of protection IEC/EN | IP40 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 4kV |
| | Control pollution degree | 3 |
| | Ambient temperature | -7...50°C |
| | Non-operating temperature | -40...80°C |
| | Ambient humidity | 95% r.h., non-condensing |
| | Maintenance | Maintenance-free |
| **Weight** | Weight | Approx. 0.4kg |

## Safety notes

- This device 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.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The actuator is to be protected against moisture. It is not suitable for outdoor applications.
- The correct functioning of the strain relief for the cable in the actuator housing is to be checked.
- The installer must check for correct principle of operation after installation.
- 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 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** Simple direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° increments.

**Manual override** Manual override possible with lever (the gearing is disengaged as long as the self-resetting lever is pressed).

**High functional reliability** The actuator switches off automatically when the end stops are reached. Pulse duration ≥0.5 s

**Combination valve/actuator** Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.

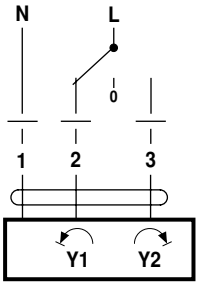
## Electrical installation

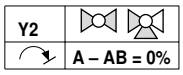
**Notes**

- Caution: Power supply voltage!

### Wiring diagrams

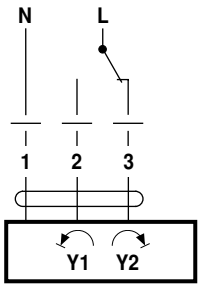
**AC 230V, 3-point**

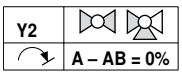



Cable colours:
1 = blue
2 = brown
3 = white

**AC 230V, Open/Close**

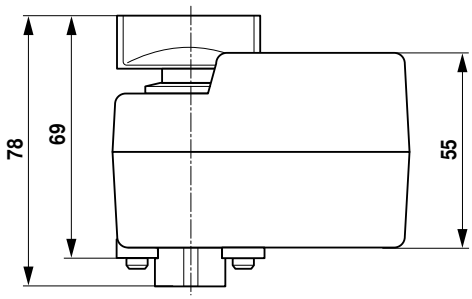


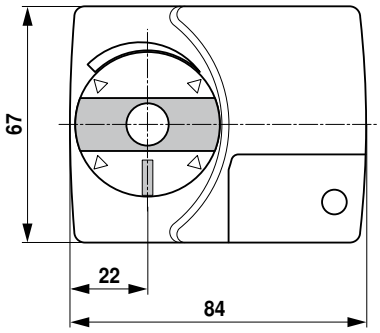




Cable colours:
1 = blue
2 = brown
3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# LR24A-SR

**Modulating rotary actuator for ball valves**
- **Nominal torque 5Nm**
- **Nominal voltage AC/DC 24V**
- **Control Modulating DC (0)2...10V**
- **Position feedback DC 2...10V**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 1.5W |
| | Power consumption in rest position | 0.4W |
| | Power consumption for wire sizing | 3VA |
| | Connection supply / control | Cable 1m, 4 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 5Nm |
| | Positioning signal Y | DC (0)2...10V |
| | Positioning signal Y note | Input impedance 100kΩ |
| | Operating range Y | DC 2...10V |
| | Position feedback U | DC 2...10V |
| | Position feedback U note | Max. 1mA |
| | Position accuracy | ±5% |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | 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 |
| **Weight** | Weight | Approx. 0.55kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation**
The actuator is connected with a standard modulating signal of DC (0)2...10V and travels to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the valve position 0...100% and as slave control signal for other actuators.

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball 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 is pressed or remains locked).

**High functional reliability**
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

## Accessories

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

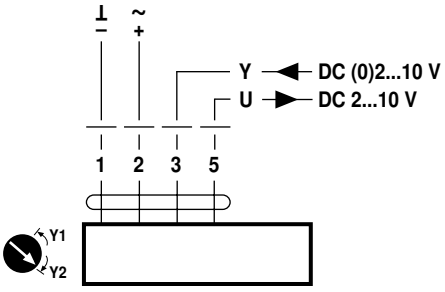
## Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

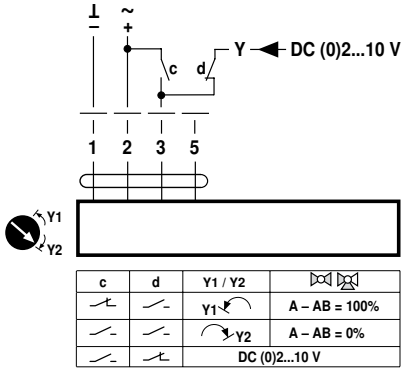
### Wiring diagrams

**AC/DC 24V, modulating**




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

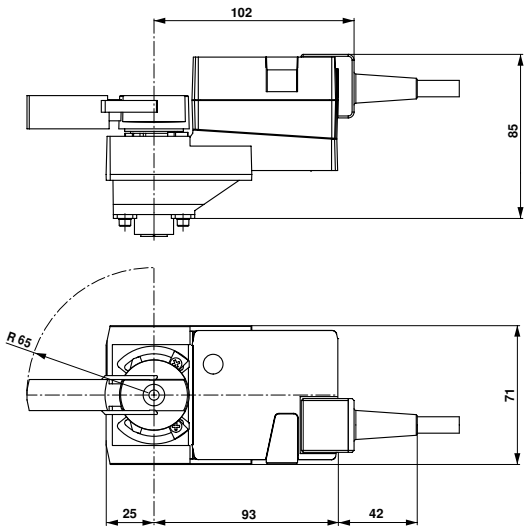
**Override control (frost protection circuit)**




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

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# LR24A

**Rotary actuator for ball valves**
- **Nominal torque 5Nm**
- **Nominal voltage AC/DC 24V**
- **Control Open/Close, 3-point**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 1.5W |
| | Power consumption in rest position | 0.2W |
| | Power consumption for wire sizing | 2VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 5Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35 dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | 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 |
| **Weight** | Weight | Approx. 0.55kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball 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 is pressed or remains locked).

**High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stops.

## Accessories

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

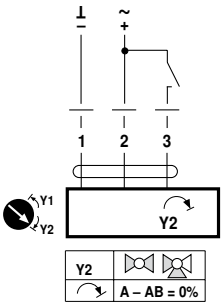
## Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

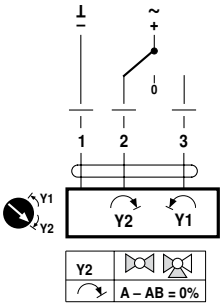
### Wiring diagrams

**AC/DC 24V, Open/Close**




Cable colours:
1 = black
2 = red
3 = white

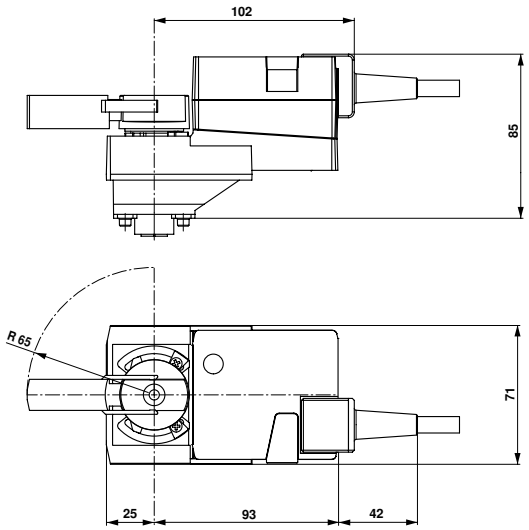
**AC/DC 24V, 3-point**




Cable colours:
1 = black
2 = red
3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# LR24A-S

**Rotary actuator for ball valves**
- **Nominal torque 5Nm**
- **Nominal voltage AC/DC 24V**
- **Control Open/Close, 3-point**
- **With integrated auxiliary switch**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 1.5W |
| | Power consumption in rest position | 0.2W |
| | Power consumption for wire sizing | 2VA |
| | Auxiliary switch | 1 x SPDT, 0...100% |
| | Switching capacity auxiliary switch | 1mA...3 (0.5) A, AC 250 V (II Protective insulated) |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Connection auxiliary switch | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 5Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | Rated impulse voltage auxiliary switch | 2.5kV |
| | 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 |
| **Weight** | Weight | Approx. 0.6kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.





**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** — Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.

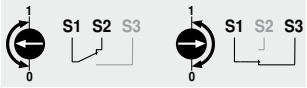
**Manual override** — Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**High functional reliability** — The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** — Adjustable angle of rotation with mechanical end stops.

**Flexible signalisation** — With adjustable auxiliary switch (0...100%)

Auxiliary switch




## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

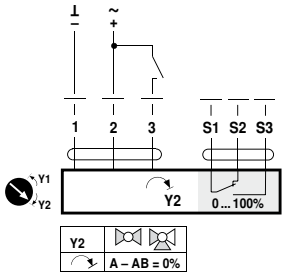
## Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

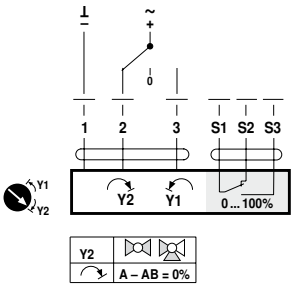
**Wiring diagrams**

**AC/DC 24V, Open/Close**




Cable colours:
1 = black
2 = red
3 = white
S1 = violet
S2 = red
S3 = white

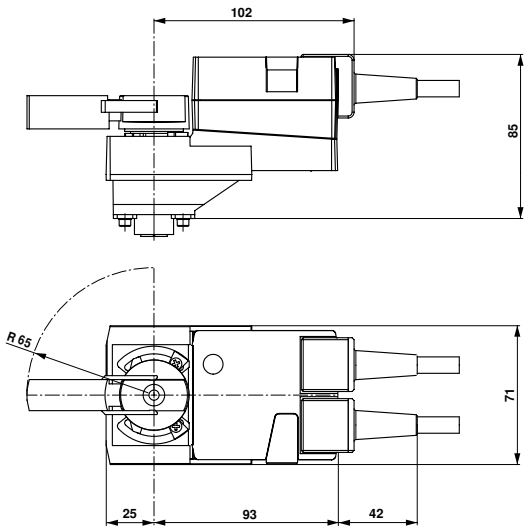
**AC/DC 24V, 3-point**




Cable colours:
1 = black
2 = red
3 = white
S1 = violet
S2 = red
S3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# LR230A

**Rotary actuator for ball valves**
- **Nominal torque 5Nm**
- **Nominal voltage AC 230V**
- **Control Open/Close, 3-point**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC 230V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 85...265V |
| | Power consumption in operation | 2W |
| | Power consumption in rest position | 0.5W |
| | Power consumption for wire sizing | 4VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 5Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | II Protective insulated |
| | Protection class UL | II Protective insulated |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 4kV |
| | 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 |
| **Weight** | Weight | Approx. 0.55kg |

## Safety notes

- This device 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.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball 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 is pressed or remains locked).

**High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stops.

## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

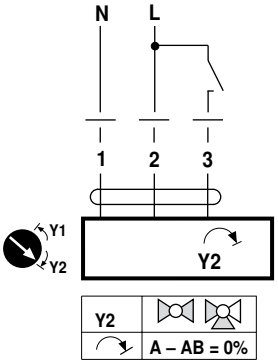
## Electrical installation

**Notes**

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

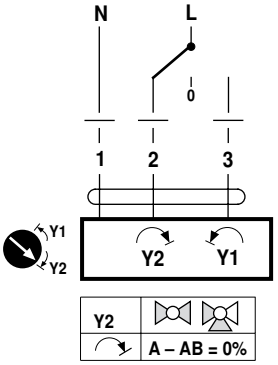
### Wiring diagrams

**AC 230V, Open/Close**




Cable colours:
1 = blue
2 = brown
3 = white

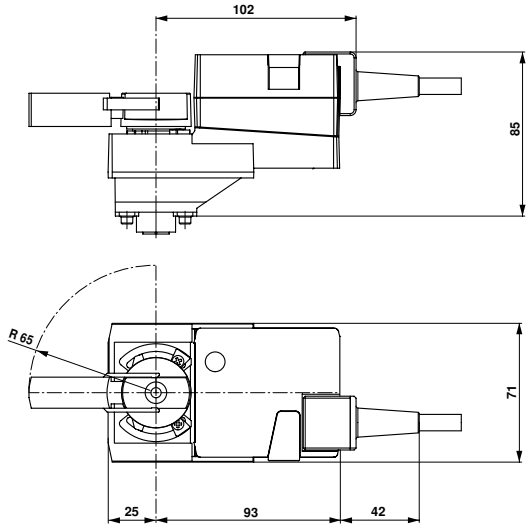
**AC 230V, 3-point**




Cable colours:
1 = blue
2 = brown
3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# LR230A-S

**Rotary actuator for ball valves**
- **Nominal torque 5Nm**
- **Nominal voltage AC 230V**
- **Control Open/Close, 3-point**
- **With integrated auxiliary switch**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC 230V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 85...265V |
| | Power consumption in operation | 2W |
| | Power consumption in rest position | 0.5W |
| | Power consumption for wire sizing | 4VA |
| | Auxiliary switch | 1 x SPDT, 0...100% |
| | Switching capacity auxiliary switch | 1mA...3 (0.5) A, AC 250V (II Protective insulated) |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Connection auxiliary switch | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 5Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | II Protective insulated |
| | Protection class UL | II Protective insulated |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 4kV |
| | Rated impulse voltage auxiliary switch | 2.5kV |
| | 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 |
| **Weight** | Weight | Approx. 0.6kg |

## Safety notes

- This device 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.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.

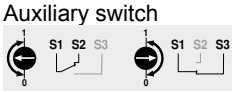
**Manual override** Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stops.

**Flexible signalisation** With adjustable auxiliary switch (0...100%)

Auxiliary switch




## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

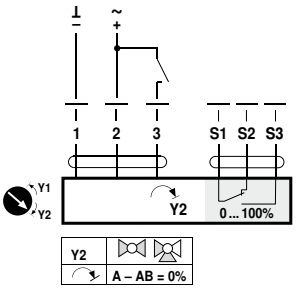
## Electrical installation

**Notes**

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

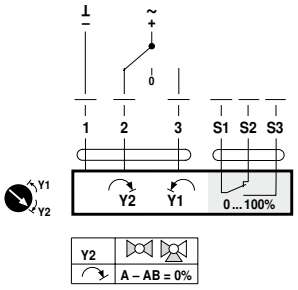
### Wiring diagrams

**AC 230V, Open/Close**




Cable colours:
1 = blue
2 = brown
3 = white
S1 = violet
S2 = red
S3 = white

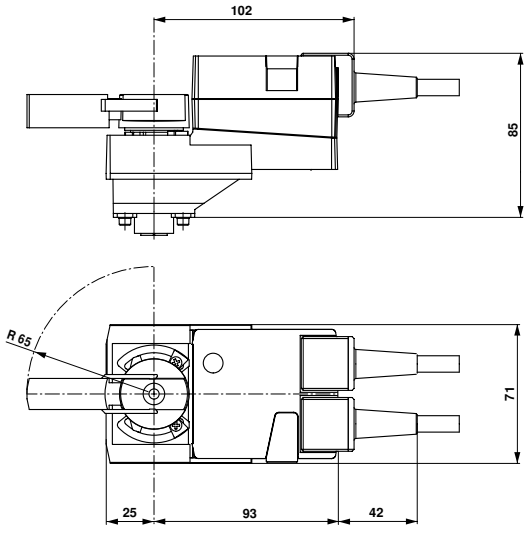
**AC 230V, 3-point**




Cable colours:
1 = blue
2 = brown
3 = white
S1 = violet
S2 = red
S3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# NR24A-SR

**Modulating rotary actuator for ball valves**
- **Nominal torque 10Nm**
- **Nominal voltage AC/DC 24V**
- **Control Modulating DC (0)2...10V**
- **Position feedback DC 2...10V**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 2.5W |
| | Power consumption in rest position | 0.4W |
| | Power consumption for wire sizing | 5VA |
| | Connection supply / control | Cable 1m, 4 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 10Nm |
| | Positioning signal Y | DC (0)2...10V |
| | Positioning signal Y note | Input impedance 100kΩ |
| | Operating range Y | DC 2...10V |
| | Position feedback U | DC 2...10V |
| | Position feedback U note | Max. 1mA |
| | Position accuracy | ±5% |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | 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 |
| **Weight** | Weight | Approx. 0.75kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

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## Product features

**Mode of operation**
The actuator is connected with a standard modulating signal of DC (0)2...10V and travels to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the valve position 0...100% and as slave control signal for other actuators.

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball 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 is pressed or remains locked).

**High functional reliability**
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

## Accessories

**Electrical accessories**

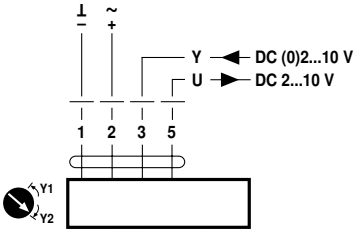
| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

## Electrical installation

**Notes**
- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

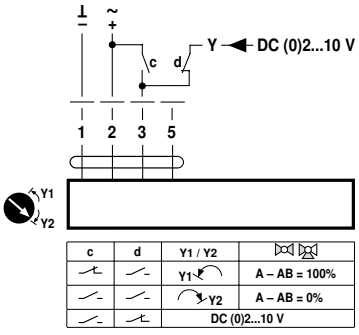
### Wiring diagrams

**AC/DC 24V, modulating**




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

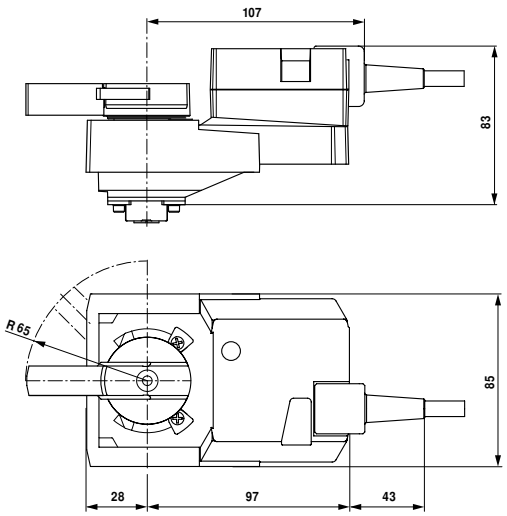
**Override control (frost protection circuit)**




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

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# NR24A

**Rotary actuator for ball valves**
- **Nominal torque 10Nm**
- **Nominal voltage AC/DC 24V**
- **Control Open/Close, 3-point**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 2W |
| | Power consumption in rest position | 0.2W |
| | Power consumption for wire sizing | 4VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 10Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | 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 |
| **Weight** | Weight | Approx. 0.75kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball 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 is pressed or remains locked).

**High functional reliability**
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

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## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

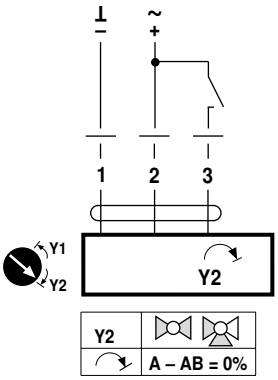
## Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

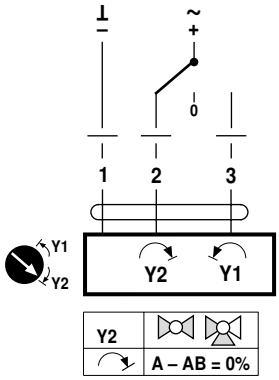
### Wiring diagrams

**AC/DC 24V, Open/Close**




Cable colours:
1 = black
2 = red
3 = white

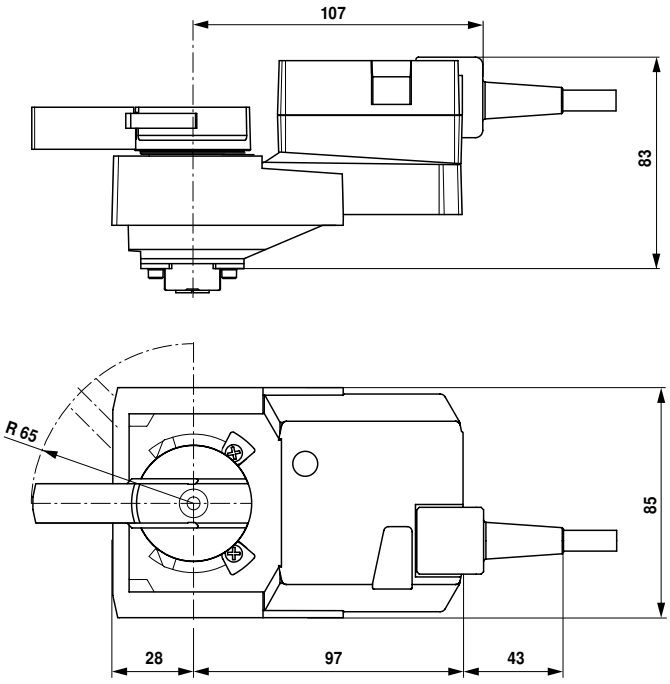
**AC/DC 24V, 3-point**




Cable colours:
1 = black
2 = red
3 = white

## Dimensions [mm]

### Dimensional drawings






UL marked actuators is optional, please contact your local Sales Representative for details.

# NR24A-S

**Rotary actuator for ball valves**
- **Nominal torque 10Nm**
- **Nominal voltage AC/DC 24V**
- **Control Open/Close, 3-point**
- **With integrated auxiliary switch**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 2W |
| | Power consumption in rest position | 0.2W |
| | Power consumption for wire sizing | 4VA |
| | Auxiliary switch | 1 x SPDT, 0...100% |
| | Switching capacity auxiliary switch | 1mA...3 (0.5) A, AC 250V (II Protective insulated) |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Connection auxiliary switch | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 10Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | Rated impulse voltage auxiliary switch | 2.5kV |
| | 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 |
| **Weight** | Weight | Approx. 0.8kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.

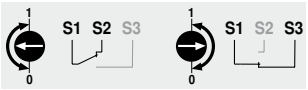
**Manual override** Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stops.

**Flexible signalisation** With adjustable auxiliary switch (0...100%)

Auxiliary switch




## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

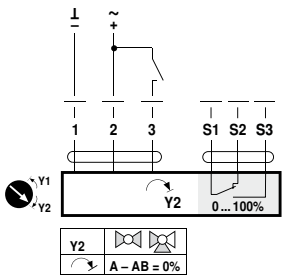
## Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

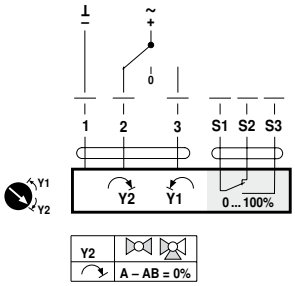
### Wiring diagrams

**AC/DC 24V, Open/Close**




Cable colours:
1 = black
2 = red
3 = white
S1 = violet
S2 = red
S3 = white

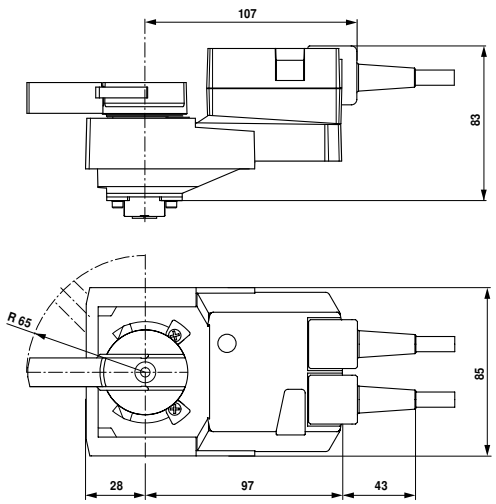
**AC/DC 24V, 3-point**




Cable colours:
1 = black
2 = red
3 = white
S1 = violet
S2 = red
S3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# NR230A

**Rotary actuator for ball valves**
- **Nominal torque 10Nm**
- **Nominal voltage AC 230V**
- **Control Open/Close, 3-point**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC 230V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 85...265V |
| | Power consumption in operation | 3W |
| | Power consumption in rest position | 0.6W |
| | Power consumption for wire sizing | 7VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 10Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | II Protective insulated |
| | Protection class UL | II Protective insulated |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 4kV |
| | 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 |
| **Weight** | Weight | Approx. 0.75kg |

## Safety notes

- This device 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.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** — Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball 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 is pressed or remains locked).

**High functional reliability** — The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** — Adjustable angle of rotation with mechanical end stops.

## Accessories

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

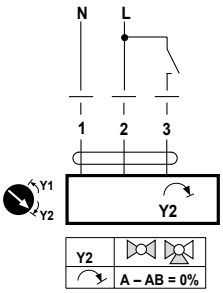
## Electrical installation

**Notes**

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

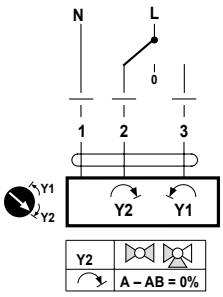
### Wiring diagrams

**AC 230V, Open/Close**




Cable colours:
1 = blue
2 = brown
3 = white

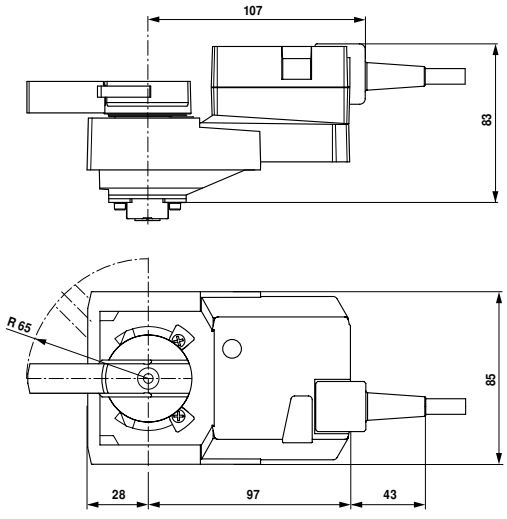
**AC 230V, 3-point**




Cable colours:
1 = blue
2 = brown
3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# NR230A-S

**Rotary actuator for ball valves**
- **Nominal torque 10Nm**
- **Nominal voltage AC 230V**
- **Control Open/Close, 3-point**
- **With integrated auxiliary switch**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC 230V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 85...265V |
| | Power consumption in operation | 3W |
| | Power consumption in rest position | 0.6W |
| | Power consumption for wire sizing | 7VA |
| | Auxiliary switch | 1 x SPDT, 0...100% |
| | Switching capacity auxiliary switch | 1mA...3 (0.5) A, AC 250 V (II Protective insulated) |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Connection auxiliary switch | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 10Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 35dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | II Protective insulated |
| | Protection class UL | II Protective insulated |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 4kV |
| | Rated impulse voltage auxiliary switch | 2.5kV |
| | 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 |
| **Weight** | Weight | Approx. 0.8kg |

## Safety notes

- This device 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.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.

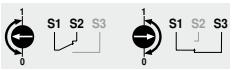
**Manual override** Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stops.

**Flexible signalization** With adjustable auxiliary switch (0...100%)

Auxiliary switch




## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

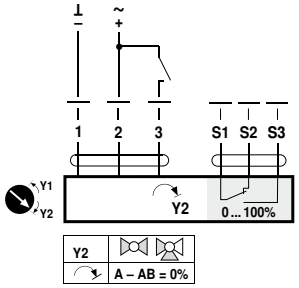
## Electrical installation

**Notes**

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

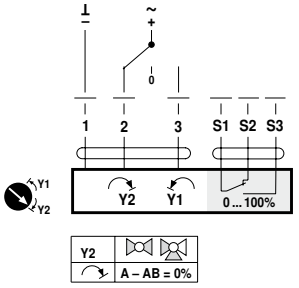
### Wiring diagrams

**AC 230V, Open/Close**




Cable colours:
1 = blue
2 = brown
3 = white
S1 = violet
S2 = red
S3 = white

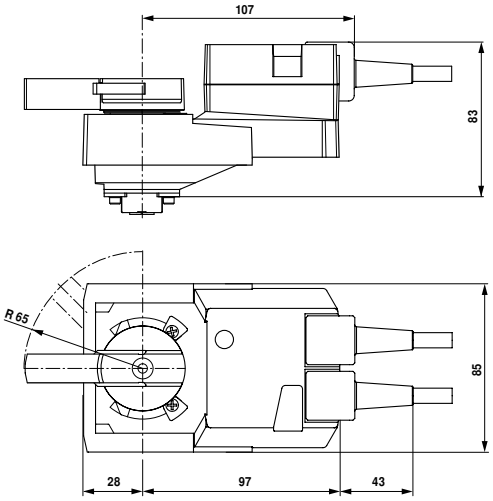
**AC 230V, 3-point**




Cable colours:
1 = blue
2 = brown
3 = white
S1 = violet
S2 = red
S3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# SR24A-SR

**Modulating rotary actuator for ball valves**
- **Nominal torque 20Nm**
- **Nominal voltage AC/DC 24V**
- **Control Modulating DC (0)2...10V**
- **Position feedback DC 2...10V**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 2.5W |
| | Power consumption in rest position | 0.4W |
| | Power consumption for wire sizing | 5VA |
| | Connection supply / control | Cable 1m, 4 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 20Nm |
| | Positioning signal Y | DC (0)2...10V |
| | Positioning signal Y note | Input impedance 100kΩ |
| | Operating range Y | DC 2...10V |
| | Position feedback U | DC 2...10V |
| | Position feedback U note | Max. 1mA |
| | Position accuracy | ±5% |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 45dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | 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 |
| **Weight** | Weight | Approx. 1kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation**
The actuator is connected with a standard modulating signal of DC (0)2...10V and travels to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the valve position 0...100% and as slave control signal for other actuators.

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball 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 is pressed or remains locked).

**High functional reliability**
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

## Accessories

**Electrical accessories**

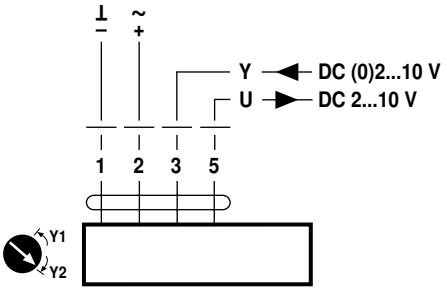
| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

## Electrical installation

**Notes**
- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

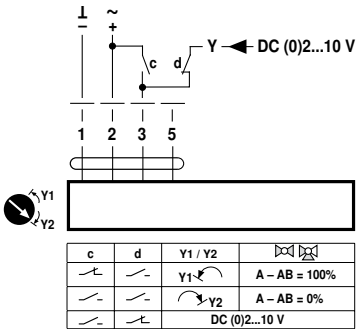
### Wiring diagrams

**AC/DC 24V, modulating**




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

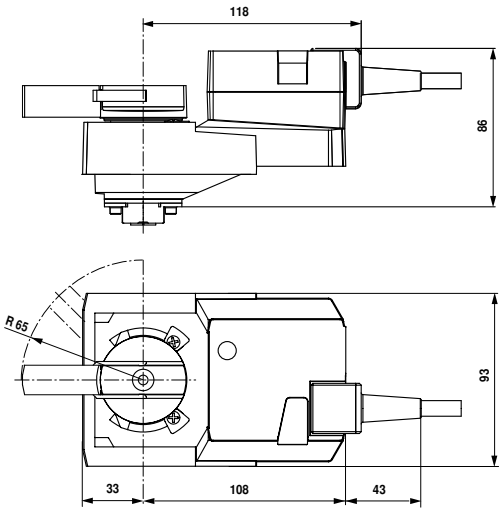
**Override control (frost protection circuit)**




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

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# SR24A

**Rotary actuator for ball valves**
- **Nominal torque 20Nm**
- **Nominal voltage AC/DC 24V**
- **Control Open/Close, 3-point**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 2.5W |
| | Power consumption in rest position | 0.2W |
| | Power consumption for wire sizing | 5.5VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 20Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 45dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | 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 |
| **Weight** | Weight | Approx. 1kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball 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 is pressed or remains locked).

**High functional reliability**
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

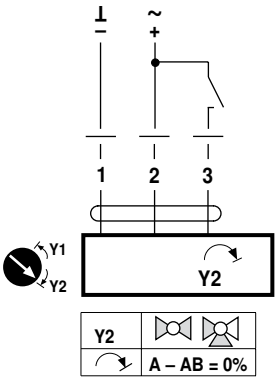
## Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

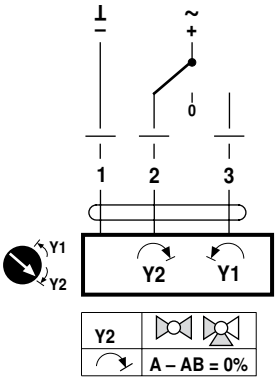
### Wiring diagrams

**AC/DC 24V, Open/Close**




Cable colours:
1 = black
2 = red
3 = white

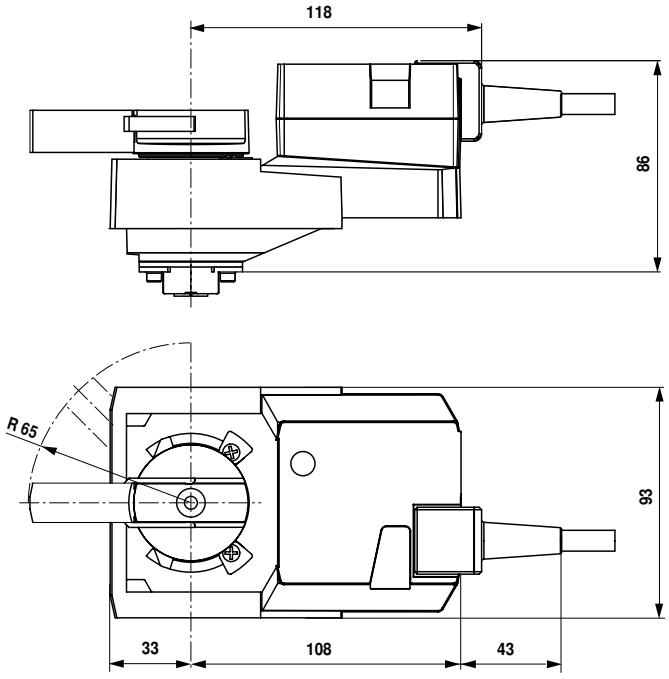
**AC/DC 24V, 3-point**




Cable colours:
1 = black
2 = red
3 = white

## Dimensions [mm]

### Dimensional drawings






UL marked actuators is optional, please contact your local Sales Representative for details.

# SR24A-S

**Rotary actuator for ball valves**
- **Nominal torque 20Nm**
- **Nominal voltage AC/DC 24V**
- **Control Open/Close, 3-point**
- **With integrated auxiliary switch**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 2.5W |
| | Power consumption in rest position | 0.2W |
| | Power consumption for wire sizing | 5.5VA |
| | Auxiliary switch | 1 x SPDT, 0...100% |
| | Switching capacity auxiliary switch | 1mA...3 (0.5) A, AC 250V (II Protective insulated) |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Connection auxiliary switch | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 20Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 45dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | Rated impulse voltage auxiliary switch | 2.5kV |
| | 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 |
| **Weight** | Weight | Approx. 1kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.





**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.

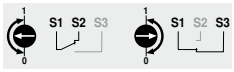
**Manual override** Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stops.

**Flexible signalisation** With adjustable auxiliary switch (0...100%)

Auxiliary switch




## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

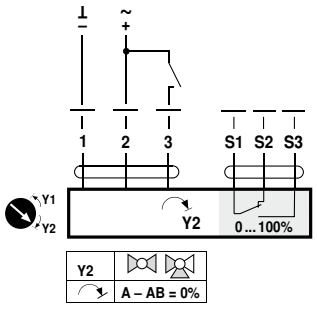
## Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

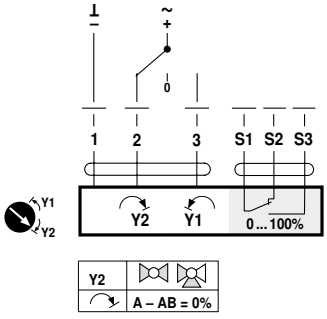
### Wiring diagrams

**AC/DC 24V, Open/Close**




Cable colours:
1 = black
2 = red
3 = white
S1 = violet
S2 = red
S3 = white

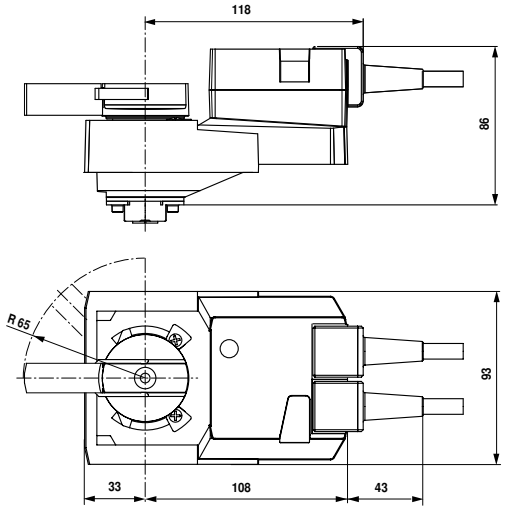
**AC/DC 24V, 3-point**




Cable colours:
1 = black
2 = red
3 = white
S1 = violet
S2 = red
S3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# SR230A

**Rotary actuator for ball valves**
- **Nominal torque 20Nm**
- **Nominal voltage AC 230V**
- **Control Open/Close, 3-point**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC 230V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 85...265V |
| | Power consumption in operation | 3W |
| | Power consumption in rest position | 0.6W |
| | Power consumption for wire sizing | 7VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 20Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 45dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | II Protective insulated |
| | Protection class UL | II Protective insulated |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 4kV |
| | 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 |
| **Weight** | Weight | Approx. 1kg |

## Safety notes

- This device 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.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball 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 is pressed or remains locked).

**High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stops.

## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

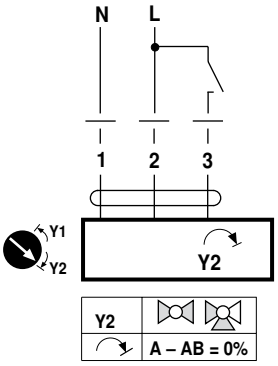
## Electrical installation

**Notes**

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

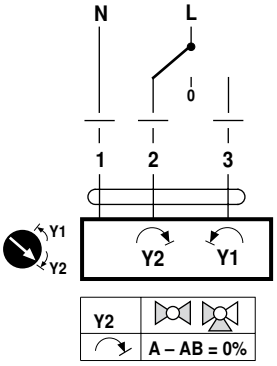
### Wiring diagrams

**AC 230V, Open/Close**




Cable colours:
1 = blue
2 = brown
3 = white

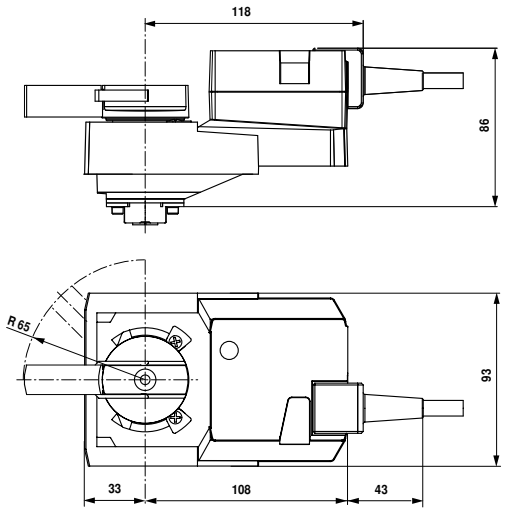
**AC 230V, 3-point**




Cable colours:
1 = blue
2 = brown
3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# SR230A-S

**Rotary actuator for ball valves**
- **Nominal torque 20Nm**
- **Nominal voltage AC 230V**
- **Control Open/Close, 3-point**
- **With integrated auxiliary switch**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC 230V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 85...265V |
| | Power consumption in operation | 3W |
| | Power consumption in rest position | 0.6W |
| | Power consumption for wire sizing | 7VA |
| | Auxiliary switch | 1 x SPDT, 0...100% |
| | Switching capacity auxiliary switch | 1mA...3 (0.5) A, AC 250V (II Protective insulated) |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Connection auxiliary switch | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 20Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 45dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | II Protective insulated |
| | Protection class UL | II Protective insulated |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 4kV |
| | Rated impulse voltage auxiliary switch | 2.5kV |
| | 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 |
| **Weight** | Weight | Approx. 1kg |

## Safety notes

- This device 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.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.

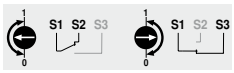
**Manual override** Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stops.

**Flexible signalisation** With adjustable auxiliary switch (0...100%)

Auxiliary switch




## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

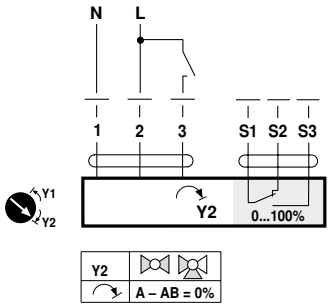
## Electrical installation

**Notes**

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

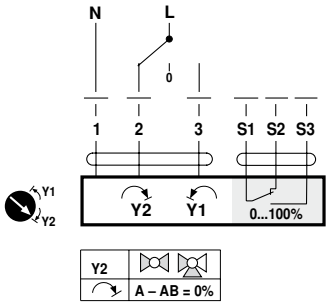
### Wiring diagrams

**AC 230V, Open/Close**




Cable colours:
1 = blue
2 = brown
3 = white
S1 = violet
S2 = red
S3 = white

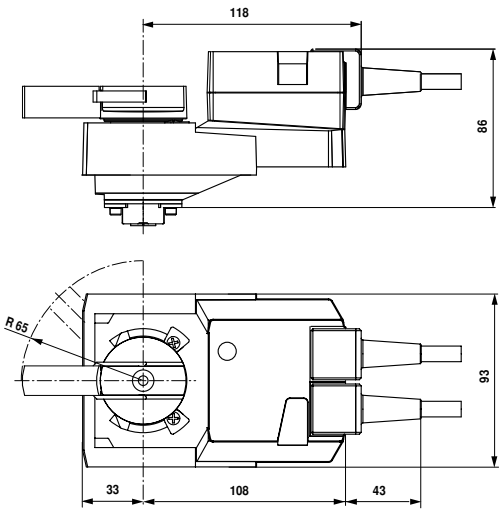
**AC 230V, 3-point**




Cable colours:
1 = blue
2 = brown
3 = white
S1 = violet
S2 = red
S3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# SR24A-5

**Rotary actuator for rotary valves**
- **Nominal torque 20Nm**
- **Nominal voltage AC/DC 24V**
- **Control Open/Close, 3-point**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 2.5W |
| | Power consumption in rest position | 0.2W |
| | Power consumption for wire sizing | 5.5VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 20Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 45dB(A) |
| | Position indication | Mechanically, integrated, two-section |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | 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 |
| **Mechanical data** | Connection flange | F05 |
| **Weight** | Weight | Approx. 1kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** — Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override** — Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**High functional reliability** — The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** — Adjustable angle of rotation with mechanical end stops.

**Combination valve/actuator** — For valves with the following mechanical specifications in accordance with ISO 5211 F05:
- Square stem head SW = 14mm for form fit coupling of the rotary actuator.
- Hole circle d = 50mm

## Accessories

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

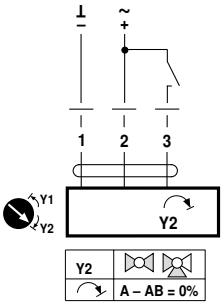
## Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

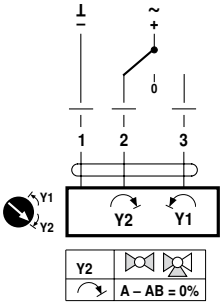
### Wiring diagrams

**AC/DC 24V, Open/Close**




Cable colours:
1 = black
2 = red
3 = white

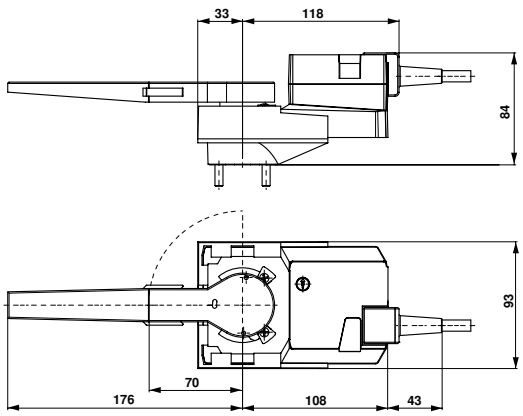
**AC/DC 24V, 3-point**




Cable colours:
1 = black
2 = red
3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# SR24A-SR-5

**Rotary actuator for rotary valves**
- **Nominal torque 20Nm**
- **Nominal voltage AC/DC 24V**
- **Control Modulating DC (0)2...10V**
- **Position feedback DC 2...10V**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 2.5W |
| | Power consumption in rest position | 0.4W |
| | Power consumption for wire sizing | 5VA |
| | Connection supply / control | Cable 1m, 4 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 20Nm |
| | Positioning signal Y | DC (0)2...10V |
| | Positioning signal Y note | Input impedance 100kΩ |
| | Operating range Y | DC 2...10V |
| | Position feedback U | DC 2...10V |
| | Position feedback U note | Max. 1mA |
| | Position accuracy | ±5% |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 45dB(A) |
| | Position indication | Mechanically, integrated, two-section |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | 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 |
| **Mechanical data** | Connection flange | F05 |
| **Weight** | Weight | Approx. 1kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation**
The actuator is connected with a standard modulating signal of DC (0)2...10V and travels to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the valve position 0...100% and as slave control signal for other actuators.

**Simple direct mounting**
Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**High functional reliability**
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

**Combination valve/actuator**
For valves with the following mechanical specifications in accordance with ISO 5211 F05:
- Square stem head SW = 14mm for form fit coupling of the rotary actuator.
- Hole circle d = 50mm

## Accessories

**Electrical accessories**

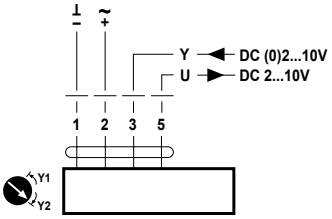
| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

## Electrical installation

**Notes**
- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

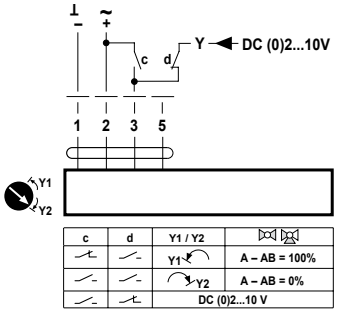
### Wiring diagrams

**AC/DC 24V, modulating**




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

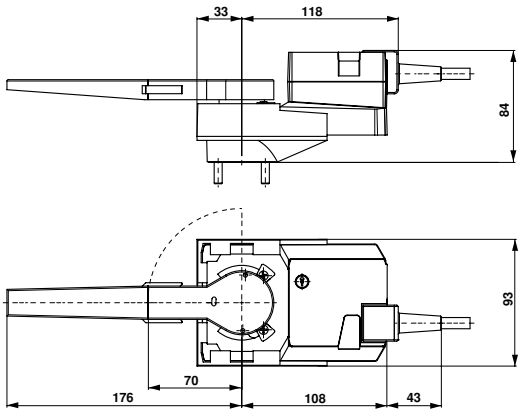
**Override control (frost protection circuit)**




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

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# SR230A-5

**Rotary actuator for rotary valves**
- **Nominal torque 20Nm**
- **Nominal voltage AC 230V**
- **Control Open/Close, 3-point**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC 230V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 85...265V |
| | Power consumption in operation | 3W |
| | Power consumption in rest position | 0.6W |
| | Power consumption for wire sizing | 7VA |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 20Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 45dB(A) |
| | Position indication | Mechanically, integrated, two-section |
| **Safety** | Protection class IEC/EN | II Protective insulated |
| | Protection class UL | II Protective insulated |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 4kV |
| | 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 |
| **Mechanical data** | Connection flange | F05 |
| **Weight** | Weight | Approx. 1kg |

## Safety notes

- This device 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.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** — Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override** — Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**High functional reliability** — The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** — Adjustable angle of rotation with mechanical end stops.

**Combination valve/actuator** — For valves with the following mechanical specifications in accordance with ISO 5211 F05:
- Square stem head SW = 14mm for form fit coupling of the rotary actuator.
- Hole circle d = 50mm

## Accessories

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

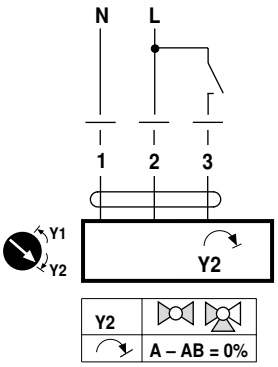
## Electrical installation

**Notes**

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

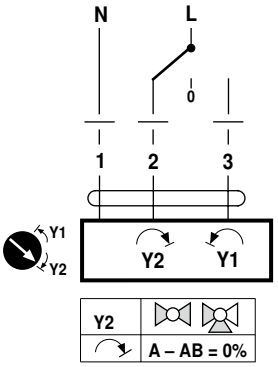
### Wiring diagrams

**AC 230V, Open/Close**




Cable colours:
1 = blue
2 = brown
3 = white

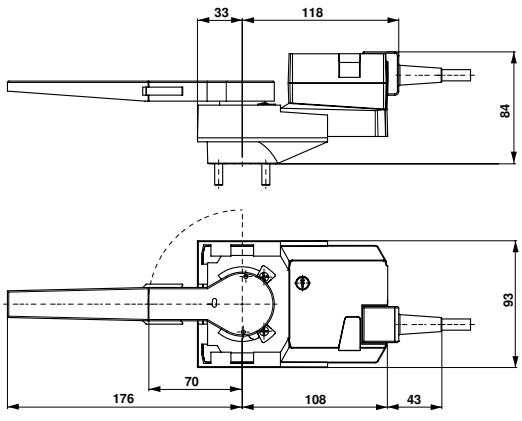
**AC 230V, 3-point**




Cable colours:
1 = blue
2 = brown
3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# SR24A-S-5

**Rotary actuator for rotary valves**
- **Nominal torque 20Nm**
- **Nominal voltage AC/DC 24V**
- **Control Open/Close, 3-point**
- **With integrated auxiliary switch**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | 2.5W |
| | Power consumption in rest position | 0.2W |
| | Power consumption for wire sizing | 5.5VA |
| | Auxiliary switch | 1 x SPDT, 0...100% |
| | Switching capacity auxiliary switch | 1mA...3 (0.5) A, AC 250 V (II Protective insulated) |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Connection auxiliary switch | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 20Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 45dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8kV |
| | Rated impulse voltage auxiliary switch | 2.5kV |
| | 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 |
| **Mechanical data** | Mechanical data | F05 |
| **Weight** | Weight | Approx. 1kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

## Product features

**Simple direct mounting** — Straightforward direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override** — Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

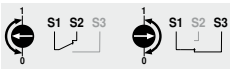
**High functional reliability** — The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** — Adjustable angle of rotation with mechanical end stops.

**Combination valve/actuator** — For valves with the following mechanical specifications in accordance with ISO 5211 F05:
- Square stem head SW = 14mm for form-fit coupling of the rotary actuator.
- Hole circle d = 50mm

**Flexible signalisation** — With adjustable auxiliary switch (0...100%)

Auxiliary switch




## Accessories

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

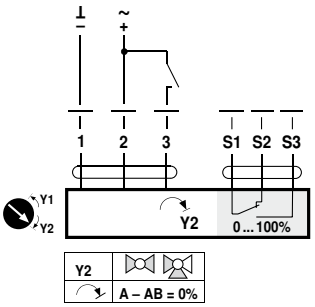
## Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

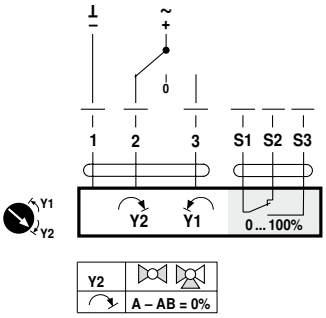
### Wiring diagrams

**AC/DC 24V, Open/Close**




Cable colours:
1 = black
2 = red
3 = white
S1 = violet
S2 = red
S3 = white

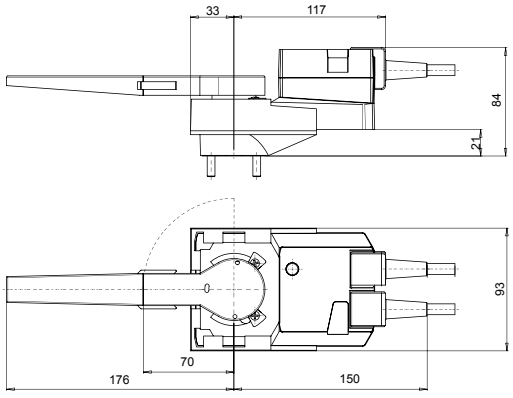
**AC/DC 24V, 3-point**




Cable colours:
1 = black
2 = red
3 = white
S1 = violet
S2 = red
S3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# SR230A-S-5

**Rotary actuator for rotary valves**
- **Nominal torque 20Nm**
- **Nominal voltage AC 230V**
- **Control Open/Close, 3-point**
- **With integrated auxiliary switch**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC 230V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 85...265V |
| | Power consumption in operation | 3W |
| | Power consumption in rest position | 0.6W |
| | Power consumption for wire sizing | 7VA |
| | Auxiliary switch | 1 x SPDT, 0...100% |
| | Switching capacity auxiliary switch | 1mA...3 (0.5) A, AC 250V (II Protective insulated) |
| | Connection supply / control | Cable 1m, 3 x 0.75mm² |
| | Connection auxiliary switch | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 20Nm |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90s / 90° |
| | Sound power level motor max. | 45dB(A) |
| | Position indication | Mechanically, pluggable |
| **Safety** | Protection class IEC/EN | II Protective insulated |
| | Protection class UL | II Protective insulated |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Low voltage directive | CE according to 2006/95/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 4kV |
| | Rated impulse voltage auxiliary switch | 2.5kV |
| | 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 |
| **Mechanical data** | Connection flange | F05 |
| **Weight** | Weight | Approx. 1kg |

## Safety notes

- This device 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.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

## Product features

**Simple direct mounting** — Straightforward direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override** — Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

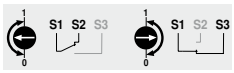
**High functional reliability** — The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation** — Adjustable angle of rotation with mechanical end stops.

**Combination valve/actuator** — For valves with the following mechanical specifications in accordance with ISO 5211 F05:
- Square stem head SW = 14mm for form-fit coupling of the rotary actuator.
- Hole circle d = 50mm

**Flexible signalisation** — With adjustable auxiliary switch (0...100%)

Auxiliary switch




## Accessories

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

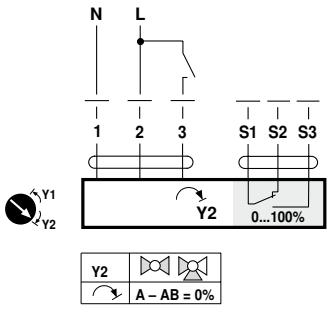
## Electrical installation

**Notes**

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

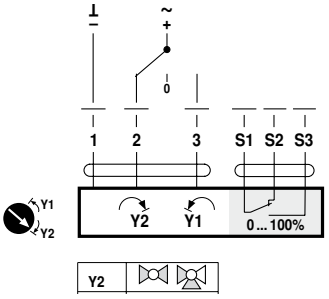
### Wiring diagrams

**AC 230V, Open/Close**




Cable colours:
1 = blue
2 = brown
3 = white
S1 = violet
S2 = red
S3 = white

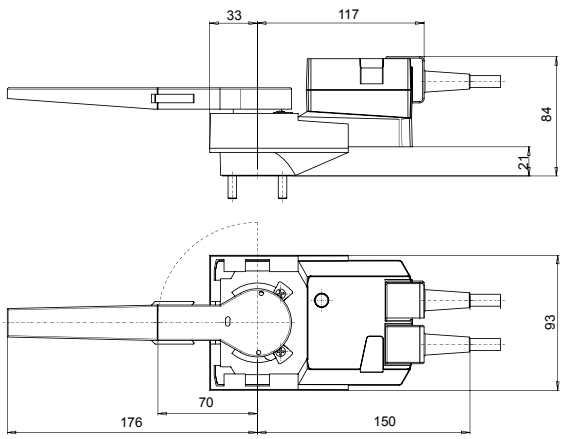
**AC 230V, 3-point**




Cable colours:
1 = blue
2 = brown
3 = white
S1 = violet
S2 = red
S3 = white

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# GR24A-5 / -7

**GR24A-5 Rotary actuator for rotary valves**
**GR24A-7 Rotary actuator for rotary valves**
- **Nominal torque 40Nm**
- **Nominal voltage AC/DC 24V**
- **Control Open/Close**

## Technical data

| | | | |
|---|---|---|---|
| **Electrical data** | Nominal voltage | | AC/DC 24V |
| | Nominal voltage frequency | | 50/60Hz |
| | Nominal voltage range | | AC 19.2...28.8V / DC 19.2...28.8V |
| | Power consumption in operation | | 4W |
| | Power consumption at rest | | 2W |
| | Power consumption for wire sizing | | 6VA |
| | Connection supply / control | | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | | Yes (note the performance data) |
| **Functional data** | Torque motor | GR24A-5 | min. 40Nm |
| | | GR24A-7 | min. 40Nm |
| | Manual override | | Gear disengagement with push-button, can be locked |
| | Running time motor | | 150s / 90° |
| | Sound power level motor max. | | 45dB(A) |
| | Position indication | | Mechanical, pluggable |
| **Safety** | Protection class IEC/EN | | III Safety extra-low voltage |
| | Protection class UL | | UL Class 2 Supply |
| | Degree of protection IEC/EN | | IP54 |
| | Degree of protection NEMA/UL | | NEMA 2, UL Enclosure Type 2 |
| | EMC | | CE according to 2004/108/EC |
| | Certification IEC/EN | | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | | Type 1 |
| | Rated current voltage motor | | 0.8kV |
| | 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 |
| **Mechanical data** | Connection flange | GR24A-5 | F05 |
| | | GR24A-7 | F07 |
| **Weight** | Weight | | Approx. 1.85kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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

**Simple direct mounting** Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override** Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

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



**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

## Product features

**Combination valve/actuator**

For valves with the following mechanical specifications in accordance with ISO 5211 F05:
- Square stem head SW = 14mm for form-fit coupling of the rotary actuator.
- Hole circle d = 50mm

For valves with the following mechanical specifications in accordance with ISO 5211 F07:
- Square stem head SW = 17mm for form-fit coupling of the rotary actuator.
- Hole circle d = 70mm

## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

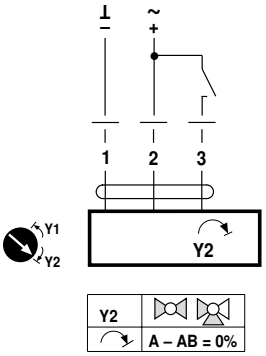
## Wiring diagram

**Notes**

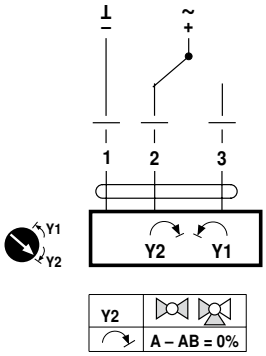
- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

**GR24A-5/-7**

**AC/DC 24V, Open/Close**

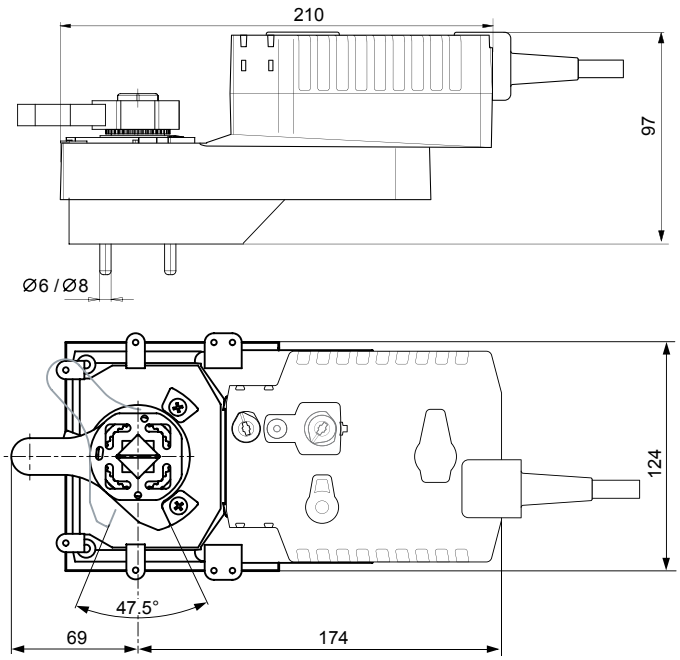



Cable colours:
1 = black
2 = red
3 = white




## Dimensions [mm]

**GR24A-5/-7**






UL marked actuators is optional, please contact your local Sales Representative for details.

# GR24A-SR-5 / -7

**Modulating rotary actuator for rotary valves**
**GR24A-SR-5 with mounting flange ISO 5211-F05**
**GR24A-SR-7 with mounting flange ISO 5211-F07**

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

## Technical data

| | | | |
|---|---|---|---|
| **Electrical data** | Nominal voltage | | AC 24V, 50/60 Hz / DC 24V |
| | Nominal voltage range | | AC 19.2...28.8V / DC 21.6...28.8V |
| | Power consumption | In operation | 4.5W @ nominal torque |
| | | At rest | 1.5W |
| | | For wire sizing | 6.5VA |
| | Connection | | Cable 1m, 4 x 0.75mm$^2$ |
| | Parallel operation | | Possible, note the performance data |
| **Functional data** | Torque (nominal torque) | | Min. 40Nm @ nominal voltage |
| | Control | Control signal Y | DC (0)2...10V, typical input impedance 100kΩ |
| | | Operating range Y | DC 2...10V |
| | Position feedback | | DC 2...10V, max. 1mA |
| | Position accuracy | | ±5% |
| | Manual override | | Gearing latch disengaged with pushbutton, can be locked |
| | Running time | | 150s / 90° |
| | Sound power level | | Max. 45dB(A) |
| | Position indication | | Mechanical, pluggable |
| **Safety** | Protection class IEC/EN | | III Safety extra-low voltage |
| | Protection class UL | | UL Class 2 Supply |
| | Degree of protection IEC/EN | | IP54 |
| | Degree of protection EMA/UL | | NEMA 2, UL Enclosure Type 2 |
| | EMC | | CE in accordance with 2004/108/EU |
| | Certification | | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | | Type 1 |
| | Rated impulse voltage | | 0.8kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | 0...+50°C |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.h., non-condensating |
| | Maintenance | | Maintenance-free |
| **Mechanical data** | Connection flange | GR24A-SR-5 | F05 |
| | | GR24A-SR-7 | F07 |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2.5kg |

## 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 assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation**
The actuator is controlled with a standard modulating signal of DC (0)2...10V and travels to the position defined by the control signal. Measuring voltage U serves for the electrical display of the actuator position 0...100% and as slave control signal for other actuators.

**Simple direct mounting**
Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

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

**Combination valve/actuator**
For valves with the following mechanical specifications in accordance with ISO 5211 F05:
- Square stem head SW = 14mm for form-fit coupling of the rotary actuator.
- Hole circle d = 50mm

For valves with the following mechanical specifications in accordance with ISO 5211 F07:
- Square stem head SW = 17mm for form-fit coupling of the rotary actuator.
- Hole circle d = 70mm

## Accessories

**Electrical accessories**

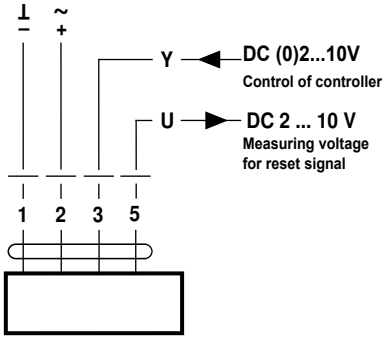
| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

## Wiring diagram

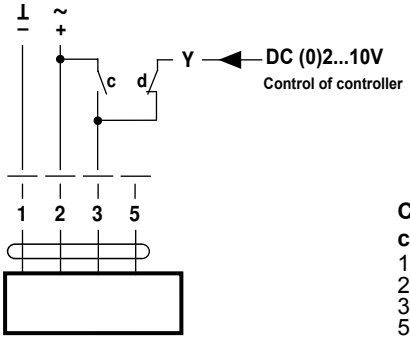
### GR24A-SR-5

**Notes**
- Connect via safety isolation transformer.
- Other actuators can be connected in parallel. Note performance data for supply.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2

**Standard connection**




**Override control** (Frost protection circuit)




**Direction of rotation**

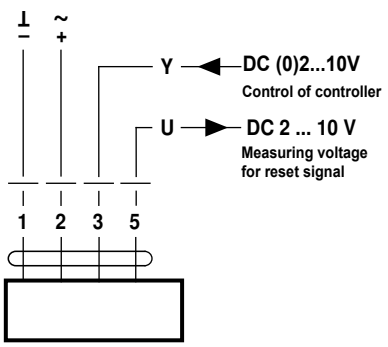

**Cable colours:**
1 = black
2 = red
3 = white
5 = orange

| c | d | Actuator | Butterfly valve |
|---|---|---|---|
| ⌐ | _\| | Y1 | A – AB = 100% |
| _\| | _\| | Y2 | A – AB = 0% |
| _\| | ⌐ | | Modulating operation |

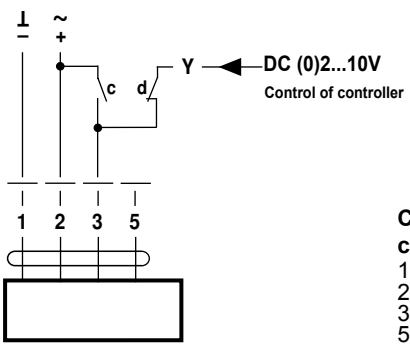
### GR24A-SR-7

**Notes**
- Connect via safety isolation transformer.
- Other actuators can be connected in parallel. Note performance data for supply.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2

**Standard connection**




**Override control** (Frost protection circuit)




**Direction of rotation**


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

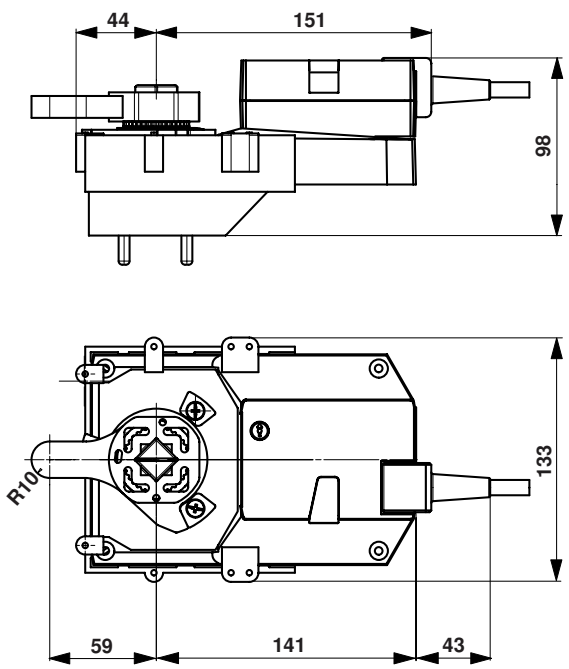
| c | d | Actuator | Butterfly valve |
|---|---|---|---|
| ⌐ | _\| | Y1 | A – AB = 100% |
| _\| | _\| | Y2 | A – AB = 0% |
| _\| | ⌐ | | Modulating operation |



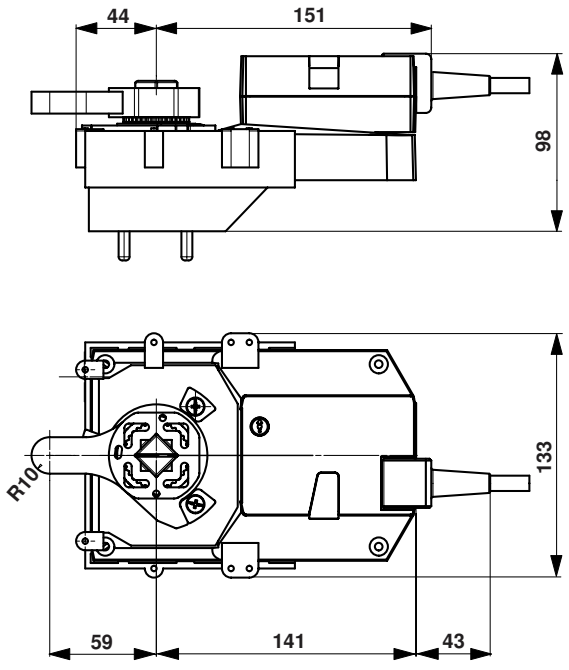
UL marked actuators is optional, please contact your local Sales Representative for details.

## Dimensions [mm]

**GR24A-SR-5**




**GR24A-SR-7**






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**GR230A-5 Rotary actuator for rotary valves**
**GR230A-7 Rotary actuator for rotary valves**

- **Nominal torque 40Nm**
- **Nominal voltage AC 230V**
- **Control Open/Close**

## Technical data

| | | | |
|---|---|---|---|
| **Electrical data** | Nominal voltage | | AC 230V |
| | Nominal voltage frequency | | 50/60Hz |
| | Nominal voltage range | | AC 85...265V |
| | Power consumption in operation | | 5W |
| | Power consumption at rest | | 2W |
| | Power consumption for wire sizing | | 9VA |
| | Connection supply / control | | Cable 1m, 3 x 0.75mm² |
| | Parallel operation | | Yes (note the performance data) |
| **Functional data** | Torque motor | GR230A-5<br>GR230A-7 | min. 40Nm<br>min. 40Nm |
| | Manual override | | Gear disengagement with push-button, can be locked |
| | Running time motor | | 150s / 90° |
| | Sound power level motor max. | | 45dB(A) |
| | Position indication | | Mechanical, pluggable |
| **Safety** | Protection class IEC/EN | | II protective insulated |
| | Protection class UL | | II protective insulated |
| | Degree of protection IEC/EN | | IP54 |
| | Degree of protection NEMA/UL | | NEMA 2, UL Enclosure Type 2 |
| | Electromagnetic compatibility | | CE according to 2004/108/EC |
| | Low-voltage directive | | CE according to 2006/95/EC |
| | Certification IEC/EN | | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | | Type 1 |
| | Rated current voltage motor | | 4kV |
| | 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 |
| **Mechanical data** | Connection flange | GR230A-5<br>GR230A-7 | F05<br>F07 |
| **Weight** | Weight | | Approx. 1.85kg |

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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 cables 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Manual override**
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

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

**Simple direct mounting**
Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Combination valve/actuator**
For valves with the following mechanical specifications in accordance with ISO 5211 F05:
- Square stem head SW = 14mm for form-fit coupling of the rotary actuator.
- Hole circle d = 50mm

For valves with the following mechanical specifications in accordance with ISO 5211 F07:
- Square stem head SW = 17mm for form-fit coupling of the rotary actuator.
- Hole circle d = 70mm

## Accessories

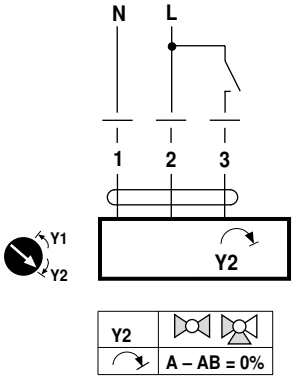
**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

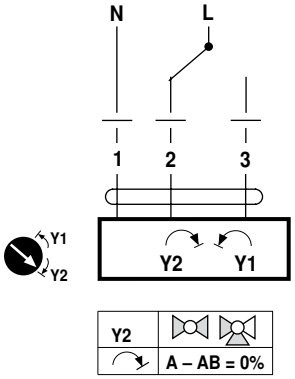
## Wiring diagram

**Notes**
- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

**GR230A-5**
**AC 230V, Open/Close**




Cable colours:
1 = blue
2 = brown
3 = white






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

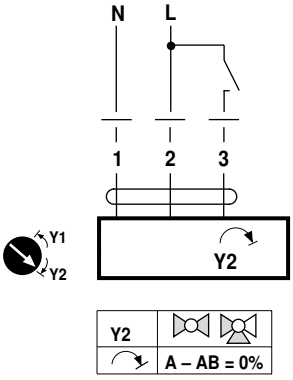
## Wiring diagram

**Notes**

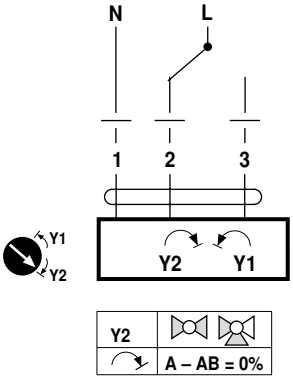
- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

**GR230A-7**

**AC 230V, Open/Close**

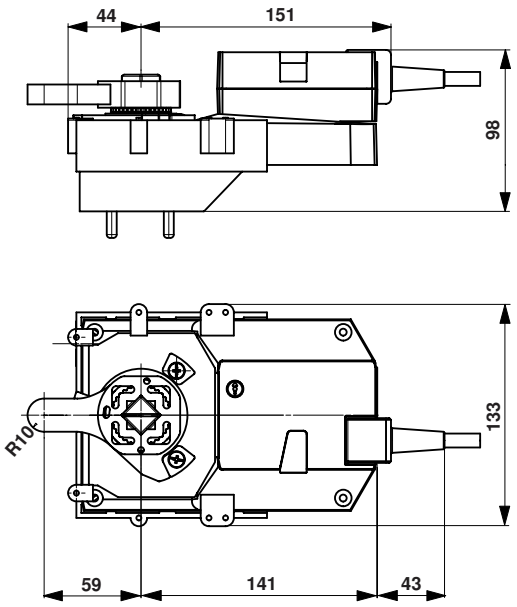



Cable colours:
1 = blue
2 = brown
3 = white

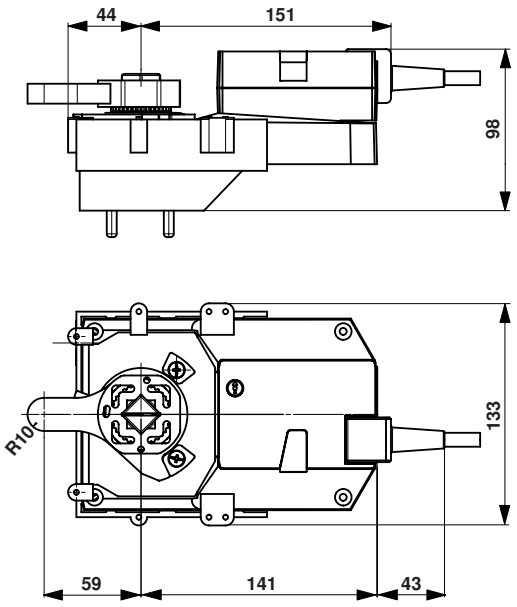



## Dimensions [mm]

**GR230A-5**




**GR230A-7**






UL marked actuators is optional, please contact your local Sales Representative for details.

# LRQ24A

**Rotary actuator for 2 and 3 way control ball valves**
- **Torque 4Nm**
- **Nominal voltage AC/DC 24V**
- **Control: Open/Close**
- **Running time 9s**

## Technical data

| | | | |
|---|---|---|---|
| **Electrical data** | Nominal voltage | | AC 24V, 50/60Hz / DC 24V |
| | Nominal voltage range | | AC/DC 19.2 ... 28.8V / DC 21.6 ... 28.8V |
| | Power consumption | In operation | 12W @ nominal torque |
| | | At rest | 1.5W |
| | | For wire sizing | 18VA (I max. 20A @ 5ms) |
| | Connection | | Cable 1m, 3 x 0.75mm$^2$ |
| | Parallel connection | | Possible, note the performance data |
| **Functional data** | Torque (nominal torque) | | Min. 4Nm @ nominal voltage |
| | Manual override | | Gearing latch disengaged with push-button, can be locked |
| | Running time | | 9s / 90° |
| | Sound power level | | Max. 52dB(A) |
| | Position indication | | Mechanical, pluggable |
| **Safety** | Protection class | | **III** Safety extra-low voltage |
| | Degree of protection | | IP54 in any mounting position, UL/NEMA 2 |
| | 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 |
| | Rated impulse voltage | | 0.8kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | 0 ... +40°C (no restrictions)<br>⚠ +40 ... +50°C (Caution: can only be used with restrictions. Please contact your Belimo representative.) |
| | Non-operating temperature | | –40 ... +80°C |
| | Ambient humidity | | 95% r.H., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 0.95kg |

## 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 assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not 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.
- Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one screw.
The assemply tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

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

**Home position**
When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position.
Factory setting: Y2 (counter-clockwise rotation)

| Rotary actuator | Rotary valve |
|---|---|
| Y2 | A – AB = 0% |
| Y1 | A – AB = 100% |

The actuator then moves into the position defined by the control signal.

## Accessories

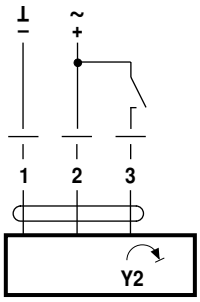
**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

## Electrical installation

**Wiring diagrams**

**Note**
- Connect via safety isolation transformer.
- Parallel connection of other actuators possible. Note performance data for supply.




**Direction of rotation**

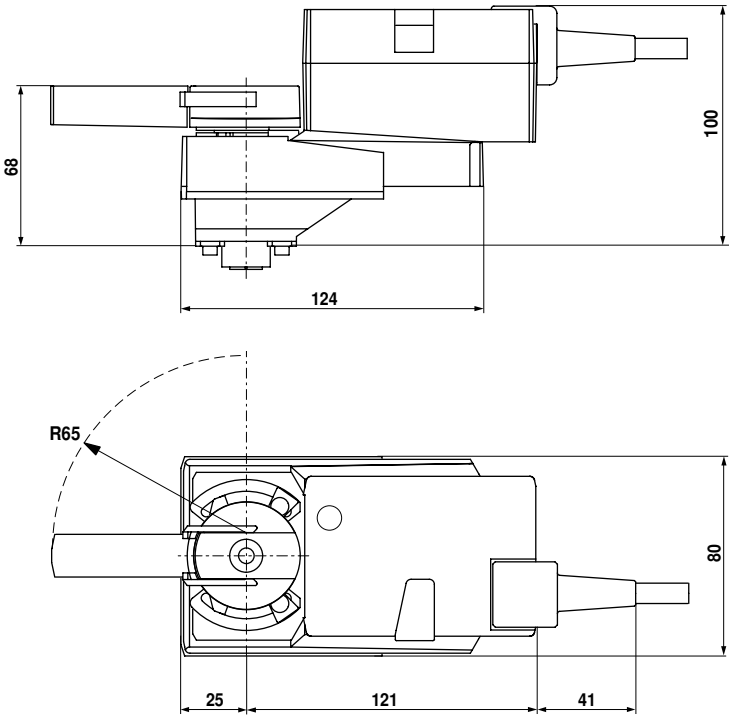

| Rotary actuator | | Rotary valve |
|---|---|---|
| Y2 | | A – AB = 0% |



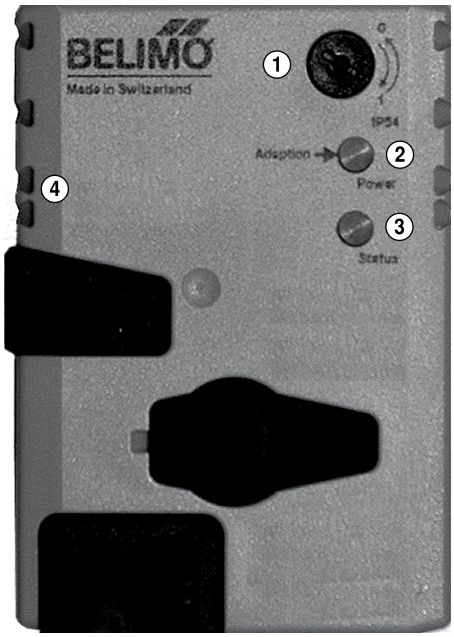
UL marked actuators is optional, please contact your local Sales Representative for details.

## Dimensions [mm]

**Dimensional drawings**




## Operating controls and indicators




① **Direction of rotation switch**
Switching over: Direction of rotation changes

② **Push-button and green LED display**
Off: No voltage supply or fault
On: In operation
Press button: Switches on angle of rotation adaptation followed by standard operation

③ **Push-button and yellow LED display**
Off: Standard operation
On: Adaptation 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

a) ② Off and ③ On
b) ② Blinking and ③ Blinking

} Check the supply connections.
Possibly ⏚ and ~ are swapped over.



UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**Modulating rotary actuator for 2 and 3 way control ball valves**
- **Torque 4Nm**
- **Nominal voltage AC/DC 24V**
- **Control: modulating DC (0)2...10V**
- **Position feedback DC 2...10V**
- **Running time 9s**

## 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 | In operation | 12W @ nominal torque |
| | | At rest | 1.5W |
| | | For wire sizing | 18VA (I max. 20A @ 5ms) |
| | Connection | | Cable 1m, 4 x 0.75mm$^2$ |
| | Parallel connection | | Possible, note the performance data |
| **Functional data** | Torque (nominal torque) | | Min. 4Nm @ nominal voltage |
| | Control | Control signal Y | DC (0)2...10V, input impedance 100kΩ |
| | | Operating range | DC 2...10V |
| | Position feedback (Measuring voltage) | | DC 2...10V, max. 0.5mA |
| | Position accuracy | | ±5% |
| | Manual override | | Gearing latch disengaged with push-button, can be locked |
| | Running time | | 9s / 90° |
| | 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 |
| | Override control | | MAX (maximum position) = 100%<br>MIN (minimum position) = 0%<br>ZS (intermediate position, only AC) = 50% |
| | Sound power level | | 52dB(A) |
| | Position indication | | Mechanical, pluggable |
| **Safety** | Protection class | | **III** Safety extra-low voltage |
| | Degree of protection | | IP54 in any mounting position, UL/NEMA 2 |
| | 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 |
| | Rated impulse voltage | | 0.8kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+40°C (no restrictions)<br>⚠ +40...+50°C (Caution: can only be used with restrictions. Please contact your Belimo representative.) |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.H., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 0.95kg |

## 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 assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not be reversed in a frost protection circuit.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Safety notes

- 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.
- Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)
- 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 is controlled with a standard modulating signal of DC (0)2...10V and moves to the position defined by the control signal. The measuring voltage U serves for the electrical display of the damper position 0...100% and as slave control signal for other actuators.

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one screw. The assembly tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

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

**Position feedback U5**
Operation of the ball valve is optimised by a limiting ring. This ring reduces the angle of rotation from 95° to 90°, i.e. U5 will deviate from Y by approximately 0.3V when the valve is closed.

**Home position**
When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position.
Factory setting: Y2 (counter-clockwise rotation)

| Rotary actuator | Rotary valve |
|---|---|
| Y2 | A – AB = 0% |
| Y1 | A – AB = 100% |

The actuator then moves into the position defined by the control signal.

## Accessories

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

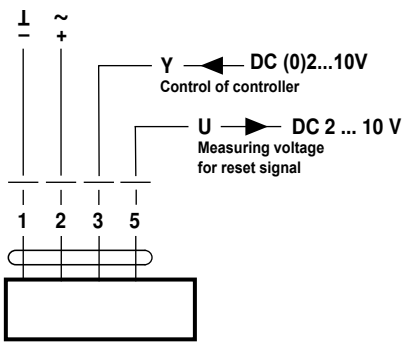
## Electrical installation

**Wiring diagram**

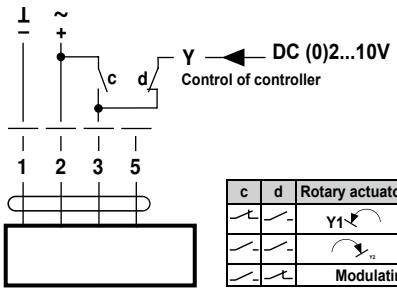
**Note**
- Connect via safety isolation transformer.
- Parellel connection of others actuators possible. Note the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2

**Direction of rotation** Y1 / Y2

**Standard connection**




**Override control (frost protection circuit)**




| c | d | Rotary actuator | Rotary valve |
|---|---|---|---|
| ⌐ | ⌐ | Y1 | A – AB = 100% |
| ⌐ | ⌐ | Y2 | A – AB = 0% |
| ⌐ | ⌐ | Modulating operation | |



UL marked actuators is optional, please contact your local Sales Representative for details.

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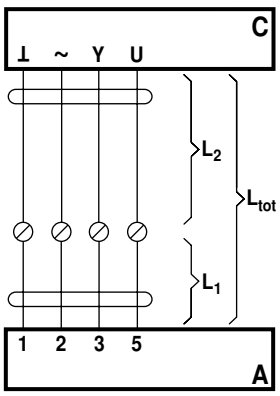
## Electrical installation

### Cable lengths

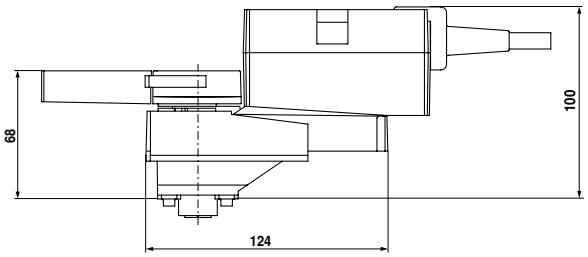


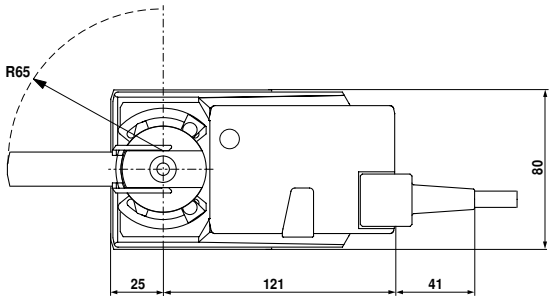

**A** = Actuator
**C** = Control unit
$L_1$ = Belimo connecting cable, 1m (4 x 0.75mm²)
$L_2$ = Customer cable
$L_{tot}$ = Maximum cable length

| Cross section $L_2$ ⊥ / ~ | Max. cable length $L_{tot} = L_1 + L_2$ | | Example for DC |
|---|---|---|---|
| | AC | DC | |
| 0.75 mm² | ≤30 m | ≤5 m | 1 m ($L_1$) + 4 m ($L_2$) |
| 1.00 mm² | ≤40 m | ≤8 m | 1 m ($L_1$) + 7 m ($L_2$) |
| 1.50 mm² | ≤70 m | ≤12 m | 1 m ($L_1$) + 11 m ($L_2$) |
| 2.50 mm² | ≤100 m | ≤20 m | 1 m ($L_1$) + 19 m ($L_2$) |

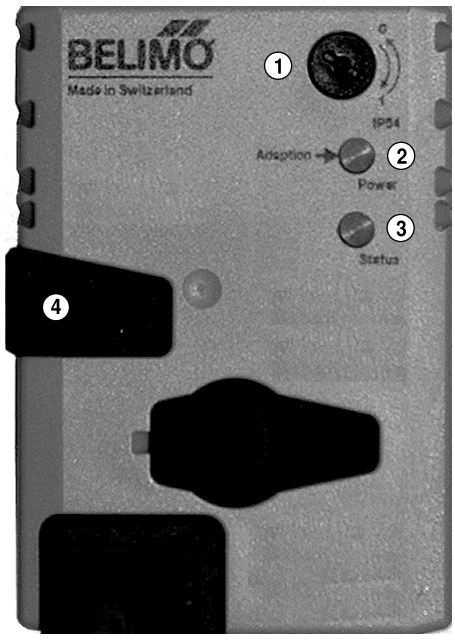
## Dimensions [mm]

### Dimensional drawings




## Operating controls and indicators




① **Direction of rotation switch**
Switching over: Direction of rotation changes

② **Push-button and green LED display**
Off: No voltage supply or fault
On: In operation
Press button: Switches on angle of rotation adaptation followed by standard operation

③ **Push-button and yellow LED display**
Off: Standard operation
On: Adaptation 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

a) ② Off and ③ On
b) ② Blinking and ③ Blinking

} Check the supply connections.
Possibly ⏚ and ~ are swapped over.



UL marked actuators is optional, please contact your local Sales Representative for details.

# NRQ24A

**Rotary actuator for 2 and 3 way control ball valves**
- **Torque 8Nm**
- **Nominal voltage AC/DC 24V**
- **Control: Open/Close**
- **Running time 9s**

## Technical data

| | | | |
|---|---|---|---|
| **Electrical data** | Nominal voltage | | AC 24V, 50/60Hz / DC 24V |
| | Nominal voltage range | | AC/DC 19.2 ... 28.8V / DC 21.6 ... 28.8V |
| | Power consumption | In operation | 12W @ nominal torque |
| | | At rest | 1.5W |
| | | For wire sizing | 18VA (I max. 20 A @ 5ms) |
| | Connection | | Cable 1m, 3 x 0.75mm² |
| | Parallel connection | | Possible, note the performance data |
| **Functional data** | Torque (nominal torque) | | Min. 8Nm @ nominal voltage |
| | Manual override | | Gearing latch disengaged with push-button, can be locked |
| | Running time | | 9s / 90° |
| | Sound power level | | Max. 52dB(A) |
| | Position indication | | Mechanical, pluggable |
| **Safety** | Protection class | | **III** Safety extra-low voltage |
| | Degree of protection | | IP54 in any mounting position, UL/NEMA 2 |
| | 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 |
| | Rated impulse voltage | | 0.8kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | 0...+40°C (no restrictions) |
| | | | ⚠ +40...+50 °C (Caution: can only be used with restrictions. Please contact your Belimo representative.) |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.H., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 1.8kg |

## 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 assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not 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.
- Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)
- 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

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one screw.
The assemply tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

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



**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

## Product features

**Home position**

When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position.
Factory setting: Y2 (counter-clockwise rotation)

| Rotary actuator | Rotary valve |
|---|---|
| Y2 | A – AB = 0% |
| Y1 | A – AB = 100% |

The actuator then moves into the position defined by the control signal.

## Accessories

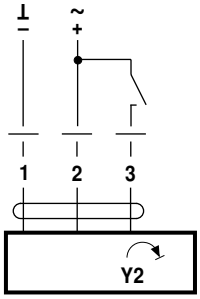
**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

## Electrical installation

**Wiring diagrams**

**Note**
- Connect via safety isolation transformer.
- Parallel connection of other actuators possible. Note performance data for supply.

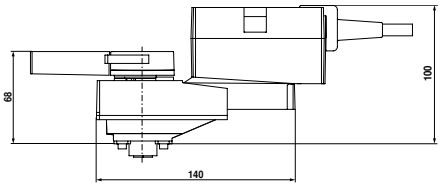


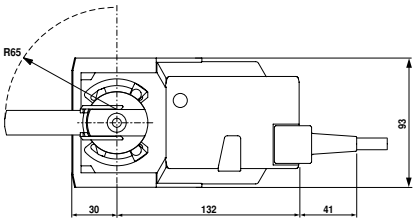

**Direction of rotation**


| Rotary actuator | | Rotary valve |
|---|---|---|
| Y2 | | A – AB = 0% |

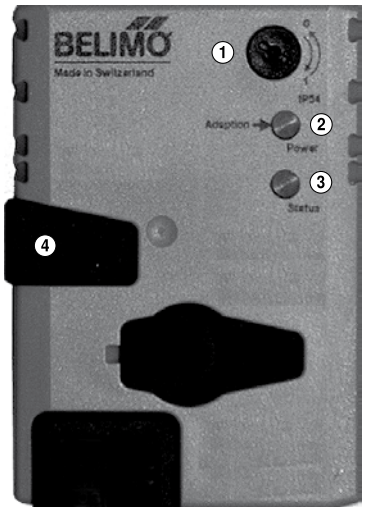
## Dimensions [mm]

**Dimensional drawings**




## Operating controls and indicators




① **Direction of rotation switch**
Switching over: Direction of rotation changes

② **Push-button and green LED display**
Off: No voltage supply or fault
On: In operation
Press button: Switches on angle of rotation adaptation followed by standard operation

③ **Push-button and yellow LED display**
Off: Standard operation
On: Adaptation 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

a) ② Off and ③ On
b) ② Blinking and ③ Blinking

} Check the supply connections. Possibly ⊥ and ~ are swapped over.



UL marked actuators is optional, please contact your local Sales Representative for details.

# NRQ24A-SR

**Modulating rotary actuator for 2 and 3 way control ball valves**
- **Torque 8Nm**
- **Nominal voltage AC/DC 24V**
- **Control: modulating DC (0)2...10V**
- **Position feedback DC 2...10V**
- **Running time 9s**

## 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 | In operation | 12W @ nominal torque |
| | | At rest | 1.5W |
| | | For wire sizing | 18VA (I max. 20 A @ 5ms) |
| | Connection | | Cable 1m, 4 x 0.75mm² |
| | Parallel connection | | Possible, note the performance data |
| **Functional data** | Torque (nominal torque) | | Min. 8Nm @ nominal voltage |
| | Control | Control signal Y | DC (0)2...10V, input impedance 100kΩ |
| | | Operating range | DC 2...10V |
| | Position feedback (Measuring voltage) | | DC 2...10V, max. 0.5mA |
| | Position accuracy | | ±5% |
| | Manual override | | Gearing latch disengaged with push-button, can be locked |
| | Running time | | 9s / 90° |
| | 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 |
| | Override control | | MAX (maximum position) = 100%<br>MIN (minimum position) = 0%<br>ZS (intermediate position, only AC) = 50% |
| | Sound power level | | 52dB(A) |
| | Position indication | | Mechanical, pluggable |
| **Safety** | Protection class | | **III** Safety extra-low voltage |
| | Degree of protection | | IP54 in any mounting position, UL/NEMA 2 |
| | 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 |
| | Rated impulse voltage | | 0.8kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+40°C (no restrictions)<br>⚠ +40...+50°C (Caution: can only be used with restrictions. Please contact your Belimo representative.) |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.H., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 1.8kg |

## 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 assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

## Safety notes

- The cable must not be removed from the device.
- Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)
- 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 is controlled with a standard modulating signal of DC (0)2...10V and moves to the position defined by the control signal. The measuring voltage U serves for the electrical display of the damper position 0...100% and as slave control signal for other actuators.

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one screw. The assembly tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

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

**Position feedback U5**
Operation of the ball valve is optimised by a limiting ring. This ring reduces the angle of rotation from 95° to 90°, i.e. U5 will deviate from Y by approximately 0.3 V when the valve is closed.

**Home position**
When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position.
Factory setting: Y2 (counter-clockwise rotation)

| Rotary actuator | Rotary valve |
|---|---|
| Y2 | A – AB = 0% |
| Y1 | A – AB = 100% |

The actuator then moves into the position defined by the control signal.

## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |

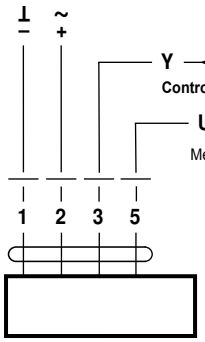
## Electrical installation

**Wiring diagram**

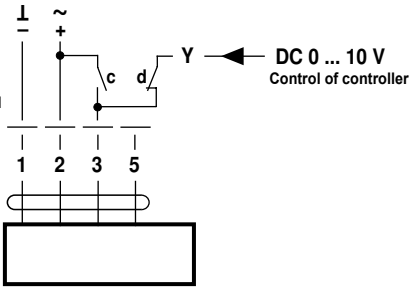
**Note**
- Connect via safety isolation transformer.
- Parellel connection of others actuators possible. Note the performance data.
- Direction of rotation switch is covered.
  Factory setting: Direction of rotation Y2

**Direction of rotation** Y1 / Y2

**Standard connection**




**Override control (frost protection circuit)**

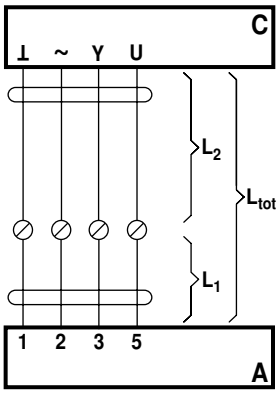





UL marked actuators is optional, please contact your local Sales Representative for details.

## Electrical installation *(continued)*

Cable lengths



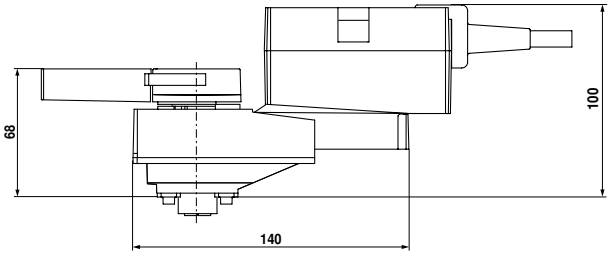

**A** = Actuator
**C** = Control unit
$L_1$ = Belimo connecting cable, 1 m (4 x 0.75 mm²)
$L_2$ = Customer cable
$L_{tot}$ = Maximum cable length

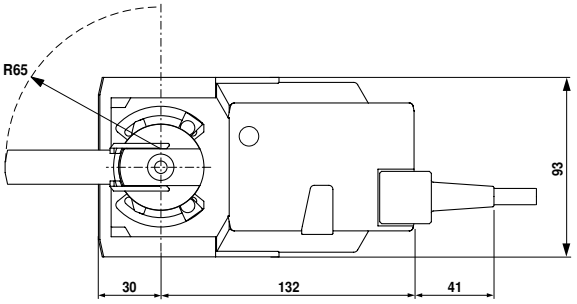
| Cross section $L_2$ ⊥ / ~ | Max. cable length $L_{tot} = L_1 + L_2$ | | Example for DC |
|---|---|---|---|
| | AC | DC | |
| 0.75 mm² | ≤30 m | ≤5 m | 1 m ($L_1$) + 4 m ($L_2$) |
| 1.00 mm² | ≤40 m | ≤8 m | 1 m ($L_1$) + 7 m ($L_2$) |
| 1.50 mm² | ≤70 m | ≤12 m | 1 m ($L_1$) + 11 m ($L_2$) |
| 2.50 mm² | ≤100 m | ≤20 m | 1 m ($L_1$) + 19 m ($L_2$) |

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

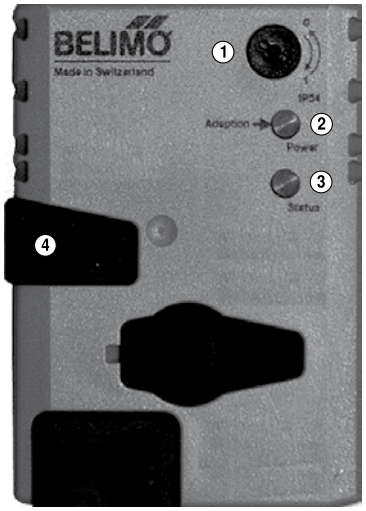
## Dimensions [mm]

**Dimensional drawings**




## Operating controls and indicators




① **Direction of rotation switch**
Switching over: Direction of rotation changes

② **Push-button and green LED display**
Off: No voltage supply or fault
On: In operation
Press button: Switches on angle of rotation adaptation followed by standard operation

③ **Push-button and yellow LED display**
Off: Standard operation
On: Adaptation 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

a) ② Off and ③ On
b) ② Blinking and ③ Blinking

} Check the supply connections. Possibly ⏚ and ~ are swapped over.



UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**Rotary actuator for ball valves**
- **Torque 16Nm**
- **Nominal voltage AC/DC 24V**
- **Control: Open/Close**
- **Running time 9s**

## Technical data

| | | | |
|---|---|---|---|
| **Electrical data** | Nominal voltage | | AC 24V, 50/60Hz / DC 24V |
| | Nominal voltage range | | AC/DC 19.2...28.8V / DC 21.6...28.8V |
| | Power consumption | In operation | 15W @ nominal torque |
| | | At rest | 2W |
| | | For wire sizing | 25VA ($I_{max}$ 20 A @ 5ms) |
| | Connection | | Cable 1m, 3 x 0.75mm$^2$ |
| | Parallel connection | | Possible, note the performance data |
| **Functional data** | Torque (nominal torque) | | Min. 16Nm @ nominal voltage |
| | Manual override | | Gearing latch disengaged with push-button, can be locked |
| | Running time | | 9s / 90° |
| | Sound power level | | Max. 52dB(A) |
| | Position indication | | Mechanical, pluggable |
| **Safety** | Protection class | | **III** Safety extra-low voltage<br>UL Class 2 Supply |
| | Degree of protection | | IP54 in any mounting position<br>NEMA 2, UL Enclosure Type 2 |
| | EMC | | CE according to 2004/108/EC |
| | Certification | | Certified to CAN/CSA E60730-01:02 |
| | Mode of operation | | Type 1 |
| | Rated impulse voltage | | 0.8kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | 0...+40°C (no restrictions)<br>⚠ +40...+50°C (Caution: can only be used with restrictions. Please contact your Belimo representative.) |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.H., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2.4kg |

## 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 assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not 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.
- Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one screw.
The assemply tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

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

**Home position**
When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position.
Factory setting: Y2 (counter-clockwise rotation)

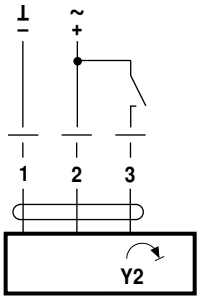
| Rotary actuator | Rotary valve |
|---|---|
| Y2 | A – AB = 0% |
| Y1 | A – AB = 100% |

The actuator then moves into the position defined by the control signal.

## Electrical installation

**Wiring diagram**

**Note**
- Connect via safety isolation transformer.
- Parallel connection of other actuators possible. Note performance data for supply.




**Direction of rotation**


| Rotary actuator | Rotary valve |
|---|---|
| Y2 | A – AB = 0% |

## Accessories

| | Description | Type |
|---|---|---|
| **Electrical accessories** | Auxiliary switch, add-on, 1 x SPDT | S1A |
| | Auxiliary switch, add-on, 2 x SPDT | S2A |
| | Feedback potentiometer 140 Ohm, add-on | P140A |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 1 kOhm, add-on | P1000A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| | Feedback potentiometer 5 kOhm, add-on | P5000A |
| | Feedback potentiometer 10 kOhm, add-on | P10000A |



UL marked actuators is optional, please contact your local Sales Representative for details.

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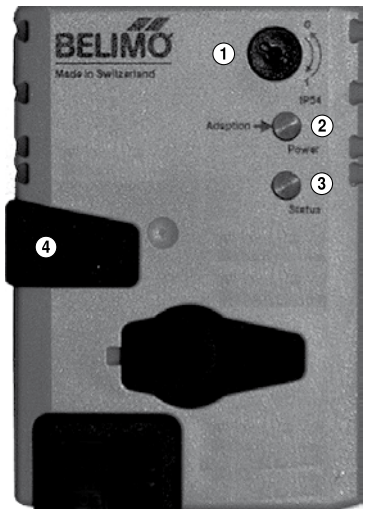
## Operating controls and indicators




**① Direction of rotation switch**
Switching over: Direction of rotation changes

**② Push-button and green LED display**
Off: No voltage supply or fault
On: In operation
Press button: Switches on angle of rotation adaptation followed by standard operation

**③ Push-button and yellow LED display**
Off: Standard operation
On: Adaptation 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

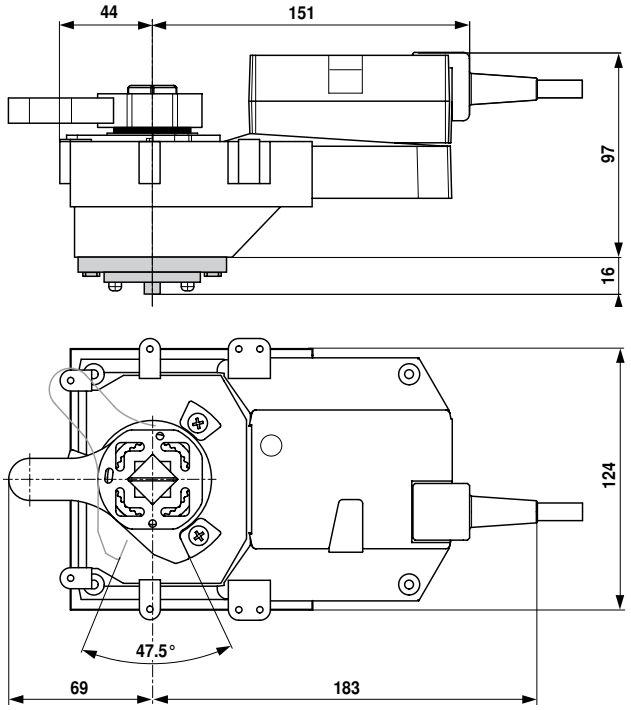
Check voltage supply connection

a) ② Off and ③ On
b) ② Blinking and ③ Blinking

} Check the supply connections.
Possibly ⏚ and ~ are swapped over.

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# SRQ24A-SR

**Modulating rotary actuator for 2 and 3 way control ball valves**
- **Torque 16Nm**
- **Nominal voltage AC/DC 24V**
- **Control: modulating DC (0)2...10V**
- **Position feedback DC 2...10V**
- **Running time 9s**

## 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 | In operation | 15W @ nominal torque |
| | | At rest | 2W |
| | | For wire sizing | 26VA (I max. 20 A @ 5ms) |
| | Connection | | Cable 1m, 4 x 0.75mm² |
| | Parallel connection | | Possible, note the performance data |
| **Functional data** | Torque (nominal torque) | | Min. 16Nm @ nominal voltage |
| | Control | Control signal Y | DC (0)2...10V, input impedance 100kΩ |
| | | Operating range | DC 2...10V |
| | Position feedback (Measuring voltage) | | DC 2...10V, max. 0.5mA |
| | Position accuracy | | ±5% |
| | Manual override | | Gearing latch disengaged with push-button, can be locked |
| | Running time | | 9s / 90° |
| | 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 |
| | Override control | | MAX (maximum position) = 100%<br>MIN (minimum position) = 0%<br>ZS (intermediate position, only AC) = 50% |
| | Sound power level | | 63dB(A) |
| | Position indication | | Mechanical, pluggable |
| **Safety** | Protection class | | **III** Safety extra-low voltage<br>UL Class 2 Supply |
| | Degree of protection | | IP54 in any mounting position<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 |
| | Mode of operation | | Type 1 |
| | Rated impulse voltage | | 0.8kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+40°C (no restrictions)<br>⚠ +40...+50°C (Caution: can only be used with restrictions. Please contact your Belimo representative.) |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.H., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2.4kg |

## 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 assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not be reversed in a frost protection circuit.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

## Safety notes

- 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.
- Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)
- 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 is controlled with a standard modulating signal of DC (0)2...10V and moves to the position defined by the control signal. The measuring voltage U serves for the electrical display of the damper position 0...100% and as slave control signal for other actuators.

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one screw. The assembly tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

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

**Position feedback U5**
Operation of the ball valve is optimised by a limiting ring. This ring reduces the angle of rotation from 95° to 90°, i.e. U5 will deviate from Y by approximately 0.3 V when the valve is closed.

**Home position**
The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out an adaption, which is when the operating range and position feedback adjust themselves to the mechanical setting range.
The detection of the mechanical end stops enables a gentle approach to the end positions, thus protecting the actuator mechanics.
The actuator then moves into the position defined by the positioning signal.
Factory setting: Y2 (counter-clockwise rotation).

**Adaption and synchronisation**
An adaption can be triggered manually by pressing the „Adaption" button. Both mechanical end stops are detected during the adaption (entire setting range).
Automatic synchronisation after pressing the gearbox disengagement button is configured.
The synchronisation is in the home position (0%).

## Accessories

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

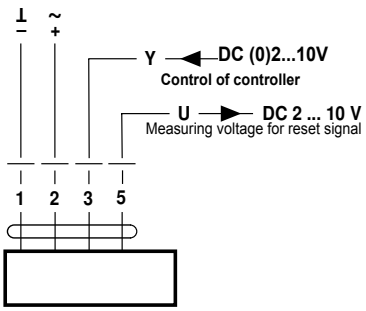
## Electrical installation

**Wiring diagram**

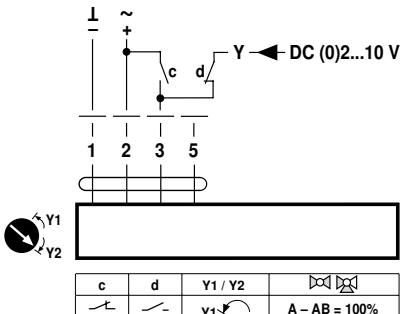
**Note**
- Connect via safety isolation transformer.
- Parellel connection of others actuators possible. Note the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2

**Direction of rotation**


**Standard connection**




**Override control (frost protection circuit)**




| c | d | Y1 / Y2 | |
|---|---|---|---|
| | | Y1 | A – AB = 100% |
| | | Y2 | A – AB = 0% |
| | | DC (0)2...10 V | |

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



UL marked actuators is optional, please contact your local Sales Representative for details.

UL marked actuators is optional, please contact your local Sales Representative for details.

## Technical data



UL marked actuators is optional, please contact your local Sales Representative for details.

## Product features

**Simple direct mounting** Simple direct mounting on the Ball Valve using only one screw.

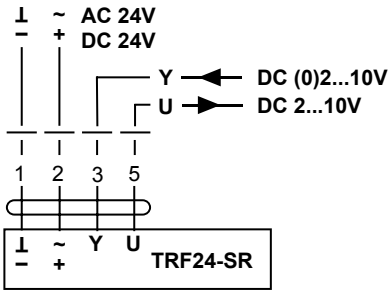
**Manual operation** No manual operation.

**High function reliability** The actuator is overload-proof, needs no limit switches and stops automatically at the end stops.

## Wiring diagram

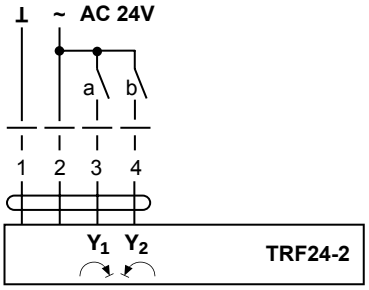
**TRF24-SR** **Modulating control**

**Notes:**
- Connection via safety isolating transformer.
- Other actuators can be connected in parallel. Please note the performance data.

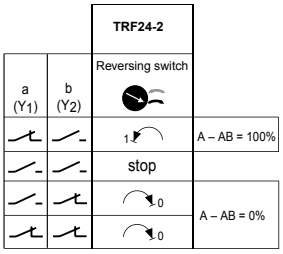



**TRF24-2** **3-point control**

**Notes:**
- Connection via safety isolating transformer.
- Other actuators can be connected in parallel. Please note the performance data.

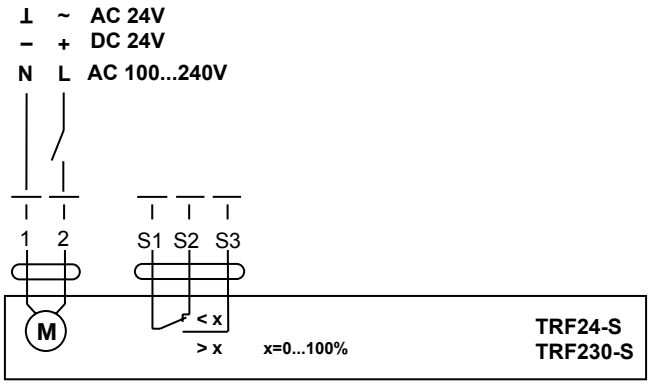


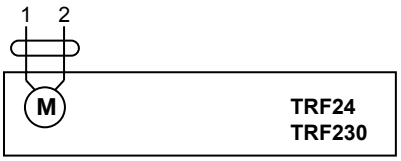

Direction of rotation




**TRF24(-S)**
**TRF230(-S)** **Open/Close control**

**Notes:**
- Caution: Power supply voltage!
- Connection via safety isolating transformer.
- Other actuators can be connected in parallel. Please note the performance data.






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

- **Mechanical Fail-Safe Rotary Actuators for:** **2-way DN25**, **3-way DN25...32 CCV**
- **Torque:** **4Nm**
- **Modulating control:** **L(R)F24-SR (AC/DC 24V)**
- **3-point control:** **LF24-3 (AC/DC 24V)**
- **Open/Close control:** **LRF24(-S) (AC/DC 24V)**, **LRF230(-S) (AC 230V)**

## Technical data

| | | |
|---|---|---|
| **Basic technical data** | Torque | Min. 4Nm @ nominal voltage |
| | Angle of rotation | 90° |
| | Direction of rotation -motor | Selected by mounting side of L/R |
| | -spring return | Selected by mounting side of L/R or reversing |
| | Sound power level | Motor: max. 45dB(A), spring return: max. 62dB(A) |
| | Position indicator | Mechancial |
| | Running time -motor | ~150s (L(R)F24-SR) ; 40...75s (LF24-3, LRF24(-S), LRF230(-S)) |
| | -spring return | ~20s (-5...+50°C) / ~ 60s (-30°C) |
| | Ambient temp. | -30...+50°C |
| | Non-operation temp. | -40...+80°C |
| | Temp. of medium | +5...+100°C (in control ball valve) |
| | Humidity | 5...95% RH, non-condensing |
| | Degree of protection | IP54 |
| | EMC | CE according to 2004/108/EC |
| | Maintenance | Maintenance-free |
| | Linkage | Linkage included in LRF.. |
| **L(R)F24-SR** | Nominal voltage range | AC 19.2...28.8V, 50/60Hz / DC 21.6...28.8V |
| | Power consumption -running | 2.5W @ nominal torque |
| | -holding | 1W |
| | For transformer sizing | 5VA |
| | Connecting cable | Cable 1m, 4x0.75mm² |
| | Control signal Y | DC (0)2...10V @ input impedance 100kΩ |
| | Position feedback signal U | DC 2...10V |
| | Protection class | III (Extra-low voltage) |
| | Weight | 1.4kg |
| **LF24-3** | Nominal voltage range | AC 19.2...28.8V, 50/60Hz / DC 21.6...28.8V |
| | Power consumption -running | 2.5W @ nominal torque |
| | -holding | 1W |
| | For transformer sizing | 5VA |
| | Connecting cable | Cable 4m, 3x0.75mm² |
| | Protection class | III (Extra-low voltage) |
| | Weight | 1.4kg |
| **LRF24(-S)** | Nominal voltage range | AC 19.2...28.8V, 50/60Hz / DC 21.6...28.8V |
| | Power consumption -running | 5W @ nominal torque |
| | -holding | 2.5W |
| | For transformer sizing | 7VA |
| | Connecting cable -motor | Cable 1m, 2x0.75mm² |
| | -S | Cable 1m, 6x0.75mm² |
| | Protection class | III (Extra-low voltage) |
| | Auxiliary switch (LRF24-S) | 2XSPDT, 1mA...3(0.5)A, AC 250V, fixed at 10°◁, 85°◁ |
| | Weight | 1.4kg |
| **LRF230(-S)** | Nominal voltage range | AC 198...264V, 50/60Hz |
| | Power consumption -running | 5W @ nominal torque |
| | -holding | 3W |
| | For transformer sizing | 7VA |
| | Connecting cable -motor | Cable 1m, 2x0.75mm² |
| | -S | Cable 1m, 6x0.75mm² |
| | Protection class | II (Totally insulated) |
| | Auxiliary switch (LRF230-S) | 2XSPDT, 1mA...3(0.5)A, AC 250V, fixed at 10°◁, 85°◁ |
| | Low voltage directive | CE according to 2006/95/EC |
| | Weight | Approx. 1.4kg |



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Simple direct mounting** — Simple direct mounting on the Ball Valve using only one screw.

**Manual operation** — LRF.. have manual operation with integral position stop.

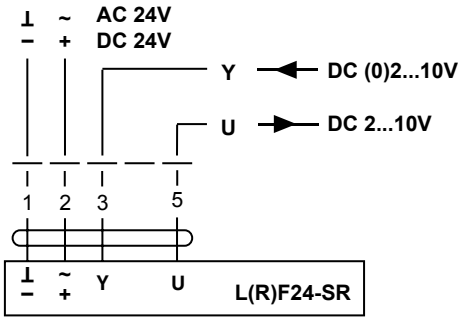
**High function reliability** — The actuator is overload-proof, needs no limit switches and stops automatically at the end stops.

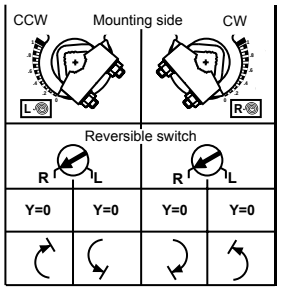
## Wiring diagram

### L(R)F24-SR

**Modulating control**

Notes:
- Connection via safety isolating transformer.
- Other actuators can be connected in parallel. Please note the performance data.

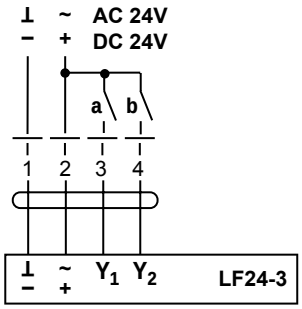


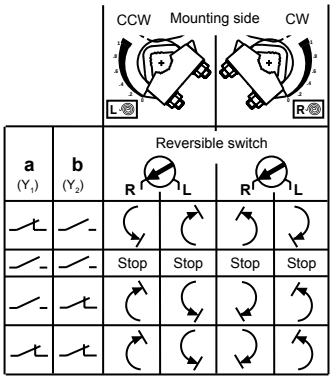




### LF24-3

**3-point control**

Notes:
- Connection via safety isolating transformer.
- Other actuators can be connected in parallel. Please note the performance data.

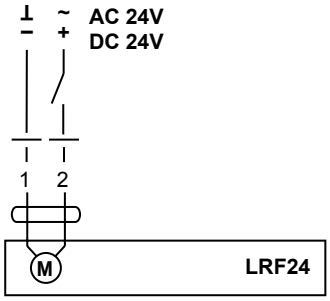


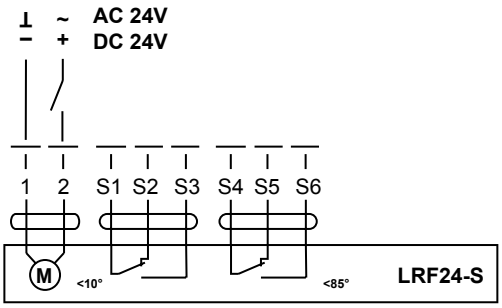




### LRF24(-S)

**Open/Close control**

Notes:
- Connection via safety isolating transformer.
- Other actuators can be connected in parallel. Please note the performance data.

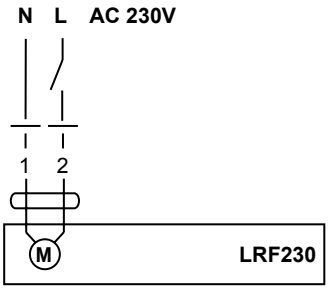


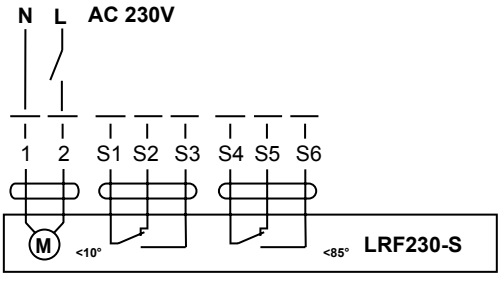




### LRF230(-S)

**Open/Close control**

Notes:
- Caution: Power supply voltage!
- Other actuators can be connected in parallel. Please note the performance data.






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**Rotary actuator with emergency function for 2- and 3-way ball valves**

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

## 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 | In operation<br>At rest<br>For wire sizing | 6W @ nominal torque<br>2.5W<br>9.5VA |
| | Connection | | Cable 1m, 2 x 0.75mm$^2$ |
| | Parallel connection | | Yes (Note performance data for supply!) |
| **Functional data** | Torque | Motor<br>Spring return | Min. 10Nm @ nominal voltage<br>Min. 10Nm |
| | Direction of rotation | Spring return<br>– NRFA | <br>Deenergised NC, ball valve closed (A – AB = 0%) |
| | Manual override | | With hand crank and interlocking switch |
| | Angle of rotation | | Max. 90° |
| | Running time | Motor<br>Spring return | 75s / 90°<br>≤20s @ –20...50°C / max. 60s @ –30°C |
| | Sound power level | Motor<br>Spring return | ≤45dB(A)<br>≤62dB(A) |
| | Position indication | | Mechanical |
| **Safety** | Protection class | | **III** Extra low voltage |
| | Degree of protection | | IP54<br>NEMA 2, UL Enclosure Type 2 |
| | EMC<br>Low-voltage directive | | CE according to 2004/108/EC<br>CE according to 2006/95/EC |
| | Certification | | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | | Type 1.AA |
| | Rated impulse voltage | | 4kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+50°C |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.h., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2kg (without ball valve) |

## 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.
- Caution: Power supply voltage possible!
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation**
The actuator is equipped with a universal power module and can process supply voltages from AC 24...240V plus DC 24...125V.
The actuator moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the safety position by spring force if the supply voltage is interrupted.

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.

**Manual override**
Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.

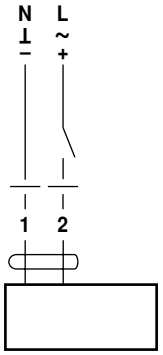
**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stop.

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

**Combination valve actuators**
Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

## Electrical installation

**Wiring diagram**



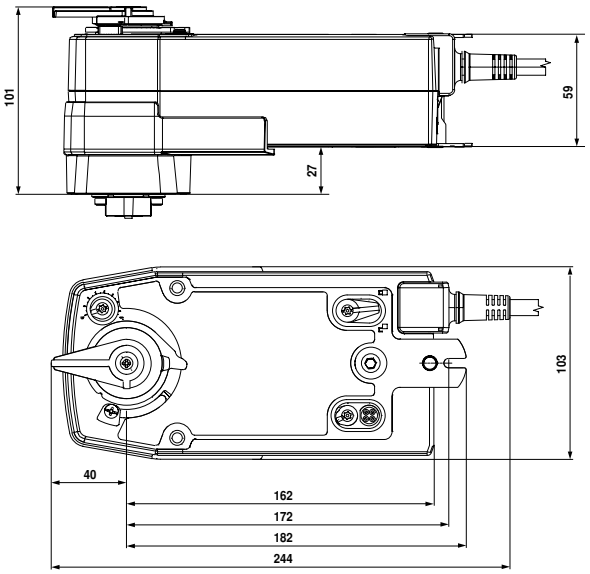

**AC 24...240V**
**DC 24...125V**

**Cable colours:**
1 = blue
2 = brown

**Notes**
- Caution: Power supply voltage possible!
- Parallel connection of other actuators possible. Note the performance data.

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**Modulating rotary actuator with emergency function for 2- and 3-way ball valves**

- **Torque 10Nm**
- **Nominal voltage AC/DC 24V**
- **Control: modulating DC (0)2...10V**
- **Position feedback DC 2...10V**
- **NRF24A-SR: Deenergised NC**

## 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 | In operation<br>At rest<br>For wire sizing | 3.5W @ nominal torque<br>2.5W<br>6VA |
| | Connection | | Cable 1m, 4 x 0.75mm$^2$ |
| | Parallel connection | | Yes (Note performance data for supply!) |
| **Functional data** | Torque | Motor<br>Spring return | Min. 10Nm @ nominal voltage<br>Min. 10Nm |
| | Control | Control signal Y<br>Operating range | DC (0)2…10V, input impedance 100kΩ<br>DC 2...10V |
| | Position feedback (measuring voltage U) | | DC 2...10V, max. 0.5mA |
| | Position accuracy | | ±5% |
| | Direction of rotation | Motor<br>Spring return<br>– NRF24A-SR | Reversible with switch ↷ / ↶<br><br>Deenergised NC, ball valve closed (A – AB = 0%) |
| | Manual override | | With hand crank and interlocking switch |
| | Angle of rotation | | Max. 90° |
| | Running time | Motor<br>Spring return | 90s / 90°<br>≤20s @ –20...50°C / max. 60s @ –30°C |
| | Sound power level | Motor<br>Spring return | ≤45dB(A)<br>≤62dB(A) |
| | Position indication | | Mechanical |
| **Safety** | Protection class | | **III** Extra low voltage / 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 |
| | Mode of operation | | Type 1.AA |
| | Rated impulse voltage | | 0.8kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+50°C |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.h., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2kg (without ball valve) |

## 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.
  All applicable legal or institutional installation regulations must be complied with.
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation** The actuator is controlled with a standard signal of DC (0)2...10V and moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the emergency position by spring force if the supply voltage is interrupted.

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.

**Manual override** Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.

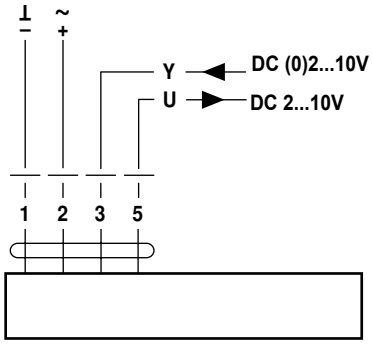
**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stop.

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

**Combination valve actuators** Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

## Electrical installation

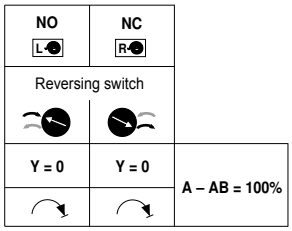
**Wiring diagram**




**Notes**
- Connect via safety isolation transformer.
- Parallel connection of other actuators possible. Note the performance data.

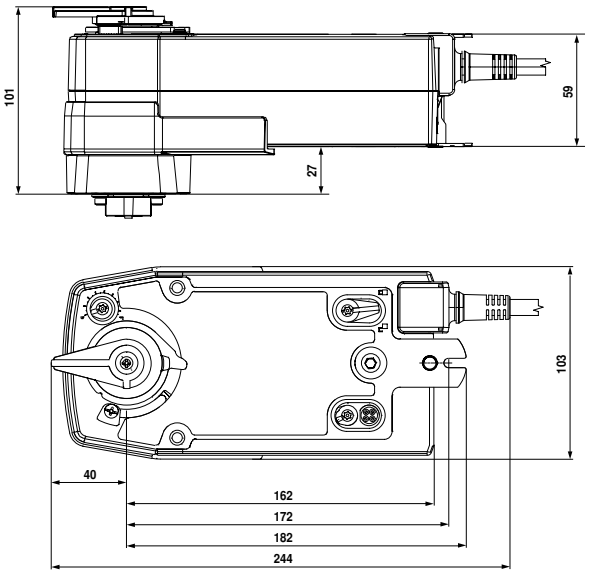
**Cable colours:**
1 = black
2 = red
3 = white
5 = orange

**Direction of rotation**




## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**Rotary actuator with emergency function for 2- and 3-way ball valves**

- **Torque 10Nm**
- **Nominal voltage AC 24...240V / DC 24...125V**
- **Control: Open/Close**
- **Two integrated auxiliary switches**
- **NRFA-S2: Deenergised NC**

## Technical data

| | | | |
|---|---|---|---|
| **Electrical data** | Nominal voltage | | AC 24...240V / DC 24...125V |
| | Nominal voltage range | | AC 19.2...264V / DC 21.6...137.5V |
| | Power consumption | In operation | 6W @ nominal torque |
| | | At rest | 2.5W |
| | | For wire sizing | 9.5VA |
| | Auxiliary switch | | 2 x SPDT, 1 x 10% / 1 x 11...90% |
| | Connection | Motor | Cable 1m, 2 x 0.75mm² |
| | | Auxiliary switch | Cable 1m, 6 x 0.75mm² |
| | Parallel connection | | Yes (Note performance data for supply!) |
| **Functional data** | Torque | Motor | Min. 10Nm @ nominal voltage |
| | | Spring return | Min. 10Nm |
| | Direction of rotation | Spring return – NRFA-S2 | Deenergised NC, ball valve closed (A – AB = 0%) |
| | Manual override | | With hand crank and interlocking switch |
| | Angle of rotation | | Max. 90° |
| | Running time | Motor | 75s / 90° |
| | | Spring return | ≤20s @ –20...50°C / max. 60s @ –30°C |
| | Sound power level | Motor | ≤45dB(A) |
| | | Spring return | ≤62dB(A) |
| | Position indication | | Mechanical |
| **Safety** | Protection class | | **II** Protective insulated |
| | Degree of protection | | IP54<br>NEMA 2, UL Enclosure Type 2 |
| | EMC<br>Low-voltage directive | | CE according to 2004/108/EC<br>CE according to 2006/95/EC |
| | Certification | | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | | Type 1.AA.B |
| | Rated impulse voltage | Actuator | 4kV |
| | | Auxiliary switch | 2.5kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+50°C |
| | Media temperature | | +5...+100°C (in ball valve)<br>–10°C with stem heating upon request |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.h., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2.3kg (without ball valve) |

## 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.
- Caution: Power supply voltage!
- It may only be installed by suitably trained personnel.
  All applicable legal or institutional installation regulations must be complied with.
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation** The actuator moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the safety position by spring force if the supply voltage is interrupted.

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.

**Manual override** Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.

**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stop.

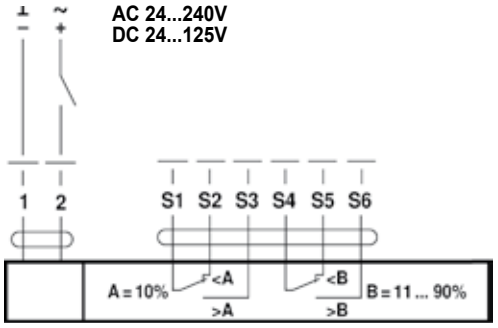
**High operational reliability** The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.

**Flexible signalisation** The actuator has one auxiliary switch with a fixed setting and one adjustable auxiliary switch. They permit a 10% or 11...90% angle of rotation to be signalled.

**Combination valve actuators** Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

## Electrical installation

**Wiring diagram**

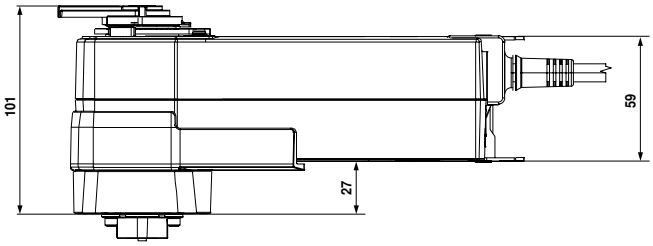


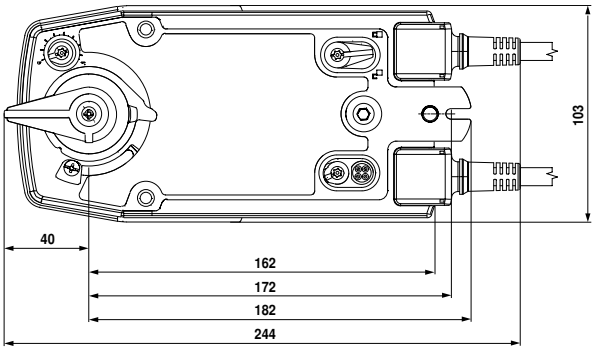

**Cable colours:**
1 = black
2 = red
S1 = violet
S2 = red
S3 = white
S4 = orange
S5 = pink
S6 = grey

**Notes**
- Connect via safety isolation transformer.
- Parallel connection of other actuators possible. Note the performance data.

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

**Rotary actuator with emergency function for ball valves**
- **Torque 20Nm**
- **Nominal voltage AC 24...240V / DC 24...125V**
- **Control: Open/Close**
- **SRFA: Deenergised NC**

## 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 | In operation<br>At rest<br>For wire sizing | 7W @ nominal torque<br>3.5W<br>18VA |
| | Connection | | Cable 1m, 2 x 0.75mm$^2$ |
| | Parallel connection | | Yes (Note performance data for supply!) |
| **Functional data** | Torque | Motor<br>Spring return | Min. 20Nm @ nominal voltage<br>Min. 20Nm |
| | Direction of rotation | Spring return<br>– SRFA | <br>Deenergised NC, ball valve closed (A – AB = 0%) |
| | Manual override | | With hand crank and interlocking switch |
| | Angle of rotation | | Max. 90° |
| | Running time | Motor<br>Spring return | 75s / 90°<br>≤20s @ –20...50°C / max. 60s @ –30°C |
| | Sound power level | Motor<br>Spring return | ≤45dB(A)<br>≤62dB(A) |
| | Position indication | | Mechanical |
| **Safety** | Protection class | | **II** totally insulated ⧈ |
| | Degree of protection | | IP54<br>NEMA 2, UL Enclosure Type 2 |
| | EMC<br>Low-voltage directive | | CE according to 2004/108/EC<br>CE according to 2006/95/EC |
| | Certification | | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | | Type 1.AA |
| | Rated impulse voltage | | 4kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+50°C |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.h., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2kg |

## 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.
- Caution: Power supply voltage possible!
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation**
The actuator is equipped with a universal power module and can process supply voltages from AC 24...240V plus DC 24...125V.
The actuator moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the safety position by spring force if the supply voltage is interrupted.

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.

**Manual override**
Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.

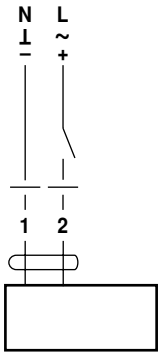
**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stop.

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

**Combination valve actuators**
Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

## Electrical installation

**Wiring diagram**



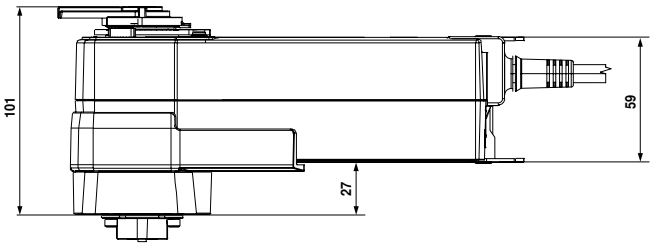

**AC 24...240V**
**DC 24...125V**

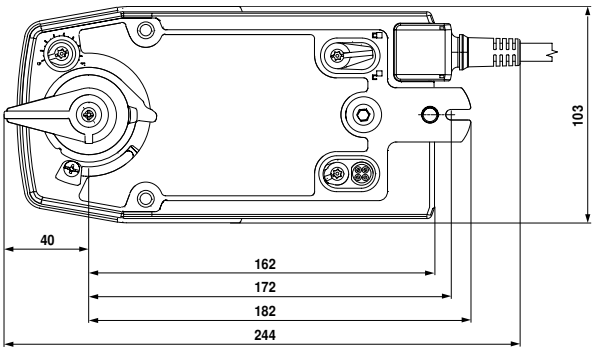
**Cable colours:**
1 = blue
2 = brown

**Notes**
- Caution: Power supply voltage possible!
- Parallel connection of other actuators possible. Note the performance data.

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

**Rotary actuator with emergency function for ball valves**

- **Torque 20Nm**
- **Nominal voltage AC 24...240V / DC 24...125V**
- **Control: Open/Close**
- **Two integrated auxiliary switches**
- **SRFA-S2: Deenergised NC**

## 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 | In operation | 7W @ nominal torque |
| | | At rest | 3.5W |
| | | For wire sizing | 18VA |
| | Auxiliary switch | | 2 x SPDT, 1 x 10% / 1 x 11...90% |
| | Connection | Motor | Cable 1m, 2 x 0.75mm$^2$ |
| | | Auxiliary switch | Cable 1m, 6 x 0.75mm$^2$ |
| | Parallel connection | | Yes (Note performance data for supply!) |
| **Functional data** | Torque | Motor | Min. 20Nm @ nominal voltage |
| | | Spring return | Min. 20Nm |
| | Direction of rotation | Spring return – SRFA-S2 | Deenergised NC, butterfly valve closed (A – AB = 0%) |
| | Manual override | | With hand crank and interlocking switch |
| | Angle of rotation | | Max. 90° |
| | Running time | Motor | 75s / 90° |
| | | Spring return | ≤20s @ –20...50°C / max. 60s @ –30°C |
| | Sound power level | Motor | ≤45dB(A) |
| | | Spring return | ≤62dB(A) |
| | Position indication | | Mechanical |
| **Safety** | Protection class | | **II** totally insulated ⧈ |
| | Degree of protection | | IP54<br>NEMA 2, UL Enclosure Type 2 |
| | EMC<br>Low-voltage directive | | CE according to 2004/108/EC<br>CE according to 2006/95/EC |
| | Certification | | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | | Type 1.AA.B |
| | Rated impulse voltage | Actuator | 4kV |
| | | Auxiliary switch | 2.5kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+50°C |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.h., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2.2kg (without butterfly valve) |

## 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.
- Caution: Power supply voltage possible!
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- 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 integrated switches of this actuator have to be connected either to Power supply voltage or safety extra low voltage. The combination Power supply voltage / safety extra low voltage is not allowed.
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation**
The actuator is equipped with a universal power module and can process supply voltages from AC 24...240V plus DC 24...125V.
The actuator moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the safety position by spring force if the supply voltage is interrupted.

**Simple direct mounting**
Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.

**Manual override**
Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stop.

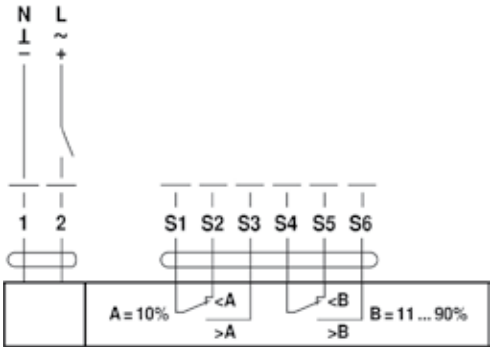
**High operational reliability**
The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.

**Flexible signalisation**
The actuator has one auxiliary switch with a fixed setting and one adjustable auxiliary switch. They permit a 10% or 11...90% angle of rotation to be signalled.

**Combination valve actuators**
Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

## Electrical installation

**Wiring diagram**

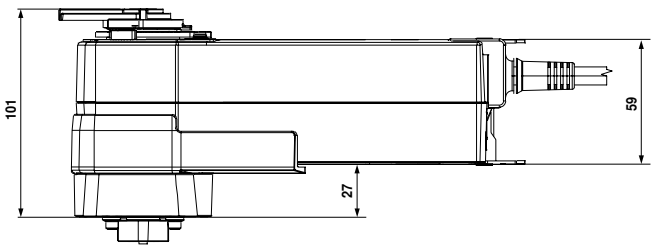


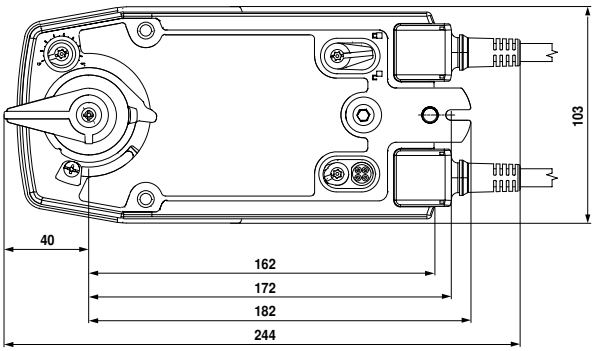

**Cable colours:**
1 = blue
2 = brown
S1 = violet
S2 = red
S3 = white
S4 = orange
S5 = pink
S6 = grey

**Notes**
- Caution: Power supply voltage possible!
- Parallel connection of other actuators possible. Note the performance data.

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**Modulating rotary actuator with emergency function for ball valves**

- **Torque 20Nm**
- **Nominal voltage AC/DC 24V**
- **Control: modulating DC (0)2...10V**
- **Position feedback DC 2...10V**
- **SRF24A-SR: Deenergised NC**

## 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 | In operation<br>At rest<br>For wire sizing | 5.5W @ nominal torque<br>3W<br>8.5VA |
| | Connection | | Cable 1m, 4 x 0.75mm² |
| | Parallel connection | | Yes (Note performance data for supply!) |
| **Functional data** | Torque | Motor<br>Spring return | Min. 20Nm @ nominal voltage<br>Min. 20Nm |
| | Control | Control signal Y<br>Operating range | DC (0)2…10V, input impedance 100kΩ<br>DC 2...10V |
| | Position feedback (measuring voltage U) | | DC 2...10V, max. 0.5mA |
| | Position accuracy | | ±5% |
| | Direction of rotation | Spring return<br>– SRF24A-SR | <br>Deenergised NC, ball valve closed (A – AB = 0%) |
| | Manual override | | With hand crank and interlocking switch |
| | Angle of rotation | | Max. 90° |
| | Running time | Motor<br>Spring return | 90s / 90°<br>≤20s @ –20...50°C / max. 60s @ –30°C |
| | Sound power level | Motor<br>Spring return | ≤45dB(A)<br>≤62dB(A) |
| | Position indication | | Mechanical |
| **Safety** | Protection class | | **III** Extra low voltage / 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 |
| | Mode of operation | | Type 1.AA |
| | Rated impulse voltage | | 0.8kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+50°C |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.h., non-condensating |
| | Maintenance | | Maintenance-free |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2kg |

## 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.
  All applicable legal or institutional installation regulations must be complied with.
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation** The actuator is controlled with a standard signal of DC (0)2...10V and moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the emergency position by spring force if the supply voltage is interrupted.

**Simple direct mounting** Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.

**Manual override** Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.

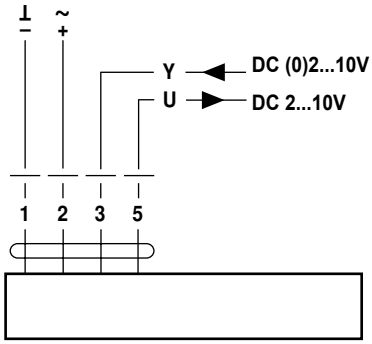
**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stop.

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

**Combination valve actuators** Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

## Electrical installation

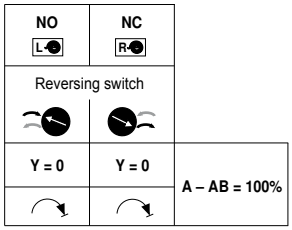
**Wiring diagram**




**Notes**
- Connect via safety isolation transformer.
- Parallel connection of other actuators possible. Note the performance data.

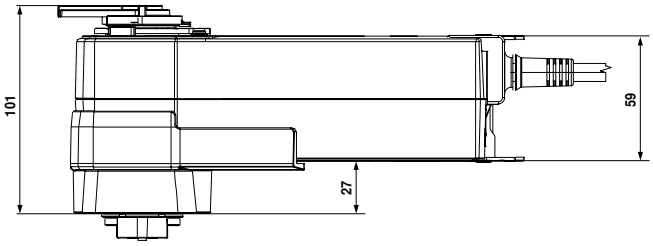
**Cable colours:**
1 = black
2 = red
3 = white
5 = orange

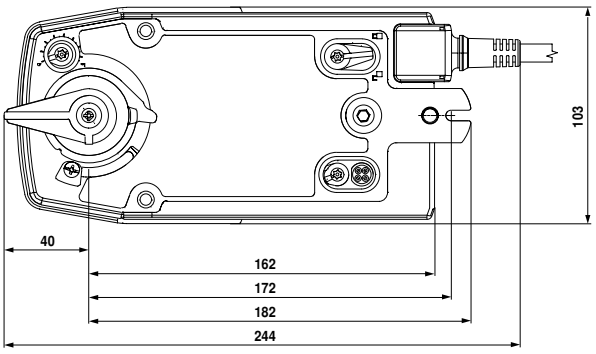
**Direction of rotation**




## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**Rotary actuator with emergency function for rotary valves**
- **Torque 20Nm**
- **Nominal voltage AC 24...240V / DC 24...125V**
- **Control: Open/Close**
- **SRFA-5: Deenergised NC**

## 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 | In operation<br>At rest<br>For wire sizing | 7W @ nominal torque<br>3.5W<br>18VA |
| | Connection | | Cable 1m, 2 x 0.75mm$^2$ |
| | Parallel connection | | Yes (Note performance data for supply!) |
| **Functional data** | Torque | Motor<br>Spring return | Min. 20Nm @ nominal voltage<br>Min. 20Nm |
| | Direction of rotation | Spring return<br>– SRFA-5 | <br>Deenergised NC, valve closed (A – AB = 0%) |
| | Manual override | | With hand crank and interlocking switch |
| | Angle of rotation | | Max. 90° |
| | Running time | Motor<br>Spring return | 75s / 90°<br>≤20s @ –20...50°C / max. 60s @ –30°C |
| | Sound power level | Motor<br>Spring return | ≤45dB(A)<br>≤62dB(A) |
| | Position indication | | Mechanical |
| **Safety** | Protection class | | **II** totally insulated ⧈ |
| | Degree of protection | | IP54<br>NEMA 2, UL Enclosure Type 2 |
| | EMC<br>Low-voltage directive | | CE according to 2004/108/EC<br>CE according to 2006/95/EC |
| | Certification | | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | | Type 1.AA |
| | Rated impulse voltage | | 4kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+50°C |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.h., non-condensating |
| | Maintenance | | Maintenance-free |
| **Mechanical data** | Connection flange | | F05 |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2kg |

## 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.
- Caution: Power supply voltage possible!
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation**
The actuator is equipped with a universal power module and can process supply voltages from AC 24...240V plus DC 24...125V.
The actuator moves the valve to the operating position at the same time as tensioning the return spring. The valve is turned back to the safety position by spring force if the supply voltage is interrupted.

**Simple direct mounting**
Straightforward direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.

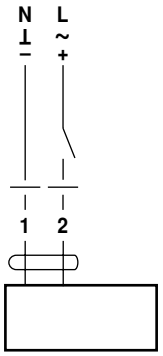
**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stop.

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

**Combination valve actuators**
Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

## Electrical installation

**Wiring diagram**



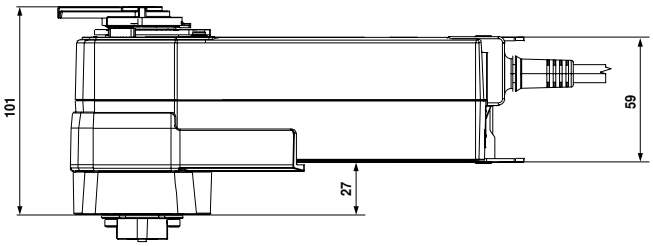

**AC 24...240V**
**DC 24...125V**

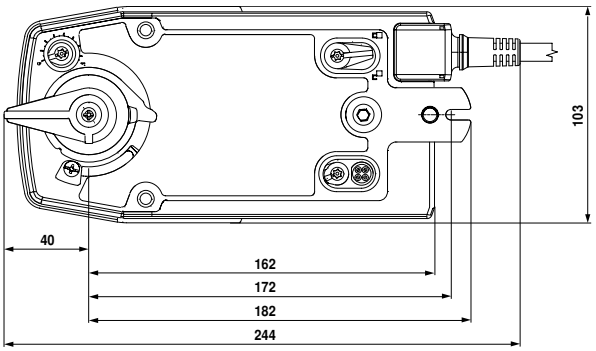
**Cable colours:**
1 = blue
2 = brown

**Notes**
- Caution: Power supply voltage possible!
- Parallel connection of other actuators possible. Note the performance data.

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**Rotary actuator with emergency function for rotary valves**
- **Torque 20Nm**
- **Nominal voltage AC 24...240V / DC 24...125V**
- **Control: Open/Close**
- **Two integrated auxiliary switches**
- **SRFA-S2-5: Deenergised NC**

## 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 | In operation | 7W @ nominal torque |
| | | At rest | 3.5W |
| | | For wire sizing | 18VA |
| | Auxiliary switch | | 2 x SPDT, 1 x 10% / 1 x 11...90% |
| | Connection | Motor | Cable 1m, 2 x 0.75mm$^2$ |
| | | Auxiliary switch | Cable 1m, 6 x 0.75mm$^2$ |
| | Parallel connection | | Yes (Note performance data for supply!) |
| **Functional data** | Torque | Motor | Min. 20Nm @ nominal voltage |
| | | Spring return | Min. 20Nm |
| | Direction of rotation | Spring return – SRFA-S2-5 | Deenergised NC, valve closed (A – AB = 0%) |
| | Manual override | | With hand crank and interlocking switch |
| | Angle of rotation | | Max. 90° |
| | Running time | Motor | 75s / 90° |
| | | Spring return | ≤20s @ –20...50°C / max. 60s @ –30°C |
| | Sound power level | Motor | ≤45dB(A) |
| | | Spring return | ≤62dB(A) |
| | Position indication | | Mechanical |
| **Safety** | Protection class | | **II** totally insulated ⧈ |
| | Degree of protection | | IP54<br>NEMA 2, UL Enclosure Type 2 |
| | EMC<br>Low-voltage directive | | CE according to 2004/108/EC<br>CE according to 2006/95/EC |
| | Certification | | Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | | Type 1.AA.B |
| | Rated impulse voltage | Actuator | 4kV |
| | | Auxiliary switch | 2.5kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+50°C |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.h., non-condensating |
| | Maintenance | | Maintenance-free |
| **Mechanical data** | Connection flange | | F05 |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2.2kg |

## 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.
- Caution: Power supply voltage possible!
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- 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 integrated switches of this actuator have to be connected either to Power supply voltage or safety extra low voltage. The combination Power supply voltage / safety extra low voltage is not allowed.
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation**
The actuator is equipped with a universal power module and can process supply voltages from AC 24...240V plus DC 24...125V.
The actuator moves the valve to the operating position at the same time as tensioning the return spring. The valve is turned back to the safety position by spring force if the supply voltage is interrupted.

**Simple direct mounting**
Straightforward direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stop.

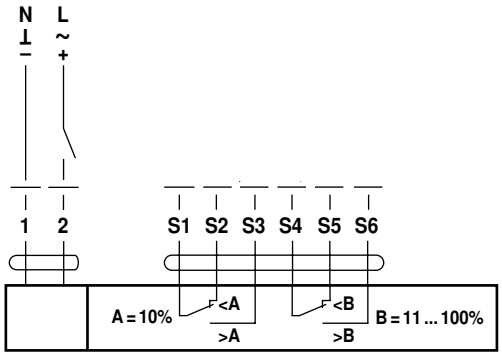
**High operational reliability**
The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.

**Flexible signalisation**
The actuator has one auxiliary switch with a fixed setting and one adjustable auxiliary switch. They permit a 10% or 11...100% angle of rotation to be signalled.

**Combination valve actuators**
Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

## Electrical installation

**Wiring diagram**

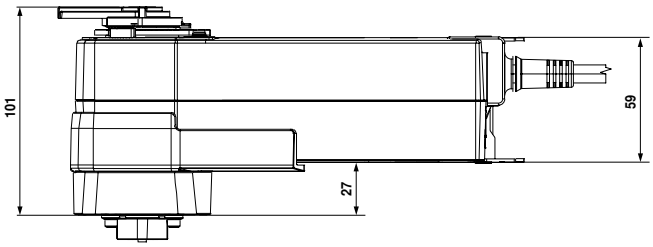


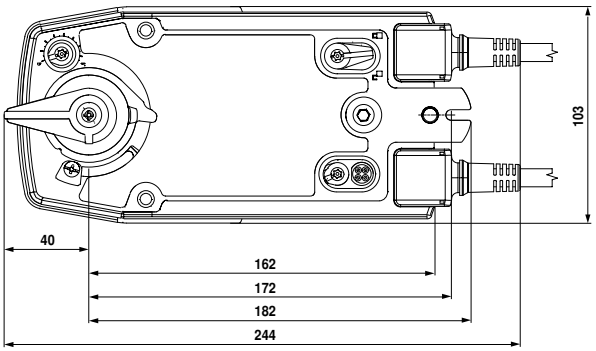

**Cable colours:**
1 = blue
2 = brown
S1 = violet
S2 = red
S3 = white
S4 = orange
S5 = pink
S6 = grey

**Notes**
- Caution: Power supply voltage possible!
- Parallel connection of other actuators possible. Note the performance data.

## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**Modulating rotary actuator with emergency function for rotary valves**

- **Torque 20Nm**
- **Nominal voltage AC/DC 24V**
- **Control: modulating DC (0)2...10V**
- **Position feedback DC 2...10V**
- **SRF24A-SR-5: Deenergised NC**

## 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 | In operation<br>At rest<br>For wire sizing | 5.5W @ nominal torque<br>3W<br>8.5VA |
| | Connection | | Cable 1m, 4 x 0.75mm$^2$ |
| | Parallel connection | | Yes (Note performance data for supply!) |
| **Functional data** | Torque | Motor<br>Spring return | Min. 20Nm @ nominal voltage<br>Min. 20Nm |
| | Control | Control signal Y<br>Operating range | DC (0)2…10V, input impedance 100kΩ<br>DC 2...10V |
| | Position feedback (measuring voltage U) | | DC 2...10V, max. 0.5mA |
| | Position accuracy | | ±5% |
| | Direction of rotation | Spring return<br>– SRF24A-SR-5 | <br>Deenergised NC, valve closed (A – AB = 0%) |
| | Manual override | | With hand crank and interlocking switch |
| | Angle of rotation | | Max. 90° |
| | Running time | Motor<br>Spring return | 90s / 90°<br>≤20s @ –20...50°C / max. 60s @ –30°C |
| | Sound power level | Motor<br>Spring return | ≤45dB(A)<br>≤62dB(A) |
| | Position indication | | Mechanical |
| **Safety** | Protection class | | **III** Extra low voltage / 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 |
| | Mode of operation | | Type 1.AA |
| | Rated impulse voltage | | 0.8kV |
| | Control pollution degree | | 3 |
| | Ambient temperature | | –30...+50°C |
| | Non-operating temperature | | –40...+80°C |
| | Ambient humidity | | 95% r.h., non-condensating |
| | Maintenance | | Maintenance-free |
| **Mechanical data** | Connection flange | | F05 |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2kg |

## 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.
  All applicable legal or institutional installation regulations must be complied with.
- 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

## Product features

**Mode of operation** The actuator is controlled with a standard signal of DC (0)2...10V and moves the valve to the operating position at the same time as tensioning the return spring. The valve is turned back to the emergency position by spring force if the supply voltage is interrupted.

**Simple direct mounting** Straightforward direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override** Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.

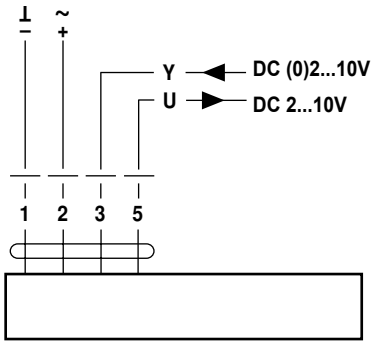
**Adjustable angle of rotation** Adjustable angle of rotation with mechanical end stop.

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

**Combination valve actuators** Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

## Electrical installation

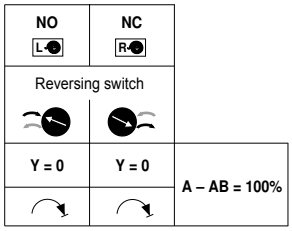
**Wiring diagram**




**Notes**
- Connect via safety isolation transformer.
- Parallel connection of other actuators possible. Note the performance data.

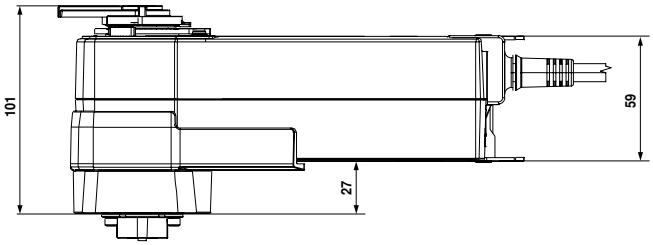
**Cable colours:**
1 = black
2 = red
3 = white
5 = orange

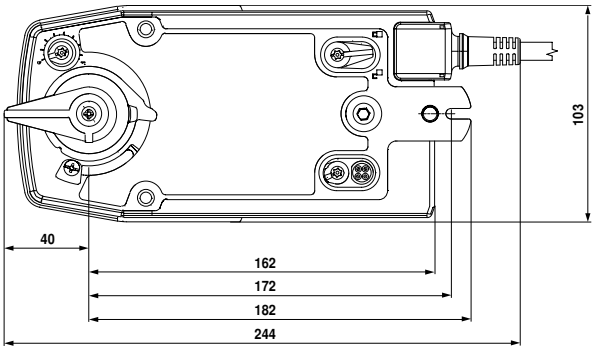
**Direction of rotation**




## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

V8.6 05.2017 • Subject to modification

**SuperCap rotary actuator with emergency setting function and extended functionalities for rotary valves with mounting flange ISO 5211-F07**

- **Torque 40Nm**
- **Nominal voltage AC/DC 24V**
- **Control: Open/Close**
- **Design lifeSuperCaps 15 years**

## Technical data

| | | | |
|---|---|---|---|
| **Electrical data** | Nominal voltage | | AC 24V, 50/60 Hz / DC 24V |
| | Nominal voltage range | | AC 19.2...28.8V / DC 21.6...28.8V |
| | Power consumption | In operation<br>At rest<br>For wire sizing | 11W @ nominal torque<br>3W<br>21VA ($I_{max}$ 20A @ 5ms) |
| | Connection | | Cable 1m, 2 x 0.75mm$^2$ |
| | Parallel operation | | Yes (note the performance data) |
| **Functional data** | Torque | | min. 40Nm @ nominal voltage |
| | Emergency setting position (POP) | | NC / NO |
| | Position accuracy | | ±5% |
| | Manual override | | Gearing latch disengaged with push button |
| | Running time | Motor<br>Emergency setting function | 150s / 90°<br>35s @ 0...50°C |
| | Sound power level | Motor<br>Emergency setting function | ≤52dB(A) @ 150s<br>≤61dB(A) |
| | Position indication | | Mechanical |
| **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 |
| | Principle of operation | | Type 1.AA |
| | Rated impulse voltage | | 0.8kV |
| | 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 |
| **Mechanical data** | Connection flange | | F07 |
| **Dimensions / Weight** | Dimensions | | See «Dimensions» |
| | Weight | | Approx. 2.8kg |

## 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.



**UL marked actuators is optional, please contact your local Sales Representative for details.**

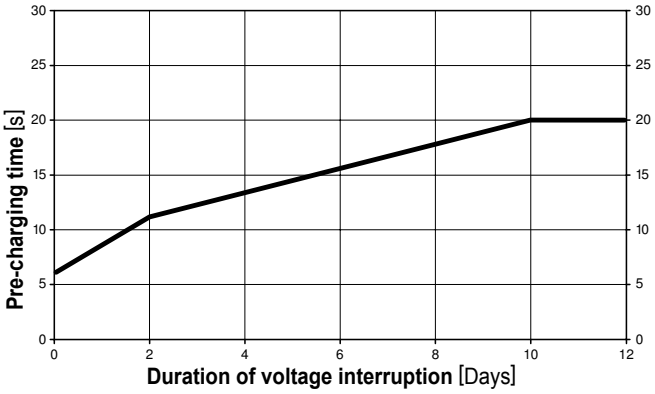
## Product features

**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.

**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 20s 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 the rotary valve with ISO 5211-F07 mounting flange. The mounting position in relation to the fitting 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.

**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.
In case of changing the emergency position from NC to NO, it is mandatory necessary to also change the direction of rotation switch.

**Rotary knob emergency setting position**
The «Emergency setting position» rotary button can be used to adjust the desired emergency setting position (POP). The POP range is in reference to the maximum angle of rotation of the actuator.
In the event of an voltage interruption, the actuator will move into the selected emergency setting position, taking into account the bridging time (PF) of 2s which was set ex-works.

**Combination valve/actuator**
For valves with the following mechanical specifications in accordance with ISO 5211 F07:
- Square stem head SW = 17mm for form-fit coupling of the rotary actuator.
- Hole circle d = 70mm

## Accessories

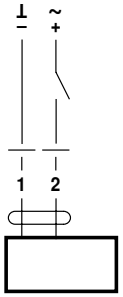
**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

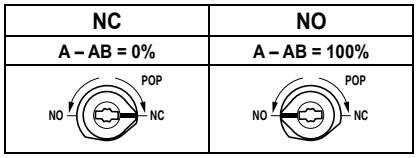
## Wiring diagram

**Wiring diagram**

**Notes**
- Connection via safety isolation transformer.
- Parallel connection of other actuators possible. Note the performance data.




**Cable colours:**
1 = black
2 = red




UL marked actuators is optional, please contact your local Sales Representative for details.



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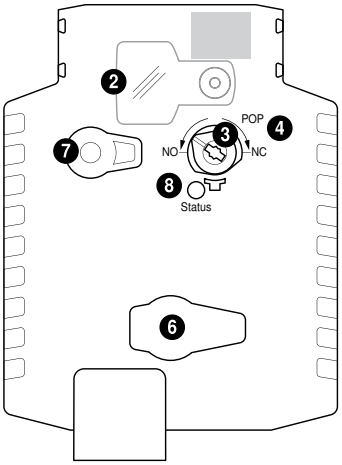
## Operating controls and indicators




2 **Cover, POP button**

3 **POP button**

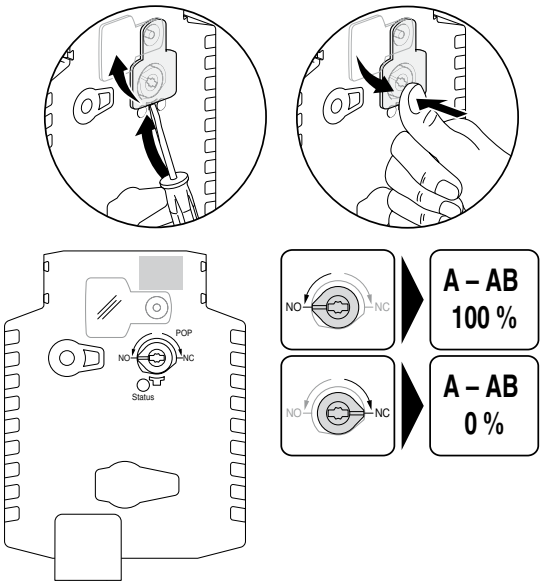
4 **Scale for manual adjustment**

6 (no function)

7 **Disengagement button**

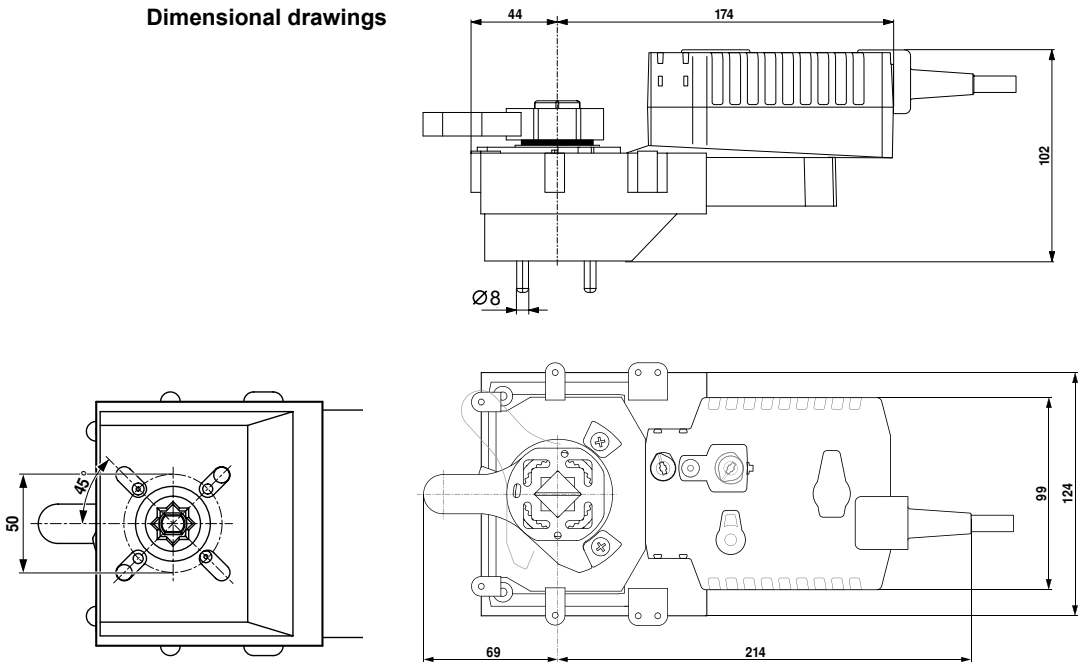
| LED display 8 green | Meaning / function |
|---|---|
| Illuminated | Operation OK / without fault |
| Blinking | POP function active |
| Off | – Not in operation<br>– Pre-charging time SuperCap<br>– Fault SuperCap |

**Setting the POP Power off position**




## Dimensions [mm]

**Dimensional drawings**






UL marked actuators is optional, please contact your local Sales Representative for details.

# GRK24A-MF-7

**Modulating SuperCap rotary actuator with emergency control function and extended functionalities for rotary valves**

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

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24V |
| | Nominal voltage frequency | 50/60Hz |
| | Nominal voltage range | AC 19.2...28.8V / DC 21.6...28.8V |
| | Power consumption in operation | 11W |
| | Power consumption in rest position | 3W |
| | Power consumption for wire sizing | 21VA |
| | Power consumption for wire sizing note | Imax 20A @ 5ms |
| | Connection supply / control | Cable 1m, 4 x 0.75mm² |
| | Parallel operation | Yes (note the performance data) |
| **Functional data** | Torque motor | Min. 40Nm |
| | Positioning signal Y | DC (0) 2...10V |
| | Positioning signal Y note | Input impedance 100kΩ |
| | Operating range Y | DC 2...10V |
| | Operating range Y variable | Start point DC 0.5...30V<br>End point DC 2.5...32V |
| | Position feedback U | DC 2...10V |
| | Position feedback U note | Max. 0.5mA |
| | Position feedback U variable | Start point DC 0.5...8V<br>End point DC 2.5...10V |
| | Setting emergency position (POP) | NC / NO or adjustable 0...100% (POP rotary button) |
| | Bridging time (PF) variable | 1...10s |
| | Position accuracy | ±5% |
| | Manual override | Gear disengagement with push-button |
| | Running time motor | 150s / 90° |
| | Running time emergency control position | 35s / 90° |
| | Adaption setting range | manual (automatic on first power-up) |
| | Sound power level motor | 52dB(A) |
| | Sound power level emergency control position | 61dB(A) |
| | Position indication | Mechanical |
| **Safety** | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Mode of operation | Type 1.AA |
| | Rated impulse voltage supply / control | 0.8kV |
| | 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 |
| **Mechanical data** | Connection flange | F07 |
| **Weight** | Weight | Approx. 2.9kg |
| **Terms** | Abbreviations | POP = Power off position / emergency setting position<br>CPO = Controlled power off / controlled emergency control function<br>PF = Power fail delay time / bridging time |



**UL marked actuators is optional, please contact your local Sales Representative for details.**

V8.6 05.2017 • Subject to modification

## Safety notes

- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. 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.
- Cables 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

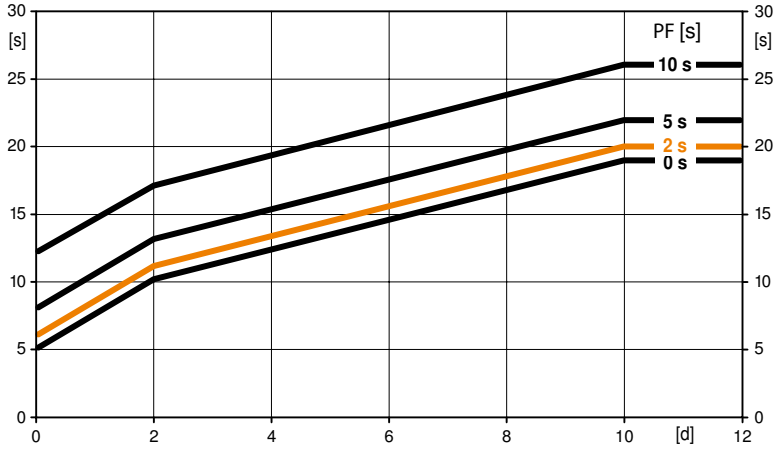
**Mode of operation**

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 moved to the selected emergency setting position (POP) by means of stored electrical energy.

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

The capacitor actuators require a pre-charging time. This time is used for charging the capacitors up to a usable voltage level. This ensures that, in the event of an electricity interruption, the actuator can move at any time from its current position into the preset emergency setting position (POP).
The duration of the pre-charging time depends mainly on following factors:
– Duration of the electricity interruption
– PF delay time (bridging time)

Typical pre-charging time




| PF [s] | [d] | | | | |
|---|---|---|---|---|---|
| | **0** | **1** | **2** | **7** | **≥10** |
| **0** | 5 | 8 | 10 | 15 | 19 |
| **2** | 6 | 9 | 11 | 16 | 20 |
| **5** | 8 | 11 | 13 | 18 | 22 |
| **10** | 12 | 15 | 17 | 22 | 26 |
| | [s] | | | | |

[d] = Electricity interruption in days
[s] = Pre-charging time in seconds
PF[s] = Bridging time
Calculation example: Given an electricity interruption of 3 days and a bridging time (PF) set at 5s, the actuator requires a pre-charging time of 14s after the electricity has been reconnected (see graphic).



UL marked actuators is optional, please contact your local Sales Representative for details.

## Product features

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

**Parameterisable actuators**
The factory settings cover the most common applications. Input and output signals and other parameters can be altered with the PC-Tool MFT-P or with the Service tool ZTH AP.

**Simple Direct mounting**
Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.

**Manual override**
Manual control with push-button possible - temporary. The gear is disengaged and the actuator decoupled for as long as the button is pressed.

**High functional reliability**
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

**Adjustable angle of rotation**
Adjustable angle of rotation with mechanical end stops.

**Combination valve/actuator**
For valves with the following mechanical specifications in accordance with ISO 5211 F07:
- Square stem head SW = 17mm for form fit coupling of the rotary actuator.
- Hole circle d = 70mm

**Home position**
The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out an adaption, which is when the operating range and position feedback adjust themselves to the mechanical setting range.
The actuator then moves into the position defined by the positioning signal.
Factory setting: Y2 (counter-clockwise rotation).

**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.

**Adaption and synchronisation**
An adaption can be triggered manually by pressing the „Adaption“ button or with the PC-Tool. Both mechanical end stops are detected during the adaption (entire setting range).
Automatic synchronisation after pressing the gearbox disengagement button is configured.
The synchronisation is in the home position (0%).
The actuator then moves into the position defined by the positioning signal.
A range of settings can be adapted using the PC-Tool (see MFT-P documentation)

**Rotary knob emergency setting position**
The «Emergency setting position» rotary knob can be used to adjust the desired emergency setting position (POP). In the event of an electricity interruption, the actuator will move into the selected emergency setting position, taking into account the bridging time (PF) of 2s which was set ex-works.
Settings: The rotary knob must be set to the «Tool» position for retroactive settings of the emergency setting position with the BELIMO service tool MFT-P. Once the rotary knob is set back to the range 0…100%, the manually set value will have positioning authority

**Bridging time (PF)**
Electricity interruptions can be bridged up to a maximum of 10s.
In the event of an electricity interruption, the actuator will remain stationary in accordance with the set bridging time. If the electricity interruption is greater than the set bridging time, then the actuator will move into the selected emergency setting position (POP).
The bridging time set ex-works is 2s. This can be modified on site in operation with the use of the BELIMO service tool MFT-P.
Settings: The rotary knob must not be set to the «Tool» position!
Only the values need to be entered for retroactive adjustments of the bridging time with the BELIMO service tool MFT-P.

## Accessories

**Electrical accessories**

| Description | Type |
|---|---|
| Auxiliary switch, add-on, 1 x SPDT | S1A |
| Auxiliary switch, add-on, 2 x SPDT | S2A |
| Feedback potentiometer 140 Ohm, add-on | P140A |
| Feedback potentiometer 200 Ohm, add-on | P200A |
| Feedback potentiometer 500 Ohm, add-on | P500A |
| Feedback potentiometer 1 kOhm, add-on | P1000A |
| Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A |
| Feedback potentiometer 10 kOhm, add-on | P10000A |

**Service Tools**

| Description | Type |
|---|---|
| Service Tool, for MF/MP/Modbus/LonWorks actuators and VAV-Controller | ZTH AP |
| Belimo PC-Tool, software for adjustments and diagnostics | MFT-P |



UL marked actuators is optional, please contact your local Sales Representative for details.

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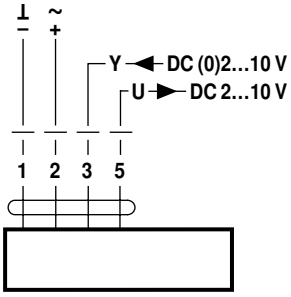
## Electrical installation

**Notes**
- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch Factory setting: Direction of rotation Y2.

Wiring diagrams

AC/DC 24V, modulating

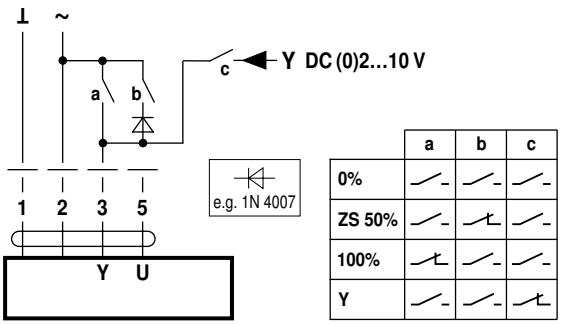



**Cable colours:**
1 = black
2 = red
3 = white
5 = orange

## Functions

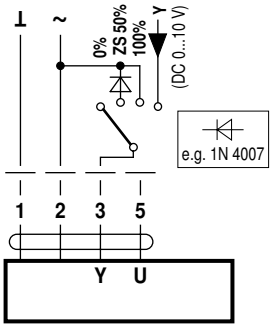
### Functions with basic values (conventional mode)

Override control with AC 24V with relay contacts

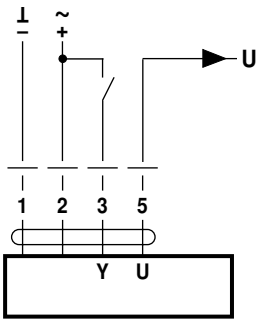



| | a | b | c |
|---|---|---|---|
| 0% | _\| | _\| | _\| |
| ZS 50% | _\| | ⌐ | _\| |
| 100% | ⌐ | _\| | _\| |
| Y | _\| | _\| | ⌐ |

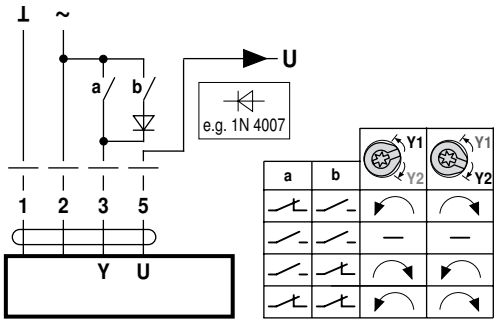
Override control with AC 24V with rotary switch




Control Open/Close



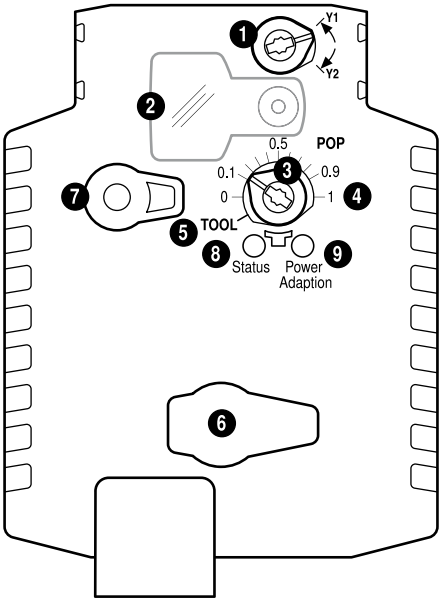

Control 3-point






UL marked actuators is optional, please contact your local Sales Representative for details.

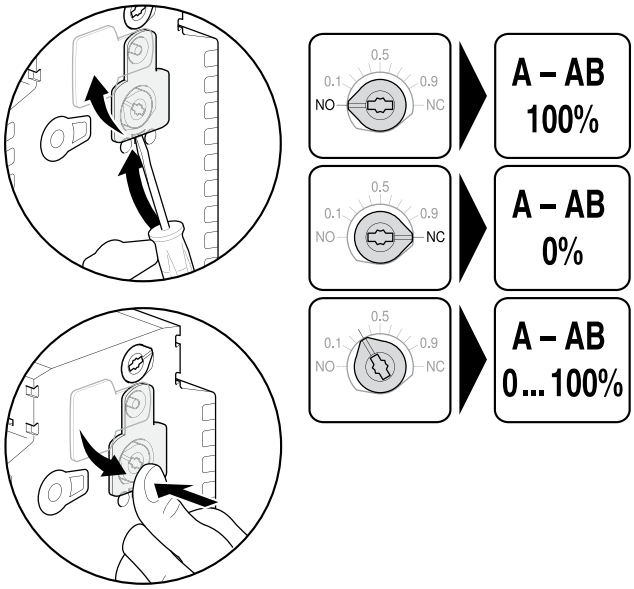
## Operating controls and indicators




1. Direction of rotation switch
2. Cover, POP button
3. POP button
4. Scale for manual adjustment
5. Position for adjustment with tool
6. Tool socket
7. Disengagement button

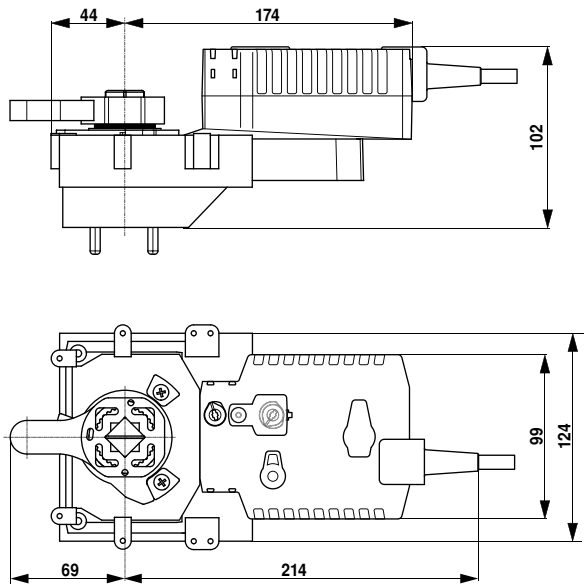
| LED displays 8 yellow | 9 green | Meaning / function |
|---|---|---|
| Off | On | Operation OK / without fault |
| Off | Flashing | POP function active |
| On | Off | Fault |
| Off | Off | Not in operation |
| On | On | Adaptation procedure running |
| Flashing | On | Communication with programming tool |

9. **Press button:** Triggers angle of rotation adaption, followed by standard operation




## Dimensions [mm]

### Dimensional drawings






UL marked actuators is optional, please contact your local Sales Representative for details.

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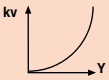
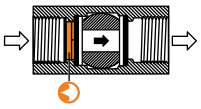
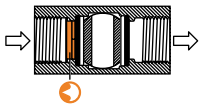
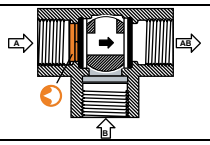
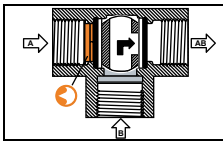
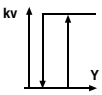
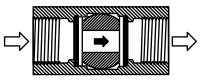
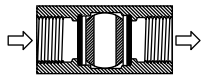
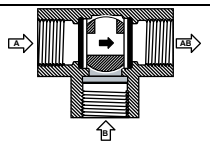
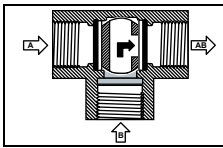
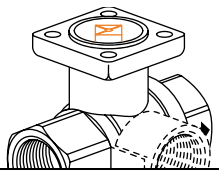
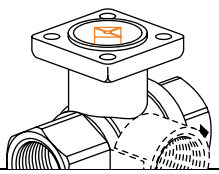
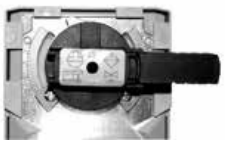
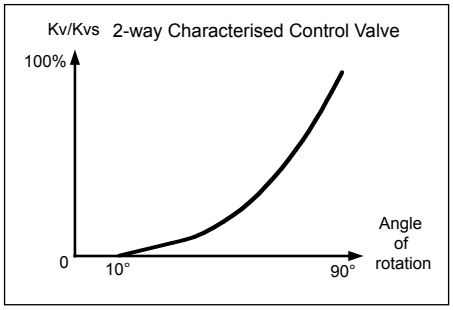
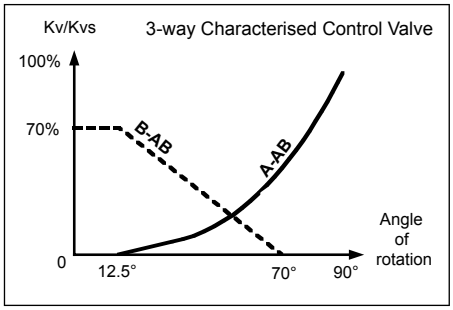
## Standard directions of flow

| | | | |
|---|---|---|---|
| Characterised Control Valves   |  Open |  Closed | 2-way R2..-..-S.., R6..AO |
| |  A-AB Open |  A-AB Closed | 3-way R3..-..-S.. |
| Open/Close Ball Valves   |  Open |  Closed | 2-way R2..-S.., R6..AO |
| |  A-AB Open |  A-AB Closed | 3-way R3..-S.. |
| Spindle position for corresponding valve flow |  |  | For 2-way and 3-way Ball Valves |
| Actuator position corresponding to Ball Valve flow direction |  |  | |

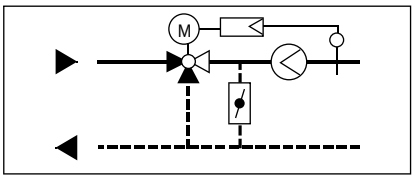
## Flow characteristics of Characterised Control Valves

Between 0° and 12.5° angle of rotation, 2-way and 3-way Characterised Control Valves function as tight-sealing shut-off devices. Between 12.5° and 90° angle of rotation, Control Ball Valves operate as regulating devices. In case of the 3-way Characterised Control Valve, the bypass flow rate (B-AB) is 70% of the nominal flow rate (A-AB).



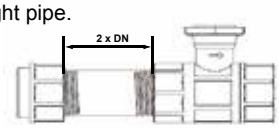

**Note:**
Due to its spherical design, the 3-way Characterised Control Valve is of limited application for conventional supply temperature control systems only. Therefore, it is recommended that supply temperature control systems are of the double-mixing circuit type (see diagram below). There are no restrictions when using mixing-type circuits for air preheaters and for injection circuits.




## Mounting, installation and commissioning

**Separate supply**
When Ball Valve and Rotary Actuator are supplied separately, they can be assembled on-site.

**Recommended straight pipe installation**
It is a general recommendation to keep minimum 2xDN of straight piping distance before the CCV installation in the pipe, to perform the best control function.For the outlet side of the CCV, there is no requirement to keep the minimum distance of straight pipe.




**Recommended mounting positions**
The Ball Valves can be mounted vertically (Fig. 1) or horizontally (Fig. 2). However, mounting the Ball Valves with the spindle pointing downwards, i.e. upside down (Fig. 3), is not recommended.

No special tools are needed for assembly. Instructions will be found packed with the valve and actuator.

**Commissioning**
Must not be carried out until the Ball Valve and Rotary Actuator have been assembled in accordance with the instructions.

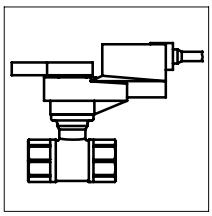
Fig.1 

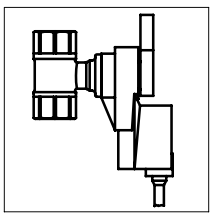
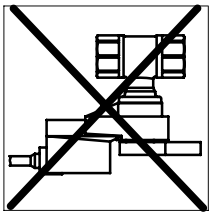
Fig.2 

Fig.3 

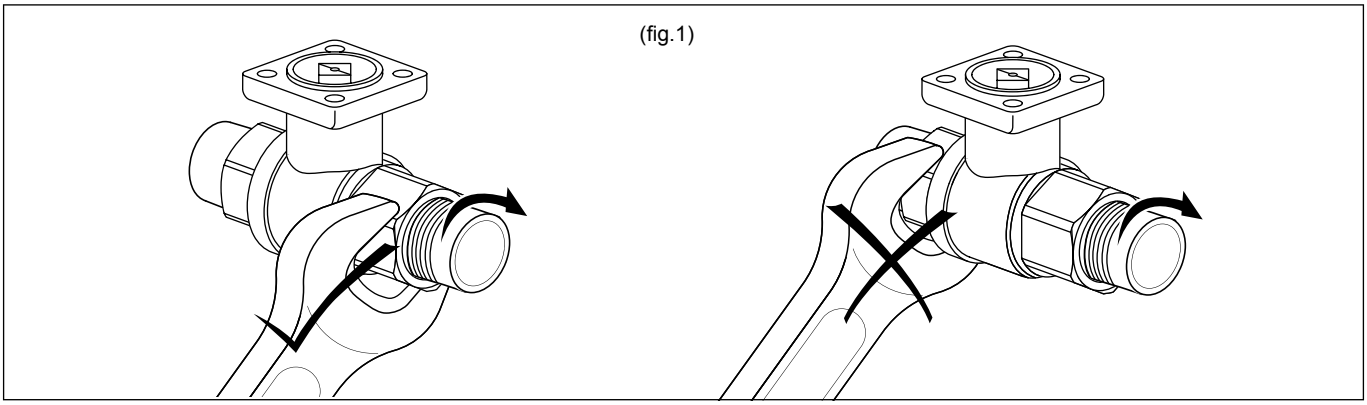


UL marked actuators is optional, please contact your local Sales Representative for details.

## DN15...50 CCV

1. Clean pipe by compressed air or steam
2. Teflon tape or other sealing filler is recommended for pipe and valve thread end, pipe dope is not allowed on thread
3. Make sure the correct wrench position (fig.1)
4. Support pipeline to avoid pipe distortion

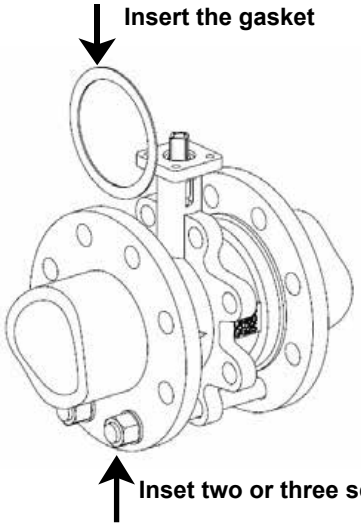
(fig.1)



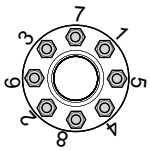
## DN65...150 CCV

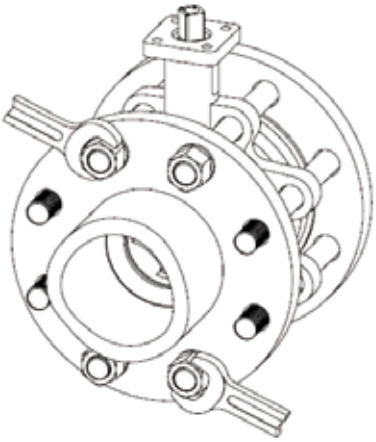
1. Clean the joint

2.




3. Insert the rest of the bolts, tighten all of the bolts evenly by the cross-over method to eliminate concentrated stresses.







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## Maintenance

- Ball Valves and Rotary Actuators are both maintenance free.
- Before any kind of service work is carried out on control devices of this type, it is essential to isolate the actuator from the power supply (by unplugging the power lead). Any pumps in the particular part of the piping system concerned must also be switched off and the appropriate isolating fittings closed (also allow everything to cool down first if necessary and reduce the pressure in the system to atmospheric).

The systems must not be returned to service until the Ball Valve and the Actuator have been properly re-installed and connected and the pipe work has been refilled in the proper manner.

**Subsequent removal**
In the case of applications where subsequent removal of Ball Valve will be necessary, it is advisable to make appropriate preparations beforehand.

**Disposal**
When a control device (Ball Valve and Actuator) has come to the end of its service life, the two parts must be dismantled and sorted into different materials before being disposed of.

## Project design

**Installing R2..xx-S.., R6..AO CCV, 2-way**
The R2..xx-S.. Characterised Control Valve is a throttling device, installed in the return line of systems in order to ensure less thermal stress on the seals of the device. The direction of flow specified must be adhered to.

**Installing R3..xx-S.. CCV, 3-way**
The R3..xx-S.. Characterised Control Valve is a mixing device. Whatever type of installation is employed, it is essential to adhere to the directions of flow specified. Whether a valve is installed in the supply or the return of a system depends on the type of hydraulic circuit being employed. No balancing valve is needed in the bypass line of a diverting circuit because of the reduced flow in the bypass.

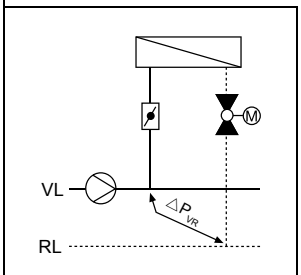
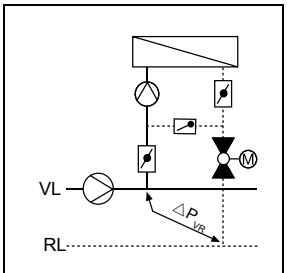
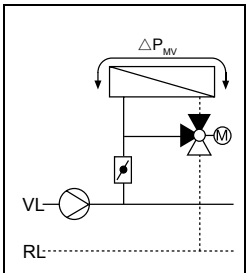
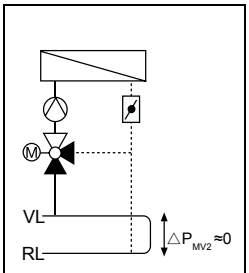
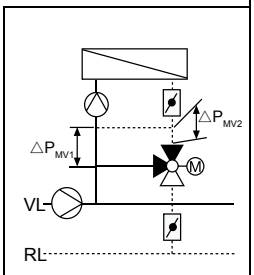
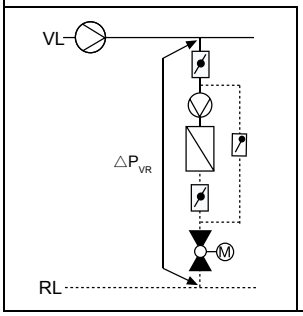
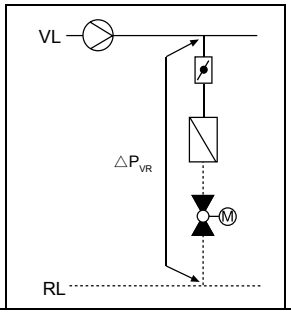
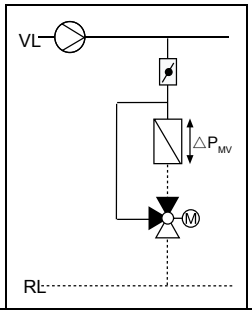
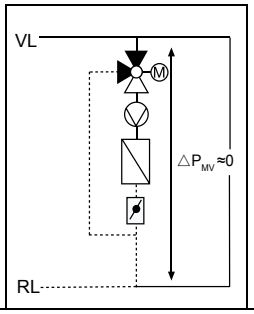
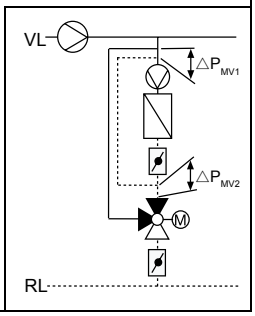
**Water quality requirements**
The water quality requirements specified in VDI2035 must be adhered to.

**Dirt filters recommended**
Characterised Control Valves are relatively sensitive control devices and in order to ensure that they give long service life, the fitting of dirt filters is recommended.

**Sufficient isolating valves**
It is essential to ensure that sufficient isolating valves are provided.

**Correct rating and sizing**
In order to ensure that the control device (Characterised Control Valve and Rotary Actuator) achieves a long service life, it is essential for the valve to be rated for the correct differential pressure $\triangle P_{V100}$ across the valve, i.e. with adequate valve authority (Pv>0.5). The differential pressure $\triangle P_{V100}$ depends on the type of hydraulic circuit in which the valve is being used.

## Differential pressures $\triangle P_{V100}$ with Characterised Control Valves full open

| | $\triangle P_{V100}$ R2..xx-S.., R6..AO Characterised Control Valves, 2-way | | $\triangle P_{V100}$ R3..xx-S.. Characterised Control Valves, 3-way | | |
|---|---|---|---|---|---|
| | **Throttling circuit**<br>$\triangle P_{V100} > \triangle P_{VR}/2$<br>Typical values:<br>15kPa < $\triangle P_{V100}$ < 150kPa | **Injection circuit with throttling device**<br>$\triangle P_{V100} > \triangle P_{VR}/2$<br>Typical values:<br>10kPa < $\triangle P_{V100}$ < 100kPa | **Diverter circuit**<br>$\triangle P_{V100} > \triangle P_{MV}$<br>Typical values:<br>5kPa < $\triangle P_{V100}$ < 50kPa | **Mixing circuit**<br>$\triangle P_{V100} > \triangle P_{MV}$<br>Typical values:<br>$\triangle P_{V100}$ > 3kPa(unpressurise manifold).<br>For other mixing<br>3kPa < $\triangle P_{V100}$ < 30kPa | **Injection circuit with 3-way Characterised Control Valve**<br>$\triangle P_{MV1} + \triangle P_{MV2} \approx 0$<br>Typical values:<br>$\triangle P_{V100}$ > 3kPa |
| Geographic Presentation |  |  |  |  |  |
| Synoptic Presentation |  |  |  |  |  |

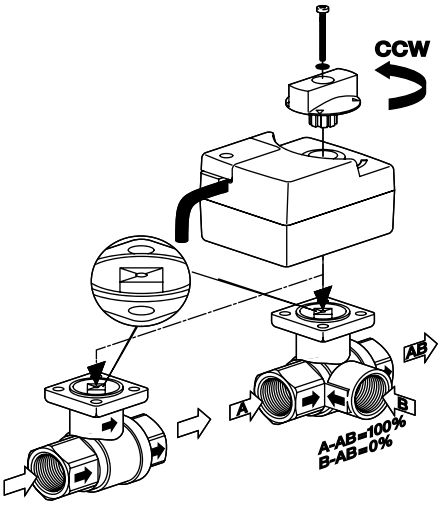
**Legend**

| | | | | | |
|---|---|---|---|---|---|
| Characterised Control Valve, 2-way with Rotary Actuator | Characterised Control Valve, 3-way with Rotary Actuator | Pump | Non-Return Damper | Balancing throttle | VL — Supply<br>RL…Return |

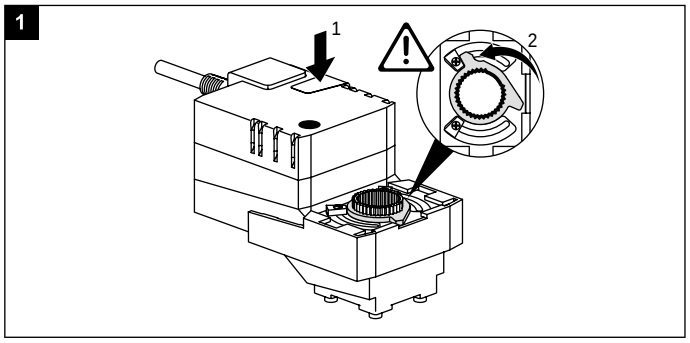
| | | |
|---|---|---|
| $\triangle P_{VR}$ Differential pressure across specified section at rated load | $\triangle P_{MV}$ Differential pressure across variable-flow section at rated load (e.g. heat exchanger) | **Note:** Dirt traps and isolating fittings are not shown. |

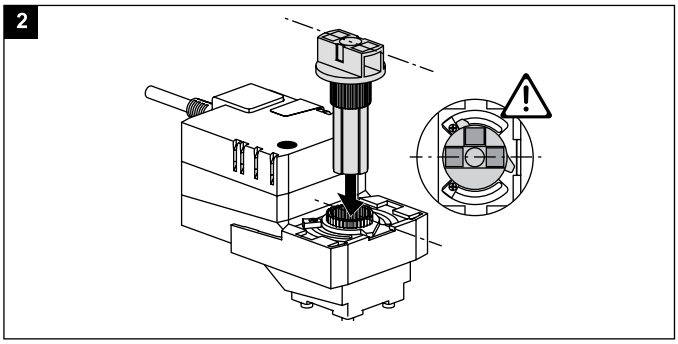
**UL marked actuators is optional, please contact your local Sales Representative for details.**

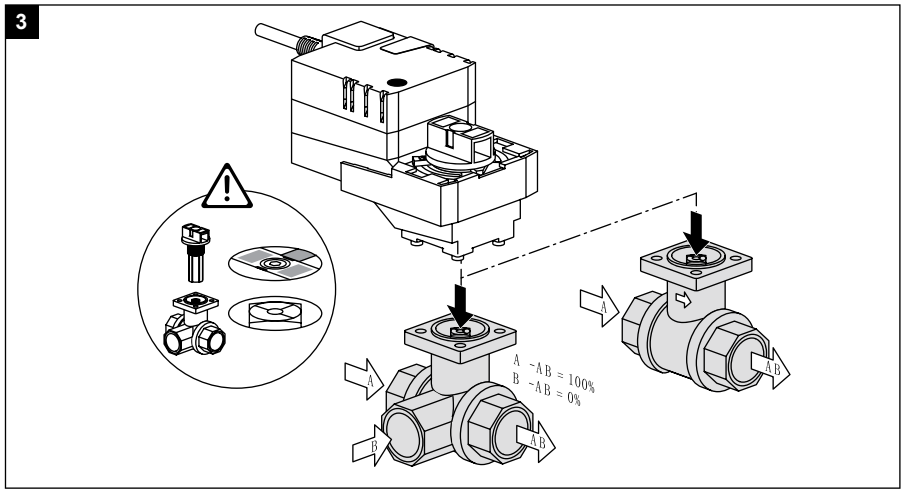
## Mounting instructions: TR..

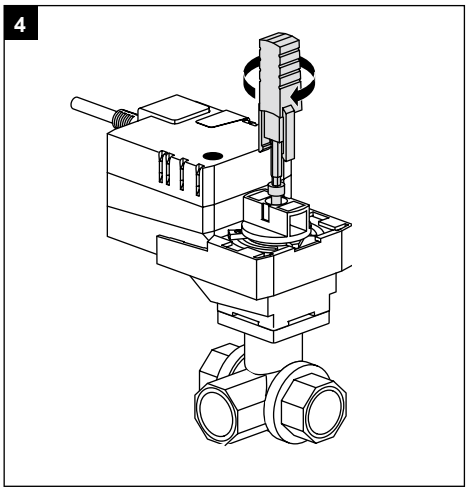


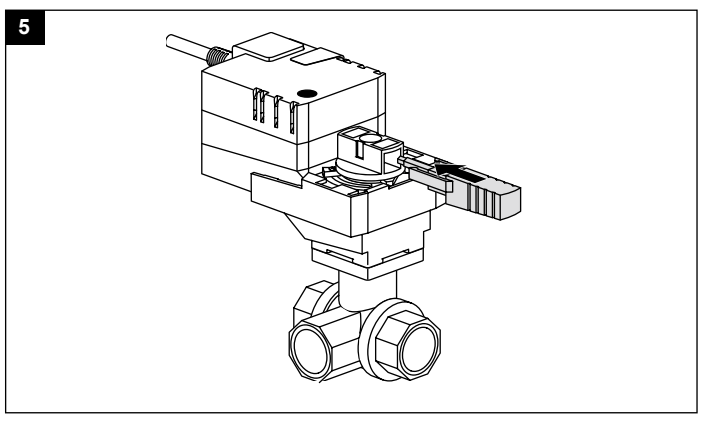

## Mounting instructions: LR.. / NR..

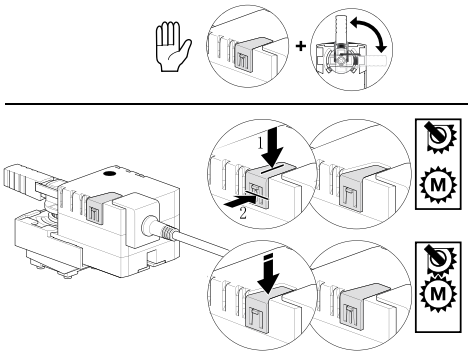








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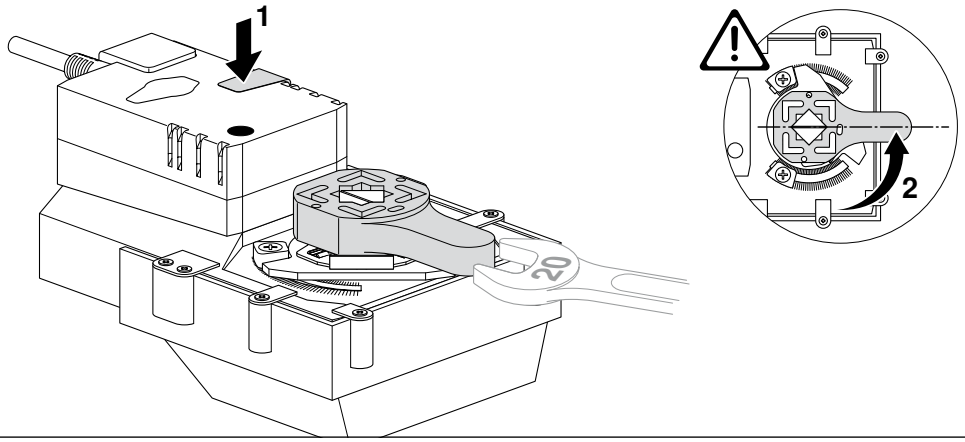


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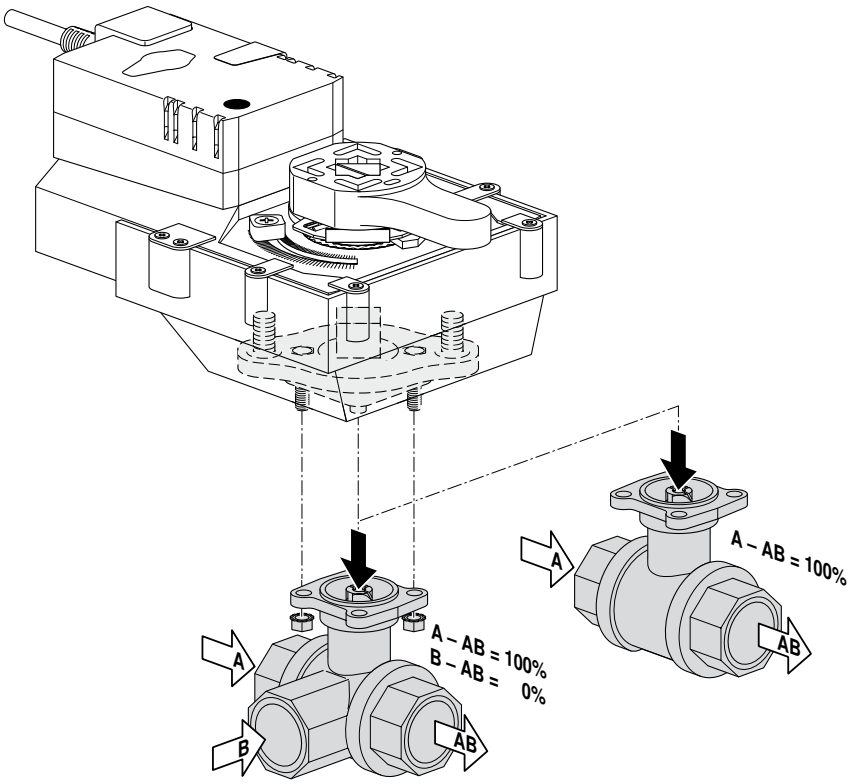


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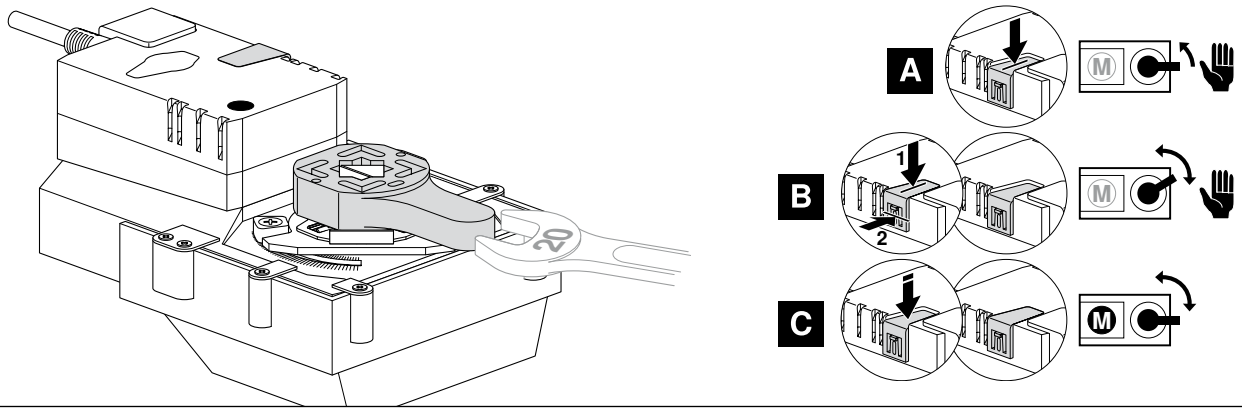




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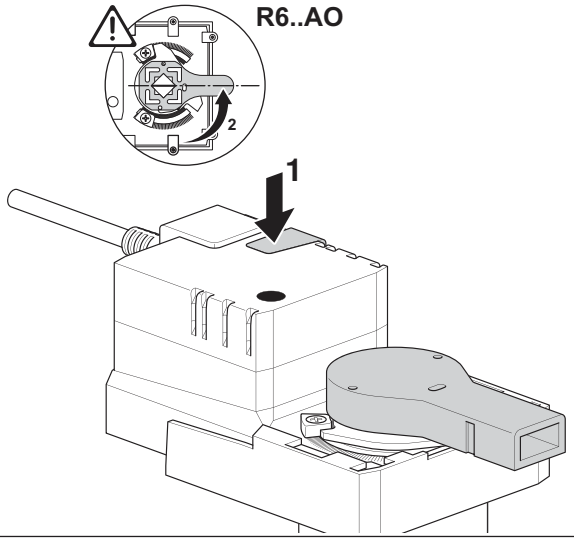


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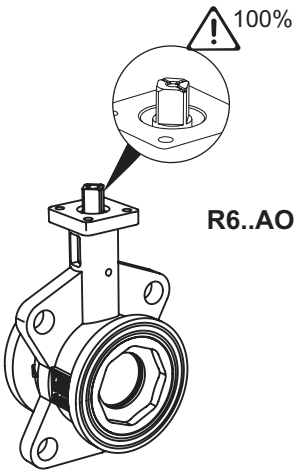


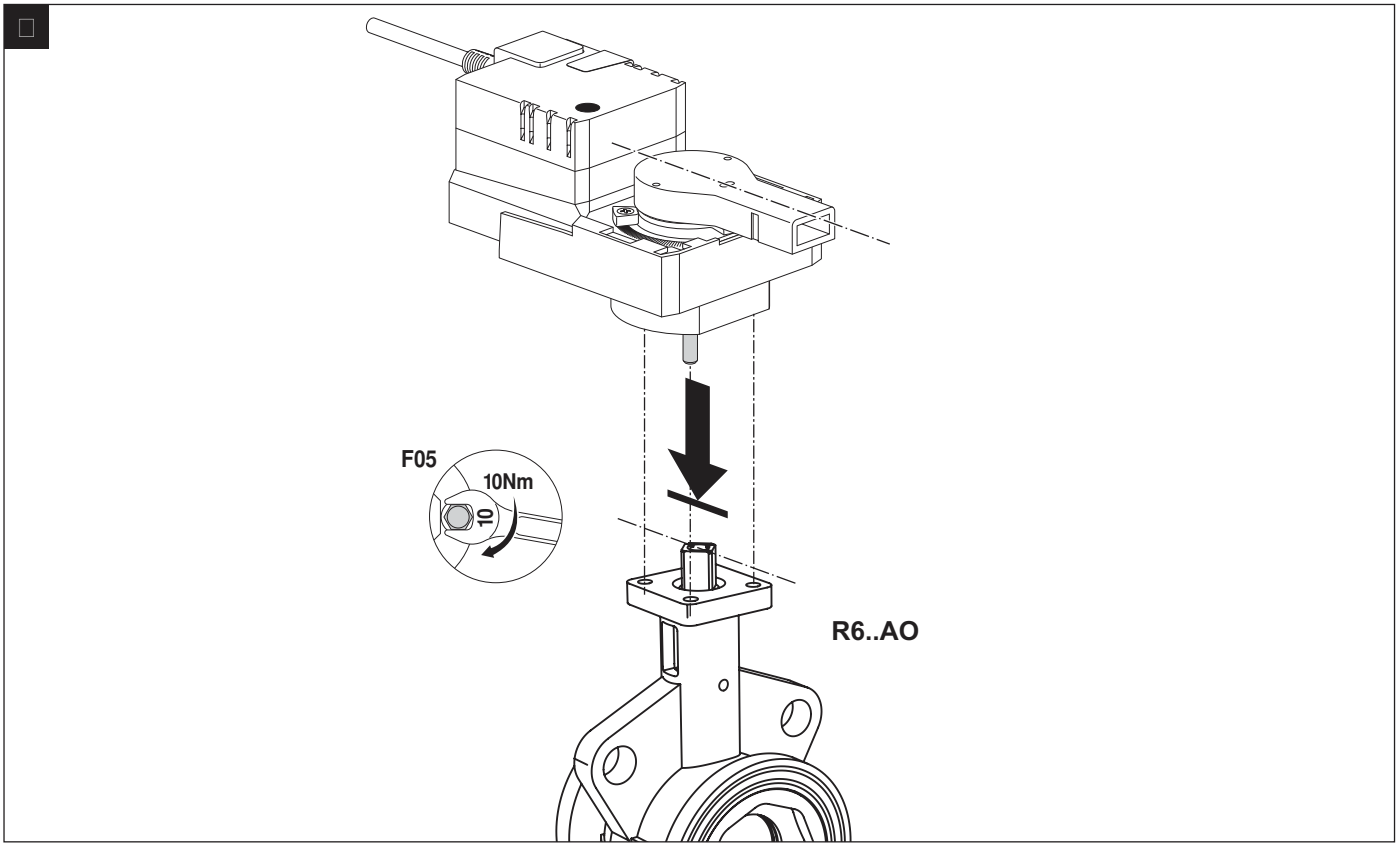


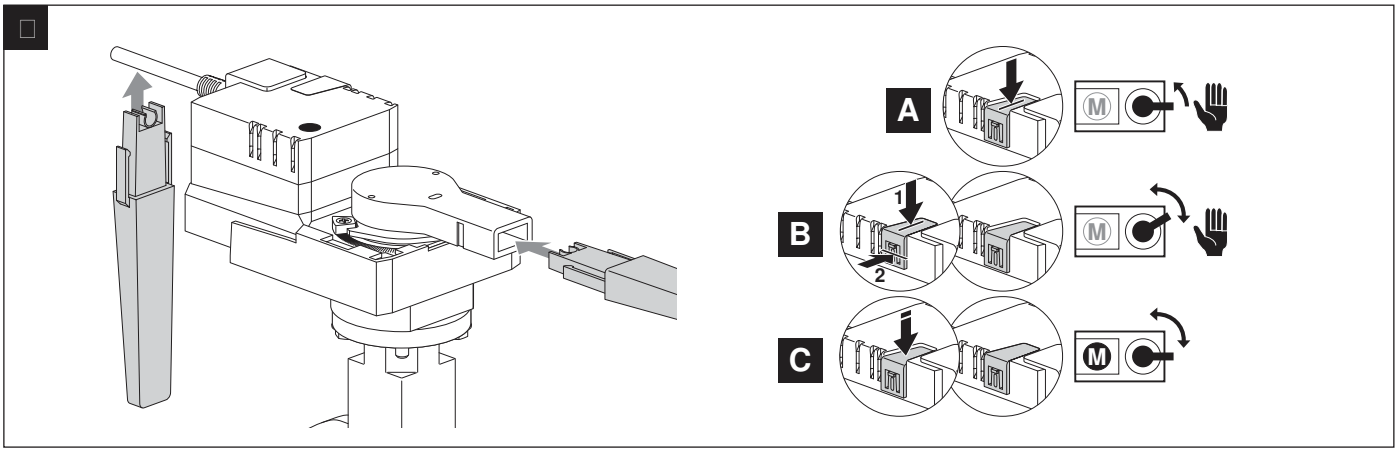




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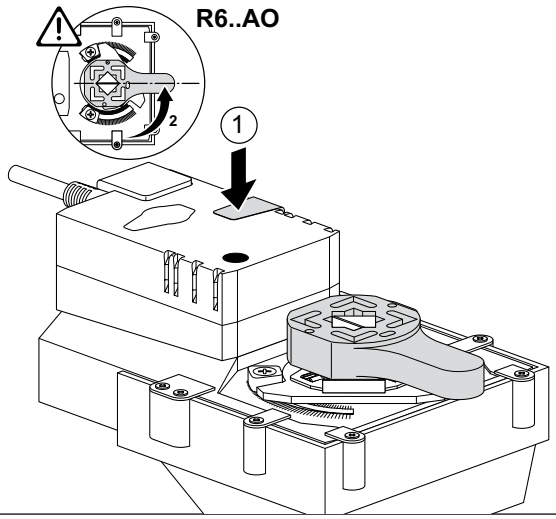


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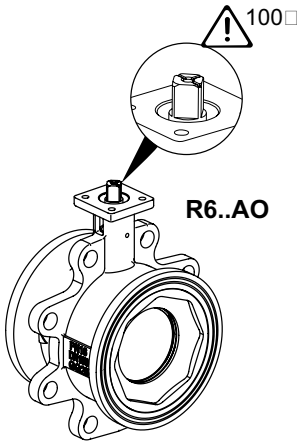


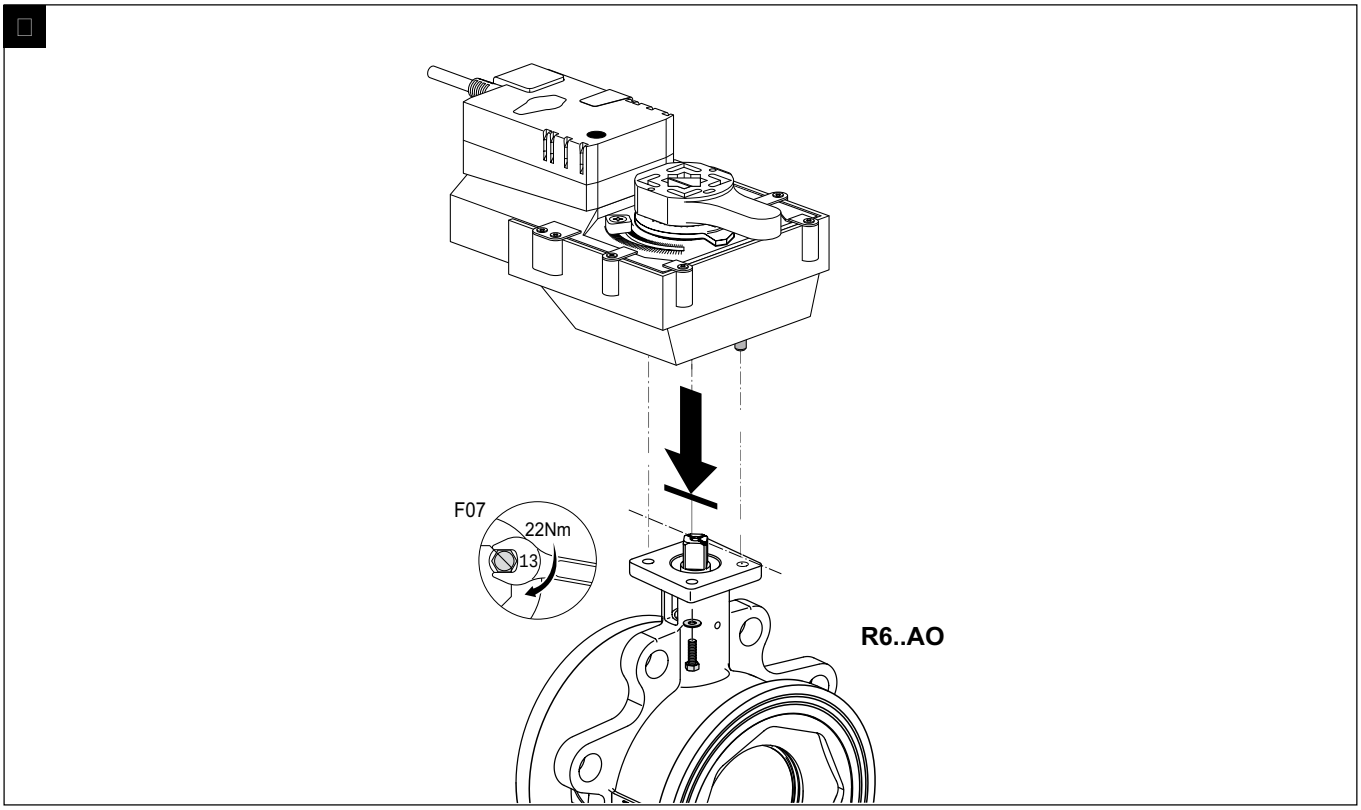


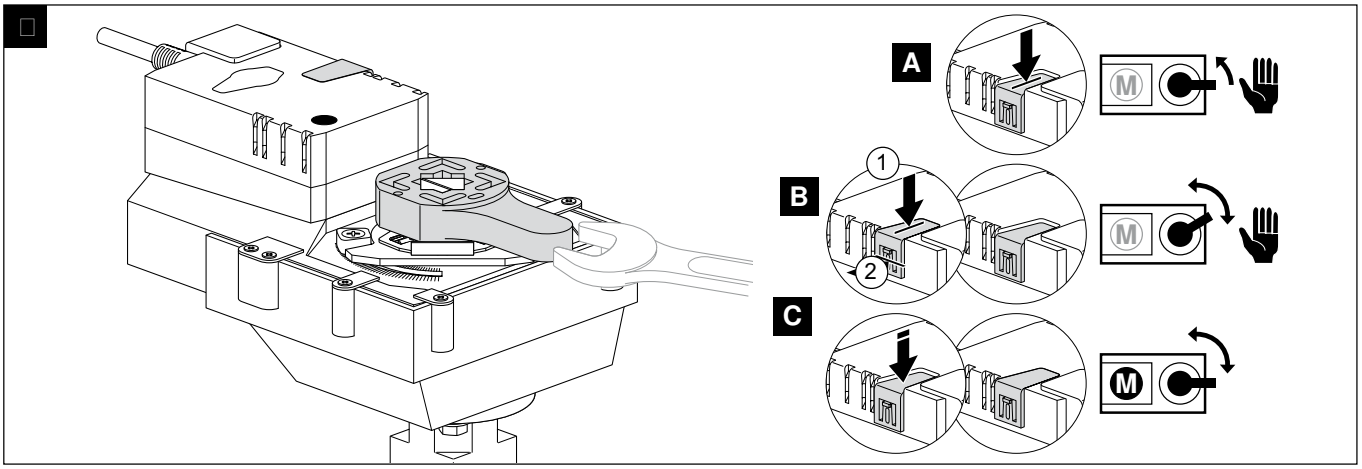




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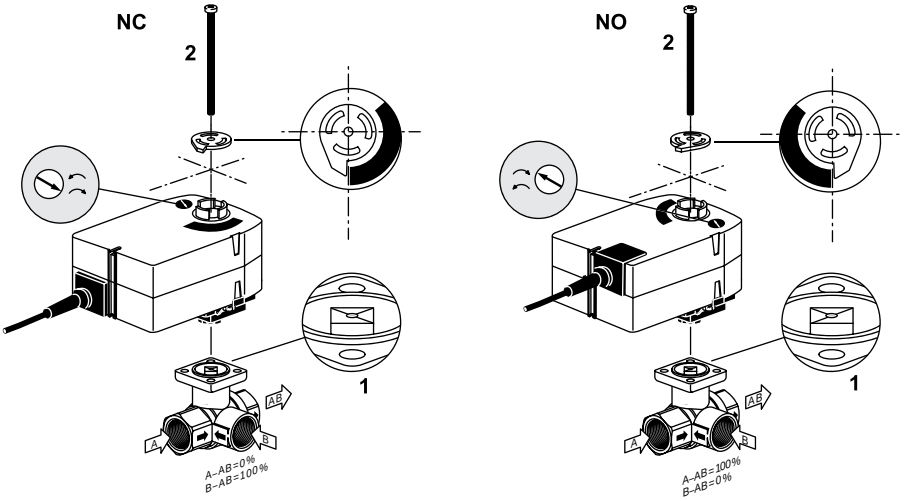


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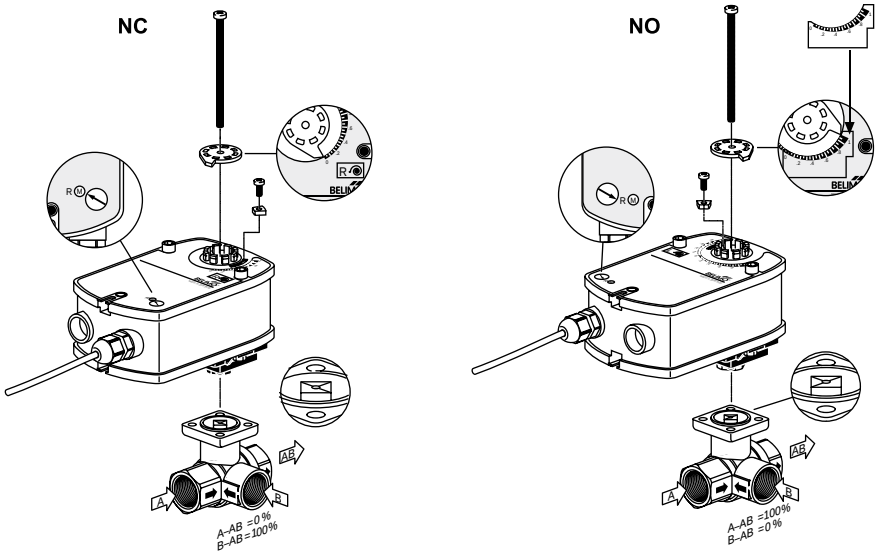




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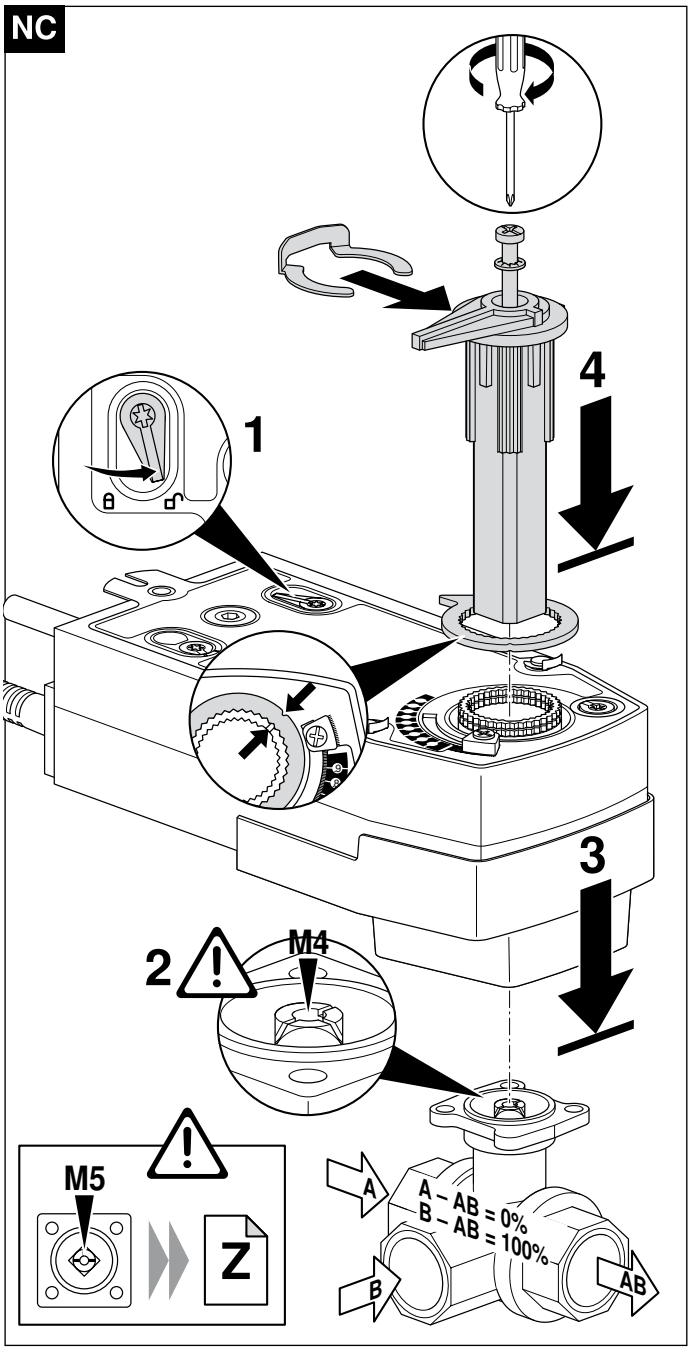


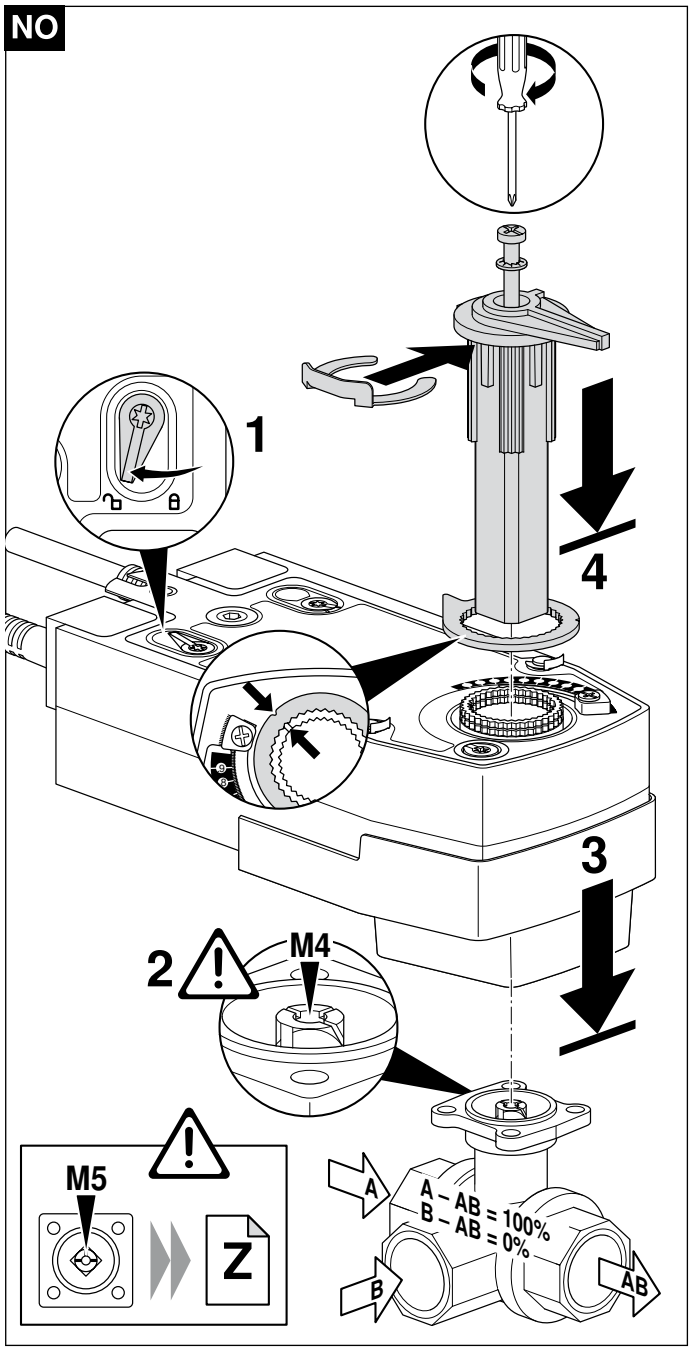


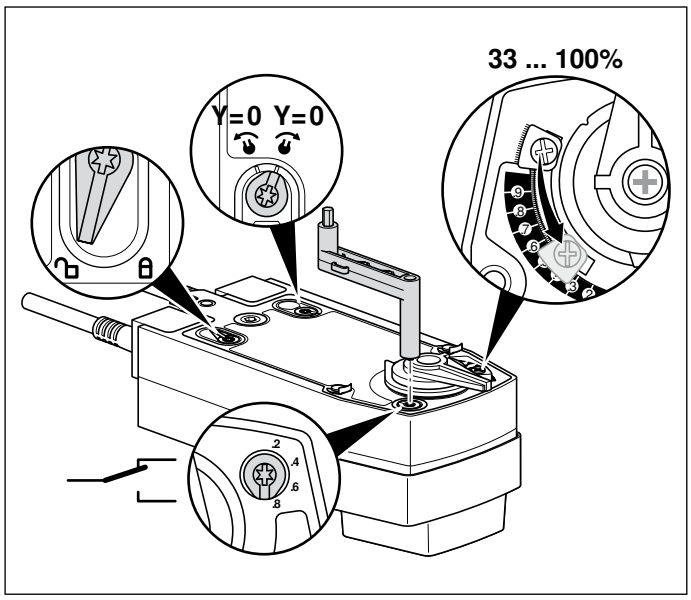


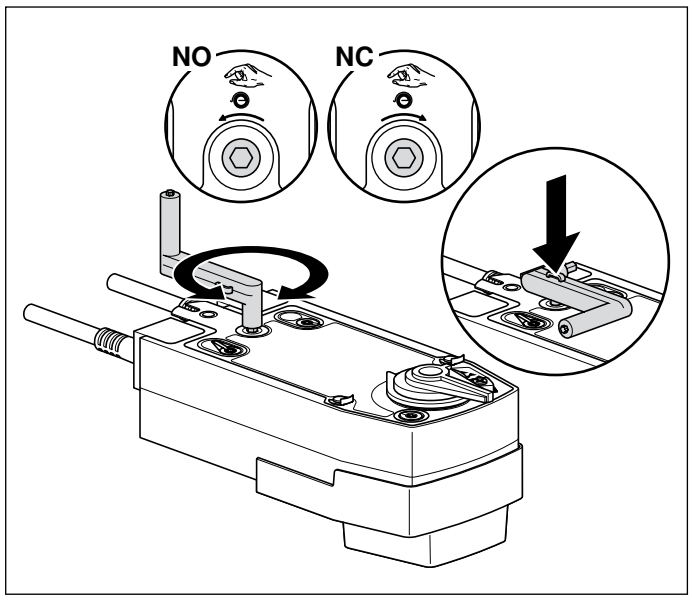




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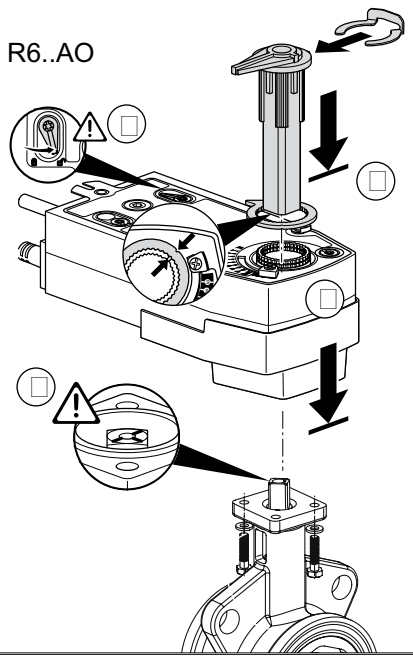
R6..AO



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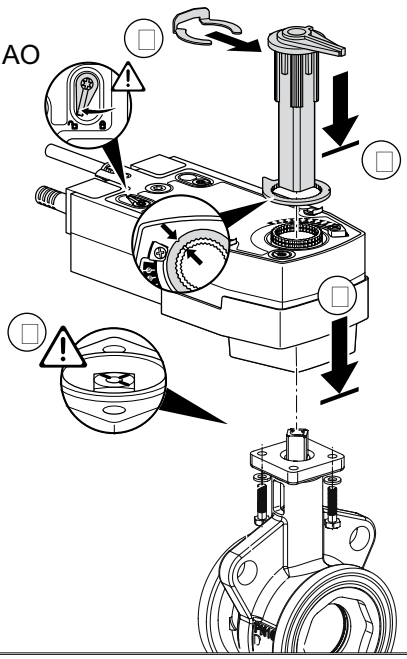



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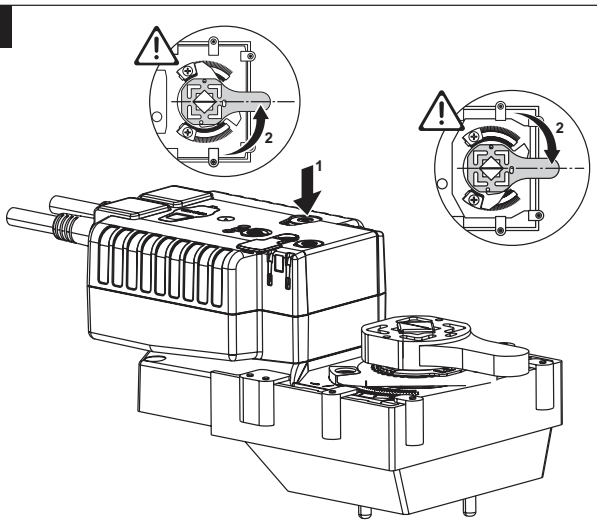


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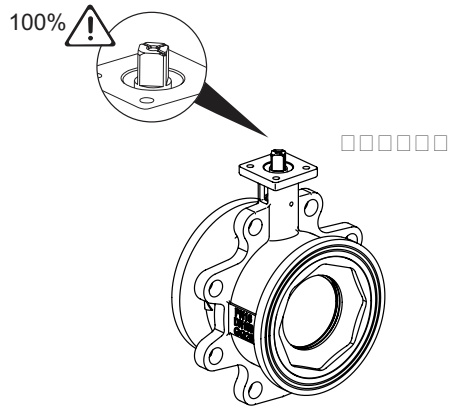


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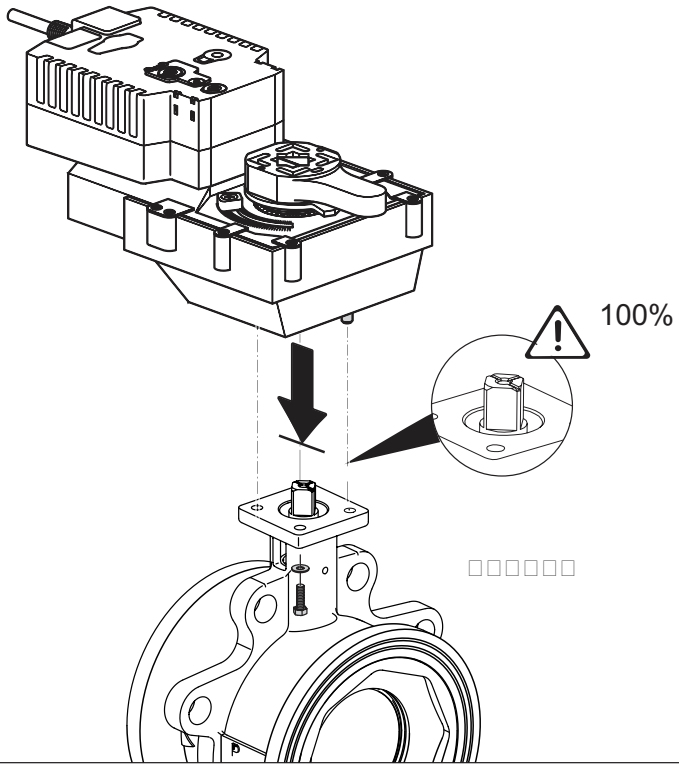


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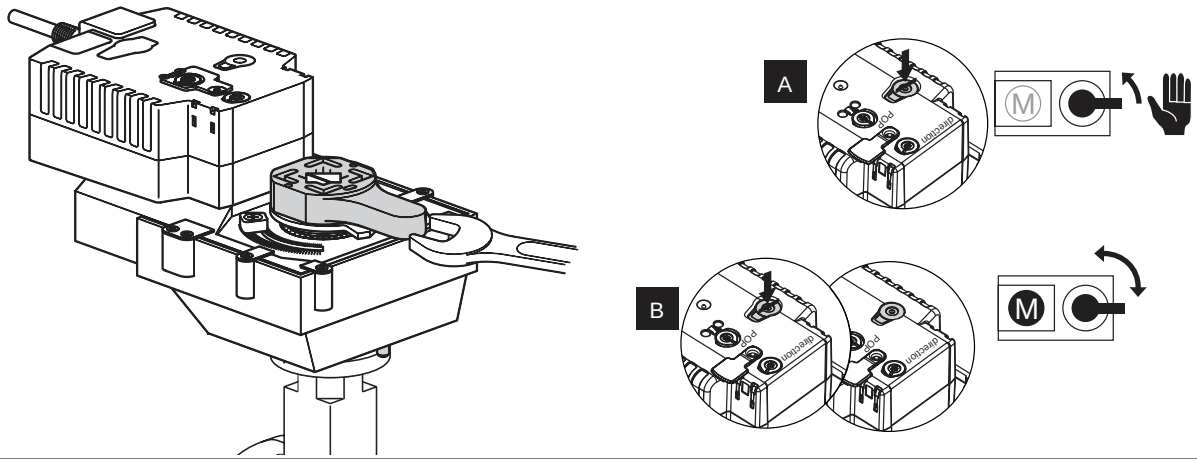




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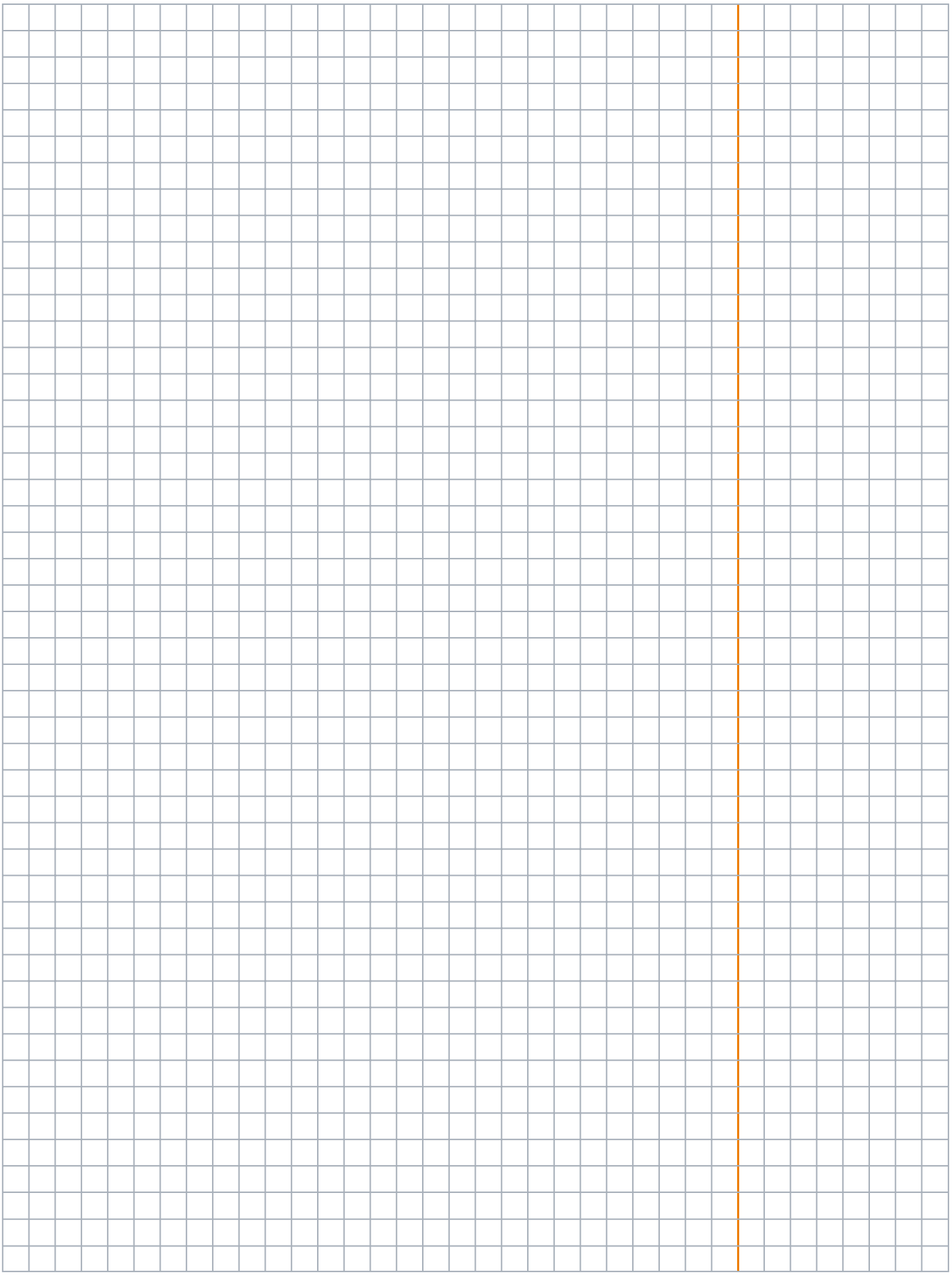

## ASIA PACIFIC HEADQUARTERS

**Belimo Actuators Ltd.**
Room 1601-6, 16/F, New Commerce Centre
19 On Sum Street, Shatin, N.T., Hong Kong
Tel: +852 2687 1716
Fax: +852 2687 1795
E-mail: info.asiapacific@belimo.ch

## Belimo AUSTRALIA

**Melbourne Office:**
Belimo Actuators Pty. Ltd.
12 Enterprise Court
Mulgrave Business Park
Mulgrave, VIC 3170, Australia
Tel: +61-(0)3-8585 7800
Fax: +61-(0)3-8585 7811
E-mail: info.australia@belimo.ch

**Sydney Office:**
Belimo Actuators Pty. Ltd.
Suite 2.20, 32 Delhi Road
North Ryde, NSW 2113, Australia
Tel: +61 (0)2 9805 1777
Fax: +61 (0)2 9805 1722
E-mail: info.australia@belimo.ch

## Belimo CHINA

**Shanghai Office:**
Belimo Actuators (Shanghai) Trading Ltd.
479 Chun Dong Road, Building C-2
Xin Zhuang Industry Park
Shanghai 201108, P.R. China
Tel: +86 21 5483 2929
Fax: +86 21 5483 2930
E-mail: info.shanghai@belimo.ch

**Beijing Office:**
Belimo Actuators Ltd.
Unit 1528-1530, 15F, Tower A
Jiatai International Mansion
No. 41, Middle East Fourth Ring Road
Chaoyang District, Beijing,100025,
P.R. China
Tel: +86 10 6462 1382/1386
Fax: +86 10 6462 1383
E-mail: info.beijing@belimo.ch

**Guangzhou Office:**
Belimo Actuators Ltd.
Room 5217-5218, China International Centre,
Tower B, 33 Zhong Shan San Road, Yuexiu District,
Guangzhou 510055, P.R. China
Tel: +86 20 3435 1860
Fax: +86 20 3435 1870
E-mail: info.guangzhou@belimo.ch

## Belimo HONG KONG

**Hong Kong Office:**
Belimo Actuators Ltd.
Room 1601-6, 16/F, New Commerce Centre
19 On Sum Street, Shatin, N.T., Hong Kong
Tel: +852 2687 1716
Fax: +852 2687 1795
E-mail: info.hongkong@belimo.ch

**Indonesia Office:**
Belimo Actuators Ltd.
Graha Kencana Building 8th Floor Block B
Jl. Raya Perjuangan 88
Kebon Jeruk - Jakarta Barat 11530, Indonesia
Tel: +62 21 5367 8278
Fax: +62 21 5366 0688
E-mail: info.indonesia@belimo.ch

**Japan Office:**
Belimo Actuators Ltd.
2nd Floor, Yamaki Building III
3-1-5 Azumabashi, Sumida-ku
Tokyo 130-0001, Japan
Tel: +81 3 6823 6961
Fax: +81 3 3626 3911
E-mail: info.japan@belimo.ch

**Malaysia Office:**
Belimo Actuators Ltd
S-13-12, First Subang, Jalan SS15/4G
47500 Subang Jaya, Selangor, Malaysia
Tel: +03-56125833
Fax: +03-56125233
E-mail: info.malaysia@belimo.ch

**Singapore Office**
Belimo Actuators Ltd.
1 Tannery Road #08-04
One Tannery, Singapore 347719
Tel: +65 6842 1626
Fax: +65 6842 1630
E-mail: info.singapore@belimo.ch

**Taiwan Office:**
Belimo Actuators Ltd.
7F-2, No.343, Jhonghe Rd., Yonghe District
New Taipei City 234, Taiwan
Tel: +886 2 2922 8805
Fax: +886 2 2922 8806
E-mail: info.taiwan@belimo.ch

**Thailand Office:**
Belimo Actuators Ltd.
90/2 Pensiri Place, Soi Phaholyothin 32
Phaholyothin Road, Chandrakasem, Jatujak
Bangkok 10900, Thailand
Tel: +662 9415582-3
Fax: +662 9415584
E-mail: info.thailand@belimo.ch

## Belimo INDIA

**Mumbai Office:**
Belimo Actuators India Pvt. Ltd.
23/ ABCD, Govt. Industrial Estate, Charkop
Kandivali West, Mumbai 400067, India
Tel: +91 22 4025 4800
Fax: +91 22 4025 4899
E-mail: info.india@belimo.ch

**Bangalore office:**
Belimo Actuators India Pvt. Ltd.
Sreerama Complex, No. 13, 2nd Floor
5th Cross Road, 6th Block, Koramangala
Bangalore – 560097, India
Tel: +91-80-40906311
Fax: +91-80-40906288
E-mail: info.india@belimo.ch

**New Delhi Office:**
Belimo Actuators India Pvt. Ltd.
Flat No. 515, DLF Tower – B
Jasola Distt. Centre, Jasola
New Delhi 110025, India
Tel: +91 11 41078501
Fax: +91 11 41078508
E-mail: info.india@belimo.ch

**Chennai Office:**
Belimo Actuators India Pvt. Ltd.
Flat no.3B, Urmilla House
#15, ARK Colony, Eldams Road
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EU BELIMO Automation AG
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Tel: +41 43 843 61 11
Fax: +41 43 843 62 68
E-mail: info@belimo.ch

AP Belimo Actuators Ltd.
Room 1601-6, 16/F, New Commerce Centre
19 On Sum Street, Shatin, N.T., Hong Kong
Tel: +852 2687 1716
Fax: +852 2687 1795
E-mail: info.asiapacific@belimo.ch

US BELIMO Aircontrol (USA), Inc.
33 Turner Road
Danbury, CT 06810
USA
Tel: +800 543-9038 / 203 791-9915
Fax: +800 228-8283 / 203 791-9919

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