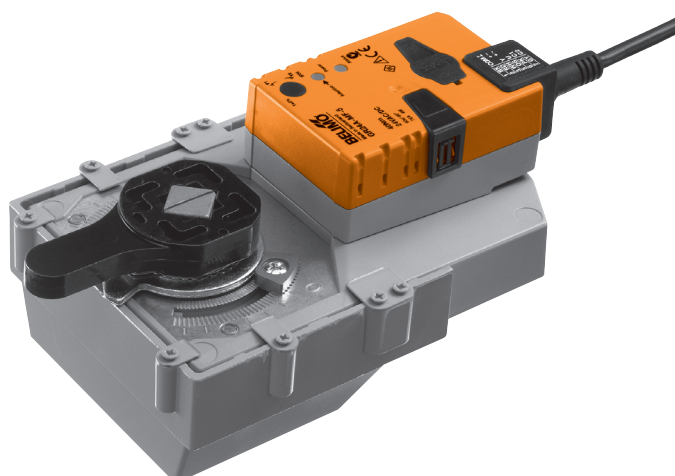


Communicative rotary actuator for butterfly valves with mounting flange ISO 5211-F05

- Torque 40 Nm
- Nominal voltage AC/DC 24 V
- Control: Modulating DC 0 ... 10 V or variable
- Position feedback DC 2 ... 10 V or variable
- Communication via BELIMO MP-Bus
- Conversion of sensor signals


**Technical data**
**Electrical data**

Nominal voltage	AC 24 V, 50/60 Hz / DC 24 V
Nominal voltage range	AC 19.2 ... 28.8 V / DC 21.6 ... 28.8 V
Power consumption	4.5 W @ nominal torque
In operation	1.5 W
At rest	7 VA
For wire sizing	
Connection	Cable 1 m, 4 x 0.75 mm <sup>2</sup>

Functional data	Factory settings	Variable	Settings
Torque (nominal torque)	Min. 40 Nm @ nominal voltage		
Control Control signal Y	DC 0 ... 10 V, input impedance 100 kΩ	Open-close, 3-point (AC only), modulating (DC 0 ... 32 V)	.....
Operating range	DC 2 ... 10 V	Start point DC 0.5 ... 30 V End point DC 2.5 ... 32 V	.....
Position feedback (Measuring voltage U)	DC 2 ... 10 V, max. 0.5 mA	Start point DC 0.5 ... 8 V End point DC 2.5 ... 10 V	.....
Position accuracy	±5%		
Manual override	Gearing latch disengaged with pushbutton, can be locked		
Running time	90 s / 90°↔	75 ... 290 s	.....
Automatic adjustment running time, operating range and measuring signal U to match the mechanical angle of rotation	Manual triggering of the adaption by pressing the «Adaption» button or with the PC-Tool	Automatic adaption whenever the supply voltage is switched on, or manual triggering	.....
Override control	MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50%	MAX = (MIN + 30°↔) ... 100% MIN = 0% ... (MAX - 30°↔) ZS = MIN ... MAX	.....
Sound power level	Max. 45 dB (A)	With a 75 s = 50 dB (A) running time 290 s = <40 dB (A)	
Position indication	Mechanical, pluggable		

**Safety**

Protection class	III Safety extra-low voltage UL Class 2 Supply
Degree of protection	IP54 in any mounting position 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 cULus according to UL 60730-1A and UL 60730-2-14 and CAN/CSA E60730-1:02
Mode of operation	Type 1
Rated impulse voltage	0.8 kV
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

**Dimensions / Weight**

Dimensions	See «Dimensions» on page 6
Weight	approx. 2.5 kg



## 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 authorized 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.

## Product features

<b>Anwendung</b>	The actuator is used together with the BELIMO butterfly valve D6.. or other valves with the following mechanical specifications: – Square stem head, WAF 14 mm, for form-fit attachment of the rotary actuator – Hole circle (d = 50 mm) for assembly with the butterfly valve <i>Adapters for other stem head dimensions available on request.</i>
<b>Mode of operation</b>	<i>Conventional operation:</i> The actuator is controlled with a standard modulating signal of DC 0 ... 10 V and moves 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. <i>Operation on the MP-Bus:</i> The actuator receives its digital positioning signal from the higher level controller via the MP-Bus and travels to the position defined. Connection U serves as communication interface and does not supply an analogue measuring voltage.
<b>Parameterisable actuators</b>	The factory settings cover the most common applications. Input and output signals and other parameters can be altered with the BELIMO Service Tool, MFT-P.
<b>Simple direct mounting</b>	Simple direct mounting on a butterfly valve with ISO 5211-F05 mounting flange. The mounting position in relation to the butterfly valve can be selected in 90° steps ↯.
<b>Manual override</b>	Manual operation is possible with the pushbutton (the gearing latch remains disengaged as long as the pushbutton is pressed or detented).
<b>Adjustable angle of rotation</b>	Adjustable angle of rotation with mechanical end stops.
<b>High functional reliability</b>	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
<b>Home position</b>	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)

Actuator	Valve
	A – AB = 0%
	A – AB = 100%

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

## Accessories

	Description	Data sheet
Electrical accessories	Auxiliary switch S..A..	T2 - S..A..
	Feedback potentiometer P..A..	T2 - P..A..
	PC-Tool MFT-P	T2 - MFT-P
	Position positioner SGA24, SGE24 and SGF24 (only in conventional mode)	T2 - SG..24
	Digital position indication ZAD24 (only in conventional mode)	T2 - ZAD24

Electrical installation

Wiring diagrams

Hinweise

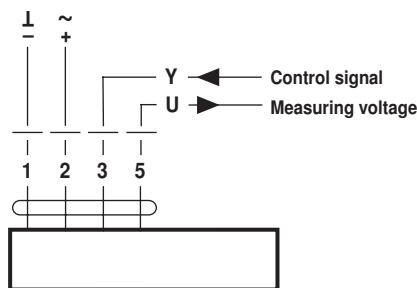
- Connect via safety isolation transformer.
- Other actuators can be connected in parallel. Note the performance data.
- Direction of rotation switch is covered. Factory default: Direction of rotation Y2



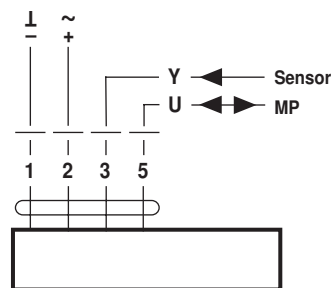
Direction of rotation



Conventional operation:



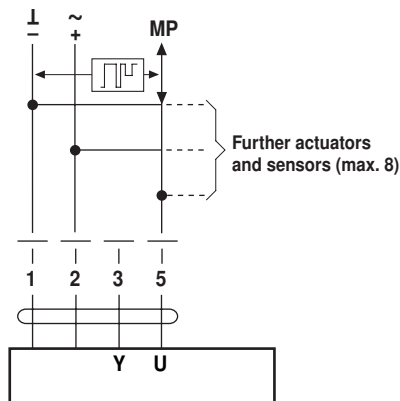
Operation on the MP-Bus



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

Functions when operated on MP-Bus

Connection on the MP-Bus

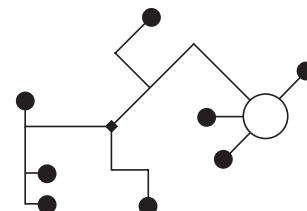


Communication and supply

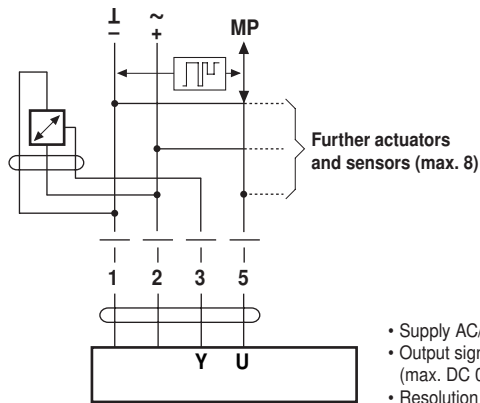
- in the same 3-wire cable
- no shielding or twisting necessary
  - no terminating resistors required

Power topology

There are no restrictions for the network topology (star, ring, tree or hybrid forms are permitted).

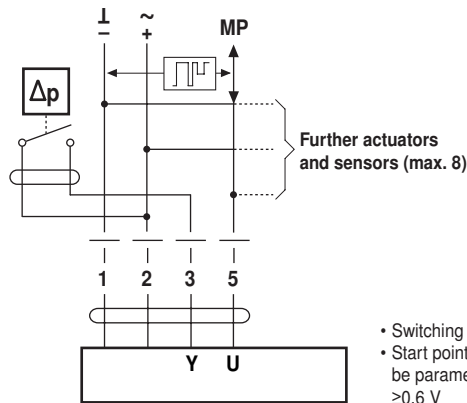


Connection of active sensors



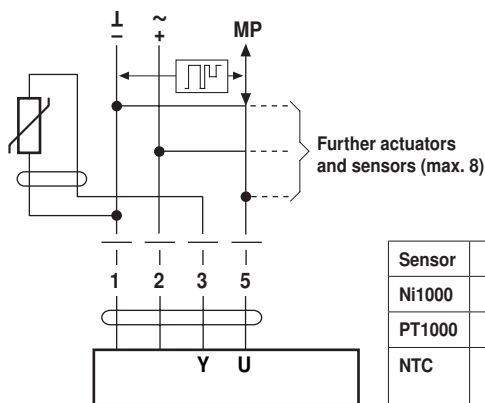
- Supply AC/DC 24 A
- Output signal DC 0 ... 10 V (max. DC 0 ... 32 V)
- Resolution 30 mV

Connection of external switching contact



- Switching current 16 mA @ 24 V
- Start point of the operating range must be parameterised on the MP actuator as  $\geq 0.6$  V

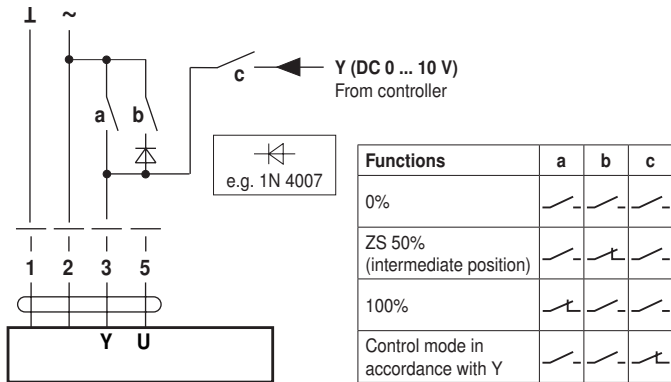
Connection of passive sensors



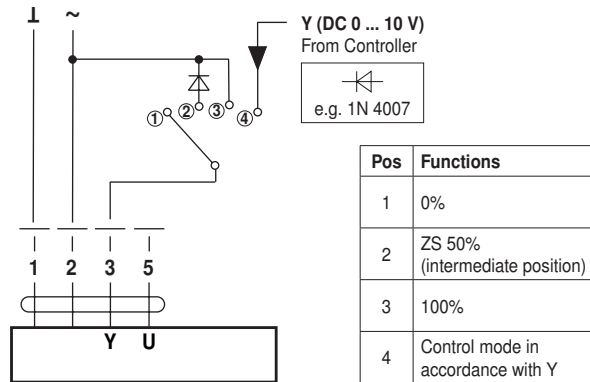
Sensor	Temperature range	Resistance range	Resolution
Ni1000	-28 ... +98 °C	850 ... 1600 Ω	1 Ω
PT1000	-35 ... +155 °C	850 ... 1600 Ω	1 Ω
NTC	-10 ... +160 °C (depending on Type)	200 Ω ... 50 kΩ	1 Ω

Functions with basic values (only in conventional mode)

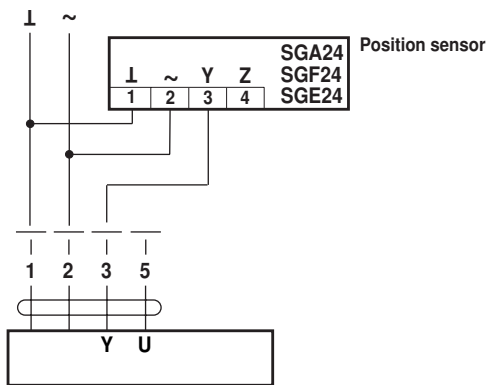
Override control with AC 24 V with relay contacts



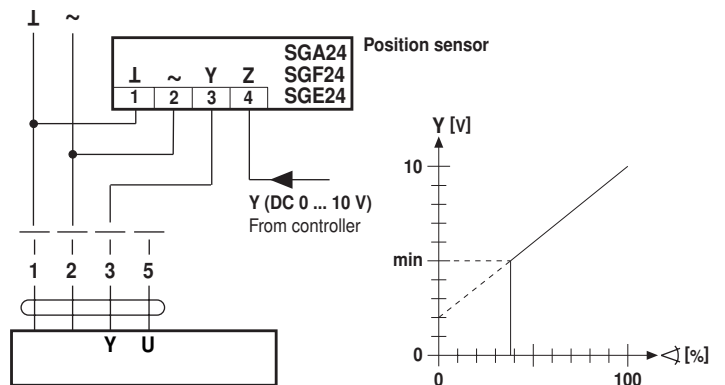
Override control with AC 24 V with rotary control switch



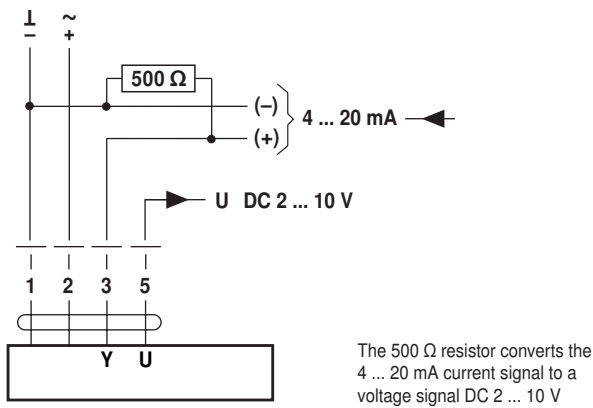
Remote control 0 ... 100 %



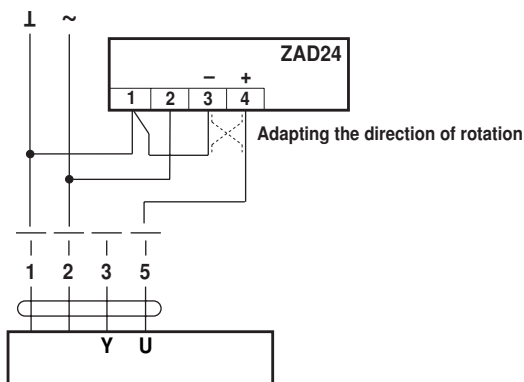
Minimum limit



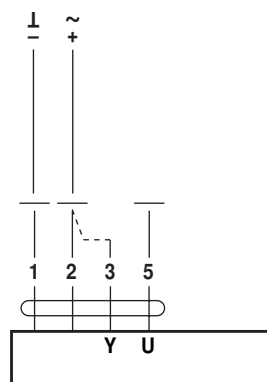
Control with 4 ... 20 mA via external resistance



Position indication



Functional check

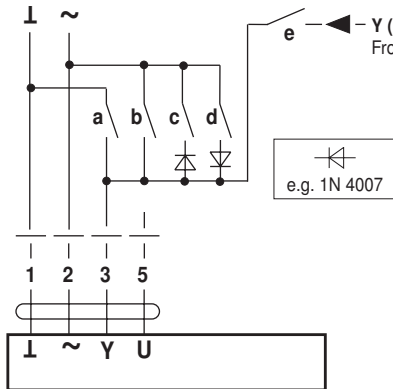


Procedure

- Apply 24 V to connection 1 and 2
- Disconnect connection 3:
  - For direction of rotation 0: Actuator turns in the direction of ↺
  - For direction of rotation 1: Actuator turns in the direction of ↻
- Short circuit connections 2 and 3:
  - Actuator travels in the opposite direction

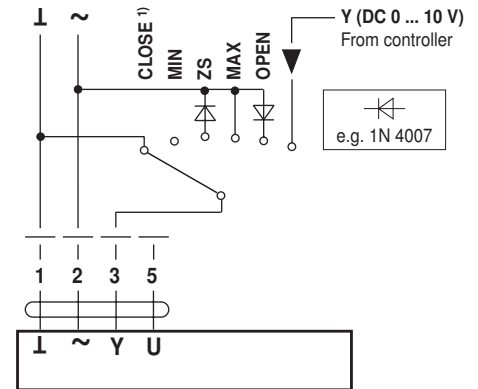
Functions for actuators with specific parameters

Override control and limiting with AC 24 V with relay contacts



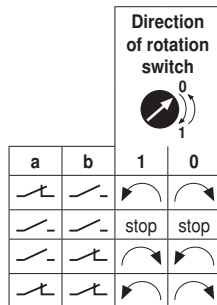
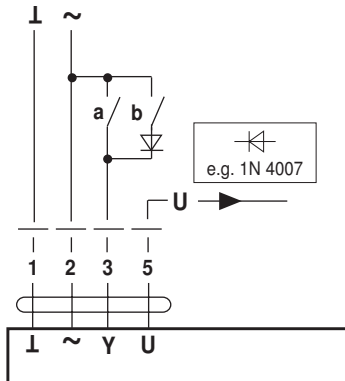
Functions	a	b	c	d	e
CLOSE <sup>1)</sup>	—	—	—	—	—
MIN	—	—	—	—	—
ZS (intermediate position)	—	—	—	—	—
MAX	—	—	—	—	—
OPEN	—	—	—	—	—
Control mode in accordance with Y	—	—	—	—	—

Override control and limiting with AC 24 V with rotary switch

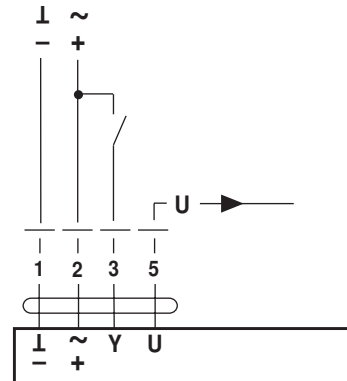


<sup>1)</sup> **Caution!** This function is only guaranteed if the start point of the operating range is defined as min. 0.6 V

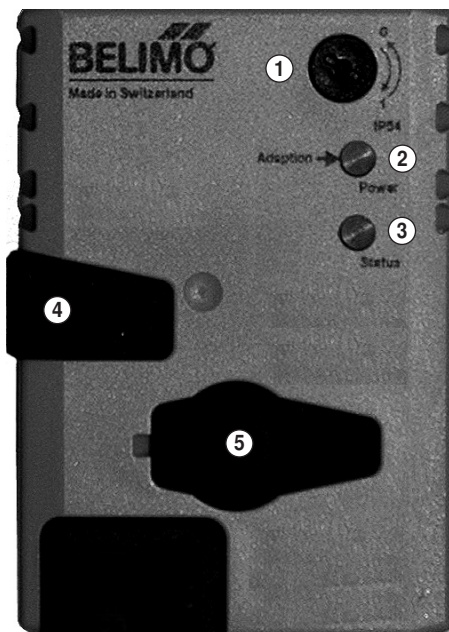
3-point control



Open-close control



Operating controls and indicators



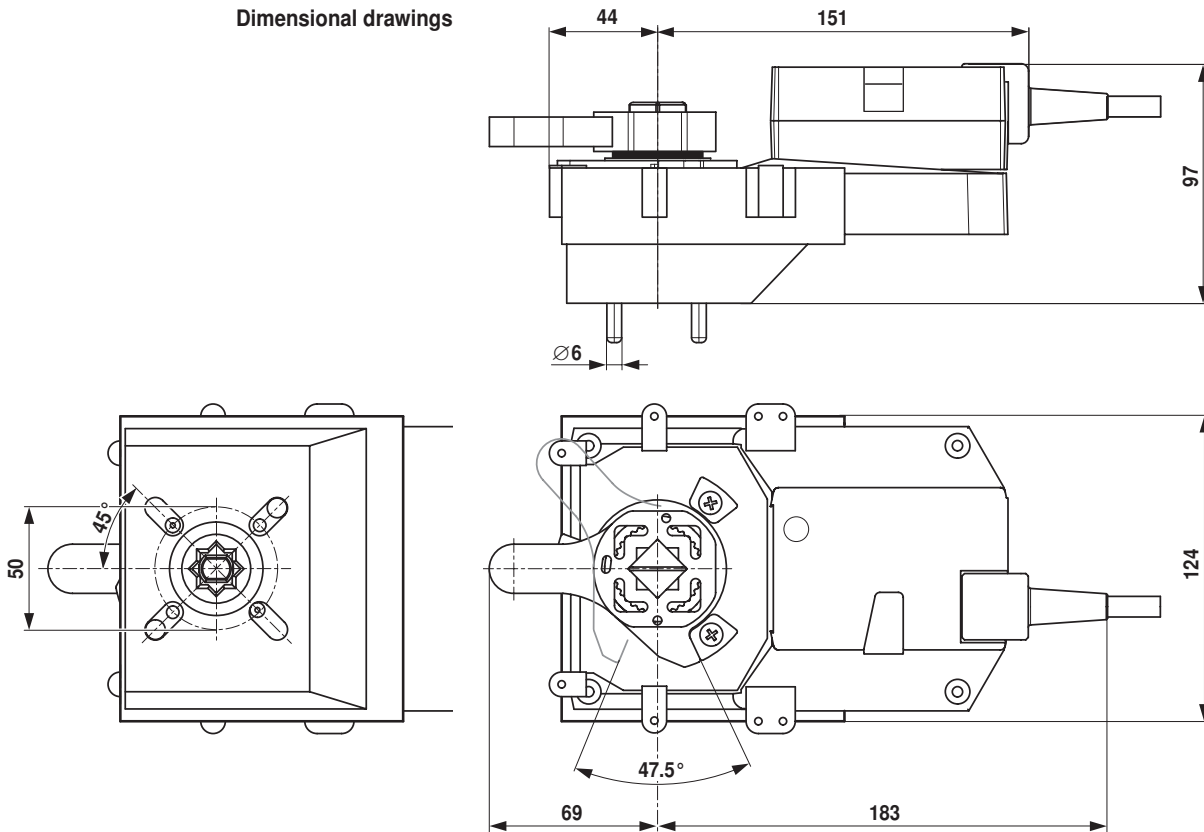
- ① **Direction of rotation switch**  
Switching over: Direction of rotation changes
- ② **Push-button and green LED display**  
Off: No voltage supply or fault  
On: In operation  
Press button: Switches on angle of rotation adaptation followed by standard operation
- ③ **Push-button and yellow LED display**  
Off: Normalbetrieb ohne MP-Bus  
Flickering: MP communication active  
On: Adaptation or synchronising process active  
Blinking: Addressing request sent to MP master  
Press button: Acknowledgment of addressing
- ④ **Gear disengagement switch**  
Press button: Gear disengaged, motor stops, manual override possible  
Release button: Gear engaged, synchronisation starts, followed by standard operation
- ⑤ **Service plug**  
For connecting parameterising and service tools

Check voltage supply connection

- a) ② Off and ③ On } Check the supply connections.
- b) ② Blinking and ③ Blinking } Possibly  $\underline{\sim}$  and  $\underline{\sim}$  are swapped over.

## Dimensions [mm]

## Dimensional drawings



## Further documentations

- Overview Valve-actuator combinations
- Data sheets for butterfly valves
- Installation instructions for actuators and/or butterfly valves, respectively
- Notes for project planning (hydraulic characteristic curves and circuits, installation regulations, commissioning, maintenance etc.)