

**Rotary actuator for butterfly valves**

- Torque motor 160 Nm (parametrised for D6200W/WL)
- Nominal voltage AC 24...240 V / DC 24...125 V
- Control modulating, communicative, hybrid
- with 2 integrated auxiliary switches
- Conversion of sensor signals
- Communication via BACnet MS/TP, Modbus RTU, Belimo-MP-Bus or conventional control


**Technical data**

<b>Electrical data</b>	Nominal voltage	AC 24...240 V / DC 24...125 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...264 V / DC 19.2...137.5 V
	Power consumption in operation	20 W
	Power consumption in rest position	6 W
	Power consumption for wire sizing	with 24 V 20 VA / with 240 V 52 VA
	Auxiliary switch	2 x SPDT, 1 x 10° / 1 x 0...90° (default setting 85°)
	Switching capacity auxiliary switch	1 mA...3 A (0.5 A inductive), AC 250 V
	Connection supply	Terminals 2.5 mm <sup>2</sup>
	Connection protective earth	earth terminal
	Connection control	Terminals 1.5 mm <sup>2</sup>
	Connection auxiliary switch	Terminals 2.5 mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
<b>Data bus communication</b>	Communicative control	BACnet MS/TP Modbus RTU MP-Bus
	Number of nodes	BACnet / Modbus see interface description MP-Bus max. 8
<b>Functional data</b>	Torque motor	160 Nm (parametrised for D6200W/WL)
	Operating range Y	2...10 V
	Input Impedance	100 kΩ
	Operating range Y variable	0.5...10 V 4...20 mA
	Position feedback U	2...10 V
	Position feedback U note	Max. 0.5 mA
	Position feedback U variable	0.5...10 V
	Position accuracy	±5%
	Manual override	hand lever
	Running time motor	35 s / 90°
	Running time motor variable	30...120 s
	Sound power level, motor	68 dB(A)
	Position indication	Mechanically (integrated)
<b>Safety data</b>	Protection class IEC/EN	I, protective earth (PE)
	Protection class UL	I, protective earth (PE)
	Degree of protection IEC/EN	IP66/67
	Degree of protection NEMA/UL	NEMA 4X
	Enclosure	UL Enclosure Type 4X
EMC	CE according to 2014/30/EU	

<b>Safety data</b>	Low voltage directive	CE according to 2014/35/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Certification UL	cULus according to UL60730-1A, UL60730-2-14 and CAN/CSA E60730-1 The UL marking on the actuator depends on the production site, the device is UL-compliant in any case
	Mode of operation	Type 1
	Rated impulse voltage supply	4 kV
	Rated impulse voltage control	0.8 kV
	Rated impulse voltage auxiliary switch	2.5 kV
	Pollution degree	3
	Ambient temperature	-30...50°C
	Storage temperature	-40...80°C
	Ambient humidity	Max. 100% RH
	Servicing	maintenance-free
<b>Weight</b>	Weight	5.8 kg

**Safety notes**


- This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Caution: Power supply voltage!
- The device has a protective earthing. Incorrect connection of the protective earth can lead to hazards due to electrical shock.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- Apart from the connection box, 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 must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- The two switches integrated in the actuator are to be operated either on power supply voltage or at safety extra-low voltage. The combination power supply voltage/safety extra-low voltage is not permitted.

**Product features**

<b>Fields of application</b>	The actuator is particularly suitable for utilisation in outdoor applications and is protected against the following weather conditions: - UV radiation - Dirt / Dust - Rain / Snow - Air humidity
<b>Converter for sensors</b>	Connection option for two sensors (passive, active or switching contacts). In this way, the analogue sensor signal can be easily digitised and transferred to the bus systems BACnet or Modbus.
<b>Parametrisable actuators</b>	The factory settings cover the most common applications. The Belimo Assistant App is required for parametrisation via Near Field Communication (NFC) and simplifies commissioning. Moreover, it provides a variety of diagnostic options. The ZTH EU service tool provides a selection of both diagnostic and setting options.
<b>Combination analogue - communicative (hybrid mode)</b>	With conventional control by means of an analogue positioning signal, BACnet or Modbus can be used for the communicative position feedback
<b>Simple direct mounting</b>	Simple direct mounting on the butterfly valve. The mounting orientation in relation to the butterfly valve can be selected in 90° (angle) increments.

<b>Manual override</b>	The valve can be manually operated using a hand crank. Unlocking is carried out manually by removing the hand crank.
<b>Internal heating</b>	An internal heater prevents condensation buildup. Thanks to the integrated temperature and humidity sensor, the built-in heater automatically switches on/off.
<b>High functional reliability</b>	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
<b>Flexible signalling</b>	The actuator has one auxiliary switch with a fixed setting (10°) and one adjustable auxiliary switch (0...90°).

**Accessories**

<b>Mechanical accessories</b>	<b>Description</b>	<b>Type</b>
	Position indicator and tappet shaft, F07, square 45° turned, SW 17, DN 125...300	ZPR01
	Tappet shaft, F07, square 45° turned, SW 17	ZPR02
	Position indicator and tappet shaft, F05, square 45° turned, SW 14, DN 80...100	ZPR03
	Hand crank for PR/PM actuator	ZPR20
<b>Service tools</b>	<b>Description</b>	<b>Type</b>
	Belimo Assistant App, Smartphone app for easy commissioning, parametrising and maintenance	Belimo Assistant App
	Converter Bluetooth / NFC	ZIP-BT-NFC
	Service Tool, with ZIP-USB function, for parametrisable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH EU
	Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: 6-pin for connection to service socket	ZK1-GEN
<b>Sensors</b>	<b>Description</b>	<b>Type</b>
	Duct/Immersion sensor Temperature 50 mm x 6 mm Pt1000	01DT-1BH
	Duct/Immersion sensor Temperature 50 mm x 6 mm Ni1000	01DT-1CH
	Duct/Immersion sensor Temperature 100 mm x 6 mm Pt1000	01DT-1BL
	Duct/Immersion sensor Temperature 100 mm x 6 mm Ni1000	01DT-1CL
	Duct/Immersion sensor Temperature 150 mm x 6 mm Pt1000	01DT-1BN
	Duct/Immersion sensor Temperature 150 mm x 6 mm Ni1000	01DT-1CN
	Duct/Immersion sensor Temperature 200 mm x 6 mm Pt1000	01DT-1BP
	Duct/Immersion sensor Temperature 200 mm x 6 mm Ni1000	01DT-1CP
	Duct/Immersion sensor Temperature 300 mm x 6 mm Pt1000	01DT-1BR
	Duct/Immersion sensor Temperature 300 mm x 6 mm Ni1000	01DT-1CR
	Duct/Immersion sensor Temperature 450 mm x 6 mm Pt1000	01DT-1BT
	Duct/Immersion sensor Temperature 450 mm x 6 mm Ni1000	01DT-1CT

**Electrical installation**

**Caution: Power supply voltage!**

Parallel connection of other actuators possible. Observe the performance data.

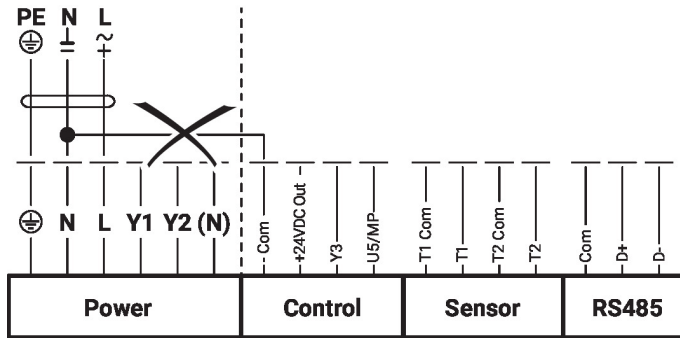
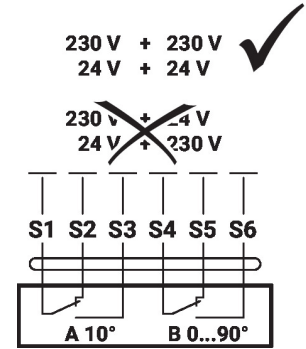
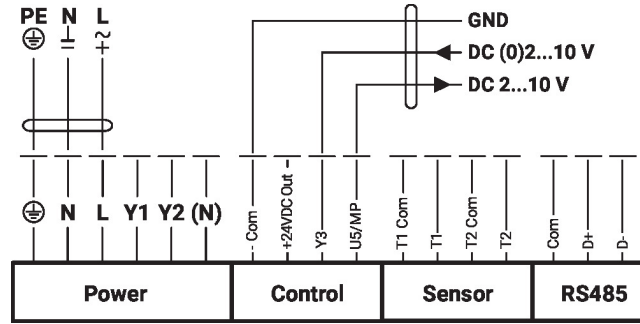
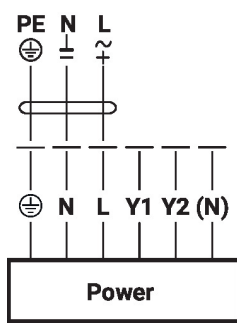
The wiring of the line for BACnet MS/TP / Modbus RTU is to be carried out in accordance with applicable RS485 regulations.

**Wiring diagrams**

AC 24...240 V / DC 24...125 V

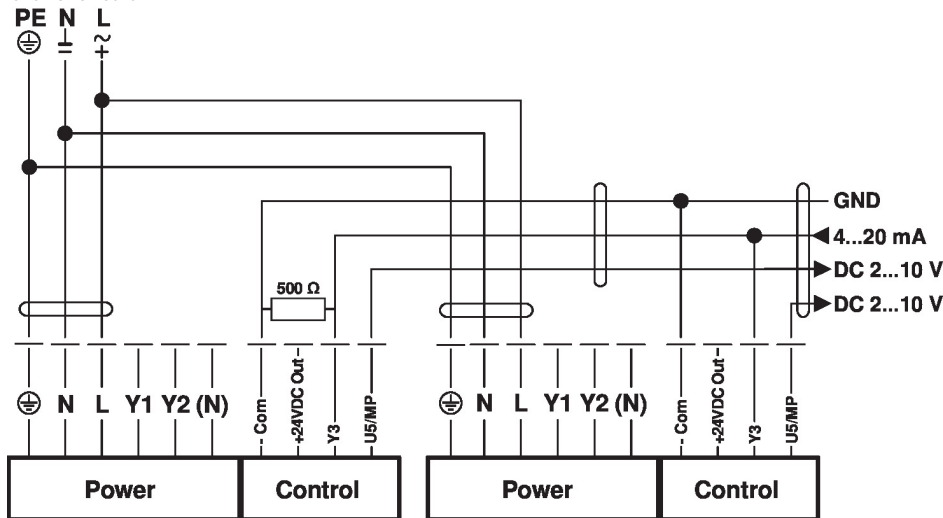
Modulating control

Connection auxiliary switch



Power supply must not be connected to the signal terminals!

Parallel circuit

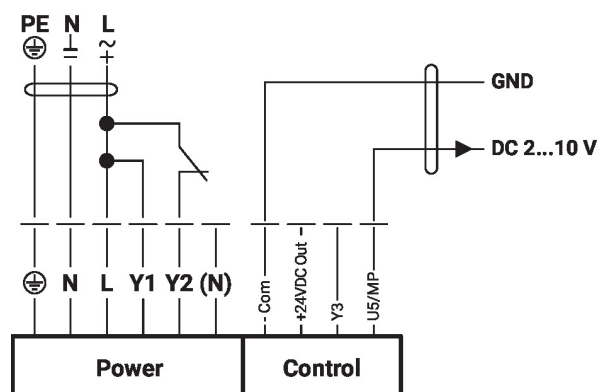
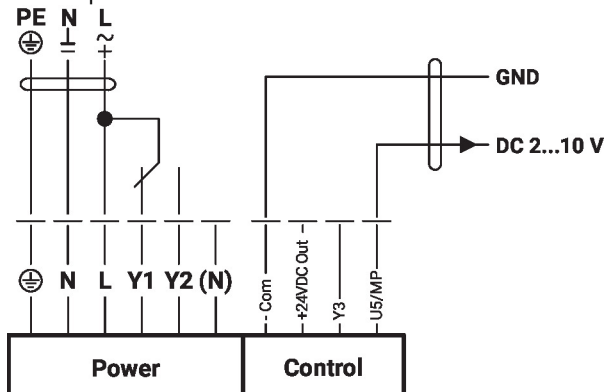


Setpoint 2...10 V

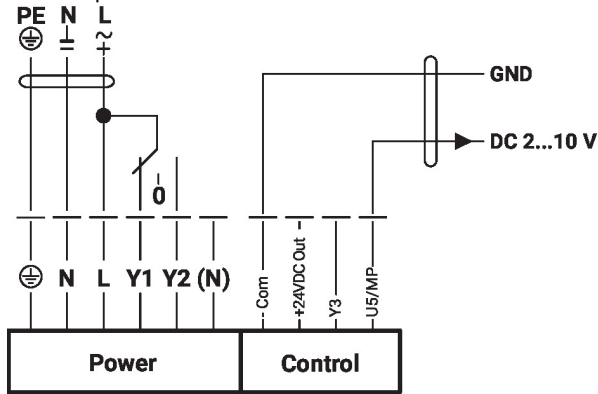
**Functions**

Functions with specific parameters (NFC)

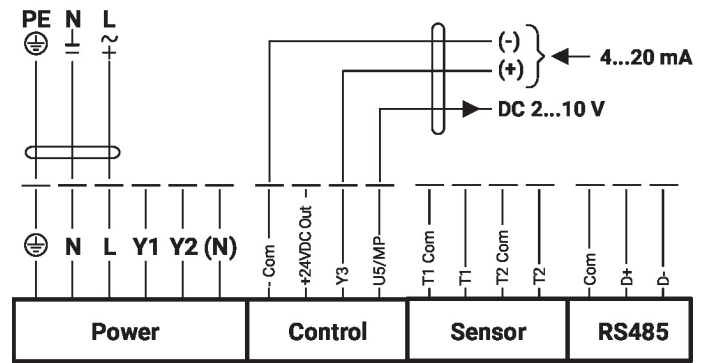
Control open/close



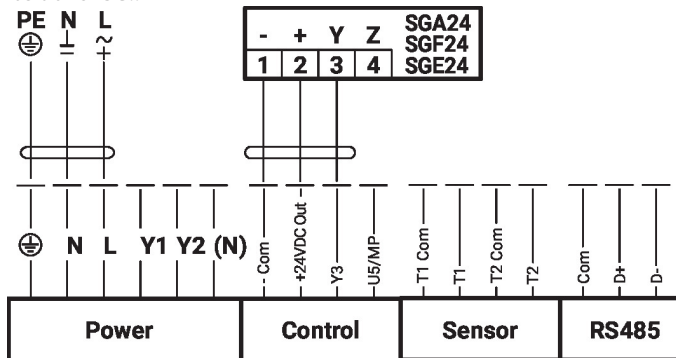
Control 3-point



Control 4...20 mA



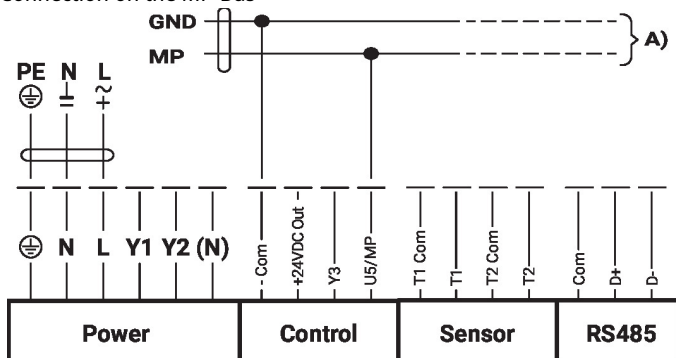
Positioner SG..



**Note**

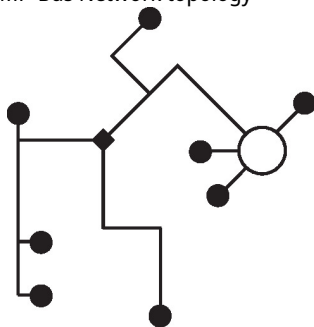
Maximum output power «DC 24 V out» 1.2 W @ 50 mA!  
A separate safety transformer must be used for higher performance!

Connection on the MP-Bus



A) Additional actuators (max. 8)

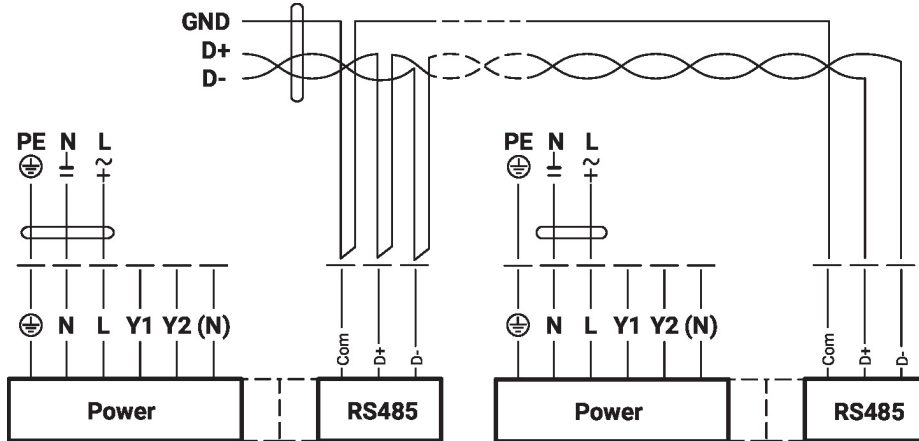
MP-Bus Network topology



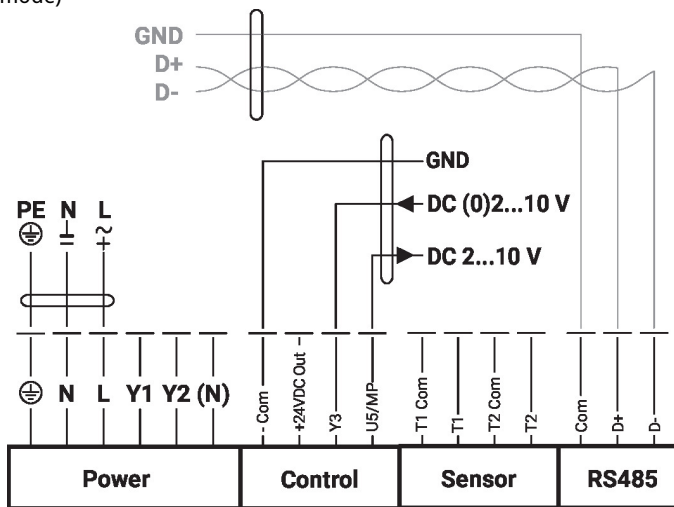
There are no restrictions for the network topology (star, ring, tree or mixed forms are permitted).  
Supply and communication in one and the same 3-wire cable

- no shielding or twisting necessary
- no terminating resistors required

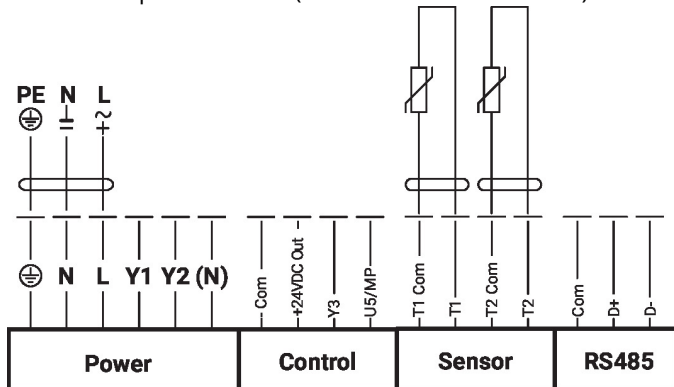
Connection BACnet MS/TP / Modbus RTU



Connection BACnet MS/TP / Modbus RTU with analog setpoint (hybrid mode)



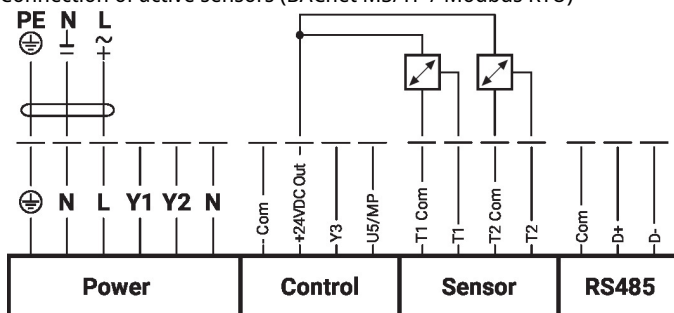
Connection of passive sensors (BACnet MS/TP / Modbus RTU)



1)	2)
200 Ω...2 kΩ	0.1 Ω
2 kΩ...10 kΩ	1 Ω
10 kΩ...55 kΩ	10 Ω

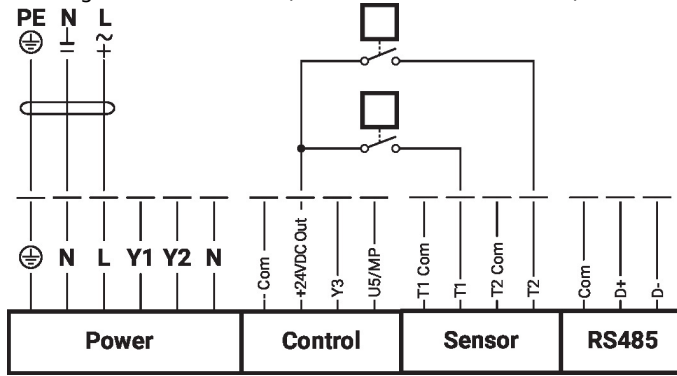
- 1) Resistance range
- 2) Resolution
- Compensation of the measured value is recommended
- Suitable for Ni1000 and Pt1000
- Suitable Belimo types 01DT...

Connection of active sensors (BACnet MS/TP / Modbus RTU)



Possible input voltage range:  
DC 0...10 V (resolution 5 mV)  
For example, to capture:  
- Active temperature sensors  
- Flow sensors  
- Pressure / differential pressure sensors

Switching contact connection (BACnet MS/TP / Modbus RTU)



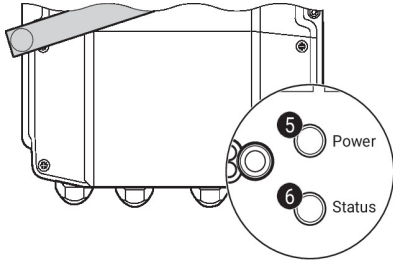
Requirements for switching contact:

The switching contact must be able to accurately switch a current of 10 mA @ 24 V.

For example, to capture:

- Flow monitors
- Operation / malfunction messages of chillers

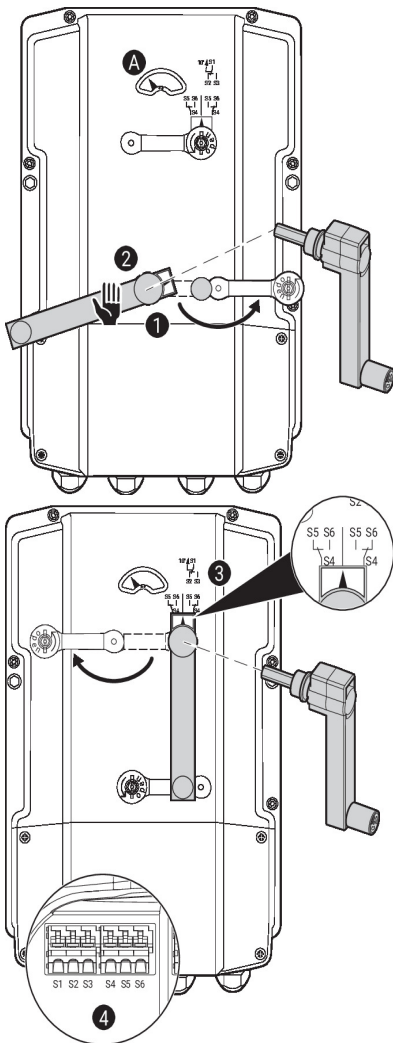
## Operating controls and indicators


**5 Push-button and LED display green**

- Off: No power supply or malfunction
- On: In operation
- Press button: Triggers test run, followed by standard mode

**6 Push-button and LED display yellow**

- Off: Standard mode
- On: Test run active
- Flickering: BACnet / Modbus communication active
- Flashing: Request for addressing from MP client
- Press button: Confirmation of the MP addressing


**Auxiliary switch settings**


**Note:** Perform settings on the actuator only in deenergised state.

For the auxiliary switch position settings, carry out points **1** to **4** successively.

**1 Gear disengagement**

Opening the manual override cover and adjusting the hand crank. Manual override is possible.

**2 Manual override control**

Turn the hand crank until the desired switching position **A** is indicated and then remove the hand crank.

**3 Auxiliary switch**

For the auxiliary switch position settings, carry out points **1** to **4** successively. Opening the auxiliary switch adjustment cover and adjusting the hand crank. Turn the hand crank until the arrow points to the vertical line.

**4 Terminals**

Connect continuity tester to S4 + S5 or to S4 + S6. If the auxiliary switch should switch in the opposite direction, rotate the hand crank by 180°.



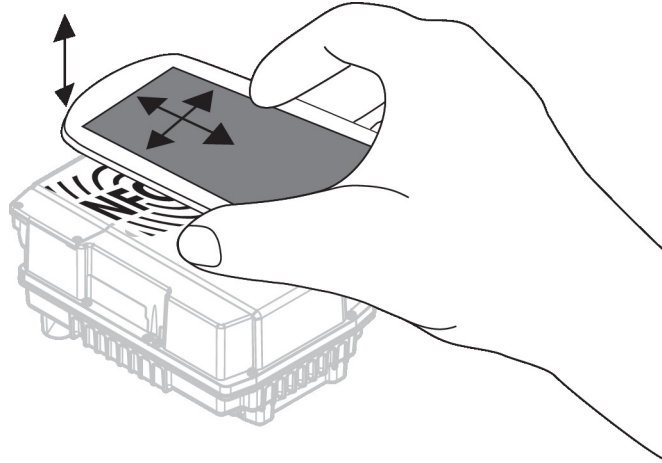
**NFC connection** Belimo devices marked with the NFC logo can be operated with the Belimo Assistant App.

Requirement:

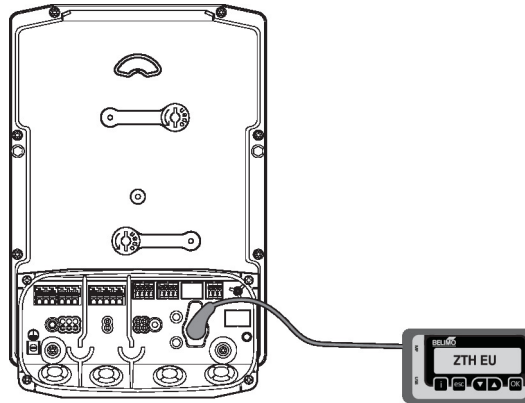
- NFC- or Bluetooth-capable smartphone
- Belimo Assistant App (Google Play & Apple AppStore)

Align NFC-capable smartphone on the device so that both NFC antennas are superposed.

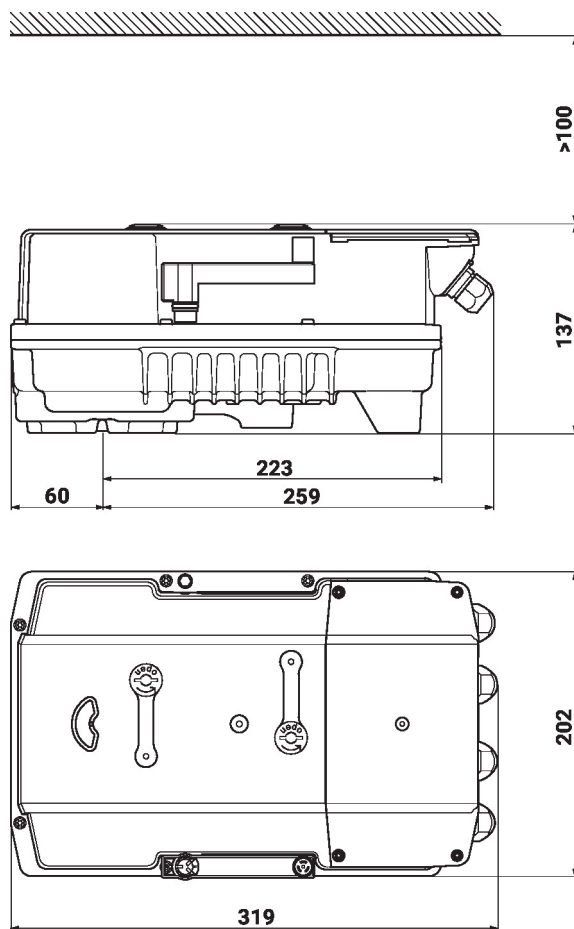
Connect Bluetooth-enabled smartphone via the Bluetooth-to-NFC Converter ZIP-BT-NFC to the device. Technical data and operation instructions are shown in the ZIP-BT-NFC data sheet.



**Service tools connection** The actuator can be configured by the ZTH EU via the service socket.



## Dimensions



## Further documentation

- Tool connections
- Description Protocol Implementation Conformance Statement PICS
- Description Modbus register
- Overview MP Cooperation Partners
- Introduction to MP-Bus Technology
- MP Glossary
- The complete product range for water applications
- Data sheets for butterfly valves
- Installation instructions for actuators and/or butterfly valves
- General notes for project planning