

Communicative rotary actuator for butterfly valves

- Nominal torque 90 Nm
- Nominal voltage AC/DC 24 V
- Control Modulating DC (0)2...10 V variable
- Stellungsrückmeldung DC 2...10 V variable
- Communication via BELIMO MP-Bus
- Conversion of sensor signals


Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	9 W
	Power consumption in rest position	2 W
	Power consumption for wire sizing	12 VA
	Connection supply / control	Cable 1 m, 4 x 0.75 mm ²
	Parallel operation	No
Functional data	Torque motor	max. 90 Nm (not constant)
	Positioning signal Y	DC 0...10 V
	Positioning signal Y note	Input impedance 100 kΩ
	Control signal Y variable	Open-close 3-point (AC only) Modulating (DC 0...32 V)
	Operating range Y	DC 2...10 V
	Operating range Y variable	Start point DC 0.5...30 V End point DC 2.5...32 V
	Position feedback U	DC 2...10 V
	Position feedback U note	Max. 0.5 mA
	Position feedback U variable	Start point DC 0.5...8 V End point DC 2.5...10 V
	Position accuracy	±5%
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	150 s / 90°
	Motor running time variable	75...290 s
	Automatic adjustment of operating range to match the mechanical angle of rotation	Automatic adaptation of operating range and feedback to match the mechanical angle of rotation: Manual triggering of the adaption by pressing the «Adaption» button or with the PC-Tool
	Override control	MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50%
	Override control variable	MAX = (MIN + 30°)...100% MIN = 0°...(MAX - 30°) ZS = MIN...MAX
Sound power level motor max.	45 dB(A)	
Position indication	Yes	
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
Certification UL	cULus according to UL 60730-1A, UL 60730-2-14 and CAN/CSA E60730-1:02	

Technical data

Safety	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-30...50°C
	Non-operating temperature	-40...80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Mechanical data	Connection flange	F07
Weight	Weight approx.	3.6 kg

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 not be adjusted.
- The angle of rotation is not permitted to be subjected to mechanical limitation. It is forbidden to alter the mechanical end stops.
- 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

Mode of operation	Conventional operation: The actuator is connected with a standard modulating signal of DC 0 ... 10V and travels to the position defined by the positioning signal. The measuring voltage U serves for the electrical display of the actuator position 0 ... 100% and as slave control signal for other actuators. Operation on the MP-Bus: 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.
Converter for sensors	Connection option for a sensor (passive or active sensor or switching contact). The MP actuator serves as an analogue/digital converter for the transmission of the sensor signal via MP-Bus to the higher level system.
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 EU.
Direct mounting	Simple direct mounting on the butterfly valve. The mounting orientation in relation to the butterfly valve can be selected in 90° (angle) increments.
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 F07: - Square stem head SW = 17 mm for form fit coupling of the rotary actuator. - Hole circle d = 70 mm

Product features

- Home position** The actuator moves to the home position when the supply voltage is switched on for the first time, i.e. at the time of commissioning or after pressing the «gear disengagement» key.
Factory setting: Y2 (counter-clockwise rotation).
The actuator then moves into the position defined by the positioning signal.

Y	
 Y2	A – AB = 0%
 Y1	A – AB = 100%

Accessories

	Description	Type
Electrical accessories	Gateway MP for BACnet MS/TP, AC/DC 24 V	UK24BAC
	Gateway MP to Modbus RTU, AC/DC 24 V	UK24MOD
	Gateway MP for LonWorks®, AC/DC 24 V, LonMark-certified	UK24LON
	Gateway MP to KNX/EIB, AC/DC 24 V, EIBA certified	UK24EIB
	Connecting board MP bus suitable for wiring boxes EXT-WR-FP...-MP	ZFP2-MP
	MP-Bus power supply for MP actuators, AC 230/24V for local power supply	ZN230-24MP
	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 EU
	Belimo PC-Tool, software for adjustments and diagnostics	MFT-P
	Adapter to Service-Tool ZTH	MFT-C
	ZIP-USB-MP interface	ZIP-USB-MP

Electrical installation

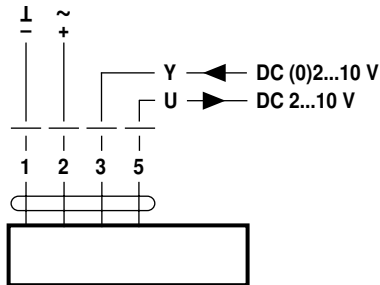


Notes

- Connection via safety isolating transformer.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

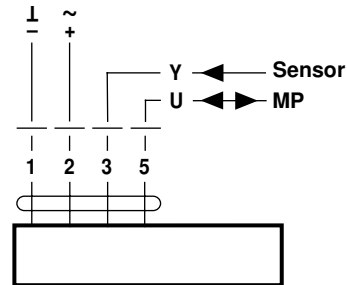
Wiring diagrams

AC/DC 24 V, modulating



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

Operation on the MP-Bus

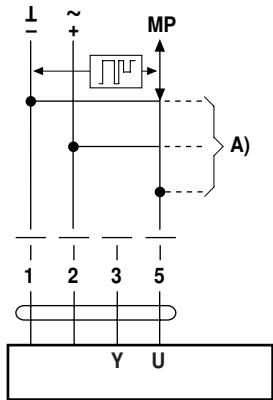


Cable colours:
 1 = black
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Functions

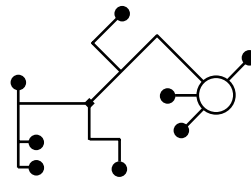
Functions when operated on MP-Bus

Connection on the MP-Bus



A) more actuators and sensors (max.8)

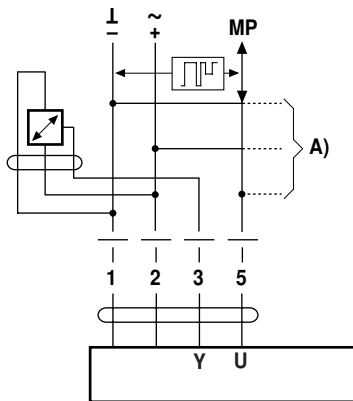
Power topology



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

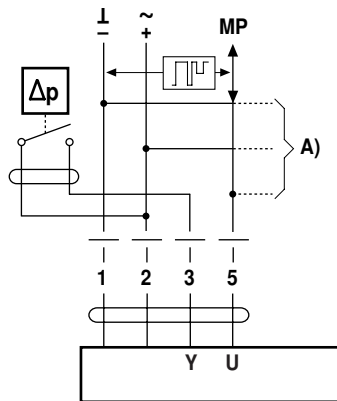
Connection of active sensors



A) more actuators and sensors (max.8)

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

Connection of external switching contact

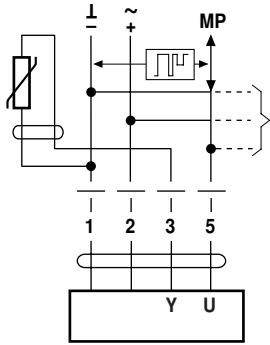


A) more actuators and sensors (max.8)

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

Functions

Connection of passive sensors

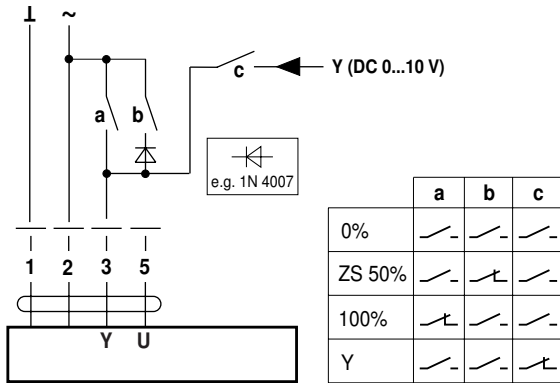


Ni1000	-28...+98 °C	850...1600 Ω ²⁾
PT1000	-35...+155 °C	850...1600 Ω ²⁾
NTC	-10...+160 °C ¹⁾	200 Ω...60 kΩ ²⁾

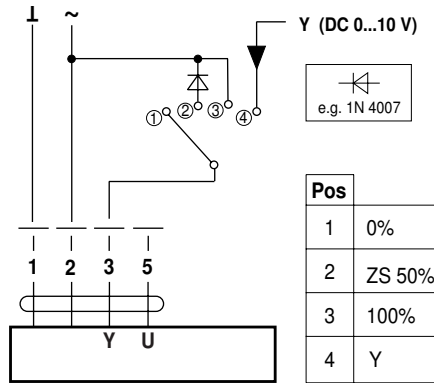
1) Depending on the type
2) Resolution 1 Ohm

Functions with basic values (only in conventional mode)

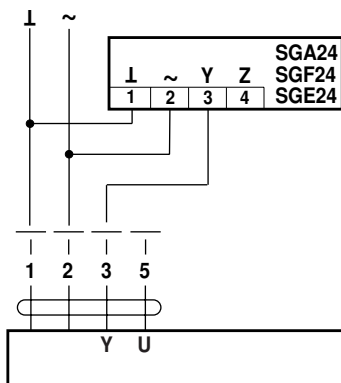
Override control with AC 24 V with relay contacts



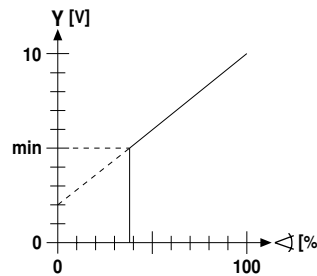
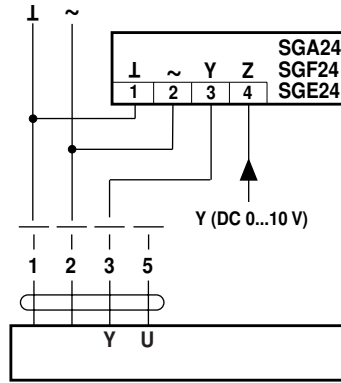
Override control with AC 24 V with rotary switch



Remote control 0...100% positioner SG..

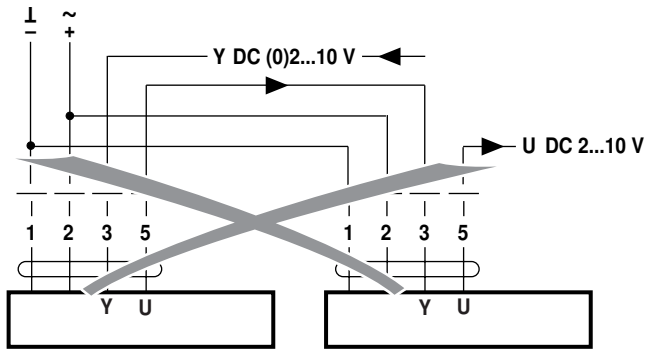


Minimum limit with positioner SG..

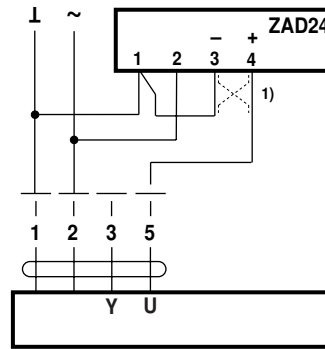


Functions

Follow-up control (position-dependent)

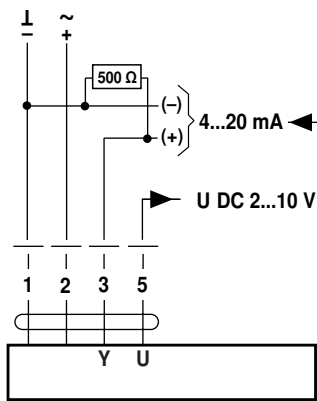


Position indication



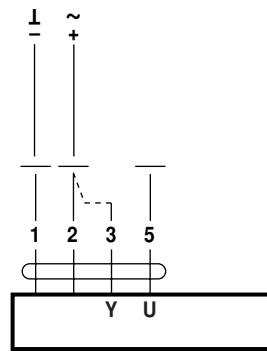
(1) Adapting the direction of rotation

Control with 4...20 mA via external resistor



Caution:
The operating range must be set to DC 2...10 V.
The 500 Ω resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V

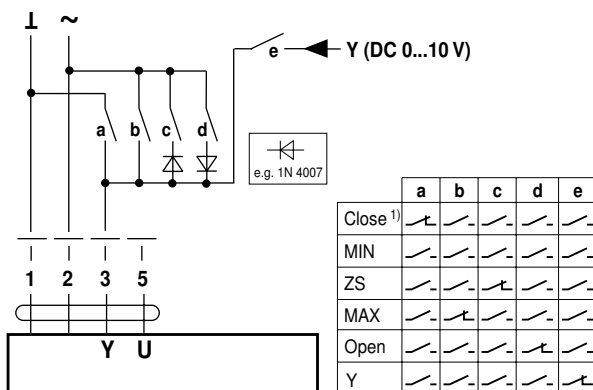
Functional check



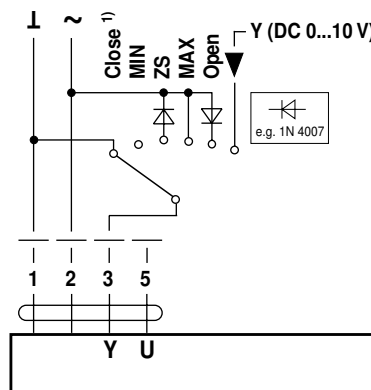
- Procedure
1. Connect 24V to connections 1 and 2
 2. Disconnect connection 3:
 - with direction of rotation 0: Actuator rotates to the left
 - with direction of rotation 1: Actuator rotates to the right
 3. Short-circuit connections 2 and 3:
 - Actuator runs in opposite direction

Functions for actuators with specific parameters (Parametrisation with PC-Tool necessary)

Override control and limiting with AC 24 V with relay contacts



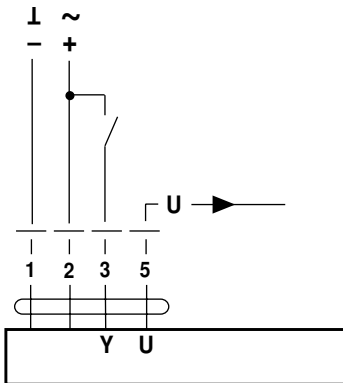
Override control and limiting with AC 24 V with rotary switch



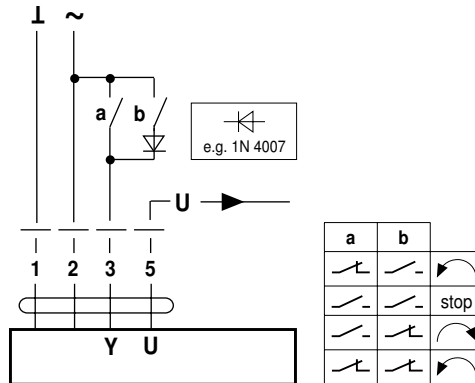
1) Caution: This function is only guaranteed if the start point of the operating range is defined as min. 0.6V.

Functions

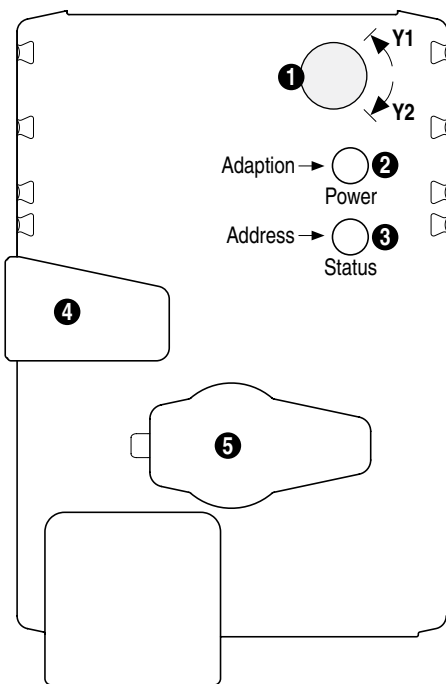
Control open-close



AC/DC 24 V, 3-point



Operating controls and indicators



1 Direction of rotation switch

Switch over: Direction of rotation changes

2 Push-button and LED display green

Off: No power supply or malfunction

On: In operation

Press button: Triggers angle of rotation adaption followed by standard operation

3 Push-button and LED display yellow

Off: Standard mode without MP bus

Flickering: MP communication active

On: Adaption or synchronising process active

Flashing: Addressing request sent to MP master

Press button: Acknowledgment of addressing

4 Gear disengagement button

Press button: Gear disengaged, motor stops, manual operation possible

Release button: Gear engaged, synchronisation starts, followed by standard operation

5 Service plug

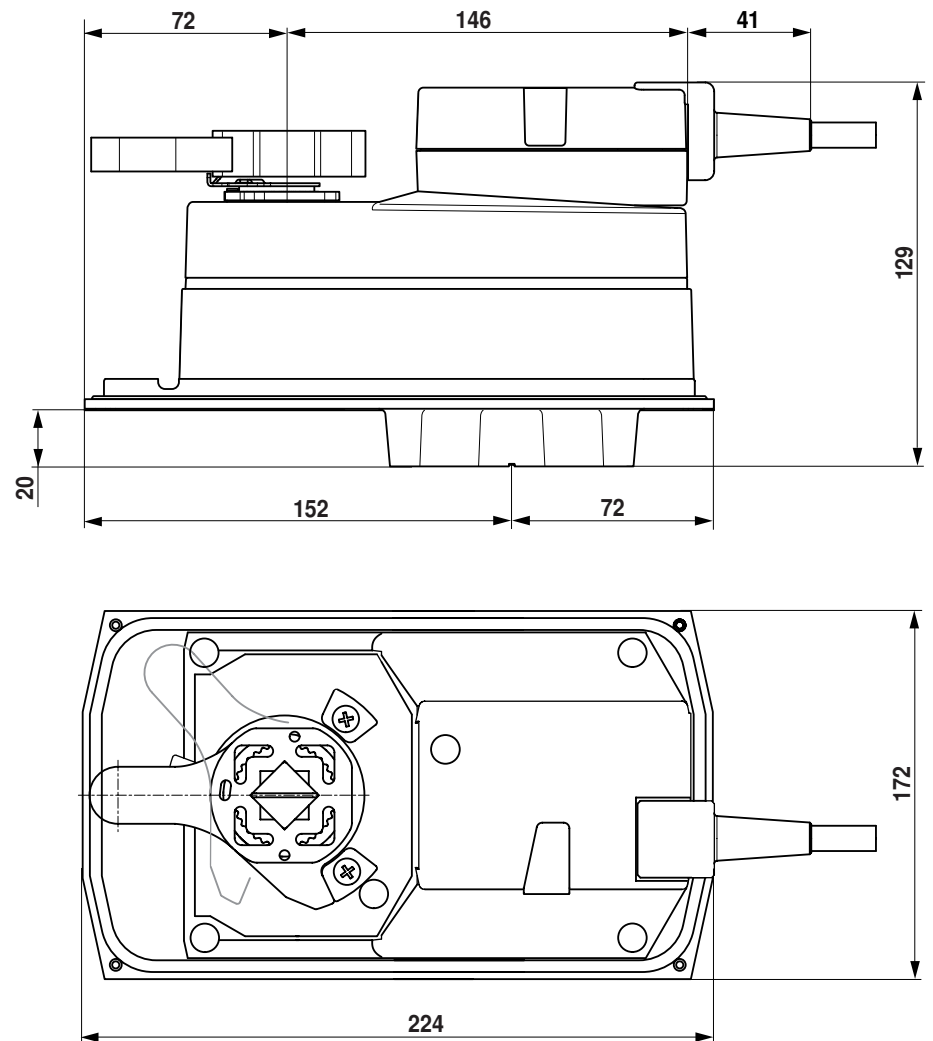
For connecting parameterising and service tools

Check power supply connection

2 Off and 3 On: Possible wiring error in power supply

Dimensions [mm]

Dimensional drawings



Further documentation

- Overview Valve-actuator combinations
- Data sheets for butterfly valves
- Installation instructions for actuators and/or butterfly valves
- General notes for project planning