

Modulating rotary actuator for rotary valves and butterfly valves

- Torque motor 40 Nm
- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V



Picture may differ from product

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	11 W
	Power consumption in rest position	3 W
	Power consumption for wire sizing	21 VA
	Inrush current (I _{max})	20.0 A @ 5 ms
	Connection supply / control	Terminals 1 m, 4x 0.75 mm ²
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	40 Nm
	Operating range Y	2...10 V
	Input impedance	100 kΩ
	Operating range Y variable	Start point 0.5...30 V End point 2.5...32 V
	Position feedback U	2...10 V
	Position feedback U note	Max. 0.5 mA
	Position feedback U variable	Start point 0.5...8 V End point 2.5...10 V
	Position accuracy	±5%
	Manual override	with push-button, can be locked
	Running time motor	150 s / 90°
	Running time motor variable	90...150 s
	Sound power level, motor	52 dB(A)
	Adaptation setting range	manual (automatic on first power-up)
	Position indication	Mechanical
Safety data	Protection class IEC/EN	III, Safety Extra-Low Voltage (SELV)
	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP66/67
	Degree of protection NEMA/UL	NEMA 4X
	Housing	UL Enclosure Type 4X
	EMC	CE according to 2014/30/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	UL Approval	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
	Type of action	Type 1
	Rated impulse voltage supply / control	0.8 kV

Technical data

Safety data	Pollution degree	3
	Ambient humidity	Max. 100% RH
	Ambient temperature	-30...50°C [-22...122°F]
	Storage temperature	-40...80°C [-40...176°F]
	Servicing	maintenance-free
Mechanical data	Connection flange	F05
Weight	Weight	2.9 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.
- Outdoor application: Only possible if no (sea) water, snow, ice, sunlight or aggressive gases act directly on the device and if it is ensured that the ambient conditions remain within the limit values specified in the data sheet at all times.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with 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 must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Fields of application	The actuator is particularly suitable for utilisation in outdoor applications and is protected against the following weather conditions: - UV radiation - Rain / Snow - Dirt / Dust - Air humidity - Alternating climate / frequent and severe temperature fluctuations (Recommendation: use the actuator with integrated factory-installed heating which can be ordered separately to prevent internal condensation)
Configurable device	The factory settings cover the most common applications. Single parameters can be modified with Belimo Assistant 2 or ZTH EU.
Simple direct mounting	Simple direct mounting on the rotary valve or butterfly valve with mounting flange. The mounting orientation in relation to the fitting can be selected in 90° steps.
Manual override	Manual control with push-button possible - temporary. The gear train is disengaged and the actuator decoupled for as long as the button is pressed.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Home position	The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out an adaptation, 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 control signal. Factory setting: Y2 (counter-clockwise rotation).

Product features

Adaptation and synchronisation An adaptation can be triggered manually by pressing the "Adaptation" button or with Belimo Assistant 2. Both mechanical end stops are detected during the adaptation (entire setting range).
Automatic synchronisation after pressing the manual override button is configured. The synchronisation is in the home position (0%).
The actuator then moves into the position defined by the control signal.
A range of settings can be made using Belimo Assistant 2.

Accessories

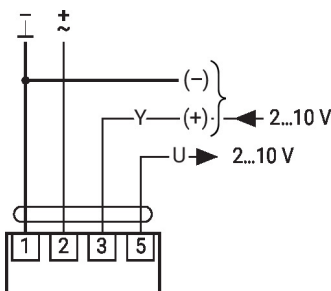
Tools	Description	Type
	Service tool, with ZIP-USB function, for configurable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH EU
	Service tool for wired and wireless setup, on-site operation and troubleshooting.	Belimo Assistant 2
	Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: 6-pin for connection to service socket	ZK1-GEN
	Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: free wire end for connection to MP/PP terminal	ZK2-GEN
	Belimo Assistant Link Bluetooth and USB to NFC and MP-Bus converter for configurable and communicative devices	LINK.10
Electrical accessories	Description	Type
	Auxiliary switch 1x SPDT add-on	S1A
	Auxiliary switch 2x SPDT add-on	S2A
	Feedback potentiometer 140 Ω add-on	P140A
	Feedback potentiometer 1 kΩ add-on	P1000A
	Feedback potentiometer 10 kΩ add-on	P10000A
Options ex works only	Description	Type
	Heater, with adjustable thermostat	HT24-MG
	Heater, with mechanical humidistat	HH24-MG

Electrical installation



Supply from isolating transformer.
Parallel connection of other actuators possible. Observe the performance data.
Direction of rotation switch Factory setting: Direction of rotation Y2.

AC/DC 24 V, modulating

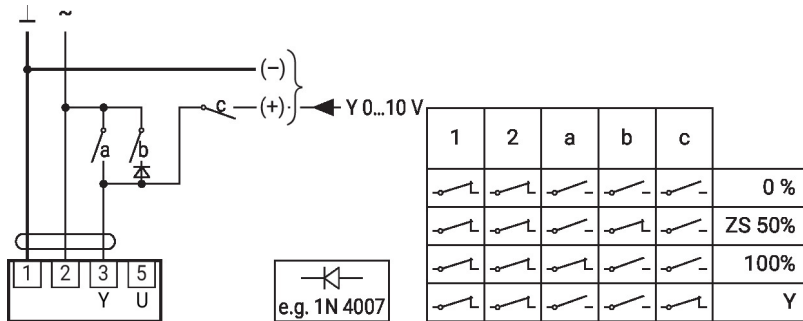


Y2	
	A - AB = 100%

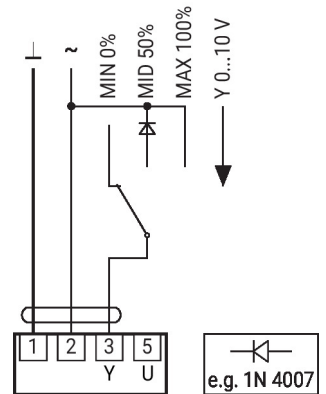
Further electrical installations

Functions with basic values (conventional mode)

Override control with AC 24 V with relay contacts

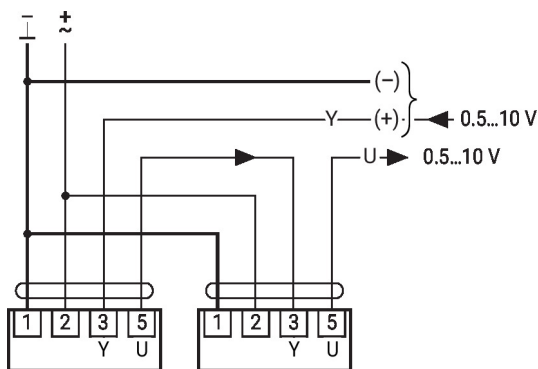
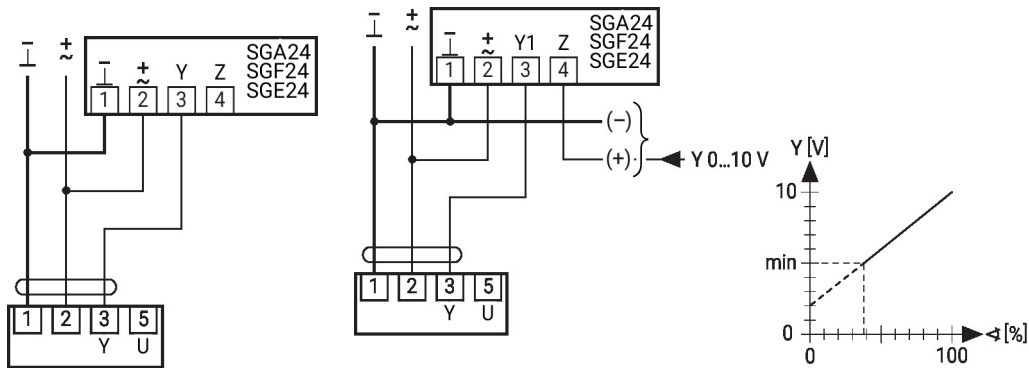


Override control with AC 24 V with rotary switch

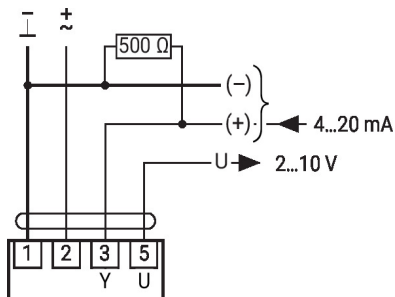


Control remotely 0...100% with positioner SG..

Minimum limit with positioner SG..



Control with 4...20 mA via external resistor



Caution:

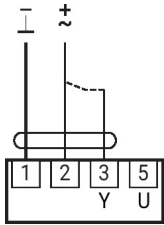
The operating range must be set to DC 2...10 V.

The 500 Ohm resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V.

Further electrical installations

Functions with basic values (conventional mode)

Functional check

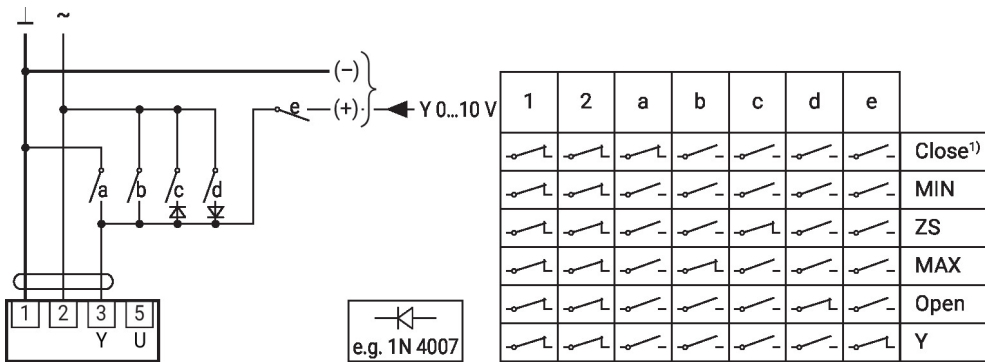


Procedure

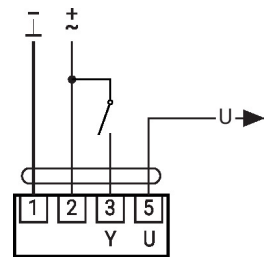
1. Connect 24 V to connections 1 and 2
2. Disconnect connection 3:
 - with direction of rotation L: Actuator rotates to the left
 - with direction of rotation R: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
 - Actuator runs in opposite direction

Functions with specific parameters (configuration necessary)

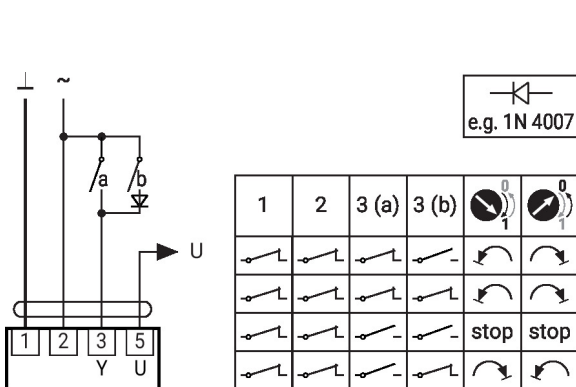
Override control and limiting with AC 24 V with relay contacts



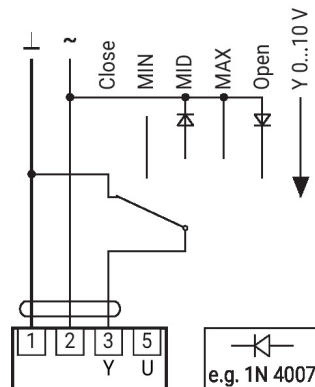
Control open/close



Control 3-point with AC 24 V

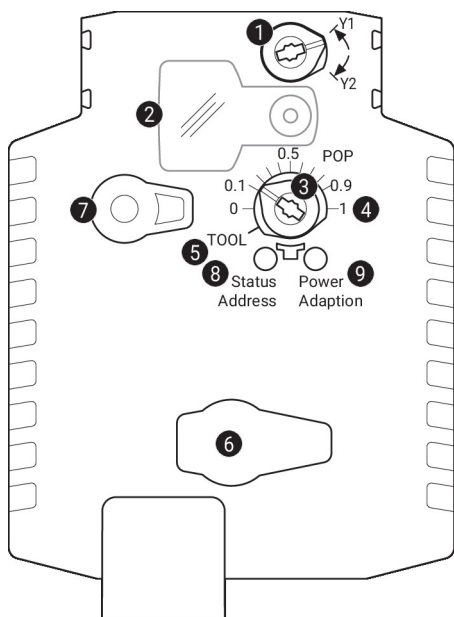


Override control and limiting with AC 24 V with rotary switch



Caution:
The "Close" function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

Operating controls and indicators


1 Direction-of-rotation switch

Switch over: Direction of rotation changes

2 Cover, POP button

3 POP button

4 Scale for manual adjustment

5 Position for adjustment with tool

6 Service plug

For connecting configuration and service tools

7 Manual override button

Press button: Gear train disengages, motor stops, manual override possible

Release button: Gear train engages, standard mode

9 Push-button (LED green)

Press button: Triggers angle-of-rotation adaptation, followed by standard mode

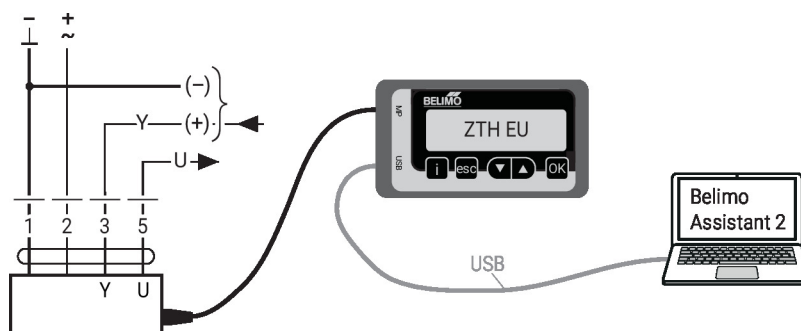
LED displays

yellow 8	green 9	Meaning / function
Off	On	Operation OK
Off	Flashing	POP function active
On	Off	Fault
Off	Off	Not in operation
On	On	Adaptation or synchronisation process active
Flickering	On	Communication with programming tool

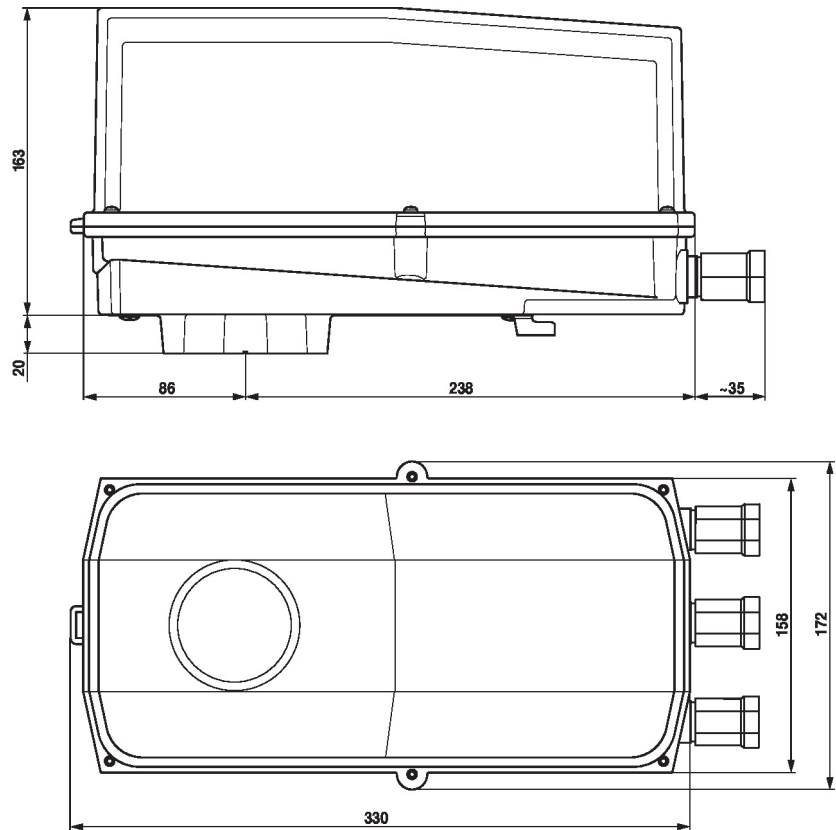
Service

Wired connection The device can be configured by ZTH EU via the service socket.
For an extended configuration, Belimo Assistant 2 can be connected.

Connection ZTH EU / Belimo Assistant 2



Dimensions



Further documentation

- The complete product range for water applications
- Data sheets for rotary valves and butterfly valves
- Installation instructions for actuators and/or rotary valves and butterfly valves
- General notes for project planning
- Quick Guide – Belimo Assistant 2