Proportional, Non-Spring Return, 24 V, Cloud, BACnet/IP, Modbus TCP

• Cloud capable and communicative rotary actuator for ball valves
• Torque motor 45 in-lb [5 Nm]
• Nominal voltage AC/DC 24 V
• Control modulating, Cloud, communicative, Hybrid
• Conversion of sensor signals
• Ethernet 10/100 Mbit/s, TCP/IP, integrated web server
• Communication via BACnet IP, Modbus TCP and Cloud

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	4 W
	Power consumption in rest position	3 W
	Power consumption for wire sizing	6 VA
	Transformer sizing	4.5 VA (class 2 power source)
	Connection supply / control	cable 3 ft. [1 m], 6 x 0.5 mm²
	Parallel operation	Yes (note the performance data)
	Electrical Connection	18 GA appliance cable, 1/2" conduit connector and RJ45 socket (ethernet)
	Overload Protection	electronic thoughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional Data	Torque motor	45 in-lb [5 Nm]
	Communicative control	Cloud BACnet IP Modbus TCP
	Operating range Y	2...10 V
	Control operating range Y note	Hybrid via 2...10 V
	Operating range Y variable	0.5...10 V
	Position accuracy	±5%
	Direction of motion motor	selectable with switch 0/1
	Manual override	external push button
	Running Time (Motor)	default 150 s, variable 70...220 s
	Running time motor variable	70...220 s
	Adaptation Setting Range	manual
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety Data	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)
	Degree of protection IEC/EN	IP54

Degree of protection note	IP54 when using protective cap or protective grommet for RJ45 socket
Degree of protection NEMA/UL	NEMA 1
Enclosure	UL Enclosure Type 1
EMC	CE according to 2014/30/EU
Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU
Quality Standard	ISO 9001
Mode of operation	Type 1
Rated impulse voltage supply / control	0.8 kV
Ambient temperature	-22...122°F [-30...50°C]
Storage temperature	-40...176°F [-40...80°C]
Ambient humidity	max. 95% r.H., non-condensing
Servicing	maintenance-free
Weight Weight	4.8 lb [2.2 kg]
Materials Housing material	UL94-5VA

Safety notes

⚠

- The device must not be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea) water, snow, ice, insolation or aggressive gases interfere directly with the actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- 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.
- Cables must not be removed from the device.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section, the design, the installation site and the ventilation conditions must be observed.
- 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.
- Cable for ZTH US to actuators w/o diagnostics socket.

Product features

Mode of operation
The actuator is controlled via the Cloud, BACnet IP or Modbus TCP and drives to the position defined by the control signal. Various data points can be written and read via the same interfaces.

Hybrid mode:

The actuator receives its analog control signal from the higher level controller and drives to the position defined. Using the Cloud, BACnet IP or Modbus TCP, various data points can be read and with the exception of the control signal written.

Converter for sensors
Connection option for two sensors (passive sensor, active sensor or switching contact). The actuator serves as an analogue/digital converter for the transmission of the sensor signal to the higher level system.

Communication
The configuration can be carried out through the integrated web server (RJ45 connection to the web browser), by communicative means or via the Cloud.

Additional information regarding the integrated web server can be found in the separate documentation.

"Peer to Peer" connection
http://belimo.local:8080
The Notebook must be set to "DHCP".
Make sure that only one network connection is active.
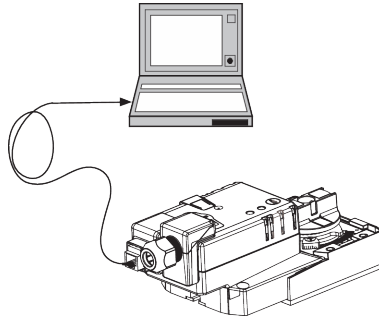**Standard IP address:**
http://192.168.0.10:8080
Static IP address
Password (read-only):
User name: «guest»
Password: «guest»

Positioning signal inversion	This can be inverted in cases of control with an analogue positioning signal. The inversion causes the reversal of the standard behaviour, i.e. for control signal 0%, the actuator is opened to max and for control signal 100%, the actuator is closed.
Simple direct mounting	Simple direct mounting on the damper shaft with a universal shaft clamp, supplied with an anti-rotation device to prevent the actuator from rotating.
Data recording	The recorded data (integrated data recording for 13 months) can be used for analytical purposes. Download csv files via web browser.
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 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 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.
Adaptation 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). The actuator then moves into the position defined by the positioning signal.

Accessories

Sähköiset lisävarusteet	Kuvaus	Tyyppi
	Grommet for RJ connection module, 50 pcs.	Z-STRJ.1
	Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: 6-pin for connection to service socket	ZK1-GEN

| Ohjemointityökalut, lisävarusteet	Kuvaus	Tyyppi
	Service Tool, with ZIP-USB function, for configurable and communicative Belimo actuators / VAV controller and HVAC performance devices	ZTH EU

Electrical installation

⚠ Connection via safety isolating transformer.

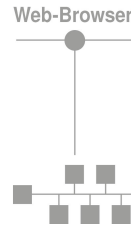Parallel power connection of additional actuators is possible. Observe the transformer size and performance data.

Wiring diagrams

AC/DC 24 V

TCP/IP
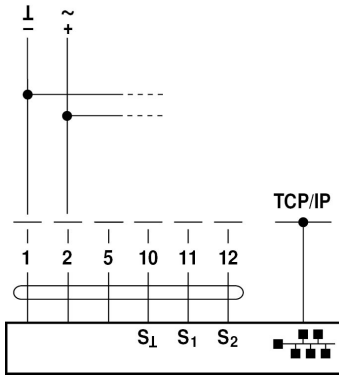
Cable colors:
1 = black
2 = red
5 = orange
10 = yellow-black
11 = yellow-pink
12 = yellow-grey

Web-Browser

Connection of a notebook for parameterisation and manual control via RJ45.

Optional connection via RJ45 (direct connection Notebook / connection via Intranet or Internet) for access to the integrated web server
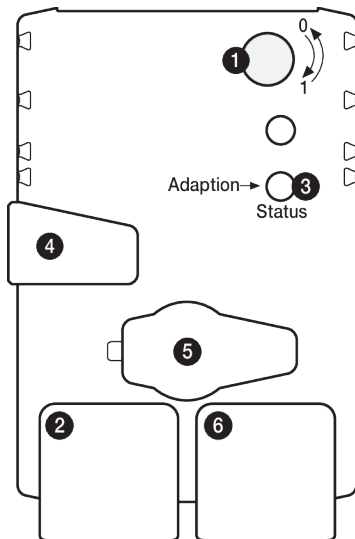
Functions

The connection diagrams shows connections for the first sensor on terminal S1, while the second sensor can be connected identically on terminal S2.

Parallel use of different sensor types is permitted.

For hybrid operation, S1 is used for the control signal Y and must be configured as an active sensor.

Operating controls and indicators

1 Direction of rotation switch
Switch: Direction of rotation changes

2 LED display green
Off: No power supply or wiring errors
On: Actuator starts operation
Flickering: In operation

3 Push-button and LED display orange
Off: Standard mode
On: Adaptation or synchronising process active
Press button: Triggers angle of rotation adaptation, followed by standard mode

4 Gear disengagement button
Press button: Gear disengages, motor stops, manual override possible
Release button: Gear engages, synchronization starts, followed by standard control mode

5 Service plug
Not used in this product

6 RJ45 socket
For the connection of TCP/IP (Cloud), BACnet/IP, and Modbus TCP

Dimensions

Dimensional drawings

⌀ 1/4" to 3/4" [6 to 20]
□ 5/16" to 3/4" [8 to 26]

2.34" [59.4]
3.47" [88]
0.86" [22]
4.57" [116]
2" [50.8]

2.6" [66]
7.43" [188.7]