

Cloud capable and communicative damper actuator for adjusting dampers in technical building installations

- Torque motor 45 in-lb [5 Nm]
- Nominal voltage AC/DC 24 V
- Control modulating, Cloud, communicative, Hybrid
- Conversion of sensor signals
- 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...26.4 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)
	Electrical Connection	18 GA appliance cable, 1/2" conduit connector and RJ45 socket (ethernet)
	Overload Protection	electronic throughout 0...95° rotation
Functional data	Torque motor	45 in-lb [5 Nm]
	Communicative control	Cloud BACnet IP Modbus TCP
	Operating range Y	2...10 V
	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
	Angle of rotation	Max. 95°, adjustable with mechanical stop
	Angle of rotation note	adjustable with mechanical stop
	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, 30...65 mm stroke	
Safety data	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 1 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; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
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	1.5 lb [0.68 kg]
Materials	
Housing material	UL94-5VA

Product features

- Application** For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.
- The actuator is controlled via the Belimo Cloud, BACnet/IP or Modbus TCP and drives to the position defined by the control variable. Multiple data points can be written and read via the control interface.
- Local control mode: the actuator receives an analog control signal from a conventional controller and drives to the control position. In addition, using the Belimo Cloud, BACnet/IP or Modbus TCP, various data points can be read and with the exception of the control signal written to the actuator. This Belimo Cloud connected damper actuator has two universal sensor inputs ready for your innovative HVAC applications.
- The two universal sensor inputs (passive, active, or contact) serve as an analogue/digital converter for the digital transmission of the sensor value to a higher level system. Selecting the sensor type is accomplished via connection to the integrated web server (RJ45 connection to the web browser) or directly via the Belimo Cloud. The actuators performance and sensor data is recorded locally with 13 months of storage. This data can be used for analytical purposes, downloaded via csv files, or used in your HVAC application.
- Mode of operation** The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.
- The LMB(X) series provides 95° of rotation and a visual indicator indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be manually disengaged with a button on the actuator cover.
- The LMB(X) actuators use a brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuator's rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in holding mode.
- Add-on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions.
- Converter for sensors** Connection option for two sensors (passive sensor, active sensor or switching contact). The actuator serves as an analog/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.
- Positioning signal inversion** This can be inverted in cases of control with an analog positioning signal. The inversion causes the reversal of the standard behavior, i.e. for control signal 0%, the actuator is opened to max and for control signal 100%, the actuator is closed.

Application	<p>For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.</p> <p>The actuator is controlled via the Belimo Cloud, BACnet/IP or Modbus TCP and drives to the position defined by the control variable. Multiple data points can be written and read via the control interface.</p> <p>Local control mode: the actuator receives an analog control signal from a conventional controller and drives to the control position. In addition, using the Belimo Cloud, BACnet/IP or Modbus TCP, various data points can be read and with the exception of the control signal written to the actuator. This Belimo Cloud connected damper actuator has two universal sensor inputs ready for your innovative HVAC applications.</p> <p>The two universal sensor inputs (passive, active, or contact) serve as an analogue/digital converter for the digital transmission of the sensor value to a higher level system. Selecting the sensor type is accomplished via connection to the integrated web server (RJ45 connection to the web browser) or directly via the Belimo Cloud. The actuators performance and sensor data is recorded locally with 13 months of storage. This data can be used for analytical purposes, downloaded via csv files, or used in your HVAC application.</p>
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 revolving.
Data recording	<p>The recorded data (integrated data recording for 13 months) can be used for analytical purposes.</p> <p>Download csv files via web browser.</p>
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	<p>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.</p> <p>The actuator then moves into the position defined by the positioning signal.</p>
Adaptation and synchronisation	An adaption can be triggered manually by pressing the "Adaption" button. Both mechanical end stops are detected during adaption for setting the mechanical working range. The actuators operating range and runtime are scaled to this working range.

Accessories

Electrical accessories	Description	Type
	Cable Gland (NEMA 4 models)	43442-00001
	Battery, 12 V, 1.2 Ah (two required)	NSV-BAT
	Battery backup system, for non-spring return models	NSV24 US
	Feedback potentiometer 10 kΩ add-on, grey	P10000A GR
	Feedback potentiometer 1 kΩ add-on, grey	P1000A GR
	Feedback potentiometer 140 Ω add-on, grey	P140A GR
	Feedback potentiometer 15 kΩ gray	P15000A-F GR
	Feedback potentiometer 2.8 kΩ add-on, grey	P2800A GR
	Auxiliary switch, mercury-free	P475
	Auxiliary switch, mercury-free	P475-1
	Feedback potentiometer 5 kΩ add-on, grey	P5000A GR
	Feedback potentiometer 500 Ω add-on, grey	P500A GR
	Auxiliary switch 1 x SPDT add-on	S1A
	Auxiliary switch 2 x SPDT add-on	S2A
	Positioner for wall mounting	SGA24
	Positioner for front-panel mounting	SGF24
	Cable Conduit Connector 1/2"	TF-CC US
	Resistor, 500 Ω, 1/4" wire resistor with 6" pigtail wires	ZG-R01
	Transformer, AC 120 V to AC 24 V, 40 VA	ZG-X40
Mechanical accessories	Description	Type

Shaft extension 170 mm Ø10 mm for damper shaft Ø 6...16 mm	AV6-20
Shaft extension 240 mm Ø20 mm for damper shaft Ø 8...22.7 mm	AV8-25
LMB(X) clamp (3/8")	K-LM10
LMB(X) clamp (1/2").	K-LM12
Standard LMB(X) clamp (5/8").	K-LM16
LMB(X) clamp (3/4").	K-LM20
Ball joint suitable for damper crank arm KH8 / KH10	KG10A
Ball joint suitable for damper crank arm KH8	KG6
Ball joint suitable for damper crank arm KH8	KG8
Damper crank arm Slot width 8.2 mm, clamping range Ø14...25 mm	KH10
Damper crank arm Slot width 8.2 mm, for Ø1.05"	KH12
Damper crank arm Slot width 6.2 mm, clamping range Ø10...18 mm	KH6
Damper crank arm Slot width 8.2 mm, clamping range Ø10...18 mm	KH8
Signal Simulator, Power supply AC 230 V	PS-100
Push rod for KG10A ball joint (36" L, 3/8" diameter).	SH10
Push rod for KG6 & KG8 ball joints (36" L, 5/16" diameter).	SH8
Anti-rotation bracket TF/NKQ/AM/NM/LM.	TF-P
Wrench 8 mm and 10 mm	TOOL-06
Adapter for auxiliary switch and feedback potentiometer	Z-SPA
17" Mounting Bracket for AF,NF,GM,AM,SM	ZG-100
Mounting Bracket: AF,NF,LF,GM,AM,NM,SM	ZG-101
Damper clip for damper blade, 3.5" width.	ZG-DC1
Damper clip for damper blade, 6" width.	ZG-DC2
Shaft extension for 1/2" diameter shafts (3" L).	ZG-LMSA
Shaft extension for 3/8" diameter shafts (4" L).	ZG-LMSA-1
Shaft extension for 1/2" diameter shafts (5" L).	ZG-LMSA-1/2-5
Mounting plate for SGF.	ZG-SGF
Weather shield 13x8x6" [330x203x152 mm] (LxWxH)	ZS-100
Base Plate, for ZS-100	ZS-101
Weather shield 16x8-3/8x4" [406x213x102 mm] (LxWxH)	ZS-150

Electrical installation

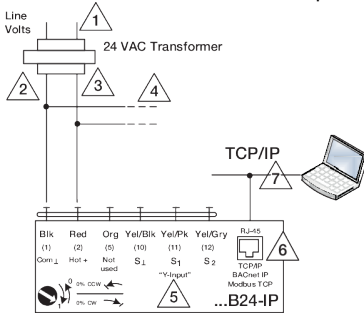


Connection via safety isolating transformer.

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

Wiring diagrams

Initial ethernet connection and set-up



Cable colors:

- 1 = black
- 2 = red
- 5 = orange
- 10 = yellow-black
- 11 = yellow-pink
- 12 = yellow-grey

Functions



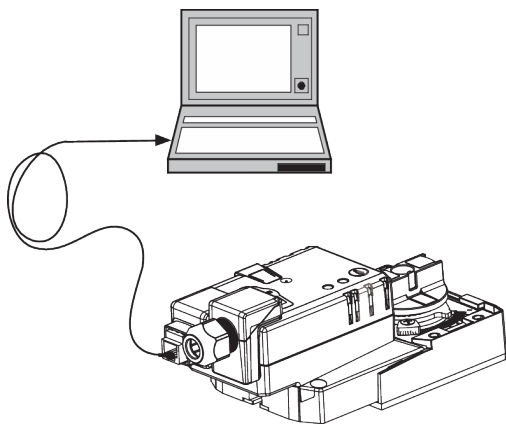
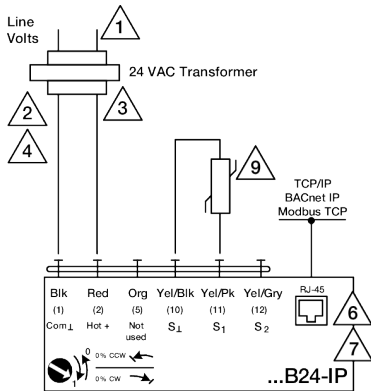
The connection diagrams shows connections for the first sensor on terminal S1, while the second sensor can be connected identically on terminal S2.

Parallel use of different sensor types is permitted.

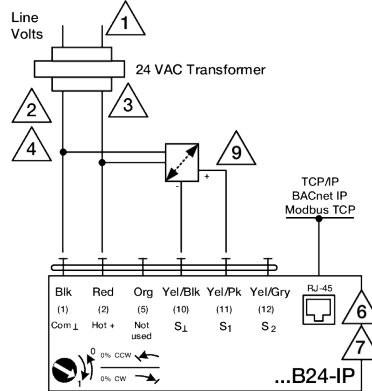
For hybrid operation, S1 is used for the control signal Y and must be configured as an active sensor.

Functions for actuators with specific parameters (NFC)

Connection of passive sensor



Connection of active sensor



"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

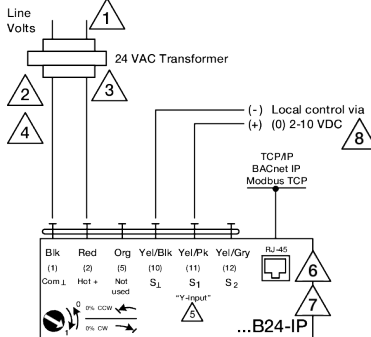
Password (read-only):

User name: «guest»

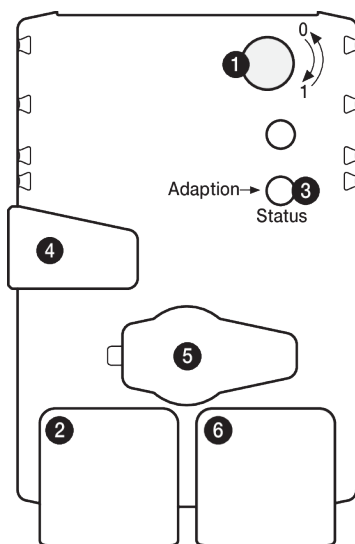
Password: «guest»

Local analog control or analog override with Belimo Cloud (TCP/IP), BACnet IP, or Modbus TCP connection

Local analog control or analog override with Belimo Cloud (TCP/IP), BACnet IP, or Modbus TCP connection



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]

