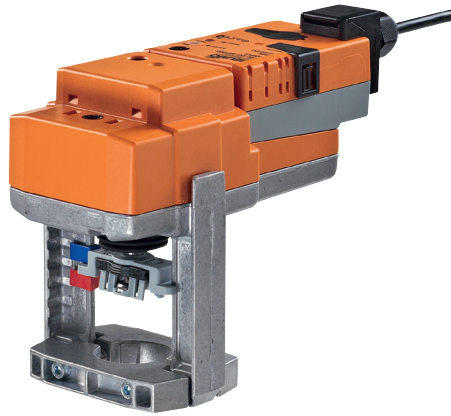# BELIMO

Communication-capable globe valve actuator for 2-way and 3-way globe valves

- Actuating force 1000 N
- Nominal voltage AC/DC 24 V
- Control modulating DC (0) 0.5 V...10 V, variable
- Nominal stroke 20 mm
- Actuating time 35 s / 20 mm

MP BUS

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	3.5 W
	Power consumption in rest position	1.5 W
	Power consumption for wire sizing	5.5 VA
	Connection supply / control	Terminals 4 mm² and cable 1 m, 4 x 0.75 mm²
	Parallel operation	Yes
Functional data	Actuating force	1000 N
	Positioning signal Y	DC 0...10 V
	Positioning signal Y note	Input impedance 100 kΩ
	Operating range Y	DC 0.5...10 V
	Operating range Y variable	Start point DC 0.5 ... 30V End point DC 2.5 ... 32V
	Position feedback U	DC 0.5...10 V
	Position feedback U note	max. 0.5 mA
	Position feedback U variable	Start point DC 0.5 ... 8V End point DC 2.5 ... 10V
	Position accuracy	5% absolute
	Manual override	Gear disengagement with push-button, can be locked
	Nominal stroke	20 mm
	Actuating time	35 s / 20 mm
	Override control MAX (maximum position)	100 %
	Override control MIN (minimum position)	0 %
	Override control ZS (intermediate position, only AC)	50 %
	Override control ZS variable	ZS = MIN ... MAX
	Sound power level motor max.	60 dB (A)
	Position indication	Mechanical 5 … 20 mm stroke
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Degree of protection IEC/EN	IP54
	EMC	CE in accordance with 2004/108/EC
	Certification IEC/EN	Certified to: IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	0°C ... 50°C
	Non-operating temperature	-40°C ... 80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight approx.	1.360 kg

Safety notes

⚠️

- This actuator has been designed for application 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 with during installation.
- The switch for changing the direction of motion/the closing point may be adjusted only by authorised personnel. The direction of stroke is critical, particularly in connection with frost protection circuits.
- 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 is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Principle of 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.
Adjustable-parameter 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-GEN.
Direct mounting	Simple direct mounting on the globe valve by means of form-fit hollow clamping jaws. The actuator can be rotated by 360° on the valve neck.
Manual override	Manual override with push-button possible - temporary, permanently. The gear is disengaged and the actuator decoupled for as long as the button is pressed / latched. The stroke can be adjusted by using a hexagon socket screw key (4 mm), which is inserted into the top of the actuator. The stroke spindle extends when the key is rotated clockwise.
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Combination valve/actuator	Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.
Position indication	The stroke is indicated mechanically on the bracket with tabs. The stroke range adjusts itself automatically during operation.
Home position	Setting ex-works: Actuator spindle is retracted. When valve-actuator combinations are shipped, the direction of motion is set in accordance with the closing point of the valve.
Direction of stroke switch	When actuated, the direction of stroke switch changes the running direction in normal operation.
Adaption of stroke range	The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out a stroke adaption, which is when the operating range and position feedback adjust themselves to the mechanical stroke. Manual triggering of the adaption can be carried out by pressing the "Adaption" button or with the PC-Tool. The actuator then moves into the position defined by the positioning signal.

Accessories

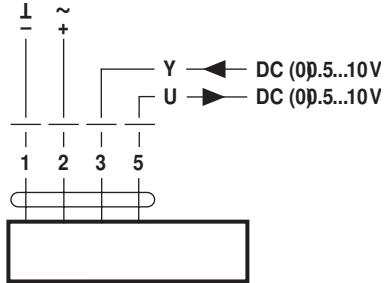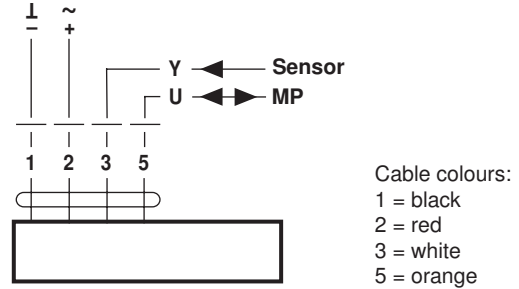|	Description	Type
Electrical accessories	Auxiliary switch add-on, 2 x SPDT	S2A-H
Service tools	Manual parameterizing device, for MF/MP/Modbus/LonWorks actuators and VAV-Control	ZTH-GEN
	Belimo PC-Tool, software for adjustments and diagnostics	MFT-P

Electrical installation

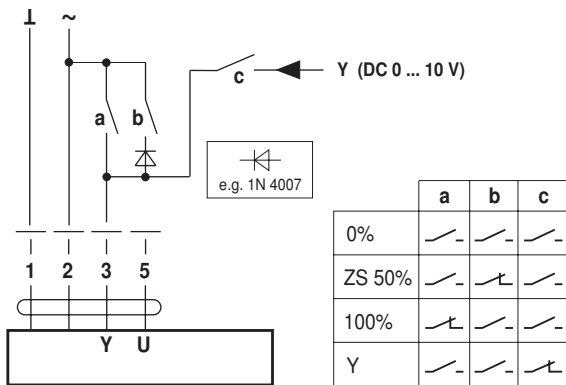| ⚠	**Notes**	• Connection via safety isolating transformer. • Parallel connection of other actuators possible. • Direction of stroke switch factory setting: Actuator spindle retracted.

Wiring diagrams

AC/DC 24V, modulating

Y ◄— DC (0)0.5...10 V
U —► DC (0)0.5...10 V

1 2 3 5

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

Operation on the MP bus

Y ◄— Sensor
U ◄—► MP

1 2 3 5

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

Functions

Functions with basic values

Override control with AC 24V with relay contacts

c ◄— Y (DC 0 ... 10 V)

a b

e.g. 1N 4007

1 2 3 5

Y U

	a	b	c
0%	╱	╱	╱
ZS 50%	╱	╱	╱
100%	╱	╱	╱
Y	╱	╱	╱

Override control with AC 24V with rotary switch

Y (DC 0 ... 10 V)

① ② ③ ④

e.g. 1N 4007

1 2 3 5

Y U

Pos	
1	0%
2	ZS 50%
3	100%
4	Y

Remote control 0 ... 100%

⊥	~	Y	Z	SGA24 SGF24 SGE24
1	2	3	4	

1 2 3 5

Y U
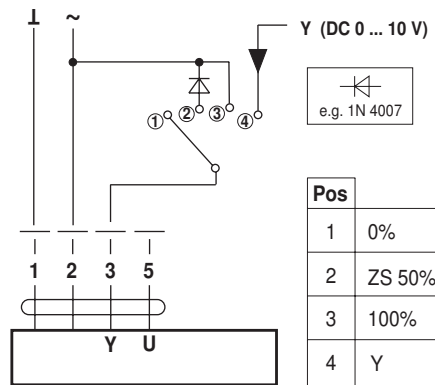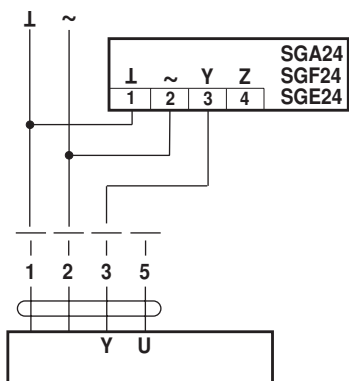
Follow-up control (position-dependent)

U DC 0.5...10 V ◄—

U DC 0.5...10 V ►

1 2 3 5   1 2 3 5

Y U   Y U
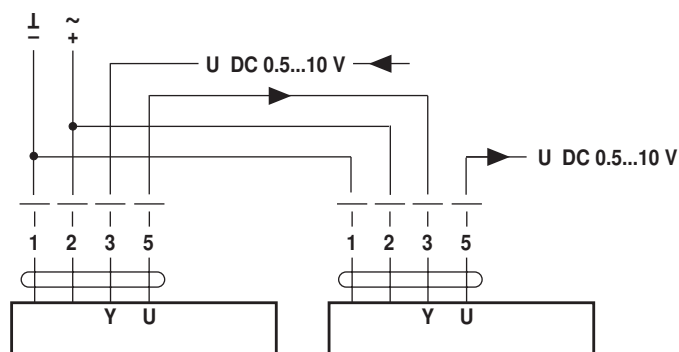
Functions

Control with 4 ... 20 mA via external resistor
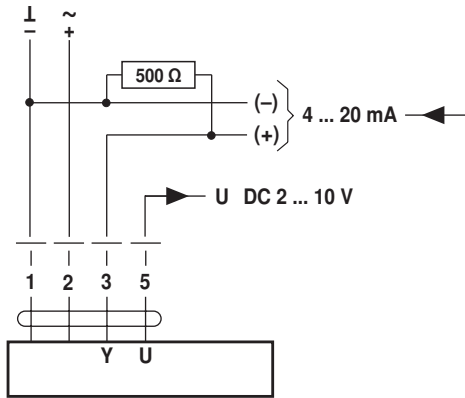
The 500 Ω resistor converts the 4 ... 20 mA current signal to a voltage signal DC 2 ... 10 V

Functions for actuators with specific parameters

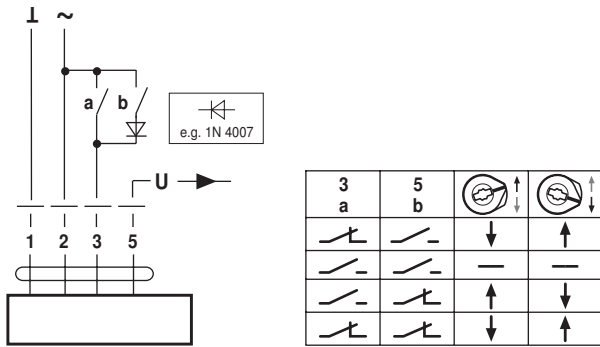**Override control and limiting with AC 24V with relay contacts**

	a	b	c	d	e
OFF [1]					
MIN					
ZS					
MAX					
ON					
Y					
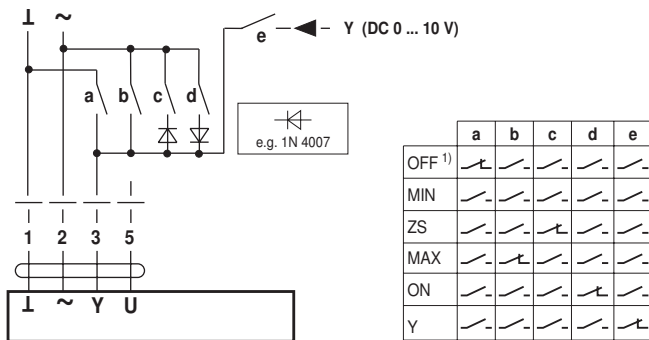
Override control and limiting with AC 24V with rotary switch
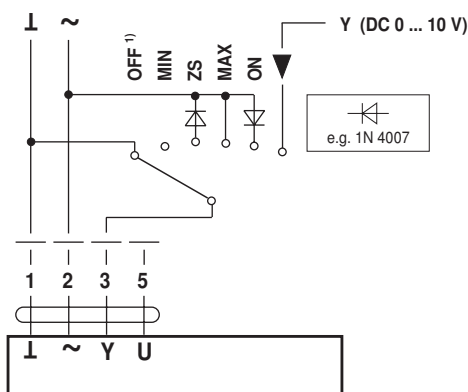
1) Caution: This function is guaranteed only if the start point of the operating range is defined as min. 0.6V.

Functions

AC 24V; 3-point

3 a	5 b	↑ ↓	↑ ↓
⊥	/	↓	↑
/	/	—	—
/	⊥	↑	↓
⊥	⊥	↓	↑

Functions when operated on MP bus

Connection on the MP bus
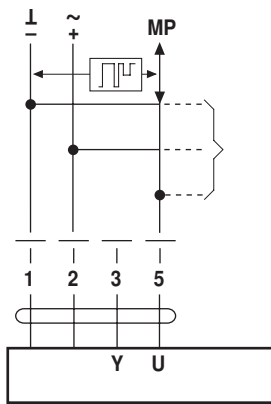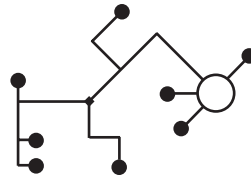
Supply and communication in
one and the same 3-wire cable
• no shielding or twisting required
• no terminating resister required

Power topology

There are no restrictions for the
network topology (star, ring, tree
or mixed forms are permitted).

Connection of active sensors
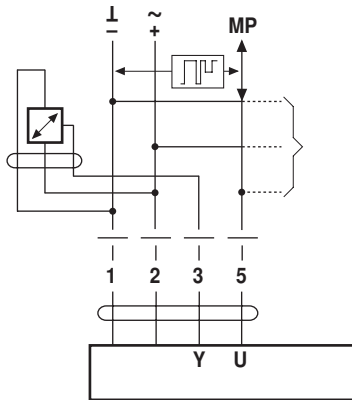
• Supply AC/DC 24 A
• Output signal DC 0 ... 10V
(max. DC 0 ... 32V)
• Resolution 30 mV

Connection of external switching contact
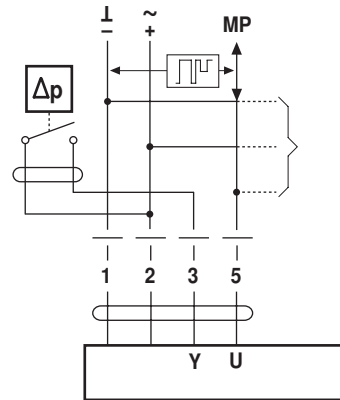
• Switching current 16 mA @ 24V
• Start point of the operating
range must be parameterised on
the MP actuator as ≥ 0.6V

Connection of passive sensors
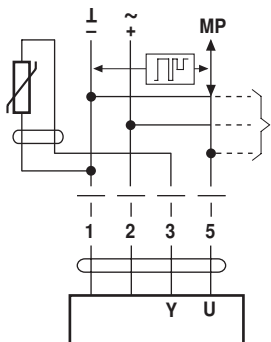
Ni1000	−28 ... +98°C	850 ... 1600 Ω [2]
PT1000	−35 ... +155°C	850 ... 1600 Ω [2]
NTC	−10 ... +160°C [1]	200 Ω ... 50 kΩ [2]

1) Depending on the type
2) Resolution 1 Ohm

Indicators and operating controls
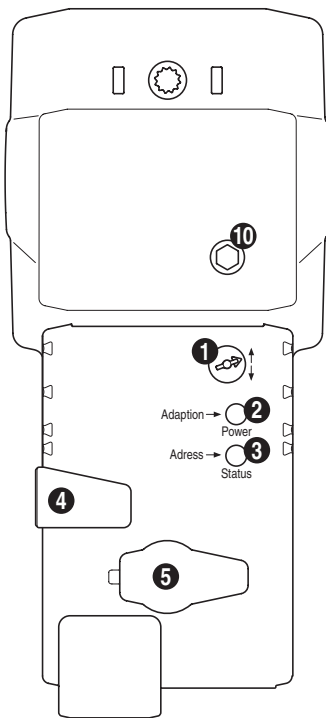
(1) Direction of stroke switch
Switching: Direction of stroke changes

(2) Push-button and LED display green
Off: No power supply or malfunction
Illuminated in green: In operation
Press button: Triggers stroke adaption, followed by standard mode

(3) Push-button and LED display yellow
Off: Standard mode
Flickering: MP communication active
Illuminated: Adaption procedure active
Blinking: Request for addressing from MP master
Press button: Confirmation of addressing

(4) Gear disengagement button
Press button: Gear disengages, motor stops, manual override possible
Release button: Gear engages, standard mode

(5) Service plug
For connecting the parameterisation and service tools

(10) Manual override
Clockwise: Actuator spindle extends
Counterclockwise: Actuator spindle retracts

LED displays (2, green) and (3, yellow)
green: Off; yellow: Illuminated;
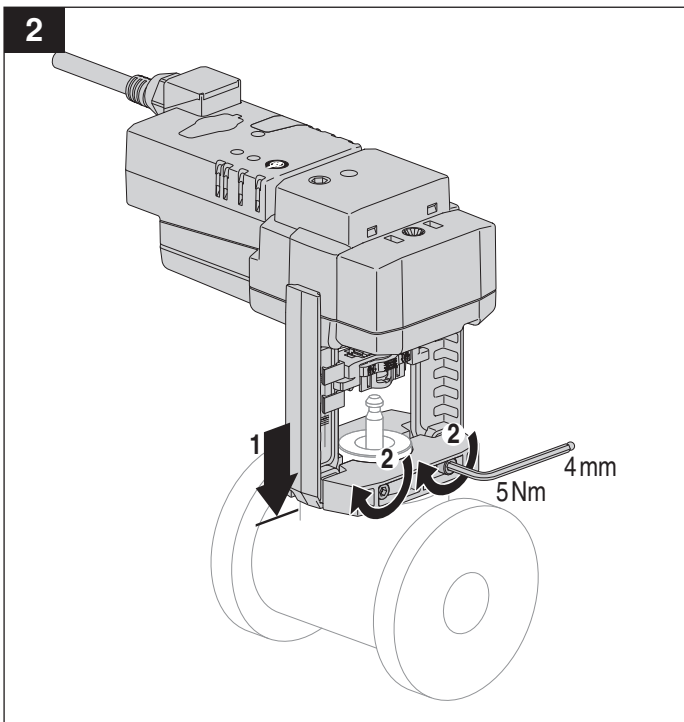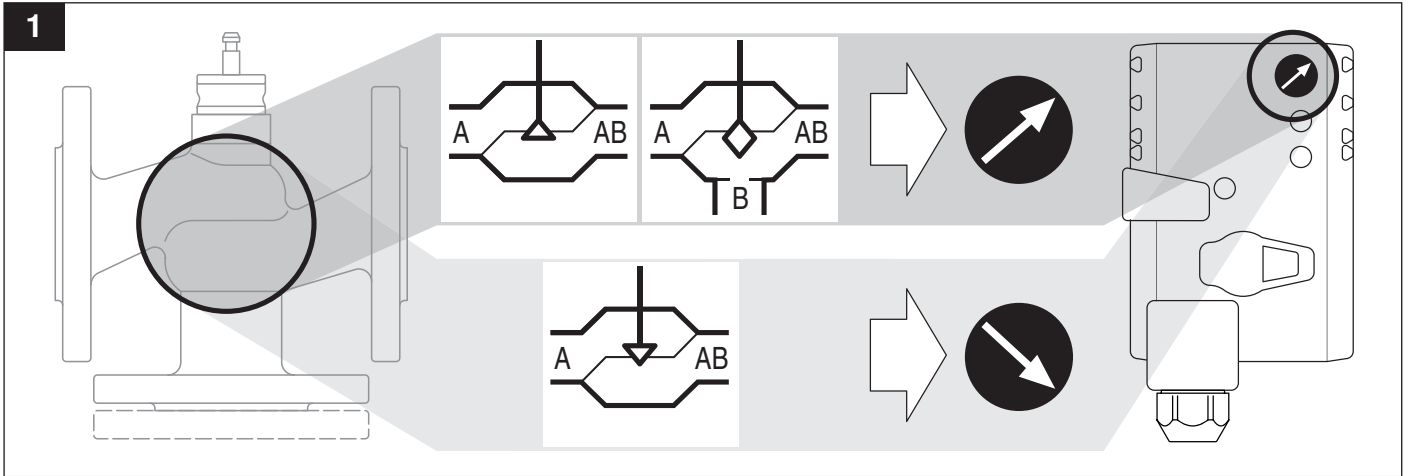Check the supply connections. The phases may have been switched.
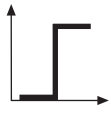
Dimensions [mm]
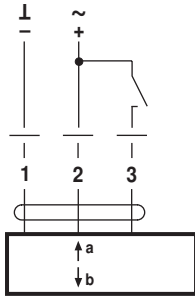
Dimensional drawings
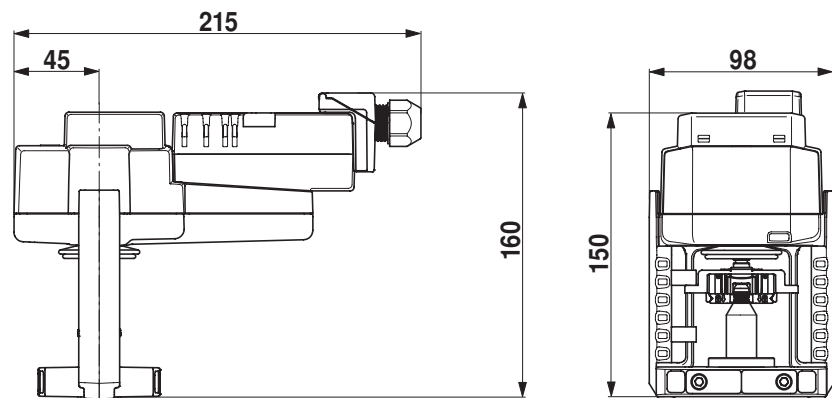
Further documentation

• Data sheets for globe valves
• Installation instructions for actuators and/or globe valves, respectively
• Notes for project planning, 2-way and 3-way globe valves
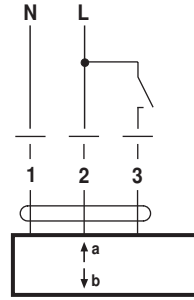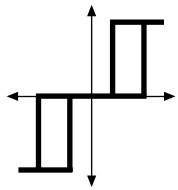• Overview "Valve-actuator combinations"
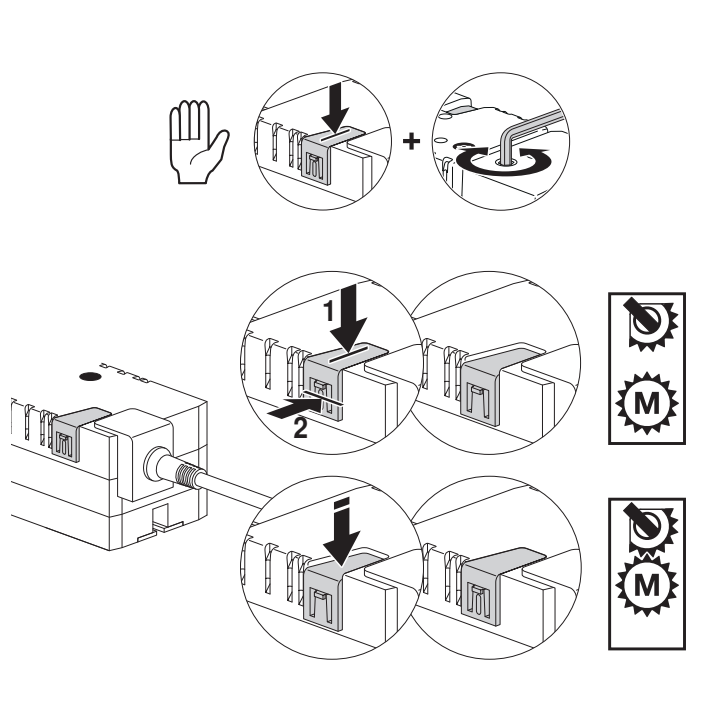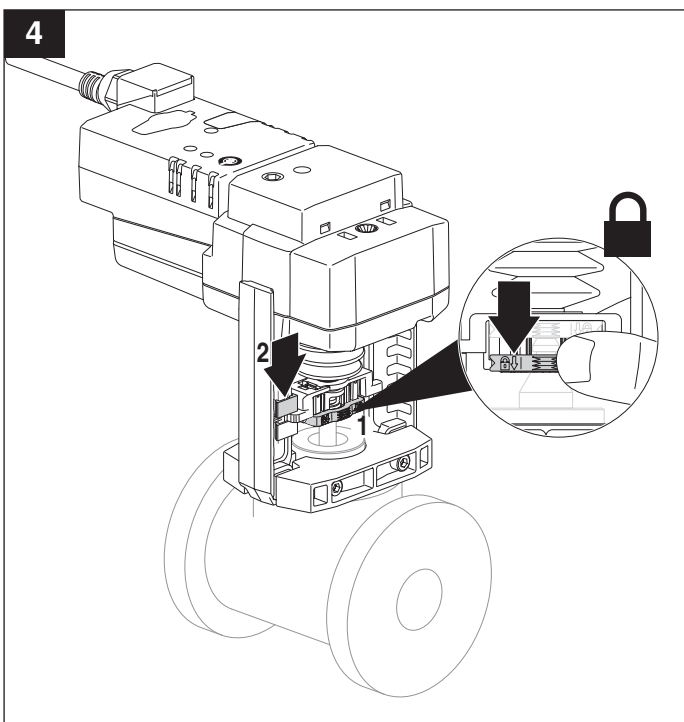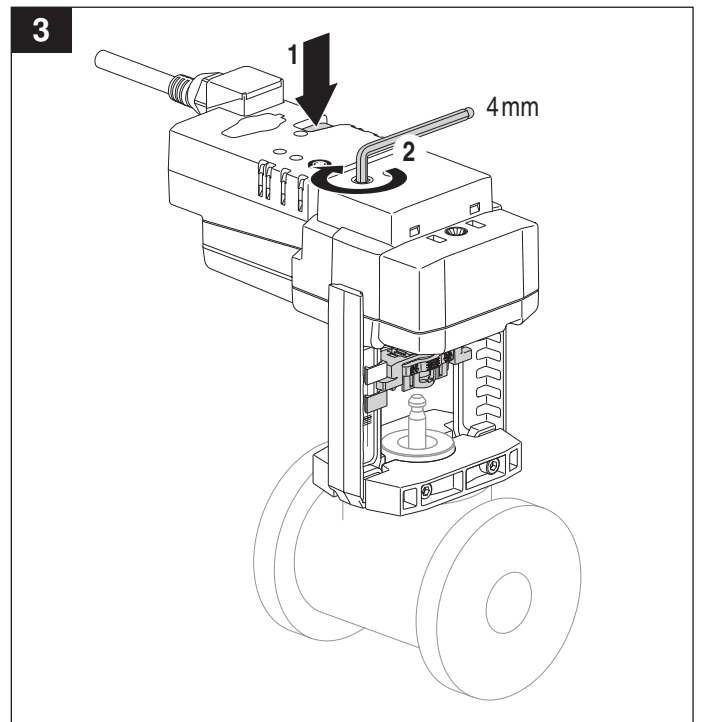
71398-00001.A

1

2

4 mm
5 Nm

3

4 mm

4

BELIMO®

AC 24 V / DC 24 V

⊥ / –   ~ / +

1   2   3

LV(C)24A
NV(C)24A
SV(C)24A

↑a   ↑a
↓b   ↓b

↑a
↓b

AC 230 V ⚠

N   L

1   2   3

LV(C)230A
NV(C)230A
SV(C)230A

↑a
↓b

AC 24 V / DC 24 V

⊥ / –   ~ / +

0

1   2   3

LV(C)24A
NV(C)24A
SV(C)24A

↑a   ↑a
↑a   ↓a
↓b   ↑b

AC 230 V ⚠

N   L

0

1   2   3

LV(C)230A
NV(C)230A
SV(C)230A

↑a   ↓a
↓b   ↑b

AC 24 V / DC 24 V

⊥ / –   ~ / +

Y ← DC (0) 0.5 ... 10 V
U → DC (0) 0.5 ... 10 V

1   2   3   5
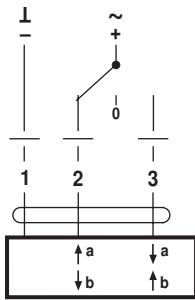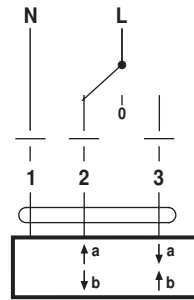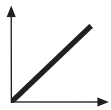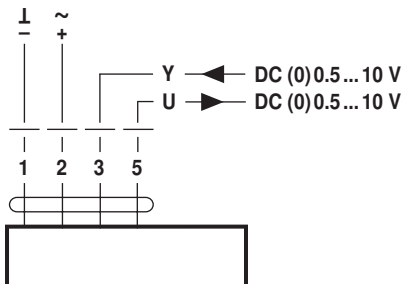
LV(C)24A-SZ   LV(C)24A-MF
NV(C)24A-SZ   NV(C)24A-MF
SV(C)24A-SZ   SV(C)24A-MF

⊥ / –   ~ / +

Y ← DC (0) 2 ... 10 V
U → DC (0) 2 ... 10 V

1   2   3   5
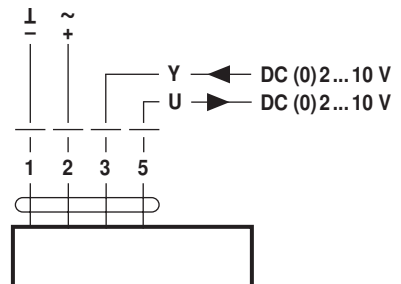
LV(C)24A-SR
NV(C)24A-SR
SV(C)24A-SR

⊥ / –   ~ / +

Y ← DC (0) 0.5 ... 10 V
U ↔ MP

1   2   3   5
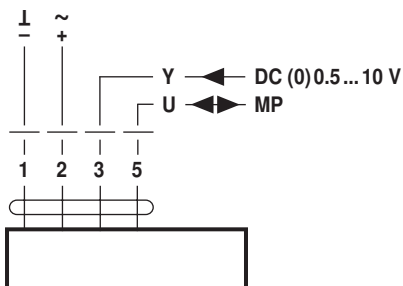
LV(C)24A-MP
NV(C)24A-MP
SV(C)24A-MP