Technical data sheet TF24-MFT

Communication-capable spring-return actuator for adjusting dampers with safety function in technical building installations

- **Damper size up to approx. 0.5 m²**
- **Nominal torque 2.5 Nm**
- **Nominal voltage AC/DC 24 V**
- **Control: modulating DC 0 V ... 10 V or variable**
- **Position feedback DC 2 V ... 10 V or variable**
- **Communication via BELIMO MP-Bus**
- **Conversion of sensor signals**

PROTECT ASSETS
FAIL-SAFE SOLUTIONS BY BELIMO

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2 V ... 28.8 V / DC 21.6 V ... 28.8 V
	Power consumption in operation	2.5 W
	Power consumption at rest	1 W
	Power consumption for wire sizing	4 VA
	Connection supply / control	Cable 1 m, 4 x 0.75 mm²
	Parallel operation	Yes
Functional data	Torque motor	Min. 2.5 Nm
	Torque spring-return	Min. 2.5 Nm
	Positioning signal Y	DC 0...10 V
	Positioning signal Y note	Input impedance 100 kΩ
	Control signal Y variable	Modulating (DC 0 .. 32 V)
	Operating range Y	DC 2...10 V
	Operating range Y variable	Start point DC 0.5 ... 30V 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 ... 8V End point DC 2.5 ... 10 V
	Position accuracy	±5%
	Direction of rotation motor	As an option with switch R / L
	Running direction	Y = 0 V: At switch position 0 (counter-clockwise rotation) / 1 (clockwise rotation)
	Running direction variable	Electronically reversible
	Manual override	no
	Angle of rotation	95°
	Running time motor	150 s / 90°
	Running time emergency control function	<25 s / 90°
	Angle of rotation adaptation variable	Automatic adaption whenever the supply voltage is switched on, or manual triggering
	Override control	MAX (maximum position) = 100% MIN (minimum position) = 0%
	Override control variable	MAX = (MIN + 32%) ... 100% MIN = 0% ... (MAX – 32%) ZS = MIN ... MAX
	Override control MAX (maximum position)	100 %
	Override control MAX variable	MAX = (MIN + 32%) ... 100%
	Override control MIN (minimum position)	0 %
	Override control MIN variable	MIN = 0% ... (MAX – 32%)
	Override control ZS (intermediate position, only AC)	50 %
	Override control ZS variable	ZS = MIN ... MAX
	Sound power level motor max.	35 dB (A)
	Position indication	Mechanical
	Service life	Min. 60,000 emergency settings
Safety	Protection class IEC/EN	III Safety extra-low voltage

Technical data

Safety	Degree of protection IEC/EN	IP42
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	Certified to: IEC/EN 60730-1 and IEC/EN 60730-2-14
	Principle of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-30°C ... 50°C
	Non-operating temperature	-40°C ... 80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight approx.	0.6 kg

Safety notes

- The actuator 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 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 cable 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

Principle of operation

The actuator moves the damper to the operating position at the same time as tensioning the return spring. The damper is turned back to the emergency position by spring energy when the supply voltage is interrupted.
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. Measuring voltage U serves for the electrical display of the damper 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 MFT actuator serves as an analogue/digital converter for the transmission of the sensor signal via MP bus to the higher level system.

Adjustable-parameter actuators

The factory settings cover the most common applications. Several parameters can be altered with the BELIMO Service Tool, MFT-P.

Direct mounting

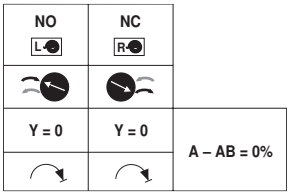
Simple direct mounting on the damper spindle with a universal spindle clamp, supplied with a universal mounting bracket to prevent the actuator from rotating.

High functional reliability

The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

Home position

When the supply voltage is switched on, the actuator automatically detects its emergency position (zero initialisation). This process, which takes place with the actuator stationary, lasts approximately 15 s.



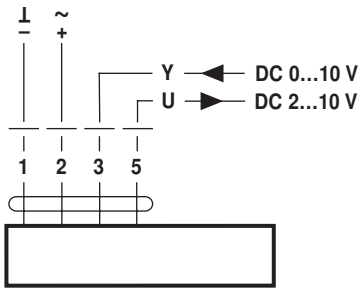
Electrical installation

Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

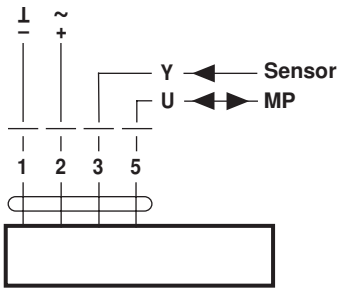
Wiring diagrams

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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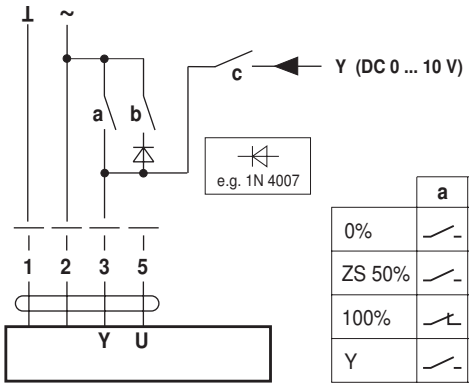
Functions

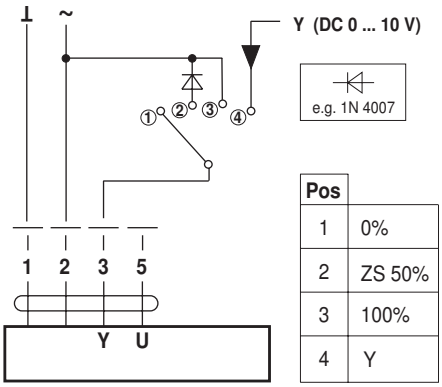
Functions with basic values

Override control with AC 24 V with relay contacts



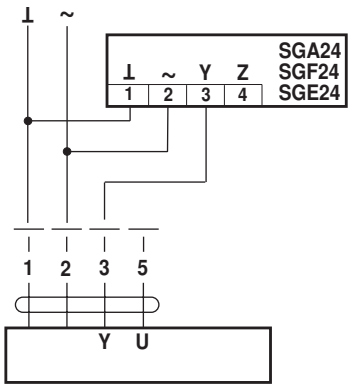
	a	b	c
0%	⌐	⌐	⌐
ZS 50%	⌐	⌐	⌐
100%	⌐	⌐	⌐
Y	⌐	⌐	⌐

Override control with AC 24 V with rotary switch

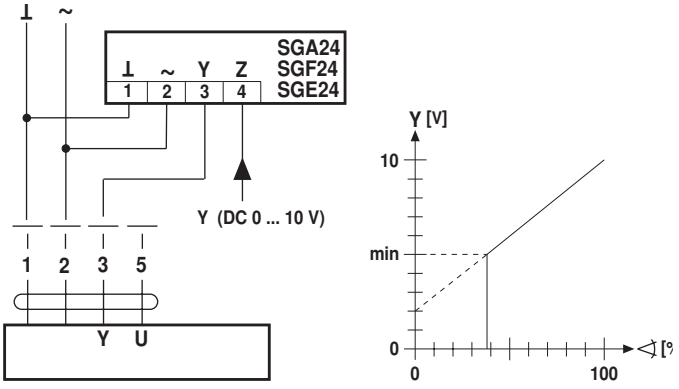


Pos	
1	0%
2	ZS 50%
3	100%
4	Y

Remote control 0 ... 100%

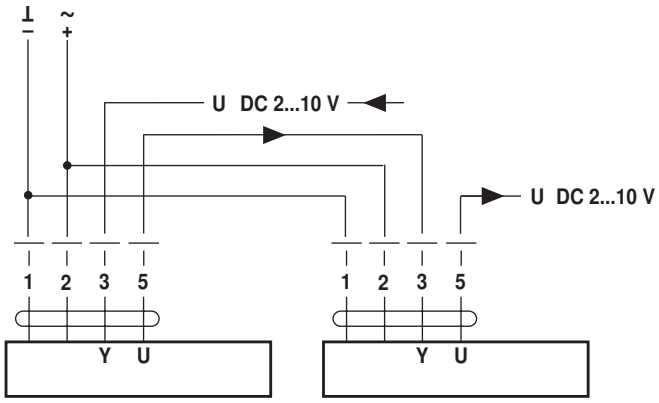


Minimum limit

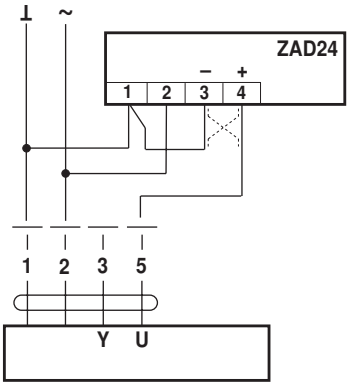


Functions

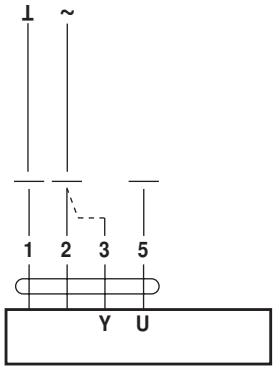
Follow-up control (position-dependent)



Position indication



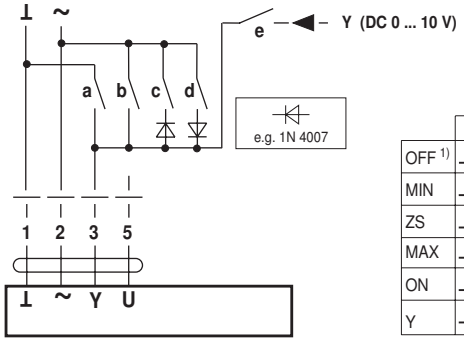
Functional check



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

Functions for actuators with specific parameters

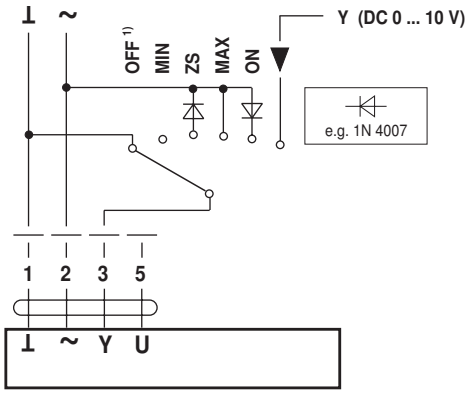
Override control and limiting with AC 24 V with relay contacts



	a	b	c	d	e
OFF [1]	t				
MIN					
ZS			t		
MAX		t			
ON				t	
Y					t

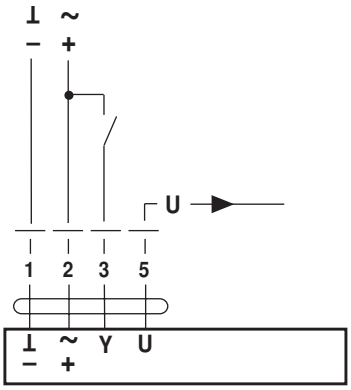
Functions

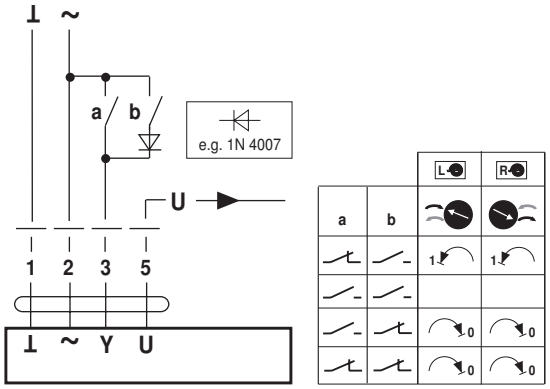
Override control and limiting with AC 24 V with rotary switch



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

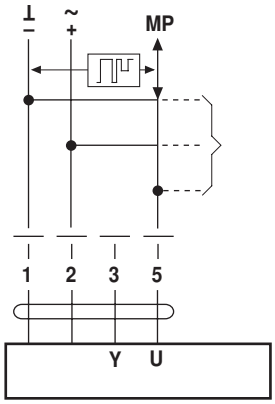
AC/DC 24 V, open-close





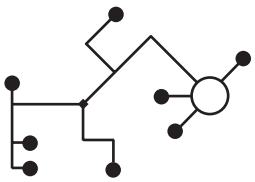
Functions when operated on MP bus

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

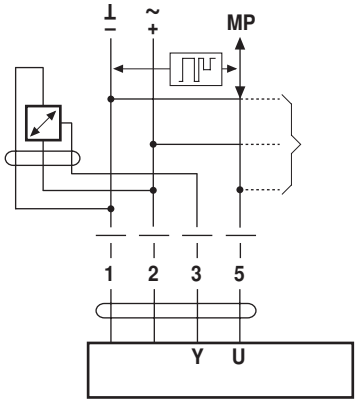
Power topology



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

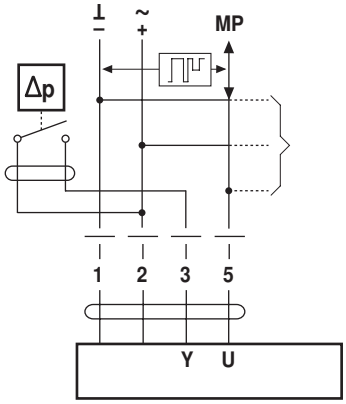
Functions

Connection of active sensors



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

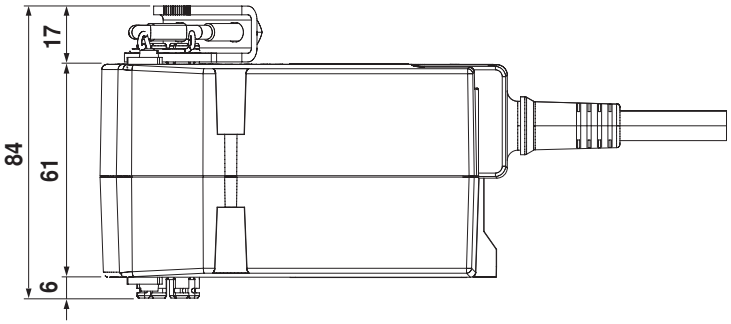
Connection of external switching contact

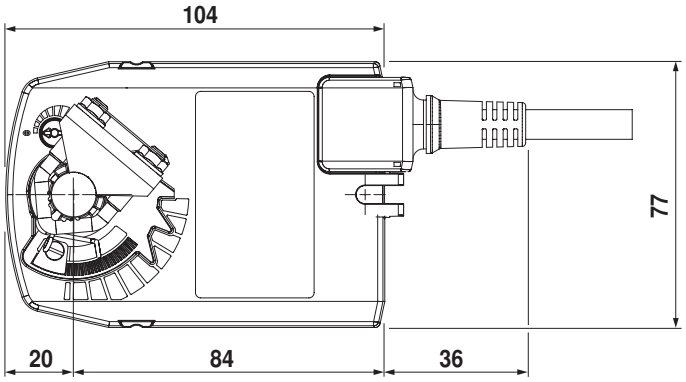


- Switching current 16 mA @ 24V
- Start point of the operating range must be parameterised on the MP actuator as ≥ 0.6V

Dimensions [mm]

Dimensional drawings





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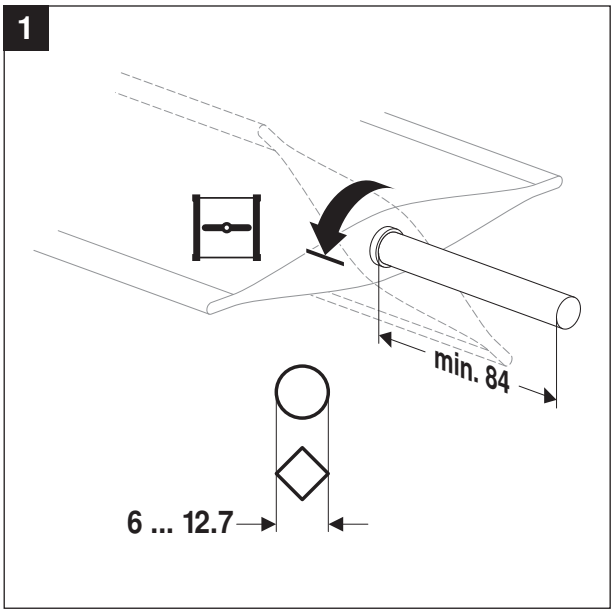
1



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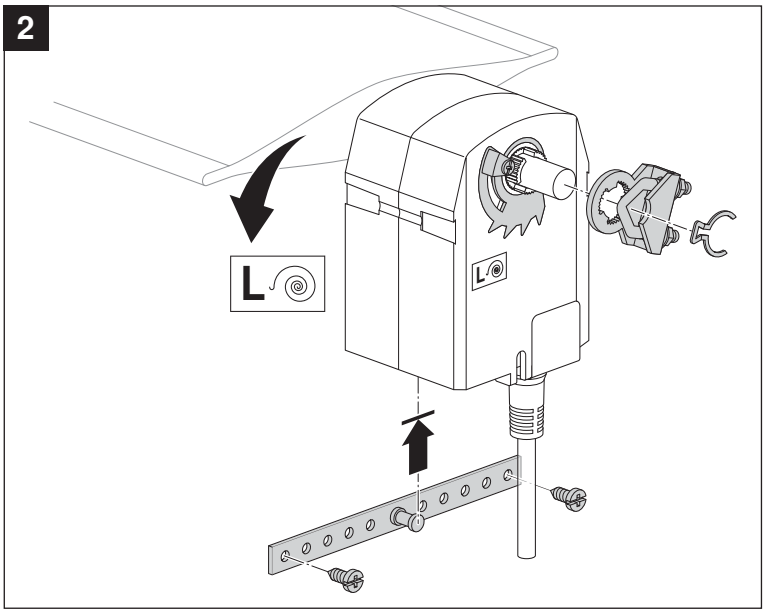

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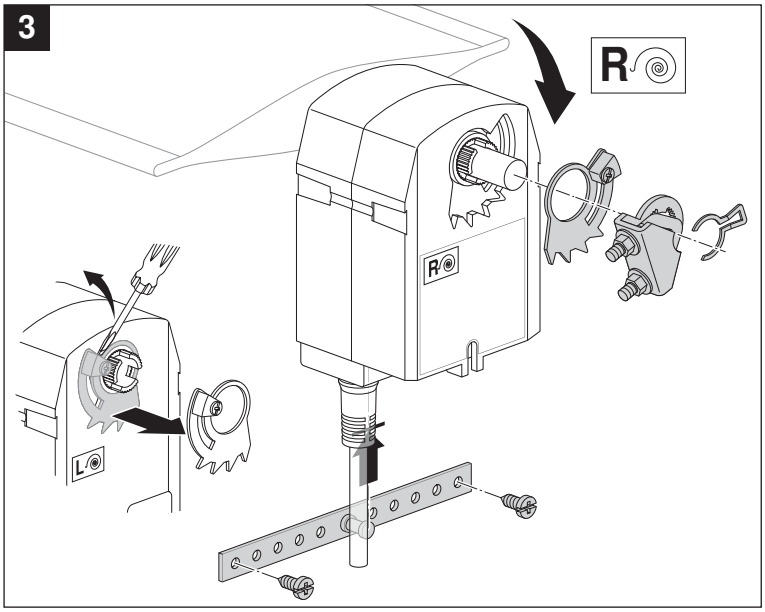

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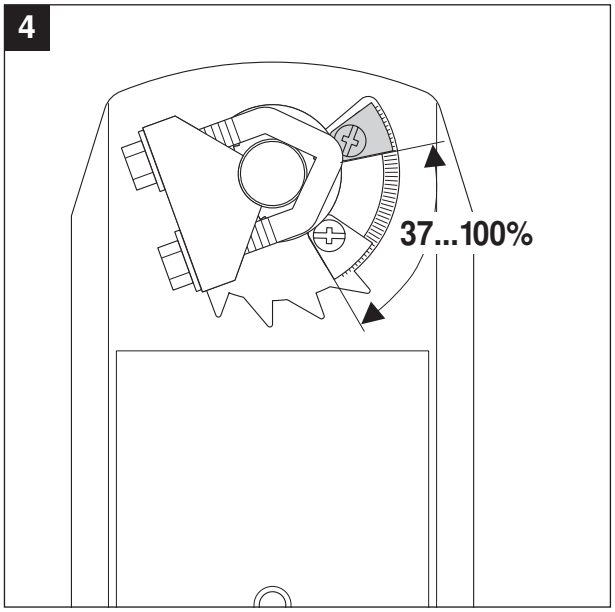
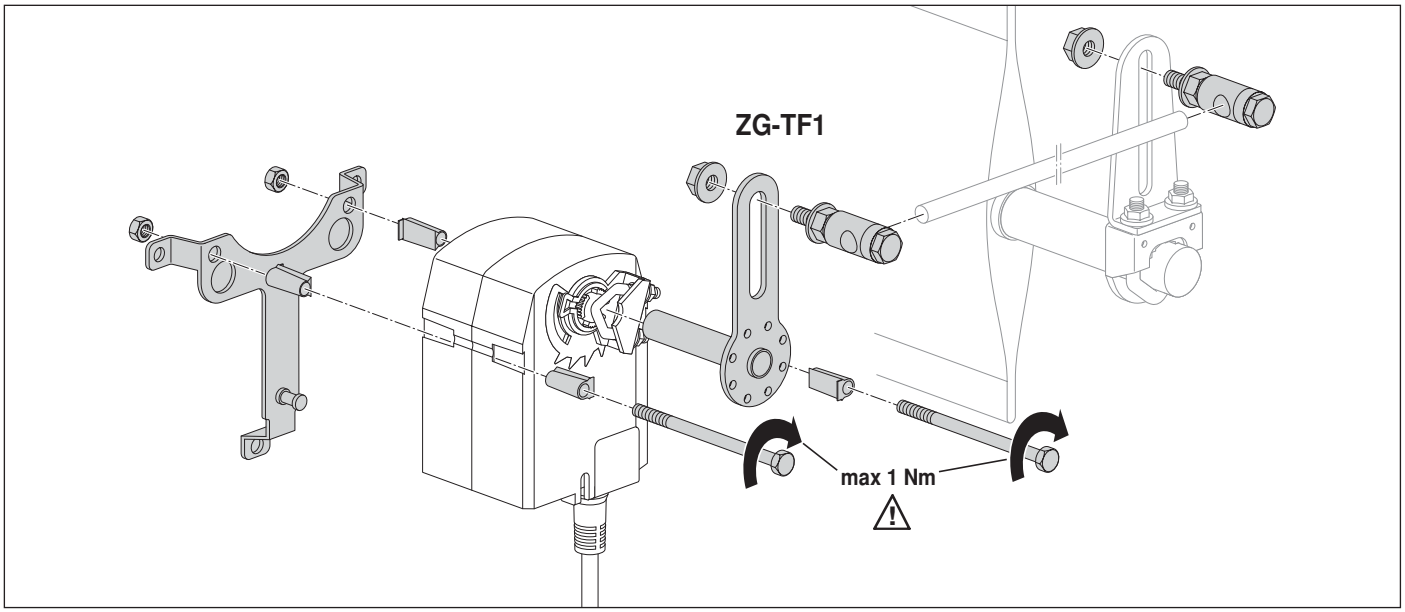
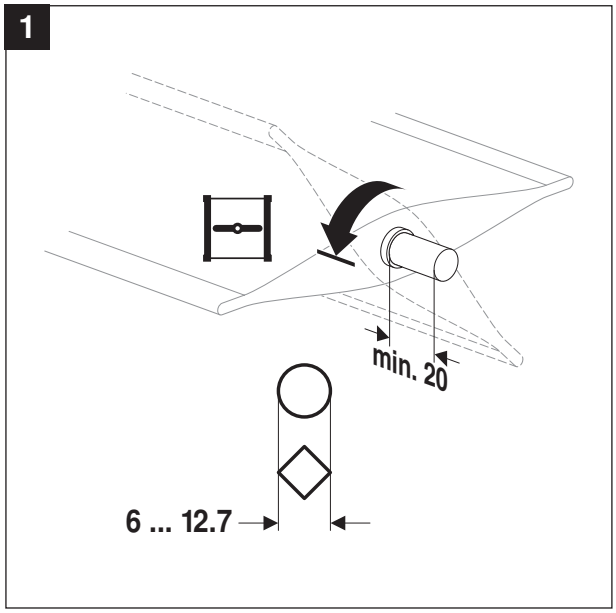
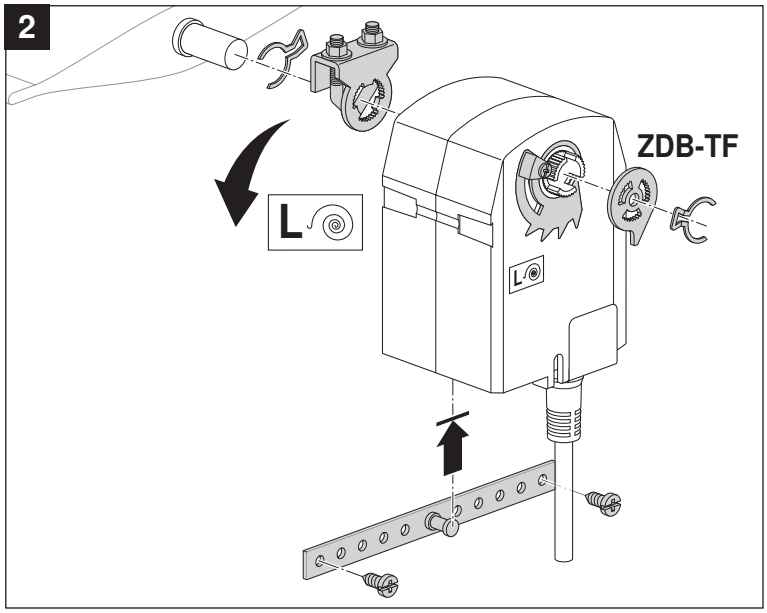
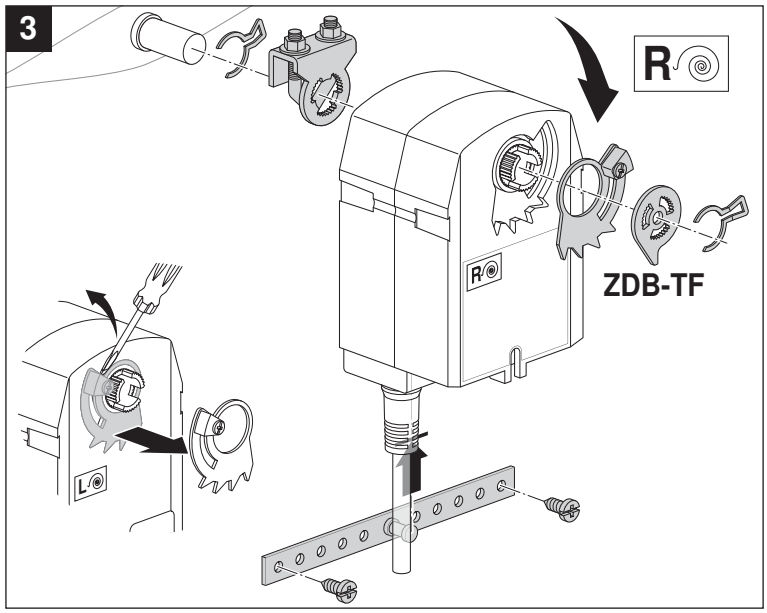


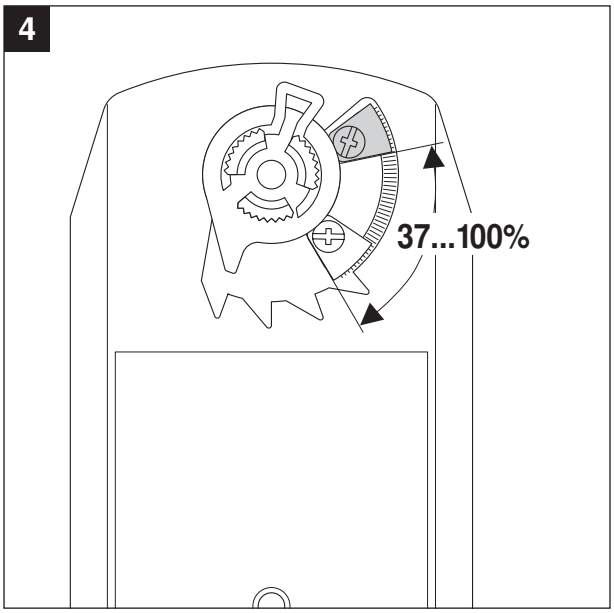


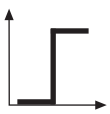
BELIMO



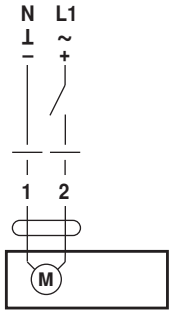




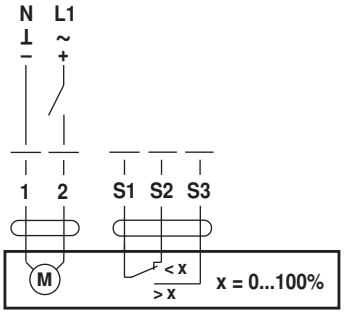




AC 230 V ⚠
AC 24 V / DC 24 V

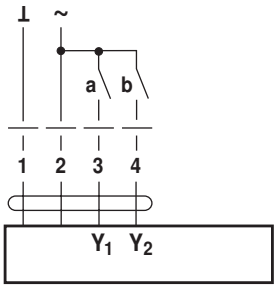


TF230 / TF24

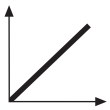


TF230-S / TF24-S

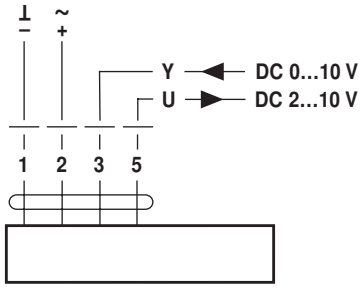
AC 24 V



TF24-3



AC 24 V / DC 24 V



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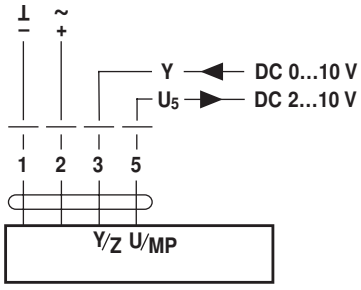

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