

Basic Non Fail-Safe multifunction technology actuator for controlling dampers in typical commercial HVAC applications.

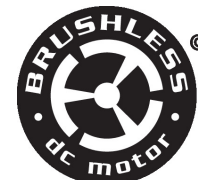
- Torque motor 90 in-lb [10 Nm]
- Nominal voltage AC/DC 24 V
- Control MFT/programmable
- Position feedback 2...10 V



Picture may differ from product



5-year warranty



**MFT**

## Technical data

<b>Electrical data</b>	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	1.3 W
	Transformer sizing	6 VA
	Electrical Connection	18 AWG plenum cable with 1/2" NPT conduit connector, degree of protection NEMA 2 / IP54, 1 m, 3 m, and 5 m
	Overload Protection	electronic throughout 0...95° rotation
<b>Functional data</b>	Torque motor	90 in-lb [10 Nm]
	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for PWM, On/Off and Floating point
	Operating range Y variable	Start point 0.5...30 V End point 2.5...32 V
	Operating modes optional	variable (VDC, PWM, on/off, floating point)
	Position feedback U	2...10 V
	Position feedback U note	Max. 0.5 mA
	Position feedback U variable	VDC variable
	Direction of motion motor	selectable with switch 0/1
	Manual override	external push button
	Angle of rotation	Max. 95°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	150 s / 90°
	Running time motor variable	45...170 s
	Sound power level, motor	45 dB(A)
	Position indication	Mechanical, 30...65 mm stroke
<b>Safety data</b>	Power source UL	Class 2 Supply
	Degree of protection NEMA/UL	NEMA 2
	Housing	UL Enclosure Type 2

## Technical data

Safety data	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
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
Weight	Weight	1.7 lb [0.77 kg]
Materials	Housing material	UL94-5VA
Footnotes	†Rated Impulse Voltage 800V, Type action 1, Control Pollution Degree 3.	

## Product features

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 mounted directly to a damper shaft up to 1.05" in diameter by means of its universal clamp. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.</p> <p>The default parameters for 2...10 V applications of the ..MFT actuator are assigned during manufacturing. If necessary, custom versions of the actuators can be ordered. The parameters can be changed by two means: pre-set and custom configurations from Belimo or on-site configurations using the Belimo PC-Tool software.</p>
Operation	<p>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.</p> <p>The NMB(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.</p> <p>The NMB(X)24-MFT 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.</p> <p>Add-on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions.</p>
Typical specification	<p>Proportional control damper actuators shall be electronic direct-coupled type, which require no crank arm and linkage and be capable of direct mounting to a shaft from 1/4" to 1/2" diameter. Actuators must provide proportional damper control response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. Actuators shall have brushless DC motor technology and be protected from overload at all angles of rotation. Actuators shall have manual override on the cover. Run time shall be constant and independent of torque. Actuators shall be cULus listed, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.</p>

## Accessories

Electrical accessories	Description	Type
	Auxiliary switch 1x SPDT add-on	S1A
	Auxiliary switch 2x SPDT add-on	S2A
	Feedback potentiometer 10 kΩ add-on, grey	P10000A GR

## Accessories

Description	Type
Feedback potentiometer 1 k $\Omega$ add-on, grey	P1000A GR
Feedback potentiometer 140 $\Omega$ add-on, grey	P140A GR
Feedback potentiometer 2.8 k $\Omega$ add-on, grey	P2800A GR
Feedback potentiometer 5 k $\Omega$ add-on, grey	P5000A GR
Feedback potentiometer 500 $\Omega$ add-on, grey	P500A GR
Positioner for wall mounting	SGA24
Resistor, 500 $\Omega$ , 1/4" wire resistor with 6" pigtail wires	ZG-R01
Transformer, AC 120 V to AC 24 V, 40 VA	ZG-X40
	ZS-T

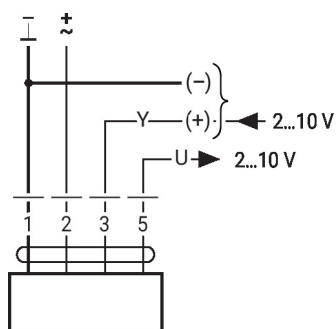
Mechanical accessories	Description	Type
	Shaft clamp reversible, clamping range $\varnothing 8...20$ mm	K-NA
	Mounting bracket for AF..	ZG-100
	Mounting bracket for AF / NF	ZG-101
	Mounting bracket	ZG-103
	Mounting bracket	ZG-104
	Mounting kit for linkage operation for flat installation	ZG-NMA
	Shaft extension 240 mm $\varnothing 20$ mm for damper shaft $\varnothing 8...22.7$ mm	AV8-25
		ZG-NMSA-1
	Weather shield 13x8x6" [330x203x152 mm] (LxWxH)	ZS-100
	Weather shield 406x213x102 mm [16x8-3/8x4"] (LxWxH)	ZS-150
	Wrench 0.32 in and 0.39 in [8 mm and 10 mm]	TOOL-06
	Linkage kit	ZG-JSL
	Jackshaft RetroFIT+ Linkage with Belimo Rotary Actuators	











## Electrical installation

## Wire colors:

- 1 = black
- 2 = red
- 3 = white
- 5 = orange

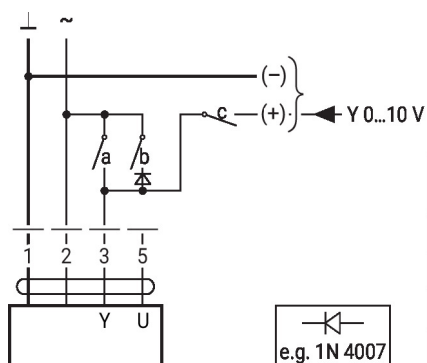
AC/DC 24 V, modulating



1	2	3		
		2 V		
		10 V		

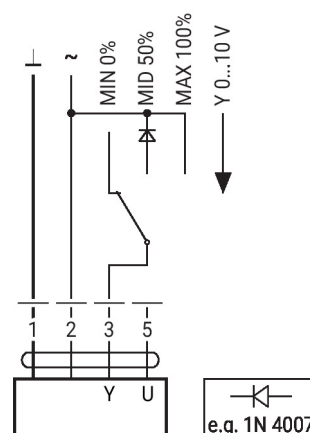
**Further electrical installations**
**Functions with basic values (conventional mode)**

Override control with AC 24 V with relay contacts



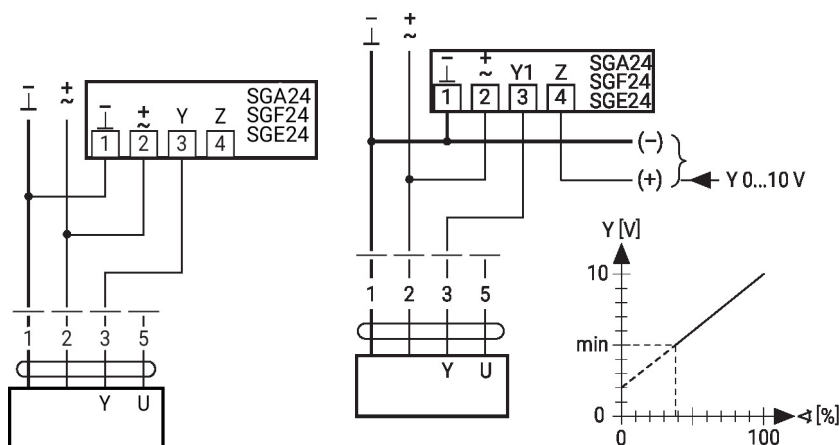
1	2	a	b	c	
					0 %
					ZS 50%
					100%
					Y

Override control with AC 24 V with rotary switch

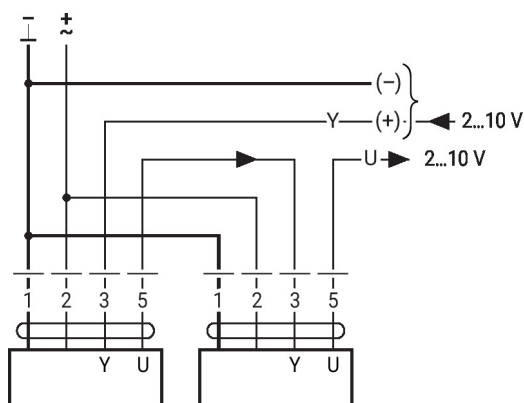


Control remotely 0...100% with positioner SG..

Minimum limit with positioner SG..



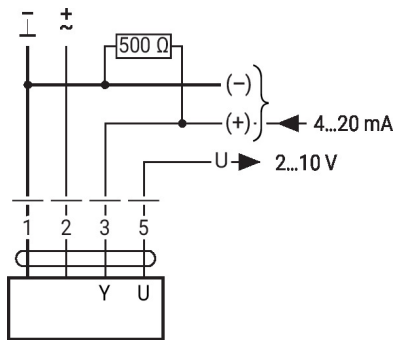
Primary/secondary operation (position-dependent)



### Further electrical installations

#### Functions with basic values (conventional mode)

Control with 4...20 mA via external resistor

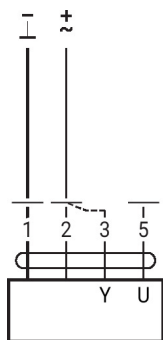


#### Caution:

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.

#### Functional check



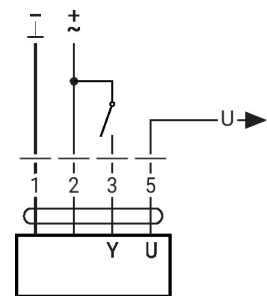
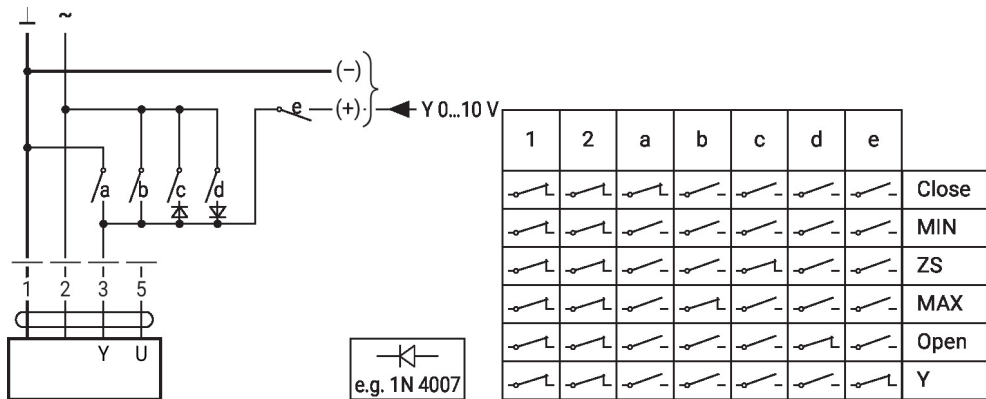
#### Procedure

1. Connect 24 V to connections 1 and 2
2. Disconnect connection 3:
  - With direction of rotation 0: Actuator rotates to the left
  - With direction of rotation 1: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
  - Actuator runs in opposite direction

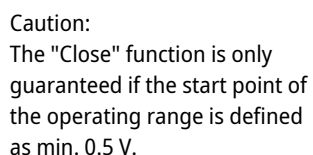
#### Functions with specific parameters (configuration necessary)

Override control and limiting with AC 24 V with relay contacts

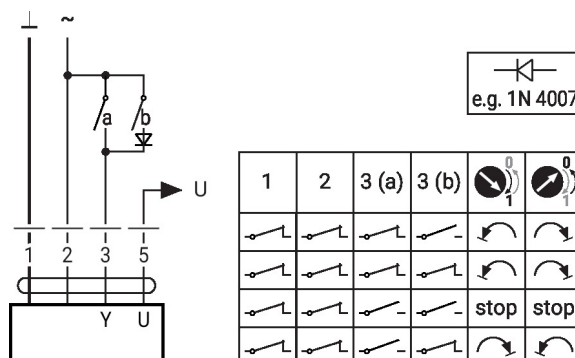
Control on/off



### Override control and limiting with AC 24 V with rotary switch



Control 3-point with AC 24 V



## PC

Ø 1/2" to 1.05" [12.7 to 26.67]

☐ 2/5" to 1.05" [10 to 26.67]

