

Customizable Fail-Safe modulating actuator for controlling dampers in typical commercial HVAC applications.

- Torque motor 90 in-lb [10 Nm]
- Nominal voltage AC/DC 24 V
- Control Modulating
- Position feedback 2...10 V
- 2x SPDT
- NEMA 4X



5-year warranty


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	2.5 W
	Transformer sizing	6 VA
	Auxiliary switch	2x SPDT, 1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V, 1x 10% / 1x 11...90%
	Switching capacity auxiliary switch	1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V
	Electrical Connection	(2) 18 AWG appliance cables, 1 m, 3 m or 5 m, with 1/2" NPT conduit connectors
	Overload Protection	electronic throughout 0...95° rotation
	Electrical Protection	actuators are double insulated
	Functional data	Torque motor
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
Position feedback U		2...10 V
Position feedback U note		Max. 0.5 mA
Direction of motion motor		selectable with switch 0/1
Direction of motion fail-safe		reversible with cw/ccw mounting
Manual override		5 mm hex crank (3/16" Allen), supplied
Angle of rotation		95°
Angle of rotation note		adjustable with mechanical end stop, 35...95°
Running Time (Motor)		95 s / 90°
Running time fail-safe		<20 s @ -20...50°C, <60 s @ -30°C
Noise level, motor		40 dB(A)
Noise level, fail-safe		62 dB(A)
Position indication	Mechanical, 5...20 mm stroke	
Safety data	Power source UL	Class 2 Supply
	Degree of protection NEMA/UL	NEMA 4X

Technical data

Safety data	Housing	UL Enclosure Type 4X
	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
	Ambient humidity	Max. 100% RH
	Ambient temperature	-22...122°F [-30...50°C]
	Ambient temperature note	-40...50°C [104...122°F] for actuator with integrated heating
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
Weight	Weight	9.7 lb [4.4 kg]
Materials	Housing material	Polycarbonate

Footnotes †Rated Impulse Voltage 800V, Type of action 1.AA.B, Control Pollution Degree 4.

Product features

Application For modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. The actuator is mounted directly to a damper shaft up to 1.05" in diameter by means of its universal clamp. The actuator operates in response to a 2 to 10 VDC, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication. Not to be used for a master-slave application.

Operation The NF..24-SR-S N4 series actuators provide true spring return operation for reliable fail-safe application and positive close off on air tight dampers. The spring return system provides constant torque to the damper with, and without, power applied to the actuator. The NF..24-SR-S N4 series provides 95° of rotation and is provided with a graduated position indicator showing 0° to 95°. The NF..24-SR-S N4 uses a brushless DC motor which is controlled by an Application Specific Integrated Circuit (ASIC) and a microprocessor. The microprocessor provides the intelligence to the ASIC to provide a constant rotation rate and to know the actuator's exact fail-safe position. The ASIC monitors and controls the brushless DC motor's rotation and provides a digital rotation sensing function to prevent damage to the actuator in a stall condition. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. The NF..24-SR-S N4 versions are provided with two built-in auxiliary switches. These SPDT switches provide safety interfacing or signaling, for example, for fan start-up. The switching function at the fail-safe position is fixed at 10°, the other switch function is adjustable between 10° to 90°. The NF..24-SR-S N4 actuator is shipped at 5° (5° from full fail-safe) to provide automatic compression against damper gaskets for tight shut-off.

For low ambient temperatures, the optional supplemental (-Y) Heater add-on is available.

Product features

Typical specification Spring return control damper actuators shall be direct coupled type which require no crank arm and linkage and be capable of direct mounting to a jackshaft up to a 1.05" diameter. The actuator must provide modulating damper control in 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. The actuators must be designed so that they may be used for either clockwise or counter clockwise fail-safe operation. Actuators shall use a brushless DC motor controlled by a microprocessor and be protected from overload at all angles of rotation. Run time shall be constant, and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position feedback. Actuators with auxiliary switches must be constructed to meet the requirements for Double Insulation so an electrical ground is not required to meet agency listings. Actuators shall be cULus listed and have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Accessories

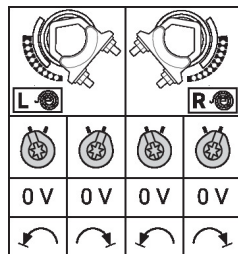
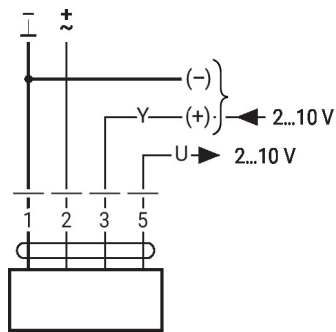
	Tools	Description	Type
		Signal simulator, Power supply AC 120 V	PS-100
Electrical accessories		Description	Type
		Gasket for cable gland (NEMA 4 models)	11097-00001
		Cable Gland (NEMA 4 models)	43442-00001
		DC Voltage Input Rescaling Module	IRM-100
		Auxiliary switch, mercury-free	P475
		Auxiliary switch, mercury-free	P475-1
		Convert Pulse Width Modulated Signal to a 2...10 V Signal for Belimo Proportional Actuators	PTA-250
		Positioner for wall mounting	SGA24
		Positioner for front-panel mounting	SGF24
		Resistor, 500 Ω, 1/4" wire resistor with 6" pigtail wires	ZG-R01
	Resistor kit, 50% voltage divider	ZG-R02	
	Transformer, AC 120 V to AC 24 V, 40 VA	ZG-X40	
Mechanical accessories		Description	Type
		Anti-rotation bracket, for AF / NF	AF-P
		Ball joint suitable for damper crank arm KH8 / KH10	KG10A
		Damper crank arm Slot width 8.2 mm, clamping range ø14...25 mm	KH10
		Push rod for KG10A ball joint L 36", 3/8" diameter	SH10
		Wrench 0.32 in and 0.39 in [8 mm and 10 mm]	TOOL-06
		Wrench 0.512 in. [13 mm]	TOOL-07
			ZG-DC1
			ZG-DC2
		1" diameter jackshaft adaptor (11" L).	ZG-JSA-1
	1-5/16" diameter jackshaft adaptor (12" L).	ZG-JSA-2	
	1.05" diameter jackshaft adaptor (12" L).	ZG-JSA-3	
Factory add-on option only		Description	Type
		Heater, with adjustable thermostat	ACT_PACK_H

Electrical installation

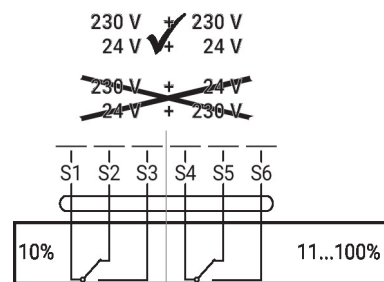
Wire colors:

- 1 = black
- 2 = red
- 3 = white
- 5 = orange
- S1 = violet
- S2 = red
- S3 = white
- S4 = orange
- S5 = pink
- S6 = grey

AC/DC 24 V, modulating



Auxiliary switch



Dimensions

PC

