

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

- Torque motor 270 in-lb [30 Nm]
- Nominal voltage AC 100...240 V
- Control On/Off
- 2 x SPDT



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 100...240 V
Nominal voltage frequency	50/60 Hz	
Nominal voltage range	AC 85...265 V	
Power consumption in operation	9 W	
Power consumption in rest position	4.5 W	
Transformer sizing	21 VA	
Auxiliary switch	2 x SPDT, 1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V, one set at 10°, one adjustable 10...90°	
Switching capacity auxiliary switch	1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V	
Electrical Connection	(2) 18 GA appliance cables, 1 m, with 1/2" conduit connectors	
Overload Protection	electronic throughout 0...95° rotation	
Electrical Protection	actuators are double insulated	
Functional data		
Torque motor	270 in-lb [30 Nm]	
Direction of motion motor	selectable by mounting L/R	
Direction of motion fail-safe	reversible with cw/ccw mounting	
Manual override	5 mm hex crank (3/16" Allen), supplied	
Angle of rotation	Max. 95°	
Angle of rotation note	adjustable with mechanical end stop, 35...95°	
Running Time (Motor)	75 s / 90°	
Running time fail-safe	10 s	
Noise level, motor	56 dB(A)	
Noise level, fail-safe	71 dB(A)	
Position indication	Mechanical	
Safety data		
Degree of protection IEC/EN	IP54	
Degree of protection NEMA/UL	NEMA 2	
Enclosure	UL Enclosure Type 2	
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	12 lb [5.3 kg]

<b>Materials</b>	Housing material	Die cast aluminium and plastic casing
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**Footnotes** †Rated Impulse Voltage 4kV, Type of Action 1.AA.B, Control Pollution Degree 3.

## Product features

<b>Application</b>	For On/Off, fail-safe control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. Control is On/Off from an auxiliary contact or a manual switch. 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. Maximum of two EF's can be piggybacked for torque loads of up to 540 in-lbs. Minimum 3/4" diameter shaft and parallel wiring.
<b>Operation</b>	The EF..120-S series actuators provide true spring return operation for reliable failsafe 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 EF..120-S series provides 95° of rotation and is provided with a graduated position indicator showing 0° to 95°. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. The EF..120-S 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 +85°. The EF..120-S actuator is shipped at 5° (5° from full fail-safe) to provide automatic compression against damper gaskets for tight shut-off.  Installation Note: Use flexible metal conduit. Push the UL listed conduit fitting device over the actuator's cable to butt against the enclosure. Screw in conduit connector. Jacket the actuator's input wiring with UL listed flexible conduit. Properly terminate the conduit in a suitable junction box.
<b>Typical specification</b>	On/Off spring return 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 actuators must be designed so that they may be used for either clockwise or counter clockwise fail-safe operation. Actuators shall be protected from overload at all angles of rotation. If required, two SPDT auxiliary switch shall be provided having the capability of one being adjustable. 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

Electrical accessories	Description	Type
	Auxiliary switch, mercury-free	P475
	Auxiliary switch, mercury-free	P475-1
	Signal simulator, Power supply AC 120 V	PS-100
	Cable conduit connector 1/2"	TF-CC US

Mechanical accessories	Description	Type
Shaft extension 240 mm	ø20 mm for damper shaft ø8...22.7 mm	AV8-25
Anti-rotation bracket	EFB(X)/GKB(X)/GMB(X).	EF-P
End stop indicator		IND-EFB
Shaft clamp reversible,	clamping range ø12...26.7 mm	K9-2
Ball joint suitable for damper crank arm	KH8 / KH10, Multipack 10 pcs.	KG10A
Damper crank arm	Slot width 8.2 mm, clamping range ø14...25 mm	KH10
Actuator arm	Slot width 8.2 mm	KH-EFB
Push rod for KG10A ball joint	36" L, 3/8" diameter	SH10
Wrench 0.512 in. [13 mm]		TOOL-07
Mounting bracket for AF..		ZG-100
Jackshaft mounting bracket.		ZG-120
ZG-JSL support plate for EFB(X)		ZG-121
Damper clip for damper blade, 3.5" width.		ZG-DC1
Damper clip for damper blade, 6" width.		ZG-DC2
Mounting kit for linkage operation for flat and side installation		ZG-EFB
1.05" diameter jackshaft adaptor (12" L).		ZG-JSA-3

## Electrical installation

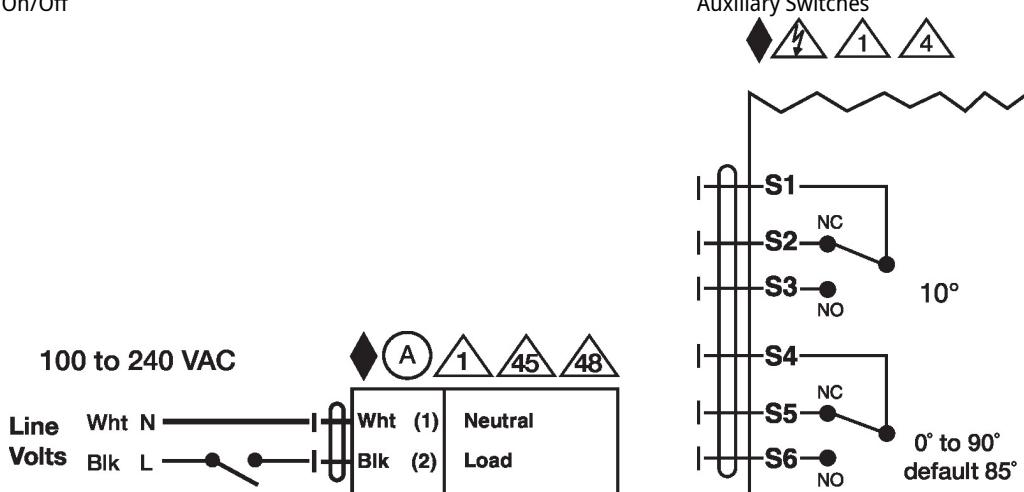
## Warning! Live electrical components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

- ◆ Meets cULus requirements without the need of an electrical ground connection.
- ⚠ Apply only AC line voltage or only UL-Class 2 voltage to the terminals of auxiliary switches. Mixed or combined operation of line voltage/safety extra low voltage is not allowed.
- Ⓐ Actuators with appliance cables are numbered.
- ⚠ Provide overload protection and disconnect as required.
- ⚠ Two built-in auxiliary switches (2x SPDT), for end position indication, interlock control, fan startup, etc.
- ⚠ 45 Actuators may be powered in parallel. Power consumption must be observed.
- ⚠ 48 Parallel wiring required for piggy-back applications.

## Wiring diagrams

On/Off



## Dimensions

