

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

- Torque motor 180 in-lb [20 Nm]
- Nominal voltage AC/DC 24 V
- Control Modulating
- Position feedback 2...10 V



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	7.5 W
	Power consumption in rest position	3 W
	Transformer sizing	10 VA
	Electrical Connection	18 GA appliance cable, 1 m, with 1/2" NPT conduit connector
	Overload Protection	electronic throughout 0...95° rotation
	Electrical Protection	actuators are double insulated
Functional data	Torque motor	180 in-lb [20 Nm]
	Operating range Y	0...20 V PhC
	Operating range Y note	Phasecut control (PhC) is only for the positive part of the sine wave (max. of 10 volts)
	Input impedance	8.2 kΩ (0.1 mA), 50 mΩ
	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)	150 s / 90°
	Running time motor note	constant, independent of load
	Running time fail-safe	<20 s @ -4...122°F [-20...50°C], <60 s @ -22°F [-30°C]
	Noise level, motor	40 dB(A)
	Noise level, fail-safe	62 dB(A)
	Position indication	Mechanical
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus listed to UL60730-1A:02; UL 60730-2-14:02 and CAN/CSA-E60730-1:02
	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

Safety data	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
Weight	Weight	5.4 lb [2.4 kg]
Materials	Housing material	Galvanized steel and plastic housing
Footnotes	†Rated Impulse Voltage 800V, Type of action 1.AA, Control Pollution Degree 3	

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. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft. The actuator operates in response to a 0-10 V phasecut control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication or master-slave applications.
Operation	The AFB24-PC series provides 95° of rotation and is provided with a graduated position indicator showing 0° to 95°. The actuator will synchronize the 0° mechanical stop or the physical damper or valve mechanical stop and use this point for its zero position during normal control operations. A unique manual override allows the setting of any actuator position within its 95° of rotation with no power applied. This mechanism can be released physically by the use of a crank supplied with the actuator. When power is applied the manual override is released and the actuator drives toward the fail-safe position. The AFB24-PC 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 zero position. The ASIC monitors and controls the brushless DC motor's rotation and provides a Digital Rotation Sensing (DRS) function to prevent damage to the actuator in a stall condition. The position feedback signal is generated without the need for mechanical feedback potentiometers using DRS. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. The AFB24-PC is mounted directly to control shafts up to 1.05" diameter by means of its universal clamp and anti-rotation bracket. A crank arm and several mounting brackets are available for damper applications where the actuator cannot be direct coupled to the damper shaft. The spring return system provides minimum specified torque to the application during a power interruption. The AFB24-PC actuator is shipped at 5° (5° from full fail-safe) to provide automatic compression against damper gaskets for tight shut-off.
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 0 to 10 V phasecut 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 or master slave applications. 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
	Transformer, AC 120 V to AC 24 V, 40 VA	ZG-X40

Mechanical accessories

Description	Type
Anti-rotation bracket, for AF / NF	AF-P
Shaft extension 240 mm ø20 mm for damper shaft ø8...22.7 mm	AV8-25
End stop indicator	IND-AFB
Shaft clamp reversible, for central mounting, for damper shafts ø12.7 / 19.0 / 25.4 mm	K7-2
Ball joint suitable for damper crank arm KH8 / KH10	KG10A
Ball joint suitable for damper crank arm KH8	KG8
Damper crank arm Slot width 8.2 mm, clamping range ø14...25 mm	KH10
Damper crank arm Slot width 8.2 mm, for ø1.05"	KH12
Damper crank arm Slot width 8.2 mm, clamping range ø10...18 mm	KH8
Actuator arm, for 3/4" shafts, clamping range ø10...22 mm, Slot width 8.2 mm	KH-AFB
Push rod for KG10A ball joint 36" L, 3/8" diameter	SH10
Push rod for KG6 & KG8 ball joints (36" L, 5/16" diameter).	SH8
Wrench 0.32 in and 0.39 in [8 mm and 10 mm]	TOOL-06
Retrofit clip	Z-AF
Mounting bracket for AF..	ZG-100
Mounting bracket	ZG-101
Dual actuator mounting bracket.	ZG-102
Mounting bracket	ZG-109
Linkage kit	ZG-110
Mounting bracket for AF / NF	ZG-118
Jackshaft mounting bracket.	ZG-120
Mounting kit for linkage operation for flat and side installation	ZG-AFB
Mounting kit for foot mount installation	ZG-AFB118
Damper clip for damper blade, 3.5" width.	ZG-DC1
Damper clip for damper blade, 6" width.	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
Weather shield 13x8x6" [330x203x152 mm] (LxWxH)	ZS-100
Baseplate, for ZS-100	ZS-101
Weather shield 406x213x102 mm [16x8-3/8x4"] (LxWxH)	ZS-150
Explosion proof housing 16x10x6.435" [406x254x164 mm] (LxWxH), UL and CSA, Class I, Zone 1&2, Groups B, C, D, (NEMA 7), Class III, Hazardous (classified) Locations	ZS-260
Weather shield 17-1/4x8-3/4x5-1/2" [438x222x140 mm] (LxWxH), NEMA 4X, with mounting brackets	ZS-300
Weather shield 17-1/4x8-3/4x5-1/2" [438x222x140 mm] (LxWxH), NEMA 4X, with mounting brackets	ZS-300-5
Shaft extension 1/2"	ZS-300-C1
Shaft extension 3/4"	ZS-300-C2
Shaft extension 1"	ZS-300-C3
Baseplate extension	Z-SF
Linkage kit	ZG-JSL
Jackshaft Retrofit Linkage with Belimo Rotary Actuators	

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.



1 Provide overload protection and disconnect as required.



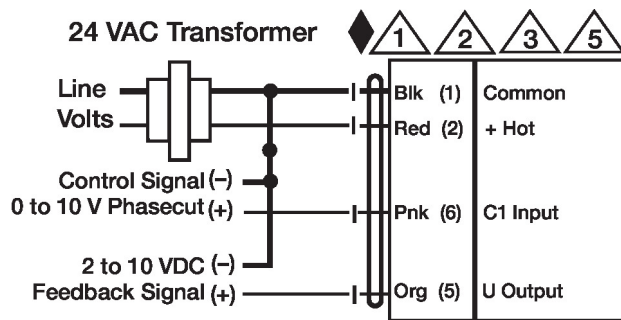
3 Actuators may also be powered by DC 24 V.



5 Only connect common to negative (-) leg of control circuits.



11 Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.



Phasecut Control

Dimensions

