

AHKX24-MFT-100 Damper Actuator Technical Data Sheet

Modulating, Electronic Fail-Safe, Linear, 24 V, Multi-Function Technology®



Technical Data

Power Supply	24 VAC, $\pm 20\%$, 50/60 Hz, 24 VDC, $\pm 10\%$
Power consumption in operation	11 W
Power consumption in rest position	3 W
Transformer sizing	22 VA (class 2 power source)
Electrical Connection	18 GA appliance or plenum cables, 3 ft [1 m], 10 ft [3 m] or 16ft [5 m], with or without 1/2" conduit connector
Overload Protection	electronic throughout full stroke
Electrical Protection	actuators are double insulated
Operating Range	2...10 V (default), 4...20 mA w/ ZG-R01 (500 Ω , 1/4 W resistor), variable (VDC, on/off, floating point)
Operating range Y variable	Start point 0.5...30 V End point 2.5...32 V
Input Impedance	100 k Ω for 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for PWM, On/Off and Floating point
Position Feedback	2...10 V, Max. 0.5 mA, VDC variable
Stroke	4" [100 mm]
Actuating force motor	100 lbf [450 N]
Direction of motion motor	selectable with switch 0/1
Direction of motion fail-safe	reversible with switch
Setting fail-safe position	adjustable with dial or tool 0...100% in 10% increments
Manual override	external push button
Running Time (Motor)	default 150 s 100 mm, variable 90...150 s
Running time fail-safe	<35 s
Bridging time	programmable 0...10 s (2 s default) delay before fail-safe activates
Pre-charging time	5...26 s
Angle of rotation adaptation	off (default)
override control	min. position = 0% , mid. Position = 50% , max. position = 100% (Default)
Ambient humidity	max. 95% r.H., non-condensing
Ambient temperature	-22...122°F [-30...50°C]
Storage temperature	-40...176°F [-40...80°C]
Degree of Protection	IP54, NEMA 2, UL Enclosure Type 2
Housing material	UL94-5VA
Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU
Noise level, motor	52 dB(A)
Noise level, fail-safe	61 dB(A)
Servicing	maintenance-free
Quality Standard	ISO 9001
Weight	3.3 lb [1.5 kg]

*Variable when configured with MFT options.

†Rated Impulse Voltage 800V, Type of action 1.AA, Control Pollution Degree 3

Linear Force min. 101 lbf.

Application

For fail-safe, modulating control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. A feedback signal is provided for position indication.

Default/Configuration

Default parameters for 2 to 10 VDC applications of the AHK...MFT actuator are assigned during manufacturing. If required, custom versions of the actuator can be ordered. The parameters are variable and can be changed by three means: Factory pre-set or custom configuration, set by the customer using PC-Tool software or the handheld ZTH US.

Operation

The AHKX24-MFT-100 provides a 4 inch linear stroke. The stroke of the gear rack can be adjusted on both sides in increments of 0.8 inches [20mm] with the mechanical end stops. When reaching the damper or actuator end position the actuator automatically stops. The gear can be manually disengaged by pressing the button located on the actuator cover. The AHKX24-MFT actuator uses a brushless DC motor controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuator rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in a holding mode. The actuator is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

Fail-Safe Indication

LED status indicator lights sequence:

Yellow off / Green on: operation ok, no faults

Yellow off / Green blinking: fail-safe mechanism is active

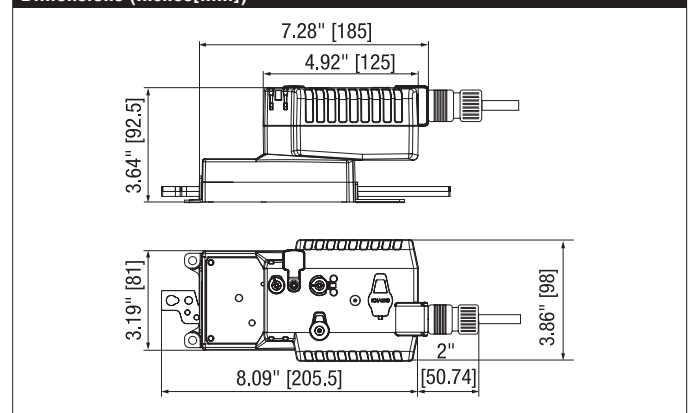
Yellow on / Green off: fault is detected

Yellow off / Green off: not in operation / capacitors charging

Yellow on / Green on: adaption running

Yellow blinking / Green on: communication with programming tool

Dimensions (Inches[mm])

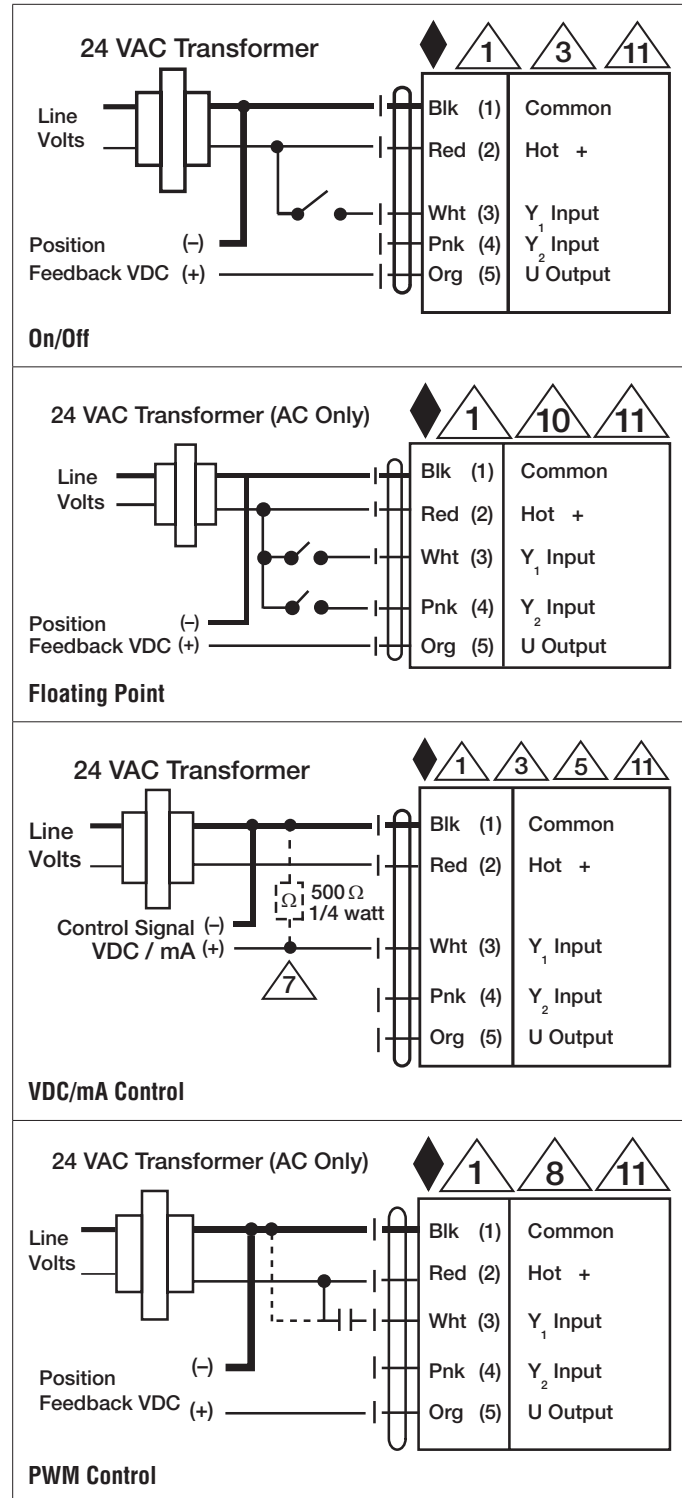


Accessories

KG10A	Ball joint
KG8	Ball joint
SH8	Push rod for KG6 & KG8 ball joints (36" L, 5/16" diameter).
Z-DS1	Rotary support
Z-KSC	3/8"-16 shaft clevis for AHK/AH.
ZG-119	Bracket for AHK/AH/LH linear actuators.
IRM-100	Input rescaling module for modulating actuators.
MFT-P	Belimo PC-Tool
PS-100	Low voltage and control signal simulator.
PTA-250	Pulse width modulation interface for modulating actuators.
SGA24	Positioners suitable for use with the modulating damper actuators LM..A-SR, NM..A-SR, SM..A-SR and GM..A-SR
SGF24	Positioners suitable for use with the modulating damper actuators LM..A-SR, NM..A-SR, SM..A-SR and GM..A-SR
TF-CC US	Cable conduit connector, 1/2".
UK24BAC	Gateway MP to BACnet MS/TP
UK24LON	Gateway MP to LonWorks
UK24MOD	Gateway MP to Modbus RTU
ZG-R01	4 to 20 mA adaptor, 500Ω, 1/4 W resistor w 6" pigtail wires.
ZG-R02	50% voltage divider kit (resistors with wires).
ZG-SGF	Mounting plate for SGF.
ZG-X40	120 to 24 VAC, 40 VA transformer.
ZK1-GEN	Connection cable
ZK2-GEN	Connection cable
ZTH US	Handheld programming tool w/ ZK1-GEN, ZK2-GEN, ZK6-GEN.
NSV24 US	Battery back-up module for non-spring return actuators.
NSV-BAT	12V 1.2AH battery (two required for NSV24 US).

Typical Specification

Modulating control, electronic fail-safe damper actuators shall be electronic type with integrated linear stroking arm. Actuators must provide modulating control in response to a 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 reversing switch and manual override on the cover. Run time shall be constant and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position feedback. 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.



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Wiring Diagrams



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.



Actuators with appliance cables are numbered.



Provide overload protection and disconnect as required.



Actuators may also be powered by 24 VDC.



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



A 500 Ω resistor (ZG-R01) converts the 4 to 20 mA control signal to 2 to 10 VDC.



Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.



For triac sink the Common connection from the actuator must be connected to the Hot connection of the controller. Position feedback cannot be used with a triac sink controller; the actuator internal common reference is not compatible.



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



IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).

