

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

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



5-year warranty



MFT

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	1.3 W
	Transformer sizing	6 VA
	Electrical Connection	18 GA plenum cable with 1/2" conduit connector, degree of protection NEMA 2 / IP54, 1 m 3 m and 5 m
	Overload Protection	electronic throughout 0...95° rotation
Functional data	Torque motor	180 in-lb [20 Nm]
	Operating range Y	0...135 Ω
	Operating range Y note	Honeywell Electronic Series 90, input 0...135 Ω
	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	90...350 s
	Noise level, motor	45 dB(A)
	Position indication	Mechanical, 30...65 mm stroke
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 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	1.5 lb [0.68 kg]
Materials	Housing material	UL94-5VA

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

Product features

Application	For proportional 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 default parameters for 0 to 135Ω input applications of the ...MFT95 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.
Operation	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. The actuator 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. The 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. Add-on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions. For low ambient temperatures, the optional supplemental (-H) Heater add-on is available.
Typical specification	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 up to 3/4" diameter. Actuators must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500 Ω 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 reversing switch and manual override on the cover. If required, actuator will be provided with screw terminal strip for electrical connections (AMX24-SR-T and NMX24-SR-T). Run time shall be constant and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position indication. 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.

Accessories

Gateways	Description	Type
Gateway MP to BACnet MS/TP		UK24BAC
Gateway MP to Modbus RTU		UK24MOD
Gateway MP to LonWorks		UK24LON

Electrical accessories	Description	Type
	Auxiliary switch 1 x SPDT add-on	S1A
	Auxiliary switch 2 x SPDT add-on	S2A
	Auxiliary switch, mercury-free	P475
	Auxiliary switch, mercury-free	P475-1
	Feedback potentiometer 140 Ω add-on, grey	P140A GR
	Feedback potentiometer 500 Ω add-on, grey	P500A GR
	Feedback potentiometer 1 kΩ add-on, grey	P1000A GR
	Feedback potentiometer 2.8 kΩ add-on, grey	P2800A GR
	Feedback potentiometer 5 kΩ add-on, grey	P5000A GR
	Feedback potentiometer 10 kΩ add-on, grey	P10000A GR
	Feedback potentiometer 15 kΩ gray	P15000A-F GR
	Battery backup system, for non-spring return models	NSV24 US
	Battery, 12 V, 1.2 Ah (two required)	NSV-BAT
	Transformer, AC 120 V to AC 24 V, 40 VA	ZG-X40
	Cable conduit connector 1/2"	TF-CC US
	Cable Gland (NEMA 4 models)	43442-00001

Mechanical accessories	Description	Type
Damper crank arm Slot width 6.2 mm, clamping range ø10...18 mm	KH6	
Damper crank arm Slot width 8.2 mm, clamping range ø10...18 mm	KH8	
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	
Ball joint suitable for damper crank arm KH8, Multipack 10 pcs.	KG6	
Ball joint suitable for damper crank arm KH8, Multipack 10 pcs.	KG8	
Ball joint suitable for damper crank arm KH8 / KH10, Multipack 10 pcs.	KG10A	
Push rod for KG6 & KG8 ball joints (36" L, 5/16" diameter).	SH8	
Push rod for KG10A ball joint 36" L, 3/8" diameter	SH10	
Damper clip for damper blade, 3.5" width.	ZG-DC1	
Damper clip for damper blade, 6" width.	ZG-DC2	
Weather shield 13x8x6" [330x203x152 mm] (LxWxH)	ZS-100	
Base plate, for ZS-100	ZS-101	
Weather shield 406x213x102 mm [16x8-3/8x4"] (LxWxH)	ZS-150	
Shaft extension 240 mm ø20 mm for damper shaft ø8...22.7 mm	AV8-25	
Anti-rotation bracket TF/NKQ/AM/NM/LM.	TF-P	
Mounting bracket for AF..	ZG-100	
Mounting bracket	ZG-101	
Wrench 0.32 in and 0.39 in [8 mm and 10 mm]	TOOL-06	
Adapter for auxiliary switch and feedback potentiometer	Z-SPA	
Actuator arm for standard shaft clamp (one-sided)	AH-25	
Clamp NM/AM 1/2", 3/4", 1"	K-AM25	
Shaft clamp reversible, clamping range ø10...20 mm	K-SA	
Mounting bracket	ZG-109	
Linkage kit	ZG-110	
Mounting bracket for LF..	ZG-112	
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	
Mounting kit for linkage operation for flat installation	ZG-NMA	
Linkage kit	ZG-JSL	
Jackshaft Retrofit Linkage with Belimo Rotary Actuators		
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	
Base plate extension for SM..A to SM../AM../SMD24R	Z-SMA	
Tools	Description	Type
Signal simulator, Power supply AC 120 V	PS-100	
Connecting cable 16 ft [5 m], A: RJ11 6/4 ZTH EU, B: 6-pin for connection to service socket	ZK1-GEN	
Connecting cable 16 ft [5 m], A: RJ11 6/4 ZTH EU, B: free wire end for connection to MP/PP terminal	ZK2-GEN	
Connecting cable 10 ft [3 m], A: RJ11 6/4 ZTH EU, B: 3-pin Weidmüller and supply connection	ZK4-GEN	
Service Tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH US	

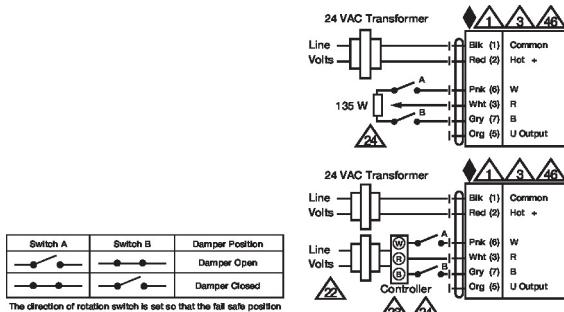
Electrical installation

 Provide overload protection and disconnect as required.

 Actuators may also be powered by DC 24 V.

 Actuators and controller must have separate transformers.

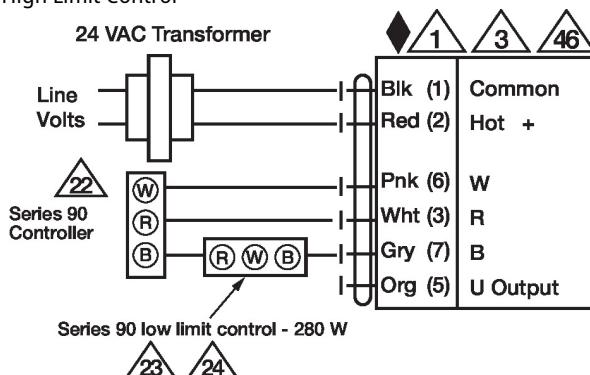
- 23 Consult controller instruction data for more detailed information.
- 24 Resistor value depends on the type of controller and the number of actuators. No resistor is used for one actuator. Honeywell® resistor kits may also be used.
- 25 To reverse control rotation, use the reversing switch.
- 46 Actuators may be controlled in parallel. Current draw and input impedance must be observed.



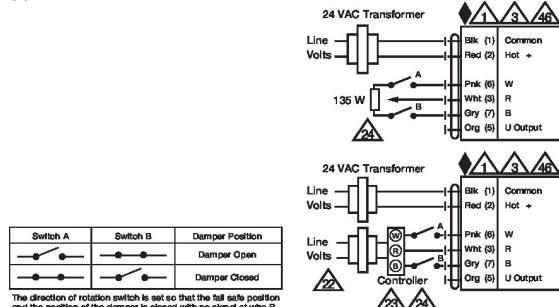
Typical and Override Control

Wiring diagrams

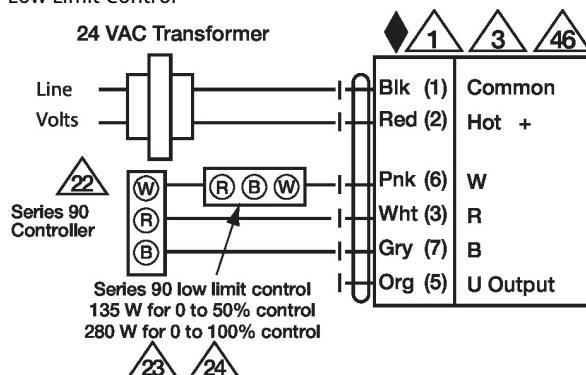
High Limit Control



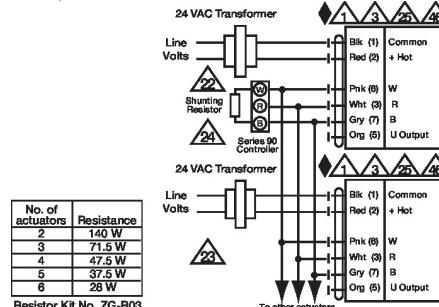
Typical and Override Control



Low Limit Control

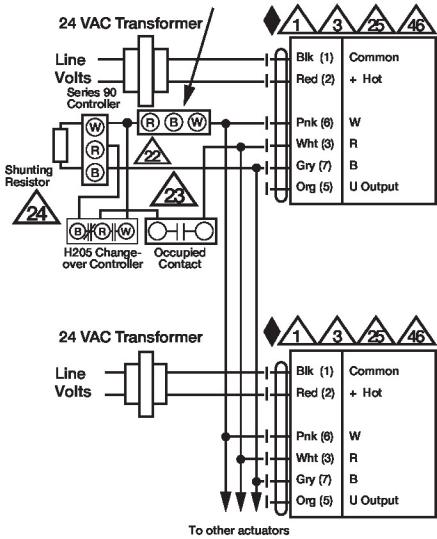


Multiple Actuators

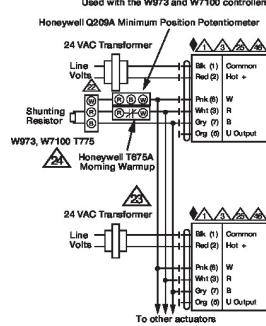
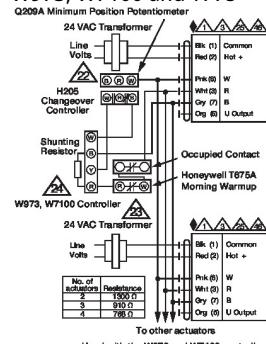


Multiple Actuators with Minimum Position Potentiometer

S963A Minimum Position Potentiometer



Multiple Actuators Used with W973, W7100 and T775



Dimensions

1/2" to 1.05" [12.7 to 26.67]

2/5" to 1.05" [10 to 26.67]

