Technical data sheet

TFX24

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

- Torque motor 22 in-lb [2.5 Nm]
- Nominal voltage AC/DC 24 V
- Control On/Off







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Nominal voltage frequency Sol/60 Hz Nominal voltage range AC 19.228.8 V / DC 21.628.8 V Power consumption in operation 2 W Power consumption in rest position 1.3 W Transformer sizing 5 VA				
Nominal voltage range AC 19.228.8 V / DC 21.628.8 V Power consumption in operation 2 W Power consumption in rest position 1.3 W Transformer sizing 5 VA Electrical Connection 18 GA appliance or plenum cables, 1 m, 3 m or 5 m, with or without 1/2" NPT conduit connector Overload Protection electronic throughout 095° rotation Electrical Protection actuators are double insulated Functional data Torque motor 22 in-lb [2.5 Nm] Direction of motion motor selectable by ccw/cw mounting Direction of motion fail-safe reversible with cw/ccw mounting Angle of rotation Max. 95° Angle of rotation note adjustable with mechanical stop Running Time (Motor) 75 s Running time (Motor) 75 s Running time fail-safe 25 s @ -4122°F [-2050°C], <60 s @ -22°F [-30°C] Noise level, motor 50 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 IP42 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 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 -22122°F [-3050°C] Sorage temperature -22122°F [-3050°C] Servicing maintenance-free	Electrical data	Nominal voltage	AC/DC 24 V	
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Transformer sizing 5 VA Electrical Connection 18 GA appliance or plenum cables, 1 m, 3 m or 5 m, with or without 1/2" NPT conduit connector Overload Protection electronic throughout 095° rotation Electrical Protection actuators are double insulated Torque motor 22 in-lb [2.5 Nm] Direction of motion motor selectable by ccw/cw mounting Direction of motion fail-safe reversible with cw/ccw mounting Angle of rotation Max. 95° Angle of rotation adjustable with mechanical stop Running Time (Motor) 75 s Running Time (Motor) 75 s Running time fail-safe 225 s @ -4122°F [-2050°C], <60 s @ -22°F [-30°C] Noise level, motor 50 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 IP42 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 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 -2212°F [-4080°C] Servicing maintenance-free Weight Weight 1.4 lb [0.63 kg]				
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Direction of motion fail-safe Angle of rotation Angle of rotation Angle of rotation note Running Time (Motor) Running time fail-safe So dB(A) Running time fail-safe Running time fail-sup Running Runnin	Functional data	Torque motor	22 in-lb [2.5 Nm]	
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Running time fail-safe		Angle of rotation note	adjustable with mechanical stop	
[-30°C] Noise level, motor 50 dB(A) Noise level, fail-safe 62 dB(A) Position indication Mechanical Power source UL Class 2 Supply Degree of protection IEC/EN IP42 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 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 -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Servicing maintenance-free Weight Weight 1.4 lb [0.63 kg]		Running Time (Motor)	75 s	
Noise level, fail-safe Position indication Mechanical Power source UL Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard UL 2043 Compliant Max. 95% RH, non-condensing Ambient temperature Servicing Weight Weight Mechanical Class 2 Supply Degree of protection IEC/EN IP42 NEMA 2 UL Enclosure Type 2 Cullus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC Ambient humidity Ams. 95% RH, non-condensing -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Servicing Weight Weight 1.4 lb [0.63 kg]		Running time fail-safe		
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Power source UL Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing UL Enclosure Quality Standard UL 2043 Compliant Ambient humidity Ambient temperature Storage temperature Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC Ambient humidity Ambient temperature Servicing Weight Class 2 Supply IP42 IP42 NEMA 2 CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU ISO 9001 Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC Ambient humidity Amx. 95% RH, non-condensing -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Servicing Meight Weight 1.4 lb [0.63 kg]		Noise level, fail-safe	62 dB(A)	
Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard UL 2043 Compliant Ambient humidity Ambient temperature Servicing Degree of protection NEMA/UL NEMA 2 UL Enclosure Type 2 CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU ISO 9001 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 -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Servicing maintenance-free Weight Weight MEMA 2 LIF42		Position indication	Mechanical	
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Agency Listing CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU Quality Standard 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 -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Servicing maintenance-free Weight Weight 1.4 lb [0.63 kg]		Degree of protection NEMA/UL	NEMA 2	
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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 -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Servicing maintenance-free Weight Weight 1.4 lb [0.63 kg]		Agency Listing		
300.22(C) of the NEC and Section 602 of the IMC Ambient humidity Max. 95% RH, non-condensing Ambient temperature -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Servicing maintenance-free Weight Weight 1.4 lb [0.63 kg]		Quality Standard	ISO 9001	
Ambient temperature Storage temperature Servicing Weight -22122°F [-3050°C] -40176°F [-4080°C] maintenance-free 1.4 lb [0.63 kg]		UL 2043 Compliant	300.22(C) of the NEC and Section 602 of the	
Storage temperature -40176°F [-4080°C] Servicing maintenance-free Weight Weight 1.4 lb [0.63 kg]		Ambient humidity	Max. 95% RH, non-condensing	
Servicing maintenance-free Weight Weight 1.4 lb [0.63 kg]		Ambient temperature	-22122°F [-3050°C]	
Weight Weight 1.4 lb [0.63 kg]		Storage temperature	-40176°F [-4080°C]	
		Servicing	maintenance-free	
Materials Housing material UL94-5VA	Weight	Weight	1.4 lb [0.63 kg]	
	Materials	Housing material	UL94-5VA	



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

Product features

Application

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 from 1/4" up to 1/2" in diameter by means of its universal clamp, 1/2" shaft centered at delivery. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.

Operation

The TF 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 consistent torque to the damper with, and without, power applied to the actuator. The TF series provides 95° of rotation and is provided with a graduated position indicator showing 0° to 90°. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. Power consumption is reduced in holding mode.

Safety Note: Screw a conduit fitting into the actuator's bushing. Jacket the actuator's input and output wiring with suitable flexible conduit. Properly terminate the conduit in a suitable junction box.

Typical specification

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 shaft up to a 1/2" diameter and center a 1/2" shaft. 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, one SPDT auxiliary switch shall be provided having the capability of being adjustable. Actuators with auxiliary switch 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, 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	Туре
	Auxiliary switch, mercury-free	P475
	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



Technical data sheet

Mechanical accessories

Description	Туре
Shaft extension 170 mm ø10 mm for damper shaft ø616 mm	AV6-20
Position indicator	IND-TF
for TFB(X)	
Shaft clamp	K8 US
for TFB(X)	
Ball joint suitable for damper crank arm KH8	KG6
Ball joint suitable for damper crank arm KH8	KG8
Damper crank arm Slot width 8.2 mm, for ø1.05"	KH12
Damper crank arm Slot width 6.2 mm, clamping range ø1018 mm	KH6
Damper crank arm Slot width 8.2 mm, clamping range ø1018 mm	KH8
TFB(X) crankarm with 5/16" slot.	KH-TF US
TFB(X) crankarm with 1/4" slot.	KH-TF-1 US
Screw fastening kit	SB-TF
Push rod for KG6 & KG8 ball joints (36" L, 5/16" diameter).	SH8
Anti-rotation bracket TF/NKQ/AM/NM/LM.	TF-P
Wrench 0.32 in and 0.39 in [8 mm and 10 mm]	TOOL-06
Angle of rotation limiter, with end stop	ZDB-TF
Mounting bracket	ZG-113
for TFB(X)	
Damper clip for damper blade, 3.5" width.	ZG-DC1
Damper clip for damper blade, 6" width.	ZG-DC2
Shaft extension for 3/8" diameter shafts (4" L).	ZG-LMSA-1
Shaft extension for 1/2" diameter shafts (5" L).	ZG-LMSA-1/2-5
TFB(X) crankarm adaptor kit (includes ZG-113).	ZG-TF112
TFB(X) crankarm adaptor kit (T bracket included).	ZG-TF2
Mounting kit	ZG-TF3
for TFB(X)	
Weather shield 13x8x6" [330x203x152 mm] (LxWxH)	ZS-100
Baseplate, for ZS-100	ZS-101
Weather shield 406x213x102 mm [16x8-3/8x4"] (LxWxH)	ZS-150

Electrical installation



Marning! 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.



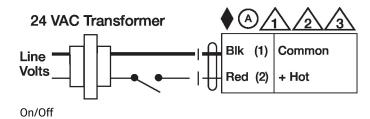
Meets cULus requirements without the need of an electrical ground connection.

A Actuators with appliance cables are numbered.

Provide overload protection and disconnect as required.

Actuators may also be powered by DC 24 V.

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





Dimensions

