

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

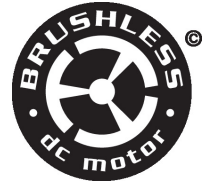
- Torque motor 22 in-lb [2.5 Nm]
- Nominal voltage AC 100...240 V
- Control Modulating
- Position feedback 2...10 V



Picture may differ from product



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 | 2.5 W |
| | Power consumption in rest position | 2 W |
| | Transformer sizing | 5.5 VA |
| | Electrical Connection | (2) 18 AWG appliance cables, 1 m, with 1/2" NPT conduit connectors |
| | Overload Protection | electronic throughout 0...95° rotation |
| | Electrical Protection | actuators are double insulated |
| | Functional data | Torque motor |
| Operating range Y | | 2...10 V |
| Operating range Y note | | 4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor) |
| Input impedance | | 100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA |
| 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 |
| Angle of rotation | | Max. 95° |
| Angle of rotation note | | adjustable with mechanical stop |
| Running Time (Motor) | | 95 s / |
| Running time motor note | | constant, independent of load |
| Running time fail-safe | | <25 s @ -20...50°C, <60 s @ -30°C |
| Sound power level, motor | | 35 dB(A) |
| Sound power level, fail-safe | | 62 dB(A) |
| Position indication | Mechanical | |
| Safety data | Degree of protection NEMA/UL | NEMA 2 |
| | Housing | 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 |

Technical data

| | | |
|--------------------|---------------------|-----------------------------|
| Safety data | 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 | 1.8 lb [0.83 kg] |
| Materials | Housing material | UL94-5VA |

Footnotes †Rated Impulse Voltage 4kV, Type of action 1.AA, Control Pollution Degree 3.

Product features

Application For fail-safe, modulating control 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 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. The actuator operates in response to a 2 to 10 VDC, or with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication.

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 95°. The TF 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 fail-safe position. The ASIC monitors and controls the brushless DC motor's rotation and provides a digital rotation sensing function to prevent damage to the actuator in a stall condition. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. Power consumption is reduced in holding mode. The actuator is double insulated so an electrical ground connection is not necessary.

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 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 shaft up to a 1/2" diameter and center on a 1/2" shaft. The actuator must provide modulating damper control in response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. The actuator 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. 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 | Type |
|------------------------|---|------------------|
| | Auxiliary switch, mercury-free | IRM-100 |
| | Auxiliary switch, mercury-free | P475 |
| | Signal simulator, Power supply AC 120 V | P475-1 PS-100 |

Accessories

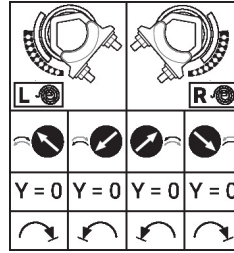
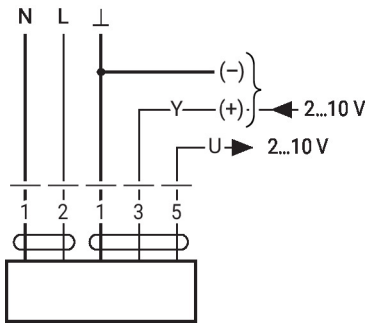
| | Description | Type |
|-------------------------------|---|---------------|
| | Convert Pulse Width Modulated Signal to a 2...10 V Signal for Belimo Proportional Actuators | PTA-250 |
| | Positioner for wall mounting | SGA24 |
| | Positioner for front-panel mounting | SGF24 |
| | Cable conduit connector 1/2" | TF-CC US |
| | Resistor, 500 Ω, 1/4" wire resistor with 6" pigtail wires | ZG-R01 |
| | Resistor kit, 50% voltage divider | ZG-R02 |
| Mechanical accessories | Description | Type |
| | Shaft extension 170 mm ø10 mm for damper shaft ø6...16 mm | AV6-20 |
| | Position indicator for TFB(X) | IND-TF |
| | Shaft clamp for TFB(X) | K8 US |
| | Ball joint suitable for damper crank arm KH8 / KH10 | KG10A |
| | 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 ø10...18 mm | KH6 |
| | Damper crank arm Slot width 8.2 mm, clamping range ø10...18 mm | KH8 |
| | | KH-TF US |
| | | KH-TF-1 US |
| | Screw fastening kit | SB-TF |
| | Push rod for KG10A ball joint L 36", 3/8" diameter | SH10 |
| | | SH8 |
| | | 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 for TFB(X) | ZG-113 |
| | | ZG-DC1 |
| | | ZG-DC2 |
| | | ZG-LMSA-1 |
| | | ZG-LMSA-1/2-5 |
| | | ZG-TF112 |
| | | ZG-TF2 |
| | | ZG-TF3 |
| | Mounting kit 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
Wire colors:

- 1 = blue
- 2 = brown
- 1 = black
- 3 = white
- 5 = orange

Electrical installation

AC 230 V, modulating



Dimensions

PC

