

TF24-3 (-S) US

On-off, spring return failsafe, reversible, floating point, 24V



Torque min. 18 in-lb, for control of air dampers

Application

For modulation or on-off 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 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.

Control is floating point from a triac or relay, or on-off from an auxiliary contact on a fan motor contactor, controller, or manual switch.

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.

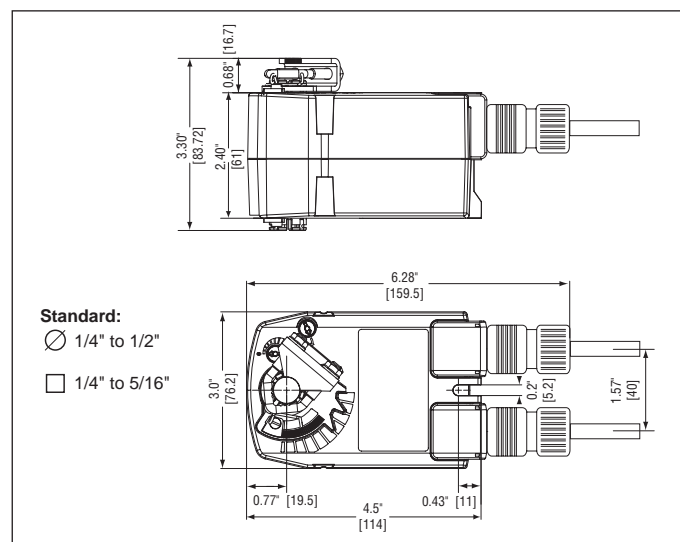
The TF series provides 95° of rotation and is provided with a graduated position indicator showing 0 to 95°.

The TF24-3 (-S) US 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. 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 TF24-3-S US version is provided with 1 built-in auxiliary switch. This SPDT switch is provided for safety interfacing or signaling, for example, for fan start-up. The switching function is adjustable between 0° and 95°. The auxiliary switch in the TF24-3-S US is double insulated so an electrical ground is not necessary.

| Technical Data | TF24-3 (-S) US |
|--------------------------------|--|
| Power supply | 24 VAC ± 20% 50/60 Hz |
| Power consumption | running: 2.5 W ; holding: 1 W |
| Transformer sizing | 4 VA (class 2 power source) |
| Electrical connection | TF24-3 US 3 ft, 18 GA plenum rated cable TF24-3-S US 3 ft, 18 GA appliance cables (2) 1/2" conduit connector |
| Overload protection | electronic throughout 0 to 95° rotation |
| Input impedance | 1000 Ω (0.6w) control inputs |
| Angle of rotation | max. 95°, adjust. with mechanical stop |
| Torque | 18 in-lb [2 Nm] |
| Direction of rotation | spring: reversible with cw/ccw mounting motor: reversible with built-in switch |
| Position indication | visual indicator, 0° to 95° (0° is spring return position) |
| Auxiliary switch (TF24-3-S us) | 1 x SPDT 3A (0.5A) @ 250 VAC, UL listed adjustable 0° to 95° (double insulated) |
| Running time | motor: 95 sec constant, independent of load spring: < 25 sec @ -4°F to +122°F [-20°C to +50°C] < 60 sec @ -22°F [-30°C] |
| Humidity | 5 to 95% RH non-condensing |
| Ambient temperature | -22°F to +122°F [-30°C to +50°C] |
| Storage temperature | -40°F to +176°F [-40°C to +80°C] |
| Housing | NEMA type 2 /IP42 |
| Housing material | UL94-5VA |
| Agency listings | cULus listed acc. to UL 60730-1 |
| Noise level | max: running < 35 db (A) spring return 62 dB (A) |
| Servicing | maintenance free |
| Quality standard | ISO 9001 |
| Weight | TF24-3 1.4 lbs (0.6 kg.) TF24-3-S 1.5 lbs (0.7 kg.) |

Dimensions [All numbers in brackets are in millimeters.]



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Accessories

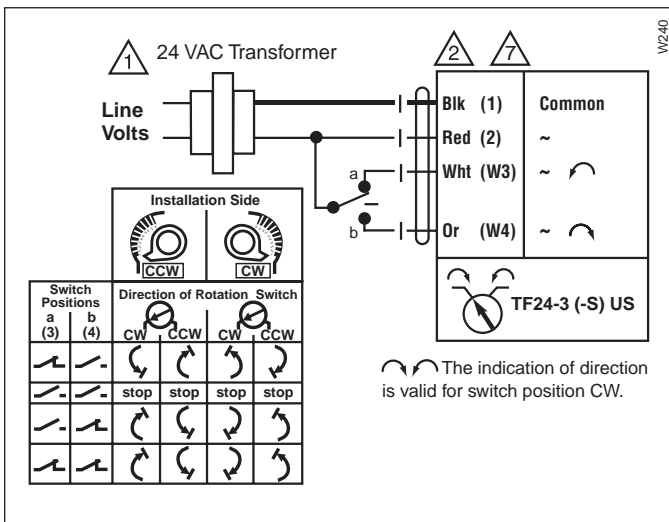
- Tool-06 8mm and 10 mm wrench
- KH-TF Crankarm for up to 1/2" round shaft
- ZG-TF2 Crankarm adaptor kit for TF
- ZG-TF112 Mounting bracket, kit for TF
- ZS-100 Weather shield (metal)
- ZS-150 Weather shield (polycarbonate)

Note: When using TF24-3 (-S) US actuators, only use accessories listed on this page.

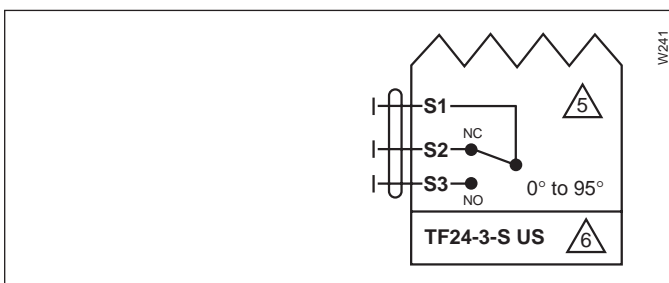
TF24-3 (-S) US Typical Specification

Floating point, on-off spring return damper actuators shall be direct coupled type which require no crankarm 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 counterclockwise fail-safe operation. Actuators shall have an external direction of rotation switch to reverse control logic. Actuators shall use a brushless DC motor and be protected from overload at all angles of rotation. If required, 1 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. Run time shall be constant and independent of torque. Actuators shall be cULus listed certified, have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

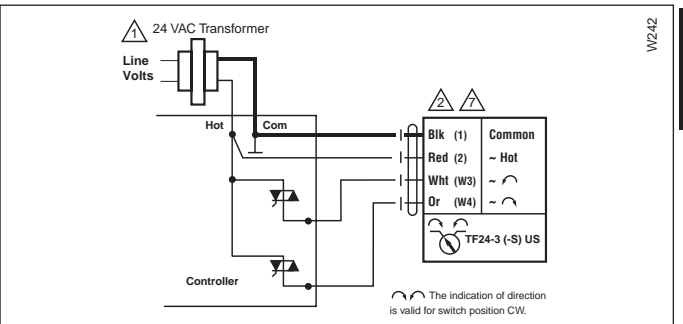
Wiring Diagrams



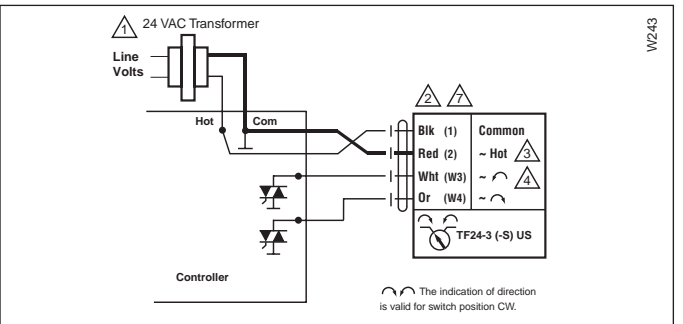
Floating point control of TF24-3 (-S) US



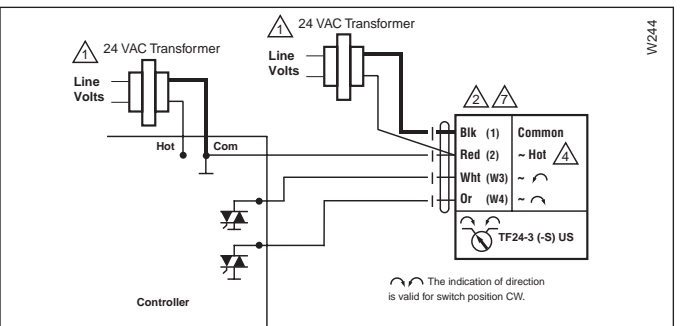
Auxiliary switch of TF24-3 (-S) US



Triac source



Triac sink



Triac sink with separate transformers

Notes:

- 1 Provide overload protection and disconnect as required.
- 2 Actuators may be connected in parallel. Power consumption must be observed.
- 3 The Common connection from the actuator must be connected to the Hot connection of the controller.
- 4 The actuator Hot must be connected to the control board Common.
- 5 For end position indication, interlock control, fan startup, etc., TF24-3-S US TF120-S US and TF230-S US incorporate one built-in auxiliary switch: 1 x SPDT, 3A (0.5A) @250 VAC, UL listed, adjustable 0° to 95°.
- 6 Meets cULus requirements without the need of an electrical ground connection.
- 7 Actuators with plenum rated cable do not have numbers on wires; use color coded instead. Actuators with appliance rated cable use numbers.