



Young Regulator Co.

7100 Krick Rd • Walton Hills, OH 44146

P: 440-232-9700 • F: 440-232-8266

www.youngregulator.com

Submit TF24 – 1-10

Model TF24

On/Off, Floating Point Control



| Technical Data | | TF24-3(-S) US |
|-----------------------|---------------|---|
| Power supply | | 24 VAC \pm 20%, 50/60 Hz |
| Power consumption | running | 2.5 W |
| | holding | 1 W |
| Transformer sizing | | 4 VA (class 2 power source) |
| Electrical connection | | 3 ft, 18 GA plenum rated cable |
| | | (-S models have 2 cables) |
| Overload protection | | electronic throughout 0 to 95° rotation |
| Input impedance | | 1000 Ω (0.6w) control inputs |
| Electrical protection | | actuators are double insulated |
| 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° spring return position) |
| 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, UL enclosure type 2 |
| Housing material | | UL94-5VA |
| Agency listings† | | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC, (and 2006/95/EC for -S versions) |
| 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) |

†Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

TF24-3-S US

| | |
|------------------|---|
| Auxiliary switch | 1 x SPDT 3A (0.5A) @ 250 VAC, UL Approved adjustable 0° to 95° (double insulated) |
|------------------|---|

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 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.

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.

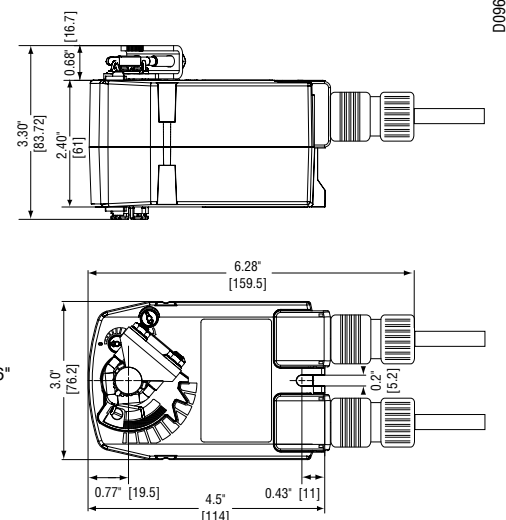
The TF series provides 95° of rotation and is provided with a graduated position indicator showing 0 to 95°.

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.

Dimensions (Inches [mm])



Standard:

⊘ 1/4" to 1/2"

□ 1/4" to 5/16"



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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. For Actuator Wiring Information and Diagrams, Please See Belimo Wiring Guide (pg 349).

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

✂️ INSTALLATION NOTES

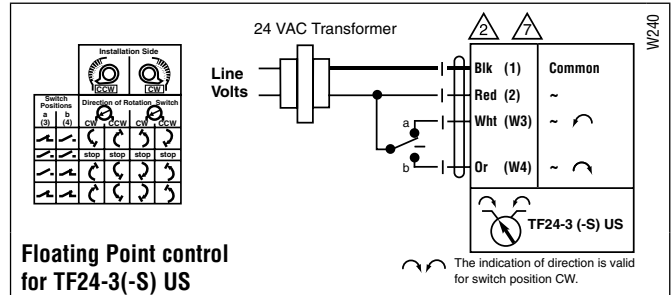
- ⚠️ **CAUTION Equipment damage!**
Actuators may be connected in parallel. Power consumption must be observed.
- ③ The Common connection from the actuator must be connected to the Hot connection of the controller.
- ④ The actuator Hot must be connected to the control board Common.
- ⑤ For end position indication, interlock control, fan startup, etc., TF24-3-S US incorporates one built-in auxiliary switch: 1 x SPDT, 3A (0.5A) @250 VAC, UL Approved, adjustable 0° to 95°.
- ⑦ Actuators with plenum rated cable do not have numbers on wires; use color coded instead. Actuators with appliance rated cable use numbers. TF24-3-S US has an Orange wire #5 instead of #4.

📄 APPLICATION NOTES

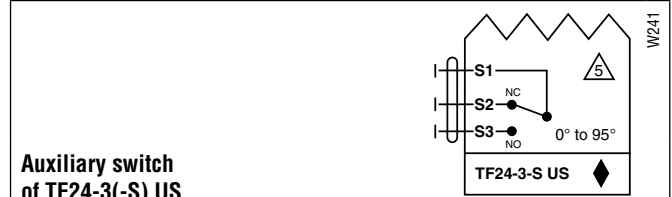
- ◆ Meets cULus requirements without the need of an electrical ground connection.

⚠️ WARNING Live Electrical Components!

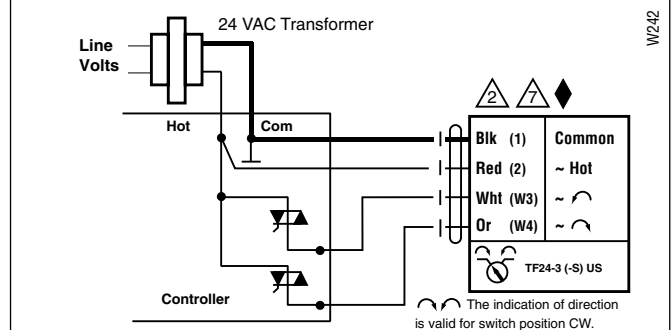
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



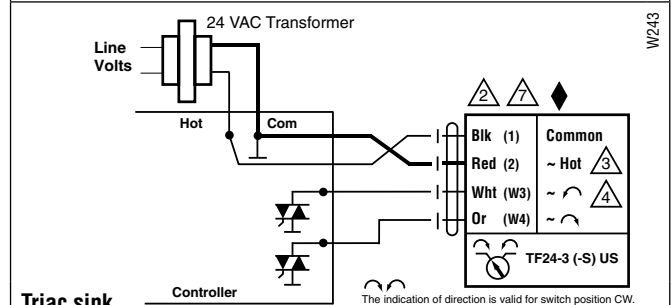
Floating Point control for TF24-3(-S) US



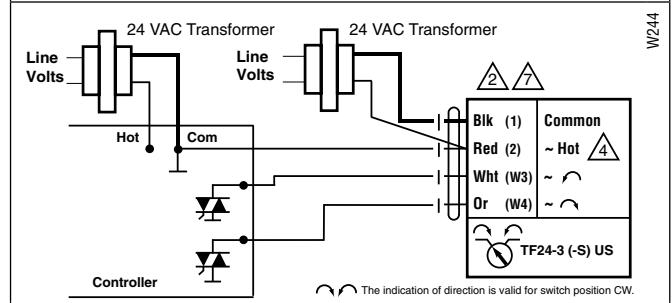
Auxiliary switch of TF24-3(-S) US



Triac source



Triac sink



Triac sink with separate transformers