

Installation Guide

Mounting

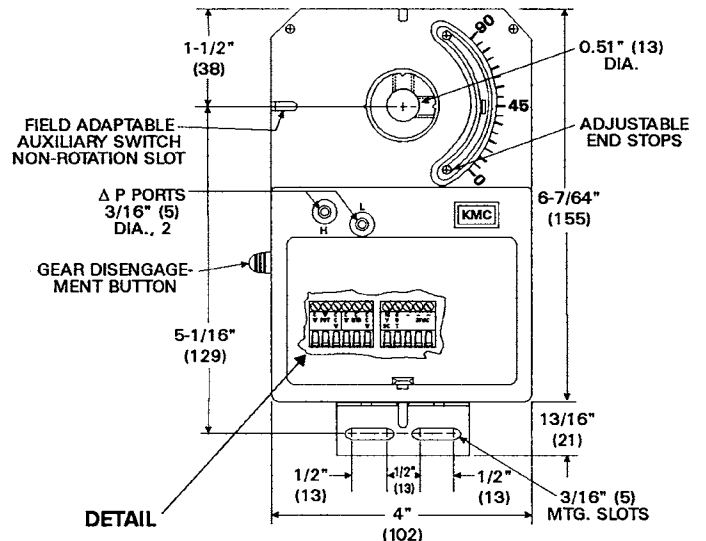
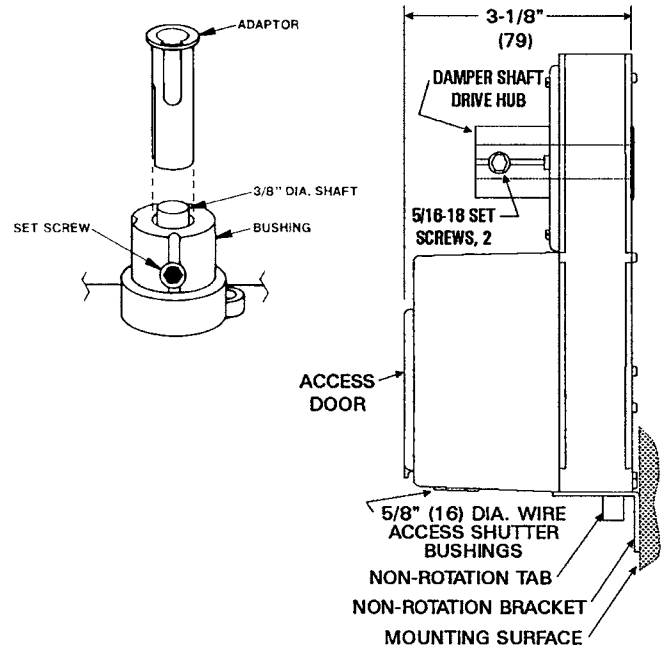
Standard Instructions

The TSP-50xx transducer-actuators are designed to mount on a standard 1/2" (13 mm) diameter shaft or a 3/8" (9.5 mm) shaft using the optional HFO-0011 adaptor (see the HFO-0011 Adaptor Instructions section below).

1. Set the TSP-50xx in the desired location.
2. Slide the TSP-50xx directly on to the 1/2" diameter damper shaft. The shaft must extend a minimum of 1-3/4" from the mounting surface.
3. Place the non-rotation bracket (supplied) on the non-rotation tab.
4. Attach the anti-rotation bracket to the mounting surface using #8 or #10 self-tapping screws (not included).
5. Depress the gear disengagement button and:
 - a. Rotate the drive hub until the indicator stops at the "90" mark if the damper is **clockwise to close**.
 - b. Rotate the drive hub to the "0" mark if the damper is **counterclockwise to close**.
6. Position the damper to full open.
7. Tighten the two 5/16"-18 hex set screws (see diagram).
8. Depress the gear disengagement button and rotate the drive hub/damper to the closed position.
9. Loosen the adjustable end stop, position it against the damper position indicator, and retighten it.

HFO-0011 Adaptor Instructions

1. Mount the TSP-5003/23 actuator over the 3/8" shaft.
2. Slide the HFO-0011 over the shaft into the drive bushing of the actuator.
3. Align the adaptor slots with the set screws.
4. Tighten the set screws.



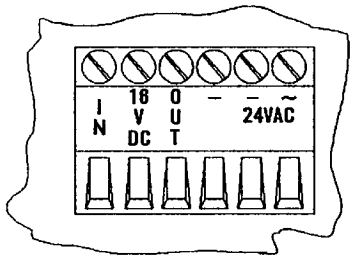
Connections and Wiring

All Models

1. Remove the TSP-50xx's wiring access door by pulling back on the door's tab and lifting upward.
2. Access for wire or cable is via two 5/8" (16 mm) diameter snap-in shutter bushings located on the bottom of the cover.
3. Remove the snap-in shutter bushing and replace with one the following connectors as needed. (Connectors not supplied, order separately):
 - a. HMO-4518 for 1/2" flexible conduit.
 - b. HMO-4520 compression connector for plenum rated cable.
 - c. HMO-4526 for rigid 1/2" conduit.

NOTE: Continue to the appropriate 2–10 VDC proportional or tri-state model section.

TSP-5002/5022 Proportional Models

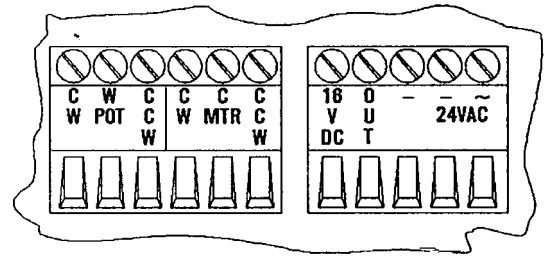


4. Wire the proportional TSP -50x2 as follows:
 - a. Terminal "IN" to 2–10 VDC proportional signal from thermostat/controller.
 - b. Terminal "16 VDC" (optional 22 mA power supply).
 - c. Terminal "OUT" (+ output) optional air velocity readout signal.
 - d. Terminal "-" thermostat/controller signal and air velocity readout reference (and 16 VDC reference if required).*
 - e. Terminal "-" to the neutral or ground side of the transformer.*
 - f. Terminal "~" to the phase side of a 24 VAC -15/+20%, 50/60 Hz, Class 2 only transformer.

*NOTE: Both "-" terminals are internally connected.

5. Reinstall the wiring access door.

TSP-5003/5023 Tri-State Models



4. Wire the tri-state TSP-50x3 as follows:
 - a. Terminal "CW" (just left of "W POT") for one side of the 10K potentiometer (1/3 watt) for optional position feedback to a controller input.
 - b. Terminal "W POT" (Wiper Potentiometer) for the wiper of the 10K pot.
 - c. Terminal "CCW" (just right of "W POT") for the other side of 10K pot.
 - d. Terminal "CW" (just left of "C MTR") to 24 VAC clockwise motor drive.
 - e. Terminal "C MTR" (Common Motor) to common for CW or CCW motor drive.
 - f. Terminal "CCW" (right of "C MTR") to 24 VAC CCW motor drive.
 - g. Terminal "OUT" (+ output) optional air velocity readout signal.
 - h. Terminal "16 VDC" (optional 22 mA power supply).
 - i. Terminal "-" optional air velocity readout reference (and 16 VDC reference if required).*
 - j. Terminal "-" to the neutral or ground side of the transformer.*
 - k. Terminal "~" to the phase side of a 24 VAC -15/+20%, 50/60 Hz, Class 2 only transformer.

*NOTE: Both "-" terminals are internally connected.

5. Reinstall the wiring access door.

Setup

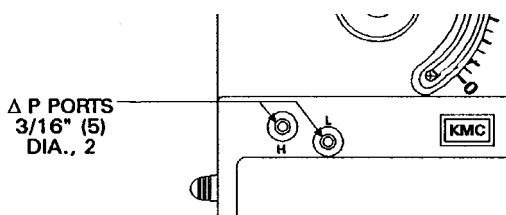
The TSP-50xx is factory calibrated to function with an SSS-1000 series differential pressure flow sensor.

Using 24" of 1/4" OD x 0.040" wall "FR" instrument and control tubing, a 3/8" to 1/4" barb union adapter, and 1" of 3/8" OD x 0.062 "FR" tubing for both connections:

1. Connect "H" port to the "H" (High) side of the SSS-100x sensor.
2. Connect the "L" port to the "L" (Low) side of the SSS-100x sensor.

NOTE: To maintain a close correlation with the factory calibration (for 0 to 3300 fpm), installations must use **exactly** 24 inches of the 1/4" tubing without restrictions such as fittings or kinks.

NOTE: The SSS-1000 series sensor must be mounted with the arrow pointing in the direction of the air flow.



Calibration

The TSP-50xx has a range of 0–3,300 fpm with a 1–5 VDC velocity output signal when using any SSS-1000 series velocity pickup. Fine tuning to a specific range is possible.

NOTE: The wiring access door must be removed to complete any of these adjustments. See removal instructions in the Connections and Wiring section.

To set a range:

1. Apply the desired velocity pressure maximum flow to the "H" and "L" ports.
2. Adjust the SPAN potentiometer until the 1–5 VDC Velocity Output signal indicates 5 VDC (read between terminals "out" and "-").

Motor Operation Test

TSP-5003/5023 Tri-State Models

1. Temporarily disconnect wires at "C MTR" and the "CW" and "CCW" terminals next to it (**NOT** the "CW" and "CCW" terminals next to "W POT").
2. Jumper the "C MTR" terminal to the "-" terminal.
3. Jumper the "CW" terminal to the "24 VAC" terminal. The shaft drive hub should be rotating in the CW direction.
4. Jumper the "C MTR" terminal to the "-" terminal.
5. Jumper the "CCW" terminal to the "24 VAC" terminal. The shaft drive hub should be rotating CCW.
6. If the actuator does not perform in this manner, check the wiring.

TSP-5002/5022 Proportional Models

1. Temporarily disconnect the thermostat connection at Terminal "IN".
2. Jumper "IN" terminal to the "16 VDC" terminal. The green Open LED should illuminate. The shaft drive hub should be rotating the damper open (until fully open). If the damper is rotating closed, change the "CW" or "CCW" to Close jumpers.
3. Jumper "IN" terminal to the "-" terminal. The red Close LED should illuminate. The shaft drive hub should be rotating the damper closed (until fully closed). If the damper is rotating open, change the "CW" or "CCW" to Close jumpers.

Accessories

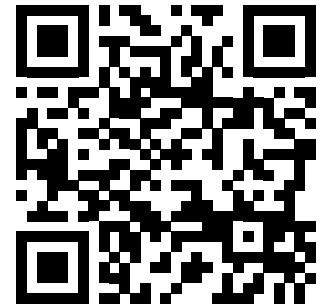
CME-1002	Single auxiliary switch
CME-1004	Double auxiliary switch
HFO-0011	3/8" shaft adaptor
HMO-1003	Replacement non-rotation bracket (one included)
HMO-4518	Snap-in connector for 1/2" flexible metal conduit
HMO-4520	Compression connector for plenum cable
HMO-4526	Female connector for 1/2" conduit
SSS-1002	DP (differential pressure) flow sensor, one sensing point, 3-5/32" (80 mm) length
SSS-1003	DP flow sensor, two sensing points, 5-13/32" (137 mm) length
SSS-1004	DP flow sensor, three sensing points, 7-21/32" (195 mm) length
SSS-1005	DP flow sensor, four sensing points, 9-29/32" (252 mm) length

Maintenance

No routine maintenance is required. Each component is designed for dependable, long-term reliability, and performance. Careful installation will also ensure long-term reliability and performance.

More Information

For specifications, see the [TSP-5000 Series Data Sheet](#) on the KMC web site.



Important Notices

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