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INTRODUCTION

Complete the following steps to install a KMC Conquest™ TSP-8003 (Dual Duct) Tri-State Actuator with Pressure Sensor for a dual duct VAV application.

NOTE: The TSP-8003 connects to a **KMC Conquest BAC-9000 Series VAV Controller** for operation.

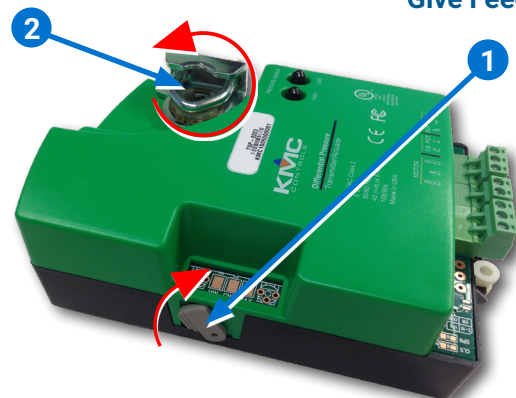
See the **TSP-8003** data sheet for actuator-specific information on the web at kmccontrols.com.

SET DRIVE HUB (45/60°) ROTATION LIMIT

NOTE: Complete the steps in this section **if** the VAV damper rotation limit is either **60 or 45** degrees.

NOTE: If the VAV damper rotates **90** degrees, skip this section and go to **Mount Actuator on page 2** instead.

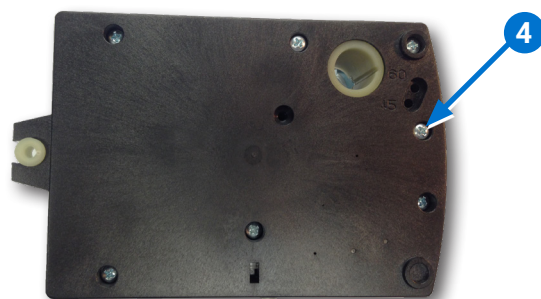
1. Push and hold the **gear release** **1** and rotate the **drive hub** and **V-clamp** **2** to the left.



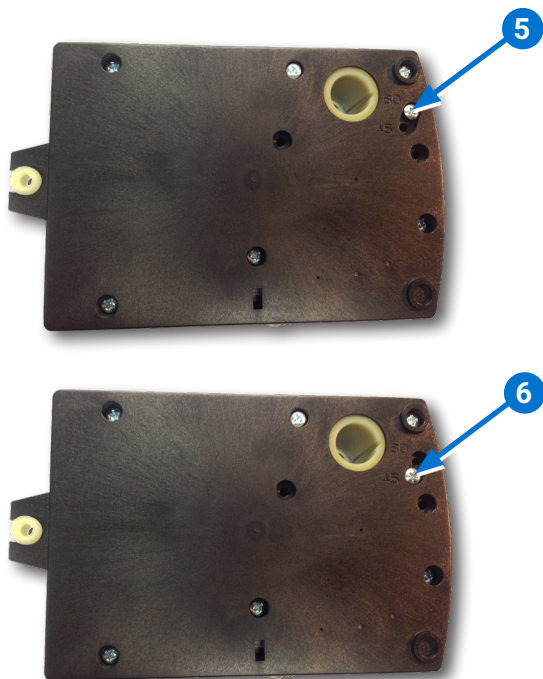
NOTE: The **V-clamp nuts** **3** should be on top.



2. Turn the controller over.
3. Remove the **stop screw** **4** from the storage location and clean any debris from the threads.



4. Insert the stop screw into the **60** **5** or **45** **6** stop hole position.



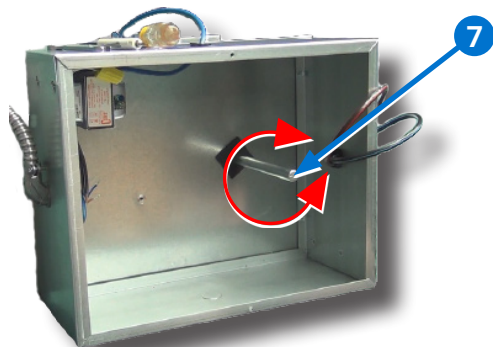
5. Tighten the screw until the screw head touches the plastic in the bottom of the recess.

NOTE: Overtightening the screw can cause compression in the case which may interfere with the actuator operation.

MOUNT ACTUATOR

NOTE: Install the actuator in a metal enclosure for RF shielding and physical protection.

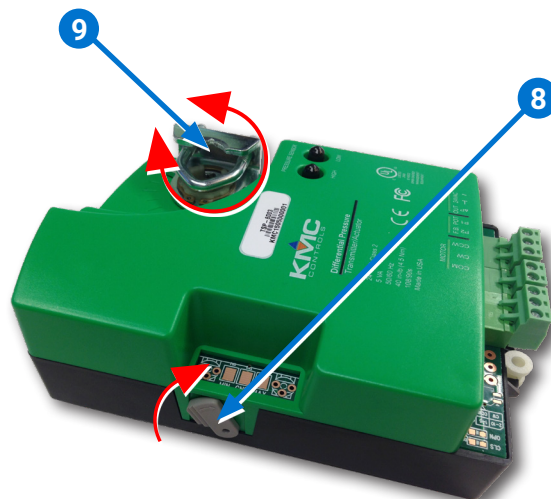
1. Manually rotate the **damper shaft** 7 on the VAV box to fully open the damper.



NOTE: The drive hub and V-clamp will be rotated in the same direction in Step 3.

2. Push and hold the **gear disengagement lever** 8 on the side of the controller.

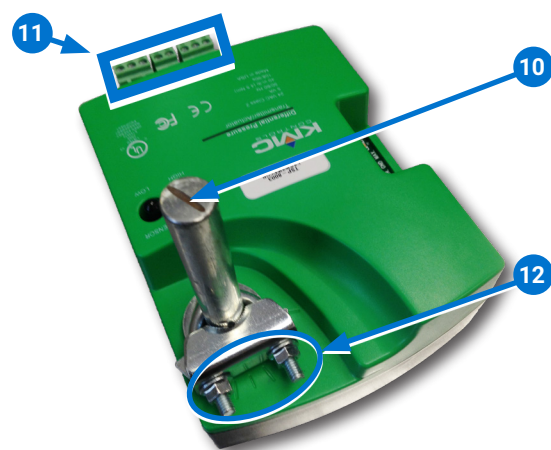
3. Rotate the **drive hub and V-clamp** 9 in the same direction that opened the damper.



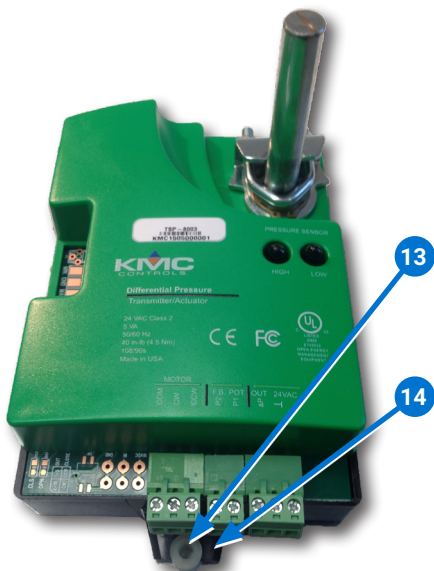
NOTE: Continue to rotate the drive hub and V-clamp until they reach a stop.

NOTE: The controller can be installed on a 3/8–5/8 inch (9.5–16 mm) round or 3/8–7/16 inch (9.5–11 mm) square damper shaft with a minimum length of 2 inches (51 mm).

4. Position the controller over the **damper shaft** 10 so that the **terminal blocks** 11 are easy to access for wiring.



5. Finger-tighten the **V-clamp nuts** 12 to position the damper shaft in the drive hub.
6. Center the **mounting bushing** 13 in the **mounting tab** 14.
7. Attach the controller to the VAV box with a **#8 sheet metal screw** through the **mounting bushing** 13.



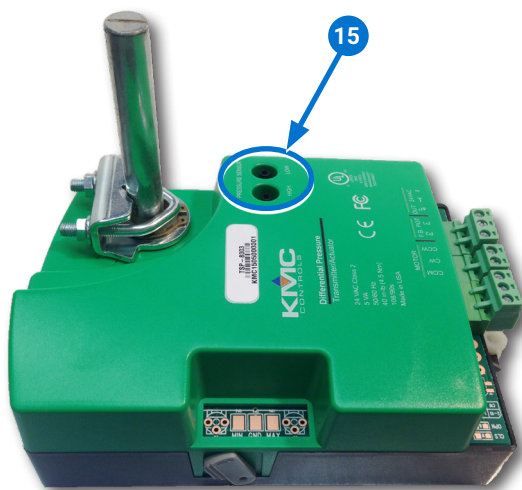
8. Evenly tighten the **V-clamp nuts** **12** on the drive hub to 30–35 in-lb.

CONNECT (OPT.) PRESSURE FLOW SENSOR

NOTE: Complete the steps in this section if an optional pressure flow sensor is to be installed.

NOTE: Use 1/4 inch (6.35 mm) FR tubing. Tubing should not be longer than 20 feet (6 meters).

1. Remove the **black shipping plugs** **15** from the PRESSURE SENSOR ports.



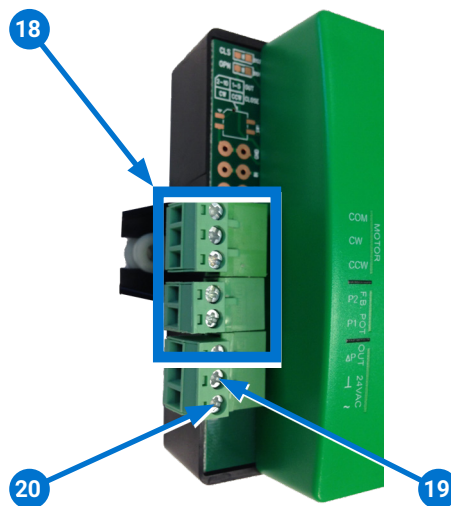
2. Connect the high pressure tube from the pressure flow sensor to the **HIGH** **16** port on the controller.

3. Connect the low pressure tube from the pressure flow sensor to the **LOW** **17** port on the controller.



CONNECT BAC-9000 SERIES CONTROLLER

4. Wire the **green terminal blocks** **18** of the TSP-8003 actuator to the **green terminal blocks** of the BAC-9000 series controller. See **Sample (TSP-8003/BAC-9001) Wiring** on page 5.



NOTE: Terminals P1 and P2 provide feedback on **damper position** with a 10K ohm (1/3 watt) potentiometer (10K ohms full CW and 0 ohms CCW). They are not polarity sensitive. Connect them to controller inputs if desired (UI6 and GND on a BAC-9000 series controller).

NOTE: Optional **ΔP** provides a 2–10 VDC output corresponding to 0–2 inches wc on the TSP-8003 pressure sensor. ΔP typically connects to UI5 on the BAC-9000 series VAV controller. The ΔP signal uses the transformer common (**⊥**) as signal ground. To use ΔP, therefore, both the TSP-8003 and the controller must be powered by the same transformer. See **Sample (TSP-8003/BAC-9001) Wiring on page 5**.

NOTE: Wire sizes 12–24 AWG can be clamped in each terminal.

NOTE: No more than two (16 AWG) wires can be joined at a common point.

CONNECT POWER

NOTE: Follow all local regulations and wiring codes.

NOTE: Use either shielded connecting cables or enclose all cables in conduit to maintain RF emissions specifications.

1. Connect the neutral side of a 24 VAC, Class-2 transformer to the **common terminal ⊥ 19** of the TSP-8003 actuator. (Usually this is the same transformer powering the connected BAC-9000 series controller.)
2. Connect the AC phase side of the transformer to the **phase terminal ~ 20** of the actuator.

CONFIGURATION AND PROGRAMMING

Setup for the TSP-8003 is done through the connected **KMC Conquest BAC-9000 Series VAV Controller**. See the documentation for that product.

REPLACEMENT PARTS

HPO-9901

Conquest Hardware
Replacement Parts Kit

NOTE: HPO-9901 includes the following:

Terminal Blocks

- (1) Black 2 Position
- (2) Grey 3 Position
- (2) Green 3 Position
- (4) Green 4 Position
- (2) Green 5 Position
- (2) Green 6 Position

DIN Clips

- (2) Small
- (1) Large

NOTE: See the **Conquest Selection Guide** for more information about replacement parts and accessories.

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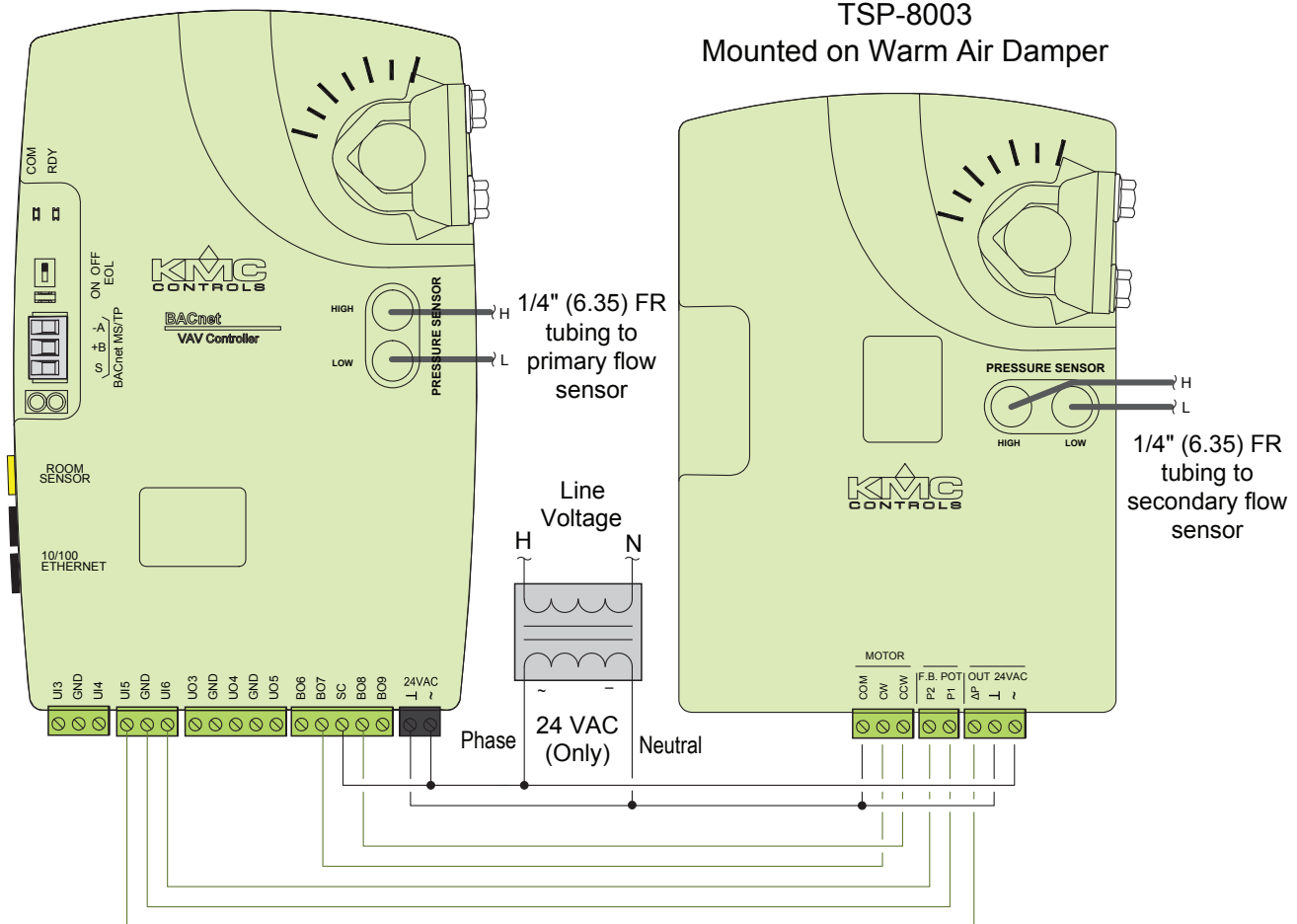


SAMPLE (TSP-8003/BAC-9001) WIRING

(Dual Duct VAV)

BAC-9001/9001CE Controller
Mounted on Cold Air Damper

TSP-8003
Mounted on Warm Air Damper



NOTE: For more information about the BAC-9000 series, see that installation guide.

NOTE: For **more wiring examples**, see the wiring diagrams that are part of the application library in KMC Connect, Converge, or TotalControl.

CONNECTIONS (SAMPLE)

BAC-9001	TSP-8003
B07 = Secondary CW	= CW
B08 = Secondary CCW	= CCW
SC = Switched Common	= Phase
U16 = Sec. Damper Position	= P2
GND = Ground	= P1
U15 = Secondary Flow	= ΔP
⊥ = Common	= ⊥