TSP-8003 Tri-State Actuator

Installation Guide

CONTENTS

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.

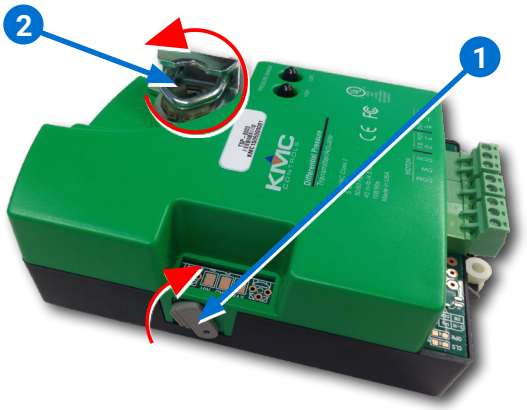
See the **TSP-8003** data sheet for actuator-specific information on the web at **kmccontrols.com**.

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.

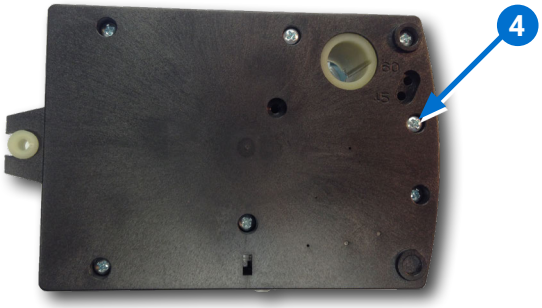
NOTE: If the VAV damper rotates **90** degrees, skip this section and go to **Mount Actuator on page 2** instead.

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

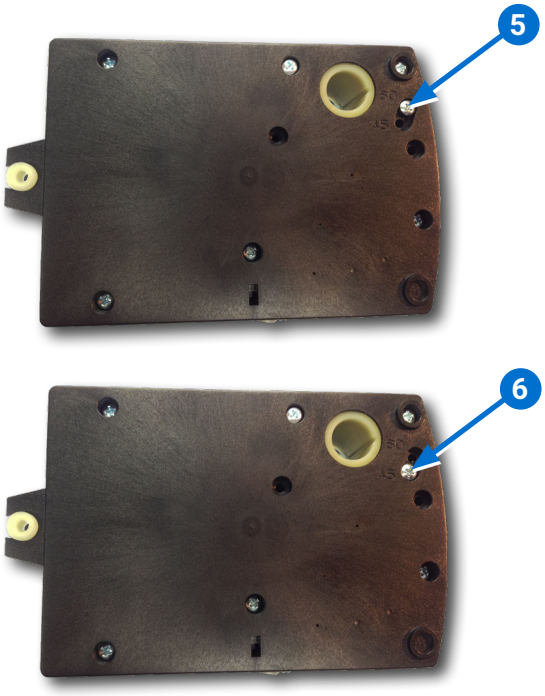


NOTE: The **V-clamp nuts** 3 should be on top.

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.



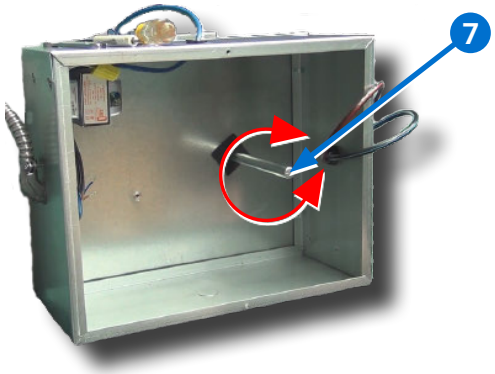
5. Tighten the screw until the screw head touches the plastic in the bottom of the recess.

   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.

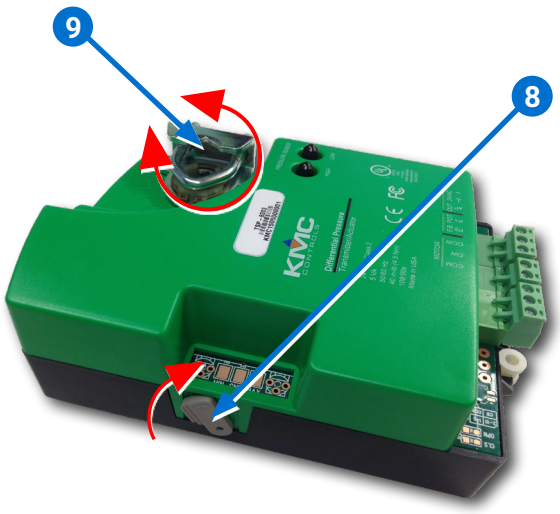
1. Manually rotate the **damper shaft** 7 on the VAV box to fully open the damper.



   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.

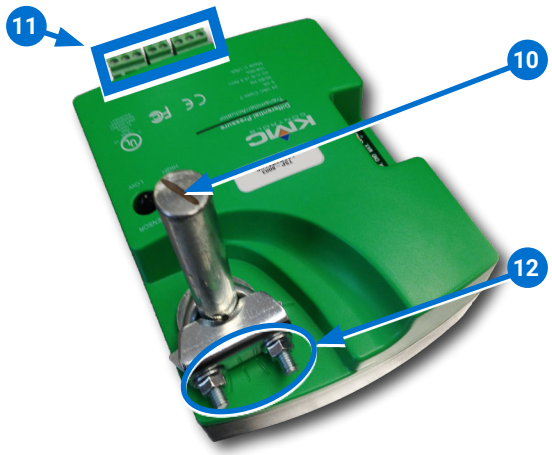
3. Rotate the **drive hub and V-clamp** 9 in the same direction that opened the damper.



   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 (99.5–11 mm) square damper shaft with a minimum length of 2 inches (51 mm).

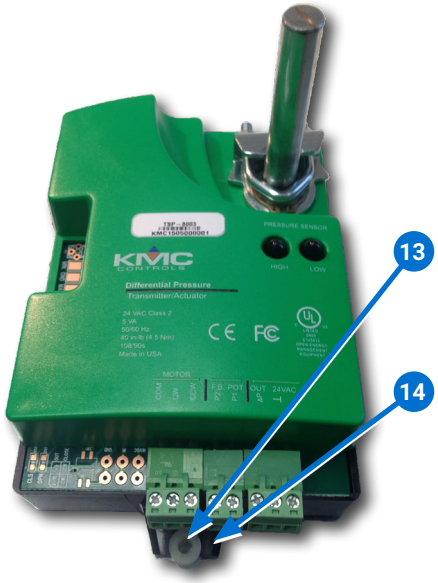
4. Position the controller over the **damper shaft** 10 so that the **terminal blocks** 11 are easy to access for wiring.



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.



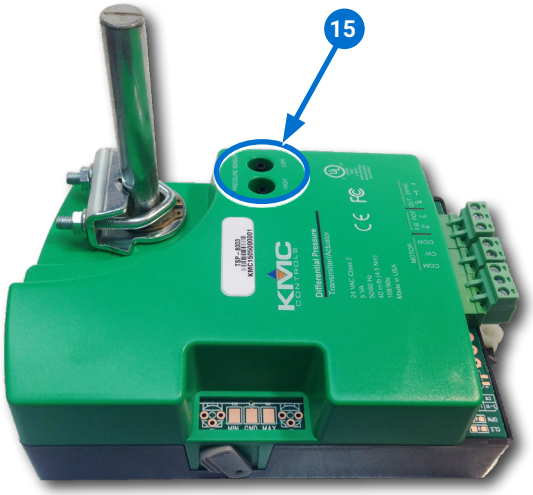
8. Evenly tighten the **V-clamp nuts** 12 on the drive hub to 30–35 in-lb.

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.

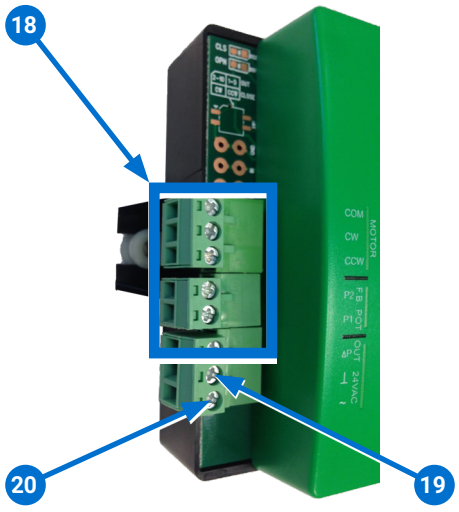


2. Connect the high pressure tube from the pressure flow sensor to the **HIGH** 16 port on the controller.

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	DIN Clips
(1) Black 2 Position	(2) Small
(2) Grey 3 Position	(1) Large
(2) Green 3 Position	
(4) Green 4 Position	
(2) Green 5 Position	
(2) Green 6 Position	

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

IMPORTANT NOTICES

The material in this document is for information purposes only. The contents and the product it describes are subject to change without notice.

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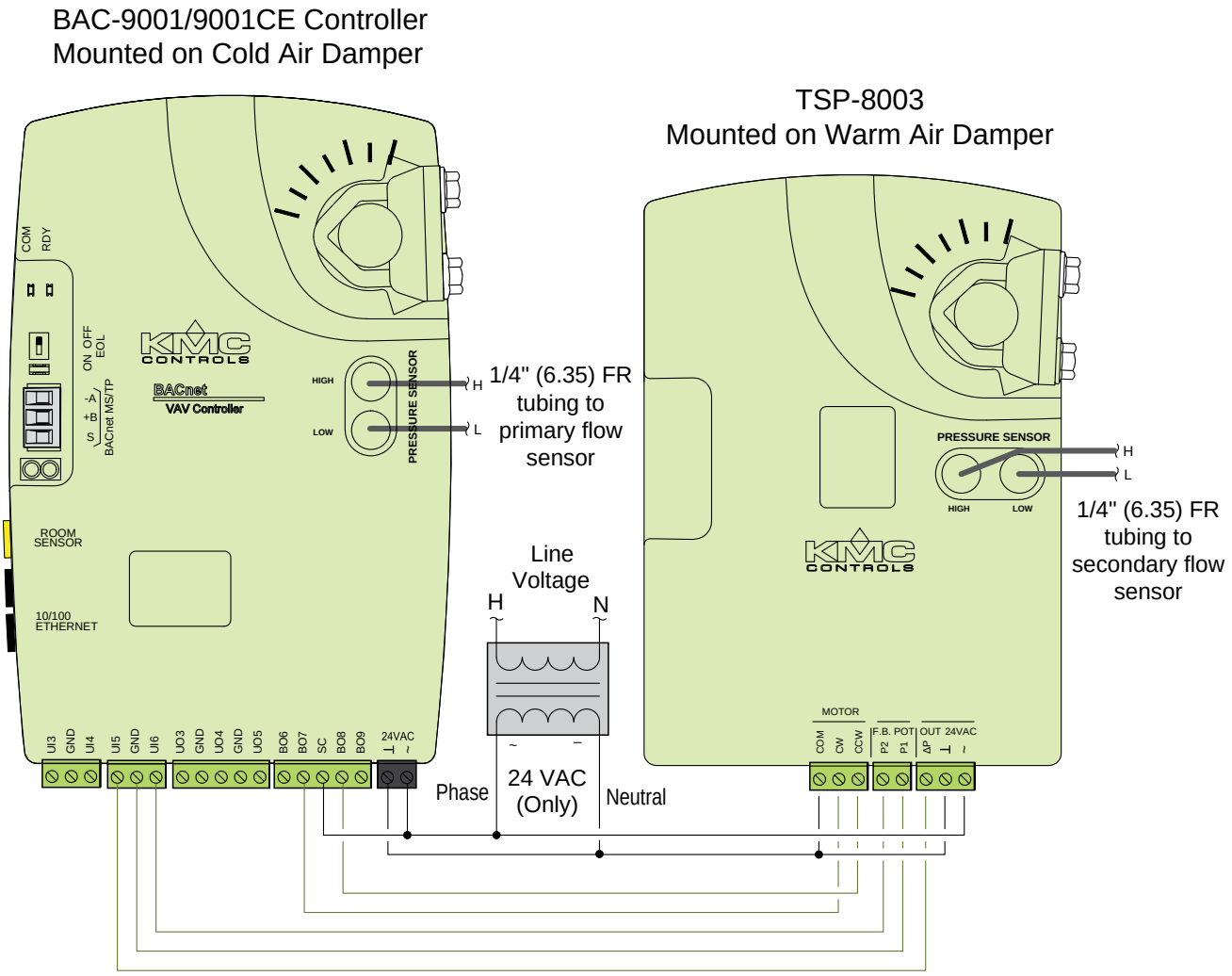
(Dual Duct VAV)



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**
BO7	=	Secondary CW	= CW
BO8	=	Secondary CCW	= CCW
SC	=	Switched Common	= Phase
UI6	=	Sec. Damper Position	= P2
GND	=	Ground	= P1
UI5	=	Secondary Flow	= ΔP
⊥	=	Common	= ⊥