

Description

This instruction is a guide for connecting and operating the 243-3 (24) V Velocity Transducer/Actuator Assembly. This controller provides a transduced output signal derived from the air flow to an input which provides a tri-state 24V AC output for regulation of damper position for flow control.

Part 1 – Transducer

Wiring

1. Use 20 AWG wire or larger for all connections. Keep output signal wires separated from power lines to avoid signal interference with power.
2. It is preferable not to ground the 24 volt AC side of the input with relation to the input transformer. If it is grounded, use Terminal #2.
3. Terminal 5 is circuit ground in common with terminal #2.

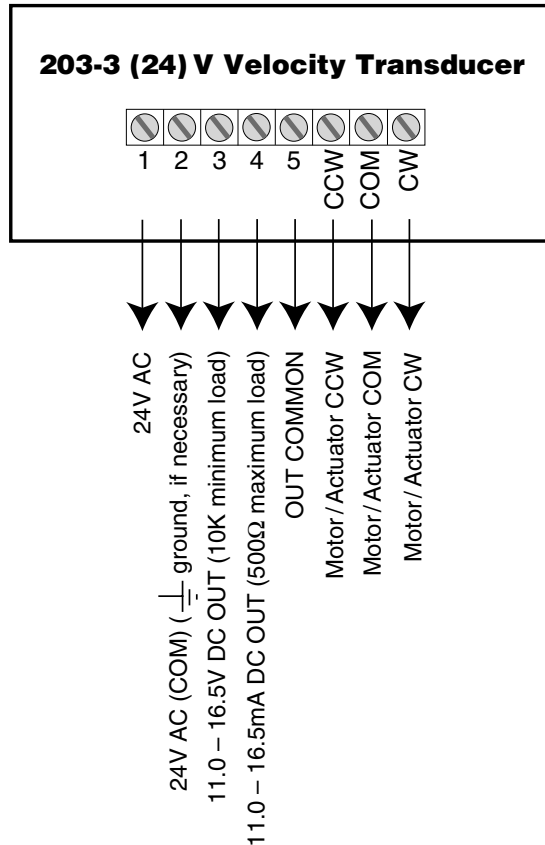


Figure 1

Mechanical

1. The transducer is factory mounted directly to one side of the 243-3 (24) V actuator.
2. Industry-approved pneumatic tubing for connecting the on-board transducer must be used. No air leaks in the tubing or connections are allowed for accurate calibration of velocity.
See Figure 2 for determining which velocity tube end goes to “HI” or “LO” pressure.
3. Locate the transducer so that the pneumatic tubing length does not exceed 18 inches from the velocity pickup in the duct to the on-board velocity probe.
4. Avoid sharp bends and kinks in the pneumatic tubing. This will allow an exact amount of calibrated air to flow through the velocity probe.
5. If tubing must be removed from the probe barbs, always cut off the tubing lengthwise at the barb. Gently remove the tubing.

CAUTION



Do not attempt to pull tubing off. (The transducer tips provide calibrated orifices and must not be damaged.)

Operation

1. Connect the 203-3 (24) V transducer as in Figure 1.
2. Terminals 3 – 5 are the output for 11.0 – 16.5V DC. Terminals 4 – 5 are the output for 11.0 – 16.5mA DC. The load impedance should be 10,000 ohms or greater (3 – 5) or 0 – 500 ohms (4 – 5).
3. Apply the 24V AC to the 203-4 (24V) transducer.
4. The output selected (11.0 – 16.5V DC or 11.0 – 16.5mA DC) will be proportional to airflow in the duct when the Velocity Pressure Pickup P/N 520-85 is used. See the curve of Velocity (FPM) vs. Velocity Volts (Vv).
5. It is the intent that this controller be used in a system, furnished by others, to accept the Velocity Output signal, and to furnish 24V AC to the Actuator to move the damper open or closed as determined by system logic.
6. Quick Transducer Test
 - a. Connect Digital Voltmeter (DVM) from 3 – 5 or 4 – 5.
 - b. Pinch hose so no air flows.
 - c. Voltage at DVM should read below 2 volts.
 - d. Let air flow through the tubing. The DVM should read greater than what was read when no air flow was in the tubing.

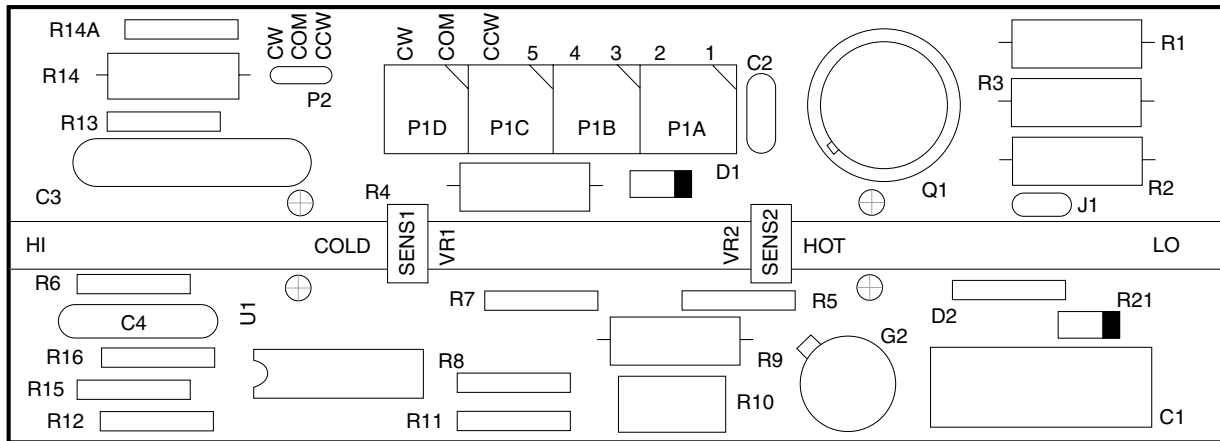
Part 2 – Actuator Installation

1. The Velocity Transducer is mounted to one side of the actuator at the factory. (See Figure 1.)
2. When it is necessary to move the damper to close or open, 24VAC must be applied to COM and CCW Terminals for causing the damper to move in a CCW manner, or 24VAC must be applied to COM and CW terminals for causing the damper to move in a CW manner.
3. Stop Pin Installation
 - a. If damper rotation is 90°, no Stop Pin is required.
 - b. If damper rotation is either 45° or 60°, do the following:
 - CW to Close damper:
 - Rotate shaft CCW Maximum.
 - Lightly tap the Stop Pin in to seat it correctly into either the 45° or 60° slot on the CW side as shown in Figure 3.
 - Rotate the shaft CW until it stops. The shaft is now in closed position.

- CCW to Close damper:
 - Rotate shaft CW Maximum.
 - Lightly tap the Stop Pin in to seat it correctly into either the 45° or 60° slot on the CCW side as shown in Figure 3.
 - Rotate the shaft CCW until it stops. The shaft is now in closed position.

4. Shaft Adapter

- a. There is a Shaft Adapter to be used if the shaft diameter of the damper is 3/8 inch. There is no need for the Adapter if the shaft diameter is 0.5 inch.
- b. See Figure 3 for orientation of the adapter. It must be opposite the screws so they will not push into the side walls of the Adapter.



203-3 (24)V PC Board Diagram
Figure 2

Troubleshooting Guide

Problem

Cause

Transducer

1. Air is flowing greater than 200 ft per minute (FPM), but the Vv output is near minimum volts.
2. Vv will not reach 15.5 – 16.5V DC or 15.5 – 16.5mA DC.

- Pneumatic tubing pinched.
- Pneumatic tubing not connected.
- Power is not at 24V AC (+15% –10%).
- Lead broken on velocity probe.
- Air velocity is not sufficient.
- The load to the controller is less than 10K ohms or greater than 500 ohms.
- Check tubing for pinching or air leaks.

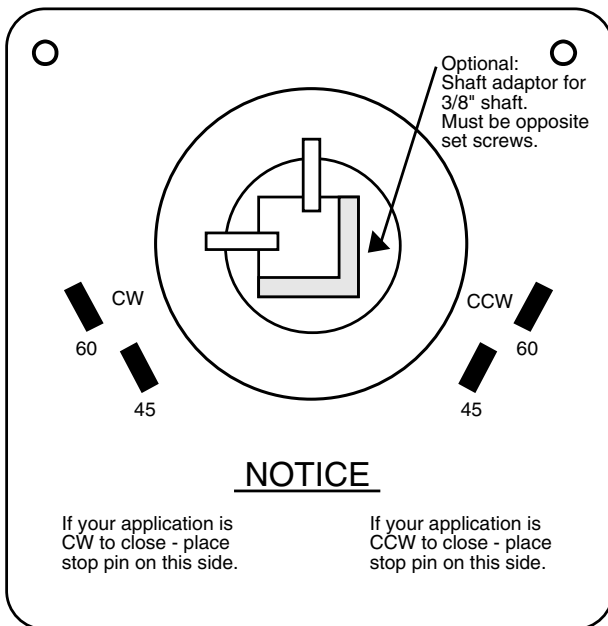


Figure 3

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