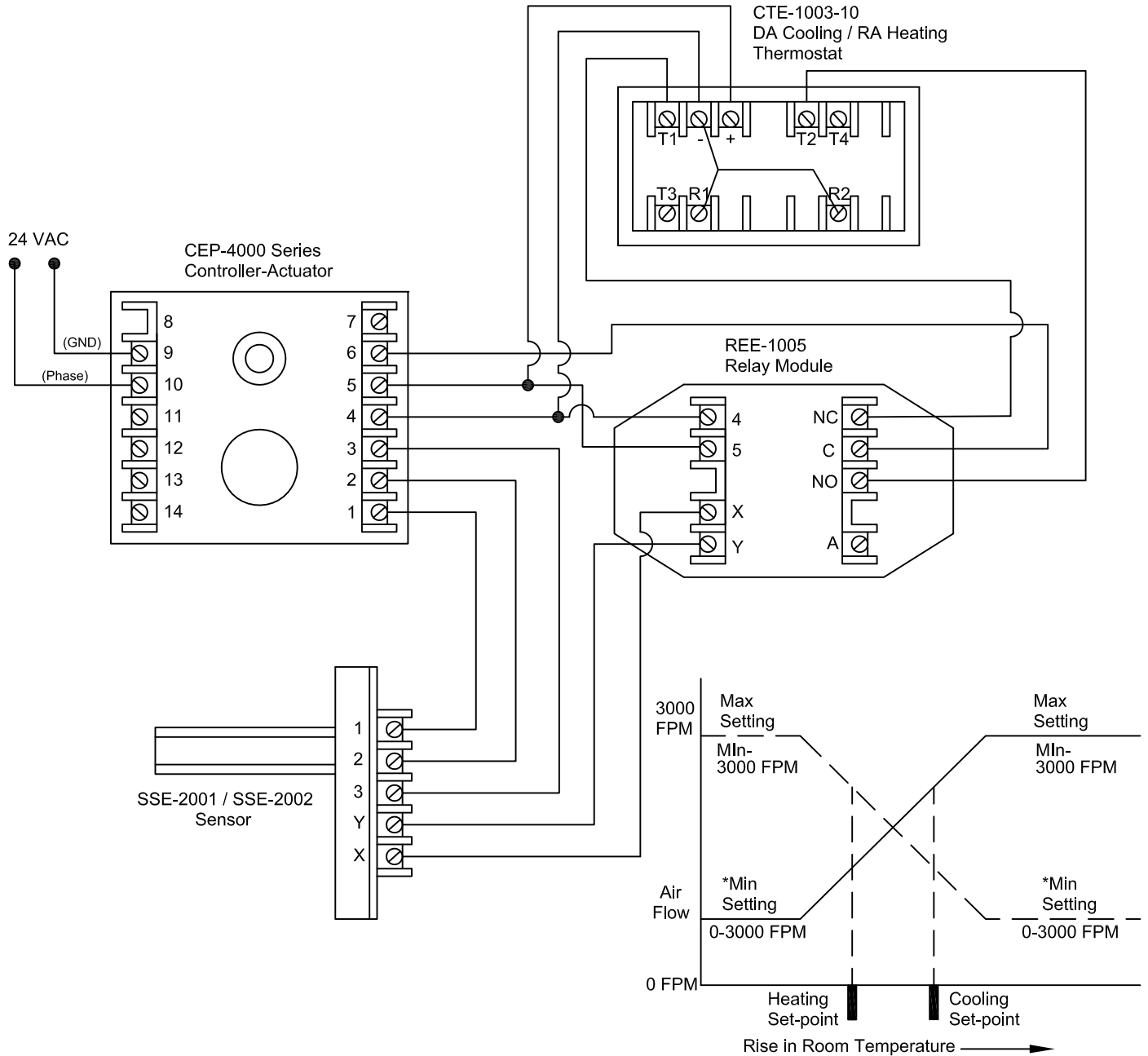


### CTE-1003 Dual Setpoint Thermostat

The CTE-1003 electronic thermostat is a dual set point thermostat for heating (RA) and cooling (DA) applications. When using a SSE-2000 series sensor and an REE-1005 Relay module (as shown below), an automatic changeover is provided for heating/cooling applications. The Sensor and Relay combination will switch between T<sub>1</sub> (cooling), or T<sub>2</sub> (heating) signal to the VAV terminal based on the temperature of the supply air. Factory defined switch points are duct temperature greater than 77°F +/- 4° F utilizes T<sub>2</sub> heating set points, and duct temperatures less than 77°F +/- 4° F switch to the T<sub>1</sub> cooling operation.



(No crossover or mixing with CTE-1103)

\*Minimums can be set at zero air flow, but a min air flow greater than zero is required to assure quick changeover.

## Installation Guide

### Mounting

The CEP-4000 series are designed to mount on a standard 1/2 in. (13 mm) diameter shaft or (using the optional HFO-0011 adaptor) on a 3/8 in. (9.5 mm) shaft.

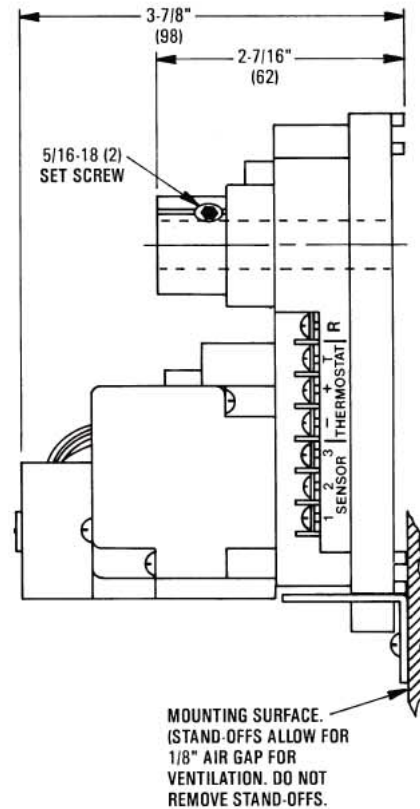
#### Standard Instructions

1. Ensure that the damper can move freely through its entire range of motion. Fix any binding before installing the CEP-4000.
2. Slide the CEP-4000 directly onto the 1/2 in. diameter damper shaft. The shaft must extend a minimum of 1-3/4 in. from the mounting surface. (For a 3/8 in. shaft, see the HFO-0011 Adaptor section below.)
3. Place the non-rotation bracket (supplied) on the non-rotation tab.
4. Attach the non-rotation bracket to the mounting surface using (2) #8 or #10 self-tapping screws (not included).
5. Check that the standoffs (on the anti-rotation bracket) provide a 1/8-inch air gap behind the unit (see illustration).
6. Torque the two 5/16-18 setscrews to 75–85 in.-lbs.
7. Mount the factory-calibrated, matching, SSE series sensor horizontally to maintain calibration at zero airflow.

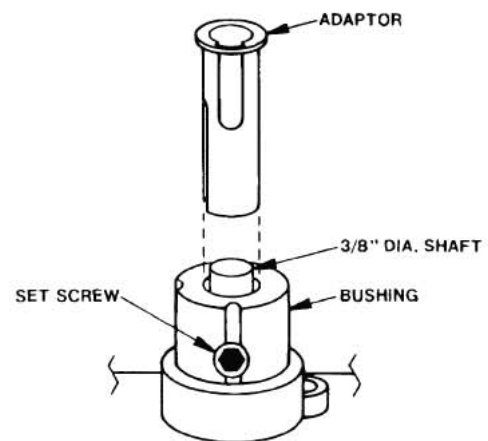
#### HFO-0011 Adaptor

1. Mount the CEP-4000 series actuator over the 3/8 in. shaft.
2. Slide the HFO-0011 over the shaft into the drive hub of the actuator.
3. Align the adaptor slots with the setscrews.
4. Partially tighten the setscrews.
5. Continue with step 2 under the Standard Instructions section above.

NOTE: See also the **CEP-4995 Universal Replacement** section on page 4 if installing that replacement model.



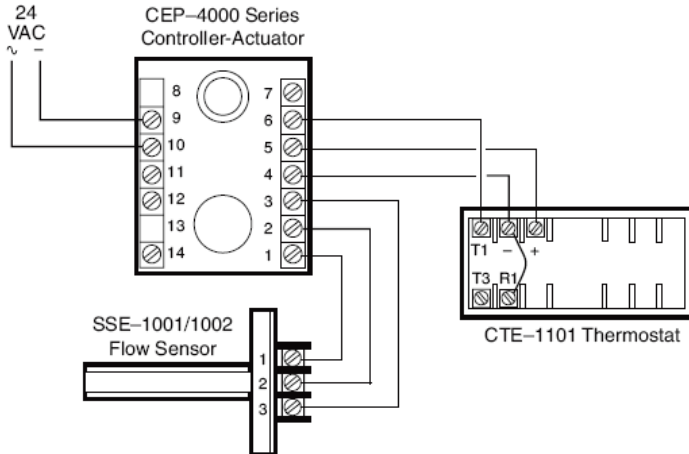
CEP-4000 Side View



HFO-0011 Adaptor

# Wiring

1. Connect the CEP to an SSE sensor:
  - A. Terminal 1 to sensor terminal 1.
  - B. Terminal 2 to sensor terminal 2.
  - C. Terminal 3 to sensor terminal 3.
2. Connect the CEP to a CTE thermostat:
  - A. Terminal 4 to thermostat terminal “-”.
  - B. Terminal 5 to thermostat terminal “+”.
  - C. Terminal 6 to thermostat terminal “T1” for cooling (CTE-1001) or “T2” for heating air flow (CTE-1002).
3. Connect the CEP to a 24 VAC, -15%/+20%, 50/60 Hz power source (disconnect the power to the transformer while wiring the CEP):
  - A. Terminal 9 to the “-” common side of the transformer.
  - B. Terminal 10 to the “~” phase side of the transformer.
4. Optionally, the duct airflow can be read by measuring the voltage on:
  - A. Terminal 2 (+) and 4 (-) for 9 to 18 VDC = 0 to 3000 fpm.
  - B. Terminal 7 (+) and 4 (-) for 1 to 5 VDC = 0 to 3000 fpm.

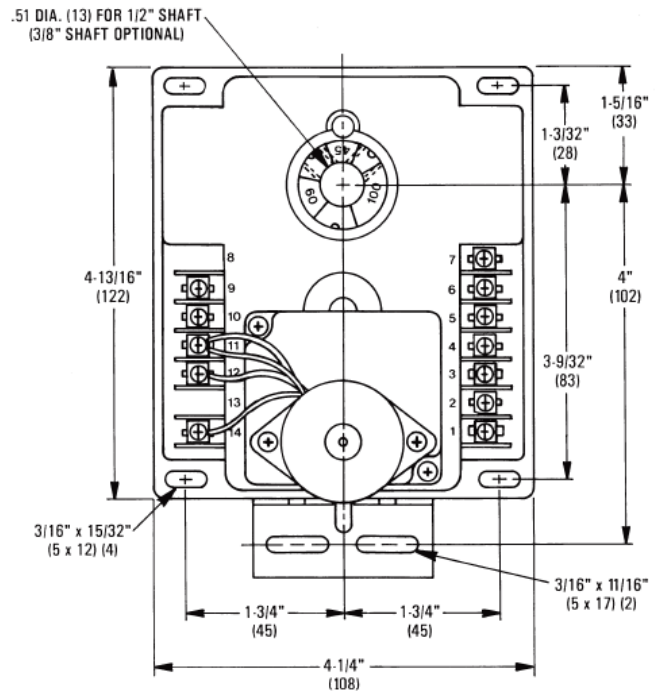


CEP-4000 Basic Connections

## ⚠ CAUTION

To prevent damage to the SSE series sensors, do not touch or handle the interior wire windings.

NOTE: If replacing a CEP-1000 or CEP-3000 series controller, the REE-1000 series relay may also need to be replaced with the equivalent REE-4000 series module. See the CEP-4000 Applications Guide for more information.



CEP-4000 Front View

## CEP-4000 Terminal Definitions:

1. Flow sensor terminal 1
2. Flow sensor terminal 2 (live flow reading with 9-18 VDC = 0-3000 fpm)\*
3. Flow sensor terminal 3
4. Thermostat (-) ground\*
5. Thermostat (+) 9.1 VDC\*
6. Requested flow from T1 or T2 thermostat (3-6 VDC = 0-3000 fpm)
7. Live flow sensor readout (1-5 VDC = 0-3000 fpm)
8. Unused
9. 24 VAC (-) common
10. 24 VAC (~) phase
11. Motor common
12. Motor drive to increase air velocity (open)\*†
13. Unused
14. Motor drive to decrease air velocity (close)\*†

## ⚠ CAUTION

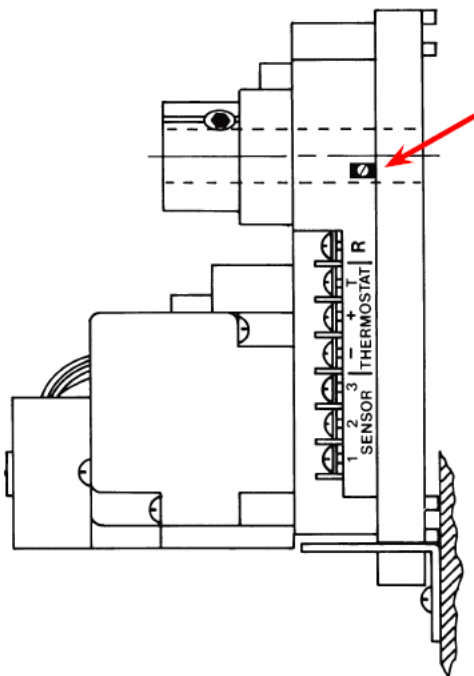
\*Do not short terminals 12 and 14, 4 and 5, or 2 and 4.

†Do not apply voltage to terminals 12 or 14.

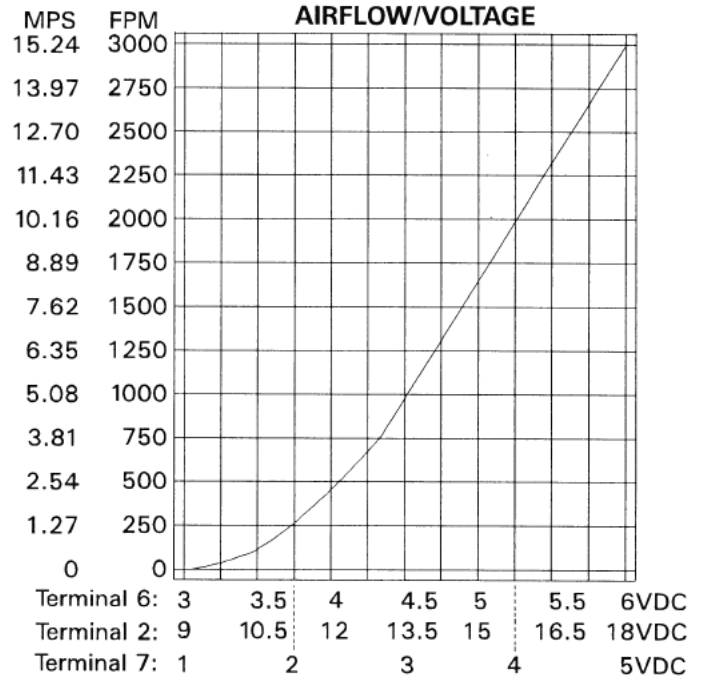
# Adjustments and Calibration

Each CEP-4000 is calibrated to its SSE series sensor at the factory. No further calibration is needed. If the units are replaced or become mismatched, complete the following steps to recalibrate the controller and sensor.

1. Follow steps 1 and 3 under the Wiring section. Connection of the thermostat is not necessary.
2. Connect the voltmeter "+" to CEP terminal 2 and "-" to CEP terminal 4.
3. Ensure zero airflow in the duct or remove the sensor from the duct and place it in a horizontal position with zero airflow.
4. Wait 5 minutes for the CEP and SSE units to stabilize.
5. Access the trimpot through the slot in the CEP-4000's side. The slot is normally covered by a label and is on the sensor/thermostat connection side (see illustration below).
6. Adjust the trimpot until the voltmeter reads 9 volts. When the adjustment is made, the voltage will immediately overshoot and then stabilize. This reestablishes the baseline. (See the CEP-4000 Airflow vs. Voltage chart.)
7. Wait an additional 5 minutes for the CEP and SSE units to stabilize.
8. Readjust if necessary.



CEP-4000 Trim Potentiometer



CEP-4000 Airflow vs. Voltage

## Rotation Setup and Override

If desired, the rotation direction can be reversed by swapping the red and blue motor wires according to the following table:

Rotation to Close	Motor Wire to Terminal 12	Motor Wire to Terminal 14
CCW	Red	Blue
CW	Blue	Red

NOTE: Motor wires must remain connected to terminal screws (11, 12, and 14) due to components beneath terminals.

To manually drive the controller/damper open or closed (with 24 VAC on terminals 9 and 10), remove the wiring to terminal 6, and temporarily jumper terminal 6 to:

- Terminal 5 (9.1 VDC) = Open
- Terminal 4 (- VDC) = Closed

NOTE: Full rotation may take five to six minutes because the actuator rotates at 18° per minute. A magnetic slip-clutch inside the actuator allows motor to continue running even when end-stops have been reached.

### ▲ CAUTION

Do not short terminals 12 and 14, 4 and 5, or 2 and 4.