

# THERMAL PRODUCTS CORPORATION

## ELECTRA-FLOW VAV CEILING DIFFUSER

### Trouble Shooting Guide

#### † Introduction

This trouble shooting guide is designed for the purpose of determining if the electronic diffuser is functioning properly (as designed). If the diffuser does not function, this guide will isolate the components that are causing the problem.

The diffuser is designed to sense the room temperature and adjust the volume of air being discharged from the diffuser by varying the damper position. The diffuser is designed to operate at static pressure conditions measured at the neck of the diffuser at no more than .5" w.g. The diffuser will function at higher pressures but excessive noise and air leakage may generate complaints.

The rated design conditions are as follows:

†	Static Pressure	.15" w.g. (measured at the neck of the diffuser)
†	Air Temperature	
	Cooling	55 degrees F. (Minimum)
	Heating	110 degrees F. (Maximum)
†	Reaction Time	
	To open	3 - 6 minutes
	To close	3 - 8 minutes
†	Changeover	
	Heat to cool	Supply air must drop below 65 deg. F.
	Cool to heat	Supply air must increase above 85 deg. F.
†	Reaction Time	5 minutes < 65 degrees F. cooling 5 minutes > 85 degrees F. heating

#### † Symptom

The diffuser will not open.

1. *Check* the damper and mechanism for freedom of movement. Remove the minimum set point set screw with a 3/32" set screw wrench. Insert the balancing pin or another tool 1/8" dia. (or less) x 2" (or longer) into the minimum set point adjustment hole. As the tool is being inserted into the adjustment hole, the damper will raise. Spring tension will be felt as the damper is opened. The damper should move smoothly open and closed with no binding or sticking being felt when moving the damper open and closed.

If the damper is sticking or rubbing on the sides of the diffuser collar, the base plate should be adjusted to center the damper in the collar. This is done by

loosening the screws on the four standoff supports that attach the base plate assembly to the back pan, centering the damper and tightening the screws. Test the damper movement to insure freedom of movement.

- 2. *Verify* that all wiring terminals are tight and that there are no broken wires.
- 3. **Verify** the supply voltage at terminal "C" and "9" on the REE-4106 relay is between 20.4 and 28.8 VAC.

If the transformer's secondary voltage to terminals "C" and "9" is not between 20.4 and 28.8 VAC, replace the transformer. If there is no voltage, be sure the power to the transformer is on. If the power is on, turn off the power and determine why the transformer was damaged before installing a new transformer and applying power.

After the supply voltage has been verified to be between 20.4 and 28.8 VAC, proceed to the next step.

- 4. **Verify** the REE-4106 supply voltage to the CTE Series thermostat is between 8.7 and 9.6 VDC between the "+" and "-" terminals.

If the CTE Series thermostat voltage is not between 8.7 and 9.6 VDC, replace the REE-4106 relay module and repeat this step. After the supply voltage has been verified to be between 8.7 and 9.6 VDC, proceed to the next step.

- 5. **Verify** the operation of the CTE Series electronic thermostat.

Measure the 0-6 VDC output voltage from the CTE Series thermostat between the "-" and "T" terminals on the REE-4106 relay module. The voltage will vary with the room temperature and the temperature set point adjustments. Adjust the cooling temperature set point adjustment to the lowest temperature on the scale and the heating temperature set point adjustment to the highest temperature on the scale. The DC voltage measured should be between 5.5 and 6.5 VDC with the room temperature not less than 55 degrees F. or greater than 86 degrees F. If the DC voltage measured is not between 5.5 and 6.5 VDC, replace the CTE thermostat and repeat this step.

Adjust the cooling temperature set point adjustment to the highest temperature on the scale and the heating temperature to the lowest temperature set point on the scale. The DC voltage measured should be between 0 and 1 VDC. If the voltage measured is greater than 1 VDC, replace the CTE thermostat and repeat this step.

- 6. **Verify** the AC output voltage to the damper actuator on the REE-4106 relay module between terminals "C" and "LOAD".

The output voltage to the damper actuator will vary by cycling or pulsing on and off. The rate of these pulses is determined by the output voltage from the thermostat. As the thermostat signal increases from 0 to 6 VDC (as measured in Step # 5), the AC output voltage to the damper actuator will pulse at slow to rapid rate. With a thermostat signal of 0 VDC, the AC output to the damper actuator will be 0 VAC. As the thermostat signal increases from 0 VDC, the AC output to the damper actuator will begin to pulse on and off. With the thermostat signal increasing, the rate of AC output pulsations will increase. When the thermostat signal approaches 6 VDC (between 5.5 and 6 VDC), the AC output to the thermostat actuator will be a constant 24 VAC.

Measure the AC output voltage to the damper actuator between terminals "C" and "LOAD" on the REE-4106 relay module. Adjust the temperature set point to lowest setting for cooling and the highest setting for heating. With the room temperature between 55 and 85 degrees F., the damper output voltage should be a constant, non-pulsing AC voltage between 20.4 and 28.8. If the output voltage is not constant AC voltage between 20.4 and 28.8, replace the REE-4106 relay module and repeat this step.

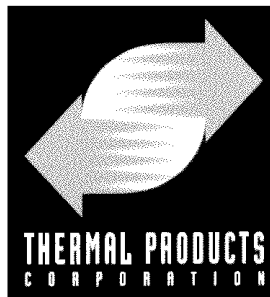
Adjust the temperature set point adjustments to the highest temperature on the cooling scale and the lowest temperature on the heating scale. The damper actuator output voltage should be 0. If the damper actuator output voltage is not 0 or is pulsing, replace the REE-4106 relay modules and repeat this step.

? 7. **Verify** the operation of the damper actuator.

Adjust the MAXIMUM damper set point adjustment to full open by turning the set screw adjustment clockwise until it is fully screwed in and stops.

Adjust the thermostat for a constant damper actuator output voltage and verify with a meter (Step #6). The damper should begin to slowly move within 3 to 4 minutes and be fully open within 6 minutes. If the damper does not open, replace the damper actuator and repeat this step.

Adjust the thermostat for 0 output voltage to the damper actuator and verify with a meter (see Step #6). The damper should begin to close within 3 to 4 minutes and be fully closed within 8 minutes. If the damper jumps or jerks open or does not close completely and smoothly, repeat Step #1.



Copyright by Thermal Products Corp. Form No. EFSTSG94-313-Eff. Date: 5/94Rev. 7/95

Thermal Products Corp.  
412 N. 6<sup>th</sup> Ave.  
Tucson, AZ 85705  
1-800-420-1153  
(520-622-7898/622-7899 FAX)  
[www.thermalproductscorp.com](http://www.thermalproductscorp.com)