



**AnemoTherm
VAV Diffuser
Installation
Operation
and Maintenance**

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AnemoTherm™ VAV Diffusers

ADJUSTMENT, BALANCING, & MAINTENANCE INSTRUCTIONS

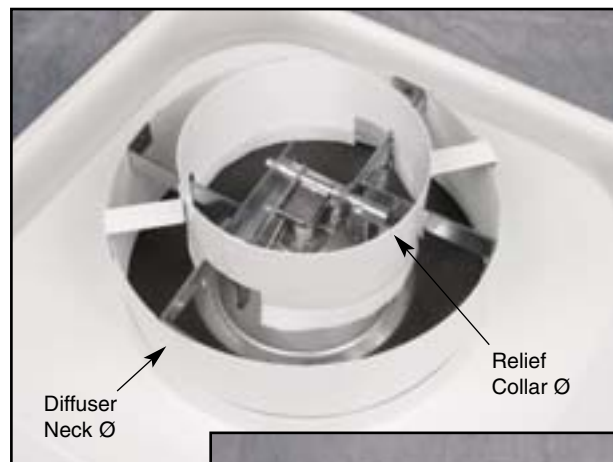
The AnemoTherm VAV diffuser has been specifically designed for VAV system applications. The air discharge opening size is varied to optimize the discharge velocity and volume.

Installation

VAV diffusers are installed similar to any other diffuser and according to specifications and applicable codes and standards.

An optional relief collar (field installed component, figure 1) may be used in the installation and added to any AnemoTherm diffuser model. Place the relief collar with legs on the outside of the diffuser collar and install with screws. A slight induction effect may exist at full open. As the disc closes, the excess air will be discharged through the opening between the duct connection and the outlet ring.

Caution: Avoid obstructing relief area with supply duct and insulation to maximize the relief area available.



Face Panel Removal

The face panel must be removed to adjust the room temperature setpoint(s) and to balance the air flow.

The face panel assembly includes (4) vertical posts with a hook at each end, that engages (4) slots in the diffuser back pan. To remove the face panel for room temperature adjustments, push the panel up slightly, rotate the panel CCW to disengage the hooks, and remove the panel from the back pan.

Note the orientation of the induction trough, located on the back of the face panel, with respect to the induction wing. When re-attaching the face panel, the induction trough must be positioned directly opposite of induction wing.



Figure 1: Relief Collar, side view

Supply Air Temperature

The supply air temperature at the diffuser should be < 68° F for the cooling mode, and > 80° F during the heating mode.

Duct Design / Balancing Dampers

The AnemoTherm diffuser becomes static pressure independent only when the system pressure is adequately controlled and calibrated. Duct work should be designed and installed to prevent excess friction losses. Static pressure regain or constant size loop duct designs are preferable to equal friction and/or equal velocity designs.

The discharge disc in the diffuser acts as a volume damper but does not eliminate the need for an upstream branch / balancing damper. The diffuser volume is adjusted at the balancing damper, not the diffuser.

Room Temperature Setpoint Adjustment Procedure

Room temperature setpoint adjustments are made by rotating the threaded, thermal actuators located behind the face panel (figure 2).

CAUTION: If the room temperature is above 74° F., the actuator will be slightly difficult to turn.

Model **ATC** – VAV Cooling: (1) thermal actuator in exact center of diffuser for room temperature setpoint (figure 3).

Model **ATHC** – VAV Cooling and VAV Heating (Auto Changeover): (1) thermal actuator in exact center of diffuser for cooling room temperature setpoint, and (1) thermal actuator offset from center of diffuser for heating room temperature setpoint (figure 4).



Figure 2: Model ATHC Thermo-Powered Sensors

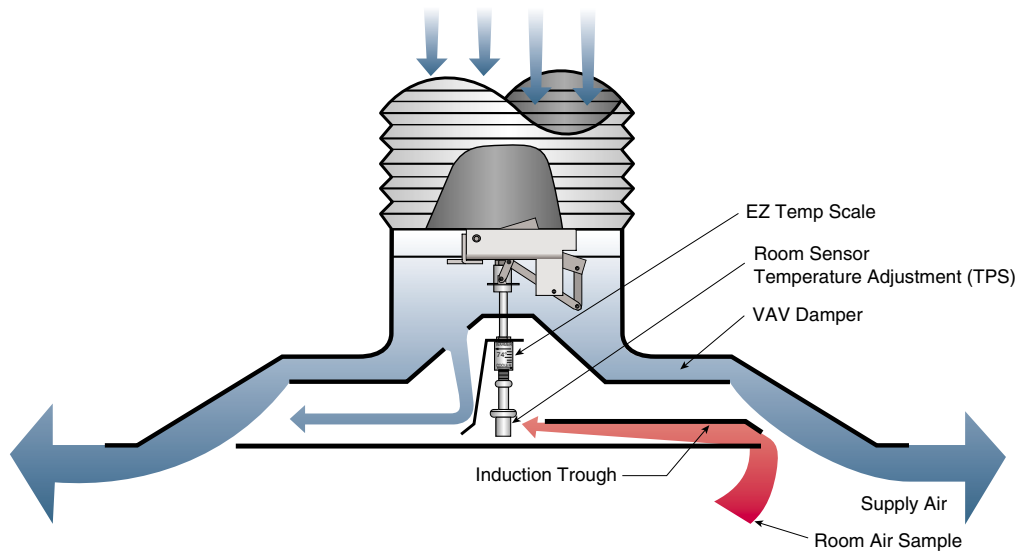


Figure 3: Model ATC Diffuser - VAV Cooling Only

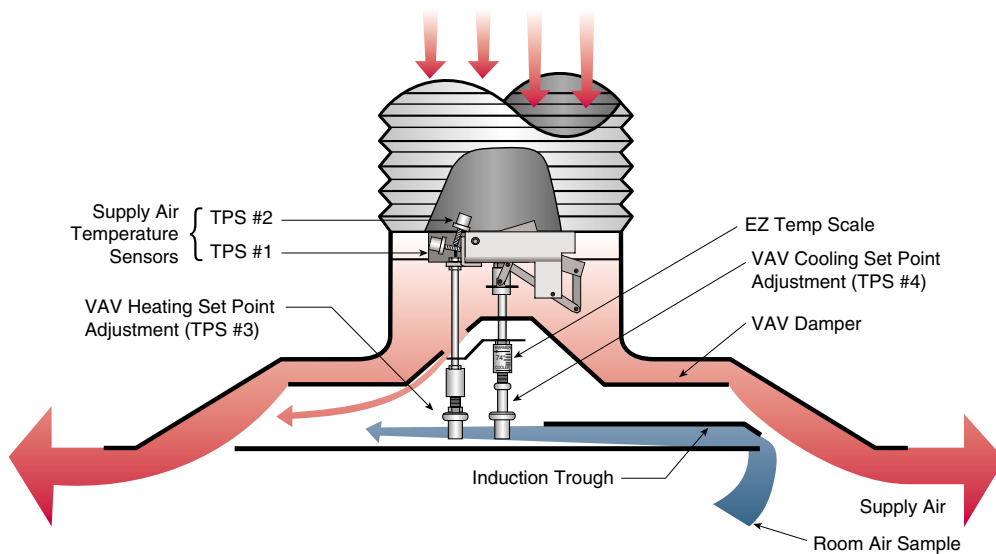


Figure 4: Model ATHC Diffuser - VAV Heating and VAV Cooling with Auto Changeover

Cooling & Heating Setpoint Adjustment

The actuators are threaded into a clear plastic sleeve, which should not turn. **Do not remove the actuator**, the internal pin is difficult to reinstall. Both the cooling and heating (if applicable) actuators are adjusted in the same manner:

The diffuser is shipped with a factory room temperature setpoints of approximately 74° F. To reduce the room temperature setpoint, turn the actuator clockwise (CW). Conversely, turn the actuator counter-clockwise (CCW) to increase the room temperature setpoint. You can determine the room temperature setpoint by aligning the end of the actuator with the indicators on the temperature scale (figure 5). Each full rotation or each indicator on the temperature scale equals $\pm 2^\circ$ F. For a 74° F degree setpoint, turn the actuator fully clockwise until it stops, then turn counter-clockwise 3 full turns.

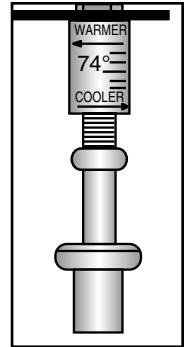


Figure 5

Static Pressure Control

VAV diffusers replace the volume control damper normally used in VAV boxes by utilizing a VAV damper in the diffuser itself. As such, and without a static pressure control system, room sound levels can reach unacceptable levels due to higher than required static pressures in the supply duct. A functioning static pressure control system is a mandatory requirement for proper system function and balancing procedures. A control pressure of .25" w.g. at mid-point between the static pressure control damper and the last branch duct is typical. The static pressure sensor should be located at that point. The static pressure sensor for a constant size duct loop system may be located anywhere within the loop, but at least 5 duct diameters downstream of the nearest obstruction.

Balancing Procedures

Anemotherm VAV diffuser units are of the variable discharge area type. There are no applicable AK factors. Therefore, the air flow rate / volume (cfm) should be determined using a capture / balancing hood.

Note that total fan capacity may not provide 100% of the demand volume to all the outlets at the same time due to design diversity. Closing branch / balancing dampers or one or more Anemotherm diffusers may be required.

Balancing a system with Static Pressure control:

1. Confirm that the system pressure is under control and operating at design setpoint. The static pressure should control to the lowest operating pressure which will allow the maximum demand volume to be supplied from the diffuser requiring the highest total pressure loss (often the last diffuser on the duct system).
2. Verify the total fan capacity. The system's "instantaneous peak demand" will require a total fan volume less than the sum of the diffuser volumes.
3. Remove the diffuser face panel, and open the diffuser damper 100% by rotating the diffuser actuator CW (about 3 full turns) to achieve a full open damper position. Do not over tighten. The balancing damper should be 100% open as well.
4. Measure the diffuser volume with a balancing hood. Note that excess volume indicates excess pressure.
5. Set the diffuser air flow rate by adjusting the branch / balancing damper to achieve maximum demand volume. After adjusting the volume, turn the actuator (CCW) 3 full turns (or other desired room temperature setpoint) and allow space temperature to control the discharge opening.
6. Replace the face panel – note proper orientation of induction trough with respect to the induction wing.

Balancing a system with both VAV diffusers and fixed geometry diffusers:

Remove the diffuser face panel, and open the diffuser damper 100% by rotating the diffuser actuator CW (about 3 full turns) to achieve a full open damper position. Do not over tighten. The balancing damper should be 100% open as well.

Balance all outlets as constant volume devices, as typical, including the Anemotherm diffusers. When the VAV diffusers are put back into a normal operating condition, the volume at the remaining outlets will vary proportionally as the VAV diffusers operate.

Return each VAV diffuser back to normal operation by turning the actuator (CCW) 3 full turns (or other desired room temperature setpoint) and allow space temperature to control the discharge opening.

Replace the face panel – note proper orientation of induction trough with respect to the induction wing.

Maintenance

All **Anemotherm Diffusers** are designed to be virtually maintenance free. We do recommend that the outer surfaces of the diffuser be kept clean. Wipe with water and mild detergent.