

# VARITHERM<sup>®</sup>

## THERMALLY POWERED VAV DIFFUSER

### INSTRUCTION SHEET

#### ▶ HOW IT WORKS

Each Varitherm<sup>®</sup> diffuser is equipped with a round internal damper which moves up and down to control the air volume delivered to the room. As supply air is directed through the diffuser, the Varitherm<sup>®</sup> induces room air over a pair of thermal actuators which will control the damper based on the user-defined temperature setpoint. These actuators are thermally powered, and are what allow each Varitherm<sup>®</sup> to provide individual comfort without the need for an external power source.

#### ▶ ROOM AIR MEASUREMENT

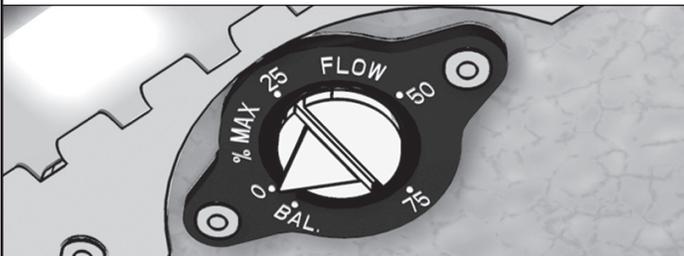
As supply air enters the Varitherm<sup>®</sup> diffuser, a portion of air is directed through the damper stack, over the supply air thermostat and is ejected out one side of the diffuser. This controlled airflow induces room air through the diffuser, and over a pair of thermally powered wax actuators which adjust the damper location.

#### ▶ COOLING MODE VPD-HC / VPD-C

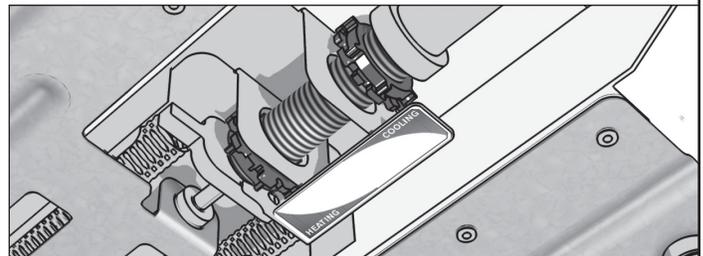
The thermal actuators operate on an engineered linkage for supply air volume control in cooling mode. When the room air becomes too cool, the actuators cause the linkage to raise the damper, and reduce airflow to the room. When the room air becomes too warm the actuators disengage from the linkage allowing the damper to lower, providing more cool air into the room.

#### ▶ HEATING MODE VPD-HC ONLY

In order for the VPD-HC to control in heating mode, the supply air must be within the specified temperature range listed in the system requirements provided. When the supply air meets the heating temperature requirements, a thermal actuator placed directly in the path of the supply air becomes active, and locks the VPD-HC into heating mode. In heating mode, damper control is the reverse of cooling control; cool room air causes the damper to open, and warm room air causes it to close.



MINIMUM AIRFLOW ADJUSTMENT & BALANCING



TEMPERATURE SETPOINT DIALS

#### ▶ Adjusting for minimum airflow and system balancing

To adjust the minimum airflow supplied to the room, turn the minimum airflow adjustment screw to the desired level. A built-in indicator on the screw allows for easy readout of the current setting. This adjustment allows control of minimum airflow from 0% (capable of full closure) to 100% forced-open mode for system balancing. In balancing mode, ensure that the damper is at its maximum open position by opening manually, if required.

#### ▶ SYSTEM REQUIREMENTS

The system should meet the following criterion:

1. Deliver supply air to the diffuser with a temperature at or below 71° F (21° C) in cooling mode.
2. Delivering supply air to the diffuser with a temperature at or above 82° F (28° C) in heating mode.
3. Maintaining a system static pressure at the inlet of each Varitherm<sup>®</sup> diffuser between 0.05" and 0.25"
4. Maintaining continuous fan operation during occupied hours.

#### ▶ Adjusting temperature setpoints

Individual temperature setpoint dials are used for room temperature adjustment in heating and cooling modes. To change the temperature setting, turn the setpoint dial in the direction required as indicated on the temperature gauge. Actual temperature is dependant on supply air temperature.

#### VARITHERM<sup>®</sup> TROUBLESHOOTING GUIDE

ISSUE	SOLUTION
Diffuser Too Noisy	Ensure that the system static pressure is below or equal to 0.25"
Lack of Fresh Air	Adjust the minimum airflow setting by turning the dial and using the gauge.
Adjusting Dials Doesn't Help	The system should deliver heat to the diffuser at 82°F (28°C) or higher, and cooling at 71°F (21°C) or lower. A system static pressure at or below 0.25" is recommended.