

E-TES SD AIR PRESSURE SENSOR OPERATION

For continuous reliable operation of the new E-TES SD LP the Air Pressure Sensor must sense the difference between the external air pressure and the internal air pressure created by the air mover to know when the heater should turn on and off. Part of this process involves the how the air mover sits in the E-TES SD Low Profile box.

Previous versions of the E-TES had high minimum air flow levels below which the heater would not operate. When using air pressure differential the air flow can approach zero while still maintaining high pressure differential readings. Lower operational air flow rates allow for much higher output air temperature and improved operation when the E-TES SD is used for floating carpet or ducting air into walls and cabinets. With higher temperature rises, the E-TES SD overheat protection system was redesigned with multiple sensors to limit the output temperature and prevent overheating.

E-TES SD System Terminology:

- ◆ **OFF Set Point:** This is the air pressure differential reading with the fan off.
- ◆ **ON Set Point:** This is the air pressure differential reading with the fan on.
- ◆ **Air Flow Trigger:** This is the air pressure differential reading at which the heater will turn on and off. During the calibration process the E-TES SD automatically calculates and sets the Air Flow Trigger half way between the Off Set Point and ON Set Point.
- ◆ **Internal Temperature Sensor:** A temperature sensor mounted on the circuit board will shut the heater off if the temperature inside the E-TES SD reaches 140°F. The E-TES SD internal temperature is the temperature of the air before it moves through the heating element. Basically it is the same as the room temperature. This sensor will cycle on & off repeatedly to limit the internal temperature of the E-TES SD.
- ◆ **Snout Temperature:** A temperature Sensor in the base of the E-TES SD snout will cycle the heater off & on to limit the output temperature if the Air Flow is restricted. This sensor is set at 170°F and will cycle on & off repeatedly to limit the output temperature.
- ◆ **Heater Safety Overtemp:** Two temperature switches on top of the heater box will shut the heater off if the heater box reaches 210°F. These switches usually will only trip in extreme conditions and will only cycle on & off for a short time before the heater locks out in the off position to prevent overheating damage.



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To get the best Air Pressure Sensor operation make sure the entire snout opening of the air mover is inside the gasket on the E-TES SD.

Air Mover Installation:

Place the snout of the air mover through the sealing gasket into the opening on the back of the E-TES SD LP.

Different models of air movers have shorter snouts or large handles which can prevent the gasket from sealing around the air mover snout. Without a good seal the air leakage may reduce the internal air pressure sensor reading. The air mover may even slide backwards when the air mover is turned on, further reducing the air pressure. A bungee cord can be used to hold the air mover in place to maintain air flow with these kinds of air movers.

E-TES SD gasket sealed securely around snout of an OmniDry 2.9 air mover



Short snout of air mover with large handle just barely sealed by E-TES SD gasket



A bungee cord can be used to secure the air mover and maintain sufficient air flow



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Air Flow Setup Screen: This allows you to recalibrate the Air Pressure Sensor to maintain proper air pressure sensor function for reliable heater operation.



Press **SELECT** to set the Air Pressure Sensor trigger point. Follow the screen directions using the **DOWN** button to set the levels with the air mover OFF & ON.



1. First turn the air mover OFF. When the fan is off and the number stops changing, press **DOWN**. This is the Off Set Point.

(Shown as 000 in this example)

2. Then turn the air mover ON at low speed. Press **DOWN** as soon as the fan on number is about 15-25 points higher than the Off Set Point. This is the ON Set Point. (Shown as 022 in this example)



3. The Air Flow Trigger point is now set. The Air Flow Trigger is approximately half way between the Off Set Point and the On Set Point.

(Shown as 012 in this example)



When a using a Flexi-Dry or during any application in which the outlet air flow of the E-TES SD is restricted, the internal air pressure will increase keeping the heater on, even though the flow rate of the air across the heating elements is decreasing. This will greatly increase the snout output temperature. The E-TES SD is designed to operate with moderate air flow restriction, with multiple temperature safety sensors and switches designed to limit the output temperature and prevent the E-TES SD from overheating in these applications.

While the multiple temperature safety switches will prevent overheating damage, if the air flow output is overly restricted, extreme restriction, approaching complete blockage of air flow, will force the heater safety over temp system to cycle the heater off & on for a short time as it works to prevent overheating. After a few cycles, the heater safety over temp system will lock out in the heater off position. Once locked out, the heater will stay off until the power to the E-TES SD is turned off and back on to reset the heater safety system.