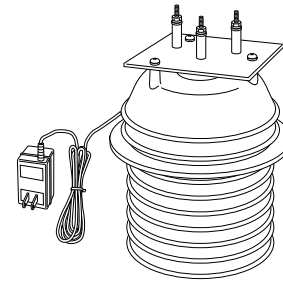


AC-POWER FAN-ASPIRATED RADIATION SHIELD

7751

WITH STANDARD TEMPERATURE/HUMIDITY SENSOR



The model 7751 Aspirated Shield protects its sensors from direct and reflected solar radiation (insolation) as well as from wind-driven rain. In addition to the shield itself, it includes:

- ▲ A Davis model 7859 Temperature/Humidity sensor (with modified housing).
- ▲ A power adapter to drive the fan motor from a 115 VAC source.

Figure 1 shows a simplified cross-section of the shield and illustrates the shield's combination of active and passive ventilation modes. These modes keep the typical radiation-induced temperature error within the shield to less than 1°F (RM Young model 43408 as reference).

Passive Ventilation

Seven shield plates shade the outer wall of the aspirated tube. These plates are made of a specially-formulated plastic proven to provide superior performance in Davis Instruments' passive radiation shield. They reflect thermal radiation, have low thermal conductivity, and permit natural air flow to reach the tube's outer surface. Their unique design permits vertical convection currents within the plate stack, preventing the trapping of warm air between the plates.

Motor-Driven Aspiration

The motor-driven fan pulls air continuously through the sensor chamber and between the three walls of the chamber. Exit air removes thermal build-up from the inner two of the three shield plates at the top of the structure. An aerodynamically-shaped baffle at the air inlet reflects and blocks radiation from below the shield.

SPECIFICATIONS (TYPICAL)

Sensor See model 7859 spec. sheet

Aspiration Rate 190 feet/min. (.9 m/s)

Radiation-Induced Temperature Error 0.6°F (0.33°C) [At solar noon. Insolation = 1040 W/m²]

Reference: RM Young model 43408. The above error specification is an estimate, based on data from a Davis model 7755, which has a measured error of 0.6°F under the above conditions and an aspiration rate of 190 feet/min. (.9 m/s).

Dimensions (see figure 1)

Height 11.3 in. (28 cm)

Max. Diameter 9.3 in. (24 cm)

Weight 3.8 lb. (1.7 kg)

Operating Temperature -58 to 131°F (-50 to +55° C)

Power

Motor Current 175 mA at 2.0 VDC (See Figure 3 for motor circuit schematic.)

Power Adapter Current 10 mA at 115 VAC

INSTALLATION

The model 7751 Aspirated Shield mounts directly to a Davis model 7702 Sensor Arm, a 7704 Rain Collector Shelf, or a 7994 Radiation Shield Bracket. Figure 4 shows the mounting hole pattern.

Note: Humitter is a registered trademark of Vaisala Corporation.

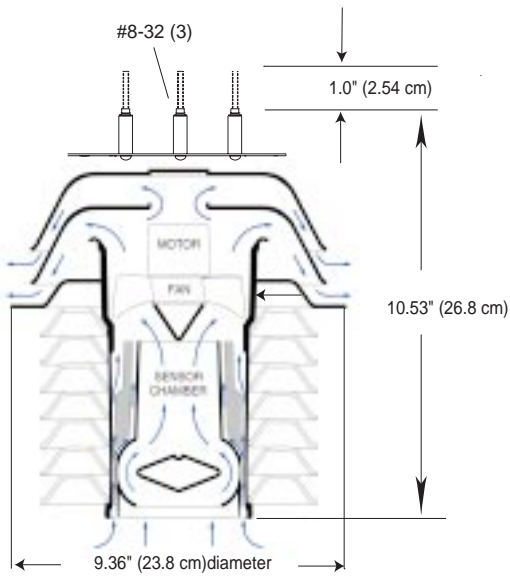


Figure 1.
Cross Section Showing Air Flow and Outside Dimensions

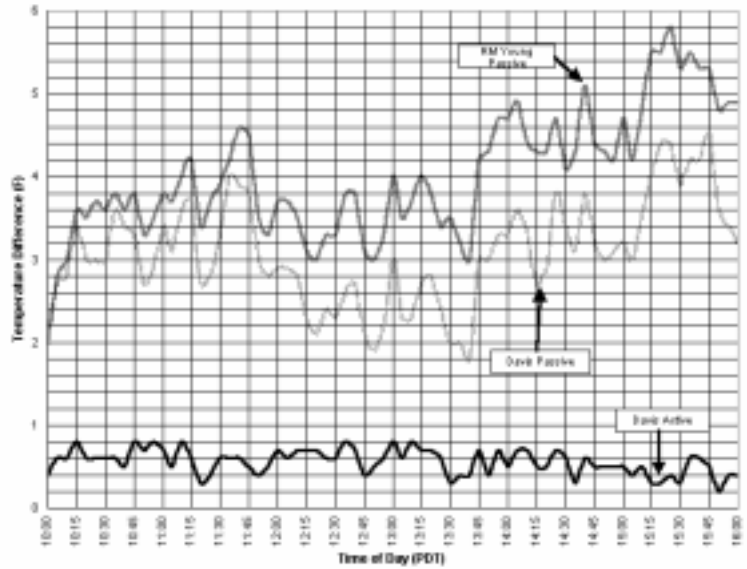


Figure 2.
Temperature Errors Inside Three Radiation Shields. Using an RM Young Model 43408 as Reference. ("RM Young Passive" is a model 41002; "Davis Passive" is a model 7714 with model 7818 Temperature Probe installed; "Davis Active" is solar-powered model 7755 with model 7818 Temperature Probe installed. Model 7751 has a similar aspiration rate.)

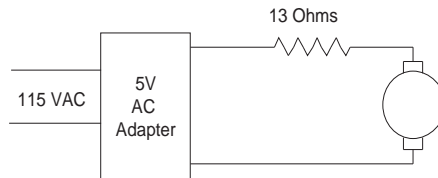


Figure 3.
Motor Circuit

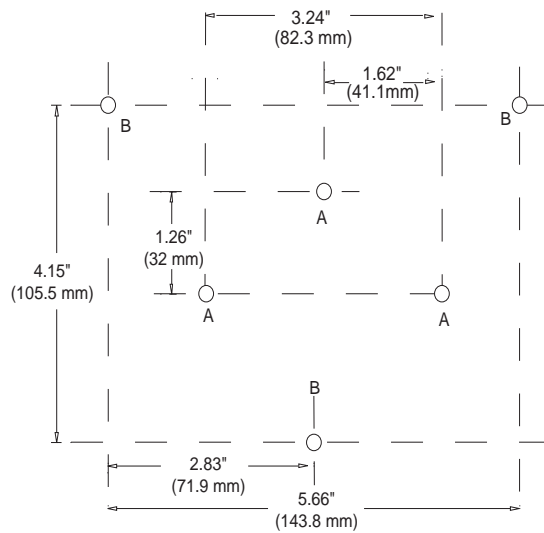


Figure 4. Mounting Hole Locations
[Either set of 3 holes (A or B) may be used]