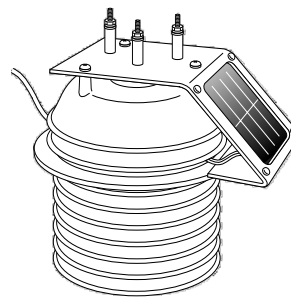


SOLAR-POWER FAN-ASPIRATED RADIATION SHIELD

WITH INDUSTRIAL TEMPERATURE/HUMIDITY SENSOR

7757



The model 7757 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 7860 Temperature/Humidity Sensor (with modified housing).
- ▲ A Solar Panel and Rechargeable Battery for 24-hour solar-powered operation.

Figure 1 shows a simplified cross-section of the shield, and illustrates the shields 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. The motor runs at approximately 40% of full speed in the absence of sunlight.

SPECIFICATIONS (TYPICAL)

Sensor See model 7860 spec. sheet

Aspiration Rate

At Insolation Rate of 1040 W/m²) 170 ft/min. (0.86 m/s)
With No Sunlight (battery power) 70 ft/min. (0.35 m/s)

Radiation-Induced Temperature Error 0.66°F (0.37°C) [At solar noon. Insolation = 1040 W/m²]

Reference: RM Young model 43408.

Note: The above temperature error is an estimate, based on data from a shield containing a Temperature Probe and having a measured error of 0.6°F at an aspiration rate of 190 ft/min. The larger volume of the Temperature/Humidity Sensor reduces the aspiration rate of model 7756 to 170ft/min.

Dimensions (see figure 1)

Height 11.3 in. (28 cm)
Max. Diameter 9.3 in. (24 cm)
Weight. 4.3 lb. (2 kg)

Operating Temperature -4 to +131°F (-20 to +55°C)

INSTALLATION

The model 7757 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.

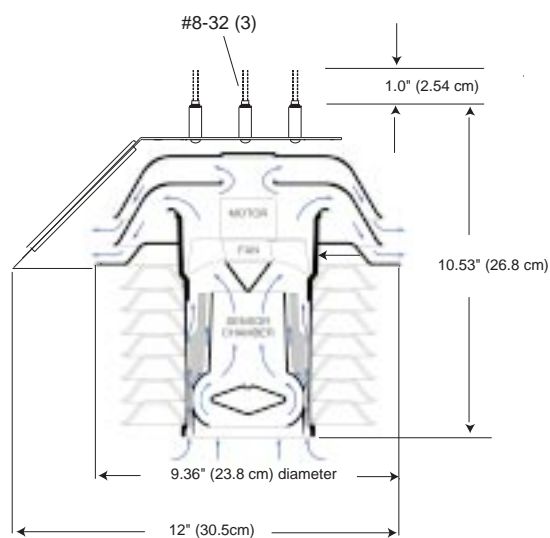


Figure 1.
Cross Section Showing Air Flow and Outside Dimensions

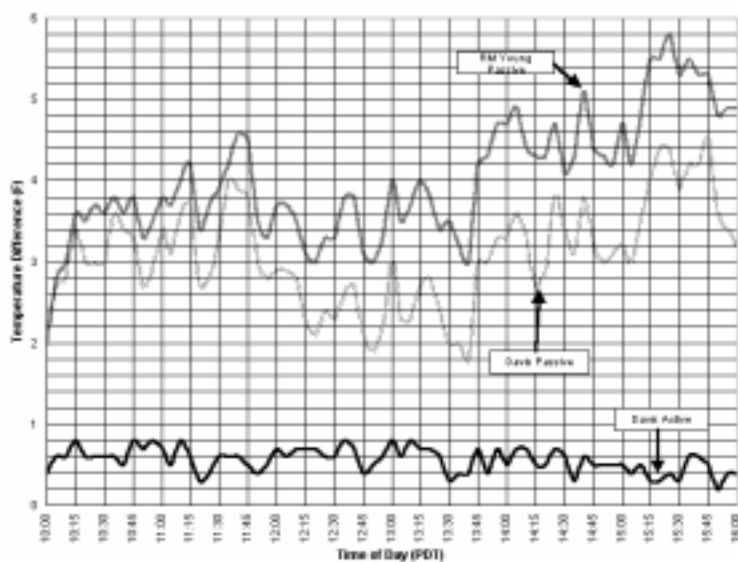


Figure 2.
Temperature Inside Three Radiation Shields, Using an RM Young Model 43408 as Reference.
("RM Young Passive" is a model 41002; "Davis Passive" is a model 7714 with model 7818
Temperature Probe installed; "Davis Active" is a solar-powered model 7755 with model 7818 Probe
installed. The aspiration rate of model 7757 is about 10% lower so its error is somewhat larger.)

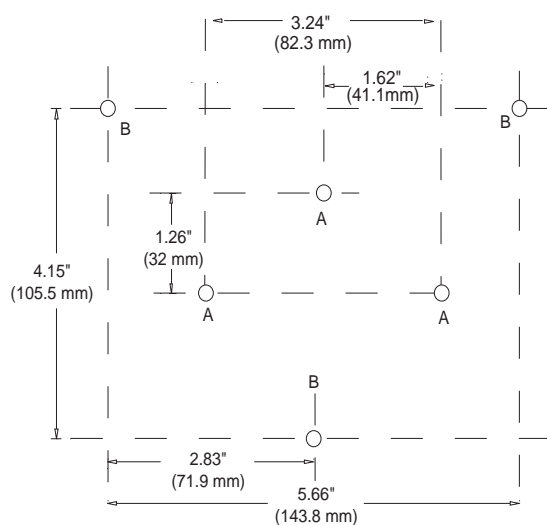


Figure 3.
Mounting Hole Locations
[Either set of 3 holes (A or B) may be used.]