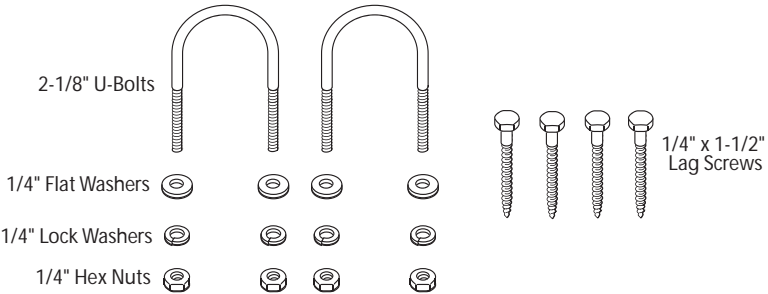
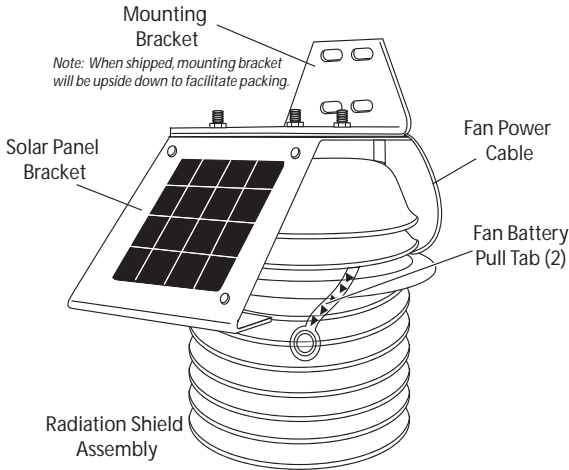


USER GUIDE

Radiation Shield with 24-Hour Fan-Aspirated Radiation Shield (product number 6838)

The 24-Hour Fan-Aspirated Radiation Shield minimizes the impact of solar radiation on sensor readings. The solar- and battery-powered, motor-driven fan draws a constant airflow through the sensor chamber. At night, when the effects of solar radiation are less, the fan runs on battery power.



Tools for Setup

In addition to the hardware provided, you will need some or all of the following materials:

- Adjustable wrench or 7/16" wrench
- Drill and 3/16" (5 mm) drill bit (if mounting on a flat, vertical surface)

Start the fan

The 24-hour fan batteries are shipped with pull tabs that prevent draining the batteries until ready to use. Pull the tabs. You should hear the fan come on.

If you can't hear the fan, you can check to make sure that it is running by placing a piece of tissue paper under the shield.

Install a Sensor

You may use either a temperature probe or a temperature/humidity sensor in your Radiation shield. (Temperature probe shown in this manual.)

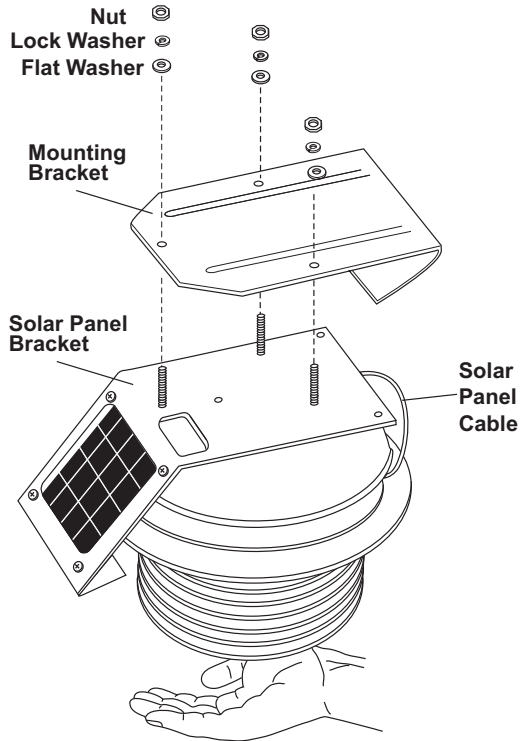
1. Place the Radiation Shield on a table or level work surface.
2. Using an adjustable wrench,

remove the three hex nuts, lock washers, and flat washers connecting the mounting bracket to the solar panel bracket and radiation shield.

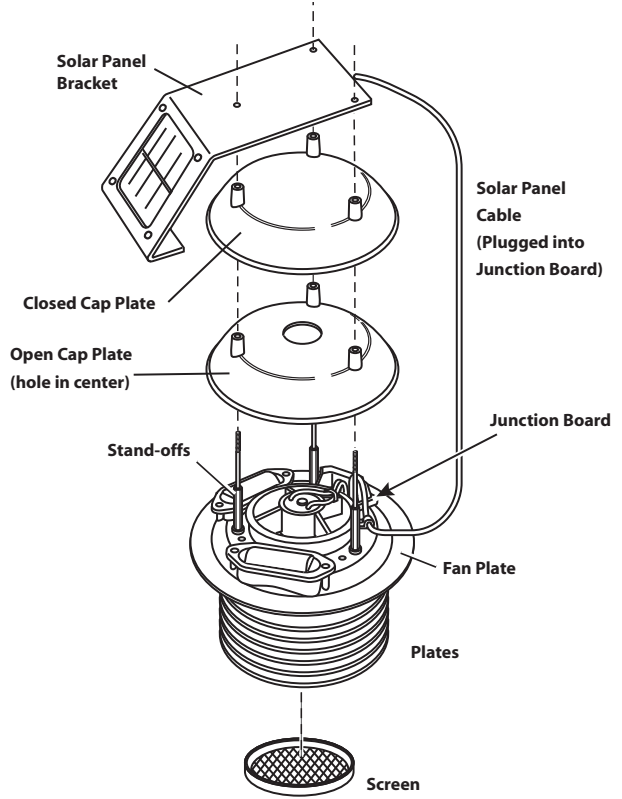
While removing the hex nuts and washers, keep the Radiation Shield on the surface or support it from the bottom. When the hex nuts and washers are removed, it will drop.

Take care not to lose the washers and nuts.

3. Lift off the mounting bracket, and the solar panel bracket (with the solar panel cable still connected).

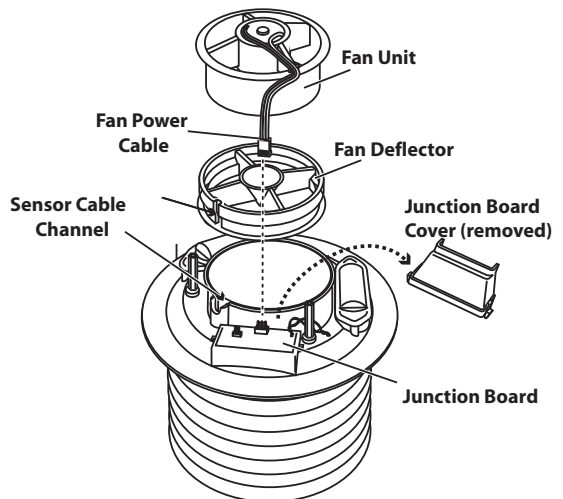


4. Remove the two cap plates.



5. Remove the white junction board cover and unplug the fan power cable from the junction board.

6. Lift out the fan and the fan deflector.



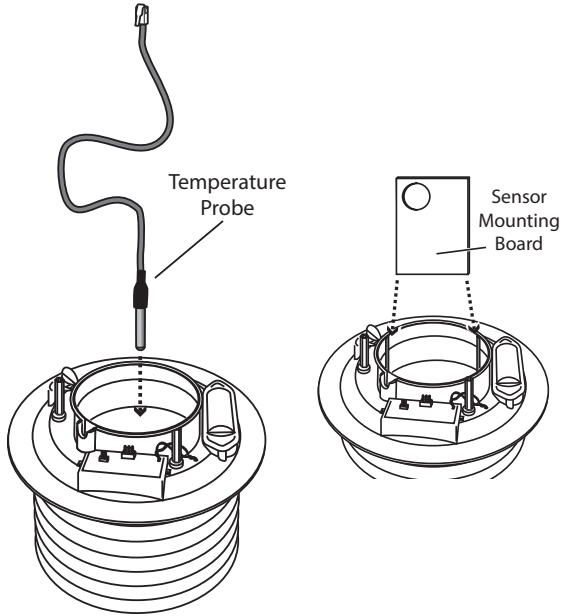
7. Remove the optional sensor mounting board. Insert the sensor into the radiation shield. You may mount your sensor to the board and slide it down into the slots on the inside of the shield.

8. Route the cable up through the channel and replace the fan deflector with the cable channels correctly aligned with the sensor cable.

9. Replace the fan and plug the fan power cable back into the junction board. The fan should start to rotate.

10. Replace the junction board cover.

11. Replace the two cap plates. (Note that the closed plate goes on top.)

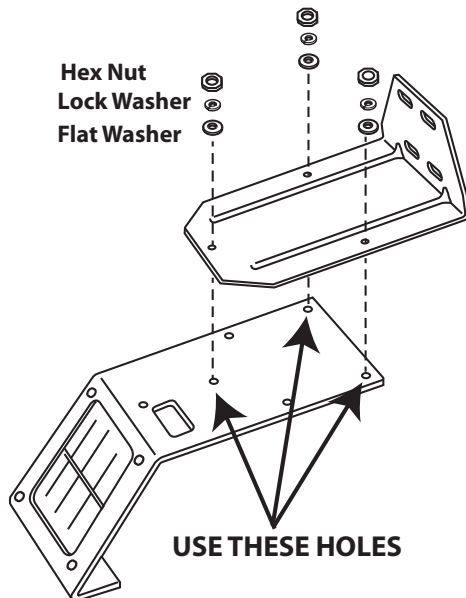


12. Replace the solar bracket, being careful to use the correct holes in the bracket as shown, and the mounting bracket.

13. Align the top of the screws with the holes in the mounting base.

14. Replace the nuts, lock washers and flat washers.

15. After mounting the Radiation Shield in its final location, connect the sensor cable to the transmitting station.



Before You Install the Radiation Shield

Choose a Location

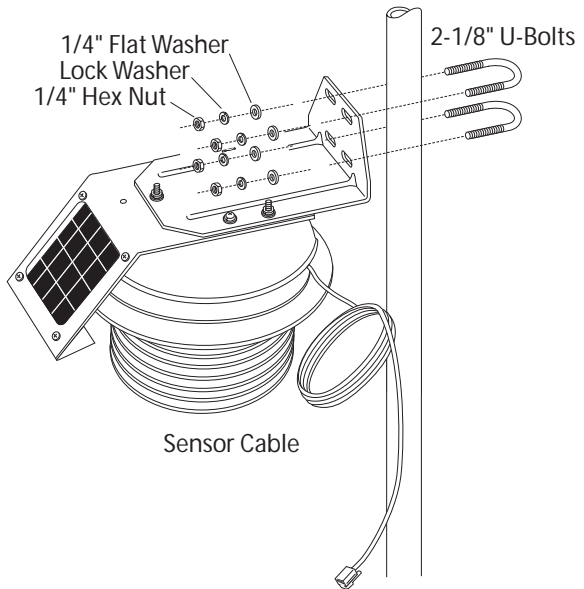
It is important to remember to choose a location that best represents the environment you would like monitor and/or protect. Consider the following factors as you choose a location:

- In the Northern Hemisphere, the solar panel should face south for maximum sun exposure. In the Southern Hemisphere, it should face north.
- Do not mount the sensor near any source of cold or heat that might distort temperature measurements.
- Mount so that the screened opening at the bottom of the shield is not blocked and air can move up into the shield.
- Mount the sensor over vegetation or soil if possible.
- Do not install over or near sprinklers, which may inflate humidity values, or near sources of radiated or reflected heat, which may inflate temperature values.
- Make sure the sensor cable can reach the transmitter when the shield is mounted.
- *Frost Monitoring:* place the sensor at about 5' (1.5m) in a grassy, open field that receives the coldest temperatures adjacent to the area at risk of frost damage.

Mounting on a Pole

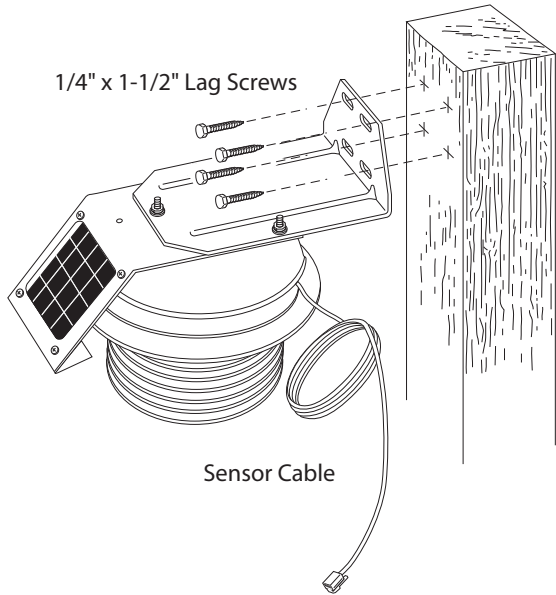
Use a pole having an outside diameter between 1" and 1-1/4" (25 – 31 mm).

1. Hold the mounting bracket against the pole. Put two U-bolts around the pole and insert the ends through the holes in the back of the mounting bracket.
2. Secure the mounting bracket using 1/4" flat washers and 1/4" hex nuts. Tighten all four sets of washers and hex nuts until the mounting bracket is firmly mounted on the pole.
3. Connect the sensor cable to the transmitting station.
4. Use the longer cable tie to secure the coil of unused cable to the pole; use the 8" cable ties to secure the uncoiled sensor cable to pole to prevent fraying in wind.



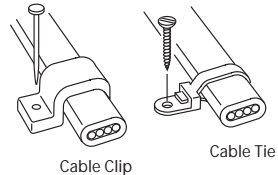
Mounting on a Post

1. Using four 1/4" x 1-1/2" lag screws, attach the mounting bracket to the surface in the desired location. Drill holes using a 3/16" (5 mm) drill bit. Use a carpenter's level when marking the holes to ensure that the bracket will be level.
2. Using an adjustable wrench or 7/16" wrench, tighten the lag screws.
3. Connect the sensor cable to the transmitting station. Use the longer cable tie to secure the coil of unused cable. Use the 8" cable ties to secure the uncoiled sensor cable to prevent fraying in wind.



A Note on Securing Cables

To prevent fraying or cutting of cables, secure them so they will not whip in the wind. Secure a cable to a metal pole by wrapping electrical tape around it or using the supplied cable ties. Make sure cables are secure by placing clips or ties approximately every 3 – 5' (1 – 1.6 m).

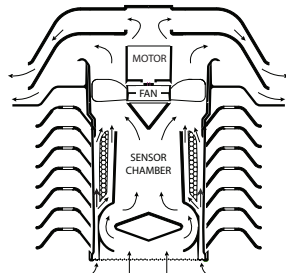


Note: Do not use metal staples or a staple gun to secure cables. Metal staples—especially when installed with a staple gun—have a tendency to cut the cables.

Maintaining Your 24- Hour Fan-Aspirated Radiation Shield

The cross-section diagram shows how the 24-Hour Fan-Aspirated Radiation Shield draws outside air up through the sensor chamber and between the three walls surrounding the sensor chamber, while the shield stack prevents radiation heating of the outer wall.

Check the radiation shield for debris or insect nests several times a year and thoroughly clean as often as



necessary. A buildup of material inside the shield reduces its effectiveness and may cause inaccurate temperature and humidity readings.

Clean by disassembling the shield and cleaning the interior surfaces of the shield and the sensor as necessary to prevent dirt build up. To disassemble, reverse the steps shown in “Install a Sensor” on page 2.

Notes on dissembling and cleaning your Radiation Shield:

- You will need an adjustable wrench; a soft, damp cloth; and a soft brush (such as a toothbrush). You will also need a small Phillips head screwdriver if you are also replacing the fan batteries.
- You will not need to remove the mounting bracket from the pole or post on which it is mounted. You will be able to remove the entire radiation shield so that you can clean it and access the sensor, the fan, and the fan batteries.
- Remember to support the radiation shield from the bottom when disassembling. When you remove the screws, the shield will drop.
- Take note of the cable placement and routing as you disassemble the shield so you can replace them correctly.
- Pull the temperature/humidity sensor up and out and clean with soft brush or cloth.
- Remove all debris from inside the shield and fan and wipe the interior surfaces with a damp cloth.
- Remove the screen from the bottom of the radiation shield. Wipe it clean, as well as up into the interior of the radiation shield. Replace the screen.
- If a new fan and batteries are needed, see “Replacing the Fan Motor and Batteries” on page 7.
- Check to make sure the fan is running by listening for it, or by holding a piece of tissue paper under the shield.
- Do not spray down or use water excessively to clean the radiation shield. This can damage the sensitive sensors or alter the data and readings the ISS is transmitting.

Tip: *If you are out in the field where it is very dusty, place the radiation shield on a convenient work place, such as a table, a piece of cardboard, or a pickup truck tailgate.*

CAUTION: DO NOT remove nesting insects or animals by spraying insect killer of any kind into the radiation shield. Chemicals could easily damage the circuitry inside your Radiation Shield.

Replacing the Fan Motor and Batteries

To replace the fan motor and batteries in the 24-Hour Fan-Aspirated Radiation Shields, use product no. 7758B: Standard Motor Kit for Fan-Aspirated Radiation Shield with Batteries.

Troubleshooting

“I am not receiving data from my sensors.”

Make sure the sensor cable is firmly connected. Try reseating the connections.

“My data does not seem to be accurate.”

Make sure the screened opening at the bottom of the radiation shield is not blocked and air can circulate up the tube. Make sure the fan is running, by listening for it or by placing a small piece of tissue paper against the screen under the shield.

“The fan is not running.”

Make sure the solar panel cable is firmly connected. If you have changed the batteries, make sure the fan batteries they were inserted in the right orientation (+ to + and - to -).

Contacting Davis Instruments

If you have questions about installing or using your Radiation Shield, please contact Davis Technical Support. We’re glad to help.

Note: Please do not return items to the factory for repair without prior authorization.

Online: www.davisinstruments.com
See copies of user manuals, product specifications, application notes, software updates, and more.

E-mail: support@davisinstruments.com

Telephone: (510) 732-7814
Monday – Friday, 7:00 a.m. – 5:30 p.m. Pacific Time.

Specifications

General

Operating Temperature -40° to +150° F (-40° to +65° C)
Non-operating Temperature -40° to +158° F (-40° to +70° C)
Shield Dimensions, with bracket 8.1" high x 9.5" width x 7.8" deep
(206 mm x 241 mm x 198 mm)
Weight 6.6 lbs. (3.0 kg)

Aspiration Rate, Solar-powered, full sun
Intake Flow Rate 190 ft./min. (0.96m/s)
Sensor Chamber Flow Rate 500 ft./min (2.5 m/s)

Aspiration Rate, Battery only
Intake Flow Rate 80 feet/min (0.4 m/s)
Sensor Chamber Flow Rate 180 feet/min (0.9 m/s)

Radiation Induced Temperature Error 0.5°F (0.3°C) [At solar noon, insolation =
1040 W/m²] (Ref: RM Young model 43408)

Battery Charge/Operating Temperature 32° to +113°F (0° to +45°C)
Battery Discharge/Storage Temperature -4° to +140°F (-20° to +60°C)
Fan Primary Power. Solar panel
Fan Secondary Power One or two 1.2 v NiMH C-cells

24-Hr Fan-Aspirated Radiation Shield, 6838

7395.360 Rev. A 3/15/19

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