

# Integrated Sensor Suite with Fan-Aspirated Radiation Shield

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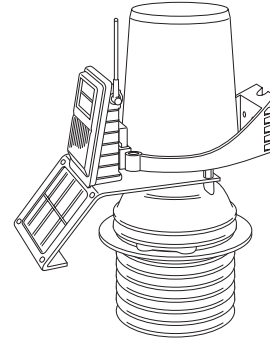
## Installation Instructions Addendum For Vantage Pro2™ and Vantage Pro2 Plus™

The Vantage Pro2™ Integrated Sensor Suite (ISS) with the Fan-Aspirated Radiation Shield uses a combination of fan-aspiration and shielding to minimize temperature measurement errors due to the effects of solar radiation.

### Fan-Aspirated ISS Addendum Overview

This addendum provides additional information specific to the installation and use of ISS models containing the fan-aspirated radiation shield. It is intended to be used in conjunction with the “Integrated Sensor Suite Installation Manual.”

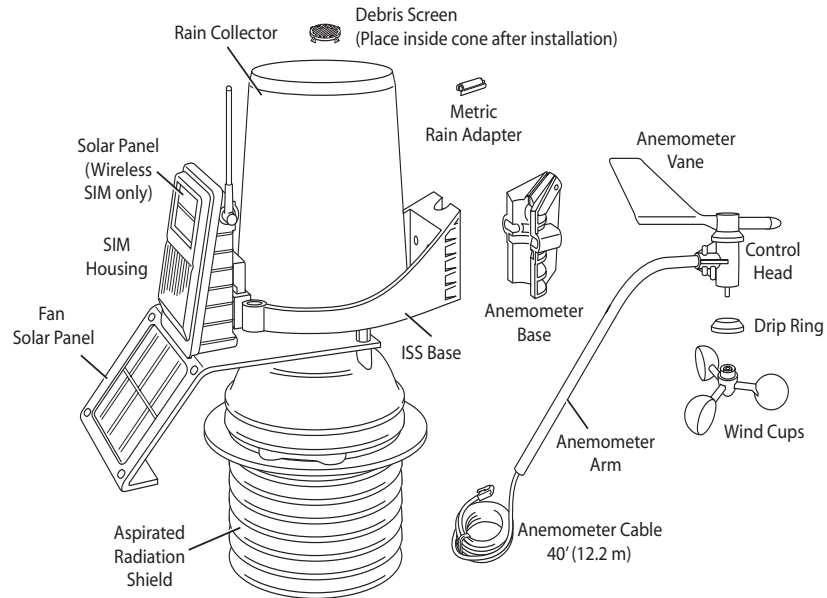
The table below shows the location of the information required to install and maintain your Fan-Aspirated ISS system.



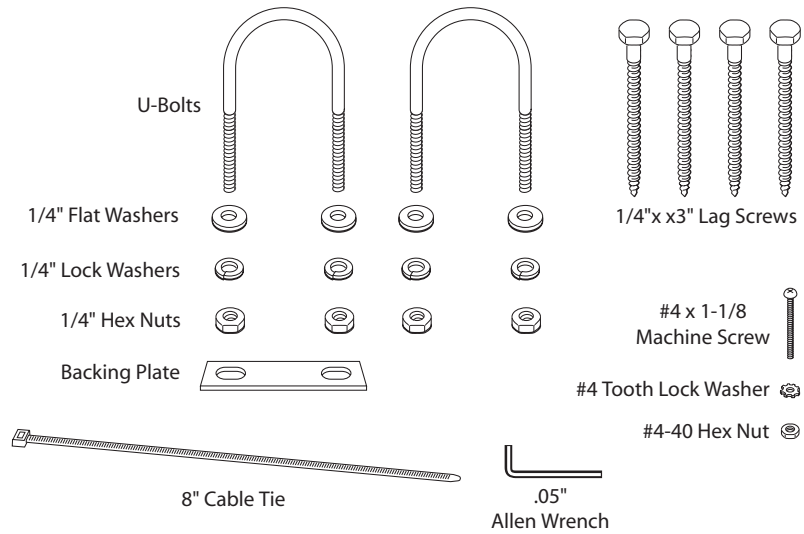
Section/Procedure	In This Addendum	In the ISS Installation Manual
Tools for Setup		X
Preparing the Anemometer		X
Preparing the Rain Collector	X	X
Preparing the Radiation Shield	X	
Powering ISS and Testing Communications		X
Powering and Testing the Fan	X	
Choosing a Site for the ISS		X
Mounting the ISS		X
Additional Mounting Options		X
Fan-Aspirated Shield Maintenance	X	
Theory of Operation	X	
Fan-Aspirated Shield Troubleshooting	X	
Fan-Aspirated Shield Specifications	X	

## Components

The Fan-Aspirated ISS includes these components:



The hardware shown here is provided for assembly and mounting:

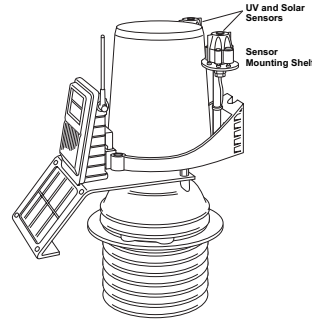


### Additional Components on Vantage Pro Plus

The Vantage Pro2 Plus™ includes an ultraviolet (UV) sensor and a solar radiation sensor. These two sensors are mounted next to the rain collector on your ISS.

See the Integrated Sensor Suite Installation Manual about mounting and maintaining these sensors.

Do not touch the small white diffusers on top of the UV and solar radiation sensors. Oil from the skin reduces sensor sensitivity.



### Tools for Installation

Refer to this section in your ISS Installation Manual for the tools needed to assemble the ISS.

### Preparing the ISS for Installation

Refer to this section in your ISS Installation Manual on assembling the ISS.

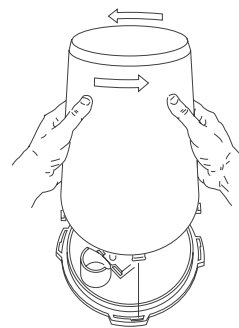
### Preparing the SIM for Installation

The ISS sensors are connected by cables to the **Sensor Interface Module (SIM)**, located inside the SIM housing. The SIM contains electronics that measure and store weather information for transmission to the console via radio. The SIM housing protects the SIM from the elements and provides easy access to the SIM cable connections.

See the ISS Installation manual on checking the sensor connections to the SIM and for any additional sensor and wireless installation instructions.

### Preparing the Rain Collector

1. Remove the rain collector cone from its base by rotating the cone counter-clockwise until its latches line up with openings which allow you to lift it off. The cone fits in the base tightly and may require extra pressure to remove it when new.



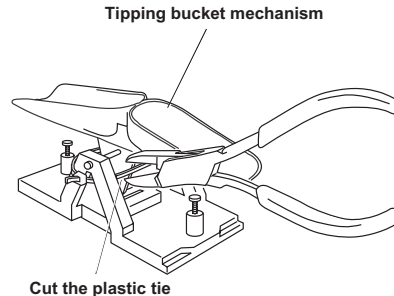
Twist off the rain collector cone

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Note: Steady the base between your knees when you rotate the rain collector.

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2. Carefully cut and remove the plastic tie (usually black in color) that holds the two-sided tipping bucket mechanism in place during shipping.
3. See the ISS Installation Manual for instructions on inserting the optional metric measurement adapter.

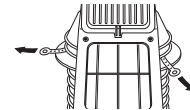


*Preparing the Rain collector*

## Preparing the Fan-aspirated Shield for Installation

The radiation shield, fan, and solar panel used to power the fan come pre-assembled with the ISS unit and require no additional assembly. However, the fan requires initial power from the pre-installed batteries. Tabs are included to ensure that the batteries installed in the fan-aspirated housing do not power the unit during shipping. To power the fan-aspirated unit:

1. Pull the battery tabs out slowly.
2. Listen for a slight whir coming from the bottom of the ISS unit. This sound signifies that the fan is running.



## Applying Power and Testing Communications

Refer to the Wireless ISS Assembly section in your ISS Installation Manual for the rest of the procedures required to power and test the ISS.

## Locating the ISS and Anemometer

Refer to this section in your ISS Installation Manual.

### Mounting the ISS

Refer to this section in your ISS Installation Manual.

### Additional Mounting Options

Refer to this section in your ISS Installation Manual.

## Fan-Aspirated Shield Batteries

The Fan-Aspirated shield is solar powered and is supplied with two NiCad C-cell batteries that come pre-installed. The following options for battery power exist:

- Use two fan batteries for maximum length of overnight aspiration but with slightly lower average daytime aspiration.

- Use only one fan battery for some overnight aspiration but with slightly higher average daytime aspiration.
- Remove both batteries for maximum daytime aspiration and no nighttime aspiration. See “Replacing Fan Motor and Batteries” on page 6 for more information.

## Fan-Aspirated Shield Maintenance

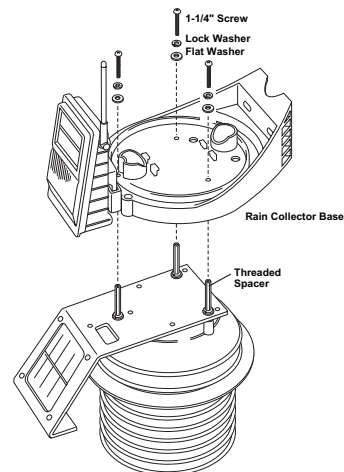
- Keep the outer surfaces clean, since the unit is less effective when the surfaces are dirty. Remove dust from the solar panel and the shield with a damp cloth. Pull off and clean the inlet screen as necessary.
- Remove any debris obstructing air flow through the radiation shield, e.g., leaves, twigs, webs, and nests.
- Avoid spraying insect killer of any kind into the radiation shield as this may damage the sensors and the shield.
- Disassemble the shield and clean interior surfaces as necessary to prevent dirt build-up. Consider replacing the motor (Part # 7758) and batteries every two to three years.
- To check the motor, listen for the slight whirring or, on a calm day, test air suction by placing a very thin one-ply piece of plastic the size of the fan screen at the bottom of the radiation shield. If the fan is working, the plastic will stick to the fan screen.

Note: The fan runs at low speeds in order to conserve limited solar and battery capacity. The fan motor turns faster on solar power and slower on battery power. For instance, if the fan motor's strength is tested when it is running on optimal solar power, testing the fan with a piece of plastic is easy. Testing on battery power alone requires more care because air movement is less.

## Disassembling the Radiation Shield

Disassemble the radiation shield for routine cleaning, maintenance, and to replace the batteries and motor. To disassemble the shield:

1. Remove the three screws connecting the rain collector base to the threaded spacers.
2. Lift the rain collector base off of the threaded spacers. For easier re-assembly, mark the holes used by the rain collector base, the holes used by the radiation shield, and the orientation of the bracket relative to the radiation shield.



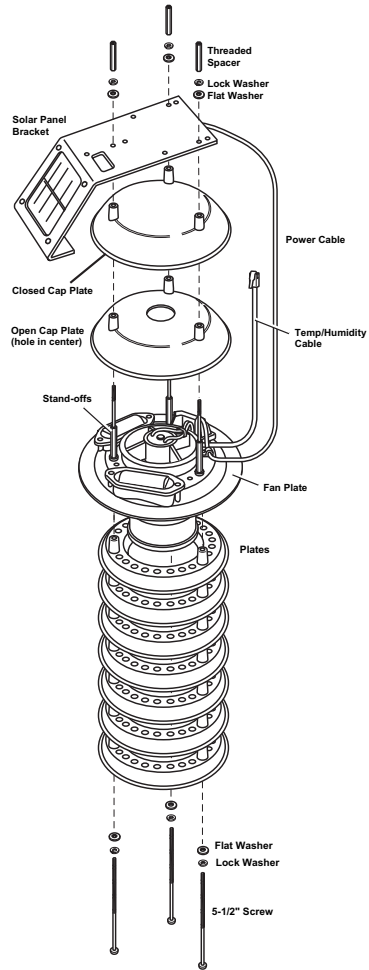
3. Unscrew the three threaded spacers holding the solar bracket and radiation shield together.
4. Remove the three screws from the bottom of the radiation shielding and separate the shield stack.

### Interior Maintenance

Once the shield has been disassembled, do the following to clean and maintain the interior of the shield:

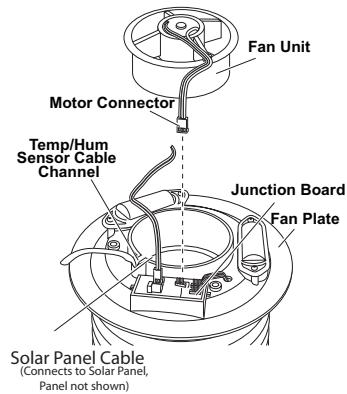
- Remove all debris from inside the shield and wipe the interior surfaces clean.
- Expose the solar panel to the sun and check that the fan rotates.
- Replace the fan motor and batteries as needed (see instructions below).

Once interior maintenance is completed, reassemble the shield and remount the ISS.

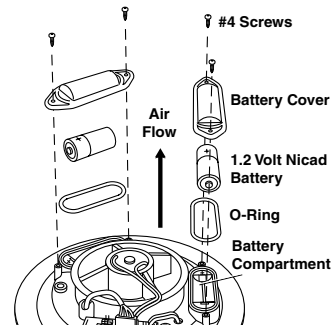


### Replacing Fan Motor and Batteries

1. Unplug the old motor and lift it from the Radiation Shield.
2. Install the new motor/fan assembly and plug its cable into the junction board.

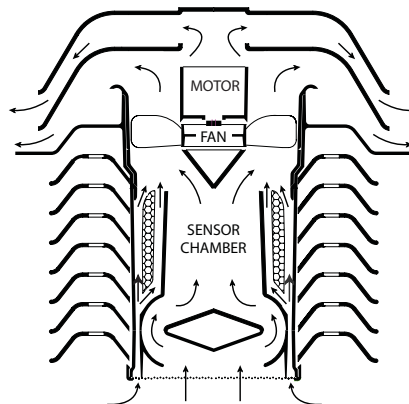


3. Remove the fan batteries.
4. Install new batteries (NiCad C-cells). Be sure to match the “+” sign on the battery with the “+” sign in the battery compartment.



### Theory of Operation

The diagram below shows how the 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.



*Cross-section of Fan-Aspirated Radiation Shield*

### Fan-Aspirated Shield Specifications

Aspiration Rate (at the sensor) . . . . .	190 ft./min. (.96 m/s) (solar-powered, full sun), 80 feet/min. (0.4 m/s) (battery only)
Radiation-Induced Temperature Error . . . . .	0.5°F (0.3°C) [At solar noon, insolation = 1040 W/m <sup>2</sup> (Reference: RM Young model 43408)]
Operating Temperature . . . . .	-40° to +140° F (-40° to +60° C)
Non-operating Temperature . . . . .	-50° to +158° F (-45° to +70° C)
Fan Primary Power Input	
ISS . . . . .	solar panel
Fan secondary power . . . . .	1 or 2 - 1.2 Volt NiCad C-cells

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## Fan-Aspirated ISS Troubleshooting

If you are experiencing problems with your Fan-Aspirated ISS, first be sure to check all cable connections. If you are unable to solve the problem, please call Davis Technical Support. We'll be glad to help. Most questions can be answered while you're on the phone. You can also e-mail us for support, or visit our website. Sorry, we are unable to accept collect calls.

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

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### Phone Support:

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

**(510) 670-0589** – Fax to Technical Support.

### E-mail Support:

**support@davisnet.com** – E-mail to Technical Support.

**info@davisnet.com** – E-mail to Davis Instruments.

### Web Support:

**www.davisnet.com** – Copies of User Manuals are available on the “Support” page. Watch for FAQs and other updates.

### Addendum, Fan-Aspirated ISS Installation

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