Model
8141-A
8141-B
8141-D

Self-Aspirated Radiation Shield

User's Manual

allweatherinc

1165 National Drive • Sacramento, California 95834 • www.allweatherinc.com

TABLE OF CONTENTS

INTRODUCTION

The Models 8141-A, 8141-B, and 8141-D Self-Aspirated Radiation Shields are designed for natural ventilation where power is not available to operate a motorized radiation shield. The design allows air to rise through the shield for constant circulation, and provides protection from direct and scattered radiation, and from precipitation contact. The Model 8141-A includes a mounting adapter compatible with the Model 5120 humidity probe, and the Models 5129 and 5140 temperature/humidity probes. The mounting adapter included with the Model 8141-B is used for mounting the Models 4470, 4480, and the 4500 series temperature probes. The 8141-D's mounting adapter is for use with the Model 5190 temperature/humidity probe.

THEORY OF OPERATION

A pure black body will absorb almost 100% of heat radiation. In contrast a pure white or highly polished surface will reflect almost 100% of heat radiation. This shield was designed to reflect most of the sun's direct radiation through the use of multiple shields with highly reflective surfaces. Openings in the top of each intermediate shield aid in natural ventilation.

Optimum temperature measurements can be made using aspirated radiation shields. Shields with fans or blowers give a constant flow of ambient air to the sensor, while self-aspirating and vane-aspirated shields must rely on natural air movement and convective flow. The self-aspirating shield must be used when power is unavailable for fan aspiration. The drawback to the self-aspirating shield is that, under calm conditions, a 2° F (1° C) error can occur due to stagnant air in the immediate surroundings. The only alternative is to use a fan-aspirated shield with a DC fan and batteries whenever power is unavailable.

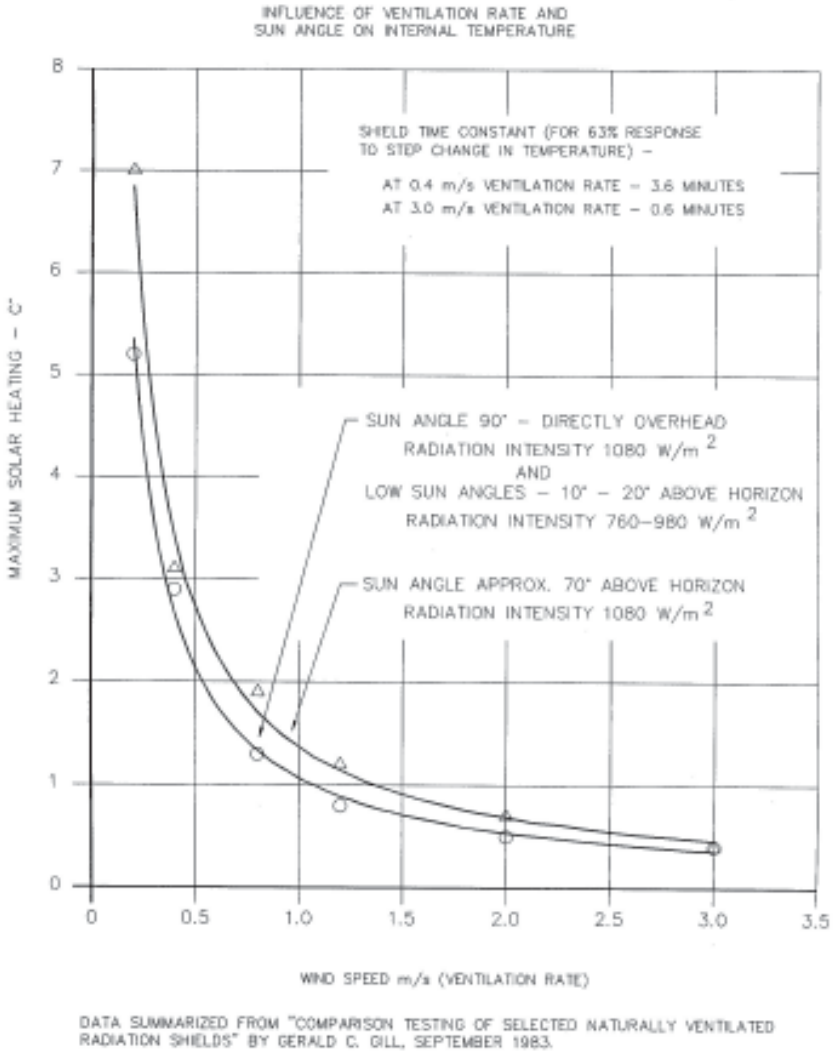

Figure 1 Model 8141 Performance Curve

INSTALLATION

This instrument is thoroughly tested and fully calibrated at the factory and is ready for installation. Please refer to the return authorization card included in the packing box if damage has occurred. Also, notify All Weather Inc.

To mount the radiation shield onto a vertical mast or onto one of the tower legs, select a section with an outside diameter from 1-2 inches, and use the U-bolt assembly provided with the shield. Do not over tighten the U-bolt nuts.

The Model 8141-A, Model 8141-B, and 8141-D are identical except for the mounting adapter provided with each. The Model 8141-A includes a mounting adapter compatible with the Model 5120, 5129, and 5140 probes; the mounting adapter included with the Model 8141-B is used for mounting a Model 4470, 4480, or the 4500 series temperature probes; and the adapter included with the Model 8141-D is used to mount a Model 5190 temperature/humidity probe.

To install a probe into the Model 8141-A or 8141-D, insert the probe into the mounting adapter and tighten.

To install a probe into the Model 8141-B, insert the probe into the mounting adapter and secure it with the clamp by tightening the clamp's two screws. Do not overtighten.

After installation, the probe's sensing element should be situated at about the shield's midpoint.

The radiation shield should be located as far as possible from sources of heat and ventilation except when it is these sources that are being measured. The shield should also be as far as possible from surfaces and large objects.

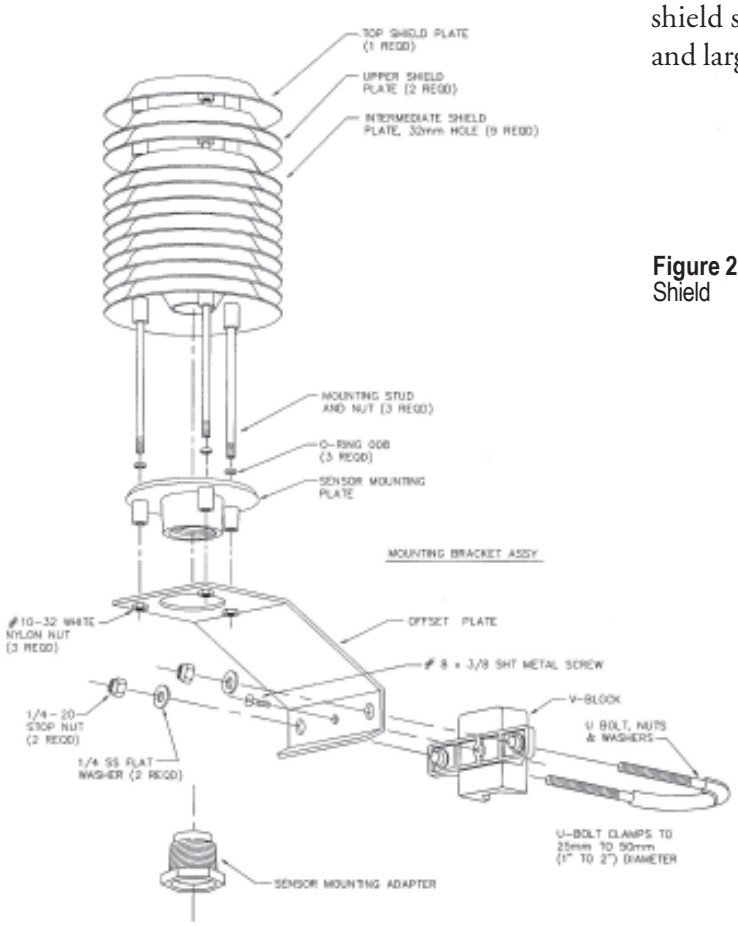

Figure 2 Model 8141 Radiation Shield

CALIBRATION

The Models 8141-A, 8141-B, and 8141-D Self-Aspirated Radiation Shields require no calibration.

MAINTENANCE

Maintenance of this instrument is limited to keeping the shield clean and free of debris. Do not paint this shield any other color. Replace any defective parts immediately.

SPECIFICATIONS

Type	Self-Aspirating
Material	UV stabilized thermoplastic
Finish	White
Mounting	V-block and U-bolt to 1”-2” vertical pipe
Capacity	
8141-A	1 Humidity Probe, or 1 combination Temperature/Humidity Probe
8141-B	1 Temperature Probe
8141-D	1 combination Temperature/Humidity Probe
Size	4.7" dia. (top plate x 10.6" H (120 x 270 mm))
Weight/Shipping	1.5 lbs./3 lbs. (0.7 kg/1.4 kg)

All Weather Inc.
1165 National Drive
Sacramento, CA 95818
Fax: 916.928.1165
Phone: 916.928.1000
Toll Free: 800.824.5873
www.allweatherinc.com

8141-001
ECN 4798
July, 1998