Model 8141-A, 8141-B, & 8141-D

Self-Aspirated Radiation Shield

PRODUCT MANUAL

8141-A, 8141-B, & 8141-D/Rev B

ADB SAFEGATE

A.0 Disclaimer / Standard Warranty

CE certification

The equipment listed as CE certified means that the product complies with the essential requirements concerning safety and hygiene. The European directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

ETL certification

The equipment listed as ETL certified means that the product complies with the essential requirements concerning safety and C22.2 No.180:13 (R2018) regulations. The CSA directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

All Products Guarantee

ADB SAFEGATE will correct by repair or replacement per the applicable guarantee below, at its option, equipment or parts which fail because of mechanical, electrical or physical defects, provided that the goods have been properly handled and stored prior to installation, properly installed and properly operated after installation, and provided further that Buyer gives ADB SAFEGATE written notice of such defects after delivery of the goods to Buyer. Refer to the Safety section for more information on Material Handling Precautions and Storage precautions that must be followed.

ADB SAFEGATE reserves the right to examine goods upon which a claim is made. Said goods must be presented in the same condition as when the defect therein was discovered. ADB SAFEGATE furthers reserves the right to require the return of such goods to establish any claim.

ADB SAFEGATE's obligation under this guarantee is limited to making repair or replacement within a reasonable time after receipt of such written notice and does not include any other costs such as the cost of removal of defective part, installation of repaired product, labor or consequential damages of any kind, the exclusive remedy being to require such new parts to be furnished.

ADB SAFEGATE's liability under no circumstances will exceed the contract price of goods claimed to be defective. Any returns under this guarantee are to be on a transportation charges prepaid basis. For products not manufactured by, but sold by ADB SAFEGATE, warranty is limited to that extended by the original manufacturer. This is ADB SAFEGATE's sole guarantee and warranty with respect to the goods; there are no express warranties or warranties of fitness for any particular purpose or any implied warranties of fitness for any particular purpose or any implied warranties other than those made expressly herein. All such warranties being expressly disclaimed.

Standard Products Guarantee

Products manufactured by ADB SAFEGATE are guaranteed against mechanical, electrical, and physical defects (excluding lamps) which may occur during proper and normal use for a period of two years from the date of ex-works delivery, and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made.

NOTE

See your applicable sales agreement for a complete warranty description.

Replaced or repaired equipment under warranty falls into the warranty of the original delivery. No new warranty period is started for these replaced or repaired products.

FAA Certified products manufactured by ADB SAFEGATE

ADB SAFEGATE L858 Airfield Guidance Signs are warranted against mechanical and physical defects in design or manufacture for a period of 2 years from date of installation, per FAA AC 150/5345-44 (applicable edition).

ADB SAFEGATE LED products (with the exception of obstruction lighting) are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years from date of installation, per FAA EB67 (applicable edition). These FAA certified constant current (series) powered LED products must be installed, interfaced and powered with and through products certified under the FAA Airfield Lighting Equipment Program (ALECP) to be included in this 4 (four) year warranty. This includes, but is not limited to, interface with products such as Base Cans, Isolation Transformers, Connectors, Wiring, and Constant Current Regulators.

Revision History

Revision	Date	Summary of Changes
A	2020 Apr 9	Added Dwyer option for 8141-D.
B	2025 Apr 1	ADB SAFEGATE (ECP#ADBSG-0001)

Contents

1. Introduction

The Self-Aspirated Radiation Shield is designed to house temperature/relative humidity probes in an environment protected from the thermal effects of solar radiation and precipitation. This shield with natural ventilation is typically used in applications where the AC power required for motor-aspirated radiation shields is not available.

The design allows air to rise through the shield for constant circulation, and provides protection for the probe from direct and scattered radiation, and from contact with precipitation.

The shield is constructed of 10 thermoplastic discs that block direct and reflected solar radiation from all angles, while permitting air flow past the probe arising from convection and wind. The disc material is specially formulated for high reflectivity and low thermal conductivity, and is resistant to ultraviolet light for improved weatherability.

A threaded hex plug adapter secures the probe inside the RM Young shield while providing easy access to the probe for calibration. The RM Young shield mounts to a vertical mast or tower leg with an outside diameter of 25–50 mm (1″ to 2″). Mounting hardware and the hex plug adapter are included.

The Dwyer shield, which supports only the Model 5190 series of temperature/humidity probes, has a plastic mounting retainer for the probe. The Dwyer shield mounts to a vertical mast or tower leg with an outside diameter of 19–38 mm (0.75″ to 1.5″).

1.1 Models

Three 8339 models are available.

Model	Probes Supported	RM Young	Dwyer
8141-A	Model 5120 humidity probe, and the Model 5129 and 5140 temperature/humidity probes	[1]	
8141-B	Model 4470, 4480, and 4500 series temperature probes	[2]	
8141-D	Model 5190 series of temperature/humidity probes	[3]	[4]

Table 1. Model 8141 Series Radiation Shields

[1] Includes a mounting adapter compatible with the Model 5120 humidity probe, and the Models 5129 and 5140 temperature/humidity probes

[2] Includes a mounting adapter for mounting the Model 4470, 4480, and 4500 series temperature probes

[3] Includes a mounting adapter for use with the Model 5190 series of temperature/humidity probes

[4] Includes mounting retainer for the Model 5190 series temperature/relative humidity probes

2. 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 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.

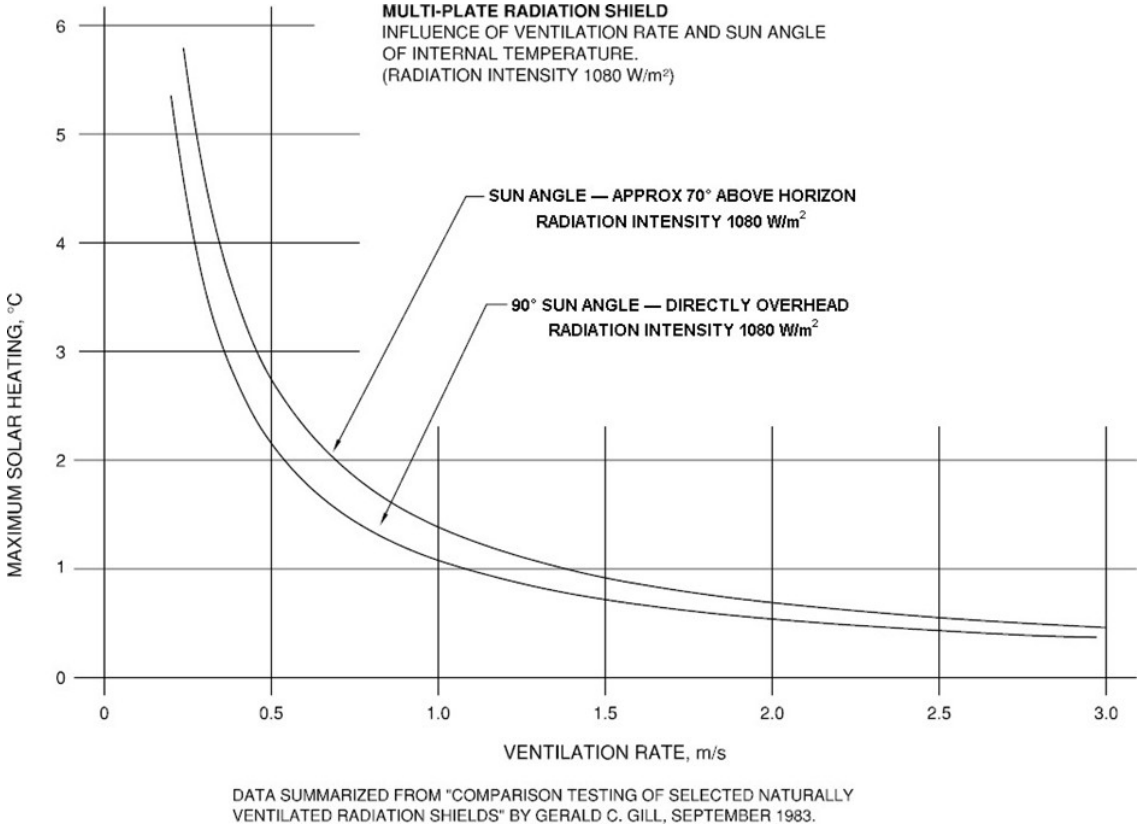

Figure 1. Model 8141 Performance Curve

3. Installation

The radiation shield 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 ADB Safegate.

Section 3.1 describes the standard installation for the Model 8141-A, 8141-B, and 8141-D radiation shields. The Model 8141-D has two variations, the RM Young variation, described in Section 3.1, and the Dwyer variation, described in Section 3.2.

3.1 RM Young Radiation Shields

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 installations 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 Model 4470, 4480, or the 4500 series temperature probes
- The adapter included with the Model 8141-D is used to mount the Model 5190 series temperature/humidity probes

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.

Refer to Figure 2.

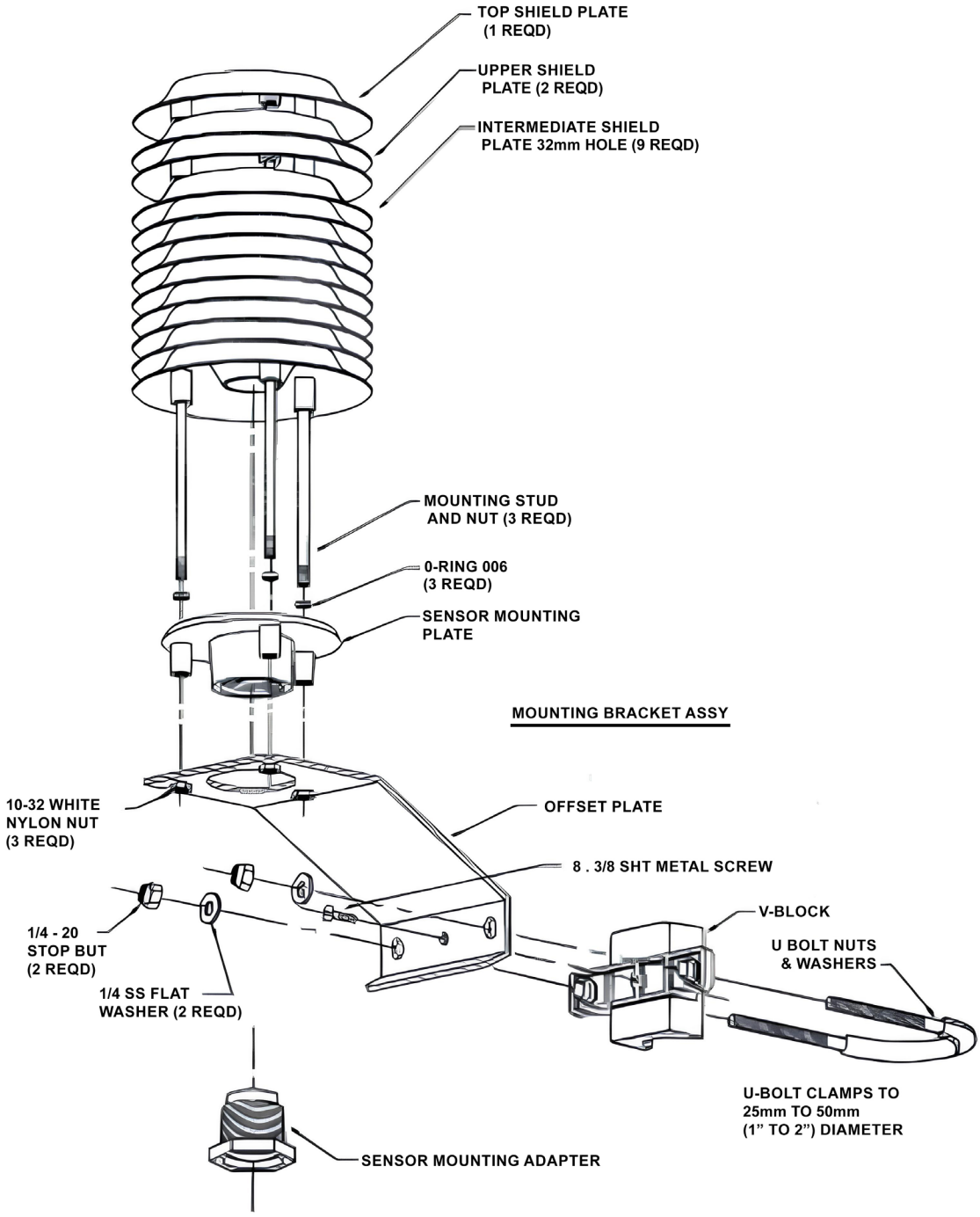

Figure 2. Model 8141 Series RM Young Radiation Shield Mounting Instructions

3.2 DWYER Radiation Shields

1. Loosen plastic probe retainer on radiation shield by unscrewing two retainer screws.
2. Insert probe into the probe retainer as shown.
3. Slide probe in mounting retainer completely into radiation shield.
4. Screw plastic probe retainer to the radiation shield until the probe is held firmly in place.
5. Do not over tighten the screws.
6. Remove the U bolt from the mounting bracket.
7. Secure the radiation shield to pipe with a diameter of 19–38 mm (0.75″ to 1.5″).

Refer to Figure 3.

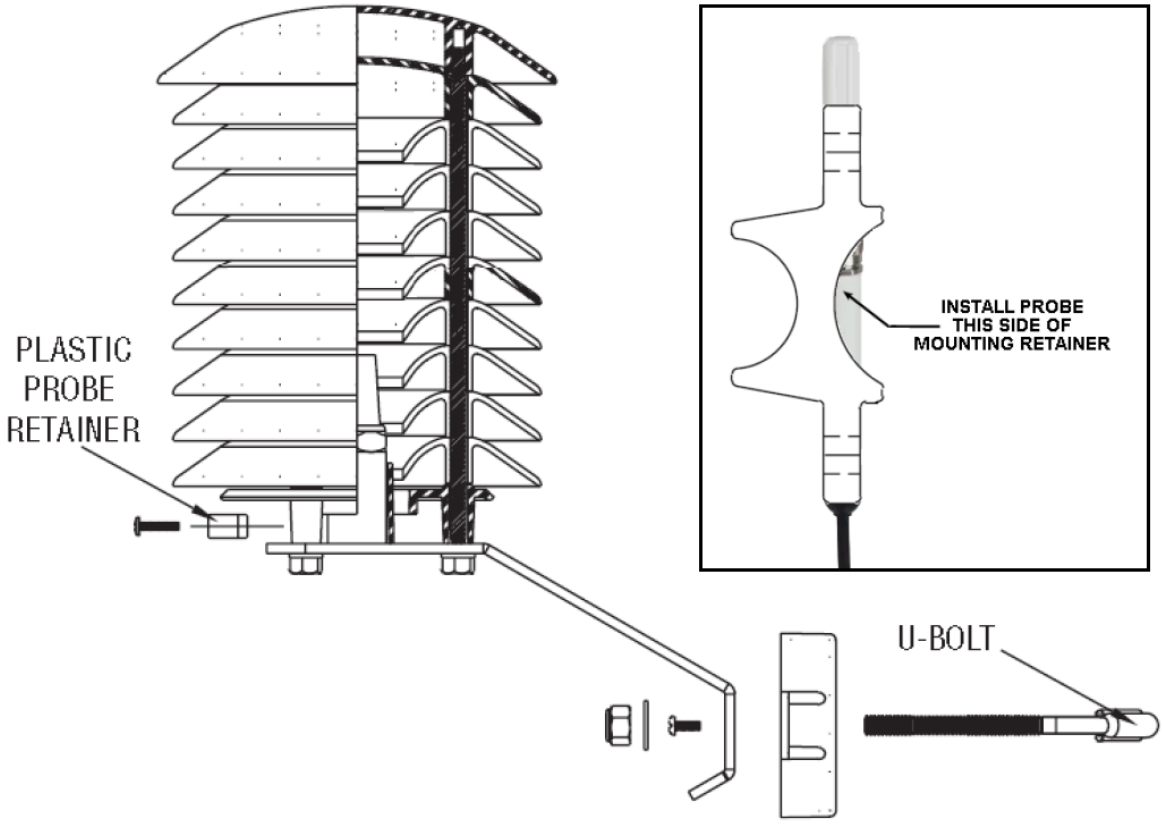

Figure 3. Model 8141-D Dwyer Radiation Shield Mounting Instructions

4. Calibration

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

5. Maintenance

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

6. Specifications

Parameter		Specification
Mounting Capacity	8141-A	1 Humidity Probe, or 1 combination Temperature/Humidity Probe
	8141-B	1 Temperature Probe
	8141-D	1 combination Temperature/Humidity Probe
Radiation Error @ 1080 W/m2 (depends on solar radiation intensity and wind speed)		0.4°C (0.7°F) rms @ 3 m/s (6.7 mph) 0.7°C (1.3°F) rms @ 2 m/s (4.5 mph) 1.5°C (2.7°F) rms @ 1 m/s (2.2 mph)
Material		UV stabilized white thermoplastic
Environmental		
Operating Temperature		-50 to +50ºC (-58 to +122ºF)
Mechanical		
Dimensions (with mounting bracket)	Young	260 mm H × 163 mm D (10.25" H × 6.4"D)
	Dwyer	130 mm D × 269 mm H (5.125" D× 10.58" H)
Mounting	Young	U-bolt fitting for vertical pipe O.D. 25–50 mm (1–2")
	Dwyer	U-bolt fitting for vertical pipe O.D. 19–38 mm (0.75" to 1.5")
Weight		0.7 kg (1.6 lb)
Shipping Weight		1.5 kg (3.2 lb)

7. Warranty

Any defect in design, materials, or workmanship which may occur during proper and normal use during a period of 1 year from date of installation or a maximum of 2 years from shipment will be corrected by repair or replacement by ADB Safegate.

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