SUN SHIELD TEMPERATURE SERIES

Installation & Operation Instructions

Phone: 1-888-967-5224
Website: workaci.com

GENERAL INFORMATION

The Solar Radiation Shield is a solution for protecting temperature sensors from error producing solar radiation and precipitation. The highly reflective white wedge-shaped plates provide maximum airflow around the sensors while at the same time minimizing direct exposure to sunlight. The passive shield is shaped to allow natural air convection around the sensors so that the air temperature inside the shield is a good representation of the outside air. This sensor is designed for use with electronic controllers in commercial heating and cooling building management systems.

It is available with multiple thermistor or RTD options.

For optimal readings, follow these tips:

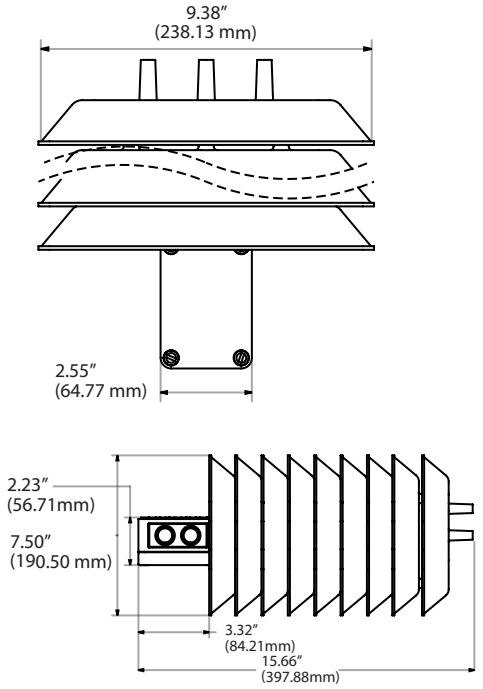
- Place the shield in an open area to insure unrestricted air flow or wind
- Keep away from large radiant heat sources, such as sun exposed buildings and solar panels.
- Avoid building exhaust vents, electrical machinery, and motors.
- Do not install over or near sprinklers. Continuous moister may damage the sensors.

MOUNTING INSTRUCTIONS

The Solar Radiation Shield is designed for two different mounting configurations such as a metal pipe with outside diameter between 1" and 1.25" (U-Bolts included) or on the side of a wooden post (Hardware Not included).

Step 1: Locate the four U-Bolt mounting holes on the back panel of the mounting bracket (B). Attach the U-Bolts (C), U-Bolt Washers (D) and 5/16" Hex Nuts (E) as shown in **Figure 2**. Finger tighten the assembly around the mounting pole. With a level, make sure the solar radiation shield is level, and tighten the hex nuts with a wrench.

FIGURE 1: ENCLOSURE DIMENSIONS



PART	QUANTITY	DESCRIPTION
A	1	Multi-Plate Shield Assembly w/Sensor Enclosure
B	1	Mounting Bracket
C	2	U-Bolts
D	2	U-Bolt Washers
E	4	5/16" U-Bolt Hex Nuts (Large)
F	3	1" Mounting Bracket Screws (Small)

Step 2: Connect the mounting bracket (B) to the top plate on the multi-plate assembly (A) with the three mounting bracket screws (F), as shown in **Figure 3**.

Install the PG11 watertight fitting supplied with the sensor if not using conduit. The outer knockout ring (PG 11/16) on housing should not be removed when using a ½" NPT conduit fitting. The 4X enclosure has (4) screws. Confirm gasketed cover is fastened securely in order to prevent any moisture being introduced

Automation Components, Inc.
2305 Pleasant View Road | Middleton, WI 53562
Phone: 1-888-967-5224 | **Website:** workaci.com

Version: 1.0
I0000892

MOUNTING INSTRUCTIONS
(Continued)
into housing.

Refer to **Wiring Instructions**) to make necessary connections.

WIRING INSTRUCTIONS
Open the cover of the enclosure. ACI recommends 16 to 26 AWG twisted pair wires or shielded cable for all sensors. Signal wiring must be run separate from low and high voltage wires (24/120/230VAC). All ACI thermistors and RTD temperature sensors are both non-polarity and non-position sensitive. All thermistor type units are supplied with (2) flying lead wires, and all RTD's are supplied with (2) or (3) flying lead wires - see **Figure 4**. The number of wires needed depends on the application.

Connect thermistor/RTD wire leads to controller analog input wires using wire nuts, terminal blocks, or crimp style connectors. All wiring must comply with all local and National Electric Codes. After wiring, attach the cover to the enclosure. Confirm gasketed cover is fastened securely in order to prevent any moisture being introduced into housing.

Note: When using a shielded cable, be sure to connect only (1) end of the shield to ground at the controller. Connecting both ends of the shield to ground may cause a ground loop. When removing the shield from the sensor end, make sure to properly trim the shield to prevent any chance of shorting.

Note: If the controller requires a (2) wire input for a RTD, connect the (2) common wires (same color) together. If the controller requires (3) wires, use (3) individual wires.

FIGURE 2: MOUNT BRACKET

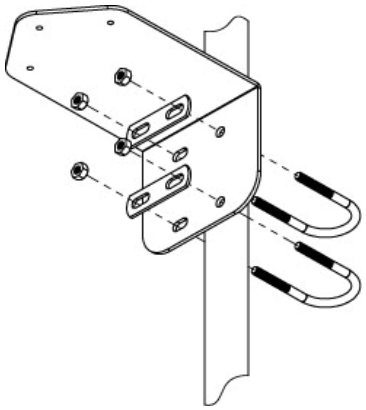


FIGURE 3: MOUNT SHIELD TO BRACKET

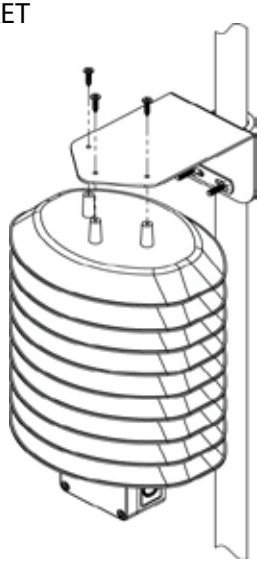
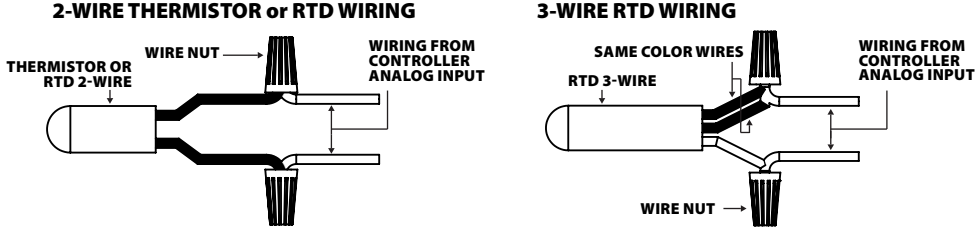


FIGURE 4: TEMPERATURE WIRING



Automation Components, Inc.
2305 Pleasant View Road | Middleton, WI 53562
Phone: 1-888-967-5224 | **Website:** workaci.com

Version: 1.0
I0000892

PRODUCT SPECIFICATIONS

SENSOR NON-SPECIFIC INFORMATION		
Number Sensing Points:	One	
Operating Temperature Range:	-40 to 70 °C (-22 to 158 °F)	
Storage Temperature Range:	-40 to 70 °C (-40 to 158 °F)	
Operating Humidity Range:	10 to 95% RH, non-condensing	
Enclosure Specifications: (Material, Flammability, NEMA/IP Ratings)	**"-4X" Enclosure**: Polystyrene Plastic, UL94-V2, IP66 (NEMA 4X)	
Lead Length | Conductor Size:	14" (35.6 cm) / 22 AWG (0.65 mm)	
THERMISTOR		
Sensor Output @ 25 °C (77 °F): (Lead Wire Colors) *Does not include CL2P	**A/1.8K:** 1.8 KΩ nominal (Red/Yellow) **A/3K:** 3 KΩ nominal (White/Brown) **A/AN (Type III):** 10 KΩ nominal (White/White) **A/AN-BC:** 5.238 KΩ nominal (White/Yellow) **A/CP (Type II):** 10 KΩ nominal (White/Green)	**A/CSI:** 10 KΩ nominal (Green/Yellow) **A/10KS:** 10 KΩ nominal (White/Blue) **A/10K-E1:** 10 KΩ nominal (Gray/Orange) **A/20K:** 20 KΩ nominal (Brown/Blue) **A/100KS:** 100 KΩ nominal (Black/Yellow)
Accuracy @ 0-70 °C (32 - 158 °F):	**A/1.8K Series:** +/- 0.5 °C @ 25 °C (77 °F) and (+/-1.0 °C) (+/-1.8 °F)	**A/10K-E1 Series:** +/- 0.3 °C (+/- 0.54 °F) **All Else:** +/- 0.2 °C (+/- 0.36 °F)
PLATINUM		
Sensor Output @ 0 °C (32 °F):	**A/100:** 100 Ω nominal	**A/1K:** 1 KΩ nominal
Accuracy:	+/- 0.06% Class A (Tolerance Formula: +/- °C = (0.15 °C + (0.002 * |t|)) where |t| is the absolute value of Temperature above or below 0 °C in °C)	
	@ -40 °C (-40 °F): +/- 0.23ºC (+/- 0.414ºF)	**@ 70 °C (158 °F):** +/- 0.29 °C (+/- 0.53 °F)
	@ 0 °C (32 °F): +/- 0.15 °C (+/- 0.27 °F)	
BALCO		
Sensor Output @ 21.1 °C (70 °F): (Lead Wire Colors)	1 KΩ nominal (Orange/Yellow)	
Accuracy:	**@ 21.1 °C (70 °F):** +/- 1%	
NICKEL		
Sensor Output @ 21.1 °C (70 °F): (Lead Wire Colors)	1 KΩ nominal (Red/Red)	
Accuracy:	**@ -40 °C (-40 °F):** +/- 1.52 °C (+/- 2.73 °F) **@ 0 °C (32 °F):** +/- 0.4 °C (+/- 0.72 °F)	**@ 21.1 °C (70 °F):** +/- 0.17 °C (+/- 0.34 °F) **@ 54.4 °C (130 °F):** +/- 0.56 °C (+/- 1.00°F)

Automation Components, Inc.
2305 Pleasant View Road | Middleton, WI 53562
Phone: 1-888-967-5224 | **Website:** workaci.com

Version: 1.0
I0000892

TROUBLESHOOTING

PROBLEM	SOLUTION(S)
Sensor reading is incorrect	• Verify sensor wiring to controller is not damaged and has continuity. • Verify sensor or wires are not shorted together. • Verify controller is setup for correct sensor curve. • Disconnect wires from sensor terminal block, tighten terminal block screws down, and take a resistance (ohm) reading with a multimeter. • Compare the resistance reading to the Temperature Vs Resistance Curves online: *http://www.workaci.com/content/thermistor-curves-0* • Verify proper mounting location to confirm no external factors are affecting reading.
Sensor reads infinity/very high resistance	• Sensor or wires are open.
Sensor reads low resistance	• Sensor or wires are shorted together.
Erratic readings	• Condensation on PCB board • Bad wire connections.

WARRANTY

The ACI Outside Series temperature sensors are covered by ACI's Five (5) Year Limited Warranty, which is located in the front of ACI'S SENSORS & TRANSMITTERS CATALOG or can be found on ACI's website: www.workaci.com.

W.E.E.E. DIRECTIVE

At the end of their useful life the packaging and product should be disposed of via a suitable recycling centre. Do not dispose of with household waste. Do not burn.

Automation Components, Inc.
2305 Pleasant View Road | Middleton, WI 53562
Phone: 1-888-967-5224 | **Website:** workaci.com

Version: 1.0
I0000892