

Radiometer

Datasheet

Model

ACPC-RMTR-AS-SC - with NEMA 4x Enclosure

Description

Mecho's Radiometer is a silicon photovoltaic cell pyranometer with a spectral response from 0.35 microns to 1.15 microns with a peak sensitivity of 0.85 microns. It is calibrated for the entire solar spectrum by comparison with a thermopile-type radiometer in direct sunlight on clear days.

The ACPC-RMTR-AS-SC is designed for installation in an unshadowed area of a building's roof. It interfaces with SolarTrac® through MechoNet+ Gateways to provide input on the sky conditions for automated control of shades, external blinds, and electrochromic windows.

The assembly includes a Radiometer housed atop a Polycarbonate NEMA 4X/IP66 rated wiring enclosure capable of withstanding the harsh outdoor environment. The ACPC-RMTR-AS-SC is ETL Listed as a system solution to ANSI/CAN/UL 325.

Features

- Full Solar Spectrum Radiometer.
- Weatherproof and capable of withstanding harsh outdoor environments.
- Monitors real-time sky conditions for automated shade control.
- Helps manage solar heat gain and glare that may affect HVAC and lighting systems.
- Low-voltage power and network class-II wiring.
- Spectral Response of 0.35 to 1.15 microns with +/- 5% accuracy.
- <1 msec full-scale response time.
- 0 - 100 mV output ratings.
- SolarTrac and Sundialer compatible
- ETL Listed as a system solution to ANSI/CAN/UL 325.



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Specifications

Equipment Kit	
Includes	Radiometer with NEMA 4X enclosures
Packaging	Flange Mount
Hardware	
Wiring	Maximum 500 ft. C cable (Part No: 82760)
Maximum Wiring Distance	Maximum limitation of 500 ft. between Radiometer and Gateway
Mechanical	
Dimensions	130 X 130 X 75 mm (5.12 X 5.12 X 2.95 in.)
Weight	Sensor and Plate: 16 oz (1 lb) Enclosures: 28 oz (1.75 lbs)
Mounting	4 holes, 4.53 x 4.53 in., 8-32 pan headed screws
Environmental	
Operating Temperature	-35 °C to 120 °C (32° to 41°F) ambient
Humidity	100% H
Agency Listings and Compliance	
RoHS Compliant	

Mounting

The Mk 1-G Sol-A-Meter is a weatherproof pyranometer (for total radiation from both sun and sky). Standard sensitivity is 50mV per cal./cm. min. (2.5 or 5mV per cal./cm. min. on request). Impedence is 1.0 ohm (0.05 and 0.10 ohm for 2.5 and 5.0mV respectively). Base is 5 in. in diameter. Shipping weight is 1-1/2 lbs.

NOTES:

- Radiometer locations to be East, South and West.
- Radiometer to be mounted clear of any shadows
- Radiometer to be roof top mounted.
- Bubble facing north.

The enclosure is non-metallic, and the shield must terminate to earth ground that should additionally terminate to the pyranometer/radiometer base.

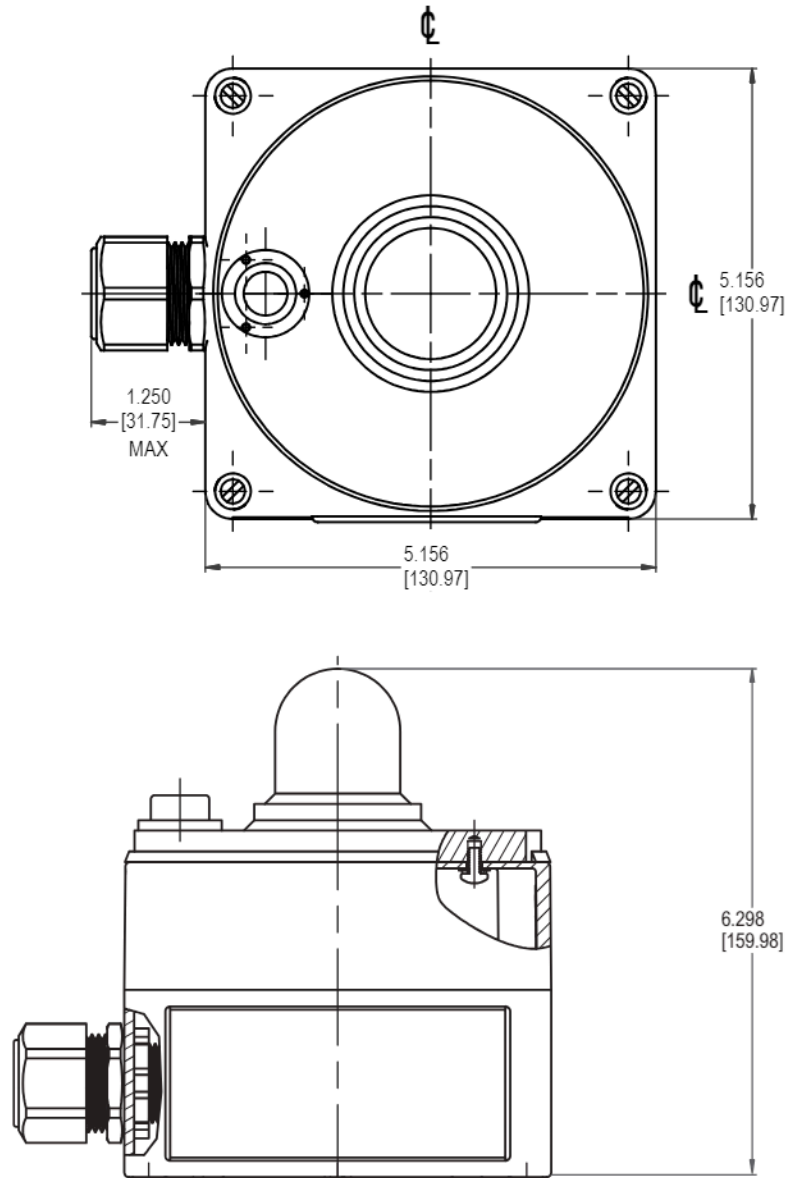
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Recommended Mounting and Wiring Details for the ACPC-RMTR-AS-SC

Installation Steps

The Radiometer should be set on a flat surface as far away as possible from any obstructions pointing directly toward the sky. The sensor's field of view is from horizon to horizon 360 degrees around the sensor, but with degrading sensitivity as one moves from the apex to the horizon. Consider the sun's track in the sky to eliminate obstructions at low solar angles if possible. Typically, the best strategy is to mount 3 radiometers on the outer extremities of the roof along the East, South, and West facades, where shadows will minimally affect its view. For the most accurate results, the instrument should be positioned. Hence, the bubble level is toward the north when the sensor is located in the Northern Hemisphere or towards the south if the sensor is located in the Southern Hemisphere. In other words, the level should be away from the side of the sensor that will receive the most sunlight or radiation.





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Installation Precautions

- To be installed and/or used in accordance with appropriate electrical codes and regulations
- All wiring must be done by a licensed electrical contractor and must conform to NEC (national electrical code) and all applicable local codes for 120vac, 230vac and low voltage wiring requirements

 **Caution:** Read all instructions before installing. If you are unsure of any part, stop and contact a qualified installer.

 **Warning:** To avoid fire, shock, or death; turn off power at circuit breaker or fuse. Test that power is off before wiring. Use this device only with copper or copper clad aluminum wire with “CC-CU” or “CU-CC” markings.

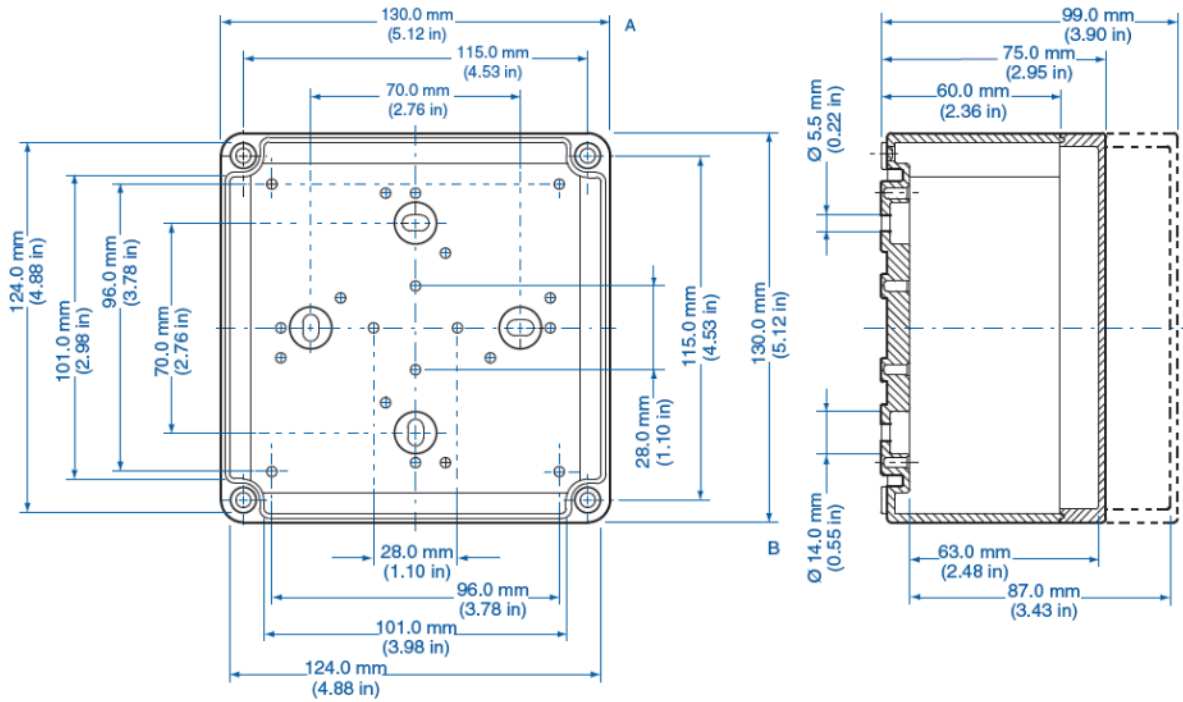
- Do not connect low voltage wires to high voltage power! Improper wiring can result in personal injury and/or damage to the switch or other equipment.
- A no. 14 AWG is the smallest conductor that may be used for branch circuit wiring.
- An outlet or terminal box to which connections to the power supply circuit will be made shall be located so that, after the appliance has been installed, such connections will be accessible for inspection.
- The leads intended to be spliced in the field shall have insulation not less than 0.8mm (1/32 in.) thick.
- Cabling diameter should be no greater than 14.5mm and conduit should be no larger than 20mm. (Europe)
- A hole, through which insulated wires pass in a sheet-metal wall within that overall enclosure of an appliance shall be provided with a smooth, rounded bushing.
- Except the drapery operator all exposed dead metal parts and all dead metal parts within the enclosure shall be reliably connected to the equipment-bonding terminal or lead.
- The impedance of the bonding connection to the motor must be at least 0.1 ohms (Canada only)
- Power supply wiring for the motors and their respective control electronics must be provided with a means for disconnecting both poles of the supply with a minimum of 3mm separation. (Europe)
- Low voltage cables should not be routed near power lines or other electrical devices that will expose the system to excessive electrical noise. High impedance, ultra low voltage (0-100mv) analog lines like those found in the radiometer should be run in its own independent conduit with cabling from like instruments separated from high voltage and high frequency, low voltage cabling. Wherever possible and as wiring codes permit steel conduit should be applied to provide extra electromagnetic shielding from other noise sources.

To Install:

1. Turn off power at the circuit breaker for the circuit that will supply the solar data collection device to which the Radiometer will be wired (i.e., SunDialer, etc.).
2. Test to ensure that the circuit is truly shut off.
3. Mount the radiometer as described above under site selection and installation and as required in the building per the appropriate national and local codes.
4. Dress the low voltage wiring for the Radiometer (for example see Figures 2 and 3 above) and wire to the 82760 cable running to the solar data collection device in accordance with local and national wiring codes. Due to the low level analog signals provided by the Radiometer it is recommended to run these signals within their own conduit in order to minimize noise coupling between other cables. Connect the BLACK (or GRAY) wire of the Radiometer ideally to a black wire running to the (-) input on the solar data collection device. Connect the RED (or BLUE) wire of the Radiometer ideally to a RED wire running to the (+) input on the solar data collection device. Connect the shield of the Radiometer to the shield of the cable. Connect the shield of the cable running to radiometer to Earth ground in a single place, preferably to an earth ground connection close to the Sundialer/Gateway. Ensure proper separation between low voltage and line voltage conductors per local and national codes. Also check precautions listed above.
5. Restore power at the circuit breaker. Installation is complete. Proper operation of the Photometer must be checked from MechoShade's SolarTrac Computer.
6. Make sure to mark/label descriptively at the input of the solar data collection device the location of the radiometer being wired to each input for future reference. (i.e.. N, S, Penthouse N, etc.)

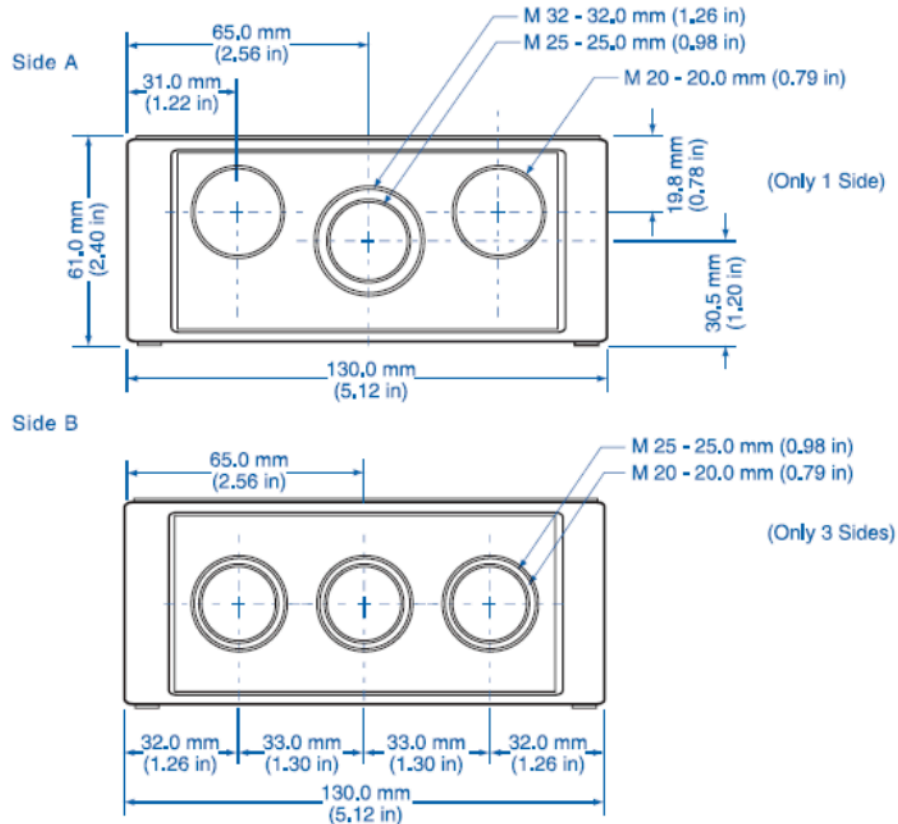
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Dimensions



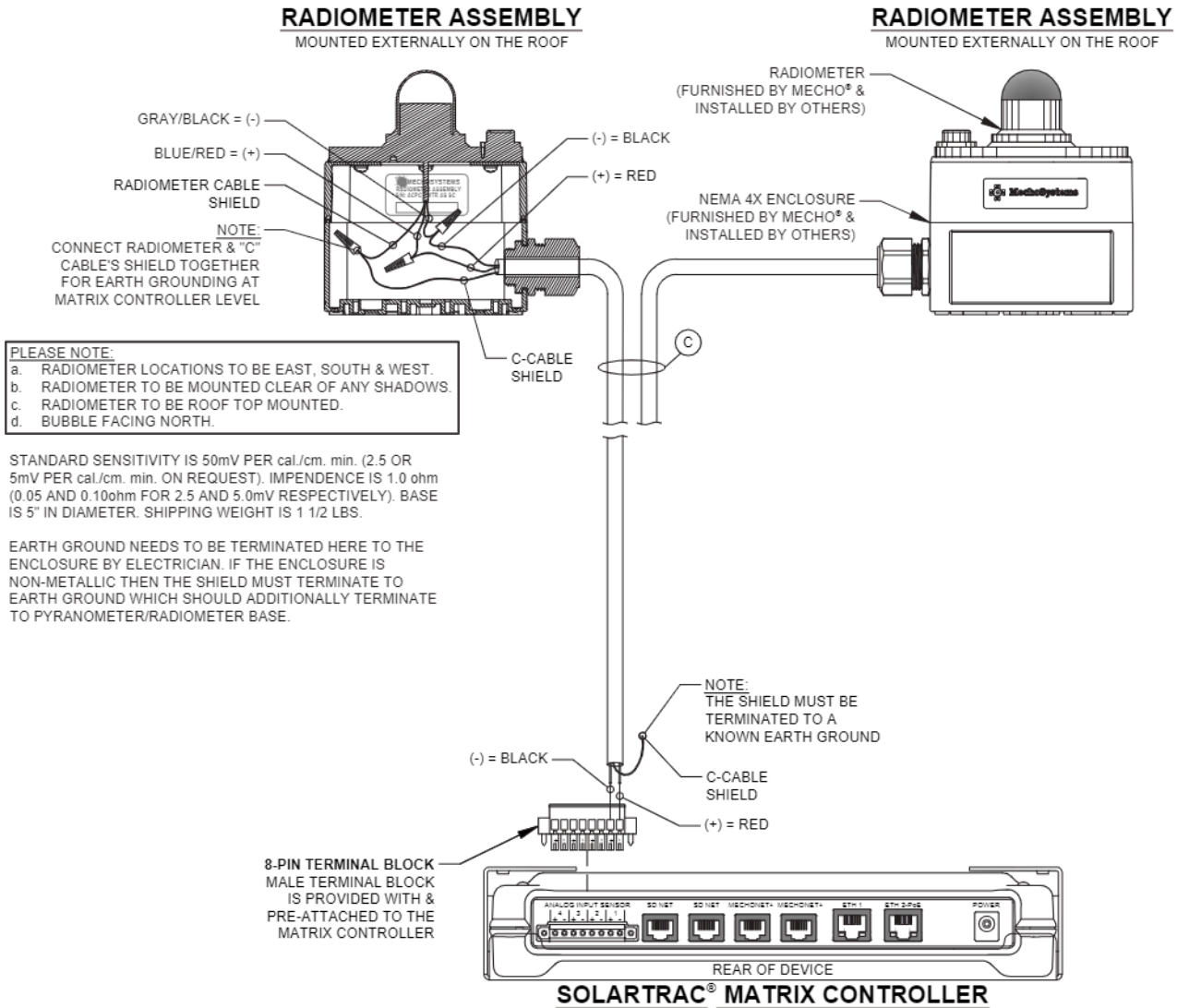
Dimensions and Mounting of the ACPC SNSR RD AS

Knockout Positions



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Dimensions



NOTE: Refer to page 7 for the Low Voltage Cable Legend information.

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MAINTENANCE

Keep the dome clean in order to maintain the accuracy of the calibration. For instruments calibrated after December 01, 1993, a provision has been made for the user to change the desiccant. To change the desiccant, turn the instrument upside down. Use a razor blade to gently cut off the name tag. Remove the plug, which is in the large hole under the name tag farthest from the three level mounting holes. Dig out the sealant and unscrew the plug with a hex wrench. Turn the instrument right side up and gently shake out the desiccant. After removing the old desiccant, refill with new and replace the plug. THE PLUG DOES NOT tighten up. Run the plug in until it is about 1/16th of an inch below the surface of the plate. Reseal completely with 100% Silicone sealant. Replace the name tag with the same sealant. The desiccant should be replaced about once a year or at the VERY FIRST sign of moisture condensing on the inside of the dome. The radiometer cannot be serviced, and the unit must be replaced in case of condensation.

LOW VOLTAGE CABLE LEGEND - EI568B

LOW VOLTAGE CABLE LEGEND - EIA568B	
NOTES:	
1. PARALLEL WIRING TO NEXT DEVICE PER BRANCH CIRCUIT CAPACITY. ALL CONNECTION MUST MEET NATIONAL AND LOCAL CODES AND REGULATIONS. 2. ADDRESS SCHEDULES REQUIRED. 3. MAXIMUM VOLTAGE FOR ALL UNMARKED CABLE IS 43.5 VDC. 4. LOW VOLTAGE CABLES SHOULD NOT BE ROUTED NEAR POWER LINES OR ELECTRICAL DEVICES SUCH AS LIGHTING BALLASTS, DIMMERS AND LED DRIVERS THAT MAY EXPOSE THE SYSTEM TO EXCESSIVE ELECTRICAL NOISE.	
A1	<p>CAT5E/6 - CABLE FOR SDNET WIRING CONNECTIONS: 24AWG 4UTP (8-CONDUCTOR STRANDED UNSHIELDED TWISTED PAIR) TERMINATION: RJ-45 MODULAR PLUG CRIMPED (EIA568B) ON BOTH ENDS Recommended OLYMPIC WIRE AND CABLE (www.olympicwire.com 1-800-526-2269) PART No. 3078M5F-8 (NON-PLENUM) or compatible cable.</p> <p style="text-align: center;">OR</p> <p>24AWG 4UTP (8-CONDUCTOR SOLID UNSHIELDED TWISTED PAIR) TERMINATION: RJ-45 MODULAR PLUG CRIMPED (EIA568B) ON BOTH ENDS Recommended OLYMPIC WIRE AND CABLE (www.olympicwire.com 1-800-526-2269) PART No. 3604M5UC-9 (PLENUM) or compatible cable.</p> <p>DISTANCE LIMITATION: 4000' CUMULATIVE. MAX. NETWORK NODES: 16. (FURNISHED & INSTALLED BY OTHERS) SEE CABLE "A" REFERENCE DRAWING FOR DETAILED SPECIFICATION.</p>
A2	<p>CAT5E/6 - CABLE FOR ETHERNET WIRING CONNECTIONS: 24AWG 4UTP (8-CONDUCTOR STRANDED UNSHIELDED TWISTED PAIR) TERMINATION: RJ-45 MODULAR PLUG CRIMPED (EIA568B) ON BOTH ENDS Recommended OLYMPIC WIRE AND CABLE (www.olympicwire.com 1-800-526-2269) PART No. 3078M5F-8 (NON-PLENUM) or compatible cable.</p> <p style="text-align: center;">OR</p> <p>24AWG 4UTP (8-CONDUCTOR SOLID UNSHIELDED TWISTED PAIR) TERMINATION: RJ-45 MODULAR PLUG CRIMPED (EIA568B) ON BOTH ENDS Recommended OLYMPIC WIRE AND CABLE (www.olympicwire.com 1-800-526-2269) PART No. 3604M5UC-9 (PLENUM) or compatible cable.</p> <p>DISTANCE LIMITATION: 325'. MAX. NODES: 2. (FURNISHED & INSTALLED BY OTHERS) SEE CABLE "A" REFERENCE DRAWING FOR DETAILED SPECIFICATION.</p>
A6	<p>CAT5E/6 - CABLE FOR MECHONET+ NETWORK WIRING CONNECTIONS: 24AWG 4UTP (8-CONDUCTOR STRANDED UNSHIELDED TWISTED PAIR) TERMINATION: RJ-45 MODULAR PLUG CRIMPED (EIA568B) ON BOTH ENDS Recommended OLYMPIC WIRE AND CABLE (www.olympicwire.com 1-800-526-2269) PART No. 3078M5F-8 (NON-PLENUM) or compatible cable.</p> <p style="text-align: center;">OR</p> <p>24AWG 4UTP (8-CONDUCTOR SOLID UNSHIELDED TWISTED PAIR) TERMINATION: RJ-45 MODULAR PLUG CRIMPED (EIA568B) ON BOTH ENDS Recommended OLYMPIC WIRE AND CABLE (www.olympicwire.com 1-800-526-2269) PART No. 3604M5UC-9 (PLENUM) or compatible cable.</p> <p>DISTANCE LIMITATION: 4000' CUMULATIVE. MAX. NODES: 250. (FURNISHED & INSTALLED BY OTHERS) SEE CABLE "A" REFERENCE DRAWING FOR DETAILED SPECIFICATION.</p> <p>PATCH LEAD CABLE NOTE: THE CUMULATIVE "DISTANCE LIMITATION" SHALL BE REDUCED BY THE LENGTH OF THE "LOW VOLTAGE MOTOR LEAD PATCH CABLES" MULTIPLIED BY 2.</p>
C	<p>ELECTRONIC CABLE FOR LOW VOLTAGE PC INTERFACE/ANALOG I/O TO SENSOR WIRING CONNECTIONS: 18AWG 1STP (2-CONDUCTOR SHIELDED TWISTED PAIR) TERMINATION: 2-PIN PHOENIX TYPE CONNECTOR/CONNECTION "+" = RED "-" = BLACK "+" = BLUE/RED "-" = GRAY/BLACK Recommended BELDEN (www.BELDEN.com 1-800-BELDEN-1) PART No.82760 (PLENUM) DISTANCE LIMITATION: 500' CUMULATIVE (FURNISHED & INSTALLED BY OTHERS)</p>

Warranty

Mecho's warranty ensures its products against defects in materials and workmanship for up to 25 years. The warranty timeline shall vary for different products. For complete warranty information, please visit <https://www.mechoshade.com/warranty> or contact your Mecho Representative.

Mecho reserves the right to make improvements or changes to its products without prior notice. Every attempt is made to ensure the information herein is accurate and up to date. Verify with the Mecho staff to confirm the product's availability, latest specifications, and suitability for your application.



Technical support

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