

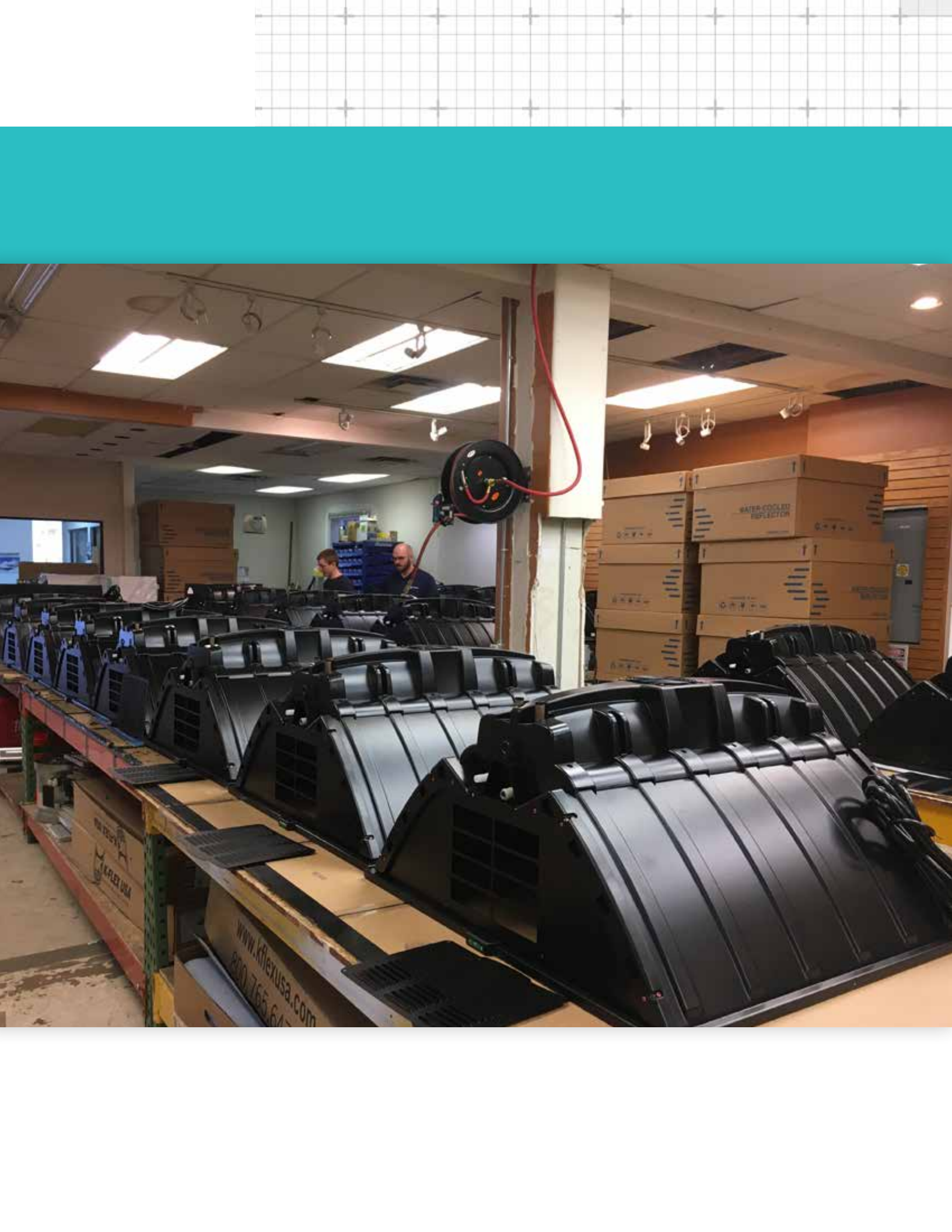
SURNA REFLECTOR

OPERATING AND MAINTENANCE MANUAL



Models: 1-REF-03, 1-REF-01
August 2017

SURNA.COM



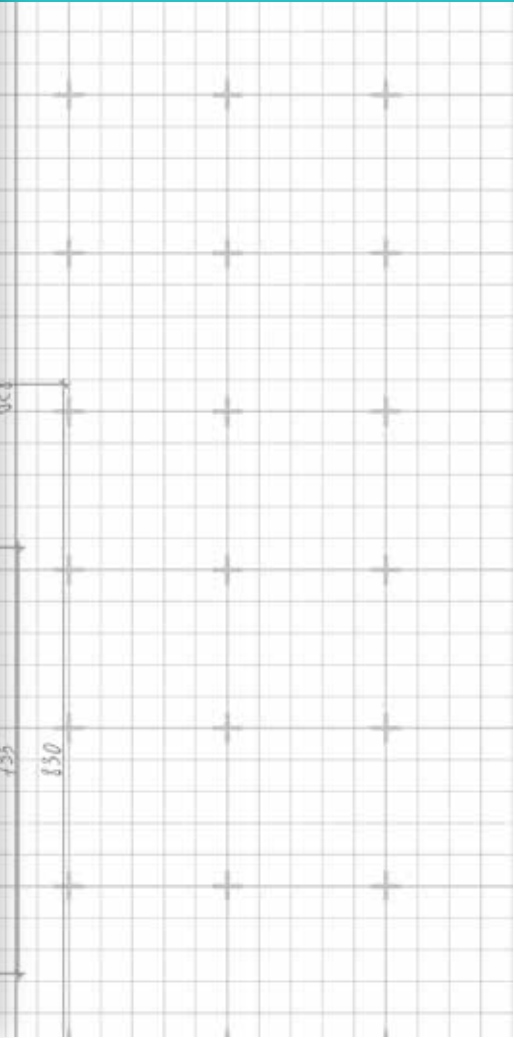
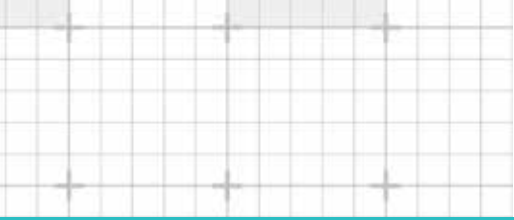


TABLE OF CONTENTS

Specifications	4
Warnings	6
Warranty Information	8
Installation Instructions	10
Routine Maintenance	15

SPECIFICATIONS

PHYSICAL	VENTED 1-REF-03	LIQUID-COOLED 1-REF-01
Length	32 in	
Width	33 in	
Height	13 in	18 in
Weight	40 lbs	59 lbs
ELECTRICAL		
Voltage	120/240V	
Amperage	9.1 A at 120V / 4.5A at 240V	
Wattage (DE)	1000W	
Frequency	60Hz	
PERFORMANCE		
Nominal Capacity	NA	1.5 GPM
Total Capacity	NA	0.5 Ton
Sensible Capacity	NA	0.4 Ton
Entering Water Temperature	NA	45°F
Leaving Water Temperature	NA	45°F
Glycol Type & Percentage	NA	Propylene Glycol - 10 to 50%
Temperature Sensor	Pane 10395	
Pressure Drop	NA	0.45 psig

ADDITIONAL INFORMATION (APPLIES TO ALL MODELS)		
Optimal Reflector Height	24 in to 36 in above canopy	
Recommended Grid	4 x 4 ft ; 4 x 5 ft ; 5 x 5 ft	
Ballast Placement	Mounted above reflector on structure or ceiling	
Light Control	Locally connected by day/night times	
Fan Control	Surna's Smart Control System for maintaining zone temperatures	



WARNINGS

DEFINITIONS

CAUTION: Risk of minor/moderate injury if precaution not taken.

WARNING: Risk of death/serious injury if warning isn't heeded.

DANGER: Risk of death/serious injury if danger isn't avoided.

SAFETY SYMBOLS USED



CAUTION: Important information, read the provided instructions carefully



WARNING: Potential electric shock hazard



WARNING: High voltage



WARNING: Cut/Crush hazard



Protective earth connection



Action prohibited

REFLECTOR SAFETY GUIDE



Please read the information in this document carefully prior to attempting the installation, operation and/or servicing of the reflector. This document contains all information required to install and operate the Surna reflector. Failure to follow the directions provided herein may impair the safeties provided and could cause damage to the equipment, damage to building facilities, and/or cause serious injury or death to the operator. Please adhere to all applicable safety guideline requirements in this document and all applicable electrical and mechanical jurisdictional codes.



Prior to providing power to the equipment, inspect the area for water spills, which may present a shock hazard to the user. Take extra care to mount accessory electrical equipment away from areas regularly exposed to water and provide secure wire and cable routing to protect personnel from shock hazards.



Only operate the equipment with an appropriately sized breaker in place and wire sizes with adequate current carrying capacity. Consult with an electrician before attempting electrical installation.



Using Surna Reflector equipment in a manner not described in this manual may void its warranty and any safeties provided herein.



Following unit installation and maintenance activities, the user shall observe the system operation to verify that normal operation has resumed prior to letting the equipment operate unattended.



Only use Surna supplied or recommended equipment with the reflector. The ballast and bulb used in the end application shall be separately certified for safety in the country of use.



Care must be taken when handling sheet metal. Sheet metal parts have sharp edges and could cause injury.



The components of this reflector assembly have been inspected at the factory and readied for shipment. Upon receiving the shipment a visual inspection of the packaging must be performed.



DO NOT use Ethylene Glycol with this system. Only Propylene Glycol is to be used at prescribed mixture ratio of atleast 30% propylene glycol.



This unit must be connected to a protective earthing system prior to operation. DO NOT remove the grounded connection while power is being supplied to the Surna reflector equipment. Doing so presents an electric shock hazard to users and service personnel.

WARRANTY INFORMATION

Equipment manufactured by Surna ("Company"), the warranty shall exist for a period of twelve (12) months from initial start-up or eighteen (18) months from date of shipment, whichever period is shorter, against failure due to defects in material and/or manufacturing and warranted to the capacities and ratings set forth in Company's catalogs and bulletins ("Warranty").

Equipment, material, and/or parts that are not manufactured by Company are not warranted by Company and carry such warranties as may be extended by the respective manufacturer.

Exclusions from this Warranty include damage or failure arising from: wear and tear; corrosion, erosion, deterioration; modifications made by others to the Equipment; repairs or alterations by a party other than Company that adversely affect the stability or reliability of the Equipment; vandalism; neglect; accident; adverse weather or environmental conditions; abuse or improper use; improper installation; commissioning by a party other than Company; unusual physical, electrical or mechanical stress; lack of proper startup or maintenance as recommended by Company; operation with any accessory, equipment or part not specifically approved by Company; and/or refrigerant not recommended or supplied by Company.

Company shall not be obligated to pay for the cost of lost refrigerant or lost product or any other direct, indirect, or consequential damages. Company's obligations and liabilities under this Warranty are limited to furnishing replacement equipment or parts, at its option, FCA (Incoterms 2000) factory or warehouse

(f.o.b. factory or warehouse for US domestic purposes) at Company-designated shipping point, freight allowed to Company's warranty agent's stock location, for all non-conforming Company manufactured Equipment which have been returned by Customer to Company.

Returns must have prior written approval by Company and are subject to restocking and replacement charges where applicable.

No warranty liability whatsoever shall attach to Company until Customer's complete order has been paid for in full and Company's liability under this Warranty shall be limited to the purchase price of the Equipment shown to be defective.

Additional warranty and service protection is available on an extra-cost basis and must be in writing and agreed to by an authorized signatory of the Company.

The warranty excludes: (a) labor, transportation and related costs incurred by the Dealer or Customer; (b) re-installation costs of repaired equipment; (c) re-installation costs of replacement equipment; (d) removal costs of equipment; (e) consequential damages of any kind; and, (f) reimbursement for loss caused by interruption of service.

EQUIPMENT MANUFACTURED BY COMPANY THAT INCLUDES A REQUIRED START-UP AND SOLD IN NORTH AMERICA WILL NOT BE WARRANTED BY COMPANY UNLESS COMPANY OR ITS AUTHORIZED AGENT PERFORMS THE EQUIPMENT STARTUP. COMPANY MAKES NO REPRESENTATION OR

WARRANTY, EXPRESS OR IMPLIED, REGARDING PREVENTION OF MOLD/MOULD, FUNGUS, BACTERIA, MICROBIAL GROWTH, OR ANY OTHER CONTAMINATES.

EXCEPT FOR COMPANY'S WARRANTY EXPRESSLY SET FORTH HEREIN, COMPANY DOES NOT MAKE, AND HEREBY EXPRESSLY DISCLAIMS, ANY WARRANTIES, EXPRESS OR IMPLIED CONCERNING ITS PRODUCTS, EQUIPMENT OR SERVICES, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF DESIGN, MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR OTHERS THAT ARE ALLEGED TO ARISE FROM COURSE OF DEALING OR TRADE.

REFLECTOR ORDER

Below is a list of all parts provided with each Surna Reflector. The following are included with the order (quantities are dependent on individual order).

All models:

1. Surna Reflector
2. Surna Reflector product manual
3. Accessory kit
 - a. Quartz Tube
 - b. Quartz Tube mounting brackets
 - c. S-hooks
 - d. 1/8 inch Allen key

Vented model:

1. MERV-12 air filter

Liquid-cooled model:

1. Fan power supply
2. Fan patch cord

NECESSARY ACCESSORIES

Below is a list of necessary accessories not included with each Surna Reflector.

All models:

1. Bulb
2. Ballast, rated for 1000W maximum
3. Mounting chain (2)
4. Ball valves (2)
5. Rubber gloves
6. Lens tissue or paper towel

Liquid-cooled model:

1. Fan controller
2. Tubing for liquid cooling and condensate circuit
3. Flowmeter
4. 1/2 inch (1.27 cm) copper-to-PEX SharkBite fittings

INSTALLATION INSTRUCTIONS

MECHANICAL

This reflector unit is designed for installation in a level, horizontal orientation onto either a ceiling or other suitable support member. The weight information for each model can be found in the **specifications** section of this document. Care must be taken to ensure the structural integrity of the supporting members and mounting hardware which should be rated appropriately to support the reflector's weight. When installing, clearances must be provided as a provision to allow servicing of the unit. If installing a liquid-cooled version, ensure that adequate space is available to facilitate servicing of the fan, water connections, and condensate ports. Each unit is provided with mounting hardware that can be connected to a chain or other suitable hanging device. Verify each unit is in a level orientation, centered over the target area. This reflector was designed for optimum photometric performance with the glass surface mounted at a distance of 24 inches (61 cm) above the plant canopy.

ELECTRICAL



All wiring shall comply with local and national codes. Attach the reflector to an appropriate ballast for Double-Ended High-Pressure Sodium bulbs rated for 1000 W (max) using the ballast cord that is attached to the reflector assembly. The ballast in use shall be appropriate for the application and shall be installed according to the manufacturer's instructions.

LIQUID-COOLED MODEL

To make the fan connection, plug the provided patchcord into the reflector assembly 3-pin connector located above the end plate opposite the water connections. Plug the provided AC/DC adapter into the patch-cord and plug the AC/DC adapter into a standard socket outlet and verify that the fan is operating normally.

PLUMBING - LIQUID-COOLED ONLY



Ball valves should be used on the supply and return plumbing connections so that the unit may be isolated at any time for maintenance or service. To complete the plumbing circuit, use ½ inch (1.27 cm) PEX tubing and ½ inch (1.27 cm) Copper-to-½ inch (1.27 cm) PEX Sharkbite fittings to connect to the ball valves installed on the manifold. If the reflector distance to canopy will ever change, lower the reflector to its lowest position before installing plumbing.

Make sure that a loop is in the PEX lines so that there are no complications in the plumbing lines as the reflector is moved up and down.

Using ½ inch (1.27 cm) flexible tubing, attach the condensate drain lines to the provided hose barbs and secure with clamps. Connect the condensate lines to either a water reclamation reservoir, or to the desired waste location.

Apply coolant flow and verify that no leaks are present. This unit was designed for 1 Gallon Per Minute (GPM) of coolant flow.

WARNING: Temperature of the coolant should not be lower than 65°F (18°C), or exceed 90°F (32°C).

WARNING: Water circuit must be leak tested prior to applying power to the bulb or fan.

WARNING: DO NOT attempt to access the reflector interior while power is applied to the unit.

IMPORTANT PUMBING TIPS

Total manifold size and length will vary depending on specific circumstances, number of reflectors, etc. Choose a supply size that is sufficient for the flow rates of all equipment supplied by the manifold.

The return manifold should be sized a minimum of ¼ inch (0.64 cm) larger than the supply manifold.

Install shut off valves at the main supply manifold and a shut off valve at each reflector. This allows individual units to be taken out of the cooling loop should servicing be necessary.

Install a fresh water bypass on the main supply manifold. This allows use of a municipal water supply for cooling should the chiller require servicing.

Only long turn 90's (piping) should be used whenever possible to avoid restriction of the water supply.

Flow rate requirements for these reflectors is 1.0 GPM (Gallons Per Minute).

Chiller temperature should not be lower than 45°F (7°C).

DO NOT use Ethylene Glycol (standard car antifreeze) with this equipment.

When plumbing is complete, start the system with clean water to flush out all residue from the system and to check the water circuit(s) for leaks. Run for approximately 5 minutes and then drain the water from the system, correcting and retesting leaks as necessary, and refill with the prescribed glycol/water mixture. Turn on the system and top off the reservoir as needed.

WIRING DIAGRAM

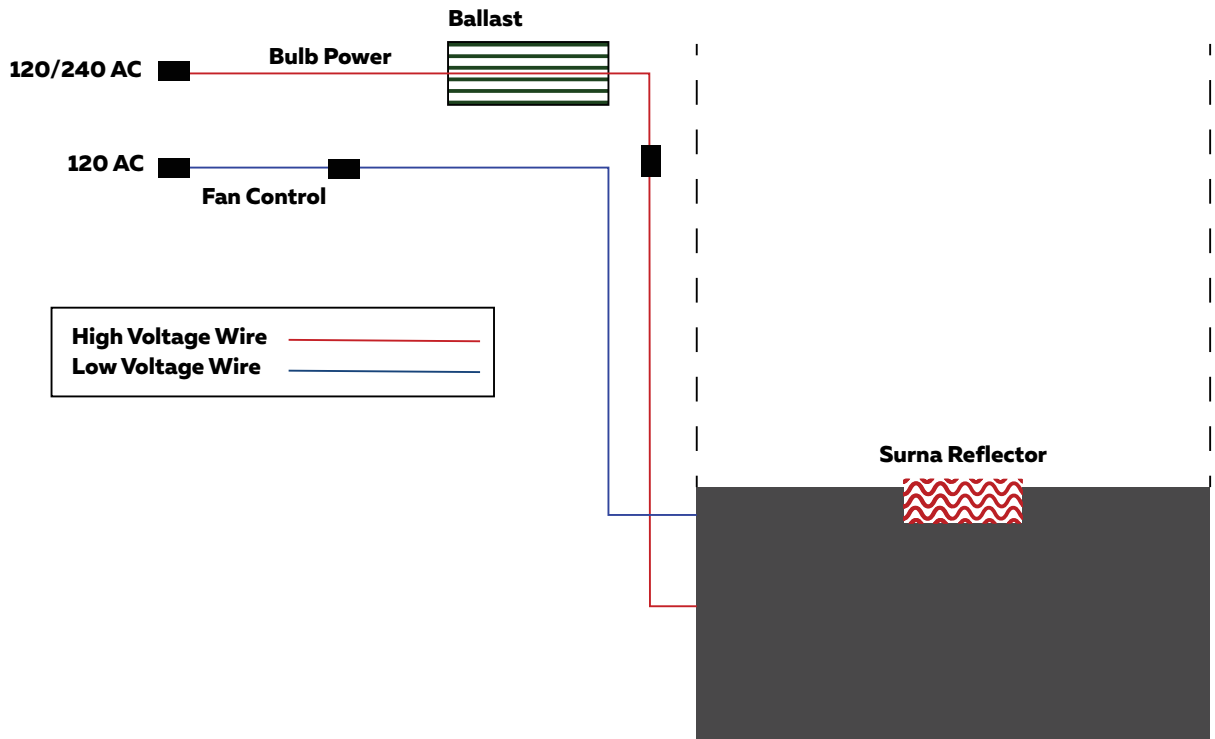


Figure 1- Wiring diagram for the Surna reflector

SET-UP INSTRUCTION

Step 1: Unbox Reflector

- Unbox the Surna Reflector and inspect for damage.
- Thoroughly inspect the glass and wings for any visible damage.
- Open Accessory Box and inspect for damage, ensuring the Quartz Tube is intact.

Step 2: Install bulb

- The Surna reflector has been designed for two types of bulbs – DE HPS or CMH. Please consult the instruction manual as to which model you have purchased.
- Place reflector on hard, steady surface, such as a work bench, with the glass surface facing down.

Step 2a: Remove access panel

- Remove access panel with 1/8 inch Allen key (included in accessory kit). Access panel is located opposite the water connections.

Step 2b: Remove sub-reflector

- Remove the sub-reflector assembly from the reflector by unplugging the subreflector assembly power cord, securing the assembly with two hands and sliding out through the access panel.

Step 2c: Assemble quartz tube

- To protect the bulb and quartz tube from fingerprints and oils, use a lens tissue and rubber gloves.
- Place bulb inside the quartz tube and slide the metal brackets onto either end of the bulb and mate with the inside of the quartz tube.

Step 2d: Mount bulb into sub-reflector

- Slide the lamp holders on either end of the sub-reflector assembly away from one another to create space in which to place the quartz tube assembly.

Step 2e: Assemble sub-reflector & bulb

- Mount the bulb and quartz tube assembly in the sub-reflector assembly by using one hand to hold the bulb in place and the other hand to slide the lamp holders towards the center of the bulb until bulb is secure.
- Verify that both bulb and quartz tube are free from fingerprints and/or contamination.

Step 2f: Place sub-reflector

- Slide sub-reflector assembly into the middle of the fixture and insert power cord into the mating receptacle located on the upper wing surface of the reflector.
- Reattach end plate using 1/8 inch Allen key.

Step 3: Hang reflector

- Use the eye hooks, S-hooks, and mounting chain to hang the unit from the supporting member. The support should be rated for a minimum of 70 lbs.

Step 3a: Measure & level reflector

- Hang, with the bottom of the Reflector (glass surface), 24 inches (61 cm) from the desired canopy height, centered over the 4 foot x 4 foot (1.2 m x 1.2 m) target area.
- Use the bubble levels found on the Reflector to ensure that the Reflector is hanging in a level position. On liquid-cooled models, ensure the reflector is not slanting away from the condensate drain connections.

Step 4: Install flowmeter (recommended) LIQUID-COOLED MODELS ONLY

- Install flow meter (not included) according to manufacturer's instructions. Place the flow meter on the hot water return line.

Step 5: Install plumbing LIQUID-COOLED MODELS ONLY

- Install cooling circuit with the reflector hung at its lowest point. Install PEX plumbing allowing for a "loop" in the tubing - making for smooth raising or lowering of the reflector.
- For ease of service, use ball valves on the supply and return lines. Using 1/2 inch (1.27 cm) PEX tubing, attach Reflector to coolant supply and return manifolds with 1/2 inch (1.27 cm) Copper-to-1/2 inch (1.27 cm)-PEX Shark-Bite type connectors.

Step 5a: Install Condensate Lines LIQUID-COOLED MODELS ONLY

- Using 1/2 inch (1.27 cm) flex tubing, attach condensate drain lines to provided hose barbs and secure with clamps. Connect the opposite end of the condensate drain lines to a water reclamation reservoir or to the desired waste location.
- Before applying power to the equipment, coolant flow should be applied to the unit and a leak check should be performed. The flow rate should be 0.25-1.0 gallon per minute (GPM). This unit was designed for a maximum of 1.0 GPM.

Step 6: Test plumbing LIQUID-COOLED MODELS ONLY

- Verify that coolant source (chiller, cooling tower, etc.) is providing coolant with a temperature range of 45 to

65°F (7 to 18°C). The lowest recommended coolant temperature for best operation is 45°F.

- If leaks are identified, shut off water flow, isolate the unit using the installed ball valves, repair leaks and retest.

If you would like to use a lower coolant temperature with the Surna Reflector, please contact the Customer Support team at support@surna.com or 303-993-5271 for further information and instruction.

Step 7: Install fan power

- Connect the fan patch cord to the fan power port on the reflector (6 pin round connector).

Step 7a: Connect fan power

- Connect the supplied AC/DC power supply adapter unit to the fan patch cord.
- Connect the AC/DC power supply adapter to a standard wall outlet. Fan should turn on once power is applied, verify for correct operation.

ROUTINE MAINTENANCE

This product is designed to provide many years of dependable, trouble free comfort when properly maintained. Proper maintenance will consist of routine filter inspections/changes, water connection inspection (liquid-cooled reflectors), bulb replacement, window cleaning, and reflectance material changing. Failure to provide periodic check-ups and cleaning can result in excessive operating cost and/or equipment failure.

For guidance on routine maintenance activities, contact Surna support.

CONTACT US

Contact Surna via email at support@surna.com or via phone at 303.993.5271.



A 1780 55th Street, Suite A
Boulder, CO 80301

P 303.993.5271

E info@surna.com

SURNA.COM