



Rigging and Assembly Instructions

SUN INDUCED DRAFT COOLING TOWERS

EVAPCO Products are Manufactured Worldwide

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Introduction

Thank you for purchasing your EVAPCO cooling tower. This manual will provide instructions for installation of the cooling tower. If any questions arise during the installation, please contact your local EVAPCO representative or us directly at our world headquarters location.

International Building Code Provisions

The International Building Code (IBC) is a comprehensive set of regulations addressing the structural design and installation requirements for building systems – including HVAC and industrial refrigeration equipment. As of June 2008, all 50 states plus Washington D.C. have adopted the International Building Code. The code provisions require that evaporative cooling equipment and all other components permanently installed on a structure must meet the same seismic design criteria as the building. The SUN Series of Open Cooling Towers are IBC 2009 compliant up to 1g with standard construction.

All items attached to the Evapco SUN cooling tower must be independently reviewed and isolated to meet applicable wind and seismic loads. This includes piping, ductwork, conduit, and electrical connections. These items must be flexibly attached to the Evapco unit so as not to transmit additional loads to the equipment as a result of seismic or wind forces.

Method of Shipment

The SUN product is always shipped in three (3) separate sections; the fan section, casing section and basin section. These sections have mating flanges and will join together in a watertight joint when sealed and bolted together as described in the following instructions. The solar panels are shipped in a separate crate. Miscellaneous items, such as sealer tape, rigging hardware, and smaller accessories are packaged in a rigging box which is placed inside the basin for shipment.

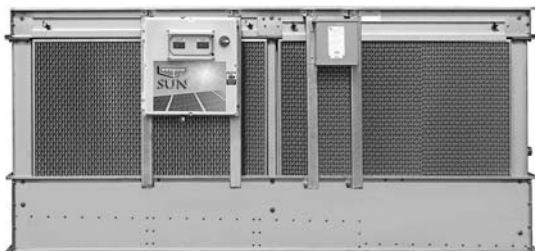


Figure 1 – Basin Section



Figure 2 – Casing Section

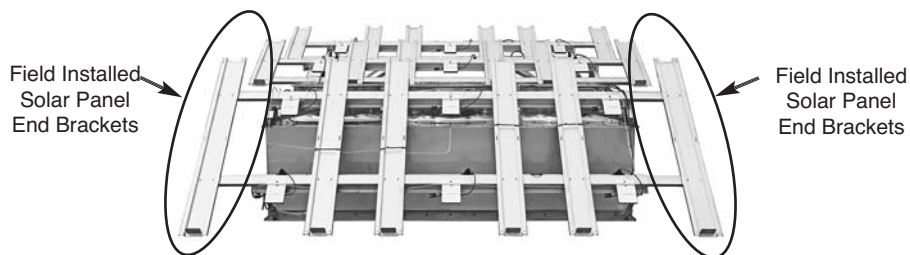


Figure 3 – Fan Section

Storage

Do not place tarps or other coverings over the top of the units if they are to be stored before installation. Excessive heat can build up if the units are covered, causing possible damage to the PVC eliminators, PVC louvers, or PVC fill.

Structural Steel Support

Two structural “I” beams running the length of the unit are all that is required to support the units. These beams should be located underneath the outer flanges of the unit. See Figure 4. Mounting holes, 3/4” in diameter, are located in the bottom flange of the unit to provide for bolting it to the structural steel (see certified print for exact bolt hole location). Bolt the basin section to the steel support before rigging the top section.

Beams should be sized in accordance with accepted structural practices. Maximum deflection of the beam under the unit to be 1/360 of the unit length, not to exceed 1/2”. Deflection may be calculated by using 55% of the operating weight as a uniform load on each beam (see certified print for operating weight).

The supporting “I” beams should be level before setting the unit. Do not level the unit by shimming between the bottom flange and the beams as this will not provide proper longitudinal support.

Support beams and anchor bolts are to be furnished by others. Always refer to certified print for unit weights, dimensions and technical data.

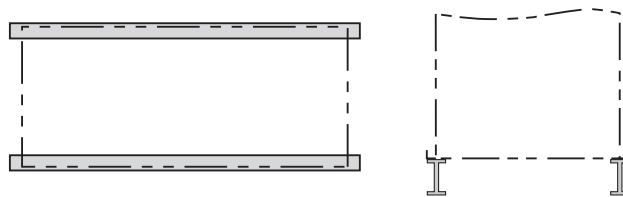


Figure 4 – Structural Steel Support

Assembling Fan Section

NOTE: MOUNT SOLAR PANELS PRIOR TO RIGGING FAN SECTION

The fan section requires a few items to be assembled prior to rigging.

NOTE: The steps below will be performed by EVAPCO Field Service.

1. Install the extension brackets to the factory mounted solar panel brackets as shown in Figure 5.
2. Mount the solar panels to the brackets using the factory supplied aluminum clips.
3. Connect each solar panel to its inverter plug (Figure 6).
4. Attach ground wire to each solar panel.
5. Mount Solar Disconnect (SUN-112-812L only).

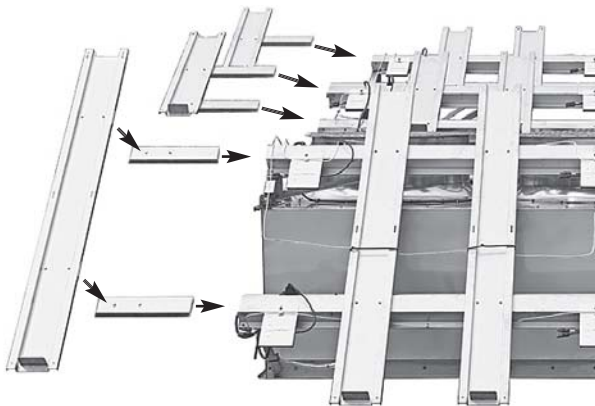


Figure 5 – Assembling Solar Panel Mounting Bracket

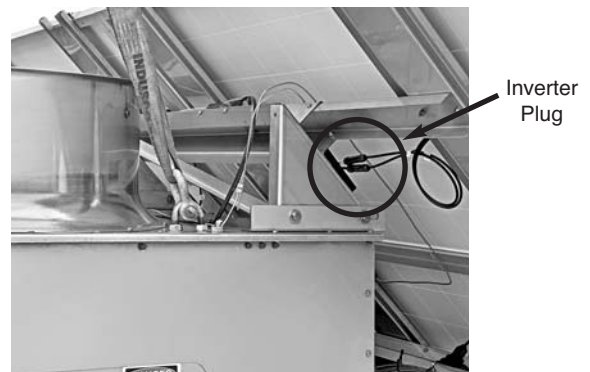


Figure 6 – Electrical Connection for Solar Panels



Rigging Basin Section

Lifting Devices are located in the upper corners of the basin section for lifting and final positioning purposes as shown in Figure 7. The hook of the crane must be a minimum dimension of "H" above the top of the section being lifted to prevent undue strain on the lifting devices. See Table 1 for the minimum "H" dimension. These lifting devices should not be used for extended lifts or where any hazard exists unless safety slings are employed under the section. **(See "Extended Lifts" on page 8 for proper arrangement). Bolt the basin section to the steel support before rigging the top section.**

Model No.	Min. "H" Dimension
SUN-19-611	11 Feet
SUN-112-812L	15 Feet

Table 1 – Minimum "H" Dimension for Basin Section

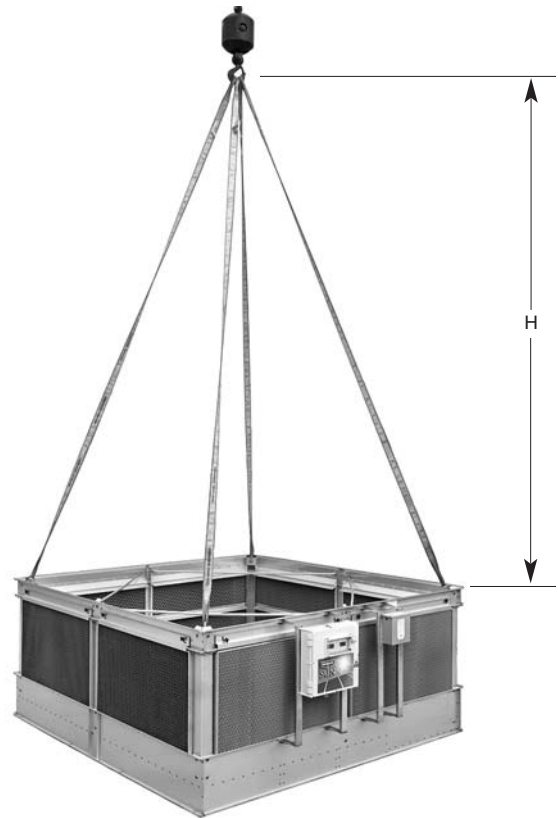


Figure 7 – Basin Section

Application of Sealer Tape to Casing

Once the solar panels are attached to the brackets and connected to the plugs, the top flanges of the casing section should be wiped down to removed any dirt or moisture. Sealer tape should be placed over the mounting hole centerline on the side flanges. **Apply two (2) strips of sealer tape, one partially overlapping the other, on the end flanges (flanges without bolt holes).** The sealer tape should overlap in the corners as shown in figure 8. Do not splice the sealer tape along the end flanges and preferably not on the side flanges if it can be avoided. **Always remove the paper backing from the sealer tape.**

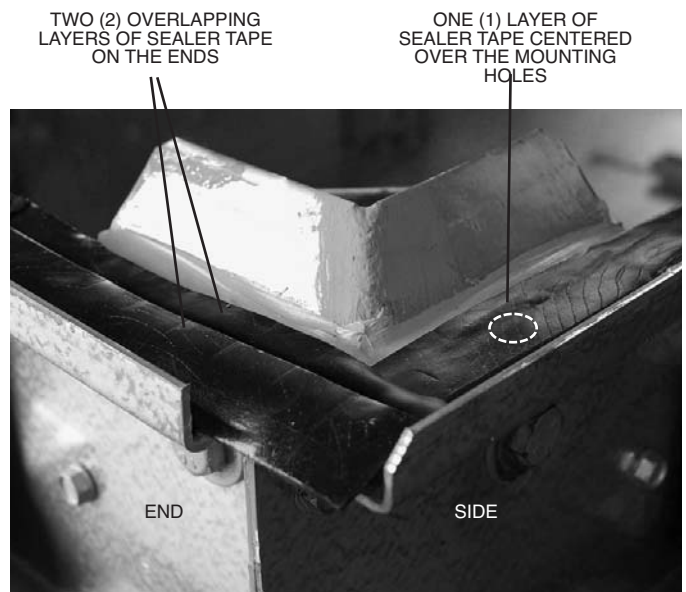


Figure 8 – Sealer Tape on Flange of Casing Section

Rigging Fan Section to Casing Section

“U” bolts are provided in the 4 corners of the fan section for lifting and final positioning. See Figure 9. The hook of the crane must be a minimum dimension “H” above the top of the fan section being lifted to prevent undue strain on the “U” Bolts. Straps should not touch solar panels or mounting brackets. See Table 2 for the minimum “H” dimension.

Check to see that the water distribution connection is in the correct position relative to the fan access doors (see certified print). Units are also provided with match markings on each section.

Wipe down the bottom of fan section to remove any dirt or moisture. **Lower the fan section to within several inches of the casing section making sure the two sections do not touch and the sealer is not disturbed.** Lower carefully and evenly, then fasten all four corners. Install the remaining fasteners, working from the corners toward the center. Fasteners must be installed in every hole on the side flange. None are required on the end flanges.

Galvanized and stainless steel units will use 3/8” nuts and bolts.

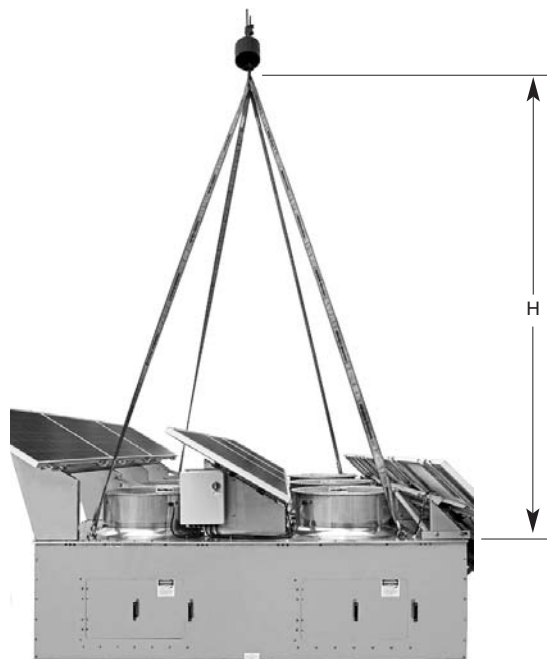


Figure 9 – Fan Section

Model No.	Min. “H” Dimension
SUN-19-611	10 Feet
SUN-112-812L	12 Feet

Table 2 – Minimum “H” Dimension for Fan Section

Note: Use straps only. Do not use chains.

Application of Sealer Tape to Basin

Once the basin section has been set on the supporting steel and bolted in place, the top flanges should be wiped down to remove any dirt or moisture. Sealer tape should be placed over the mounting hole centerline on the side flanges. **Apply two strips of sealer tape, one partially overlapping the other, on the end flanges (flanges without bolt holes).** The sealer tape should overlap on the corners as shown in Figure 10. Do not splice the sealer tape along the end flanges and preferably not on the side flanges if it can be avoided. **Always remove the paper backing from the sealer tape.**

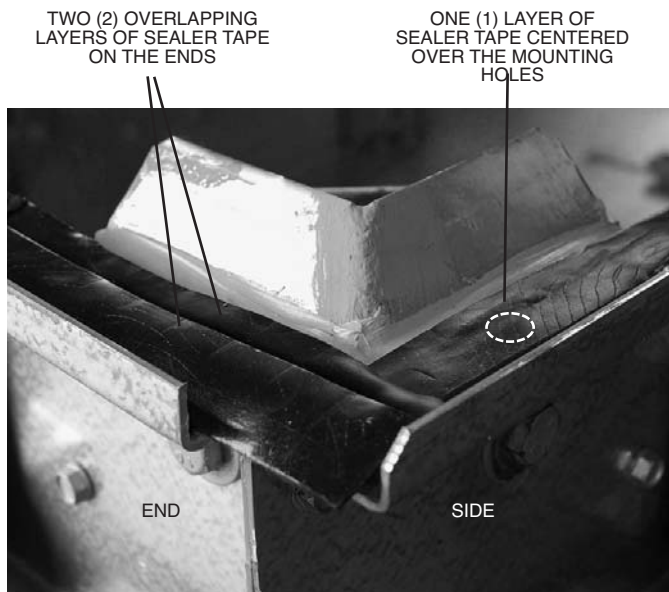


Figure 10 – Sealer Tape on Flange of Basin Section



Rigging Fan/Casing section to Basin Section

The same four (4) “U” bolts that were used to rig the fan section to the casing section are used to rig the fan/casing to the basin section. The hook of the crane must remain a minimum “H” dimension as shown in Table 2, on page 5, in the previous step.

Before assembling the Fan/Casing section to the basin section, remove any loose parts shipped in the pan.

Check to see that the water distribution connection on the top section is in the correct position relative to the basin section (see certified print). Units are also provided with match markings on each section (e.g. A1 of basin section should match up with A1 of top section).

Wipe down the bottom of the casing section to remove any dirt or moisture. **Lower the fan/casing section to within several inches of the basin section making sure the two sections do not touch and the sealer is not disturbed.** Lower carefully and evenly, then fasten all four corners. Install the remaining fasteners, working from the corners toward the center. Fasteners must be installed in every hole on the side flange. None are required on the end flanges.

Galvanized and stainless steel units will use 3/8” nuts and bolts.

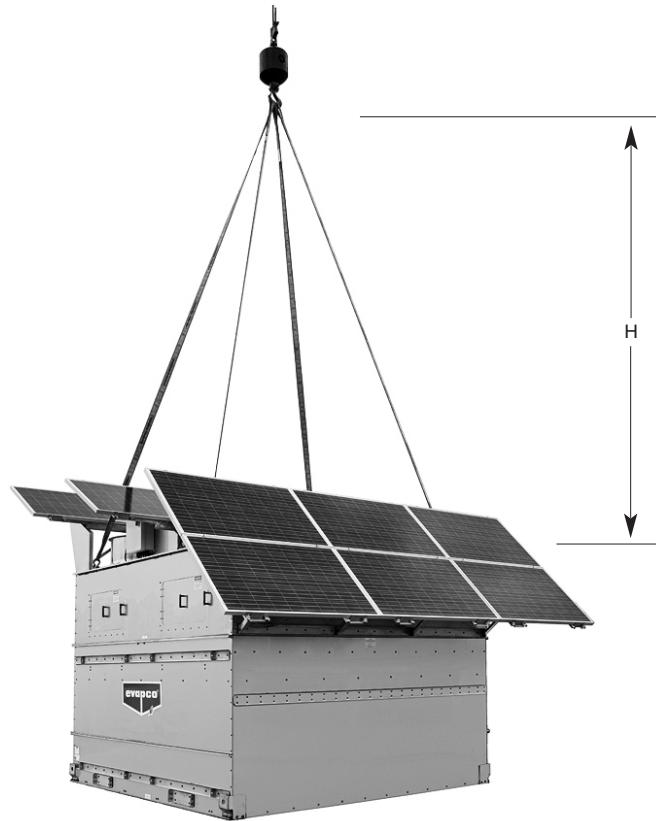


Figure 11 – Fan/Casing Rigging to Basin

Final Assembled Unit

NOTE: THE SUN CANNOT BE RIGGED FULLY ASSEMBLED

Figure 12 shows a fully assembled SUN Tower.



Figure 12 – Fully Assembled Unit

Electrical Component Overview

THE FOLLOWING STEPS MUST BE PERFORMED BY THE INSTALLING CONTRACTORS AFTER THE SUN COOLING TOWER IS FULLY ASSEMBLED.

- Step 1: Wire (according to local codes) the Solar Trunk Cable to the Solar Disconnect (SUN 112-812L only).
- Step 2: Wire (according to local codes) the Solar Disconnect power wire to the Sun Panel.
- Step 3: Wire (according to local codes) the Fan Distribution Panel power and control wires to the SUN Panel.
- Step 4: Connect the bare copper solar ground wire to the SUN panel (or appropriate ground).
- Step 5: Wire (according to local codes) incoming power to the SUN panel.
- Step 6: Control Interface
 - a. For local control through Evapco provided thermocouple, install thermocouple in the cold water basin (see location drawing in submittal) or return piping.
 - b. For interface with Building Automation System, control wires must be run to SUN Panel.
 - 1. Remote control from a 0-10 V signal relating to fan speed (0-100%)
 - 2. Remote control using MODBUS protocol.
- Step 7: Bring an Ethernet line with internet access to the SUN Panel and connect it to the Envoy device.

Refer to wiring diagram in project submittal for additional detail.

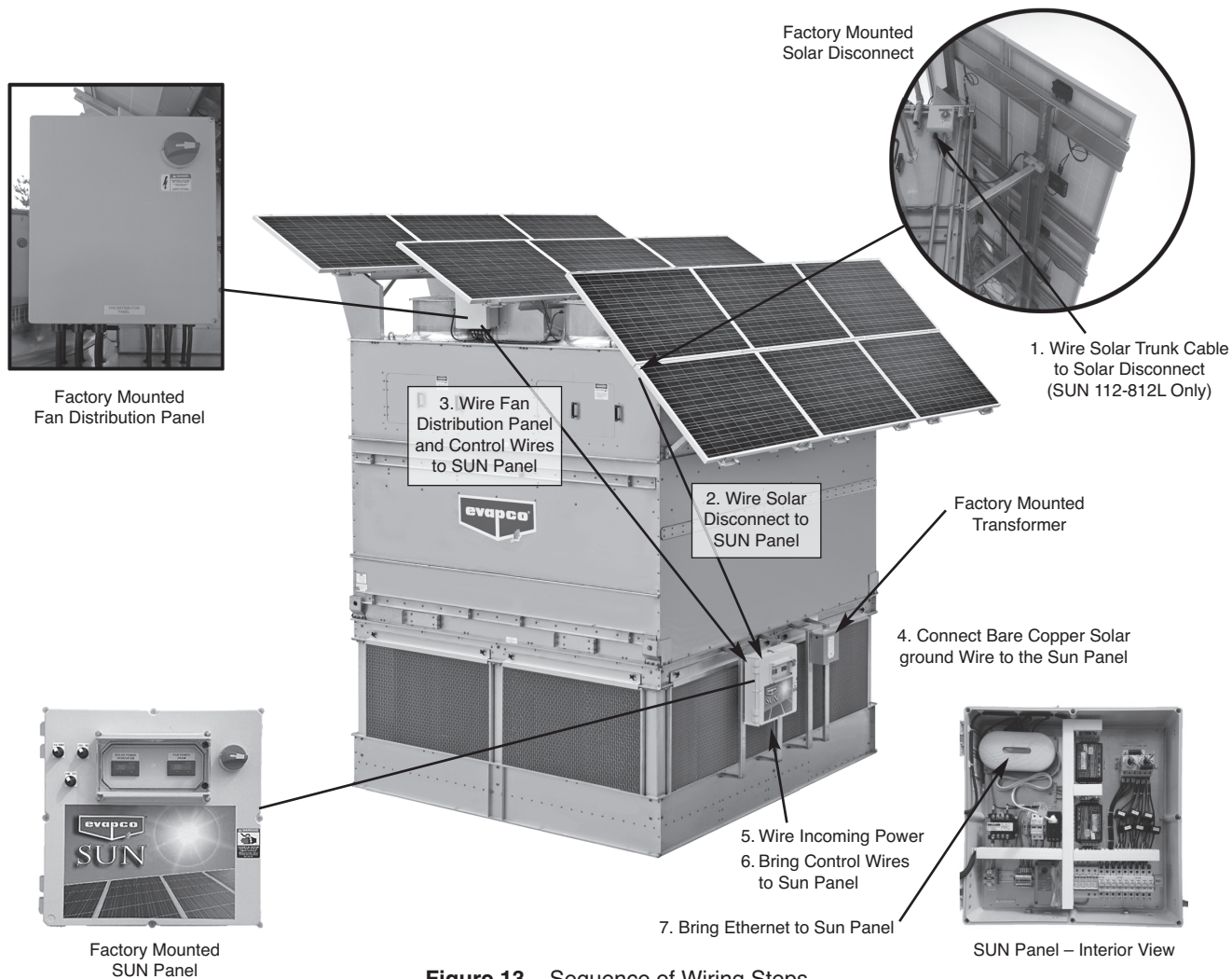


Figure 13 – Sequence of Wiring Steps



Extended Lifts

Important: The lifting devices and “U” bolts should be used for final positioning only and for lifting where no danger exists. If they are used for extended lifts, safety slings should be provided under the sections. Safety slings and skids should be removed before final positioning of the unit.

The preferred method for extended lifts is to use slings under the unit. See Figures 14a & 14b. Spreader should always be used between the cables at the top of the section to prevent damage to the upper flanges or fan cylinders. Be sure to keep slings away from solar panels.

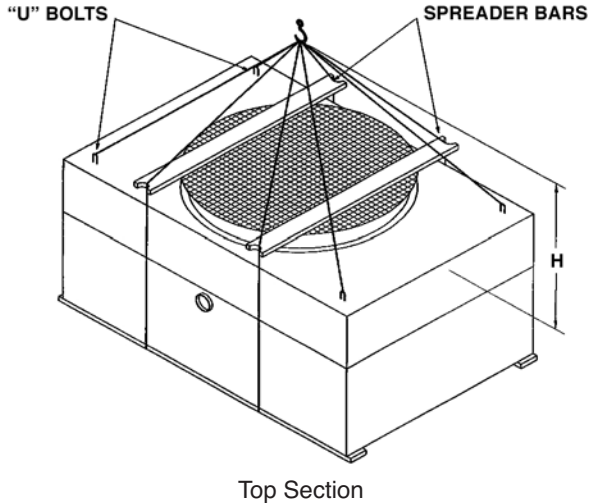


Figure 14a – Proper Rigging Method for Extended Lifts (top section)

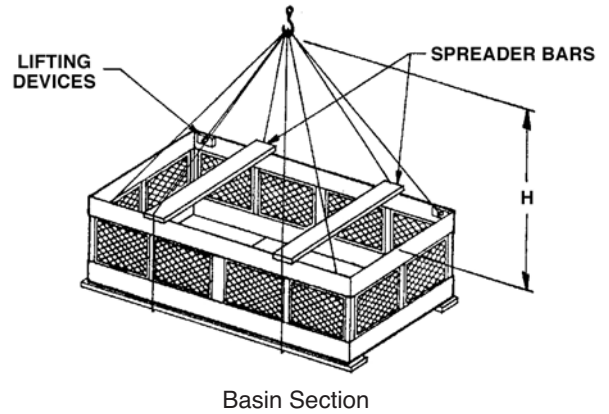


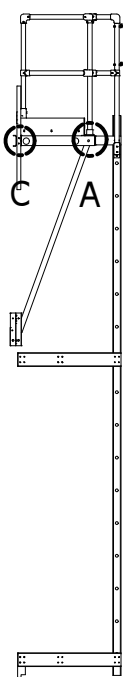
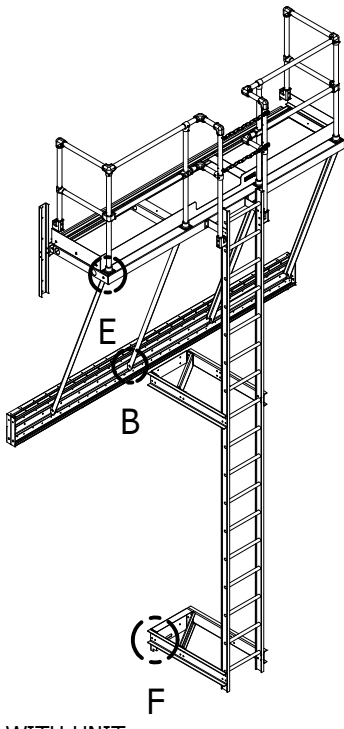
Figure 14b – Proper Rigging Method for Extended Lifts (basin section)



Field Assembly of Working Platform and Ladder

The working platform/ladder assemblies are shipped in the basin of the unit. In some cases they are shipped separately due to basin accessories that interfere with storage. The platform is partially assembled prior to shipment for minimal field assembly.

The platform and ladder assembly should be attached after the unit is fully assembled following the instructions below.

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<p style="text-align: center; margin: 0;">STAINLESS STEEL OPTION</p> <table border="1" style="border-collapse: collapse; width: 100%; font-size: 8px;"> <tr> <td style="padding: 2px;">PART NO.</td> <td style="padding: 2px;">RAW MATL</td> </tr> </table> <p style="margin-top: 5px;">NOTE:</p> <ol style="list-style-type: none"> 1. ALL 1/4Ø HOLES SHOULD BE 11/32Ø 2. USE STAINLESS STEEL N.C. SET-UP SHEET 	PART NO.	RAW MATL	<p style="font-size: 10px; margin: 0;">REVISIONS</p> <p style="font-size: 8px; margin: 0;">△ REMOVED NOTE. MCS 7/16/13</p>	<p style="text-align: center; font-size: 14px; margin: 0;">EVAPCO, INC.</p> <table border="1" style="border-collapse: collapse; width: 100%; font-size: 8px;"> <tr> <td colspan="3" style="padding: 2px;">TITLE</td> </tr> <tr> <td colspan="3" style="text-align: center; padding: 2px;">FIELD ASSY PLATFORM GEN ARR</td> </tr> <tr> <td style="padding: 2px;">GA</td> <td style="padding: 2px;">RAW MATL</td> <td style="padding: 2px;">CUT SIZE</td> </tr> <tr> <td style="padding: 2px;">DATE</td> <td style="padding: 2px;">SCALE</td> <td style="padding: 2px;">N.C. INFO.</td> </tr> <tr> <td style="padding: 2px;">DRAWN BY</td> <td style="padding: 2px;">CHKD BY</td> <td style="padding: 2px;">PART NO.</td> </tr> <tr> <td style="padding: 2px;">NEXT ASSEMBLY:</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">093-29154GA</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">1</td> </tr> </table>	TITLE			FIELD ASSY PLATFORM GEN ARR			GA	RAW MATL	CUT SIZE	DATE	SCALE	N.C. INFO.	DRAWN BY	CHKD BY	PART NO.	NEXT ASSEMBLY:					093-29154GA			1
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Note: SUN-112-812L Platform consists of two ladders.



SUN Induced Draft Cooling Towers

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DETAIL E	DETAIL F		
	12x DW & 14X UNITS ONLY		
SHIP THIS DRAWING WITH UNIT			
STAINLESS STEEL OPTION		EVAPCO, INC.	
PART NO.	RAW MATL	TITLE	
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REVISIONS		DRAWN BY	N.C. INFO.
REMOVED NOTE.		KCW	PART NO.
TLS 4/3/13		NEXT ASSEMBLY:	REV. NO.
			093929152GA
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General Information - Start-up & Maintenance Start-up Details Shipping Chocks and Debris

Remove any chocks that have been placed inside the unit for shipping purposes. Clean all debris from the pan prior to start-up. Close and secure all access doors.

Bleed-off Line

Make sure a bleed line and valve are installed on the pump discharge side of the system piping to a convenient drain. The bleed-off valve should be open.

Strainer

Check the strainer(s) in the pan to make sure they are in the proper location over the pump suction and alongside the anti-cavitation hood. See Figure 15.

Screens

Protective fan screens are provided across the top of the fan cylinders of all models. Check and tighten all bolts.

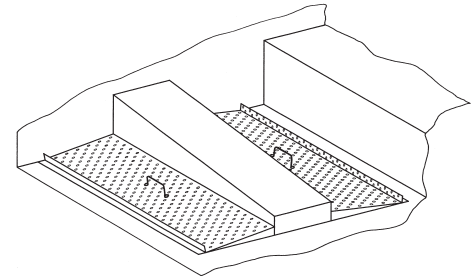


Figure 15 – Strainer Location

Adjustment of Float Valve

The float valve should be adjusted to maintain the proper water level as specified in the maintenance instructions. At start-up, the pan should be filled to the overflow level. During operation, the water level will drop to no more than 5" below the overflow. The water level can be checked during operation by opening the removable louver section near the makeup valve while the pump is running and the fans are off.

Starting Sequence

Refer to Operation and Maintenance Instructions for complete initial start up requirements.

Maintenance

Once the installation is complete and the unit is turned on, it is important that it be properly maintained. Maintenance is not difficult or time-consuming but must be done regularly to assure full performance of the unit. Refer to the maintenance instructions supplied with the unit for proper maintenance procedures.

Freeze Protection

Proper freeze protection must be provided if the unit is located in a cold climate. Refer to maintenance instructions as well as product bulletins for further information.



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