Rigging and Assembly Instructions

evapco

ICT
INDUCED DRAFT COOLING TOWERS

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Factory Assembled Steel Cooling Towers

This section describes the rigging and installation of complete steel cooling towers. For instructions on rigging cooling towers with steel basins and FRP casings please refer to page 5.

Method of Shipment

Models ICT 4-54 is normally shipped fully assembled while all other models are shipped with the top section separate from the bottom section. These sections have mating flanges and will join together in a waterproof joint when sealed and bolted together as described in the following instructions. Miscellaneous items, such as sealer, self-tapping screws and any other required materials, are packaged and placed inside the pan for shipment.

Storage

Do not place tarps or other coverings over the top of the units if the units 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. For extended storage beyond six months rotate the fan motor shaft(s) monthly.

Structural Steel Support

Two structural "**I**" beams running the length of the unit are all that is required for support of the units. These beams should be located underneath the outer flanges of the unit (see Figure 1). Mounting holes, 19 mm 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 bottom 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 13 mm 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.

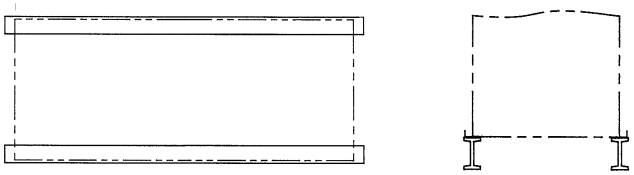

Figure 1 - Structural Steel Support.

Rigging Bottom Section

Lifting Bottom Section

Lifting devices are located in the upper corners of the bottom section for lifting and final positioning purposes as shown in Figure 2. 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 3 for proper arrangement.)** Bolt the bottom section to the steel support before rigging the top section.

UNIT NO.	MIN. H (m)
ICT 4-54 to 94	1,5
ICT 4-66 to 96	1,5
ICT 4-59 to 99	2,7
ICT 4-612 to 912	3,3

Table 1 - Minimum H Dimension for Bottom Sections.

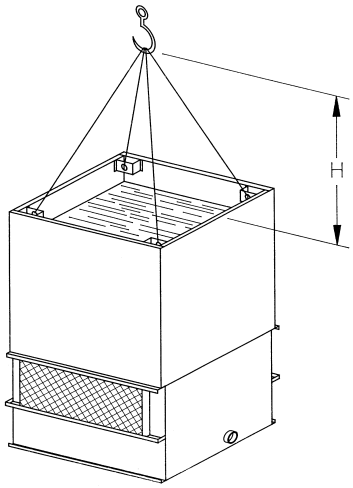

Figure 2 - Bottom Section.

Application of Sealer Tape

Once the bottom 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.

The sealer tape should overlap on the corners as shown in Figure 3. 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.**

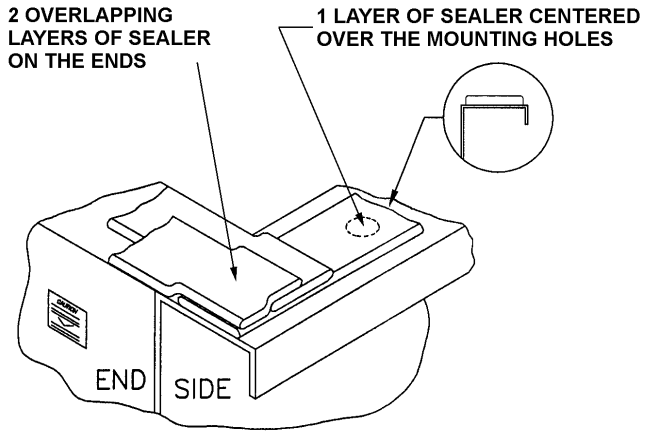

Figure 3 - Sealer on flange of Bottom Section.

Top Section

"U" bolts are provided in the four corners of the top section for lifting and final positioning (See Figure 4). On units with two fans per top section, models ICT 4-59 through 4-912, spreader bars must always be used between the cables at the top of the unit to prevent damage to the fan cylinders. See Figure 5 for proper arrangement of cables on fan sections with dual fans. The hook of the crane must be a minimum dimension "H" above the top section being lifted to prevent undue strain on the "U" bolts. See Table 2 for the minimum "H" dimension.

UNIT NO.	MIN. H (m)
ICT 4-54 to 94	1,5
ICT 4-66 to 96	1,8
ICT 4-59 to 99	2,4
ICT 4-612 to 912	3,3

Table 2 - Minimum H Dimension for Top Sections.

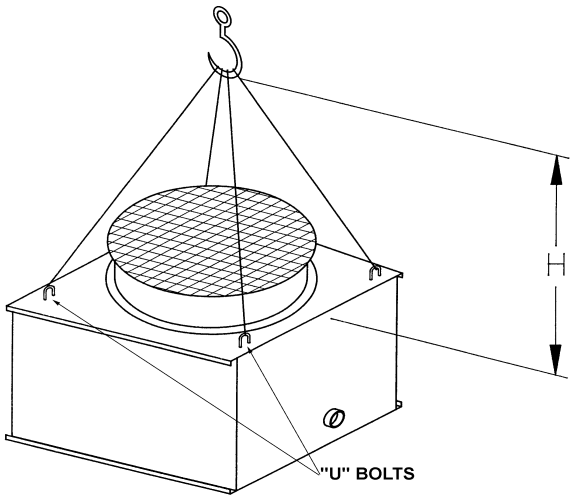

Figure 4 - Top Sections, Models ICT 4-64 through ICT 4-96.

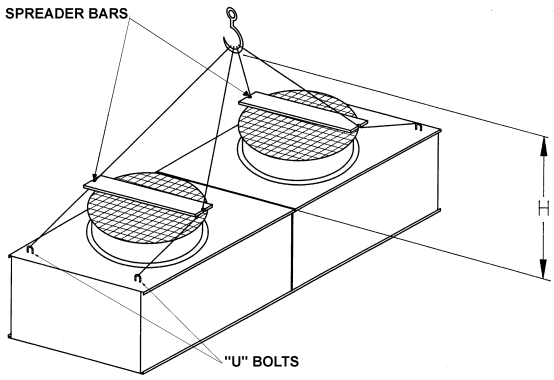

Figure 5 - Top Section, Models ICT 4-59 through ICT 4-912.

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.

The preferred method for extended lifts is to use slings under the unit (see Figure 6). Spreader bars should always be used between the cables at the top of the section to prevent damage to the upper flanges or fan cylinders.

Safety slings and skids should be removed before final positioning of the unit.

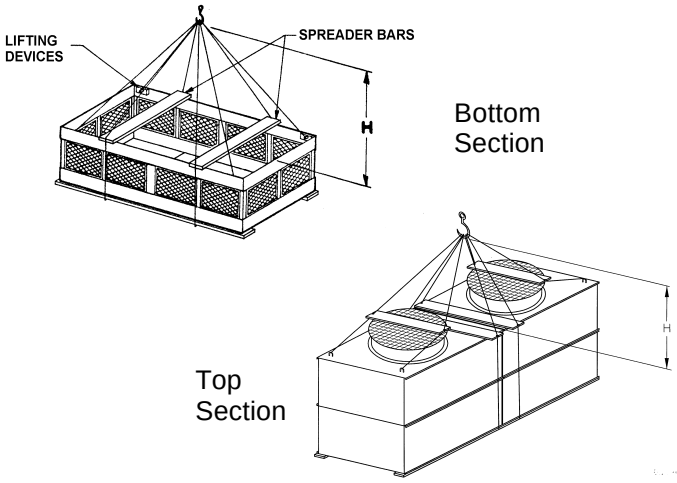

Figure 6 - Proper Rigging Method for Extended Lifts.

Assembly of the Top Section to the Bottom Section

Before assembling the top section to the bottom section, remove any loose parts shipped in the pan.

Wipe the flanges on the bottom of the top section. Check to see that the water distribution connection on the top section is in the correct position relative to the bottom section (see certified print).

Lower the top section to within several centimeters of the bottom section making sure the two sections do not touch and the sealer is not disturbed. Place drift pins (see Figure 7) in at least 3 of the corner mounting holes and gradually lower the top section into place using the drift pins to guide the section down accurately onto the mating flange.

Place self-tapping screws in all four corner bolt holes. Then continue to install the rest of the self-tapping screws working from the corners toward the center, using drift pins to align the holes. A self-tapper must be installed in every hole on the side flanges although none are required on the end flanges.

Note: 8 mm bolts, nuts and washers are used on stainless steel units.

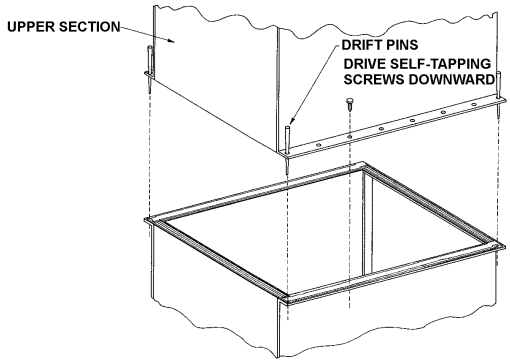

Figure 7 - Mating Upper Section to Bottom Section.

Rigging Fully Assembled Towers

Table 3 lists units which can be assembled prior to final positioning for rigging in one lift. The unit is assembled by the procedures described in the “Assembly of the Top Section to the Bottom Section” starting on Page 3.

All “U” bolts on the top section are to be used for lifting and final positioning of the unit as shown in Figure 8 and 9. The hook of the crane must be a minimum dimension of “H” above the top of the unit being lifted to prevent undue strain on the “U” bolts. See Table 3 for minimum “H” dimension.

The “U” Bolts 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 3 for proper arrangement.)**

UNIT NO.	MIN.H (m)
ICT 4-54 to 94	1,5
ICT 4-66 to 96	1,8
ICT 4-59 to 99	2,7
ICT 4-612 to 912	3,6

Table 3 - Minimum H Dimension for Fully Assembled Units.

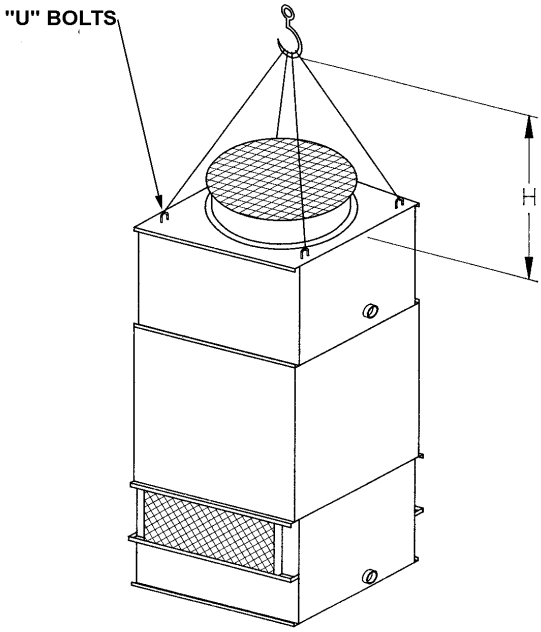

Figure 8 - Fully Assembled Unit, Models ICT 4-54 through 4-96.

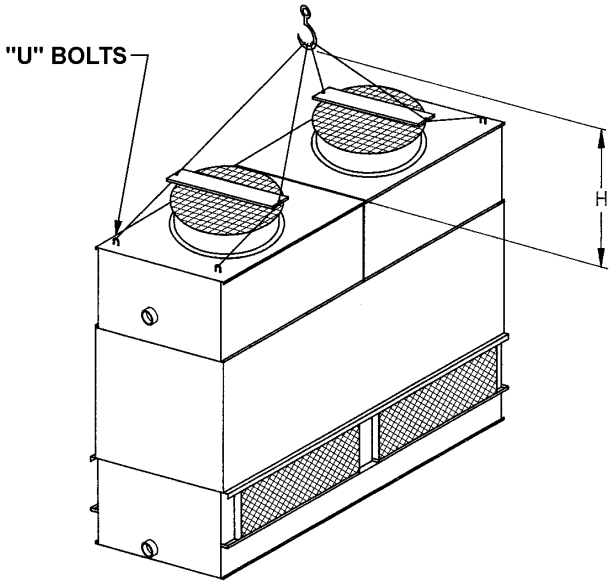

Figure 9 - Fully Assembled Unit, Models ICT 4-59 through 4-912.

Fiberglass Reinforced Polyester (FRP) Cooling Towers

This section describes the rigging and assembly of models ICT 4-54 through ICT 4-912 cooling towers with FRP casings and stainless steel basins. For instructions on rigging complete steel cooling towers please refer to page 2.

Method of Shipment

All models with fiberglass construction ship with the top section separate from the bottom section. These sections have mating flanges and will join together in a waterproof joint when sealed together as described in the following instructions. Miscellaneous items, such as sealer, nuts and bolts, and many other required materials are packaged and placed inside the pan for shipment.

Storage

Please refer to page 2 for instructions on storage requirements.

Structural Steel Support

Please refer to page 2 for details on structural steel support requirements.

Rigging

Bottom Section

Lifting devices are located in the corners of the bottom section for lifting and final positioning purposes as shown in Figure 10. The hook of the crane must be a minimum dimension “H” above the top of the section being lifted to prevent undue strain on the lifting devices. See Table 4 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 **(see “Extended Lifts” on page 3 for proper arrangement).** Bolt the bottom section to the steel support before rigging the top section.

UNIT NO.	MIN. H (m)
ICT 4-54 to 94	1,5
ICT 4-66 to 96	1,8
ICT 4-59 to 99	2,7
ICT 4-612 to 912	3,3

Table 4 - Minimum H Dimension for Bottom Sections.

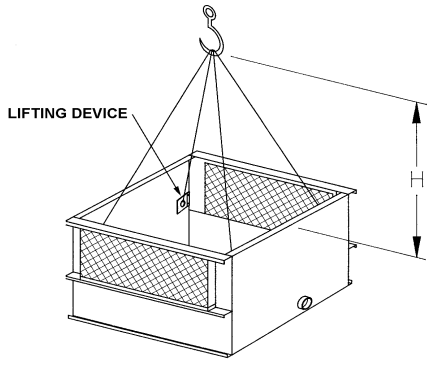

Figure 10 - Bottom Section.

Top Section

Lifting Devices are provided for lifting and final positioning (see Figures 11 & 12). The hook of the crane must be a minimum “H” dimension to prevent undue strain on the lifting devices. See Table 5 for the minimum “H” dimension.

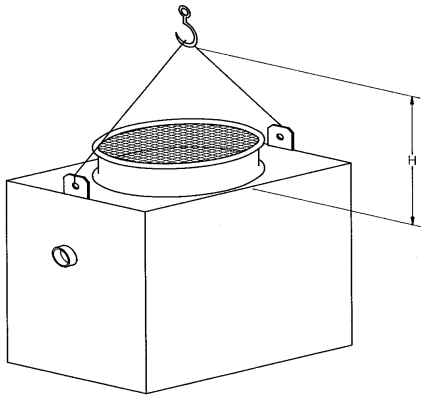

Figure 11 - Top Section, Models ICT 4-54 through 4-96.

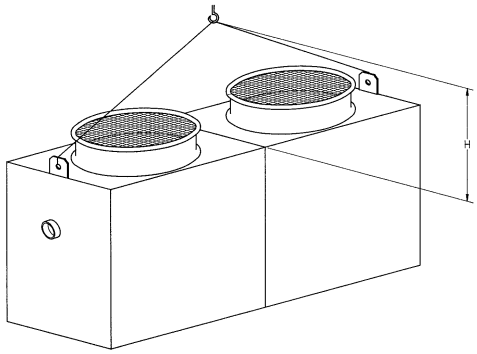

Figure 12 - Top Section, Models ICT 4-59 through 4-912.

UNIT NO.	MIN H. (m)
ICT 4-54 to 94	2,1
ICT 4-66 to 96	2,1
ICT 4-59 to 99	2,7
ICT 4-612 to 912	3,3

Table 5 - Minimum H Dimension for Top Sections.

Extended Lifts

Please refer to page 3 for details on extended lifts.

Assembly of Top Section to Bottom Section

Please refer to instructions on page 3 for details on mating top to bottom sections. Stainless steel nuts and bolts will be used in lieu of self-tapping screws.

CAUTION: Models provided with FRP construction cannot be rigged fully assembled.

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. For installation details, see the "Maintenance Instructions Bulletin."

Strainer

Check the strainer(s) in the pan to make sure they are in the proper location over the pump suction, alongside of the anticavitation hood. (See Figure 13)

Screens

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

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.

The water level can be checked during operation by opening the removable louver section at the valve while the pump is running and the fans are off.

Starting Sequence

Before starting the unit, check that all access openings, safety screens and covers are in place. Then start the unit as outlined below:

1. Fill the pan to the overflow level.

2. Start the water pumps. Check the water flow to the unit by checking the spray water pressure at the water inlet. It should be the same as the pressure indicated on the certified drawing.

3. Start the fans. Check the fans for proper rotation. Directional arrows are placed on the side of the fan cylinder.

NOTE: Do not operate the fans while the pump is off. Damage to the PVC fill can result during dry operation. Always start the water pumps first, with the fan motors following.

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 enclosed 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.

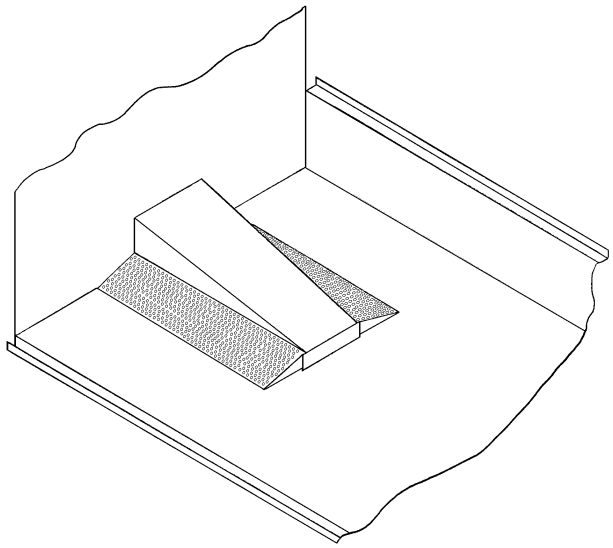

Figure 13 - Strainer Location.

Rigging Harware Parts are shipped together the unit(s) for field assembly