



Rigging and Installation Manual

LPT SERIES FORCED DRAFT COOLING TOWERS
LRW SERIES FORCED DRAFT CLOSED CIRCUIT COOLERS
LRC SERIES FORCED DRAFT EVAPORATIVE CONDENSERS

EVAPCO Products are Manufactured Worldwide

EVAPCO, Inc. — World Headquarters & Research/Development Center

EVAPCO, Inc. • P.O. Box 1300 • Westminster, MD 21158 USA
Phone: +1 410-756-2600 • Fax: +1 410-756-6450 • E-mail: marketing@evapco.com

EVAPCO North America

EVAPCO, Inc.

World Headquarters
P.O. Box 1300
Westminster, MD 21158 USA
Phone: 410-756-2600
Fax: 410-756-6450
E-mail: marketing@evapco.com

EVAPCO East

5151 Allendale Lane
Taneytown, MD 21787 USA
Phone: 410-756-2600
Fax: 410-756-6450
E-mail: marketing@evapco.com

EVAPCO Midwest

1723 York Road
Greenup, IL 62428 USA
Phone: 217-923-3431
Fax: 217-923-3300
E-mail: evapcomw@evapcomw.com

EVAPCO West

1900 West Almond Avenue
Madera, CA 93637 USA
Phone: 559-673-2207
Fax: 559-673-2378
E-mail: contact@evapcowest.com

EVAPCO Iowa

925 Quality Drive
Lake View, IA 51450 USA
Phone: 712-657-3223
Fax: 712-657-3226

EVAPCO Iowa

Sales & Engineering
215 1st Street, NE
P.O. Box 88
Medford, MN 55049 USA
Phone: 507-446-8005
Fax: 507-446-8239
E-mail: evapcomn@evapcomn.com

EVAPCO Northwest

P.O. Box 1727
Lake Oswego, OR 97035 USA
Phone: 503-639-2137
Fax: 503-639-1800

EVAPCO Newton

701 East Jourdan Street
Newton, IL 62448 USA
Phone: 618-783-3433
Fax: 618-783-3499
E-mail: evapcomw@evapcomw.com

EVAPCO-BLCT Dry Cooling, Inc.

981 US Highway 22 West
Bridgewater, NJ 08807 USA
Phone: 1-908-379-2665
E-mail: info@evapco-blct.com

Refrigeration Valves & Systems Corporation

A wholly owned subsidiary of EVAPCO, Inc.
1520 Crosswind Dr.
Bryan, TX 77808 USA
Phone: 979-778-0095
Fax: 979-778-0030
E-mail: rvs@rvscorp.com

EvapTech, Inc.

A wholly owned subsidiary of EVAPCO, Inc.
8331 Nieman Road
Lenexa, KS 66214 USA
Phone: 913-322-5165
Fax: 913-322-5166
E-mail: marketing@evaptechinc.com

Tower Components, Inc.

A wholly owned subsidiary of EVAPCO, Inc.
5960 US HWY 64E
Ramseur, NC 27316
Phone: 336-824-2102
Fax: 336-824-2190
E-mail: mail@towercomponentsinc.com

EVAPCO Europe

EVAPCO Europe BVBA

European Headquarters
Industrieterrein Oost 4010
3700 Tongeren, Belgium
Phone: (32) 12-395029
Fax: (32) 12-238527
E-mail: evapco.europe@evapco.be

EVAPCO Europe S.r.l.

Via Ciro Menotti 10
I-20017 Passirana di Rho, Milan, Italy
Phone: (39) 02-939-9041
Fax: (39) 02-935-00840
E-mail: evapcoeuropa@evapco.it

EVAPCO Europe S.r.l.

Via Dosso 2
23020 Piateda Sondrio, Italy

EVAPCO Europe GmbH

Meerbuscher Str. 64-78, Haus 5
D-40670 Meerbusch, Germany
Phone: (49) 2159-69560
Fax: (49) 2159-695611
E-mail: info@evapco.de

Flex Coil a/s

A wholly owned subsidiary of EVAPCO, Inc.
Knøsgårdvej 115
9440 Aabybro, Denmark
Phone: (45) 9824-4999
Fax: (45) 9824-4990
E-mail: info@flexcoil.dk

EVAPCO S.A. (Pty.) Ltd.

A licensed manufacturer of Evapco, Inc.
18 Quality Road
Isando 1600, Republic of South Africa
Phone: (27) 11 392-6630
Fax: (27) 11-392-6615
E-mail: evapco@evapco.co.za

Evap Egypt Engineering Industries Co.

A licensed manufacturer of Evapco, Inc.
5 Al Nasr Road St.
Nasr City, Cairo, Egypt
Phone: (20) 2-24022866 / (20) 2-24044997/8
Fax: (20) 2-404-4667/ Mob: (20) 12-3917979
E-mail: primacool@link.net / shady@primacool.net

EVAPCO Asia/Pacific

EVAPCO China

Asia/Pacific Headquarters
1159 Luoning Rd. Baoshan Industrial Zone
Shanghai, P. R. China, Postal Code: 200949
Phone: (86) 21-6687-7786
Fax: (86) 21-6687-7008
E-mail: marketing@evapcochina.com

Evapco (Shanghai) Refrigeration Equipment Co., Ltd.

1159 Louning Rd., Baoshan Industrial Zone
Shanghai, P.R. China, Postal Code: 200949
Phone: (86) 21-6687-7786
Fax: (86) 21-6687-7008
E-mail: marketing@evapcochina.com

Beijing EVAPCO Refrigeration Equipment Co., Ltd.

Yan Qi Industrial Development District
Huai Rou County
Beijing, P.R. China, Postal Code: 101407
Phone: (86) 10 6166-7238
Fax: (86) 10 6166-7395
E-mail: evapcobj@evapcochina.com

EVAPCO Australia Pty Ltd.

34-42 Melbourne Road - P.O. Box 436
Riverstone, N.S.W. Australia 2765
Phone: (61) 29 627-3322
Fax: (61) 29 627-1715
E-mail: sales@evapco.com.au

EvapTech Composites Sdn. Bhd

No. 70 (Lot 1289) Jalan Industri 2/3
Rawang Integrated Industrial Park
Rawang, Selangor, 48000 Malaysia
Phone: 60 3 6092-2209
Fax: 60 3 6092-2210

EvapTech Asia Pacific Sdn. Bhd

A wholly owned subsidiary of EapTech, Inc.
IOI Business Park, 2/F Unit 20
Persiaran Puchong Jaya Selatan
Bandar Puchong Jaya,
47170 Puchong, Selangor, Malaysia
Phone: +(60-3) 8070 7255
Fax: +(60-3) 8070 5731
E-mail: marketing-ap@evaptech.com

Visit EVAPCO's Websites at: www.evapco.eu / www.mrgoodtower.eu

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Method of Shipment

LP/LR forced draft units are shipped fully assembled. Miscellaneous items, such as sealer, self-tapping screws and any other required materials, are packaged and placed inside the pan for shipment.

NOTE: All hoods and attenuation packages are factory inspected prior to shipment to verify proper fit for rigging. Please take extra care to handle and rig unit section per the instructions of this manual to avoid possible distortion and poor casing alignment. It is advisable to check each section upon receipt and during each lift to ensure that the factory alignment has not been altered. Should the field inspection indicate the section alignment ("square") has been altered, please contact the factory or your local EVAPCO representative for additional instructions to obtain proper section fit.

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. For extended storage beyond six months rotate the fans and fan motor shaft(s) monthly. Also, the fan shaft bearings should be purged and regreased prior to start-up.

General

For extended lifts, or where hazards may exist, it is recommended that safety slings and spreaders be employed for safety. Refer to the extended lift information in this bulletin.

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 LPT Series Cooling Towers, LR Series Coolers and Condensers are IBC 2012 compliant up to 1g with standard construction and up to 5.12g with additional structural modifications.

All items attached to the EVAPCO LPT Cooling Tower, Evapco LR Closed Circuit Cooler or LR Evaporative Condenser 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.

Structural Steel Support

Two structural "I" beams running the length of the unit are required for supporting the unit. These beams should be located underneath the outer flanges of the unit as shown in Figure 1. See Table 1 for Steel Support Dimensions. Table 1 lists units according to the nominal plan area of their heat transfer section. Overall dimensions will be different.

Mounting holes, 19 mm in diameter, are located in the bottom flange for bolting to the structural steel. Refer to the recommended structural steel support drawing and certified print for exact bolt hole location. Bolt the bottom section to the steel support before rigging any hoods or attenuation.

Beams should be sized in accordance with accepted structural practices. Maximum deflection of the beam under the unit should 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 to within 3 mm in 2 m 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.

NOTE: Consult IBC 2012 for required steel support layout and structural design.

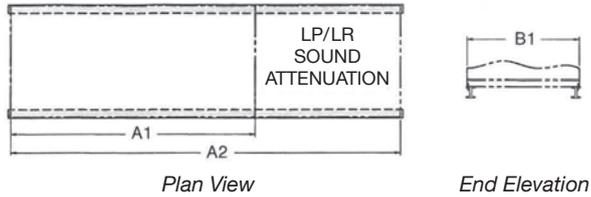


Figure 1 – Structural Steel Support

Table 1 – Steel Support Dimensions

Coil/Casing Footprint	A1 (mm)	A2 (mm)	B1 (mm)
3' x 6'	3099	4207	1029
5' x 6'	3734	4839	1540
5' x 9'	4632	5737	1540
5' x 12'	5556	6661	1540
8' x 9'	4632	5740	2388
8' x 12'	5556	6664	2388

Rigging the Main Unit

Lifting devices are located on the sides of the unit near the bottom as shown in Figure 2a. It is recommended that units be lifted using a boom oriented along the length of the unit with the cables straddling the unit at the lift points (Figure 2a). An alternative method is to lift the unit with a single hook, lashing the cables to the lift points on the unit directly (Figure 2b). Spreader bars are necessary in both cases to prevent damage to the sides of the unit.

When a boom is used, the distance “A” between the lift points on the boom should be set equal to the distance between the lift points on the unit and the crane hook must be located a minimum distance “H1” above the top of the unit as shown in Figure 2a. When no boom is used, the crane hook must be a minimum distance “H2” above the lifting points on the unit as shown in Figure 2b.

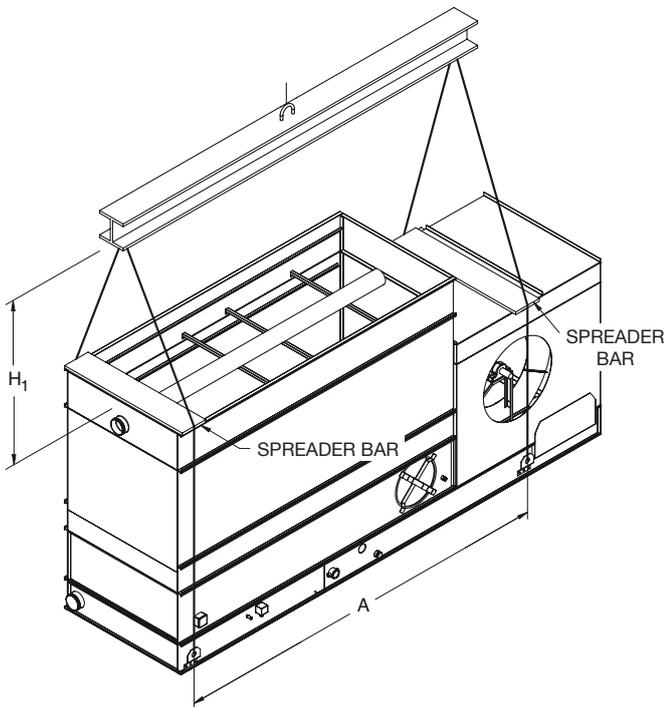


Figure 2a – Recommended Rigging - LP/LR Main Unit

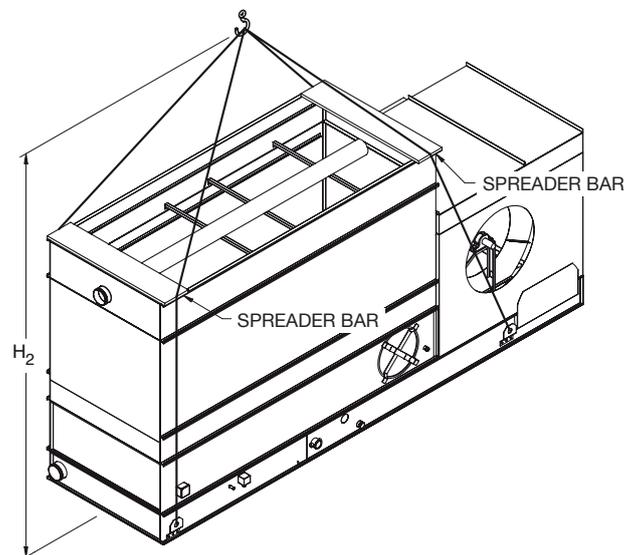


Figure 2b – Alternate Rigging - LP/LR Main Unit

Table 2 shows minimum “H” dimensions and gives “A” dimensions for the different unit sizes.

Table 2 – Dimensional Guidelines for Lift Cables.
Dimensions Refer to Drawings in Figure 2a and 2b.

Coil/Casing Footprint	A Towers (mm)	A Coolers Condensers (mm)	H1 (mm)	H2 (mm)
3' x 6'	2185	2185	915	3050
5' x 6'	2590	2590	1525	3660
5' x 9'	3480	3480	1525	3960
5' x 12'	4420	4420	1525	4270
8' x 9'	3505	3380	2135	5180
8' x 12'	4420	4290	2135	6100

Extended Lifts

The recommended method for extended lifts is to use slings under the unit (Figures 3a and 3b). Safety slings, spreaders and skids should be removed before final positioning of the unit.

NOTE: Always use safety slings for extended lifts or where any safety hazard exists.

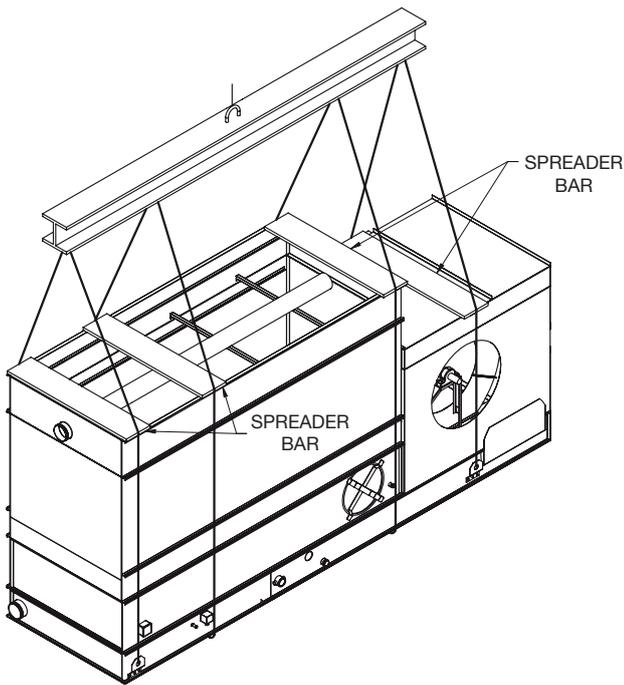


Figure 3a – Recommended Safety Sling Rigging

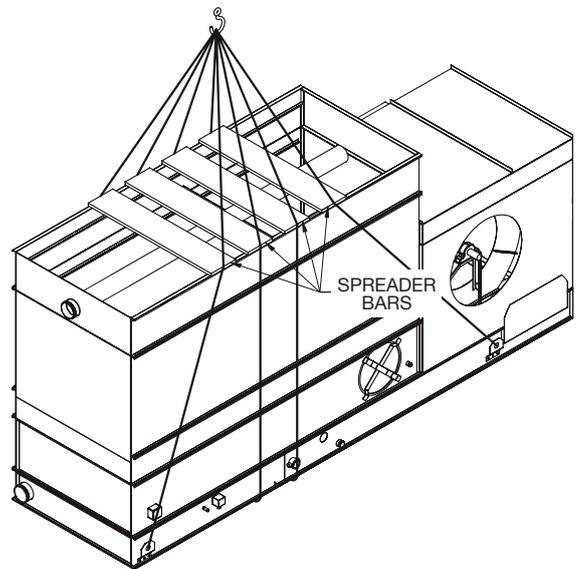


Figure 3b – Alternative Safety Sling Rigging

Applying Sealer Tape

If the unit was shipped with optional discharge attenuation or discharge hoods sealer tape must be applied prior installation of the section. Once the unit has been set on the supporting steel and bolted in place, wipe the top flanges to remove any dirt or moisture. Place sealer tape 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 4. 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.

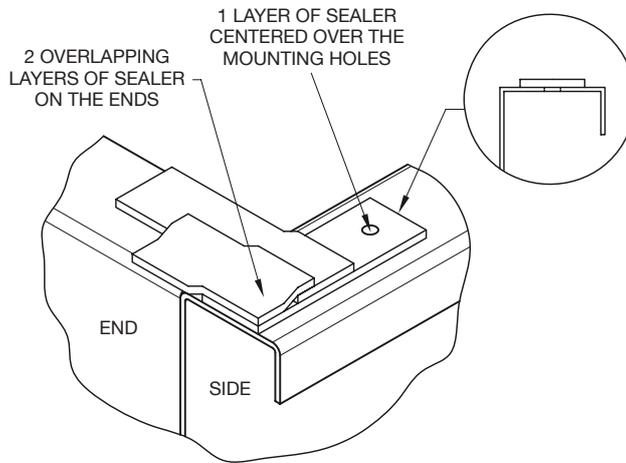


Figure 4 – Proper Sealer Tape Application
Hood or attenuation only

Rigging and Assembling Discharge and Intake Accessories

Intake sound attenuators and discharge hoods/discharge attenuators are not assembled to the main unit when shipped and must be separately rigged and assembled in the field. Four accessories fall into this group - discharge hood (may be straight or tapered), discharge attenuation, fan-end sound attenuator and fan side attenuators. These are shown mounted in Figure 5 and construction details are referenced to Figures 7, 9 and 11 respectively.

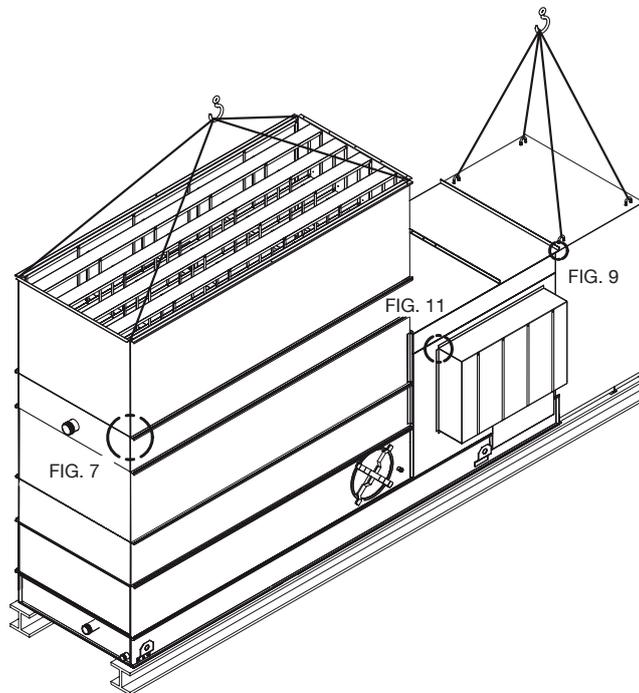


Figure 5 – Discharge and Intake Accessory Rigging

Rigging Discharge Hoods and Discharge Attenuators

Discharge Hoods may be either straight or tapered. Discharge Attenuators will be straight-sided. Both must be rigged with a separate lift after the main unit has been secured to the structural supports. The rigging for both types of accessories is shown in Figures 6a and 6b. The lifting cables must be long enough to allow the crane hook to be a minimum dimension “H” above the top of the assembly. These “H” values are given in Table 3.

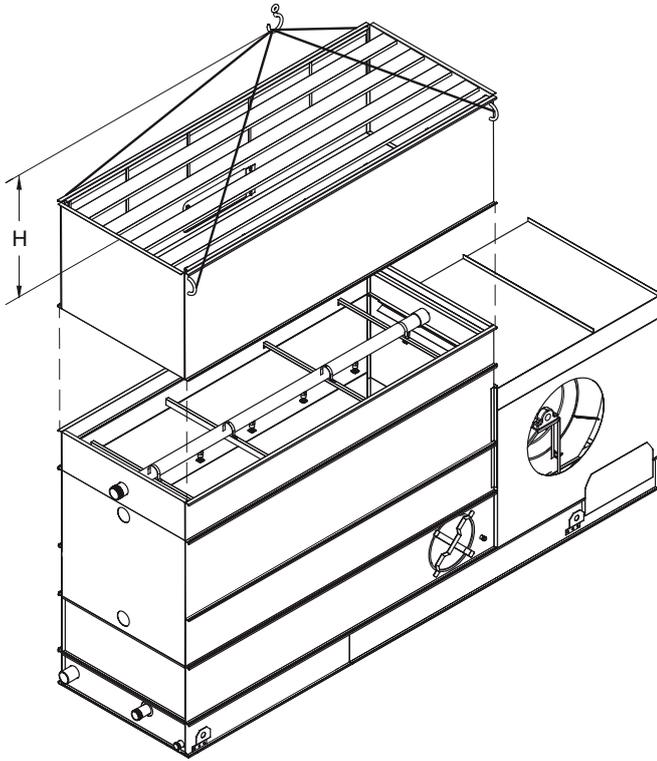


Figure 6a – Rigging Straight Discharge Hood or Discharge Attenuation

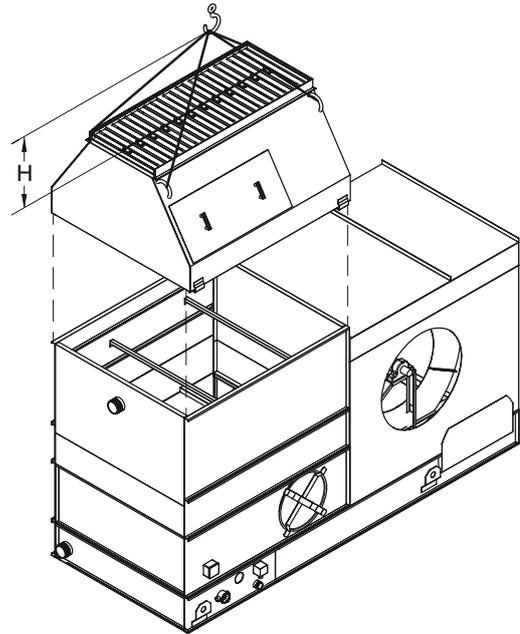


Figure 6b – Rigging Tapered Discharge Hood

Table 3 – “H” Dimensions for Discharge Hoods

Coil/Casing Footprint	H (mm)
3' x 6'	2440
5' x 6'	2440
5' x 9'	3050
5' x 12'	4570
8' x 9'	3050
8' x 12'	4570

On galvanized and stainless steel units use M8 nuts and bolts to secure the hood or attenuation to the casing. Construction details referenced in Figure 5 are shown in Figure 7 below.

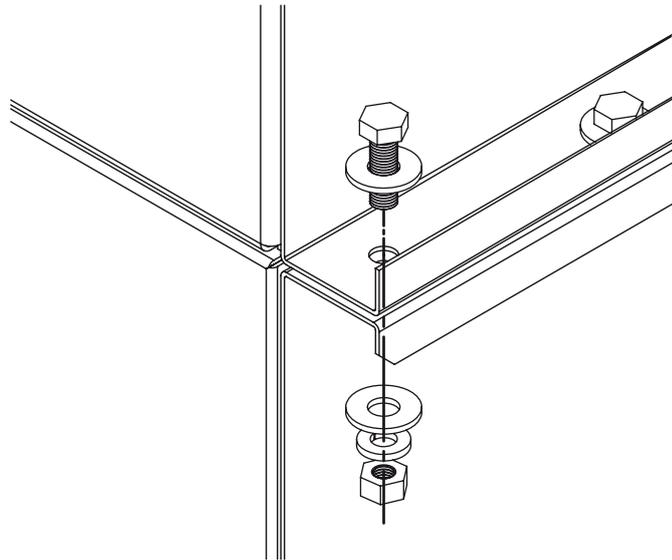


Figure 7 – Discharge Hood or Attenuation Assembly Details

Rigging Fan End Sound Attenuation

Fan end sound attenuators must be rigged with a separate lift after the main unit has been secured to the structural supports. The rigging for the fan-end sound attenuator assembly is shown in Figure 8. The lifting cables must be long enough to allow the crane hook to be a minimum dimension “H” above the top of the assembly. These “H” values are given in Table 4.

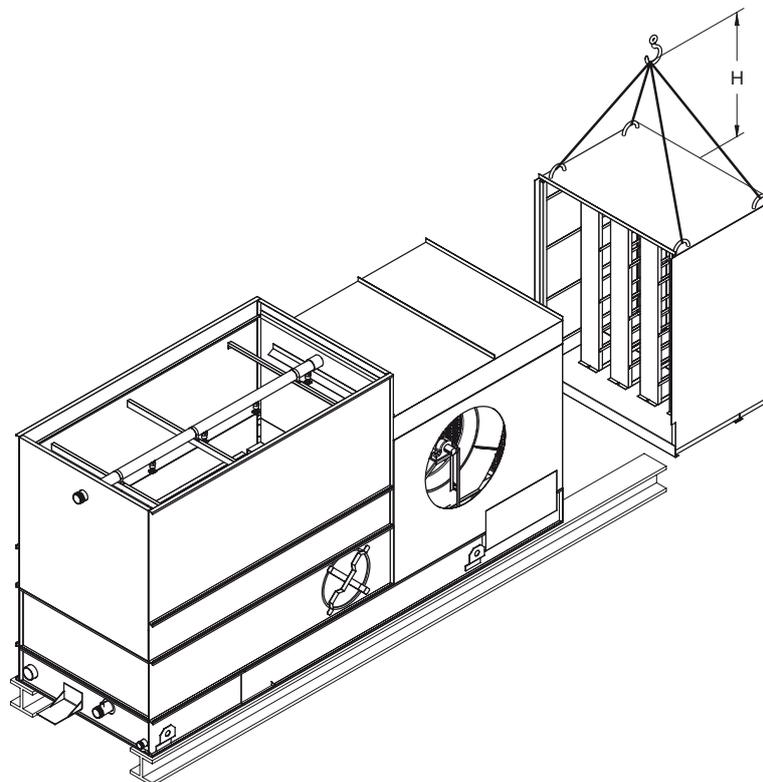


Figure 8 – Rigging Fan-End Sound Attenuator Assembly

Table 4 – “H” Dimensions for Fan-End Sound Attenuator Assembly

Coil/Casing Footprint	H (mm)
3' x 6'	1220
5' x 6'	1525
5' x 9'	1525
5' x 12'	1525
8' x 9'	2440
8' x 12'	2440

On galvanized units, the fan-end sound attenuator housing is secured on the sides and top with M8 self-tapping bolts. On stainless steel units, the fan-end sound attenuator housing is secured on the sides using M6 threaded machine bolts that are set into rivnuts located in the side panel of the main unit and on the top using M8 stainless steel nuts and bolts. Construction details referenced in Figure 5 are shown in Figure 9. At the time the fan-side attenuator is fitted to the main unit, be sure that the fan belt adjustment extension tube at the base of the fan-end sound attenuator assembly is properly mated with the hex head fitting at the main unit.

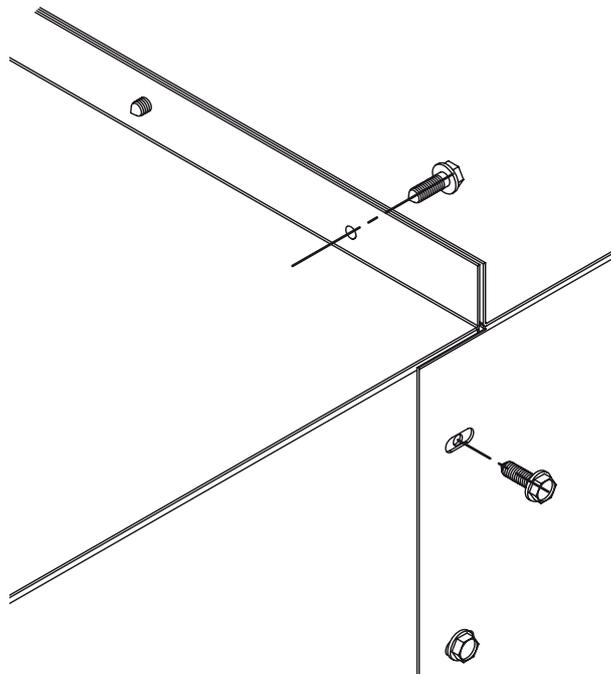


Figure 9 – Fan-End Sound Attenuator Assembly Details

Rigging Fan-Side Attenuators

On galvanized units, the fan-side sound attenuators are secured to the main unit using M8 self-tapping bolts. On stainless steel units, it is secured using M6 threaded machine bolts which are set into rivnuts located in the side panel of the unit. Assembly is shown in Figure 10 and construction details referenced in Figure 5 are shown in Figure 11 below.

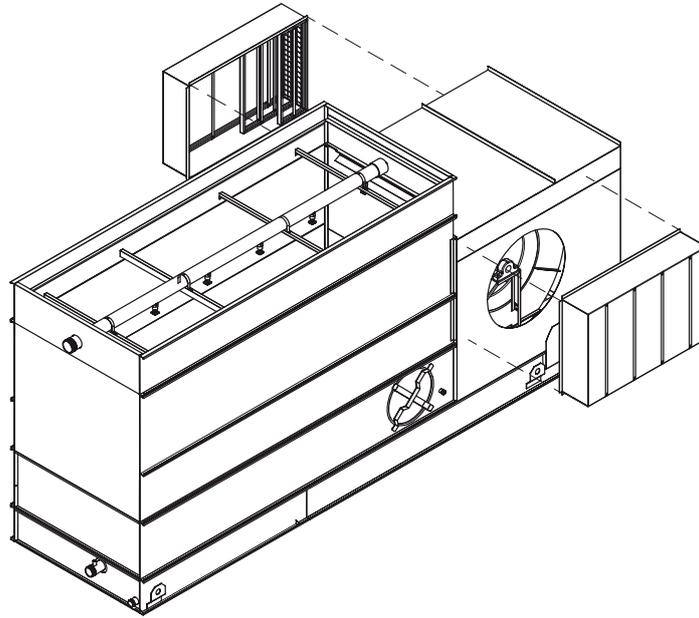


Figure 10 – Rigging Fan-Side Sound Attenuator Assembly

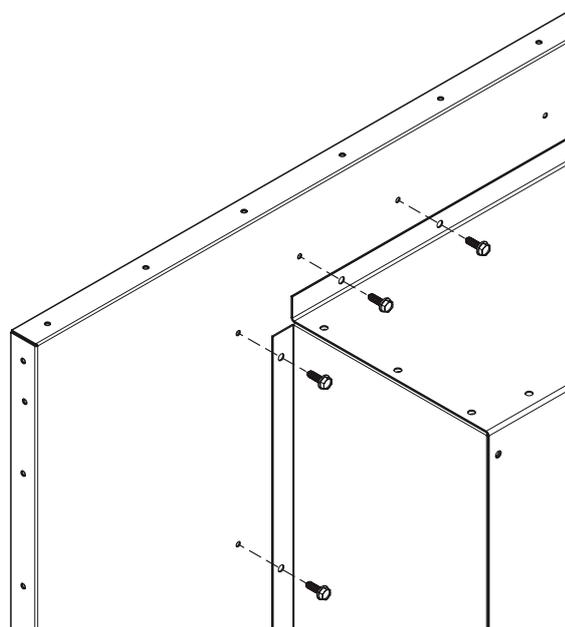


Figure 11 – Fan-Side Sound Attenuator Assembly Details

Final Assembly and Start-up Details

Shipping Materials - Remove any wood chocks, spare parts, or miscellaneous items that have been placed inside the unit for shipping purposes. Clean all debris from the basin.

Pump Discharge Line - Connect the riser pipe from the pump discharge on the pan-fan section to the riser pipe on the coil section using the flexible connection and hose clamps provided.

Bleed-off Line - A bleed-off line and valve are installed on the unit when shipped with a pump. On units shipped without a pump (remote sump applications) make sure a bleed-off line and valve are properly sized and installed on the discharge side of the pump and connected to a convenient drain. In either case, the bleed-off valve should be fully open.

Strainer - Check the strainer in the basin to ensure that it is in its proper location over the pump suction as shown in Figures 12a and 12b.

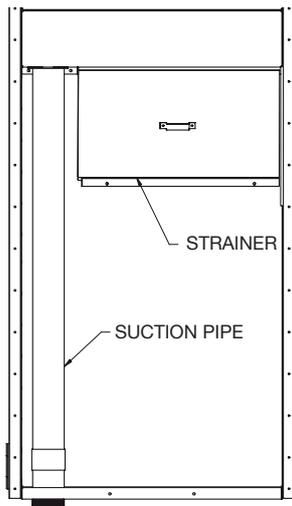


Figure 12a – Strainer Location on 1 m and 1,5 m Wide Units

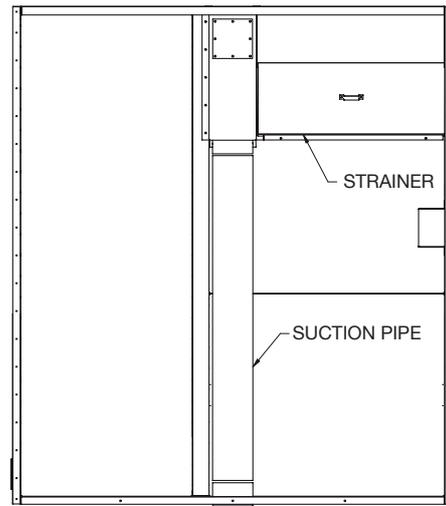


Figure 12b – Strainer Location on 2,4 m Wide Units

Screens - Protective air inlet screens are provided across the front of the fan section of all models. Screens or panels are provided on the bottom of the fan section.

Float Valve Adjustment - The float valve is pre-set at the factory, however adjustment should be checked after rigging. The float valve should be adjusted so that the center of the float is 1-2 cm below the center of the overflow connections when the valve is in the fully closed position. Raise or lower the float by using the wing nuts on the vertical threaded rod. Do not adjust the horizontal rod. During normal operation, the water level will drop 8-10 cm below the overflow in condensers and coolers; and to approximately 12-15 cm below the overflow in cooling towers. See Table 5 for normal operating level for the LR and LP style units.

Table 5 – Minimum Operating Level

Coil/Casing Footprint	Min. Operating Level (mm)
3' x 6'	200
5' x 6'	200
5' x 9'	200
5' x 12'	200
8' x 9'	200
8' x 12'	200

Fan Rotation - Bump start and check the fans for proper rotation. Directional arrows are placed on the outside of centrifugal fan housings or on the inside of axial fan cylinders.

Pump Rotation - Bump start and check the pump for proper rotation. Directional arrows are found on the pump impeller housing.



Freeze Protection

The simplest and most effective way of keeping the recirculated water from freezing is to use a remote sump. With a remote sump, when the recirculating water pump is shut off all recirculating water drains back to the sump.

If a remote sump is not being used, pan heaters are available. However, the basin heater will not prevent the external water lines, pump or pump piping from freezing. For installations where water will be left in the basin during freezing conditions, the make-up water supply, overflow and drain lines, as well as the pump and pump piping up to the overflow level must be heat traced and insulated to protect them from damage. Any other connections or accessories at or below the water level must also be heat traced and insulated.

The pan heaters are designed to prevent pan water from freezing when the unit is idle (no fan). If the unit will be operated dry (no water over coil) but will not be completely drained, please consult EVAPCO marketing to upsize the heaters.

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 operation and maintenance instructions supplied with the unit for proper maintenance procedures.

Water Treatment

Proper water treatment is an essential part of the maintenance required for evaporative cooling equipment. Galvanized equipment should be passivated prior to equipment startup to avoid the formation of white rust. For more information on passivation and white rust, please download a copy of EVAPCO's Engineering Bulletin 36 at www.evapco.eu. The spray water and the fluid inside the heat transfer coil should both be maintained with a water treatment program to ensure efficient system operation while maximizing the equipments service life. For more information on recommended water chemistry for EVAPCO equipment, see the Operation and Maintenance Instructions for this equipment.

Rigging Hardware Parts List

Table 6 lists those parts which are shipped together with the unit(s) for field assembly and/or spare parts. These parts will be found in a cardboard box wrapped in plastic and secured in the basin of the unit.

Table 6 – LP Tower and LR Cooler and Condenser Attenuation and Discharge Hood Rigging Box Parts List (galvanized and stainless steel construction)

Nominal Plan Area of Heat Transfer Section	Extra Nozzles	M8 x 25 Bolt	M8 Hex Nut	M8 Flat Washer	M8 Lock Washer	Sealer Tape
3' x 6'	1	14	14	28	14	2
5' x 6'	1	14	14	28	14	2
5' x 9'	1	22	22	44	22	3
5' x 12'	1	26	26	52	26	3
8' x 9'	2	22	22	44	22	3
8' x 12'	2	26	26	52	26	3



Accessory Location Checklist

Accessories can ship in a variety of locations depending on the type of accessory, the size of the unit and the accessories purchased with the unit. See Table 7 for a guide to accessory location.

Table 7 – Unit Accessory Shipping Location

Unit Accessories	Shipping Location
Aluminum Ladder	Shipped Separately on Truck Bed
Discharge Attenuation	Shipping Location is Unit Dependent - If Space is Available: Loosely Mounted on Unit - If No Space is Available: Shipped Separately on Truck Bed
Discharge Hood with Dampers	Shipping Location is Unit Dependent - If Space is Available: Loosely Mounted on Unit - If No Space is Available: Shipped Separately on Truck Bed
Electric Basin Heater	Shipping Location is Unit Dependent - End Mounted Heater: Installed in Unit Basin - Side Mounted Heater: Strapped Inside Unit Basin
Electric Basin Heater Low Water Cutout	Shipped in Rigging Box Strapped Inside Unit Basin
Electric Basin Heater Thermostat	Shipping Location is Unit Dependent - End Mounted Thermostat: Mounted on Unit Basin - Side Mounted Thermostat: Shipped in Rigging Box
Electronic Water Level Control Probes	Mounted in PVC standpipe
Electronic Water Level Control	PVC Standpipe Strapped Inside Unit Basin
Factory Mounted Crossover Piping	Welded to Coil Connections
Fan Screens (If not mounted)	Shipping Location is Unit and Accessory Dependent - If Space is Available: Strapped Inside Unit Basin - If No Space is Available: Crated and Shipped Separately on Truck Bed
Hot Water or Steam Coil	Installed in Unit Basin
Inlet Attenuation	Shipping Location is Unit Dependent - If Space is Available: Loosely Mounted on Unit - If No Space is Available: Shipped Separately on Truck Bed
Remote Sump Trash Screen	Installed In Unit Basin
Rigging Hardware	Shipped in Rigging Box Strapped Inside Unit Basin
Safety Cage	Attached to the Ladder
Sealer Tape	Shipped in Rigging Box Strapped Inside Unit Basin
Sump Sweeper Piping with and without High Flow Eductors	Installed in Unit Basin
Vibration Switch	Mounted in Fan Section
Water Silencers	Installed in Unit Basin



EVAPCO Europe bvba • Industriezone, Tongeren-Oost 4010 • 3700 Tongeren, Belgium
Phone: (32) 12 395029 • Fax: (32) 12 238527 • E-mail: evapco.europe@evapco.be

EVAPCO Europe Srl • Via Ciro Menotti 10 • I-20017 Passirana di Rho, Milano, Italy
Phone: (39) 02 9399041 • Fax: (39) 02 93500840 • Email: evapcoeuropa@evapco.it

EVAPCO Europe GmbH • Meerbuscher Str. 64-78, Haus 5 • D-40670 Meerbusch, Germany
Phone: (49) 2159-6956-0 • Fax: (49) 2159-6956-11 • Email: info@evapco.de

