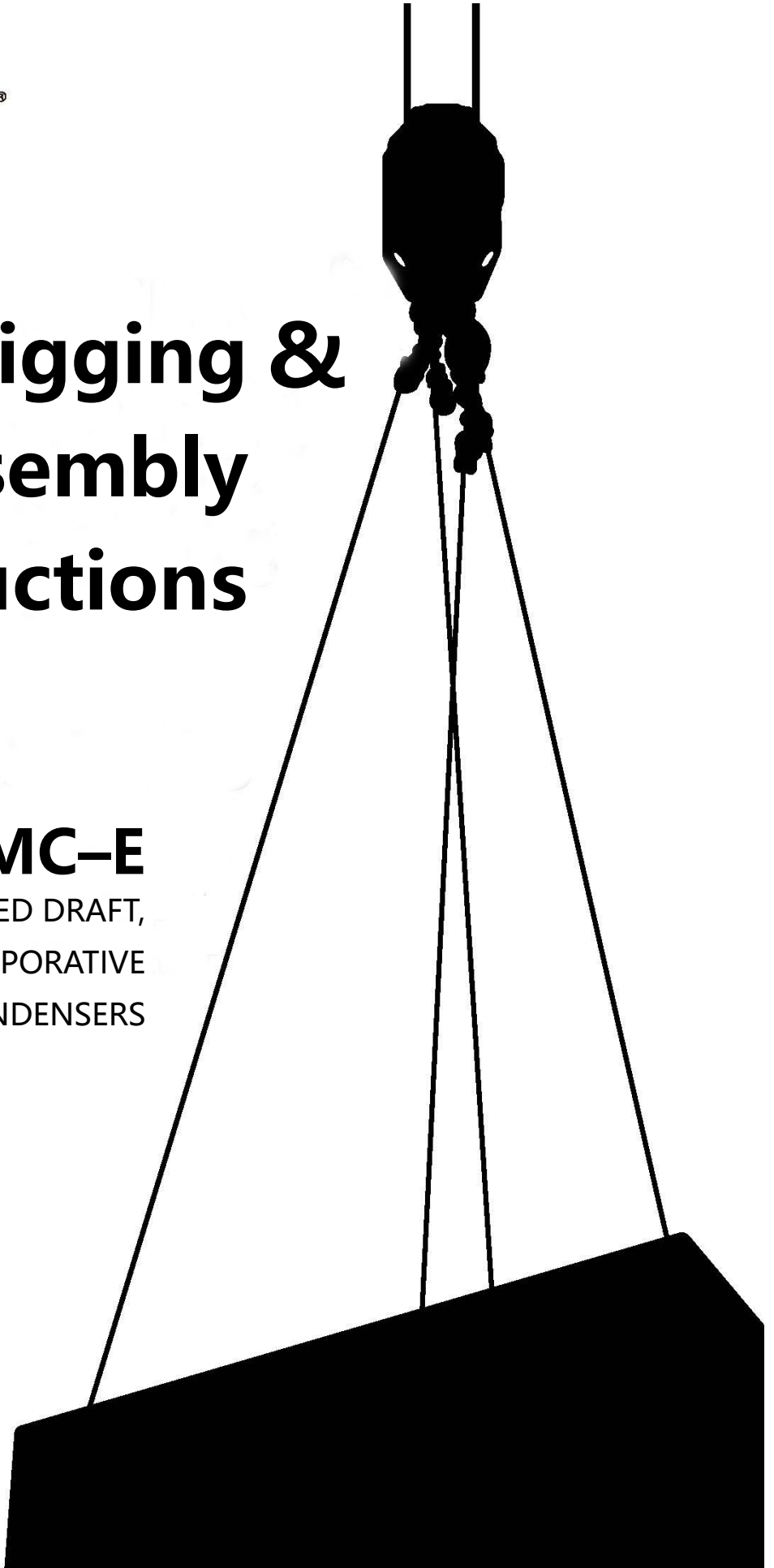




Rigging & Assembly Instructions

PMC-E
FORCED DRAFT,
EVAPORATIVE
CONDENSERS



BULLETIN 125D



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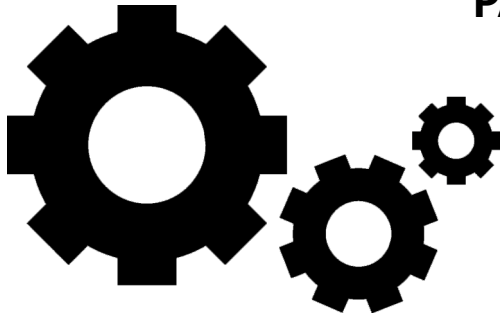
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The PMC SERIES FORCED DRAFT EVAPORATIVE CONDENSERS should be rigged and assembled using the instructions and recommendations outlined in this bulletin.

All personnel should review these procedures, as well as the latest industry-approved Installation practices, prior to rigging and assembly. The information in this bulletin is for informational purposes only. These instructions do not purport to cover all variations and possible contingencies in connection with installation. Additionally, the procedures described therein are subject to change without prior notice, due to EVAPCO, Inc.' s ongoing research and development.

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Method of Shipment

Forced draft units are shipped either fully assembled (small units) or with the coil section(s) separate from the basin/fan section(s). 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.

NOTE: All casing sections are factory inspected prior to shipment to verify proper fit for rigging. Please take extra care to handle and rig each 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 fan and fan motor shaft(s) monthly. Also, the fan shaft bearings should be purged and regreased prior to startup.

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. Since 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 PMC-E condensers are compliant with the latest IBC codes.

All items attached to the EVAPCO PMC-E 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.

Mounting holes, 3/4" (19mm) 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 basin/fan section to the steel support before rigging the coil section.

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 1/2" (13mm). 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 1.5mm in 1m 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 the latest version of the IBC code for required steel support layout and structural design.

Table 1 – Steel Support Dimensions

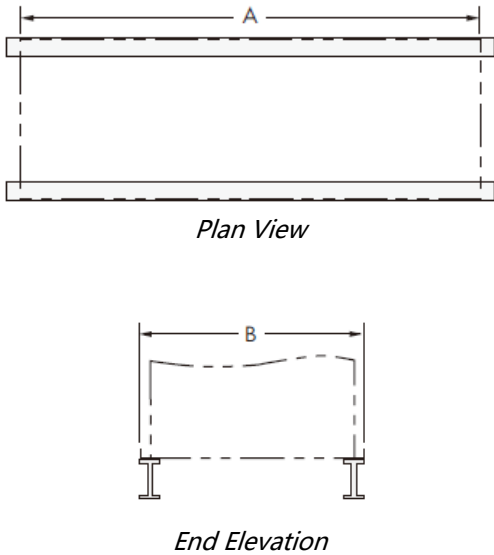


Figure 1 – Structural Steel Support

Box Size (m)	A (mm)	B (mm)
1.5m Wide Models		
1.5 x 3.6	3648	1930
1.5 x 5.4	5490	1930
3m Wide Models		
3 x 3.6	3651	2991
3 x 5.4	5490	2991
3 x 7.2	7337	2991
3 x 11	11024	2991
3.6m Wide Models		
3.6 x 3.6	3651	3616
3.6 x 5.4	5490	3616
3.6 x 6	6102	3616
3.6 x 7.2	7337	3616
3.6 x 11	11024	3616
3.6 x 12.2	12243	3616

(See Table 2 for model numbers corresponding to box size)

Rigging the Basin/Fan Section — Standard Lift

U-bolts or similar lifting points are located in the basin/fan section for lifting and final positioning purposes as shown below in Figures 2 and 3. Units with lengths up to 6m have 4 total lift points. Units with lengths over 6m long units have either 6 or 8 lift points. See Table 2 for the minimum “H” dimensions for rigging the basin/fan assembly. Always use safety slings for extended lifts or where any hazard exists. See the “Extended Lifts” section in this bulletin.

NOTE: Use all of the U-bolts or lift points provided for lifting.

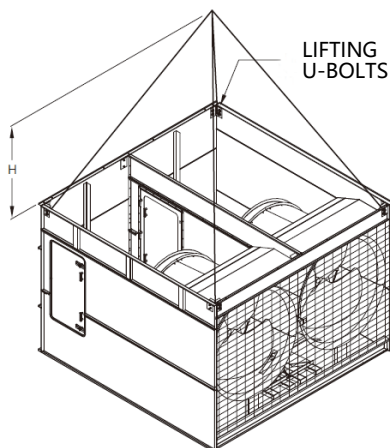


Figure 2 – Basin/Fan Section (up to 6m Long)

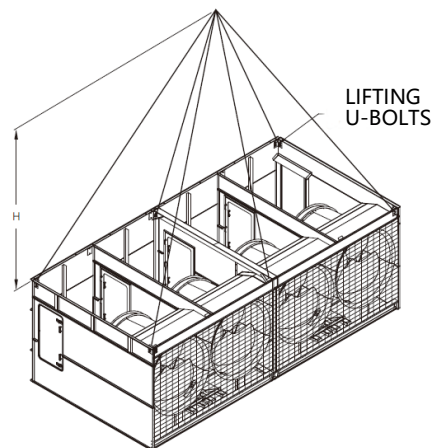


Figure 3 – Basin/Fan Section (Over 6m Long)

Table 2 – Minimum “H” Dimension for the Basin/Fan Section Rigging (Standard Lift)

Box Size (m)	Model Numbers	“H” Dimensions (m)
1.5m Wide Models		
1.5 x 3.6	PMC-175E to 240E	3.6
1.5 x 5.4	PMC-250E to 375E	5.2
3m Wide Models		
3 x 3.6	PMC-332E to 530E	4.3
3 x 5.4	PMC-503E to 792E	5.4
3 x 7.2	PMC-725E to 1056E	7
3 x 11	PMC-1006E to 1586E	10
3.6m Wide Models		
3.6 x 3.6	PMC-376E to 640E	4.6
3.6 x 5.4	PMC-568E to 955E	5.8
3.6 x 6	PMC-715E to 1013E	6
3.6 x 7.2*	PMC-752E to 1286E	7
3.6 x 11	PMC-1137E to 1911E	10
3.6 x 12.2	PMC-1705E to 2019E	11

* This box size has two 3.6m long coil sections

Rigging the Basin & Fan Section — Extended Lift

The recommended method for extended lifts is to use slings under the unit as shown in **Figure 4**. Spreader bars should always be used between the cables at the top of the section to prevent damage to the upper flanges. See **Table 3** for the minimum “H” dimensions for rigging the basin/fan assembly.

NOTE: The U-bolts or other lifting points should be used for final positioning only and for lifting where no danger exists. If they are used for extended lifts, safety slings and spreader bars should be provided under the sections as shown.

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

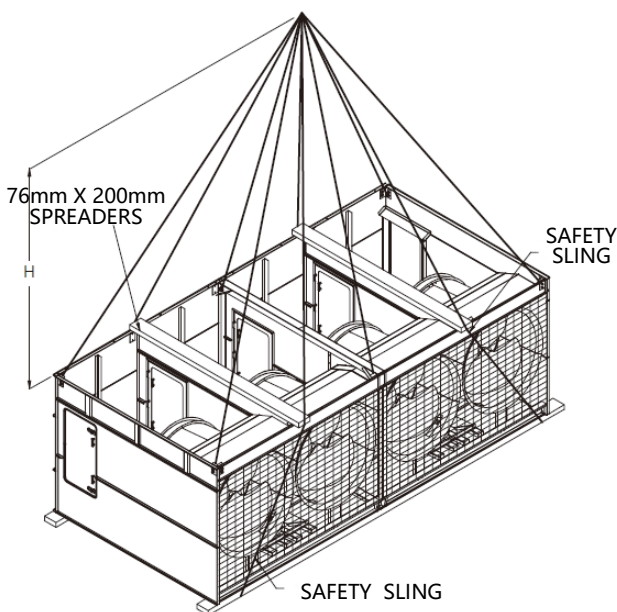


Figure 4 – Proper Rigging Method for Extended Lifts

Table 3 – Minimum “H” Dimension for the Basin/Fan Section Rigging (Extended Lift)

Box Size (m)	“H” Dimensions (m)
1.5m Wide Models	
1.5 x 3.6	3.6
1.5 x 5.4	5.2
3m Wide Models	
3 x 3.6	4.3
3 x 5.4	5.4
3 x 7.2	7
3 x 11	10
3.6m Wide Models	
3.6 x 3.6	4.6
3.6 x 5.4	5.8
3.6 x 6	6
3.6 x 7.2*	7
3.6 x 11	10
3.6 x 12.2	11

(See **Table 2** for model numbers corresponding to box size)

Applying Sealer Tape

Once the bottom section 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. (NOTE: Sealer tape is applied completely around the perimeter of the section.)**

The sealer tape should overlap on the corners as shown in **Figure 5**. 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.**

For units which have two or more coil sections, sealer tape must be applied to all internal flanges (**Figure 6**).

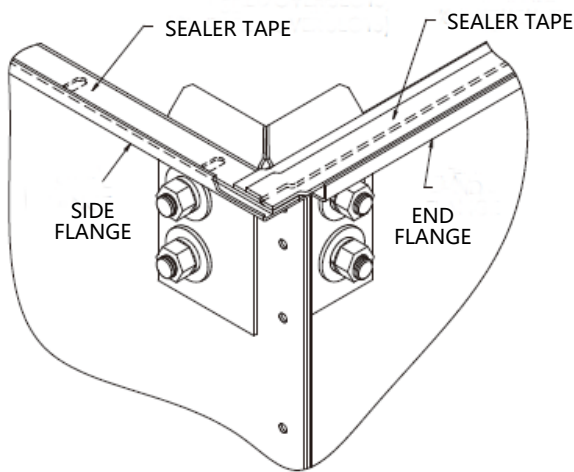


Figure 5 – Proper Sealer Tape Application

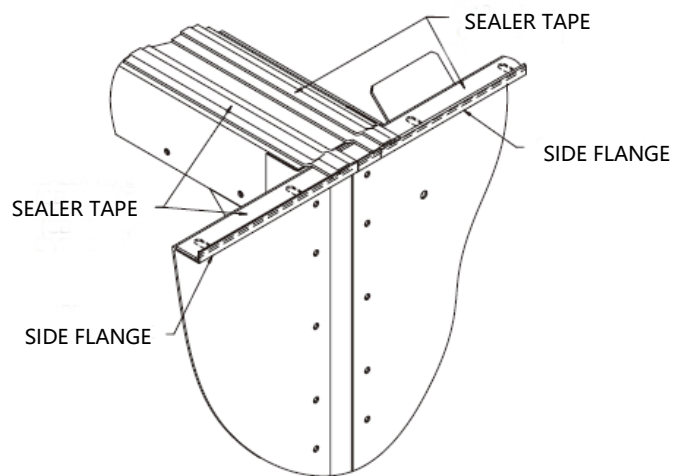


Figure 6 – Sealer Detail for Center Joint of Units with Two or More Coil Sections

Rigging the Coil Section

U-bolts or lift points are located inside the casing on the four corners of the coil for small single coil sections. These lift points are for lifting and final positioning (**Figure 7**). On larger coil sections, the lifting points are on the outside of the casing section (**Figures 8 and 9**).

The end and center eliminator sections on small, single coil sections should be removed before lifting from the U-bolts or lift points.

See **Table 4** for the minimum “H” dimensions for rigging the coil section. Always use safety slings for extended lifts or where any hazard exists. See the “Extended Lifts” section in this bulletin.

NOTE: Use all of the U-bolts or lift points provided for lifting.

CAUTION: On units shipped as two separate sections, do not assemble sections and attempt to lift the entire unit. The U-bolts and lift points are designed to carry only the weight of their individual section.

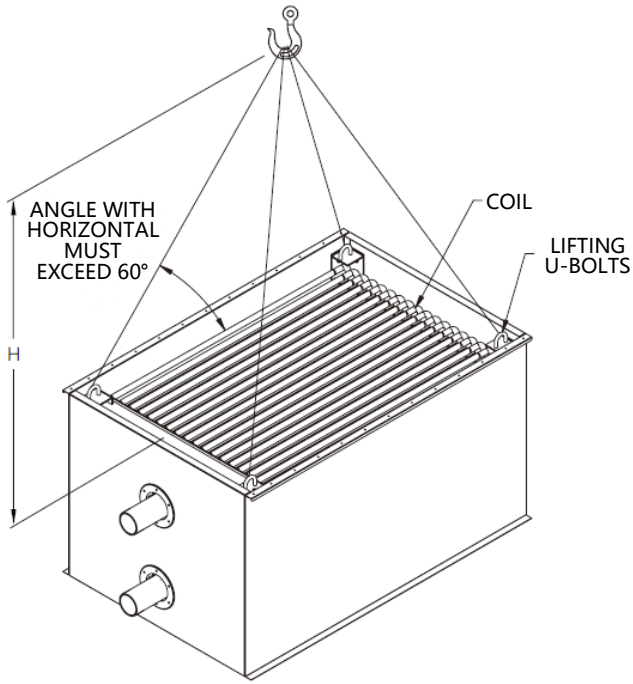


Figure 7 – Small, Single Coil Sections

BOX SIZES:
1.5m x 3.6m
1.5m x 5.4m

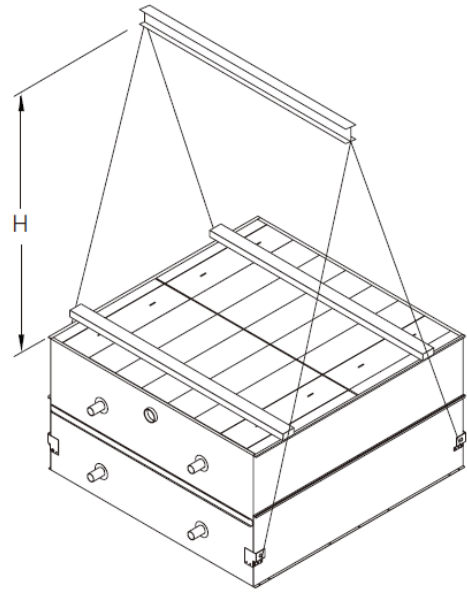


Figure 8 – Large Coil Section (3.6m Long Sections)

BOX SIZES:
3m x 3.6m
3m x 7.2m
3.6m x 3.6m
3.6m x 7.2m

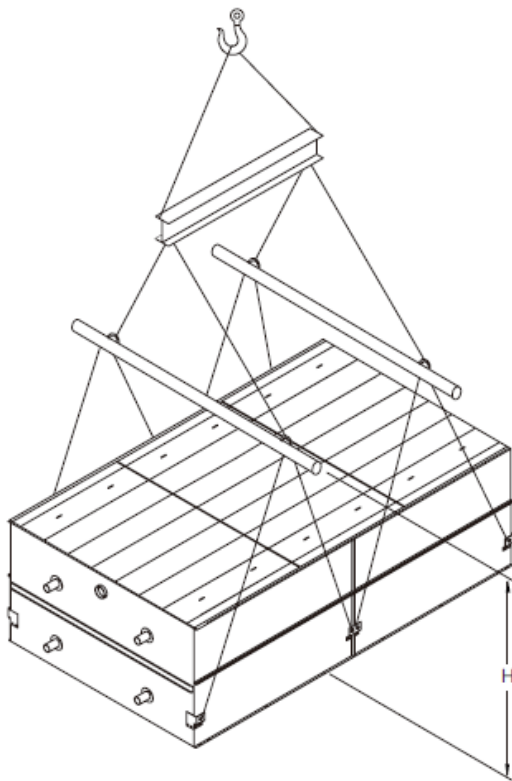


Figure 9 – Large Coil Section (5.5m Long and Up)

BOX SIZES:
3m x 5.4m, 3m x 11m
3.6m x 5.4m, 3.6m x 6m
3.6m x 11m, 3.6m x 12.2m

Table 4 – Minimum “H” Dimension for Coil Section

Box Size (m)	“H” Dimensions (m)
1.5m Wide Models	
1.5 x 3.6	3.6
1.5 x 5.4	5.2
3m Wide Models	
3 x 3.6	4.3
3 x 5.4	2.7
3 x 7.2	7
3 x 11	5.2
3.6m Wide Models	
3.6 x 3.6	4.6
3.6 x 5.4	2.7
3.6 x 6	3
3.6 x 7.2	7
3.6 x 11	5.2
3.6 x 12.2	5.8

(See **Table 2** for model numbers corresponding to box size)

Assembly of the Coil Section to the Basin/Fan Section

Before assembling the coil section to the cold water basin/fan section, remove any loose parts shipped in the basin.

Wipe the flanges on the bottom of the coil section. Check to see that the water distribution connection on the coil section is in the correct position relative to the basin/fan section (see certified print). Confirm that sealer tape has been applied to the top of the basin/fan section as shown in **Figures 5 and 6**.

Lower the coil section to within several inches of the basin/fan section, making sure the two sections do not touch and the sealer tape is not disturbed. Place drift pins (see **Figure 12 and 13**) in at least three (3) of the corner mounting holes and gradually lower the coil section into place using the drift pins to guide the section down accurately onto the mating flange. On long sections, 5.4m and longer, drift pins should be used midway along the sides as well.

Place fasteners in all four (4) corner bolt holes. Then, continue to install the rest of the fasteners working from the corners toward the center, using drift pins to align the holes. A fastener must be installed in every hole on the side flanges, although none are required on the end flanges.

For units with two coil sections, mount the first as described, and then follow the same procedure for the second section.

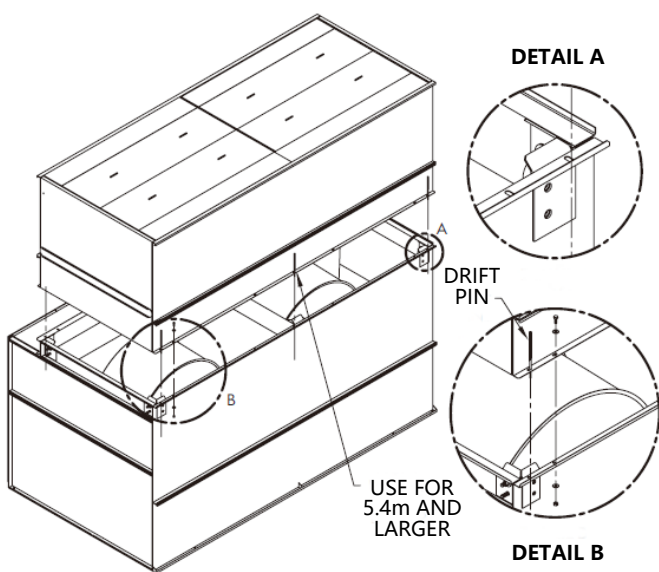


Figure 12 – Mating Coil Section to Basin/Fan Section

BOX SIZES:
1.5m x 3.6m
1.5m x 5.4m

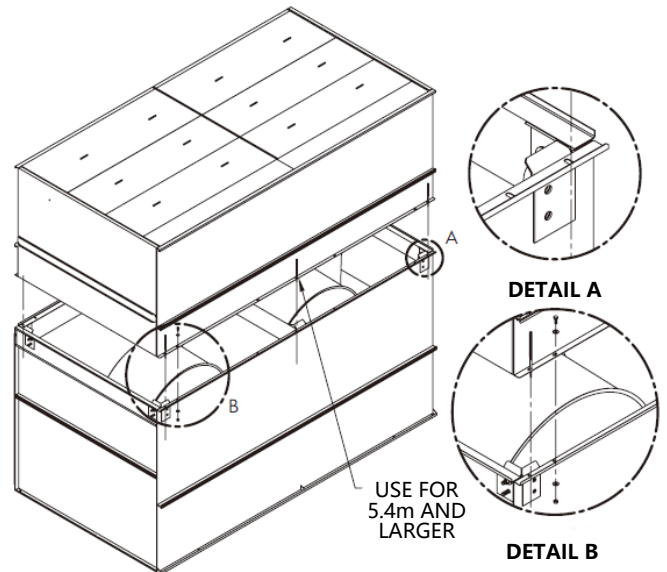


Figure 12 – Mating Coil Section to Basin/Fan Section

BOX SIZES:
3m x 3.6m
3m x 5.4m
3m x 7.2m
3m x 11m
3.6m x 3.6m
3.6m x 5.4m
3.6m x 6m
3.6m x 7.2m
3.6m x 11m,
3.6m x 12.2m

Optional Straight-Sided Hood Section

Some units may be supplied with an optional discharge hood section. This section will ship from the factory as a separate item or loosely mounted on top of either the basin and fan section or coil section to reduce freight charges. Each hood section is equipped with U-bolts located at the four corners for lifting and final positioning (**Figure 14**). Always use safety slings for extended lifts or where any hazard exists.

NOTE: When combined with other sections, the hood must be removed prior to any lift. In all cases the hood section must be rigged as a separate part.

Once the coil section has been secured to the basin and fan section, 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 as shown in **Figures 5 and 6**. Remove any shipping blocks or other obstructions. Lower the hood onto the top flange of the coil section.

Install the retainer clips in all four corners as shown in **Figure 14**. For 5,4m-long hoods, two (2) additional clips are provided and are to be fastened in the middle of each side.

NOTE: Always lift the hood separately and follow the rigging sequence shown.

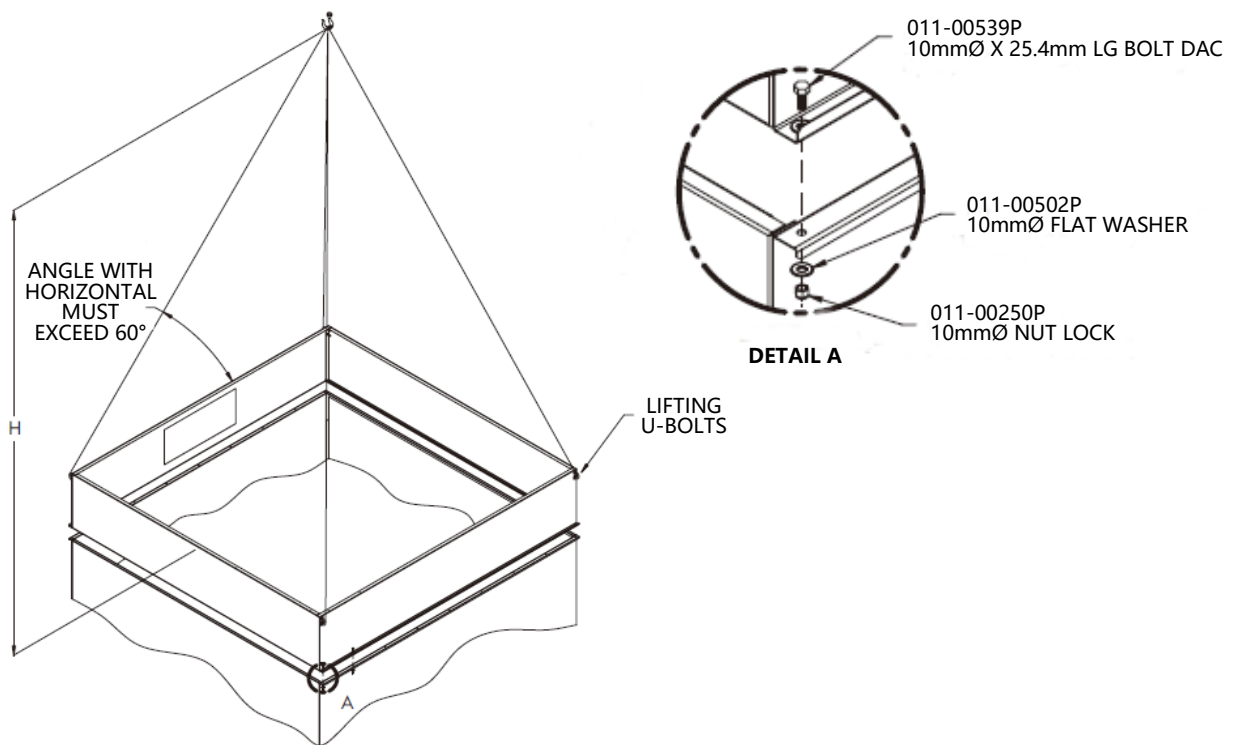


Figure 14 – Discharge Hood Rigging and Assembly (Shown without Dampers)

See **Table 6** for the minimum “H” dimensions for rigging the discharge hood for both standard and extended lifts.



Table 6 – Minimum “H” Dimension for Rigging Discharge Hoods and Discharge Attenuation

Box Size (m)	“H” Dimensions (mm)
1.5m Wide Models	
1.5 x 3.6	3073
1.5 x 5.4	4674
3m Wide Models	
3 x 3.6	3073
3 x 5.4	4674
3 x 7.2	3073
3 x 11	4674
3.6m Wide Models	
3.6 x 3.6	3073
3.6 x 5.4	4674
3.6 x 6	5207
3.6 x 7.2	3073
3.6 x 12.2	5207

(See **Table 2** for model numbers corresponding to box size)

Rigging Hardware Parts List

The following table lists those parts which are shipped together with the unit(s) for field assembly.

Table 7 – Parts Shipped with Unit(s) by Box Size

Box Size (m)	Bolt ₁	Lock Nut ₁	Washer ₁	Sealer Tape
1.5 x 3.6	14	14	28	3
1.5 x 5.4	16	16	28	3
3 x 3.6	14	14	28	4
3 x 5.4	16	16	32	5
3 x 7.2	28	28	56	8
3 x 11	32	32	64	10
3.6 x 3.6	14	14	28	5
3.6 x 5.4	16	16	32	6
3.6 x 6	16	16	32	6
3.6 x 7.2	28	28	56	10
3.6 x 11	32	32	64	12
3.6 x 12.2	32	32	64	12

¹ 5/16” Diameter Hardware

(See **Table 2** for model numbers corresponding to box size)

Field Assembly of External Service Platform and Ladder

The external service platform and ladder assemblies are shipped separate from the unit. The platform is partially assembled prior to shipment to minimize field assembly. The platform and ladder assembly should be attached after the unit is fully rigged following the instructions below in **Figure 15**.

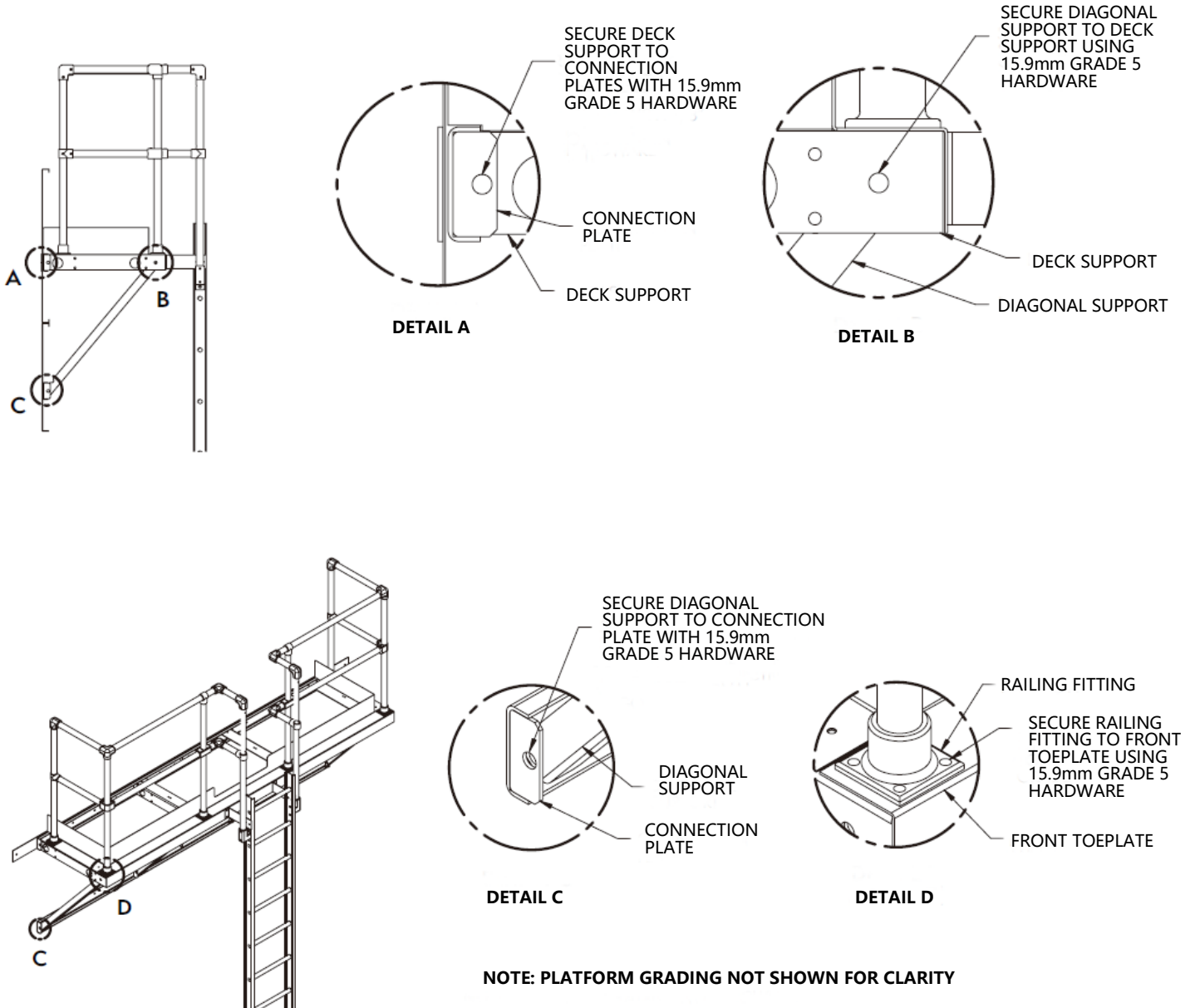


Figure 15 – Field Assembly of External Service Platform and Ladder

Final Assembly and Startup 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 basin and 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 - Remove the strainer and inspect for any debris which may have accumulated below the suction hood. Reinstall the strainer in the basin to ensure that it is in its proper location over the pump suction.

Screens - Protective air inlet screens are provided across the front of the fan section of all models. Screens are not provided on the bottom of the fan section since most of the units are mounted on steel beams, either on the roof or at ground level. If units are installed in an elevated position, bottom screens are recommended for safety protection and should be provided by the installing contractor.

Float Valve Adjustment - The float valve is preset at the factory; however, adjustment should be checked after rigging. At initial startup, the water level should be adjusted so that the center of the float is 25mm 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, when the unit is under load, the water level should be adjusted so that the operating level is 76mm to 100mm below the overflow.

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

Pump Rotation - After filling the basin to overflow with fresh water, bump start and check the pump for proper rotation. Directional arrows are found on the pump impeller housing.

Maintenance

Once 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 maximum trouble free performance of the unit. Refer to the Operation and Maintenance Instructions enclosed with the unit for proper maintenance procedures.

Also, proper freeze protection must be provided if the unit is located in a cold climate. Refer to the factory supplied Operation and Maintenance Instructions and Checklist, as well as factory product bulletins for further information.



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