

Rigging and Assembly Instructions

PM SERIES FORCED DRAFT EVAPORATIVE CONDENSERS CLOSED CIRCUIT COOLERS & COOLING TOWERS

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Method of Shipment

Forced draft units are shipped either fully assembled (small units) or with the top section(s) separate from the bottom 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 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 fan 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 LS Series Coolers and Condensers are IBC 2006 compliant up to 1g with standard construction and up to 5.12g with additional structural modifications.

All items attached to the Evapco PM Series Closed Circuit Cooler or PM Series 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” 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 the top 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”. 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 1/8" in 6' 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 2006 for required steel support layout and structural design.

Table 1 – Steel Support Dimensions

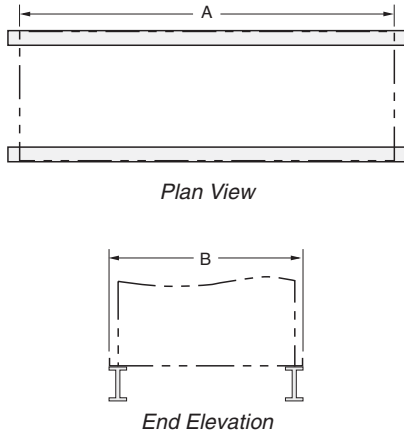


Figure 1 – Structural Steel Support

PMC-E, PMWQ & PMTQ Dimensions		
Box Size	A	B
5' Wide Models		
5' x 12'	11' 11-5/8"	6' 4"
5' x 18'	18' 1/8"	6' 4"
10' Wide Models		
10' x 12'	11' 11-3/4"	9' 9-3/4"
10' x 18'	18' 1/8"	9' 9-3/4"
10' x 24'	24' 7/8"	9' 9-3/4"
10' x 36'	36' 2"	9' 9-3/4"
12' Wide Models		
12' x 12'	11' 11-3/4"	11' 10-3/8"
12' x 18'	18' 1/8"	11' 10-3/8"
12' x 20'	20' 1/4"	11' 10-3/8"
12' x 24'	24' 7/8"	11' 10-3/8"
12' x 36'	36' 2"	11' 10-3/8"
12' x 40'	40' 2"	11' 10-3-8"

Rigging Pan/Fan Section—Standard Lift

U-bolts or similar lifting points are located in the pan-fan section for lifting and final positioning purposes as shown below in Figures 2 and 3. Units with lengths up to 20' have 4 total lift points. Units with lengths over 20' long units have either 6 or 8 lift points. See Table 2 for the minimum "H" dimensions for rigging the pan-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.

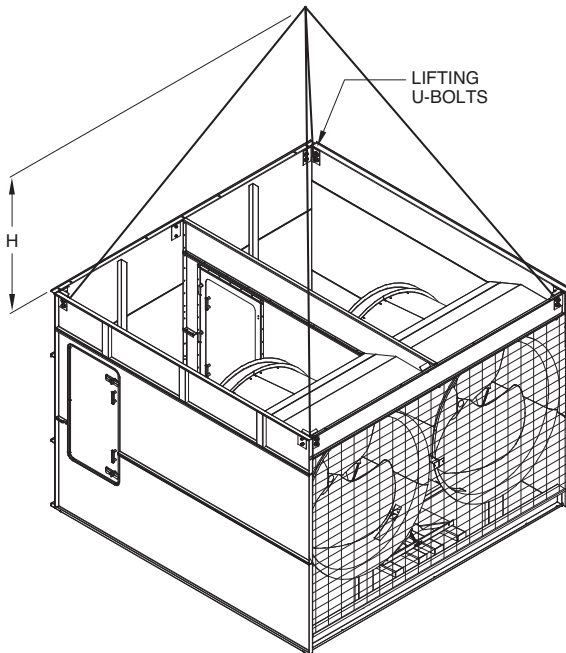


Figure 2 – Pan/Fan Section (up to 20' Long)

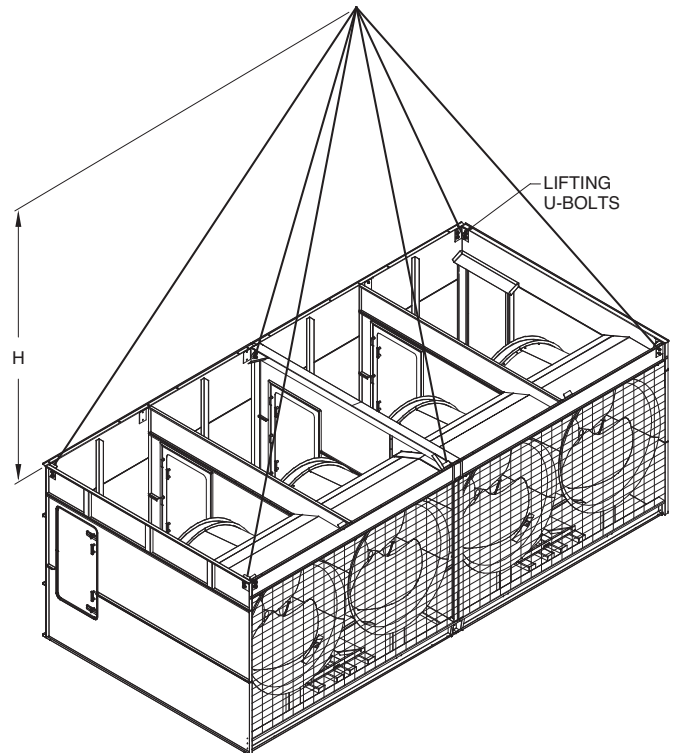


Figure 3 – Pan/Fan Section (over 20' Long)

* Units shown with optional Super Low Sound Fan



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

PMC-E, PMWQ & PMTQ Dimensions	
Box Size	“H” Dimension
5' Wide Models	
5' x 12'	12'
5' x 18'	17'
10' Wide Models	
10' x 12'	14'
10' x 18'	18'
10' x 24'	23'
10' x 36'	33'
12' Wide Models	
12' x 12'	15'
12' x 18'	19'
12' x 20'	20'
12' x 24'	23'
12' x 36'	33'
12' x 40'	36'

Rigging Pan/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 pan-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.

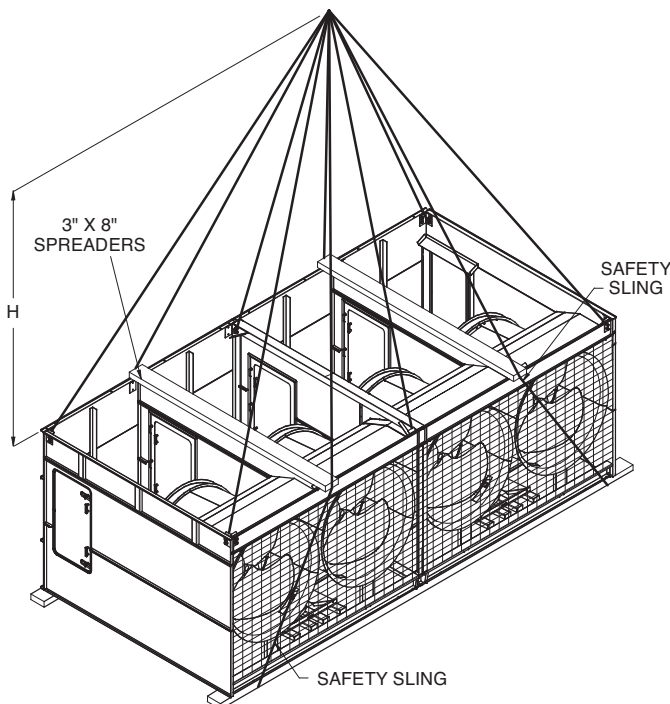


Figure 4 – Proper Rigging Method for Extended Lifts

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

PMC-E, PMWQ & PMTQ Dimensions	
Box Size	“H” Dimension
5' Wide Models	
5' x 12'	12'
5' x 18'	17'
10' Wide Models	
10' x 12'	14'
10' x 18'	18'
10' x 24'	23'
10' x 36'	33'
12' Wide Models	
12' x 12'	15'
12' x 18'	19'
12' x 20'	20'
12' x 24'	23'
12' x 36'	33'
12' x 40'	36'

* Unit shown with optional Super Low Sound Fan

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 coil sections, sealer tape must be applied to all internal flanges (Figure 6).

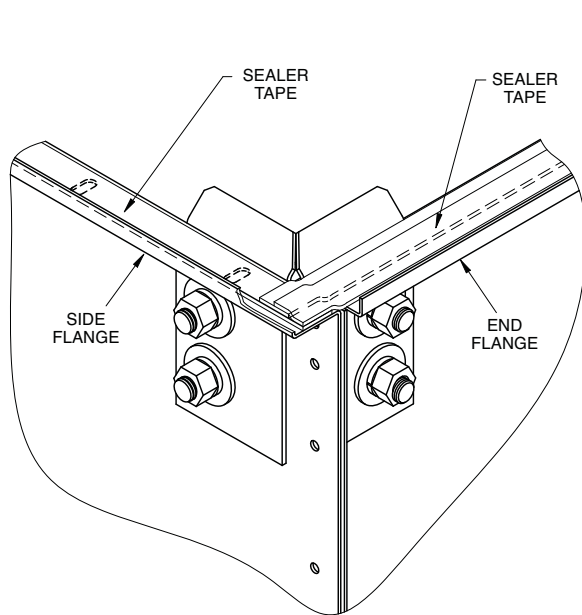


Figure 5 – Proper Sealer Tape Application

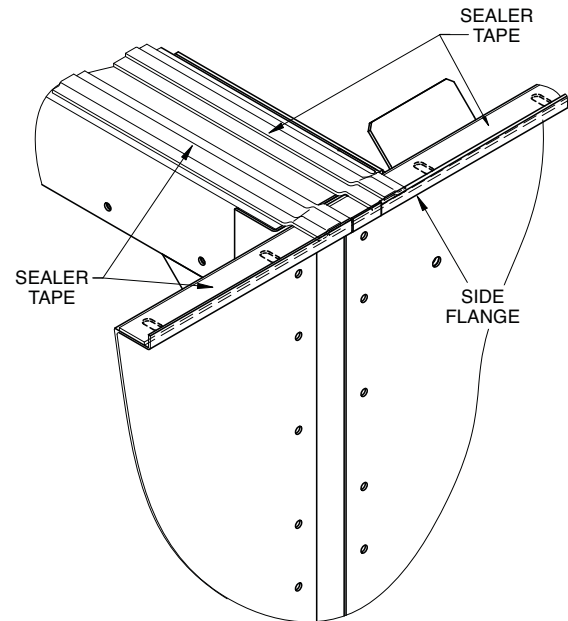


Figure 6 – Sealer Detail for Center Joint of Units with Two or More Coil Sections

Rigging the Coil Casing Section

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

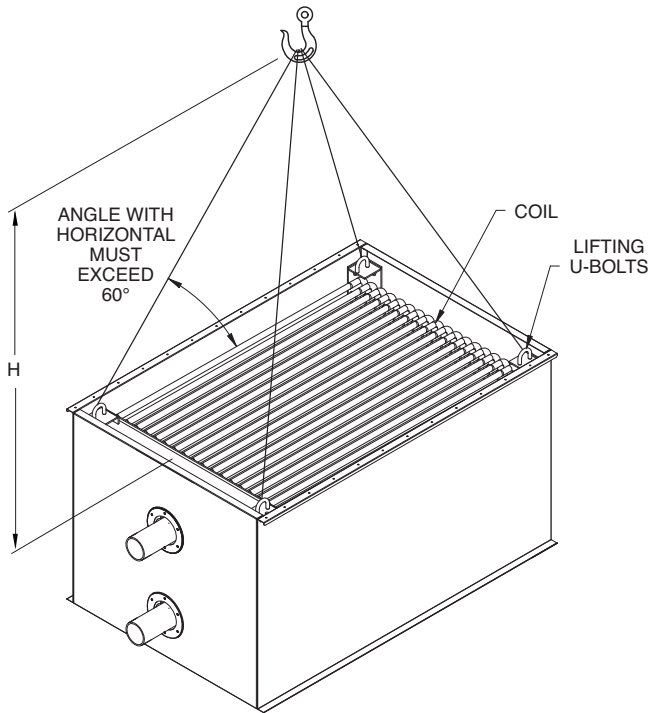


Figure 7 – Small, Single Coil Sections
(PMC-175E to 375E)

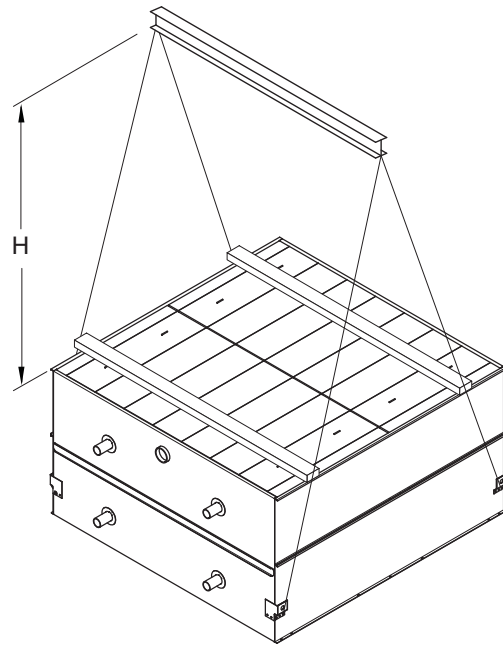


Figure 8 – Large Coil Section (12' Long Units)
(PMC-332E to 519E & PMC-772E to 1038E)
(PMC-420E to 631E & PMC-890E to 1261E)
(PMWQ-10-3G12 to 10-7J12 & 10-3G24 to 10-7J24)
(PMWQ-12-3G12 to 10-7J12 & 12-3G24 to 10-7J24)

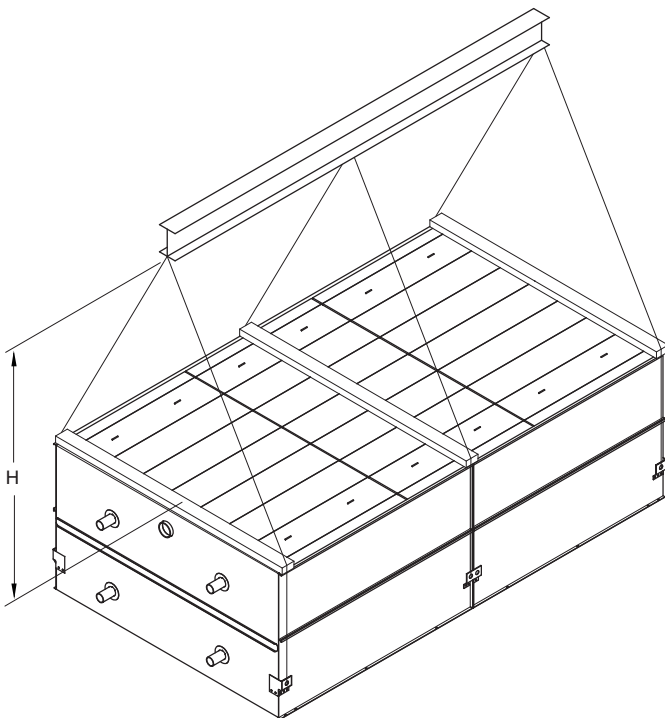


Figure 9 – Large Coil Section (18' Long and Up)
(PMC-503E to 778E & PMC-1006E to 1556E)
(PMC-634E to 1258E & PMC-1269E to 1985E)
(PMWQ-10-3G18 to 10-7J18 & 10-3G36 to 10-7J36)
(PMWQ-12-3G18 to 12-7J40)

Table 4 – Minimum “H” Dimension for Coil Casing Section

PMC-E & PMWQ Dimensions	
Box Size	“H” Dimension
5' Wide Models	
5' x 12'	12'
5' x 18'	17'
10' Wide Models	
10' x 12'	14'
10' x 18'	18'
10' x 24'	23'
10' x 36'	33'
12' Wide Models	
12' x 12'	15'
12' x 18'	19'
12' x 20'	20'
12' x 24'	23'
12' x 36'	33'
12' x 40'	36'

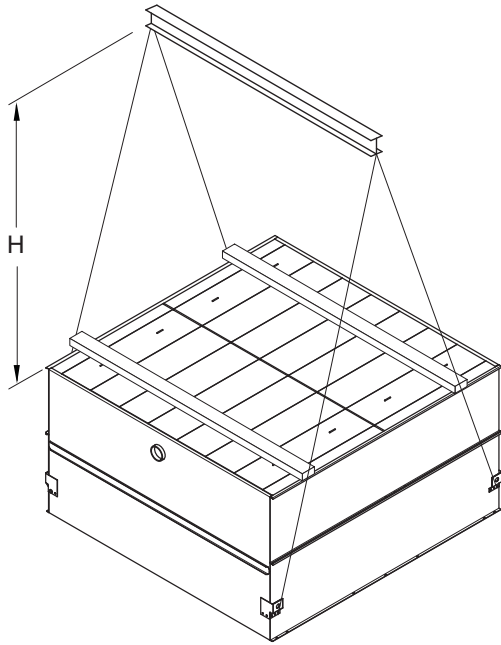


Figure 10 – Large Casing Section (12' Long Units)
 (PMTQ 10112 to 10912 & 10124 to 10924)
 (PMTQ 12112 to 12912 & 12124 to 12924)

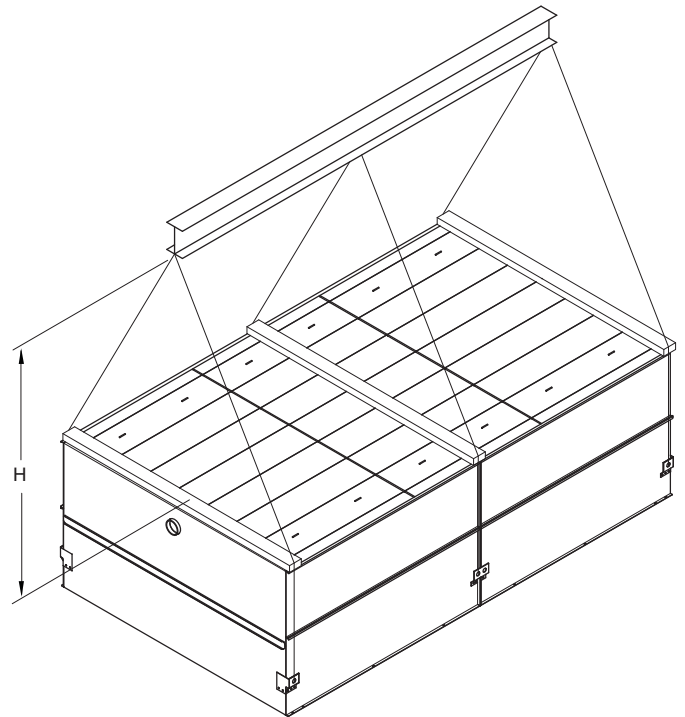


Figure 11 – Large Casing Section (18' Long and Up)
 (PMTQ 10118 to 10918 & 12136 to 12936)
 (PMTQ 12118 to 12940)

Table 5 – Minimum “H” Dimension for Casing Section

PMTQ Dimensions	
Box Size	“H” Dimension
10' Wide Models	
10' x 12'	14'
10' x 18'	18'
10' x 24'	23'
10' x 36'	33'
12' Wide Models	
12' x 12'	15'
12' x 18'	19'
12' x 20'	20'
12' x 24'	23'
12' x 36'	33'
12' x 40'	36'



Assembly of the Coil Section to the Pan/Fan Section

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

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 pan-fan section (see certified print). Confirm that sealer tape has been applied to the top of the pan-fan section as shown in Figures 5 and 6.

Lower the coil section to within several inches of the pan-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 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, 18 feet and longer, drift pins should be used midway along the sides as well.

Place fasteners in all four 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.

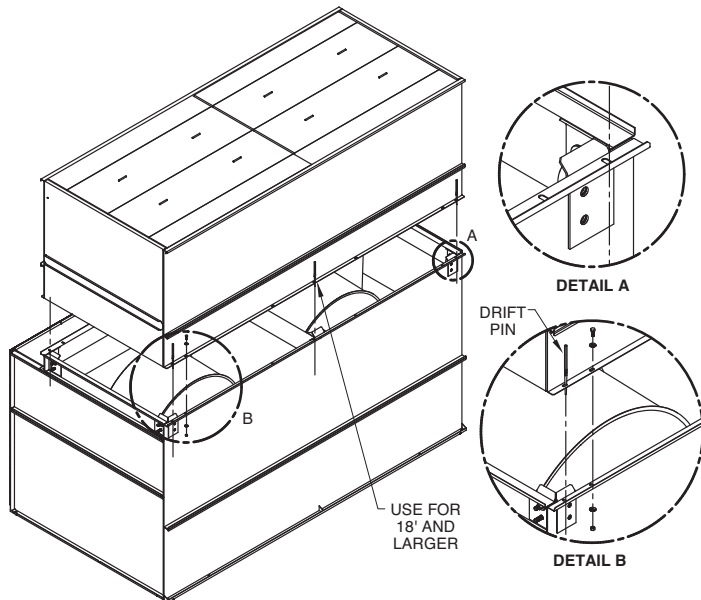


Figure 12 – Mating Upper Section to Basin Section
(PMC-250E to 375E)

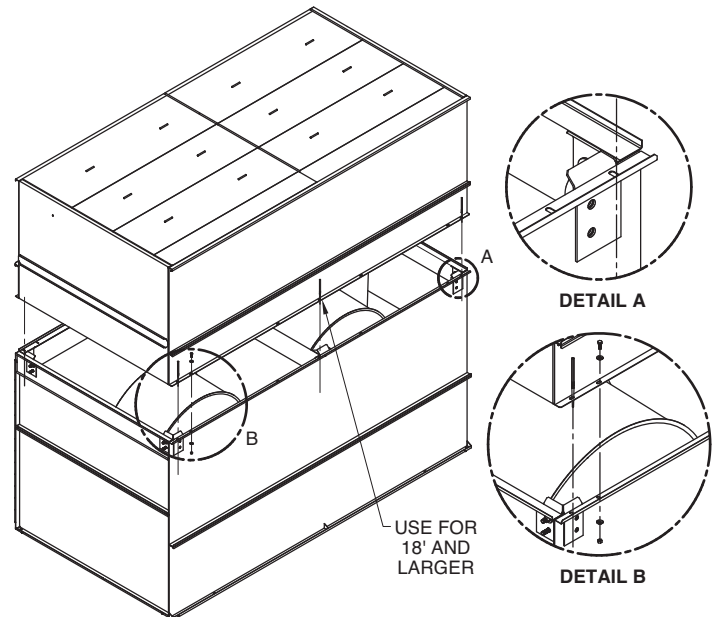


Figure 13 – Mating Upper Section to Basin Section
(PMC-332E to 1985E)
(PMWQ-10-3G12 to 12-7J40)
(PMTQ 10112 to 12940)

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 pan-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 pan-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 18 foot long hoods, two 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.

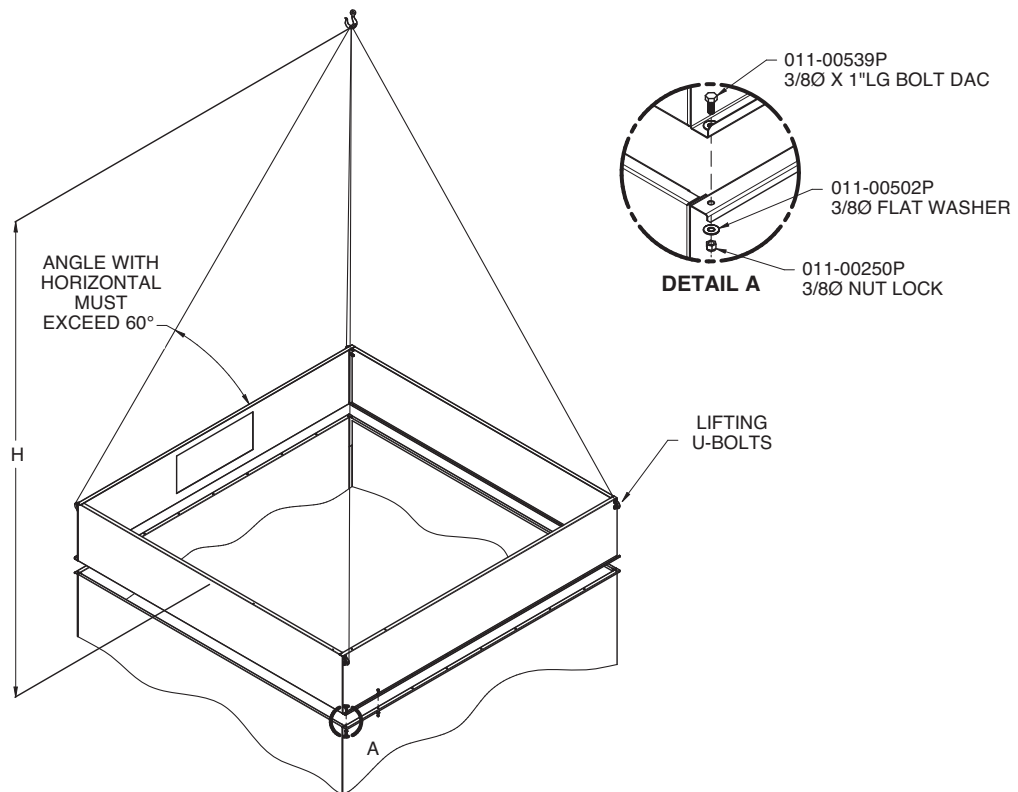


Figure 14 – Discharge Hood Rigging and Assembly (Shown Without Dampers)

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

PMC-E, PMWQ & PMTQ Dimensions	
Box Size	“H” Dimension
5' Wide Models	
5' x 12'	121"
5' x 18'	184"
10' Wide Models	
10' x 12'	121"
10' x 18'	184"
10' x 24'	121"
10' x 36'	184"
12' Wide Models	
12' x 12'	121"
12' x 18'	184"
12' x 20'	205"
12' x 24'	121"
12' x 40'	205"

Rigging Hardware Parts List

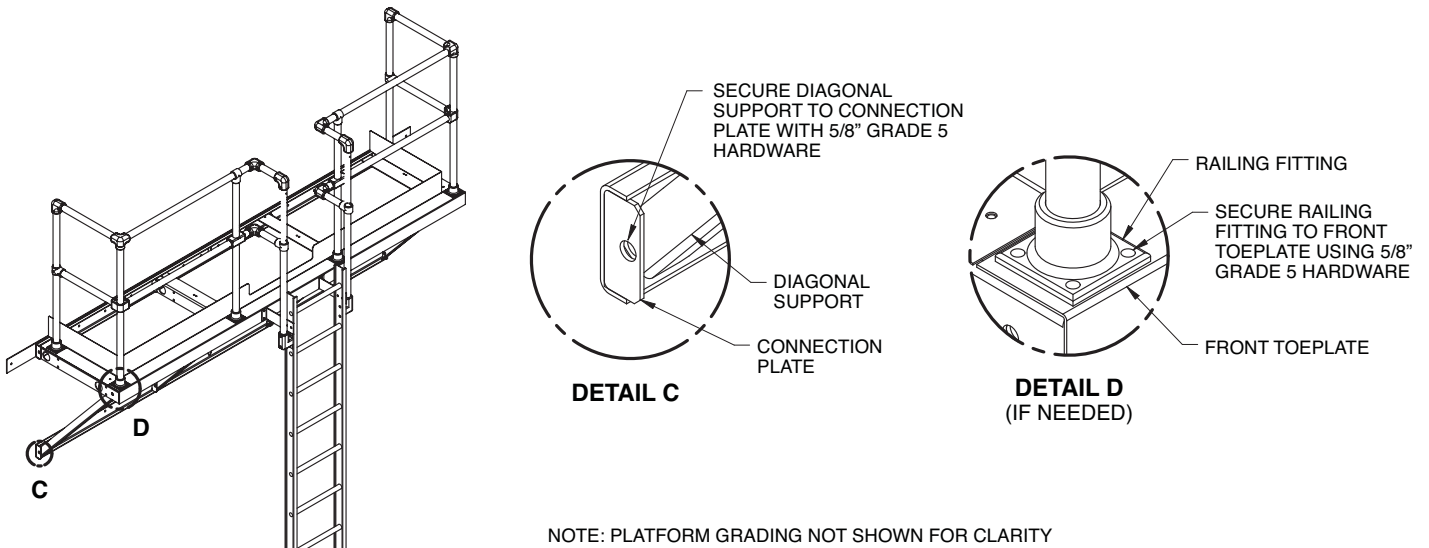
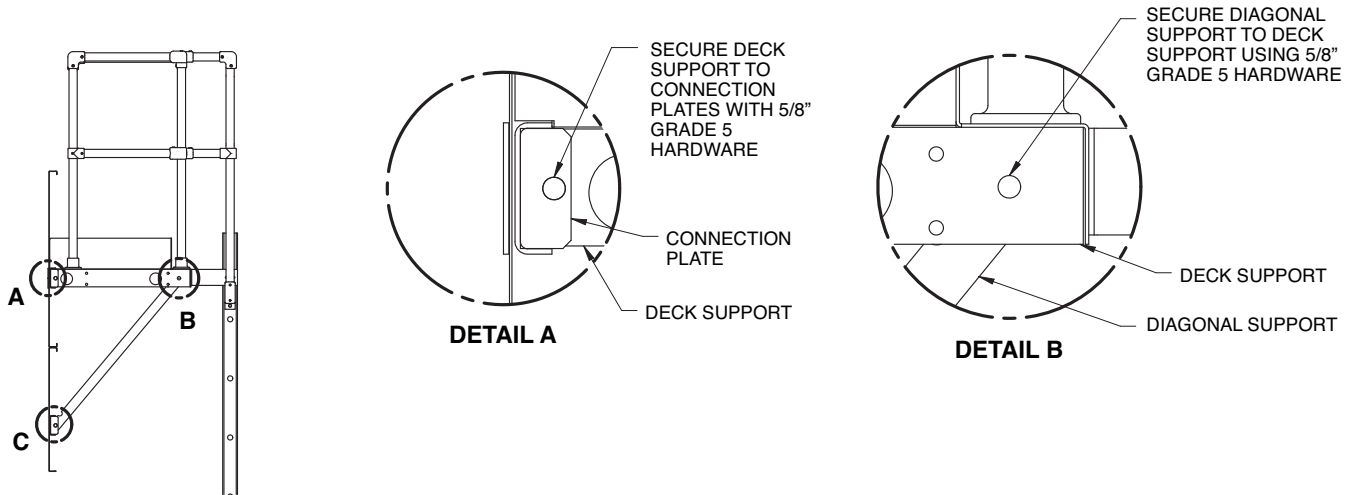
The following table lists those parts which are shipped together with the unit(s) for field assembly.

Box Size	Bolt ¹	Lock Nut ¹	Washer ¹	Sealer Tape
5' x 12'	14	14	28	3
5' x 18'	16	16	28	3
10' x 12'	14	14	28	4
10' x 18'	16	16	32	5
10' x 24'	28	28	56	8
10' x 36'	32	32	64	10
12' x 12'	14	14	28	5
12' x 18'	16	16	32	6
12' x 20'	16	16	32	6
12' x 24'	28	28	56	10
10' x 36'	32	32	64	12
10' x 40'	32	32	64	12

¹ 5/16" Diameter Hardware

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.



NOTE: PLATFORM GRADING NOT SHOWN FOR CLARITY



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 - 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 pre-set at the factory, however adjustment should be checked after rigging. At initial start-up, the water level should be adjusted so that the center of the float is 1" 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 3" to 4" 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 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 Maintenance Instructions and Checklist as well as factory product bulletins for further information.

