



Rigging & Assembly Instructions

PM SERIES & eco-PM SERIES

FORCED DRAFT
EVAPORATIVE
CONDENSERS



Mr. GoodTower





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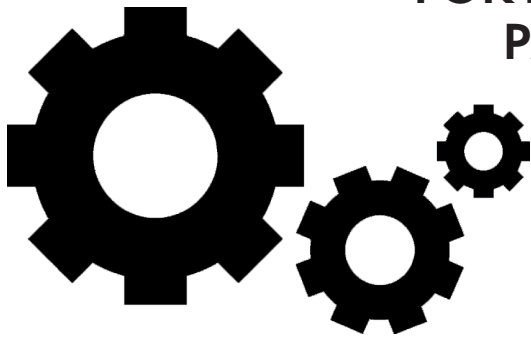
The eco-PM & PM SERIES FORCED DRAFT EVAPORATIVE CONDENSERS should be rigged and assembled using the instructions and recommendations outlined in this bulletin.

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 herein 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 heat transfer casing (top) section(s) separate from the basin and fan (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 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 PM series and eco-PM series coolers and condensers are compliant with the latest IBC codes 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, PM series evaporative condenser, or eco-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 the latest IBC code for required steel support layout and structural design.

Table 1 – Steel Support Dimensions

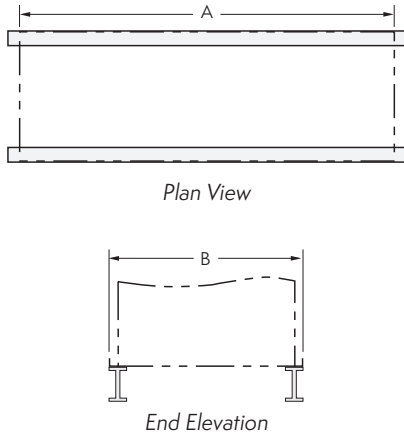


Figure 1 – Structural Steel Support

PMC-E, eco-PMC, PMRC, eco-PMRC		
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	A	B
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	A	B
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"

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

Rigging the Basin & Fan (Bottom) Section – Standard Lift

U-bolts or similar lifting points are located in the basin and 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 basin and 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.

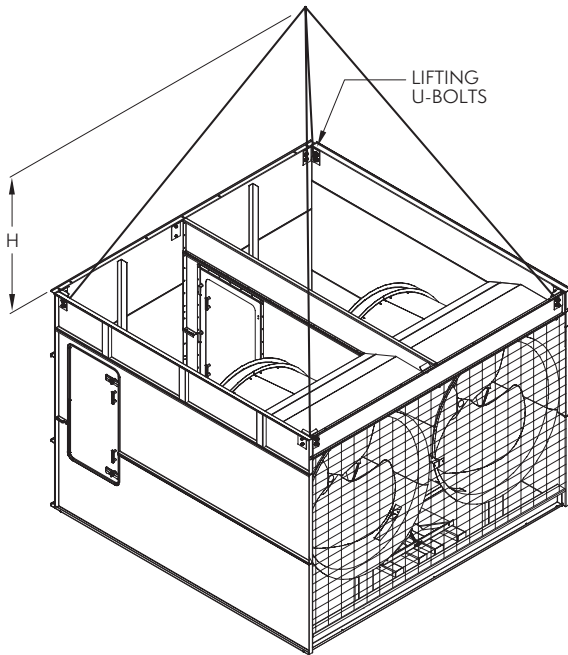


Figure 2 – Basin & Fan Section (up to 20' Long)

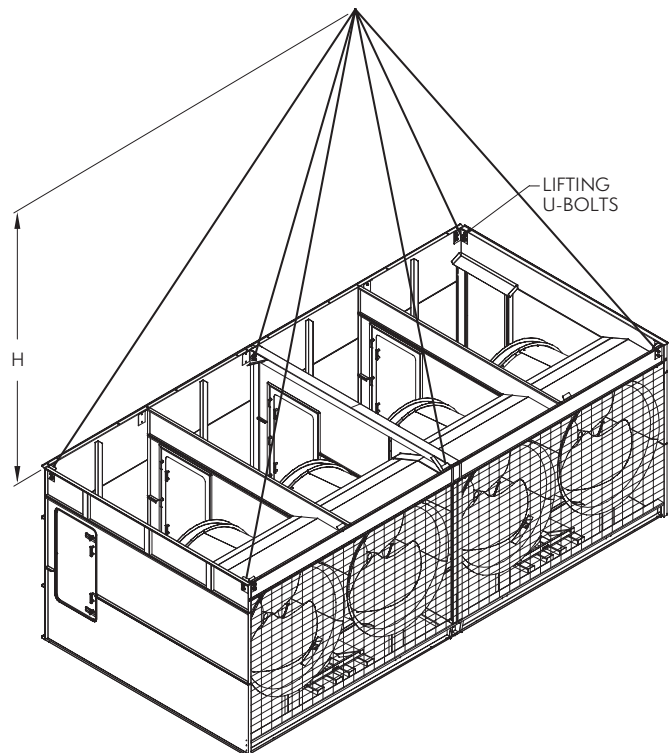


Figure 3 – Basin & Fan Section (over 20' Long)



PM & eco-PM SERIES FORCED DRAFT EVAPORATIVE CONDENSERS

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

Box Size	Model Numbers PM	Model Numbers eco-PM	“H” Dimension
5’ Wide Models			
5’ x 12’	PMC-175E to 240E	eco-PMC-183 to 252	12’
5’ x 18’	PMC-250E to 375E	eco-PMC-279 to 387	17’
10’ Wide Models			
10’x12’	PMRC-332 to PMRC-530	eco-PMRC-275 to eco-PMRC-559	14’
10’x18’	PMRC-503 to PMRC-792	eco-PMRC-479 to eco-PMRC-831	18’
10’x24’	PMRC-725 to PMRC-1056	eco-PMRC-549 to eco-PMRC-1118	23’
10’x36’	PMRC-1006 to PMRC-1586	eco-PMRC-959 to eco-PMRC-1662	33’
12’ Wide Models			
12’ x 12’	PMRC-376 to PMRC-678	eco-PMRC-314 to eco-PMRC-688	15’
12’ x 18’	PMRC-568 to PMRC-1012	eco-PMRC-632 to eco-PMRC-1024	19’
12’ x 20’	PMRC-715 to PMRC-1074	eco-PMRC-573 to eco-PMRC-1095	20’
12’ x 24’ (1)*	PMRC-654 to PMRC-1332	-	23’
12’ x 24’ (2)**	PMRC-816 to PMRC-1326	eco-PMRC-794 to eco-PMRC-1376	23’
12’ x 36’	PMRC-1137 to PMRC-2024	eco-PMRC-1263 to eco-PMRC-2047	33’
12’ x 40’	PMRC-1705 to PMRC-2138	eco-PMRC-1148 to eco-PMRC-2191	36’

* This box size has one 24’ long heat transfer casing top section

** This box size has two 12’ long heat transfer casing top sections

Rigging the Basin & Fan (Bottom) 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 and 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.

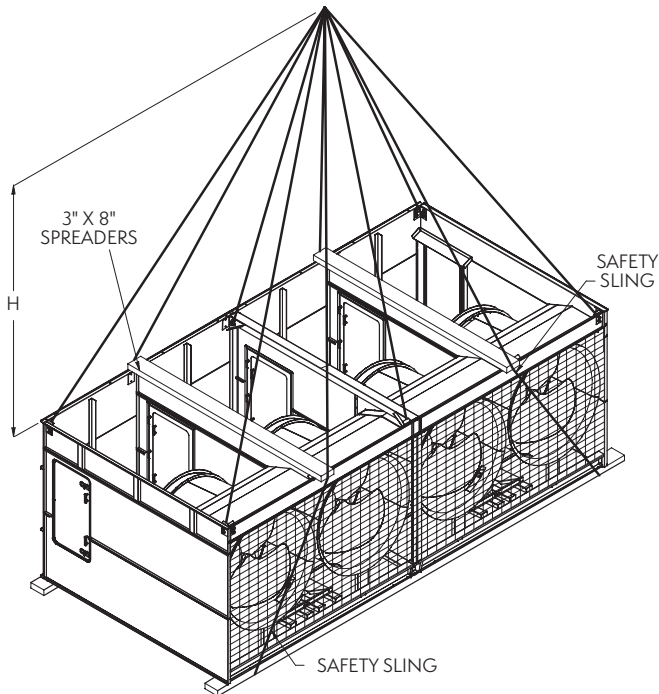


Figure 4 – Proper Rigging Method for Extended Lifts

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

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’ (1)	23’
12’ x 24’ (2)	23’
12’ x 36’	33’
12’ x 40’	36’

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

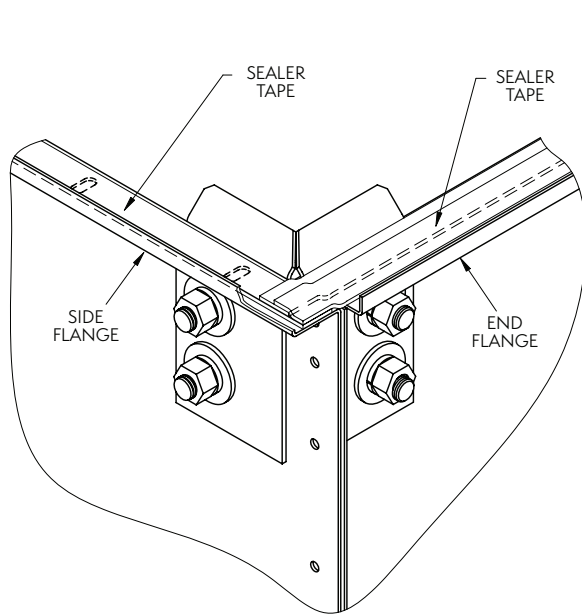


Figure 5 – Proper Sealer Tape Application

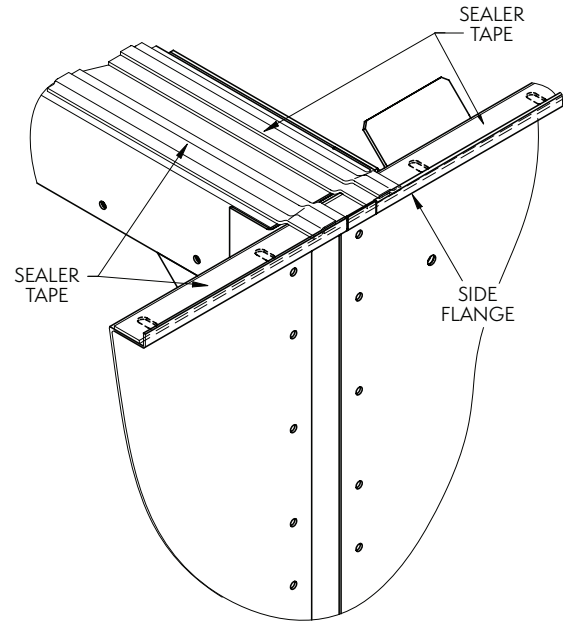


Figure 6 – Sealer Detail for Center Joint of Units with Two or More Casing Sections

Rigging the Heat Transfer Casing (Top) 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 casing 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 casing sections should be removed before lifting from the U-bolts or lift points.

See **Table 4** for the minimum "H" dimensions for rigging the casing 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.

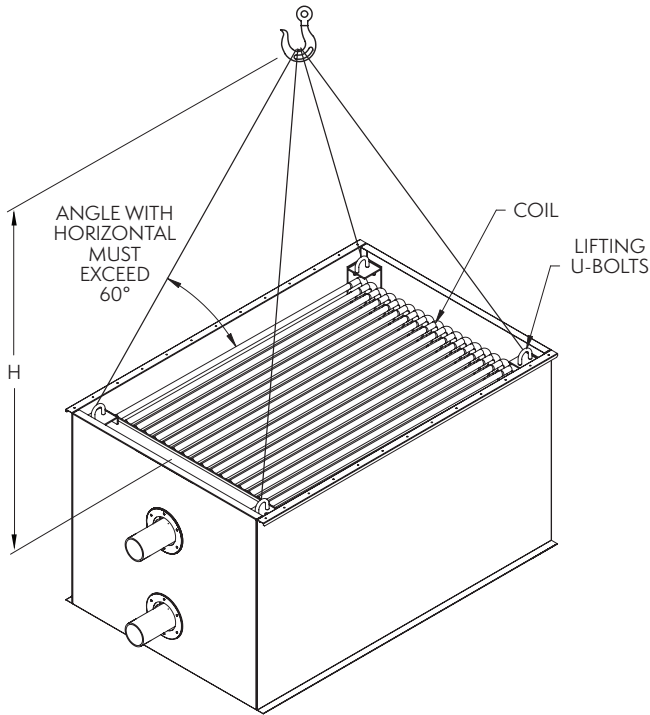


Figure 7 – Small, Single Casing Sections

BOX SIZES:
5' x 12'
5' x 18'

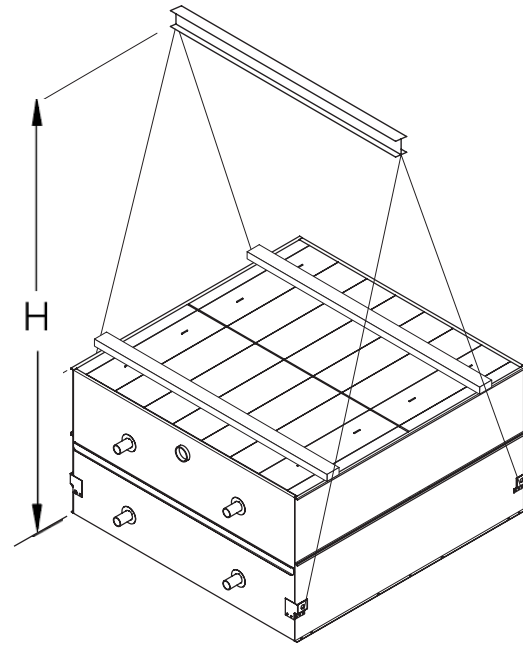


Figure 8 – Large Casing Section (12' Long Sections)

Box sizes:
10' x 12'
10' x 24'
12' x 12'
12' x 24' (2)

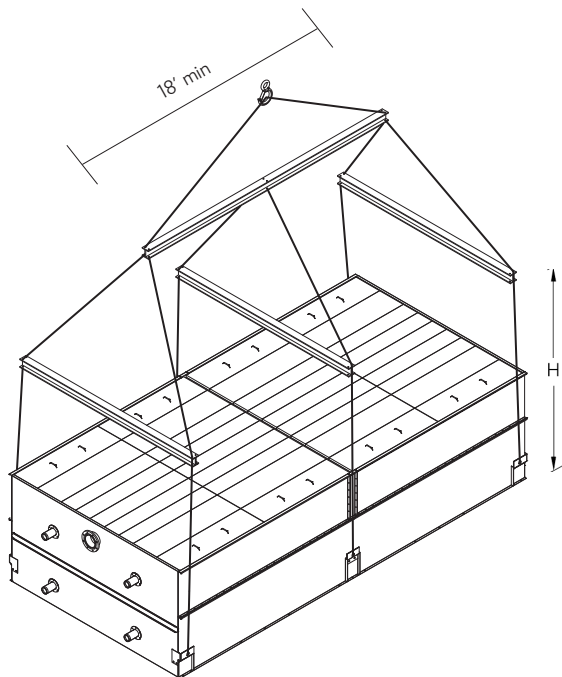


Figure 9 – Large Casing Section (18' Long and Up)

BOX SIZES:
10' x 18', 10' x 36'
12' x 18', 12' x 20'
12' x 24' (1), 12' x 36', 12' x 40'

Table 4 – Minimum "H" Dimension for Coil Casing Section

Box Size	"H" Dimension
5' Wide Models	
5' x 12'	12'
5' x 18'	17'
10' Wide Models	
10' x 12'	15'
10' x 18'	9'
10' x 24'	15'
10' x 36'	9'
12' Wide Models	
12' x 12'	15'
12' x 18'	9'
12' x 20'	9'
12' x 24' (1)	9'
12' x 24' (2)	15'
12' x 36'	9'
12' x 40'	9'

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

Assembly of the Heat Transfer Casing (Top) Section to the Basin & Fan (Bottom) Section

Before assembling the heat transfer casing (top) section to the cold water basin and fan (bottom) section, remove any loose parts shipped in the basin.

Wipe the flanges on the bottom of the casing section. Check to see that the water distribution connection on the casing section is in the correct position relative to the basin and fan section (see certified print). Units are also provided with match markings on each section, as shown in Appendix A. Confirm that sealer tape has been applied to the top of the basin and fan section as shown in **Figures 5 and 6**.

Lower the casing section to within several inches of the basin and 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 casing 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 (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 casing sections, mount the first as described, and then follow the same procedure for the second section.

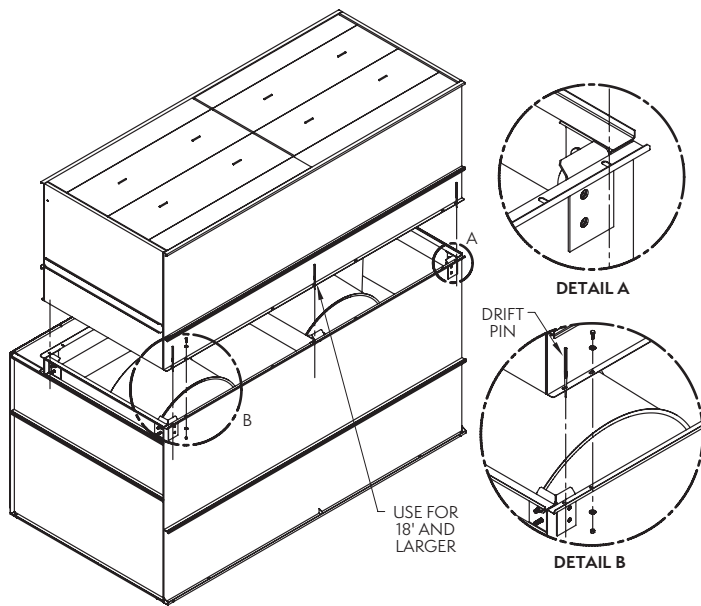


Figure 12 – Mating Casing (Top) Section to Basin & Fan (Bottom) Section

BOX SIZES:
5' x 12'
5' x 18'

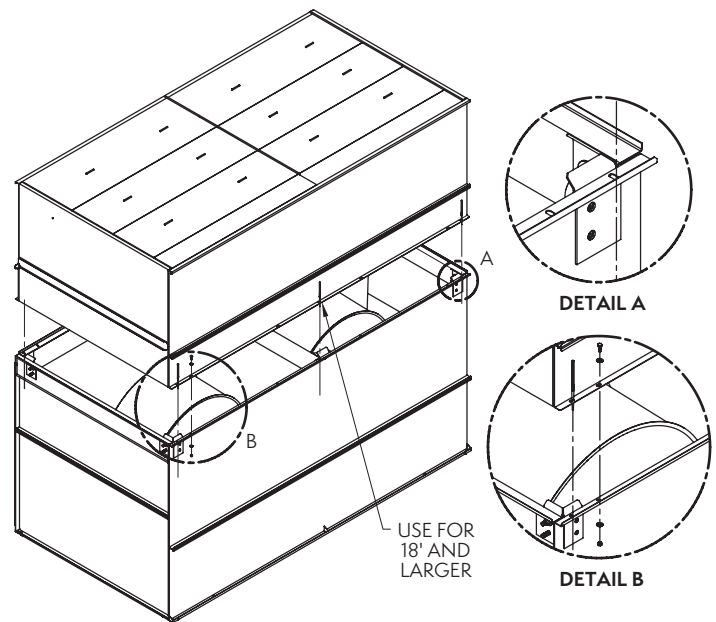


Figure 13 – Mating Casing (Top) Section to Basin & Fan (Bottom) Section

BOX SIZES:
10' x 12'
10' x 18'
10' x 24'
10' x 36'
12' x 12'
12' x 18'
12' x 20'
12' x 24' (2)
12' x 24' (1)
12' x 36'
12' x 40'



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 casing 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 casing 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 casing section.

Install the retainer clips in all four corners as shown in **Figure 14**. For 18-foot-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.

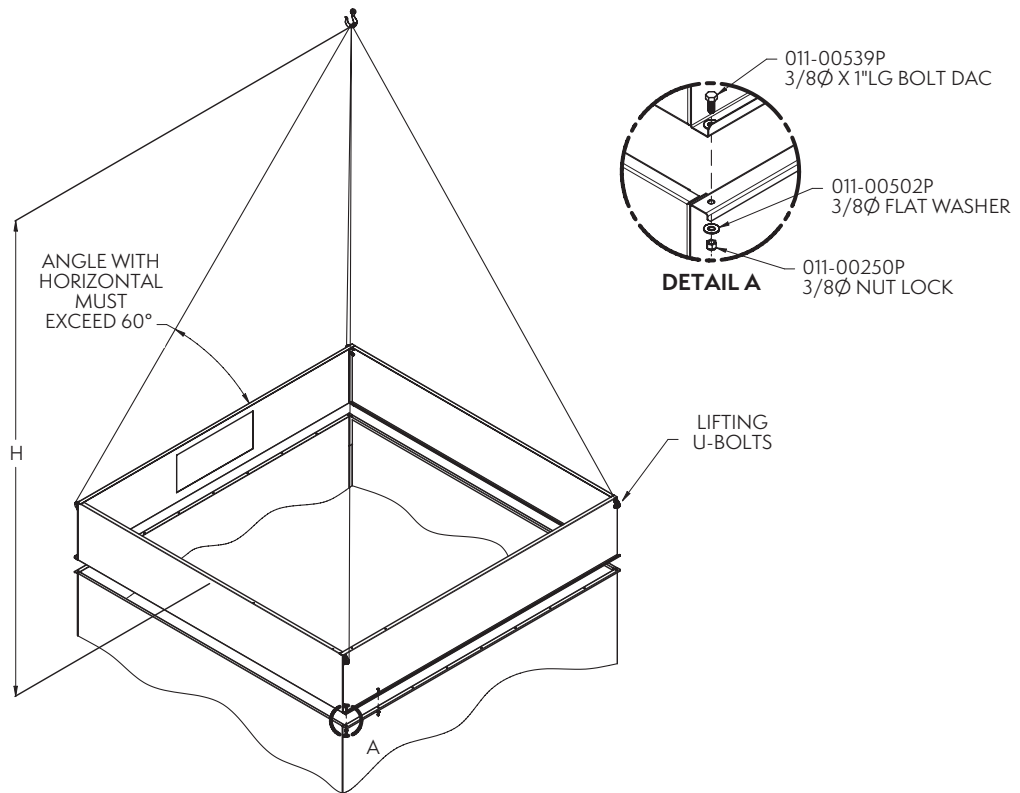


Figure 14 – Discharge Hood Rigging and Assembly (Shown without Dampers)

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

PMC-E, eco-PMC, PMRC and eco-PMRC 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’ (1)	121”
12’ x 24’ (2)	121”
12’ x 40’	205”

(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	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’ (1)	28	28	56	10
12’ x 24’ (2)	28	28	56	10
12’ x 36’	32	32	64	12
12’ x 40’	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**.

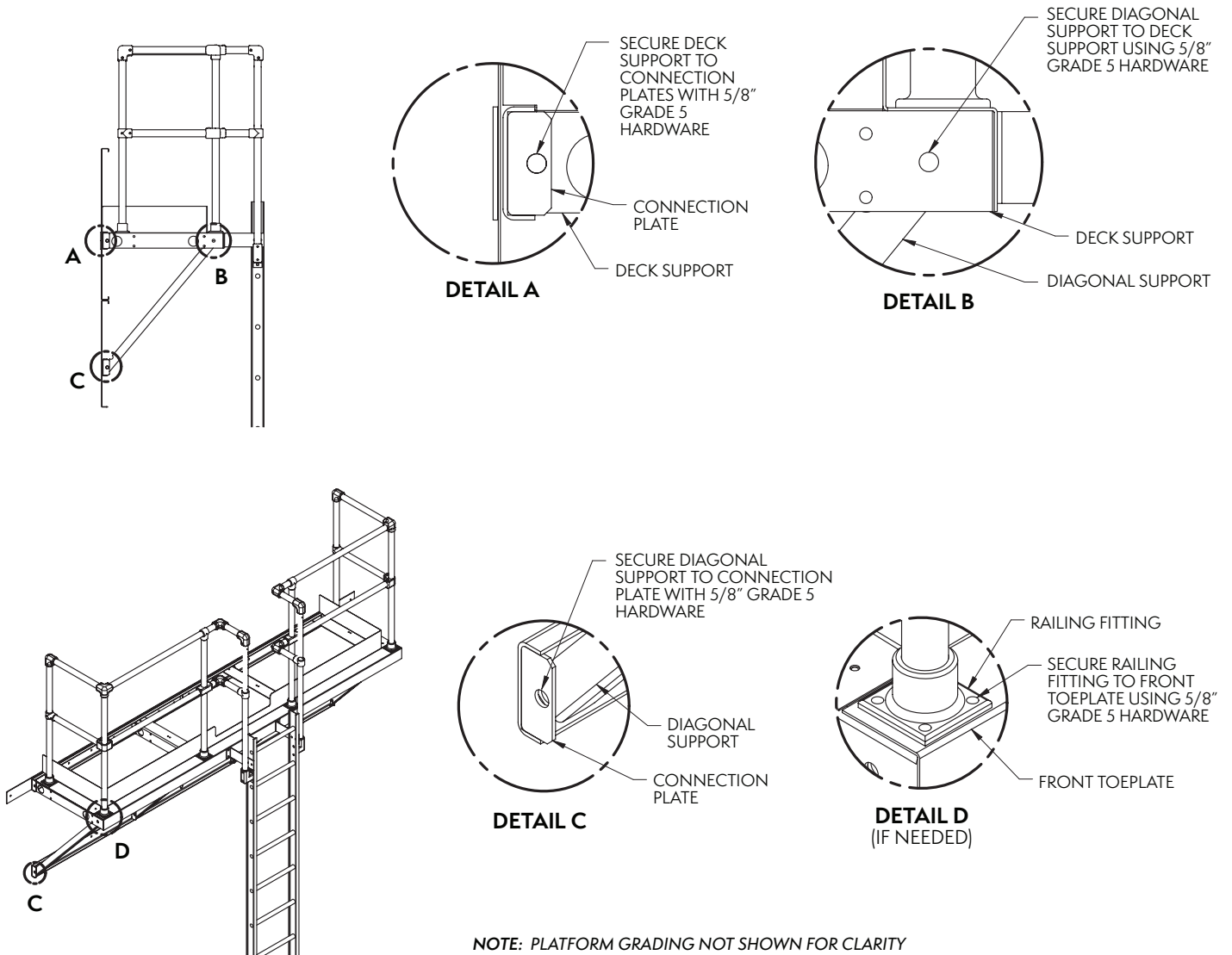


Figure 15 – Field Assembly of External Service Platform and Ladder



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 casing 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 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

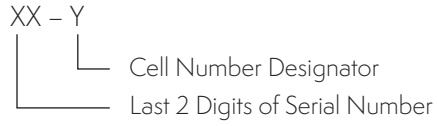
Once installation is complete and the unit is turned on, it is important that it be properly maintained. Maintenance is not difficult or time consuming, but must be done regularly to assure maximum trouble free performance of the unit. Refer to the maintenance instructions enclosed with the unit for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



Appendix A

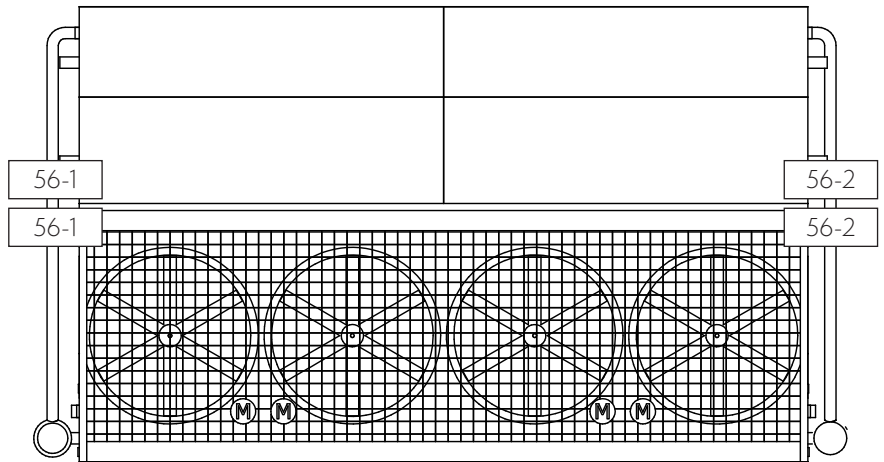
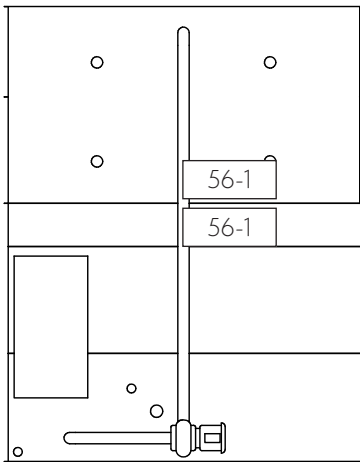
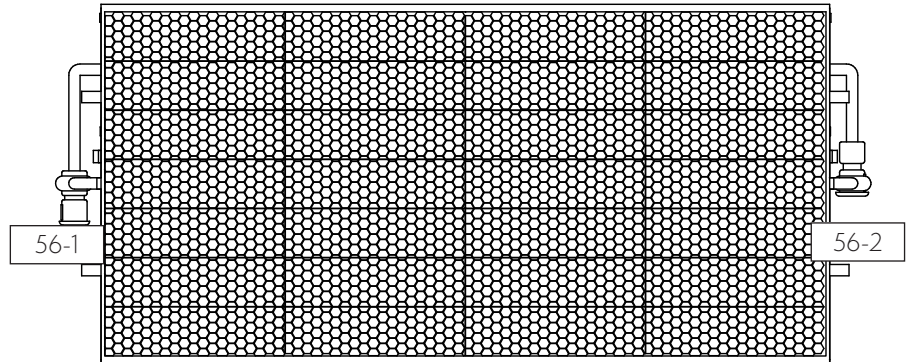
Units are provided with match markings on each section. Standard match marking location is at the rigging seam on the connection face. Standard match marking designation is shown below:



Example:

Serial Number: 23p123456 Number of Casing Sections: 2

Match Marks: Cell #1: 56-1 Cell #2: 56-2





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