FXV3
CLOSED CIRCUIT COOLING TOWER
CXVT
EVAPORATIVE CONDENSER
RIGGING & ASSEMBLY INSTRUCTIONS
IMPORTANT NOTICE

FXV3/CXVT should be rigged and assembled as outlined in this bulletin.

These procedures should be thoroughly reviewed prior to the rigging and assembly of the equipment to acquaint all personnel with procedures to be followed and to ensure that all necessary equipment is available beforehand.

Be sure to have a copy of the submittal package available for reference. If you do not have a copy of this drawing, or if you need additional information about this unit, contact your local BAC Representative whose name and telephone number are on a label adjacent to the access door. The model number and serial number of the unit are also located in this area.
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1. **Warnings and Cautions**

**Safety Precautions**

- **WARNING**: Failure to use appropriate lifting equipment can result in a dropped load, causing severe injury, death, and/or property damage. Lifts must be performed by qualified riggers following BAC published Rigging Instructions, and generally accepted lifting practices. The use of a supplemental safety sling may also be required if the lift circumstances warrant its use, as determined by the rigging contractor.

- **WARNING**: To prevent bodily injury or property damage, only qualified personnel qualified should undertake the installation, operation, maintenance, and repair of this equipment. Proper care, procedures, and tools must be used in handling, lifting, installing, operating, maintaining, and repairing this equipment.

- **CAUTION**: Equipment damage may occur if water, snow, ice, or debris has collected in the basin or elsewhere in the unit. Such accumulations will add substantially to the equipment's lifting weight placing equipment at risk of damage that could result in injury. Before an actual lift is undertaken, ensure no water, snow, ice, or debris has collected in the basin or elsewhere in the unit.

- **WARNING**: Equipment damage may occur if the unit is not properly anchored before operation begins. Equipment damage could result in death or serious injury. Ensure unit is properly anchored before operation beings.

- **WARNING**: ENDURADRIVE® Fan System motors can induce voltage and current in the motor leads by rotating the motor shaft, even when the motor is completely disconnected from the power source, which can lead to severe bodily injury or death from electrical shock. Mechanically lock or tie down the fan until all wiring has been completed and before servicing the drive system, or when performing any motor maintenance procedure.

- **WARNING**: Magnetic and electromagnetic fields in the vicinity of current carrying conductors and ENDURADRIVE® Fan System motors can result in a serious health hazard to persons with cardiac pacemakers, metal implants, and hearing aids. To avoid risk, stay away from the area surrounding the ENDURADRIVE® Fan System motor.

- **WARNING**: The ENDURADRIVE® Fan System variable frequency drive may apply hazardous voltages to the motor leads after power to the controller has been turned off. To avoid the risk of severe bodily injury or death from electrocution, verify that the controller is incapable of delivering hazardous voltages and that the voltage at the motor leads is zero before servicing the drive system, or when performing any motor maintenance procedure.
Equipment Precautions

- Each unit must be located and positioned to prevent the introduction of discharge air into the ventilation systems of the building on which the unit is located and of adjacent buildings.
- For weight information, refer to the submittal drawing package.
- All single-cell and multi-cell units must be rigged one section at a time.
- For weight information, refer to the submittal drawing package. Any motors or accessories shipped in the cold water basin must be removed prior to installing the upper (mechanical and coil casing) section.
- Failure to level the coil module for rigging will prevent proper engagement of rigging guides.
- ENDURADRIVE® Fan System mechanical braces are structurally required and are not removable.
2. Introduction

Safety

Adequate precautions appropriate for the installation and location of these products should be taken to safeguard the equipment and the premises from damage and the public from possible injury. The procedures listed in this manual must be thoroughly reviewed prior to rigging and assembly. Read all warnings, cautions and notes.

When the fan speed of the unit is to be changed from the factory set speed, including the use of a variable speed device, steps must be taken to avoid operating the equipment at or near the fan’s “critical speed,” which could result in fan failure and possible injury or damage. Before changing fan speed, consult your local BAC Representative and refer to the resonant speed identification procedure available in the operation & maintenance manual.

**WARNING**: Failure to use appropriate lifting equipment can result in a dropped load, causing severe injury, death, and/or property damage. Lifts must be performed by qualified riggers following BAC published Rigging Instructions, and generally accepted lifting practices. The use of a supplemental safety sling may also be required if the lift circumstances warrant its use, as determined by the rigging contractor.

Shipping

Models FXV3/CXVT are factory assembled to ensure uniform quality with minimum field assembly. FXV3/CXVT models ship in four sections per cell (one lower and three upper: each coil section ships separately) to minimize rigging and freight costs. Contact your local BAC Representative for more information. For the dimensions and weights of a specific unit or section, refer to the submittal drawings.

**WARNING**: To prevent bodily injury or property damage, only qualified personnel qualified should undertake the installation, operation, maintenance, and repair of this equipment. Proper care, procedures, and tools must be used in handling, lifting, installing, operating, maintaining, and repairing this equipment.
Pre-Rigging Checks

When the unit is delivered to the jobsite, it should be checked thoroughly to ensure all required items have been received and are free of any shipping damage prior to signing the bill of lading.

The following parts should be inspected (if applicable for the unit’s configuration):

- Sheaves and Belts
- Exterior Surfaces
- Interior Surfaces
- Bearing Supports
- Louvers/Combined Inlet Shields
- Fan Motor(s)
- Spray Water Pumps
- Fan Guard(s)
- Mating Surfaces Between Sections/Modules
- Fan(s) and Fan Shaft(s)
- Miscellaneous Items: All bolts, nuts, washers, and sealer tape required to assemble sections or component parts are furnished by BAC and shipped with the unit.
- Water Distribution System
- Fan(s) and Fan Shaft(s)
- Cold Water Basin Accessories

Unit Weights

Before rigging any unit, the weight of each section should be verified from the unit submittal drawing. Unit print weights include the final assembled unit with all accessories.

**CAUTION**: Equipment damage may occur if water, snow, ice, or debris has collected in the basin or elsewhere in the unit. Such accumulations will add substantially to the equipment’s lifting weight placing equipment at risk of damage that could result in injury. Before an actual lift is undertaken, ensure no water, snow, ice, or debris has collected in the basin or elsewhere in the unit.

Anchoring

Seven-eighths inch (7/8”) diameter holes are provided in the bottom flange of the basin section for bolting the unit to the support beams. Refer to the suggested support drawing included in the submittal for location and quantity of the mounting holes. The unit must be level for proper operation. Anchor bolts must be provided by others. The IBC rating is only certified with standard anchorage locations. Using alternate anchorage locations or alternate steel supports will void any IBC wind or seismic ratings. Contact your local BAC Representative for details.

**WARNING**: Equipment damage may occur if the unit is not properly anchored before operation begins. Equipment damage could result in death or serious injury. Ensure unit is properly anchored before operation begins.
Cold Weather Operation

These products must be protected by mechanical and operational methods against damage and/or reduced effectiveness due to possible freeze-up. Refer to the FXV and FXV3 Closed Circuit Cooling Tower CXVB and CXVT Evaporative Condenser Operation & Maintenance Manual at www.BaltimoreAircoil.com or contact your local BAC Representative for recommended protection alternatives.

Placement

All evaporative cooling equipment must be placed in a location that ensures an adequate supply of fresh air into the air intakes. When units are located adjacent to walls or in enclosures, care must be taken to ensure the warm, saturated, discharge air is not redirected back to the air intakes. Each unit must be positioned to prevent the introduction of discharge air into the ventilation systems of the building on which the unit is located and of adjacent buildings. For detailed recommendations on BAC equipment layout, see our website at www.BaltimoreAircoil.com or contact your local BAC Representative.

**NOTICE:** Each unit must be located and positioned to prevent the introduction of discharge air into the ventilation systems of the building on which the unit is located and of adjacent buildings.

Warranties

Please refer to the Limitation of Warranties (located in the submittal package) applicable to and in effect at the time of the sale/purchase of these products.

Unit Operation

Prior to start-up and unit operation, refer to the unit operation & maintenance manual shipped with the unit and also available at www.BaltimoreAircoil.com.
3. Unit Rigging & Assembly

Rigging

NOTICE: For weight information, refer to the submittal drawing package.

NOTICE: All single-cell and multi-cell units must be rigged one section at a time.

WARNING: Failure to use appropriate lifting equipment can result in a dropped load, causing severe injury, death, and/or property damage. Lifts must be performed by qualified riggers following BAC published Rigging Instructions, and generally accepted lifting practices. The use of a supplemental safety sling may also be required if the lift circumstances warrant its use, as determined by the rigging contractor.

Refer to Table 1 and Figure 1, Figure 2, and Figure 3 for each section’s required minimum spreader bar length $W_1$ and the recommended minimum vertical dimension “H”.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Lower Section</th>
<th>Plenum Section</th>
<th>Coil Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H</td>
<td>W1</td>
<td>H</td>
</tr>
<tr>
<td>FXV3-1224-xxx</td>
<td>20'</td>
<td>12'</td>
<td>20'</td>
</tr>
<tr>
<td>FXV3-1426-xxx</td>
<td>20'</td>
<td>14'</td>
<td>22'</td>
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<tr>
<td>CXVT-x-1224-x, XECXVT-1224-x, CXVT-x-2424-x, XECXVT-2424-x</td>
<td>20'</td>
<td>12'</td>
<td>20'</td>
</tr>
<tr>
<td>CXVT-x-1426-x, XECXVT-1426-x, CXVT-x-2826-x, XECXVT-2826-x</td>
<td>20'</td>
<td>14'</td>
<td>22'</td>
</tr>
</tbody>
</table>

Table 1. Minimum Vertical Dimension and Spreader Bar Length for FXV3 and CXVT Units

<table>
<thead>
<tr>
<th>FXV3 Model Number</th>
<th>Nominal Box Size</th>
<th>Coil Module Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>FXV3-1224-20x-xx</td>
<td>12’ x 24’</td>
<td>Short</td>
</tr>
<tr>
<td>FXV3-1224-24x-xx</td>
<td>12’ x 24’</td>
<td>Short</td>
</tr>
<tr>
<td>FXV3-1224-28x-xx</td>
<td>12’ x 24’</td>
<td>Tall</td>
</tr>
<tr>
<td>FXV3-1224-30x-xx</td>
<td>12’ x 24’</td>
<td>Tall</td>
</tr>
<tr>
<td>FXV3-1224-32x-xx</td>
<td>12’ x 24’</td>
<td>Tail</td>
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<tr>
<td>FXV3-1224-36x-xx</td>
<td>12’ x 24’</td>
<td>Tall</td>
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<td>FXV3-1426-28x-xx</td>
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<td>FXV3-1426-30x-xx</td>
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<tr>
<td>FXV3-1426-32x-xx</td>
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<tr>
<td>FXV3-1426-36x-xx</td>
<td>14’ x 26’</td>
<td>Tall</td>
</tr>
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Table 2. FXV3 Nominal Box Size & Coil Module Height by Model Number
<table>
<thead>
<tr>
<th>CXVT Model Number</th>
<th>Nominal Box Size</th>
<th>Coil Module Height</th>
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</thead>
<tbody>
<tr>
<td>CXVT-581-1224-15</td>
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<td>CXVT-617-1224-15</td>
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<td>CXVT-658-1224-30</td>
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<td>CXVT-676-1224-25</td>
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<td>CXVT-699-1224-30</td>
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<td>CXVT-700-1224-40</td>
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<td>CXVT-731-1224-50</td>
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<td>CXVT-744-1224-40</td>
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<td>CXVT-754-1224-60</td>
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<td>CXVT-778-1224-50</td>
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<td>CXVT-808-1224-60</td>
<td>12’ x 24’</td>
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</tr>
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<td>CXVT-813-1224-50</td>
<td>12’ x 24’</td>
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</tr>
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<td>CXVT-816-1224-40</td>
<td>12’ x 24’</td>
<td>Short</td>
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<td>CXVT-843-1224-60</td>
<td>12’ x 24’</td>
<td>Tall</td>
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<td>CXVT-855-1224-50</td>
<td>12’ x 24’</td>
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<td>CXVT-887-1224-60</td>
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<td>CXVT-1005-1426-75</td>
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<td>CXVT-1015-1426-60</td>
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<td>CXVT-963-1426-75</td>
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<td>Short</td>
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<tr>
<td>CXVT-965-1426-60</td>
<td>14’ x 26’</td>
<td>Short</td>
</tr>
<tr>
<td>CXVT-981-1426-50</td>
<td>14’ x 26’</td>
<td>Tall</td>
</tr>
</tbody>
</table>

Table 3. CXVT Nominal Box Size & Coil Module Height by Model Number
Lifting Cable

Safety Slings

Spreader Bar

Lifting Cable

Safety Slings

Figure 1. Plenum Module Lift

Figure 2. Coil Module Lift

Figure 3. Lower Section Lift

Figure 4. Lower Section Sealing Detail

W1 (MIN)

Critical Seal (See Figure 6)

Perimeter Flange Seals

Spreader Bar

W1 (MIN)

Critical Seal (See Figure 7)
Section Assembly

**NOTICE:** For weight information, refer to the submittal drawing package. Any motors or accessories shipped in the cold-water basin must be removed prior to installing the upper (mechanical and coil casing) section.

1. Remove any accessories shipped in the cold-water basin.
2. Position the lower section on the unit supports and bolt in place. Refer to Figure 3 on Page 12 and Anchoring on Page 8.
3. Wipe moisture and dirt from the perimeter flange and plenum step as shown in Figure 4.
4. Apply flat butyl sealer tape (BAC part #554000) across the entire plenum step seal as shown in Figure 5.
   a. Refer to critical seal area shown in Figure 4 and detailed in Figure 7.
5. Apply a 2” x 2” piece of flat butyl sealer tape to the corner rigging guides as shown in Figure 4 and detailed in Figure 6.
6. Apply flat butyl sealer tape around the entire perimeter of the lower section. Align the tape on the perimeter flange as shown in Figure 8. See Figure 6 and Figure 7 for critical sealing areas, allow 1” overlap tape at these locations.

![Figure 5. FXV3 and CXVT Lower Section](image-url)
Figure 6. Perimeter Seal Detail

Figure 7. Plenum Step Detail

Align inside edge of tape with edge of flat surface.

Figure 8. Application of Butyl Sealer Tape

Flat Butyl Sealer Tape

Inside Face

2” x 2” Piece of Flat Butyl Sealer Tape (Allow 1” Overlap)
7. Lift and set the plenum module. Refer to Figure 1 for lifting details. Center the plenum module transversely and longitudinally. The rigging guides (Figure 9 & Figure 10) will engage when the plenum module is within 2" of the lower section.

8. Bolt the plenum module in place at the four internal bracket locations using provided 1/2" hardware. See Figure 11 for typical bolting detail.
9. Connect the lower section and plenum section internal spray water piping by using rubber couplings and SST T-bolt hose clamps. Refer to Figure 13 for connection details.

See Detail B (typical both ends)

Plenum Section
(Details hidden for clarity)

See Detail A (typical both ends)

Rubber Coupling with SST T-Bolt Hose Clamps

Detail A – Lower Section to Plenum Section

Rubber Coupling with SST T-Bolt Hose Clamps

Detail B – Plenum Section to Coil Module

*Figure 13. Internal Spray Water Piping Connections*
10. Before rigging the coil modules, wipe any moisture and debris from the corner columns and apply “D” seals (BAC part # 271665) at two locations on each coil module as shown in Figure 14 and Figure 15.
   
a. Coil module height “short” will receive 78” of “D” seal. Coil module height “tall” will receive 97” of “D” seal. Refer to Table 2 and Table 3 to determine coil module height.

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**Figure 14. Coil Module as Seen from the Plenum Side**

**Figure 15. Detail of Corner Column**
11. Lift the coil module and verify that it is level. Refer to Figure 2 for lifting details. Adjust lifting devices as necessary to level the coil module before attempting to set. As shown in Figure 16, the coil connections of the coil module weigh more and will affect the balance. Tolerances are given in Figure 17 and Figure 18.

**NOTICE:** Failure to level the coil module for rigging will prevent proper engagement of rigging guides.

12. To engage the rigging guides, the coil module must be positioned between 2-3/4" to 3-3/4" above the lower section as it is moved towards the plenum module. Once the coil module rigging guides have engaged the plenum module corner columns, lower the coil into final position as shown in Figure 19.

13. Bolt the coil module to the lower section along the louver face flange, see Figure 11 for typical bolting detail.
14. Install four (4) internal splice plates connecting upper section and lower section purlins, as shown in Figure 20. Use 1/2” Grade 5 hardware.

12. Install external splice plates on the upper section plate for every pair of lifting ears (4 locations total). Use two splice plates, one on top of the other at these locations. Refer to Figure 21. Use 1/2” Grade 5 hardware.
13. Join coil section to upper plenum section. Refer to **Figure 22** and
14. **Figure 23**.
   a. Remove corner drift eliminator to gain access to coil section.
   b. Using supplied 1/2" Grade 5 hardware, bolt upper plenum section to coil section. Refer to **Figure 22** and
   c. **Figure 23**.
   d. Repeat on all 4 corners of the upper plenum section.
15. Join lower section to upper plenum section. Refer to **Figure 22** and **Figure 24**.
   a. Using supplied 1/2" Grade 5 hardware, bolt lower section to upper plenum section. Refer to **Figure 22** and **Figure 24**.
   b. Repeat until all 8 brackets are bolted together. 4 brackets are located above the access door and 4 brackets are located under the drift eliminator pan.
16. Connect the plenum section and coil module internal spray water piping by using rubber couplings and SST T-bolt hose clamps. Refer to **Figure 13** for connection details.
Mechanical Section’s Shipping Braces Removal on (Optional) Gear and Belt Drive Units (Optional)

Gear and belt fan drive systems may be supplied with shipping braces as shown in Figure 25 and Figure 26. Belt fan drive systems include the Baltidrive® Power Train and Baltiguard™ Fan System. Shipping braces are required for shipping only. Remove the shipping braces if they interfere with platform handrails or obstruct the working area. Shipping braces may be loosened to help align the upper plenum section with the coil module.

**NOTICE:** ENDURADRIVE® Fan System mechanical braces are structurally required and are not removable.

![Figure 25. Belt Drive Shipping Bracing](image1)

![Figure 26. Gear Drive Shipping Bracing](image2)
Plain Pipe Stub Coil Connections Nitrogen Charge Removal

Coils may be supplied with plain pipe stub coil connections that are capped and charged with nitrogen from the factory. Refer to Figure 27 for information on validating coil charge pressure. Plain pipe stub coil connections must be field cut and beveled before welding. Prior to cutting the pipe stub, relieve the pressure inside each coil using the factory installed Schrader valve.

Figure 27. Coil Connections Capped and Charged
3. Accessory Installation

General Packing & Labeling Information

The parts for your new BAC equipment have been carefully packed to ensure that they arrive in good condition and have been sorted by field kit. This has been done to reduce the possibility of misplacing items and ensure trouble-free assembly. Note that extra hardware, caulk, and sealer tape (if required) have been provided to accommodate field assembly conditions.

Parts are individually labeled with for easy identification. Key information is provided on each part label to help identify the proper location for each part. This information is shown in Figure 28.

![Sample Part Label](image.png)
ENDURADRIVE® Fan System Installation

The ENDURADRIVE® Fan System is optional for select Series FXV3 and CXVT models. The ENDURADRIVE® Fan System variable frequency drive (VFD) is to be installed per the ACS880+N5350 Cooling Tower Drives User’s Guide available at www.abb.com. The fan motor must be wired directly into the VFD and cannot be wired across the line. For wiring details, refer to the submittal drawings.

Warnings for the ENDURADRIVE® Fan System

⚠️ WARNING: ENDURADRIVE® Fan System motors can induce voltage and current in the motor leads by rotating the motor shaft, even when the motor is completely disconnected from the power source, which can lead to severe bodily injury or death from electrical shock. Mechanically lock or tie down the fan until all wiring has been completed and before servicing the drive system, or when performing any motor maintenance procedure.

⚠️ WARNING: Magnetic and electromagnetic fields in the vicinity of current carrying conductors and ENDURADRIVE® Fan System motors can result in a serious health hazard to persons with cardiac pacemakers, metal implants, and hearing aids. To avoid risk, stay away from the area surrounding the ENDURADRIVE® Fan System motor.

⚠️ WARNING: The ENDURADRIVE® Fan System variable frequency drive may apply hazardous voltages to the motor leads after power to the controller has been turned off. To avoid the risk of severe bodily injury or death from electrocution, verify that the controller is incapable of delivering hazardous voltages and that the voltage at the motor leads is zero before servicing the drive system, or when performing any motor maintenance procedure.

Important Notes for the ENDURADRIVE® Fan System

- VFD must be powered on at all times so that trickle current can remove moisture from motor when idle.
- Use only a shielded motor power cable with a complete circumferential braided or copper film/tape ground jacket around the power leads. This ground should be secured to the motor frame from within the motor terminal box and must return without interruption to the drive ground.
- To prevent equipment damage, be sure that the electrical service is not capable of delivering more than the maximum motor rated amps listed on the rating plate.
Access Door Platform & Ladder Installation

Refer to Table 4 for access door platform installation information. For ladder opening safety gate installation refer to Ladder Opening Safety Gate Installation on Page 55.

<table>
<thead>
<tr>
<th>Reference Drawing</th>
<th>Spray Water Type</th>
<th>Drawing Number</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Door Platform Installation</td>
<td>N/A</td>
<td>TA1JRR</td>
<td>26</td>
</tr>
<tr>
<td>Access Door Platform Ladder Installation</td>
<td>Remote Sump</td>
<td>Figure 29</td>
<td>25</td>
</tr>
<tr>
<td>Access Door Platform Ladder Installation</td>
<td>Pump Suction</td>
<td>CAR130</td>
<td>27</td>
</tr>
</tbody>
</table>

*Table 4. Access Door Platform Reference Drawings*

- GLV/BBD: PVC 3/8”X2 1/2” BOLT WITH 2FW, LW & NUT
- SST: SST 3/8”X2 1/2” BOLT WITH 2FW & NYLOCK

*Figure 29. Access Door Platform Ladder Installation, Remote Sump*
Figure 30. TA1JRR Access Door Platform Installation

NOTES:
1. SEE GENERAL FASTENING INSTRUCTIONS FOR TYPICAL DETAILS.
2. ALL UNSPECIFIED HARDWARE IS:
   - GLV/BBD: PVC Ø3/8" X 1 1/4" LG BOLT WITH 2 FW, LW & NUT
   - SST: SST Ø3/8" X 1 1/4" LG BOLT WITH 2FW & NYLOCK NUT
3. PLATFORM FOR STANDARD LADDER POSITION SHOWN. LADDER OPENING MAY BE ON EITHER SIDE OR END OF PLATFORM. SEE SUBMITTAL PACKAGE FOR LADDER LOCATIONS.
Figure 31. CAR130 Access Door Platform Ladder Installation, Pump Suction
Fan Deck Extension Installation

Fan deck extensions are shown in Figure 32 and Figure 33. Refer to Table 5 for fan deck extension installation reference drawings. Refer to Table 2 and Table 3 on Page 10 and 11, to determine unit width. For fan deck handrail installation information refer to Fan Deck Handrail Installation on Page 62. For fan deck ladder installation information refer to section Fan Deck Ladder Installation on Page 78.

<table>
<thead>
<tr>
<th>Reference Drawing</th>
<th>Unit Width</th>
<th>Drawing Number</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan Deck Extension Installation</td>
<td>12’</td>
<td>TA15RR</td>
<td>29</td>
</tr>
<tr>
<td>Fan Deck Extension Installation</td>
<td>14’</td>
<td>TA16RR</td>
<td>30</td>
</tr>
</tbody>
</table>

*Table 5. Fan Deck Extension Reference Drawings*

*Figure 32. Plan View, Fan Deck Extension*

*Figure 33. Side Elevation, Fan Deck Extension*
Figure 34. TA15RR Fan Deck Extension Installation 12’ Units
Figure 35. TA16RR Fan Deck Extension Installation 14’ Units

**STEP 1 - FRAME ASSEMBLY**

- "AFA" and "ARF" are installed on 3/8 studs, use 3/8 nut, LW & FV (16 places)
- Orient "AFA" as shown to avoid interference (typ both ends)
- Orient "ARF" bolt back to back
- S/16"x1 1/4" Lg cutter grating clip

**DETAIL A**

- Fasten "AFA" outside "AFA".
- "ARF"

**DETAIL B**

- Fasten "ARF" inside "ARF".
- "AFA"

**FIELD INSTALLATION NOTE:**

- Remove factory hardware if supplied.
- Use existing holes for mounting the fan deck extension to the unit.

**STEP 2 - BRACE INSTALLATION**

- Bolt "ARF" to bottom brackets first, then to "AFA" & "ARF"

**STEP 3 - GRATING INSTALLATION**

**NOTES:**

1. See general fastening instructions for typical details.
2. All unspecified fasteners are:
   - 2-1/2" x 6" x 1/4" LG bolt with FV, LW & FV,
   - SRT, SST, 3/8" x 1/4" LG bolt with FV & FV lock nut.
External Motor Gear Drive Motor Base, Platform & Ladder Installation

Refer to Table 6 for external motor gear drive motor base, platform, and ladder installation reference drawings. For multi-section ladder assembly refer to Multi-Section Ladder Assembly on Page 76. For ladder opening safety gate installation refer to Ladder Opening Safety Gate Installation on Page 55.

<table>
<thead>
<tr>
<th>Reference Drawing</th>
<th>Drawing Number</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Motor Gear Drive Motor and Base Installation</td>
<td>CMR053</td>
<td>32</td>
</tr>
<tr>
<td>External Motor Gear Drive Platform Installation</td>
<td>TA4KRR</td>
<td>33</td>
</tr>
<tr>
<td>External Motor Gear Drive Platform Ladder Installation</td>
<td>TL0ZRR</td>
<td>34</td>
</tr>
<tr>
<td>External Motor Gear Drive Platform Ladder Safety Cage</td>
<td>TL1CRR</td>
<td>35</td>
</tr>
</tbody>
</table>

Table 6. External Motor Gear Drive Platform Reference Drawings

Figure 36. End Elevation External Motor Gear Drive with Platform
Figure 37. CMR053 External Motor Gear Drive Motor and Base Installation
Figure 38. TA4KRR External Motor Gear Drive Platform Installation

FASTEN TO UPPER BRACKET WITH (3) 8"x3/4" BOLTS WITH F/F & L/L INTO A KIN-NUT (3 PLACES)

FASTEN TO UPPER BRACKET WITH (3) 8"x3/4" BOLTS WITH F/F & L/L INTO A KIN-NUT (3 PLACES)

NOTES:
1. SEE GENERAL FASTENING INSTRUCTIONS FOR TYPICAL DETAILS.
2. LOCATE PLATFORM PER SUBRETAILS

Baltimore Aircoil Company
Figure 39. TL0ZRR External Motor Gear Drive Platform Ladder Installation
Figure 40. TL1CRR External Motor Gear Drive Platform Ladder Safety Cage Installation
Positive Closure Damper (PCD) Hood Platform & Ladder Installation

Refer to Table 7 for PCD hood platform & ladder installation information. For multi-section ladder assembly refer to Section Multi-Section Ladder Assembly on Page 76. For ladder opening safety gate installation refer to Section Ladder Opening Safety Gate Installation on Page 55.

<table>
<thead>
<tr>
<th>Reference Drawing</th>
<th>Drawing Number</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD Hood Platform Installation</td>
<td>TA19RR</td>
<td>37</td>
</tr>
<tr>
<td>PCD Hood Platform Ladder Installation</td>
<td>TL0VRR</td>
<td>38</td>
</tr>
</tbody>
</table>

*Table 7. PCD Hood Platform Reference Drawings*

*Figure 41. Plan View, PCD Hood Platform*  
*Figure 42. Side Elevation, PCD Hood Platform*
Figure 43. TA19RR PCD Hood Platform Installation
Figure 44. TL0VRR PCD Hood Platform Ladder Installation
Internal Service Platform Railing and Ladder Installation

Refer to Table 8 for internal service platform railing installation information. Refer to Table 9 internal service platform ladder assembly information. Refer to Table 10 for internal service platform ladder installation information. Refer to Table 2 and Table 3 to determine coil module height. For ladder opening safety gate installation refer to Section Ladder Opening Safety Gate Installation on Page 55.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Service Platform Railing Installation</td>
<td>Gear or Belt</td>
<td>Short</td>
<td>TA6TRR</td>
<td>40</td>
</tr>
<tr>
<td>Internal Service Platform Railing Installation</td>
<td>Gear or Belt</td>
<td>Tall</td>
<td>TA6XRR</td>
<td>41</td>
</tr>
<tr>
<td>Internal Service Platform Railing Installation</td>
<td>ENDURADRIVE® Fan System</td>
<td>Short</td>
<td>TA6URR</td>
<td>42</td>
</tr>
<tr>
<td>Internal Service Platform Railing Installation</td>
<td>ENDURADRIVE® Fan System</td>
<td>Tall</td>
<td>TA6YRR</td>
<td>43</td>
</tr>
<tr>
<td>Internal Service Platform Ladder Deflector Installation</td>
<td>ENDURADRIVE® Fan System</td>
<td>Short or Tall</td>
<td>TL2TRR</td>
<td>44</td>
</tr>
</tbody>
</table>

Table 8. Internal Service Platform Railing Reference Drawings

<table>
<thead>
<tr>
<th>Reference Drawing</th>
<th>Spray Water Type</th>
<th>Fan Drive Type [1]</th>
<th>Drawing Number</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Service Platform Ladder Assembly</td>
<td>Pump Suction</td>
<td>Gear or Belt</td>
<td>TL2FRR</td>
<td>45</td>
</tr>
<tr>
<td>Internal Service Platform Ladder Assembly</td>
<td>Pump Suction</td>
<td>ENDURADRIVE® Fan System</td>
<td>TL2GRR</td>
<td>46</td>
</tr>
<tr>
<td>Internal Service Platform Ladder Assembly</td>
<td>Remote Sump</td>
<td>Gear or Belt</td>
<td>TL2KRR</td>
<td>47</td>
</tr>
<tr>
<td>Internal Service Platform Ladder Assembly</td>
<td>Remote Sump</td>
<td>ENDURADRIVE® Fan System</td>
<td>TL2LRR</td>
<td>48</td>
</tr>
</tbody>
</table>

Table 9. Internal Service Platform Ladder Assembly Reference Drawings

<table>
<thead>
<tr>
<th>Reference Drawing</th>
<th>Spray Water Type</th>
<th>Fan Drive Type [1]</th>
<th>Coil Module Height [2]</th>
<th>Drawing Number</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Service Platform Ladder Installation</td>
<td>Pump Suction</td>
<td>Gear or Belt</td>
<td>Short or Tall</td>
<td>TL2HRR</td>
<td>49</td>
</tr>
<tr>
<td>Internal Service Platform Ladder Installation</td>
<td>Pump Suction</td>
<td>ENDURADRIVE® Fan System</td>
<td>Short</td>
<td>TL2PRR</td>
<td>50</td>
</tr>
<tr>
<td>Internal Service Platform Ladder Assembly</td>
<td>Pump Suction</td>
<td>ENDURADRIVE® Fan System</td>
<td>Tall</td>
<td>TL2JRR</td>
<td>51</td>
</tr>
<tr>
<td>Internal Service Platform Ladder Installation</td>
<td>Remote Sump</td>
<td>Gear or Belt</td>
<td>Short or Tall</td>
<td>TL2MRR</td>
<td>52</td>
</tr>
<tr>
<td>Internal Service Platform Ladder Installation</td>
<td>Remote Sump</td>
<td>ENDURADRIVE® Fan System</td>
<td>Short</td>
<td>TL2QRR</td>
<td>53</td>
</tr>
<tr>
<td>Internal Service Platform Ladder Assembly</td>
<td>Remote Sump</td>
<td>ENDURADRIVE® Fan System</td>
<td>Tall</td>
<td>TL2NRR</td>
<td>54</td>
</tr>
</tbody>
</table>

Table 10. Internal Service Platform Ladder Installation Reference Drawings

1 Baltidrive® Power Train and Baltiguard™ Fan System are belt fan drive.
2 Refer to Table 2 and Table 3 to determine coil module height.
Figure 45. TA6TRR Internal Service Platform Railing Installation, Gear or Belt, Short Coil Module
Figure 46. TA6XRR Internal Service Platform Railing Installation, Gear or Belt, Tall Coil Module
Figure 47. TA6URR Internal Service Platform Railing Installation, ENDURADRIVE® Fan System, Short Coil Module
Figure 48. TA6YRR Internal Service Platform Railing Installation, ENDURADRIVE® Fan System, Tall Coil Module
Figure 49. TL2TRR Internal Service Platform Ladder Deflector Installation, ENDURADRIVE® Fan System
Figure 50. TL2FRR Internal Service Platform Ladder Assembly, Pump Suction, Gear or Belt
Figure 51. TL2GRR Internal Service Platform Ladder Assembly, Pump Suction, ENDURADRIVE® Fan System
Figure 52. TL2KRR Internal Service Platform Ladder Assembly, Remote Sump, Gear or Belt
Figure 53. TL2LRR Internal Service Platform Ladder Assembly, Remote Sump, ENDURADRIVE® Fan System
Figure 54. TL2HRR Internal Service Platform Ladder Installation, Pump Suction, Gear or Belt
Figure 55. TL2PRR Internal Service Platform Ladder Installation, Pump Suction, ENDURADRIVE® Fan System, Short Coil Module
Figure 56. TL2JRR Internal Service Platform Ladder Installation, Pump Suction, ENDURADRIVE® Fan System, Tall Coil Module
Figure 57. TL2MRR Internal Service Platform Ladder Installation, Remote Sump, Gear or Belt
Figure 58. TL2QRR Internal Service Platform Ladder Installation, Remote Sump, ENDURADRIVE® Fan System, Short Coil Module
Figure 59. TL2NRR Internal Service Platform Ladder Installation, Remote Sump, ENDURADRIVE® Fan System, Tall Coil Module
Ladder Opening Safety Gate Installation

Refer to Table 11 for ladder opening safety gate installation information.

<table>
<thead>
<tr>
<th>Reference Drawing</th>
<th>Drawing Number</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ladder Opening Safety Gate for Internal Service Platform &amp; External Motor Gear Drive Platform</td>
<td>TR0XRR</td>
<td>56</td>
</tr>
<tr>
<td>Ladder Opening Safety Gate for Fan Deck, Access Door Platform &amp; PCD Hood Platform</td>
<td>TR1ARR</td>
<td>57</td>
</tr>
</tbody>
</table>

Table 11. Ladder Opening Safety Gate Reference Drawings

Figure 60. Ladder Opening Safety Gate
Figure 61. TR0XRR Ladder Opening Safety Gate for Internal Service Platform & External Motor Gear Drive Platform
Figure 62. TR1ARR Ladder Opening Safety Gate for Fan Deck, Access Door Platform & PCD Hood Platform
Cold Water Basin Connection Installation

Refer to Table 12 for cold water basin connection installation information.

<table>
<thead>
<tr>
<th>Reference Drawing</th>
<th>Drawing Number</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold Water Basin Side Outlet Depressed Sump Box Installation</td>
<td>S3BR19</td>
<td>59</td>
</tr>
<tr>
<td>Backing Ring Installation for Bottom Connections (galvanized or SST cold water basin)</td>
<td>S3BUM9</td>
<td>60</td>
</tr>
<tr>
<td>Backing Ring Installation for Bottom Connections (TriArmor® Corrosion Protection System)</td>
<td>TB0ERR</td>
<td>61</td>
</tr>
</tbody>
</table>

*Table 12. Cold Water Basin Connection Reference Drawings*
Figure 63. S3BR19 Cold Water Basin Side Outlet Depressed Sump Box Installation
Figure 64. S3BUM9 Backing Ring Installation for Bottom Connections (galvanized or SST cold water basin)
Figure 65. TB0ERR Backing Ring Installation for Bottom Connections (TriArmor® Corrosion Protection System)
Fan Deck Handrail Installation

Refer to Figure 66 and Figure 67 to aid in determining the associated reference drawing for fan deck handrail installation. Fan deck handrail installation information is shown in Table 13. For ladder opening safety gate installation refer to Section Ladder Opening Safety Gate Installation on Page 55.

**Figure 66. Multi-cell Fan Deck Handrail Reference Drawing Arrangement**

**Figure 67. Single-cell Fan Deck Handrail Reference Drawing Arrangement**
<table>
<thead>
<tr>
<th>Reference Drawing</th>
<th>Ladder Opening</th>
<th>Drawing Number</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Louver Face Railing Installation on Single Cell Unit</td>
<td>No</td>
<td>TR43RR</td>
<td>64</td>
</tr>
<tr>
<td>Louver Face Railing Installation on Single Cell Unit</td>
<td>Yes</td>
<td>TR44RR</td>
<td>65</td>
</tr>
<tr>
<td>Louver Face Railing Installation on Multi-cell Front Unit</td>
<td>No</td>
<td>TR45RR</td>
<td>66</td>
</tr>
<tr>
<td>Louver Face Railing Installation on Multi-cell Front Unit</td>
<td>Yes</td>
<td>TR46RR</td>
<td>67</td>
</tr>
<tr>
<td>Louver Face Railing Installation on Multi-cell Center Unit</td>
<td>No</td>
<td>TR4FRR</td>
<td>68</td>
</tr>
<tr>
<td>Louver Face Railing Installation on Multi-cell Center Unit</td>
<td>Yes</td>
<td>TR4GRR</td>
<td>69</td>
</tr>
<tr>
<td>Louver Face Railing Installation on Multi-cell Rear Unit</td>
<td>No</td>
<td>TR47RR</td>
<td>70</td>
</tr>
<tr>
<td>Louver Face Railing Installation on Multi-cell Rear Unit</td>
<td>Yes</td>
<td>TR48RR</td>
<td>71</td>
</tr>
<tr>
<td>End Wall Railing Installation Layout</td>
<td>N/A</td>
<td>TR4CRR</td>
<td>72</td>
</tr>
<tr>
<td>Fan Deck Extension Railings Installation</td>
<td>N/A</td>
<td>TR4DRR</td>
<td>73</td>
</tr>
<tr>
<td>End Wall Railing with Fan Deck Extension Installation Layout</td>
<td>N/A</td>
<td>TR4HRR</td>
<td>74</td>
</tr>
<tr>
<td>Railing Plug Installation</td>
<td>N/A</td>
<td>TR1XRR</td>
<td>75</td>
</tr>
</tbody>
</table>

Table 13. Fan Deck Handrail Installation Reference Drawings
Figure 68. TR43RR Louver Face Railing Installation on Single Cell Unit, No Ladder Opening
Figure 69. TR44RR Louver Face Railing Installation on Single Cell Unit, with Ladder Opening
Figure 70. TR45RR Louver Face Railing Installation on Multi-cell Front Unit, No Ladder Opening
Figure 71. TR46RR Louver Face Railing Installation on Multi-cell Front Unit, with Ladder Opening
Figure 72. TR4FRR Louver Face Railing Installation on Multi-cell Center Unit, No Ladder Opening
Figure 73. TR4GRR Louver Face Railing Installation on Multi-cell Center Unit, with Ladder Opening
Figure 74. TR47RR Louver Face Railing Installation on Multi-cell Rear Unit, No Ladder Opening
Figure 75. TR48RR Louver Face Railing Installation on Multi-cell Rear Unit, with Ladder Opening

NOTES:
1. SEE GENERAL FASTENING INSTRUCTIONS FOR TYPICAL DETAILS.
2. ALL UNSPECIFIED FASTENERS ARE:
   - GLV18SS: PVC S/LOX LD TAPPER
   - SST: SST 5/16X1 BOLT WITH 2FW & NYLOC NUT.
3. SLIDE ALL RAILS INTO POSITION BEFORE TIGHTENING BOLTS ON "ZAA" AND INSTALLING TOEBORDS.
4. LEFT REAR COIL MODULE SHOWN, RIGHT REAR MODULE IS MIRROR IMAGE.

**DETAIL A**

**DETAIL B**

1-1/4" Elbow

USE 3/8X1 3/4 LG BOLT WITH FW & LW
(3 PER "ZAA")

#14X1 1/2" LG SELF-DRILLING TAPPER
(4 PER "ZAA")
Figure 77. TR4DRR Fan Deck Extension Railings Installation
Figure 78. TR4HRR End Wall Railing with Fan Deck Extension Installation Layout
NOTES:
1. INSTALL PLUGS AFTER FASTENING ALL COMPONENTS INTO PLACE.
2. ONLY INSTALL PIPE PLUGS IN ENDS OF RAILS NEXT TO A LADDER OPENING.
3. HAND INSERT PLUGS INTO ENDS OF RAILS, AND TAP INTO PLACE WITH A SOFT MALLET.
4. DO NOT OVER TIGHTEN PLUGS, OR CRACKING MAY OCCUR.

Figure 79. TR1XRR Railing Plug Installation
Multi-Section Ladder Assembly

Ladders shipped in sections must be spliced together. Refer to Figure 81 and Figure 82 for ladder section splicing details. The upper, lower and extension ladder sections can be identified by referring to the reference drawing key code listed in Table 14. The reference drawing key code can be found on the individual part label as shown in Figure 28 on Page 23. Refer to Figure 80 for side/end designations.

<table>
<thead>
<tr>
<th>Ladder Type</th>
<th>Upper Ladder Section</th>
<th>Lower Ladder Section</th>
<th>Ladder Extension Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>End to Fan Deck</td>
<td>LAA</td>
<td>LAB</td>
<td></td>
</tr>
<tr>
<td>End to Fan Deck Extension</td>
<td>LAC</td>
<td>LAD</td>
<td></td>
</tr>
<tr>
<td>Side to Fan Deck</td>
<td>LAE</td>
<td>LAF</td>
<td>LAZ</td>
</tr>
<tr>
<td>End to External Motor Gear</td>
<td>LAG</td>
<td>LAB</td>
<td></td>
</tr>
<tr>
<td>Drive Platform</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Side to PCD Hood Platform</td>
<td>LAL</td>
<td>LAM</td>
<td></td>
</tr>
</tbody>
</table>

Table 14. Multi-Section Ladder Assembly Reference Drawing Key Codes
A
DETAIL  A
SPLICE
3/8X1 1/4 LG BOLT
WITH 2FW, LW & NUT
(6) PER SIDE

ADJUST POSITION OF
BOTTOM BRACKET AS
REQUIRED TO SECURE
BOTTOM OF LADDER TO
LANDING PLATFORM PER
RELEVANT REGULATIONS

B
ADJUST POSITION OF
BOTTOM BRACKET AS
REQUIRED TO SECURE
BOTTOM OF LADDER TO
LANDING PLATFORM PER
RELEVANT REGULATIONS

Figure 81. Ladder Assembly (Two Sections)

Figure 82. Ladder Assembly (Three Sections)

3/8X2 LG BOLT WITH 2FW, LW & NUT
(6) PER SIDE
Fan Deck Ladder Installation

Refer to Figure 83 to aid in determining the associated reference drawing for fan deck ladder installation. Fan deck ladder installation information is shown in Table 15.

![Figure 83. Fan Deck Ladder Installation Reference Drawing Arrangement](image)

<table>
<thead>
<tr>
<th>Reference Drawing</th>
<th>Drawing Number</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>End Ladder to Fan Deck Installation</td>
<td>TL0PRR</td>
<td>79</td>
</tr>
<tr>
<td>End Ladder to Fan Deck Extension Installation</td>
<td>TL0RRR</td>
<td>80</td>
</tr>
<tr>
<td>Side to Fan Deck Installation</td>
<td>TL0TRR</td>
<td>81</td>
</tr>
</tbody>
</table>

Table 15. Fan Deck Ladder Installation Reference Drawings
Figure 84. TLOPRR End Ladder to Fan Deck Installation

- 3/8 X 1 1/4" LG BOLT WITH 2 PW, LW & NUT (1 PER SIDE)
- 3/8 X 1 1/4" LG BOLT WITH 2 PW, LW & NUT (3 PER SIDE)
- DETAIL A UPPER LADDER ATTACHMENT
- DETAIL B MID LADDER ATTACHMENT
- DETAIL C BOTTOM LADDER ATTACHMENT
- DETAIL D OPTIONAL LADDER EXTENSION FOOT ADJUSTMENT

Adjust position of bottom bracket as required to secure bottom of ladder to landing platform per relevant regulations.

Optional ladder extension.
Figure 85. TL0RRR End Ladder to Fan Deck Extension Installation
Figure 86. TL0TRR Side to Fan Deck Installation
Motor Davit Assembly & Installation

The motor davit assembly is shown in Figure 87. Refer to Figure 88 for a detailed assembly and installation reference drawing.

Figure 87. Motor Davit Assembly

- Davit Base
- Davit Arm
- Davit Wrap Assembly
NOTE:
MAXIMUM LIFTING CAPACITY OF 1850 LBS

Figure 88. TM00RR Mechanical Removal Assembly
Positive Closure Damper (PCD) Hood Installation

The FXV3’s innovative design results in a low heat loss when the unit is idle. When additional heat loss reduction is desired, coil air intake hoods with factory mounted PCDs with stainless steel linkages and damper actuators can be provided. The motor actuators are easily accessible. The addition of optional factory mounted insulation to the hood and casing can further reduce the heat loss by minimizing losses due to conduction.

Refer to Figure 89 and Figure 90 for PCD hood installation details.
Figure 90. TN0ERR PCD Hood Installation

NOTES:
1. SEE GENERAL FASTENING AND SEALING INSTRUCTIONS FOR TYPICAL DETAILS.
Ladder Safety Cage Installation

For ladder safety cage installation information refer to Figure 91.
**Fan Cowl Extension Installation**

For fan cowl extension installation information refer to **Figure 92**.

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**Figure 92. CMR078 Fan Cowl Extension Installation**
Fan Guard Installation

For fan guard installation information refer to Figure 93.
Discharge Attenuation Installation

For discharge attenuation information refer to Figure 94.
Intake Attenuation Installation

For discharge attenuation information refer to Figure 95.
FXV3
CLOSED CIRCUIT COOLING TOWER
CXVT
EVAPORATIVE CONDENSER
RIGGING & ASSEMBLY INSTRUCTIONS