# General Service Bulletin

**RTHB-SB-8**

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| Library | **Service Literature** |
| Product Section | **Refrigeration** |
| Product | **Rotary Liquid Chillers - W/C** |
| Model | **RTHB** |
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# Subject: RTHB Disassembly Dimensions for Limited Access Installations

## Introduction:

The RTHB units can be disassembled for applications with limited access. This bulletin covers the disassembly and reassembly instructions for the RTHB units.

## Discussion:

This bulletin will cover the procedures for removing the starter panel, compressor, interconnecting piping plus separating the evaporator and condenser.

# IMPORTANT NOTICE

Effective July 1, 1992, all service operations must use recovery systems to minimize losses of refrigerant to the atmosphere when servicing units with Class I and Class II refrigerants.

Class I (CFC) and Class II (HCFC) refrigerants include CFC-12, HCFC-22, CFC-500, CFC-502, CFC-11, CFC113 and HCFC-123. Deliberate venting is prohibited by Section 608 of the Clean Air Act.

In the normal service of air conditioning systems, there are three major activities mandated by the EPA regulations: recovery, recycling and reclaiming.

1. **Recovery** - the act of removing refrigerant from the air conditioning unit so that losses of refrigerant to the atmosphere are minimized.

Whenever a refrigeration circuit is opened, the recovery of the refrigerant is required. If there is no reason to believe that the refrigerant is “bad”, such as during service of gaskets, expansion valves or solenoid valves, the refrigerant is often returned to the unit without treatment. (Note: Always follow the equipment manufacturers recommendations regarding replacement of unit filter driers during service.)

If there is reason to suspect that the refrigerant is bad, such as with a compressor failure, the refrigerant should either be replaced or recycled,

Recovery is also required when a piece of equipment is decommissioned. This prevents the loss of refrigerant upon disposal of the unit. The recovered refrigerant usually is sold to refrigerant reclaimers rather than reused in the customer's new equipment.

2. **Recycling** - the act of cleaning recovered refrigerant for use in the customer’s equipment.

First, the refrigerant is boiled to separate the oil. Then it is run through a filter drier to separate moisture and acid.

Because of limited field testing capability, the quality and identity of any recycled refrigerant is suspect. For this reason, the EPA will most likely allow recycling of refrigerant only when it is returned to its original owner. Resale of the recycled refrigerant to third parties will not be allowed.

As a result, most servicers will only recycle refrigerant when the quantity of the refrigerant to be recycled and the expertise of the technician make it attractive to do so. Most suspect refrigerant will be sold to a reclaimer rather than be serviced in the field.

3. **Reclaiming** - the act of purifying refrigerant and testing it to ARI 700 “new” refrigerant standards. With reclamation, each batch of refrigerant undergoes extensive laboratory tests and the waste streams are disposed of according to environmental regulations.

Most reclamation will be done at centralized processing facilities because of the testing, waste handling and EPA certification requirements for reclamation. The Trane Company and others offer reclamation services for most refrigerants.

Reclamation is probably the most attractive alternative for users with salvaged and suspect refrigerant.

# REFRIGERANT EMISSION CONTROL

Evidence from environmental scientists indicates that the ozone in our upper atmosphere is being reduced, due to the release of CFC fully halogenated compounds.

The Trane Company encourages every effort to eliminate, if possible, or vigorously reduce the emission of CFC, HCFC and HFC refrigerants into the atmosphere that result from installation, operation, routine maintenance, or major services on this equipment. Always act in a responsible manner to conserve refrigerants for continued use, even when acceptable alternatives are available. Conservation and emission reduction can be accomplished by following recommended Trane operation, maintenance and service procedures, with specific attention to the following:

1. Refrigerant used in any type of air conditioning or refrigerating equipment should be recovered for reuse, recovered and/or recycled for reuse, reprocessed (reclaimed), or properly destroyed, whenever it is removed from equipment by an EPA certified Type 11 or Universal Technician. Never release refrigerant into the atmosphere.
2. Always determine possible recycle or reclaim requirements of the recovered refrigerant before beginning recovery by any method. Questions about recovered refrigerants and acceptable refrigerant quality standards are addressed in ARI Standard 700.
3. Use approved containment vessels and safety standards. Comply with all applicable transportation standards when shipping refrigerant containers.
4. To minimize emissions while recovering refrigerant, use recycling equipment. Always use methods which will pull the required vacuum while recovering and condensing refrigerant into containment.
5. When leak checking with trace refrigerant and nitrogen, use HCFC-22 (R-134a), rather than CFC-12 (R-12) or any other fully halogenated refrigerants. Be aware of any new leak test methods which eliminate refrigerant as a trace gas.
6. When cleaning system components or parts, avoid using CFC-11 (R-11) or CFC-113 (R-113). Refrigeration system cleanup methods which use filters and dryers are preferred. Do not use solvents which have ozone depletion factors. Properly dispose of used materials.
7. Take extra care to properly maintain all service equipment that directly supports refrigeration service work, such as gauges, hoses, vacuum pumps and recycling equipment.
8. Stay aware of unit enhancements, conversion refrigerants, compatible parts and manufacturer's recommendations which will reduce refrigerant emissions and increase equipment operating efficiencies. Follow manufacturer's specific guidelines for conversion of existing systems.
9. In order to assist in reducing power generation emissions, always attempt to improve equipment performance with improved maintenance and operations that will help conserve energy resources.

# READ IMPORTANT NOTICES BEFORE SERVICING THE RTHB

**Warnings and Cautions**

**Warnings** are provided to alert personnel to potential hazards that can result in personal injury or death; they do not replace the manufacturer's recommendations.

**Cautions** alert personnel to conditions that could result in equipment damage.

Your personal safety and reliable operation of this machine depend upon strict observance of these precautions. The Trane Company assumes no liability for installation or service procedures performed by unqualified personnel.

To prevent injury or death due to electrocution, use care when performing control setup, adjustments or any other service related operation when the electrical power is on. Position all electrical disconnects in the "OPEN" position and lock them.

**WARNING**

**Disconnect and Lockout or Tagout all electrical power, including remote disconnects, before servicing. Failure to do so can cause severe personal injury or death.**

**CAUTION:It is essential to confirm that proper phase rotation is established - Phase A to Ll, Phase B to L2, and Phase C to L3. Phase rotation must be checked with a phase sequence indicator before start-up, otherwise catastrophic damage to the compressor may result.**

**CAUTION: Do not check the unit oil level with the unit operating. Severe oil loss will occur. Protective clothing must be worn when checking the oil level.**

**CAUTION: The compressor oil heater must be energized for a minimum of 24 hours prior to unit operation, to prevent compressor damage caused by liquid refrigerant in the compressor at start-up.**

**CAUTION: Do not use untreated or improperly treated water. To do so may result in equipment damage.**

**CAUTION: Proper water flow through the evaporator must be established prior to unit operation.**

**CAUTION: Do not charge the compressor with liquid refrigerant.**

# Section 1
# Refrigerant Handling

## 1-1. General

The following bulletin lists the procedures for disassembling and reassembling an RTHB unit. If the entire unit must be disassembled be certain to follow each section in order. Do not attempt to split the chiller in two halves. It will result in two assemblies that are top heavy.

**WARNING**

**To avoid personal injury, death or equipment damage, do not attempt to move the unit in two halves. Follow each section in the order outlined below.**

It is assumed that electrical power has not been in any way connected to the unit control/starter panel.

## 1-2. Refrigerant and Oil Removal

Prior to disassembly, the refrigerant needs to either be isolated in the condenser or removed from the system. The oil needs to be removed from the system also.

There is an option to ship the unit with a nitrogen charge. With this option, the unit still ships with the entire oil charge and approximately 20 psi nitrogen. Refer to the sales order to determine how the unit was ordered.

**CAUTION: If water is connected to the unit, water must be flowing through both the evaporator and condenser before removing the refrigerant. Refrigerant pressures below 65 psig can cause freezing and rupturing of the heat exchangers.**

*Refrigerant Isolation*

If the unit has isolation valves, use the following steps to store the charge in the condenser.

1. Close the butterfly valve on the top of the condenser.
2. Close the large angle valve at the bottom of the condenser.
3. Connect one end of a refrigerant hose to the bottom of the evaporator on the evaporator charging valve and the other end to a liquid transfer pump. From the liquid transfer pump, connect another hose to the charging valve on bottom of the condenser.
4. After the liquid is in the condenser, remove the vapor using the same connection points and a recovery system.

*Refrigerant Removal*

If no isolation valves are installed, remove the entire charge from the system.

1. Open all valves.
2. Connect a liquid transfer pump to the charging valve on the bottom of the evaporator.
3. Transfer the liquid to a storage tank.
4. Use the same point to transfer the vapor to the storage tank.

*Oil Charge Removal*

Regardless of where the refrigerant is stored, the oil needs to be removed from the system and stored in a sealed container.

1. Drain the oil from the oil charging valve located at the discharge end of the oil separator.

# Section 2
# Starter Panel Removal

## 2-1. General

The refrigerant and oil does not need to be removed for this process. However, if the starter and or control panel needs to be removed, as well as, the refrigerant, the two processes can occur simultaneously.

## 2-2. Starter Panel Removal

1. Label and record all wiring and conduit so that it can be reconnected correctly.
2. Label and remove the motor terminal leads.

**CAUTION: Whenlooseningretainingnuts on the motor terminals, use backup wrench to avoid applying excessive torque to the motor terminals. Failure to use backup wrench may cause terminals to develop a leak path between the copper conductor and porcelain.**

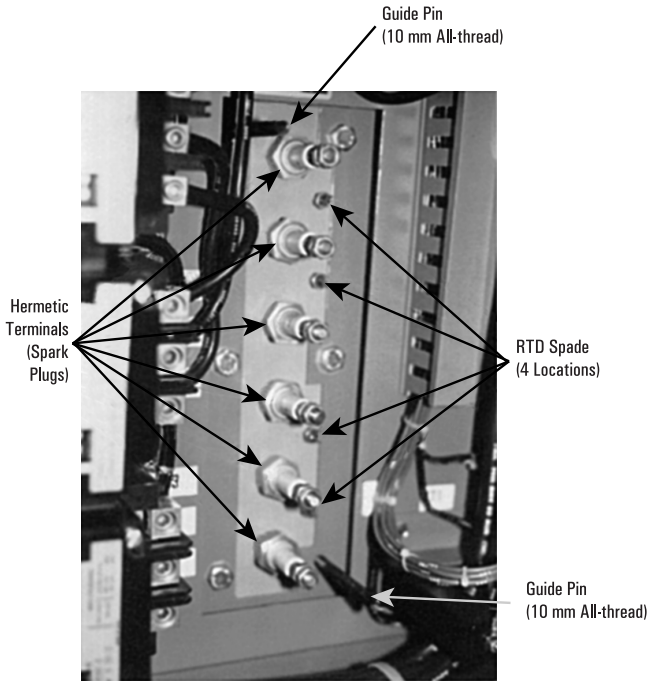
3. Install two eyebolts to the top of the starter panel. Secure the eyebolts to an overhead support to avoid dropping the panel on the motor terminals. Be sure that the weight of the starter is being supported by an appropriate lifting mechanism. Refer to Section 5 for details.

**CAUTION: DO NOT hit the motor terminals when removing the starter panel. If the motor terminals are cracked or develop a leak they must be replaced.**

4. Remove two of the bolts that secure the starter panel to the motor housing and insert two 10 mm all-thread guide pins, approximately 5 inches long. These are located near T1 and T6 compressor motor terminals. Refer to Figure 2-1.
5. Remove the remaining bolts.
6. Pull the starter panel horizontally along the guide pins, until the panel clears the motor terminal plugs.

*Figure 2-1.Guide Pins for Starter Panel Removal*

7. Lower and secure the starter panel.




8. Follow the steps in reverse to reassemble the starter panel.

# Section 3
# Compressor Removal

## 3-1. General

If the compressor needs to be removed, first follow the “Refrigerant and Oil Removal” procedures and the “Starter Panel Removal” then proceed with the steps outlined below.

## 3-2. Tools Required

Below is a brief list of some of the tools and parts required to remove the compressor.

1. Two 24 inch long angle iron supports, shown in Figure 3-5.
2. Lifting flange described in Figure 3-4.

*Note: Use a local vendor for fabrication of the flange.*

3. Two, 12 mm all-thread guide pins, 2 3/4 inches long, for alignment of the compressor and suction flange during reassembly. Refer to Figure3-3.
4. Required compressor gasket/o-ring change-out kit.
5. Refrigerant recovery equipment and tanks.
6. A-frame and hoist with lifting capability equal to or greater than the weight of the entire compressor. Be certain to include all required safety factors. Refer to Section 5 for specific weights.
7. A set of meteric and standard socket wrenches.

## 3-3. Procedures

1. Position the A-frame over the entire length of the unit. Refer to Figure 3-1.

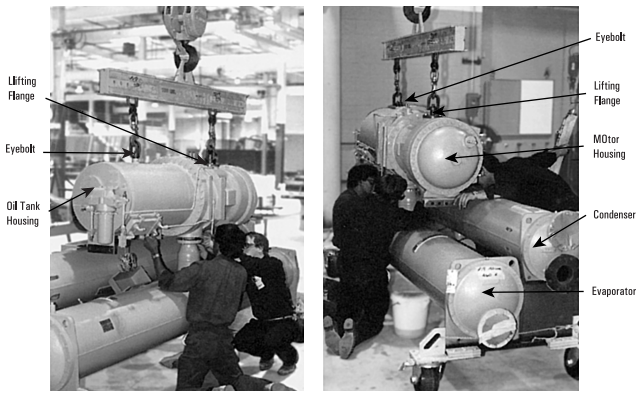



*Figure 3-1.Compressor Removal*

2. The A-frame must be capable of supporting the entire compressor weight. Refer to Table 5-1.

**CAUTION: The mechanism must be equipped with safety harnesses that are capable of holding the weight of the compressor, in the event of a lifting mechanism failure.**

3. Remove the discharge line from the compressor and the condenser.
4. Unbolt the liquid line from the bottom of the compressor.
5. Unbolt the economizer line from the top of the motor housing flange.
6. Mark the orifice plates. The orifices are directionally sensitive and may slip while removing the economizer line.
7. Remove the economizer line with the refrigerant filter by removing the stub bolt nuts at the refrigerant filter inlet flange. Refer to Figure 3-2.

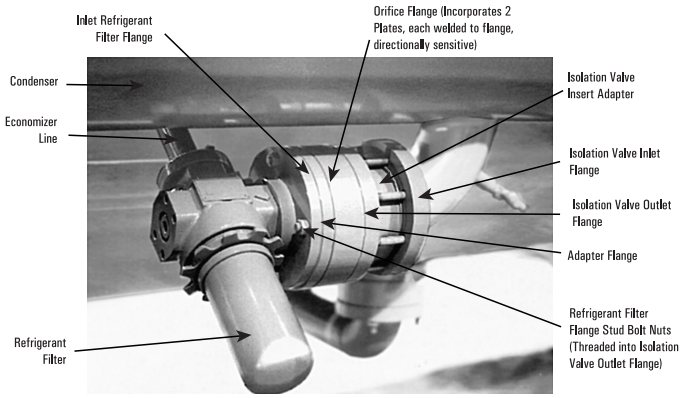


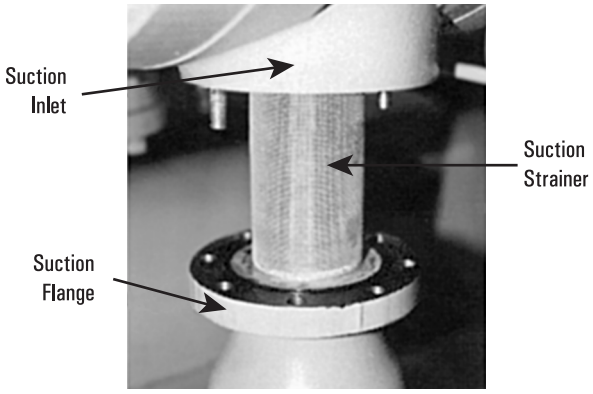

*Figure 3-2.Economizer Line Disassembly*

*Note: Once the economizer line and refrigerant filter are removed, the orifice (at the inlet of the refrigerant filter flange) can shift away from the o-ring. Be sure to have all new orifice o-rings available for re-installation, in the event of orifice slippage.*

8. Cover all openings to prevent contamination.
9. Remove the bolts from the compressor suction connection at the bottom of the rotor housing and insert the guide pins. Refer to Figure 3-3.
10. Install a 16 mm eyebolt into the collar located on the top of the oil tank housing. This is one of the

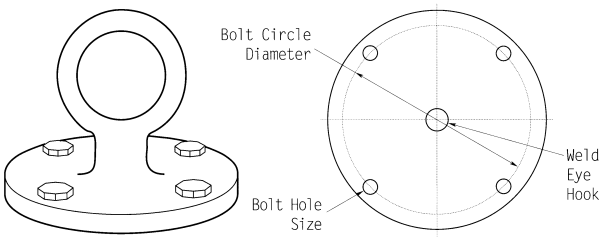
two required lifting points.

*Figure 3-3.Suction Line Guide Pins*




11. Install the lifting flange on the top of the motor housing in the holes used for attaching the economizer line angle valve. No o-ring is required. Refer to Figure 3-4.

*Figure 3-4.Lifting Flange Specification for Removing Removing Compressor (locally supplied)*



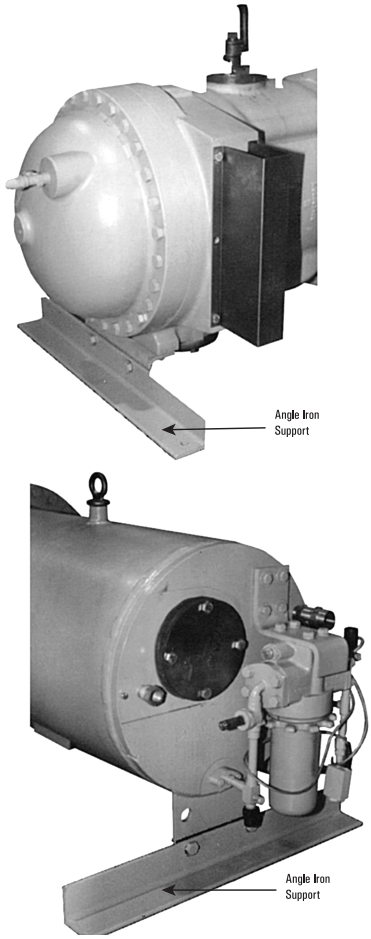

| | RTHA 130-150 | RTHA 180-215 | RTHA 255-300 | RTHA 380-450 |
|---|---|---|---|---|
| Bolt Circle | 4.375" | 4.750" | 5.375" | 5.875" |
| Bolt Holes | .551" | .551" | .551" | .551" |

12. Secure the eyebolts to the lifting mechanism.
13. Install a safety harness under each end of the compressor for additional safety.

**CAUTION: Be sure that the weight of the compressor is being supported by the A-frame.**

14. Remove the bolts from the support brackets under the compressor and remove the bolts from the liquid line to motor housing flange.
15. Raise the compressor directly upward approximately 10" and remove the suction strainer.
16. Lower the compressor to within two inches of the floor. Install two angle iron supports, one at each end of the compressor, to the mounting support brackets. Refer to Figure 3-5.

*Figure 3-5.Angle Iron Support for Compressor*




17. Lower the compressor to the floor.

**CAUTION: Take care in providing some protection for the machined surface on the suction line flange. Provide blocks under the compressor rotor and motor housings sufficient to keep the compressor from resting on the suction flange.**

## Section 4
# Uncouple the Evaporator and Condenser Shell Assemblies

### 4-1. General

**CAUTION: To avoid personal injury, death or equipment damage, do not split the unit into two halves with the compressor still mounted to the evaporator. It is too top heavy and will tip upon trying to move.**

Refer to the tables and figures through out this bulletin, for weights and dimensions.

### 4-2. Separating the Evaporator and the Condenser

Units ordered with the separable shell option have the evaporator and condenser bolted together rather than welded. All prior sections must be completed entirely before attempting this procedure.

1. Unbolt the liquid line from the bottom of the evaporator and set aside.
2. Set the A-frame over the condenser and attach to the four lifting points prior to unbolting the condenser from the evaporator.

**CAUTION: To avoid personal injury, equipment damage, or death, attach the condenser to a lifting mechanism prior to separating the evaporator from the condenser.**

3. Unbolt the shell supports connecting both shells together.
4. If the A-frame can not be left supporting the condenser through the entire move until the evaporator is re-attached, the base of the condenser must be removed and the condenser must be set on field supplied braces, on the floor. The condenser can not be left unsupported with the base still attached.
5. The evaporator and condenser shells have holes near the top of both tubesheets so that a 4-point lifting procedure can be used. Refer to the “Rigging” section for further details.

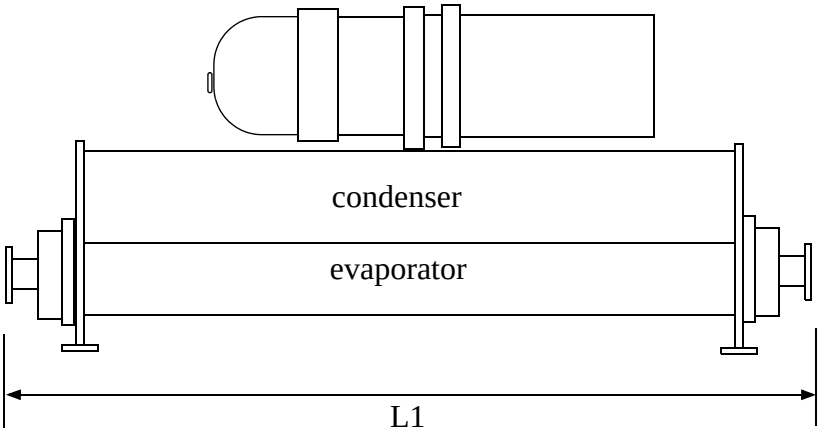



*Table 4-1: Evaporator length (L1) with water boxes installed*

| | | 130/150 ton in (cm) | | 180/215 tons in (cm) | | | 255/300 tons in (cm) | | | 380/450 tons in (cm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pass** | **PSI** | std | long | std | long | ext | std | long | ext | std | long |
| **Standard Water Boxes** | | | | | | | | | | | |
| 1 | 150 | 112.1 (285) | 142.1 (361) | 113.3 (288) | 143.3 (364) | 143.5 (364.5) | 113.3 (288) | 143.5 (364) | 150.1 (381) | 120.1 (305) | 150.1 (381) |
| 2 | 150 | 112.3 (285) | 142.3 (361) | 114.1 (290) | 144.1 (366) | 137.1 (348) | 107.1 (272) | 137.1 (348) | 151.4 (385) | 121.4 (308) | 151.4 (385) |
| 2 | 300 | 112.6 (286) | 142.6 (362) | 114.3 (291) | 144.4 (367) | 144.9 (368) | 114.9 (292) | 144.9 (368) | 151.4 (385) | 121.4 (308) | 151.4 (385) |
| 3 | 150 | 106.9 (272) | 136.9 (348) | 108.9 (277) | 138.6 (352) | 139.5 (354) | 109.5 (278) | 139.5 (354) | 144.9 (368) | 114.9 (292) | 144.9 (368) |
| 3 | 300 | 108.5 (276) | 138.5 (352) | 111.8 (284) | 141.8 (360) | 142.3 (361) | 112.3 (285) | 142.3 (361) | 146.5 (372) | 116.5 (296) | 146.5 (372) |
| 4 | 150 | 104.1 (265) | 134.1 (341) | 106.4 (270) | 136.4 (346) | 136.9 (348) | 106.9 (272) | 136.9 (348) | 141.4 (359) | 111.4 (283) | 141.38 (359) |
| 4 | 300 | 104.3 (265) | 134.4 (341) | 106.9 (272) | 136.9 (348) | 137.4 (349) | 107.4 (273) | 137.4 (349) | 141.5 (359) | 111.5 (283) | 141.5 (359) |
| **Marine Water Boxes** | | | | | | | | | | | |
| 2 | 300 | 110.9 (282) | 140.9 (358) | 118.3 (301) | 148.3 (377) | 148.8 (378) | 118.8 (302) | 148.8 (378) | 153.3 (389) | 123.3 (313) | 153.3 (389) |
| 3 | 300 | 118.1 (300) | 148.1 (376) | 128.1 (325) | 158.3 (402) | 159 (404) | 129 (328) | 159 (404) | 165.3 (420) | 135.3 (344) | 165.3 (420) |
| 4 | 300 | 110.9 (282) | 140.9 (358) | 118.3 (301) | 148.3 (377) | 148.8 (378) | 118.8 (302) | 148.8 (378) | 153.3 (389) | 123.3 (313) | 153.3 (389) |

Note:
1. Dimensions +/- 0.5 inches

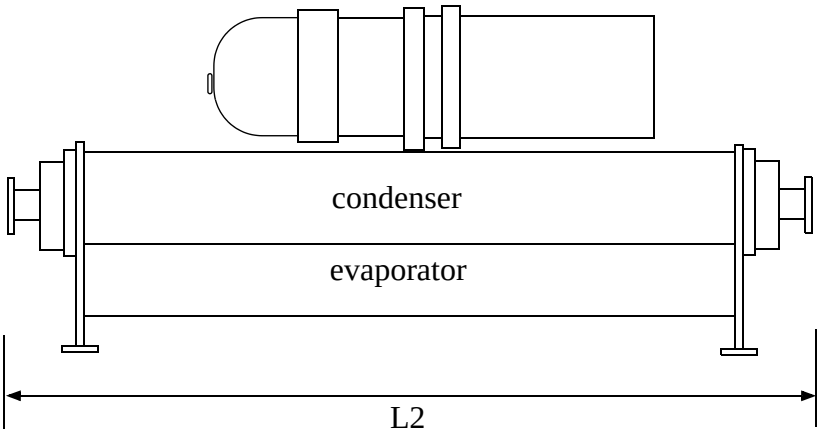



*Table 4-2: Condenser length (L2) with water boxes installed*

| | | 130/150 ton in (cm) | | 180/215 tons in (cm) | | | 255/300 tons in (cm) | | | 380/450 tons in (cm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pass** | **PSI** | std | long | std | long | ext | std | long | ext | std | long |
| **Standard Water Boxes** | | | | | | | | | | | |
| 2 | 150 | 102 (259) | 132 (335) | 103.5 (263) | 133.5 (339) | 137.6 (350) | 104.6 (266) | 134.6 (342) | 138.5 (352) | 108.5 (276) | 11'-6 1/2" |
| 2 | 300 | 111.1 (282) | 141.1 (358) | 114.1 (290) | 144.1 (366) | 145.8 (370) | 115.8 (294) | 145.8 (370) | 151.3 (384) | 121.3 (308) | 151.3 (384) |
| 3 | 150 | n/a | n/a | 109.4 (278) | 139.4 (354) | 142.1 (361) | 112.1 (285) | 142.1 (361) | 145.2 (369) | 115.2 (293) | 145.2 (369) |
| 3 | 300 | n/a | n/a | 110.3 (281) | 140.3 (356) | 142.8 (363) | 112.8 (287) | 142.8 (363) | 145.6 (370) | 117.6 (299) | 145.6 (370) |
| **Marine Water Boxes** | | | | | | | | | | | |
| 2 | 300 | 108.1 (275) | 138.1 (351) | 111.9 (284) | 141.9 (360) | 165.8 (421) | 135.8 (345) | 165.8 (421) | 172.8 (439) | 136.9 (348) | 172.9 (439) |
| 3 | 300 | n/a | n/a | n/a | n/a | 167 (424) | 128 (325) | 167 (424) | 163.8 (416) | 133.8 (340) | 163.8 (416) |

Note:
1. Dimensions +/- 0.5 inches

# Section 5
# Component Weights

## 5-1. General

The easiest way to move the components into the equipment room, or final location for the installation, is to set the components on carts and roll them into place. If stairwells are involved other means will be necessary to install the equipment. Overhead hoists may be used to pick up the starter panel, compressor, evaporator and condenser.

**WARNING**
**To avoid personal injury, death or equipment damage, do not use cables (chains or slings) except as stated.**

*Lifting*
If the components must be lifted use the following:

- 3 point lift on compressor
- 4 point lift on evaporator and condenser
- 2 point on the starter panel

Refer to section 7 and 8 for specific details on rigging. Refer to Table 5-1 for component weights.

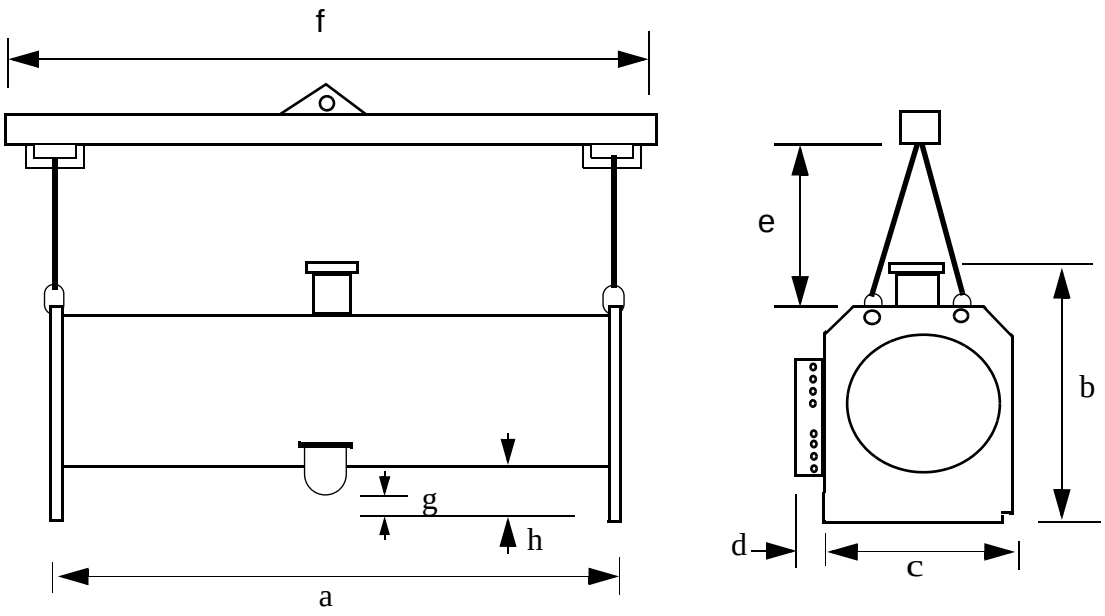
*Table 5-1: RTHB Component Weights*

| Unit tonnage | Shell Length | COMP lbs (kg) | EVAP w/o heads lbs (kg) | EVAP Heads (both) lbs (kg) | COND w/o heads lbs (kg) | COND Heads (both) lbs (kg) | Unit mtd. Starter lbs (kg) | Control Panel and Cl. Access lbs (kg) | Comp. dis. Pipe lbs (kg) | Inter-connecting piping, supports, etc lbs (kg) | Unit Total lbs (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RTHB 130/150 | STD | 2500 (1134) | 850 (386) | 150 (68) | 950 (431) | 150 (68) | 450 (204) | 100 (45) | 100 (45) | 200 (91) | 5450 (2472) |
| RTHB 130/150 | LONG | 2500 (1134) | 1050 (476) | 150 (68) | 1200 (544) | 150 (68) | 450 (204) | 100 (45) | 100 (45) | 200 (91) | 5900 (2676) |
| RTHB 180/215 | STD | 2950 (1338) | 1150 (522) | 250 (113) | 1250 (567) | 200 (91) | 450 (204) | 100 (45) | 150 (68) | 250 (113) | 6800 (3084) |
| RTHB 180/215 | LONG | 2950 (1338) | 1450 (658) | 250 (113) | 1450 (658) | 200 (91) | 450 (204) | 100 (45) | 150 (68) | 250 (113) | 7250 (3289) |
| RTHB 180/215 | EXT | 2950 (1338) | 2100 (952) | 300 (136) | 2050 (930) | 250 (113) | 450 (204) | 100 (45) | 200 (91) | 250 (113) | 8650 (3924) |
| RTHB 255/300 | STD | 4200 (1905) | 1700 (771) | 500 (227) | 1750 (794) | 400 (181) | 450 (204) | 100 (45) | 200 (91) | 250 (113) | 9550 (4332) |
| RTHB 255/300 | LONG | 4200 (1905) | 2100 (953) | 500 (227) | 2050 (930) | 400 (181) | 450 (204) | 100 (45) | 200 (91) | 250 (113) | 10250 (4649) |
| RTHB 255/300 | EXT | 4200 (1905) | 3100 (1406) | 500 (227) | 2950 (1338) | 650 (295) | 450 (204) | 100 (45) | 250 (113) | 300 (136) | 12500 (5670) |
| RTHB 380/450 | STD | 6300 (2858) | 2550 (1157) | 800 (363) | 2350 (1066) | 650 (295) | 450 (204) | 100 (45) | 250 (113) | 300 (136) | 13750 (6237) |
| RTHB 380/450 | LONG | 6300 (2858) | 3100 (1406) | 800 (363) | 2950 (1338) | 650 (295) | 450 (204) | 100 (45) | 250 (113) | 300 (136) | 14900 (6758) |

**Notes:**
1. All weights +/- 5%
2. Weights do not include refrigerant or oil. Refer to RTHB-SB-6 for details.
3. Water box weights are for standard water boxes only.

# Section 6
# RTHB Evaporator Dimensions

*Figure 6-1.Evaporator Dimensions*




| | | 130/150 ton in (cm) | | 180/215 tons in (cm) | | | 255/300 tons in (cm) | | | 380/450 tons in (cm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions | Description | std | long | std | long | ext | std | long | ext | std | long |
| a | length of barrel from tubesheet to tubesheet | 90 (229) | 120 (305) | 90 (229) | 120 (305) | 120 (305) | 90 (229) | 120 (305) | 120 (305) | 90 (229) | 120 (305) |
| b | from bottom of tubesheet to top of suction flange | 31.6 (80) | 31.6 (80) | 37.8 (96) | 37.8 (96) | 41.5 (105) | 41.5 (105) | 41.5 (105) | 44 (112) | 45 (114) | 45 (114) |
| c | width of tubesheet | 18.3 (46) | 18.3 (46) | 21.8 (55) | 21.8 (55) | 21.8 (55) | 24.0 (61) | 24.0 (61) | 24.0 (61) | 29.7 (75) | 29.7 (75) |
| d | width of separable shell holding plate | 3.0 (8) | 3.0 (8) | 3.0 (8) | 3.0 (8) | 3.0 (8) | 3.0 (8) | 3.0 (8) | 3.0 (8) | 3.0 (8) | 3.0 (8) |
| e | minimum height from tubesheet to lifting bar | 24.0 (61) | 24.0 (61) | 24.0 (61) | 24.0 (61) | 24.0 (61) | 24.0 (61) | 24.0 (61) | 24.0 (61) | 24.0 (61) | 24.0 (61) |
| f | minimum length of lifting bar to perform four point lift | 96 (244) | 126 (320) | 96 (244) | 126 (320) | 126 (320) | 96 (244) | 126 (320) | 126 (320) | 96 (244) | 126 (320) |
| g | bottom of evap inlet elbow to bottom of evap foot | 0.8 (2) | 0.8 (2) | 0.8 (2) | 0.8 (2) | 0.8 (2) | 1.5 (4) | 1.5 (4) | 1.5 (4) | 1.5 (4) | 1.5 (4) |
| h | bottom of evap to bottom of foot | 4.4 (11) | 4.4 (11) | 5.3 (14) | 5.3 (14) | 5.3 (14) | 6.1 (16) | 6.1 (16) | 5.0 (13) | 5.0 (13) | 5.0 (13) |

Note:
1. Dimensions +/- 0.5 inches

# Section 7
# RTHB Condenser Dimensions

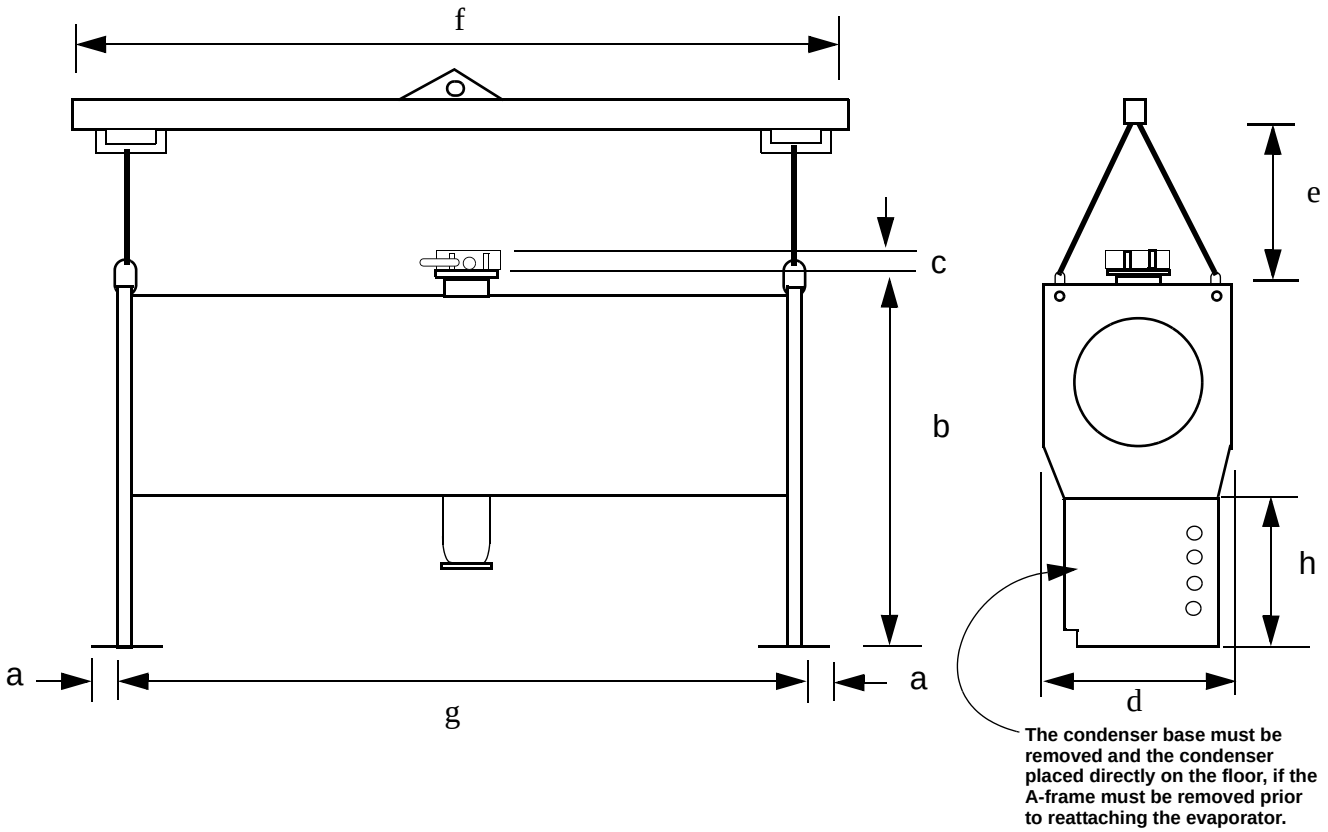



*Figure 7-1.Condenser Dimensions*

| | | 130/150 ton in (cm) | | 180/215 tons in (cm) | | | 255/300 tons in (cm) | | | 380/450 tons in (cm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions | Description | std | long | std | long | ext | std | long | ext | std | long |
| a | from tubesheet to outer edge of foot | 1.3 (3) | 1.3 (3) | 1.3 (3) | 1.3 (3) | 1.3 (3) | 1.3 (3) | 1.3 (3) | 1.3 (3) | 1.3 (3) | 1.3 (3) |
| b | from bottom of foot to top of condenser inlet flange | 34.5 (88) | 34.5 (88) | 41.9 (106) | 41.9 (106) | 49 (124) | 49 (124) | 49 (124) | 52 (132) | 54 (137) | 57 (145) |
| c | height of optional isolation valve | 3.5 (9) | 3.5 (9) | 4.5 (11) | 4.5 (11) | 4.5 (11) | 4.5 (11) | 4.5 (11) | 4.5 (11) | 4.5 (11) | 4.5 (11) |
| d | width of condenser tubesheet | 16.3 (41) | 16.3 (41) | 19.3 (49) | 19.3 (49) | 21.8 (55) | 21.8 (55) | 21.8 (55) | 27 (69) | 27 (69) | 27 (69) |
| e | Min. from tubesheet to lifting bar | 24 (61) | 24 (61) | 24 (61) | 24 (61) | 24 (61) | 24 (61) | 24 (61) | 24 (61) | 24 (61) | 24 (61) |
| f | Min. length of lifting bar | 97 (246) | 128 (325) | 97 (246) | 128 (325) | 128 (325) | 97 (246) | 128 (325) | 128 (325) | 97 (246) | 128 (325) |
| g | Length of barrel (no water boxes) | 91.8 (233) | 121.9 (310) | 91.8 (233) | 121.9 (310) | 121.9 (310) | 91.8 (233) | 121.9 (310) | 121.9 (310) | 91.8 (233) | 121.9 (310) |
| h | height of condenser base | 14.1 (36) | 14.1 (36) | 17.0 (43) | 17.0 (43) | 20.0 (51) | 21.0 (53) | 21.0 (53) | 19.9 (51) | 19.9 (51) | 19.9 (51) |

Note:
1. Dimensions +/- 0.5 inches

# Section 8
# RTHB Compressor Dimensions

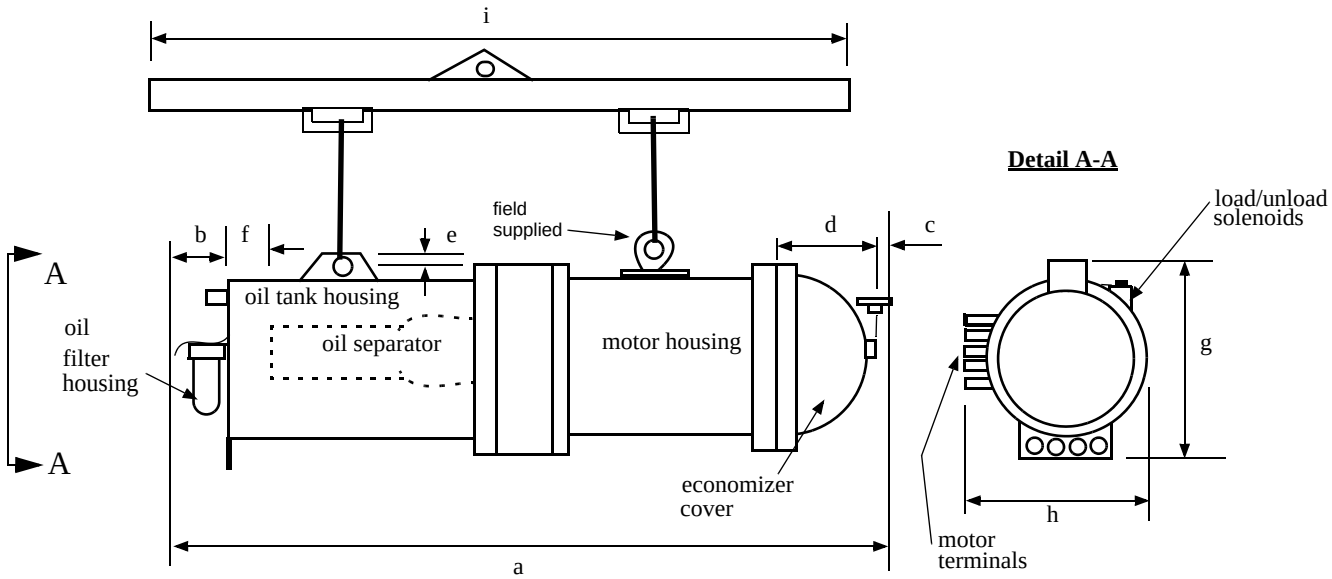



*Figure 8-1.Compressor Dimensions*

| Dimensions | Description | 130/150 ton std & long in (cm) | 180/215 tons std, long & ext in (cm) | 255/300 tons std, long & ext in (cm) | 380/450 tons std & long design seq. A-T in (cm) | 380/450 tons std & long design seg. U - later in (cm) |
|---|---|---|---|---|---|---|
| a | length of compressor with filter and valves installed | 83 (211) | 89.50 (227) | 89.75 (228) | 99.00 (251) | 103.00 (262) |
| b | width of oil filter | 6.50 (17) | 6.50 (17) | 6.50 (17) | 6.50 (17) | 6.50 (17) |
| c | additional length of angle valve | 2.75 (7) | 2.75 (7) | 2.75 (7) | 2.75 (7) | 2.75 (7) |
| d | length of economizer cover | 9.50 (24) | 9.50 (24) | 9.50 (24) | 10.25 (26) | 10.25 (26) |
| e | additional height of lifting lug | 1.50 (4) | 1.50 (4) | 1.50 (4) | 1.50 (4) | 1.50 (4) |
| f | length from end of oil separator (internal) to end of oil tank housing | 6.00 (15) | 5.25 (13) | 4.00 (10) | 4.25 (11) | 8.25 (21) |
| g | total height of compressor | 27.00 (69) | 30.00 (76) | 34.00 (86) | 39.00 (99) | 39.00 (99) |
| h | total width of compressor | 24.50 (62) | 25.50 (65) | 30.50 (77) | 34.00 (86) | 34.00 (86) |
| i | length of spreader bar for lifting | 83 (211) | 90 (229) | 90 (229) | 100 (254) | 100 (254) |

Notes:
1. Dimensional tolerances ± 0.5 inches.

# Section 9
# RTHB Unit Dimensions

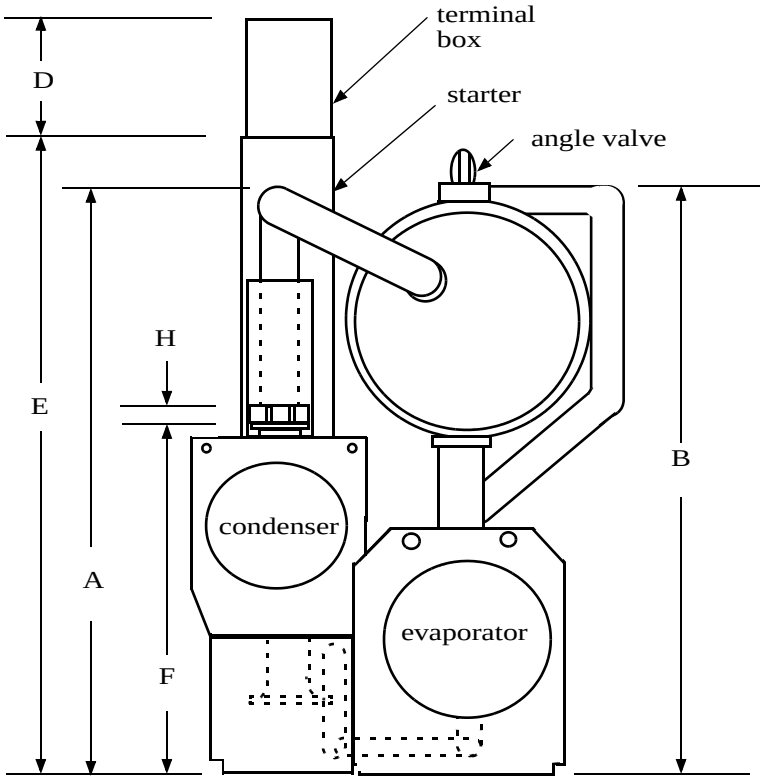



*Table 9-1: RTHB Unit Dimensions*

| | 130/150 ton in (cm) | | 180/215 tons in (cm) | | | 255/300 tons in (cm) | | | 380/450 tons in (cm) | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions | std | long | std | long | ext | std | long | ext | std | long |
| A | 61.50 (156) | 61.50 (156) | 71.50 (182) | 71.50 (182) | 72.00 (183) | 79.50 (202) | 79.50 (202) | 68.50 (174) | 68.50 (174) | 68.50 (174) |
| B | 58.25 (148) | 58.25 (148) | 66.75 (170) | 66.75 (170) | 68.75 (175) | 77.25 (196) | 77.25 (196) | 76.50 (194) | 79.50 (202) | 79.50 (202) |
| D | 14.00 (36) | 14.00 (36) | 14.00 (36) | 14.00 (36) | 14.00 (36) | 14.00 (36) | 14.00 (36) | 14.00 (36) | 14.00 (36) | 14.00 (36) |
| E | 63.50 (161) | 63.50 (161) | 70.25 (178) | 70.25 (178) | 75.88 (193) | 75.88 (193) | 75.88 (193) | 80.00 (203) | 80.00 (203) | 80.00 (203) |
| F | 34.50 (88) | 34.50 (88) | 42.00 (107) | 42.00 (107) | 49.00 (125) | 49.00 (125) | 49.00 (125) | 52.00 (132) | 54.00 (137) | 57.00 (145) |
| H | 3.50 (9) | 3.50 (9) | 4.50 (11) | 4.50 (11) | 4.50 (11) | 4.50 (11) | 4.50 (11) | 4.50 (11) | 4.50 (11) | 4.50 (11) |

**Notes:**
1. Add 1" for units with insulation.
2. Dimensional tolerances ±1/4".
3. Control panel height from base is less than compressor height from base.

# Section 10
# Reassembly

## 10-1. General

Once the unit is completely disassembled, it should be stored and moved with all ports, connections and openings sealed. This can be done with tape and plastic. The tighter the unit is sealed, the less moisture will need to be removed on reassembly.

While reassembling the unit, follow all previous procedures in reverse. Use new o-rings and gaskets on all joints after thoroughly cleaning each flange.

**CAUTION: Be certain to remove all coverings from connections prior to reassembling.**

## 10-2. Sealants

Use Tight or any acceptable substitute on all threaded connections on reassembling.

Lightly coat all o-rings with the unit mineral oil on reassembly. Refer to Table 10-1 for torque values.

## 10-3. Evacuation

Once the unit is completely reassembled, test the unit for any leaks. Pressurize the unit with 100 psi of nitrogen and a trace of R-22. Leak test all joints and confirm all leaks with a soap bubble test.
Once all leaks are repaired, connect a vacuum pump and pull the system down to 500 microns.

Once the system has pulled down, perform a standing rise test for at least one hour. The pressure should not rise any more than 150 microns, the pressure does rise more than 150 microns, there is either a leak or moisture in the system.

## 10-4. Parts Ordering

This bulletin is informational only and does not authorize any parts or labor.

*Table 10-1: Torque Values for RTHB Bolts*

| Item | Unit Size (tons) | Bolt Size (mm) | Quanity Bolts | Hexhead (mm) | Max. Torque (ft-lbs) | Sealing Method |
|---|---|---|---|---|---|---|
| Discharge line to isloation valve of insert for isolation valve flange | 130-215 | M12 x 40 | 8 | 19 | 70 | o-ring |
| | 255-300 | M12 x 50 | 8 | 19 | 70 | o-ring |
| | 380-450 | M12 x 50 | 8 | 19 | 70 | o-ring |
| Discharge line to oil tank flange | 130-215 | M12 x 40 | 4 | 19 | 70 | o-ring |
| | 255-300 | M12 x 45 | 8 | 19 | 70 | o-ring |
| | 380-450 | M12 x 50 | 8 | 19 | 70 | o-ring |
| Econimizer line flange to motor housing | 130-150 | M12 x 45 | 4 | 19 | 70 | o-ring |
| | 180-215 | M12 x 40 | 4 | 19 | 70 | o-ring |
| | 255-300 | M12 x 40 | 4 | 19 | 70 | o-ring |
| | 380-450 | M12 x 40 | 4 | 19 | 70 | o-ring |
| Liquid line sump flange to motor housing | 130-150 | M12 x 45 | 8 | 19 | 70 | o-ring |
| | 180-215 | M12 x 45 | 8 | 19 | 70 | o-ring |
| | 255-300 | M12 x 50 | 16 | 19 | 70 | o-ring |
| | 380-450 | M12 x 50 | 16 | 19 | 70 | o-ring |
| Motor Hermetic terminals (spark plugs) | 130-150 | n/a | 6 | 1 1/8 | 50 | aluminum washer |
| | 180-215 | n/a | 6 | 1 3/8 | 175 | copper washer |
| | 255-300 | n/a | 6 | 1 3/8 | 175 | copper washer |
| | 380-450 | n/a | 6 | 1 3/8 | 175 | copper washer |
| Refrigerant filter flange stud bolts (inlet) | 130-215 | M12 x 115 | 4 | 19 | 70 | o-ring |
| | 255-300 | M12 x 115 | 4 | 19 | 70 | o-ring |
| | 380-450 | M12 x 115 | 4 | 19 | 70 | o-ring |
| Suction line to rotor housing | 130-150 | M12 x 45 | 8 | 19 | 70 | o-ring |
| | 180-215 | M12 x 45 | 8 | 19 | 70 | o-ring |
| | 255-300 | M12 x 45 | 8 | 19 | 70 | o-ring |
| | 380-450 | M12 x 50 | 16 | 19 | 70 | o-ring |

**Note:**
Coat all o-rings and gaskets with Trane Oil-15 or Oil-31.