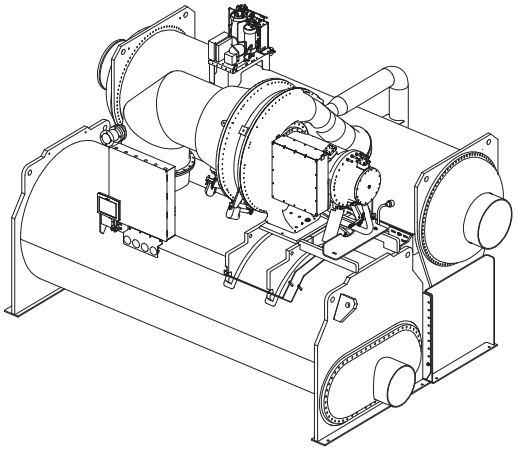
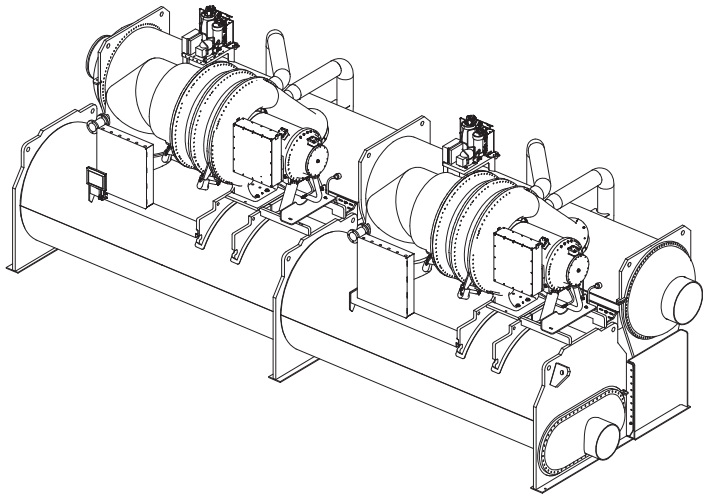
Installation Instructions

Disassembly and Reassembly Units

CenTraVac® Water-cooled Chillers
Models: CVHH, CDHH





Model Numbers: CVHH, CDHH

X39641259006

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

January 2024 **CVHH-SVN001F-EN**

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury. All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labeling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

Note: *Graphic labels (shown above) are used for CE application only.*

Important:

- Before servicing, disconnect all power sources and allow at least 30 minutes for capacitors to discharge.
- All electrical enclosures–unit or remote–are IP2X.

⚠WARNING

Refrigerant May Be Under Positive Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.
System contains refrigerant and may be under positive pressure; system may also contain oil. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or non-approved refrigerant additives.

Copyright

Factory Warranty Information

Compliance with the following is required to preserve the factory warranty:

All Unit Installations

Startup MUST be performed by Trane, or an authorized agent of Trane, to VALIDATE this WARRANTY. Contractor must provide a two-week startup notification to Trane (or an agent of Trane specifically authorized to perform startup).

Additional Requirements for Units Requiring Disassembly and Reassembly

When a new chiller is shipped and received from our Trane manufacturing location and, for any reason, it requires disassembly or partial disassembly, and reassembly–which could include but is not limited to the evaporator, condenser, control panel, compressor/motor, economizer, purge, factory-mounted starter or any other components originally attached to the fully assembled unit–compliance with the following is required to preserve the factory warranty:

- Trane, or an agent of Trane specifically authorized to perform start-up and warranty of Trane products, will perform or have direct on-site technical supervision of the disassembly and reassembly work.
- The installing contractor must notify Trane–or an agent of Trane specifically authorized to perform startup and warranty of Trane products–two weeks in advance of the scheduled disassembly work to coordinate the disassembly and reassembly work.
- Start-up must be performed by Trane or an agent of Trane specifically authorized to perform startup and warranty of Trane products.

Trane, or an agent of Trane specifically authorized to perform start-up and warranty of Trane products, will provide qualified personnel and standard hand tools to perform the disassembly and reassembly work at a location specified by the contractor. The contractor shall provide the rigging equipment such as chain falls, gantries, cranes, forklifts, etc. necessary for the disassembly and reassembly work and the required qualified personnel to operate the necessary rigging equipment.

Trademarks

All trademarks referenced in this document are the trademarks of their respective owners.

Revision History

- Updated the title and X-code of the literature.
- Updated figures in Components chapter.
- Updated tables in Dimensions and Weights chapter.
- Updated Final Installation Procedures section in Unit Reassembly chapter.

Table of Contents

Components

The following components are identified in Figure 1, p. 6 through Figure 8, p. 7:

1. Suction Elbow
2. Compressor
3. Control Power Transformer Panel
4. Control Panel
5. Condenser
6. Motor Housing
7. Economizer
8. Oil Tank Assembly
9. Purge
10. Evaporator
11. Display Panel

Figure 1. CVHH (back view)

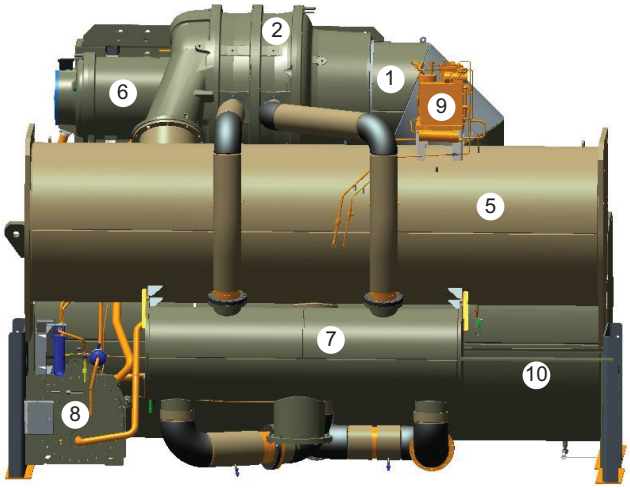


Figure 2. CVHH (bottom view)

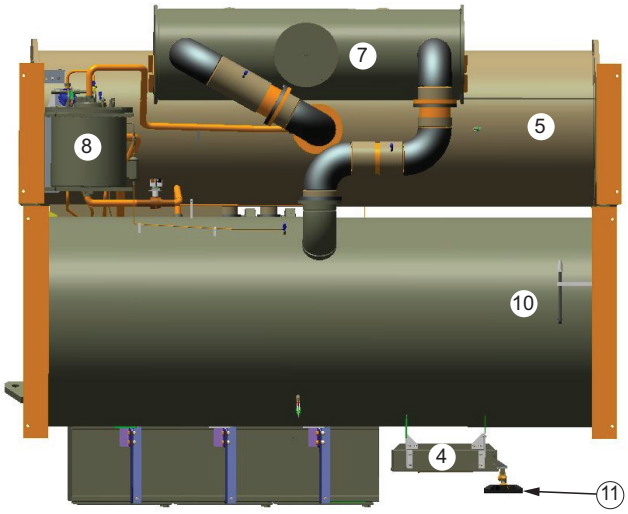


Figure 3. CVHH (left-hand view)

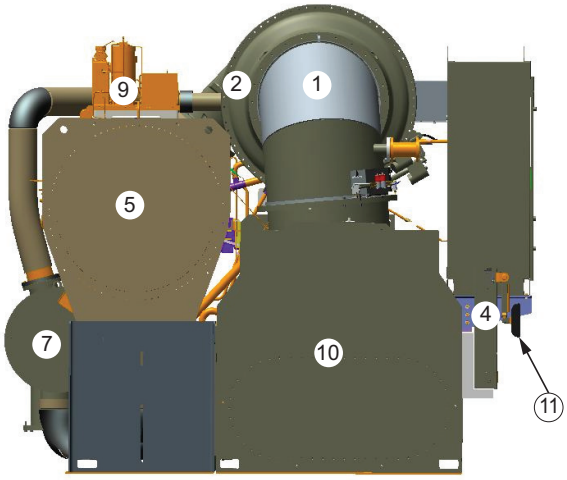


Figure 4. CVHH (right-hand view)

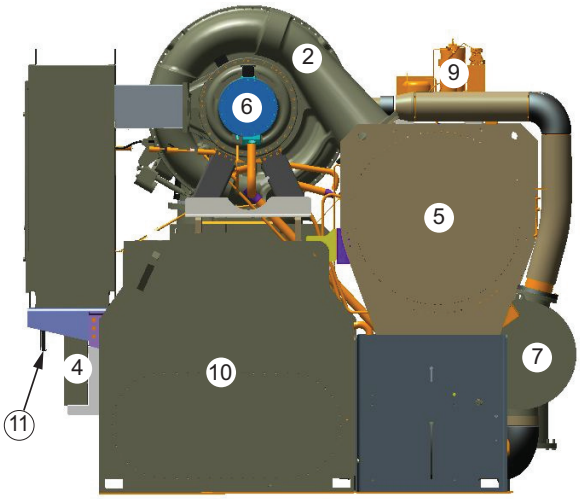


Figure 5. CVHH with AFDE (front view)

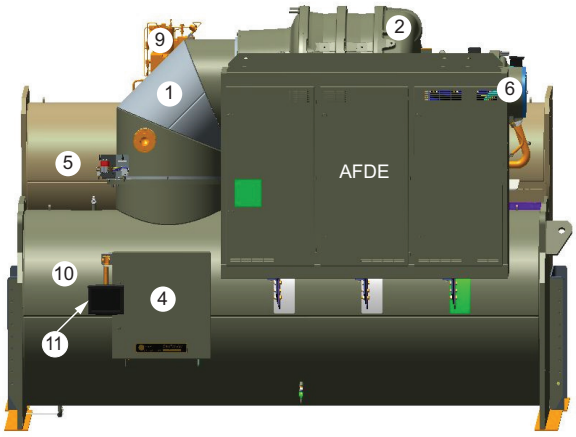


Figure 6. CVHH with wye-delta (front view)

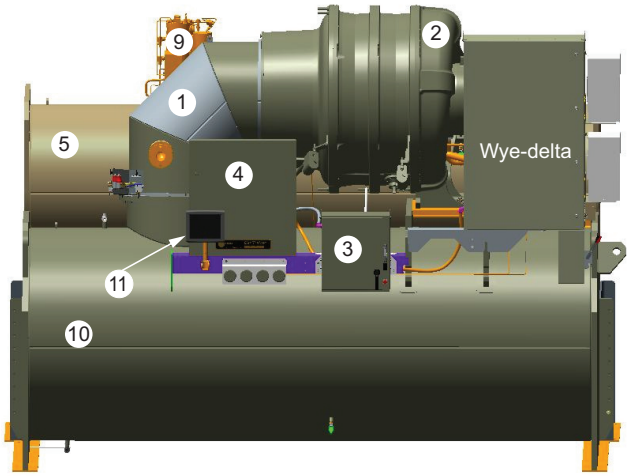


Figure 7. CVHH with AFDE (top view)

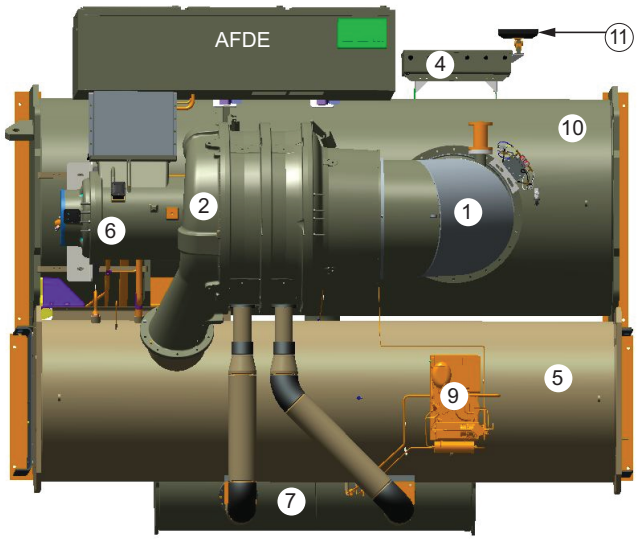
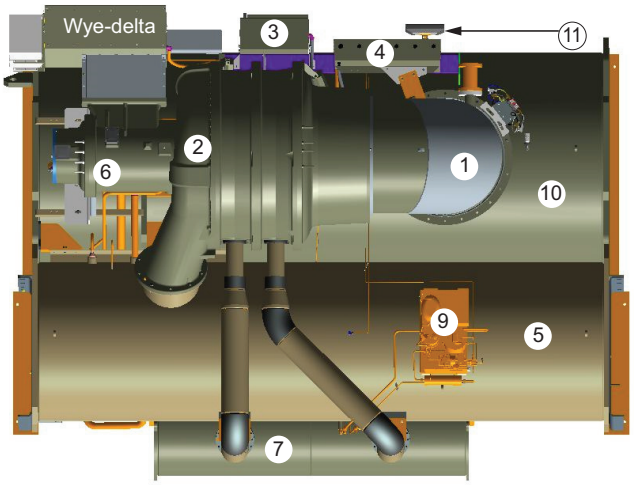


Figure 8. CVHH with wye-delta (top view)



General Information

The information and procedures in this document are to facilitate unit disassembly *for clearance and access reasons during the installation process*.

All CVHH and CDHH chillers ship standard with separable shells and compressor doweling (shell and foot) for take-apart applications. The process is to be initiated by experienced service technicians. Contact your local Trane Service office for assistance if required.

The separable shell feature includes a bolt-together design between the evaporator and condenser and allows the shells to be separated in the field.

Important: *These procedures do NOT apply to units that have been installed and electrical supply wiring has been completed.*

Trane Responsibilities

- Trane, or an agent of Trane specifically authorized to perform start-up and warranty of Trane products, will perform or have direct on-site technical supervision of the disassembly and reassembly work.
- *Prior to disassembly of unit*, remove the oil charge from the oil tank.
- Replace all gaskets with new gaskets or O-rings and sealing compound.[1]
- Evacuate the chiller under 1000 microns.[1]
- *If applicable*, recharge the chiller with dry nitrogen to 34.5 kPag (5 psig).[1]

Contractor Responsibilities

- Handle/lift and rig equipment.
- Protect all internal components from exposure to elements, which could contaminate or corrode chiller components.
- Replace and/or repair insulation.
- Reconnect electrical connections.
- Spot paint the chiller if necessary.

Metric Conversions

ft·lb x 1.3558	=	Newton·meter
lb x 0.4536	=	kg
in x 25.4000	=	mm

[1] The contractor should assist a qualified Trane Technician with this responsibility.

Dimensions and Weights

Dimensions

Table 1. For Figure 9, p. 14 and Figure 10, p. 15: Dimension data for CVHH and CDHH

Shell Size	Comp Size	A		B		C		E		F		G		H		J	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
100L/100L	120	2974	117.1	2251	88.6	2636	103.8	2721	107.1	1500	59.1	1827	71.9	2809	110.6	1170	46.1
	105																
100M/100M	120	2974	117.1	2251	88.6	2636	103.8	2721	107.1	1500	59.1	1827	71.9	2802	110.3	1170	46.1
	105																
100/10HM	120	3332	131.2	2334	91.9	N/A	N/A	2721	107.1	1500	59.1	1827	71.9	2979	117.3	1170	46.1
	105																
130M/130M	120	3039	119.6	2421	95.3	2806	110.5	2721	107.1	1500	59.1	1827	71.9	2975	117.1	1340	52.8
	105																
130/13HM	120	3439	135.4	2501	98.5	N/A	N/A	2721	107.1	1500	59.1	1827	71.9	3180	125.2	1340	52.8
	105																
160M/200M	120	3136	123.5	2611	102.8	2996	118.0	2721	107.1	1500	59.1	1827	71.9	3177	125.1	1530	60.2
	105																
160M/20HM	120	3675	144.7	2687	105.8	N/A	N/A	2721	107.1	1500	59.1	1827	71.9	3339	131.5	1530	60.2
	105																
200L/200L	170	3017	118.8	2689	105.9	3056	120.3	2721	107.1	1500	59.1	1827	71.9	3227	127.0	1589	62.6
	155																
200L/20HL	170	3611	142.2	2746	108.1	N/A	N/A	2721	107.1	1500	59.1	1827	71.9	3399	133.8	1589	62.6
	155																
200L/220L	120	3161	124.4	2723	107.2	3056	120.3	2721	107.1	1500	59.1	1827	71.9	3349	131.9	1589	62.6
	105																
220L/220L	120	3315	130.5	2770	109.1	3155	124.2	2721	107.1	1500	59.1	1827	71.9	3346	131.7	1715	67.5
	105																
	170	3315	130.5	2770	109.1	3155	124.2	2721	107.1	1500	59.1	1827	71.9	3346	131.7	1715	67.5
	155																
220L/22HL	170	3854	151.7	2835	111.6	N/A	N/A	2721	107.1	1500	59.1	1827	71.9	3490	137.4	1715	67.5
	155																
400M/440M	120	3161	124.4	2723	107.2	3056	120.3	2721	107.1	1500	59.1	1827	71.9	3349	131.9	1589	62.6
	105																
440M/440M	170	3315	130.5	2770	109.1	3155	124.2	2721	107.1	1500	59.1	1827	71.9	3346	131.7	1715	67.5
	155																
440X/440X	170	3315	130.5	2770	109.1	3155	124.2	2721	107.1	1500	59.1	1827	71.9	3346	131.7	1715	67.5
	155																
440M/44HM	170	3315	130.5	2770	109.1	3155	124.2	2721	107.1	1500	59.1	1827	71.9	3346	131.7	1715	67.5
	155																
440X/44HX	170	3315	130.5	2770	109.1	3155	124.2	2721	107.1	1500	59.1	1827	71.9	3346	131.7	1715	67.5
	155																

Note: Unit approximate lengths from tubesheet to tubesheet:

Simplex
Short = 4064 mm (160 in.)
Long = 4578 mm (180 in.)

Duplex
Short = 7925 mm (312 in.)
Long = 9144 mm (360 in.)

Table 2. For Figure 9, p. 14 and Figure 10, p. 15: Dimension data for CVHH and CDHH

Shell Size	Comp Size	K		USID, USTR, UATR, UPIR, UXL L1		UAFD Only L2		M1		M2		N		USID, USTR, UATR, UPIR, UXL P1		UAFD Only P2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
100L/100L	120	1554	61.2	1515	59.6	1640	64.6	1362	53.6	59	2.3	2772	109.1	2093	82.4	1579	62.2
	105																
100M/100M	120	1554	61.2	1515	59.6	1640	64.6	1362	53.6	59	2.3	2772	109.1	2093	82.4	1579	62.2
	105																
100/10HM	120	1554	61.2	1494	58.8	N/A	N/A	1720	67.7	36	1.4	3130	123.2	2093	82.4	N/A	N/A
	105																
130M/130M	120	1724	67.9	1512	59.5	1707	67.2	1362	53.6	123	4.8	2775	109.3	2262	89.1	1579	62.2
	105																
130/13HM	120	1724	67.9	1499	59.0	N/A	N/A	1720	67.7	131	5.2	3133	123.3	2263	89.1	N/A	N/A
	105																
160M/200M	120	1914	75.4	1580	62.2	1830	72.0	1140	44.9	389	15.3	2883	113.5	2453	96.6	1579	62.2
	105																
160M/20HM	120	1914	75.4	1580	62.2	N/A	N/A	1701	67.0	270	10.6	3235	127.4	2453	96.6	N/A	N/A
	105																
200L/200L	170	1971	77.6	1725	67.9	2057	81.0	1299	51.1	232	9.1	2903	114.3	2512	98.9	1579	62.2
	155																
200L/20HL	170	1971	77.6	1725	67.9	N/A	N/A	1746	68.7	226	8.9	3355	132.1	3512	138.3	N/A	N/A
	155																
200L/220L	120	1971	77.6	1725	67.9	2057	81.0	1505	59.3	244	9.6	2853	112.3	2512	98.9	1579	62.2
	105																
220L/220L	120	2113	83.2	1882	74.1	2195	86.4	1463	57.6	244	9.6	3033	119.4	2638	103.9	1579	62.2
	105																
	170	2113	83.2	1882	74.1	2195	86.4	1463	57.6	244	9.6	3033	119.4	2638	103.9	1579	62.2
	155																
220L/22HL	170	2120	83.5	1782	70.2	N/A	N/A	1900	74.8	274	10.8	3620	142.5	2638	103.9	N/A	N/A
	155																
400M/440M	120	1971	77.6	1725	67.9	2057	81.0	1505	59.3	244	9.6	2853	112.3	2512	98.9	1579	62.2
	105																
440M/440M	170	2113	83.2	1882	74.1	2195	86.4	1463	57.6	244	9.6	3033	119.4	2638	103.9	1579	62.2
	155																
440X/440X	170	2113	83.2	1882	74.1	2195	86.4	1463	57.6	244	9.6	3033	119.4	2638	103.9	1579	62.2
	155																
440M/44HM	170	2113	83.2	1882	74.1	2195	86.4	1463	57.6	244	9.6	3033	119.4	2638	103.9	1579	62.2
	155																
440X/44HX	170	2113	83.2	1882	74.1	2195	86.4	1463	57.6	244	9.6	3033	119.4	2638	103.9	1579	62.2
	155																

Note: Unit approximate lengths from tubesheet to tubesheet:

Simplex
Short = 4064 mm (160 in.)
Long = 4578 mm (180 in.)

Duplex
Short = 7925 mm (312 in.)
Long = 9144 mm (360 in.)

Table 3. For Figure 9, p. 14 and Figure 10, p. 15: Dimension data for CVHH and CDHH

Shell Size	Comp Size	R		T		USID, USTR, UATR, UPIR, UXL U1		UAFD Only U2		USID, USTR, UAFD V1		UATR, UPIR, UXL V2		W		X	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
100L/100L	120	605	23.8	1058	41.7	3099	122.0	3224	126.9	3078	121.2	3173	124.9	2278	89.7	1856	73.1
	105	935	36.8														
100M/100M	120	605	23.8	1058	41.7	3099	122.0	3224	126.9	3078	121.2	3173	124.9	2278	89.7	1856	73.1
	105	935	36.8														
100/10HM	120	605	23.8	1058	41.7	3499	137.8	N/A	N/A	3078	121.2	3173	124.9	2453	96.6	1825	71.9
	105	935	36.8														
130M/130M	120	605	23.8	1058	41.7	3152	124.1	3347	131.8	3246	127.8	3342	131.6	2445	96.3	1994	78.5
	105	935	36.8														
130/13HM	120	605	23.8	1058	41.7	3555	140.0	N/A	N/A	3246	127.8	3342	131.6	2654	104.5	1995	78.5
	105	935	36.8														
160M/200M	120	605	23.8	1058	41.7	3202	126.1	3452	135.9	3439	135.4	3533	139.1	2653	104.4	2158	85.0
	105	935	36.8														
160M/20HM	120	605	23.8	1058	41.7	3727	146.7	N/A	N/A	3437	135.3	3533	139.1	2816	110.9	2185	86.0
	105	935	36.8														
200L/200L	170	605	23.8	1058	41.7	N/A	N/A	3502	137.9	3496	137.6	3592	141.4	2703	106.4	2244	88.3
	155	935	36.8														
200L/20HL	170	605	23.8	1058	41.7	N/A	N/A	N/A	N/A	3498	137.7	3592	141.4	2875	113.2	2244	88.3
	155	935	36.8														
200L/220L	120	605	23.8	1058	41.7	N/A	N/A	3607	142.0	3496	137.6	3592	141.4	2826	111.3	2244	88.3
	105	935	36.8														
220L/220L	120	605	23.8	1058	41.7	N/A	N/A	3774	148.6	3598	141.7	3692	145.4	2823	111.1	2370	93.3
	105	935	36.8														
	170	605	23.8	1058	41.7	N/A	N/A	3774	148.6	3598	141.7	3692	145.4	2823	111.1	2370	93.3
	155	935	36.8														
220L/22HL	170	605	23.8	1058	41.7	N/A	N/A	N/A	N/A	3597	141.6	3692	145.4	2967	116.8	2370	93.3
	155	935	36.8														
400M/440M	120	605	23.8	1058	41.7	N/A	N/A	3607	142.0	3496	137.6	3592	141.4	2826	111.3	2244	88.3
	105	935	36.8														
440M/440M	170	605	23.8	1058	41.7	N/A	N/A	3774	148.6	3598	141.7	3692	145.4	2823	111.1	2370	93.3
	155	935	36.8														
440X/440X	170	605	23.8	1058	41.7	N/A	N/A	3774	148.6	3598	141.7	3692	145.4	2823	111.1	2370	93.3
	155	935	36.8														
440M/44HM	170	605	23.8	1058	41.7	N/A	N/A	3774	148.6	3598	141.7	3692	145.4	2823	111.1	2370	93.3
	155	935	36.8														
440X/44HX	170	605	23.8	1058	41.7	N/A	N/A	3774	148.6	3598	141.7	3692	145.4	2823	111.1	2370	93.3
	155	935	36.8														

Note: Unit approximate lengths from tubesheet to tubesheet:

Simplex
Short = 4064 mm (160 in.)
Long = 4578 mm (180 in.)

Duplex
Short = 7925 mm (312 in.)
Long = 9144 mm (360 in.)

Table 4. For Figure 9, p. 14 and Figure 10, p. 15: Dimension data for CVHH and CDHH

Shell Size	Comp Size	Control Panel AA1		UAFD AA2		AB		AC		USID, USTR Y1		USID, USTR Y2		UATR, UPIR, UXL Y1		UATR, UPIR, UXL Y2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
100L/100L	120	282	11.1	N/A	N/A	2942	115.8	1358	53.5	3292	129.6	1700	66.9	3345	131.7	1762	69.4
	105																
100M/100M	120	282	11.1	N/A	N/A	2942	115.8	1358	53.5	3292	129.6	1700	66.9	3345	131.7	1762	69.4
	105																
100/10HM	120	282	11.1	N/A	N/A	3342	131.6	1337	52.6	3690	145.3	1685	66.3	3746	147.5	1741	68.5
	105																
130M/130M	120	344	13.5	N/A	N/A	3060	120.5	1420	55.9	3343	131.6	1703	67.0	3399	133.8	1759	69.3
	105																
130/13HM	120	344	13.5	N/A	N/A	3463	136.3	1413	55.6	3746	147.5	1689	66.5	3801	149.6	1745	68.7
	105																
160M/200M	120	269	10.6	N/A	N/A	3185	125.4	1563	61.5	3393	133.6	1771	69.7	3449	135.8	1827	71.9
	105																
160M/20HM	120	269	10.6	N/A	N/A	3711	146.1	1563	61.5	3916	154.2	1771	69.7	3974	156.5	1827	71.9
	105																
200L/200L	170	274	10.8	N/A	N/A	3229	127.1	1783	70.2	3362	132.4	1916	75.4	3417	134.5	1972	77.6
	155																
200L/20HL	170	N/A	N/A	N/A	N/A	3805	149.8	1783	70.2	3738	147.2	1916	75.4	3994	157.2	1972	77.6
	155																
200L/220L	120	194	7.6	274	10.8	3333	131.2	1783	70.2	3466	136.5	1916	75.4	3522	138.7	1972	77.6
	105																
220L/220L	120	103	4.1	267	10.5	3507	138.1	1928	75.9	3387	133.3	1808	71.2	3541	139.4	1962	77.2
	105																
	170	103	4.1	267	10.5	3507	138.1	1928	75.9	3387	133.3	1808	71.2	3541	139.4	1962	77.2
	155																
220L/22HL	170	105	4.1	N/A	N/A	4256	167.6	1928	75.9	4137	162.9	1808	71.2	4291	168.9	1962	77.2
	155																
400M/440M	120	194	7.6	274	10.8	3333	131.2	1783	70.2	3466	136.5	1916	75.4	3522	138.7	1972	77.6
	105																
440M/440M	170	103	4.1	267	10.5	3507	138.1	1928	75.9	3387	133.3	1808	71.2	3541	139.4	1962	77.2
	155																
440X/440X	170	103	4.1	267	10.5	3507	138.1	1928	75.9	3387	133.3	1808	71.2	3541	139.4	1962	77.2
	155																
440M/44HM	170	103	4.1	267	10.5	3507	138.1	1928	75.9	3387	133.3	1808	71.2	3541	139.4	1962	77.2
	155																
440X/44HX	170	103	4.1	267	10.5	3507	138.1	1928	75.9	3387	133.3	1808	71.2	3541	139.4	1962	77.2
	155																

Note: Unit approximate lengths from tubesheet to tubesheet:

Simplex
Short = 4064 mm (160 in.)
Long = 4578 mm (180 in.)

Duplex
Short = 7925 mm (312 in.)
Long = 9144 mm (360 in.)

Table 5. For Figure 9, p. 14 and Figure 10, p. 15: Dimension data for CVHH and CDHH

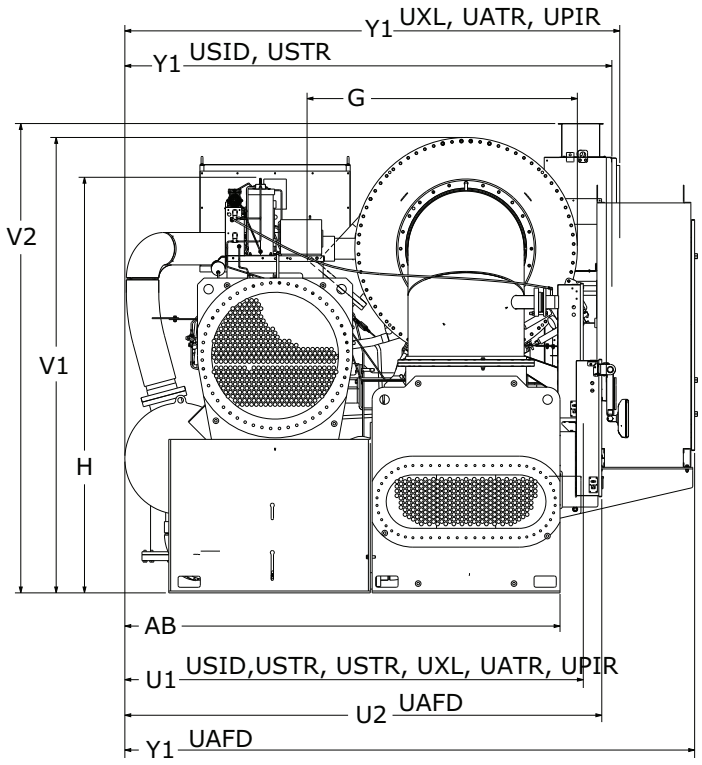
Shell Size	Comp Size	UAFD				UAFD Only		Hinged Waterbox	
		Y1		Y2		AD1		AD2	
		mm	in.	mm	in.	mm	in.	mm	in.
100L/100L	120	3852	151.7	2268	89.3	141	5.6	200	7.9
	105								
100M/100M	120	3852	151.7	2268	89.3	141	5.6	200	7.9
	105								
100/10HM	120	N/A	N/A	N/A	N/A	N/A	N/A	200	7.9
	105								
130M/130M	120	3905	153.7	2265	89.2	111	4.4	200	7.9
	105								
130/13HM	120	N/A	N/A	N/A	N/A	N/A	N/A	200	7.9
	105								
160M/200M	120	3995	157.3	2333	91.9	86	3.4	200	7.9
	105								
160M/20HM	120	N/A	N/A	N/A	N/A	N/A	N/A	200	7.9
	105								
200L/200L	170	3923	154.4	2478	97.6	186	7.3	122	4.8
	155								
200L/20HL	170	N/A	N/A	N/A	N/A	N/A	N/A	186	7.3
	155								
200L/220L	120	4028	158.6	3476	136.9	186	7.3	274	10.8
	105								
220L/220L	120	4049	159.4	2470	97.2	74	2.9	187	7.4
	105								
	170	4049	159.4	2470	97.2	74	2.9	187	7.4
	155								
220L/22HL	170	N/A	N/A	N/A	N/A	N/A	N/A	176	6.9
	155								
400M/440M	120	4028	158.6	3476	136.9	186	7.3	274	10.8
	105								
440M/440M	170	4049	159.4	2470	97.2	74	2.9	187	7.4
	155								
440X/440X	170	4049	159.4	2470	97.2	74	2.9	187	7.4
	155								
440M/44HM	170	4049	159.4	2470	97.2	74	2.9	187	7.4
	155								
440X/44HX	170	4049	159.4	2470	97.2	74	2.9	187	7.4
	155								

Note: Unit approximate lengths from tubesheet to tubesheet:

Simplex
Short = 4064 mm (160 in.)
Long = 4578 mm (180 in.)

Duplex
Short = 7925 mm (312 in.)
Long = 9144 mm (360 in.)

Figure 9. For Table 1, p. 9 through Table 5, p. 13, mm (in.)



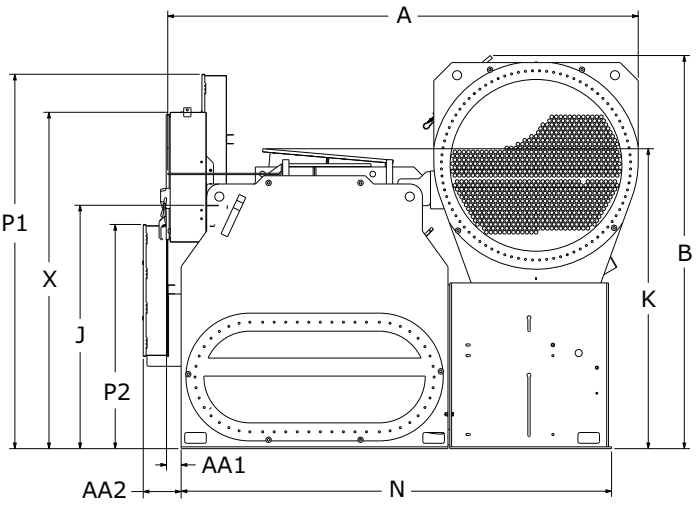
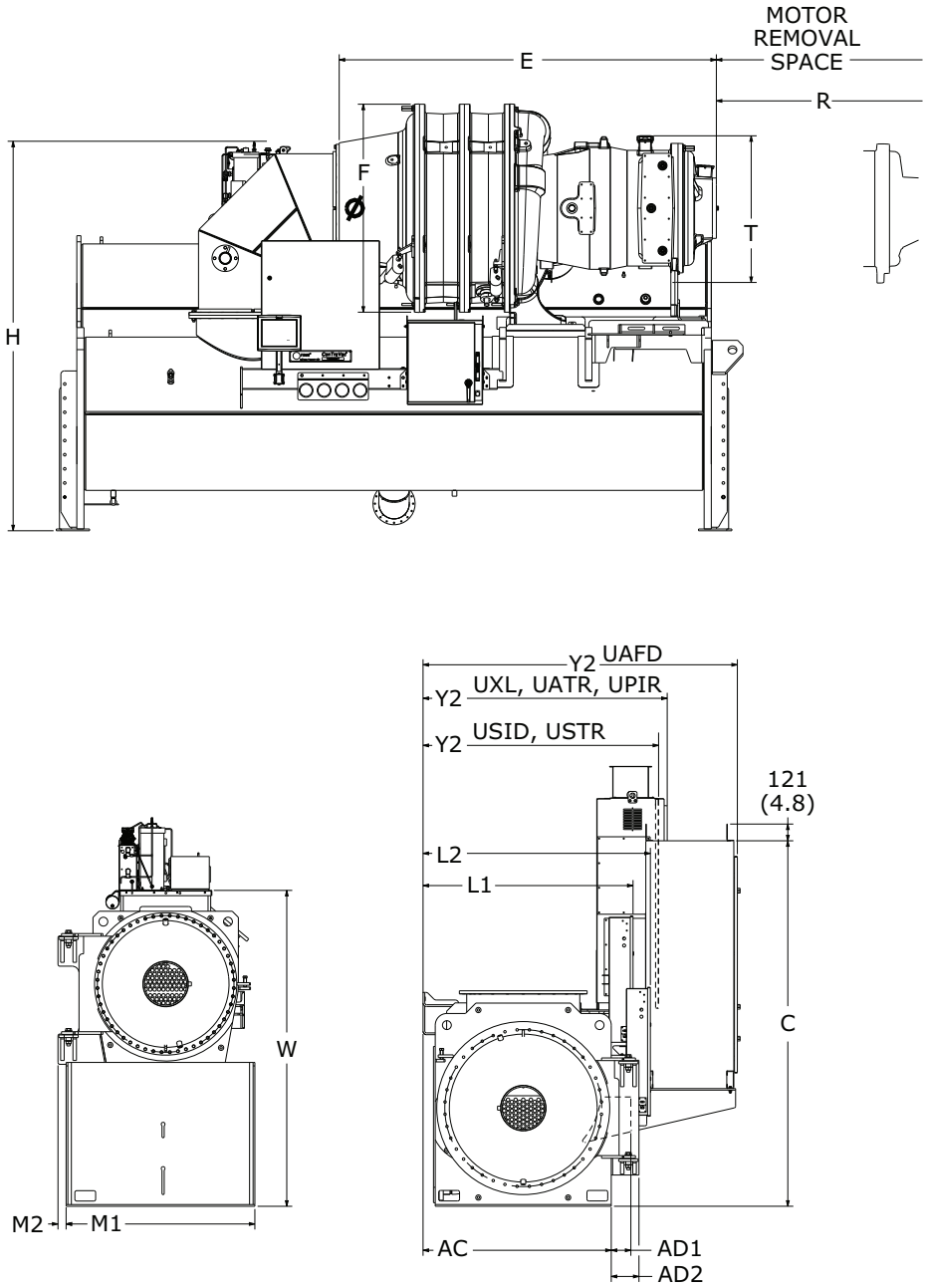


Figure 10. For Table 1, p. 9 through Table 5, p. 13, mm (in.)



Weights

Table 6. CVHH and CDHH CenTraVac™ chiller maximum weights, 1034.2 kPaG (150 psig) non-marine waterboxes, without starter[(a)]

Model	Comp Size	Hz	Evap Size	Cond Size	Weight without Starter[(a)]			
					Operating		Shipping	
	NTON	HRTZ	EVSZ	CDSZ	kg	lb	kg	lb
CVHH	900–1200	60	100M	100M	20384	44938	17897	39456
	900–1200	60	100L	100L	21203	46745	18487	40757
	900–1200	60	100M	10HM	24941	54985	21656	47744
	900–1200	60	130M	130M	22790	50244	19700	43431
	900–1200	60	130M	13HM	28379	62564	24342	53664
	900–1200	60	160M	200M	26127	57601	22225	48997
	900–1200	60	160M	20HM	32446	71531	27520	60672
	900–1200	60	200L	220L	28872	63651	24335	53650
	900–1200	60	220L	220L	30920	68167	25842	56971
	1700–1500	60	200L	200L	27932	61579	23767	52397
	1700–1500	60	200L	20HL	34873	76881	29574	65199
	1700–1500	60	220L	220L	31334	69080	26256	57884
	1700–1500	60	220L	22HL	40128	88467	33602	74079
	950–1050	50	100M	100M	21322	47006	18835	41524
	950–1050	50	100L	100L	22141	48813	19425	42825
	950–1050	50	100M	10HM	25879	57053	22594	49812
	950–1050	50	130M	130M	23728	52312	20638	45499
	950–1050	50	130M	13HM	29317	64632	25280	55732
	950–1050	50	160M	200M	27065	59669	23163	51065
	950–1050	50	160M	20HM	33384	73599	28458	62740
	950–1050	50	200L	220L	29810	65719	25273	55718
	950–1050	50	220L	220L	31858	70235	26780	59039
	1550	50	200L	200L	28957	63839	24792	54657
	1550	50	200L	20HL	35898	79141	30599	67459
	1550	50	220L	220L	32359	71340	27281	60144
	1550	50	220L	22HL	41153	90727	34627	76339
CDHH	2000–2600	60	400M	440M	49094	108234	41888	92348
	2800–3300	60	440M	440M	54045	119148	45486	100280
	2800–3300	60	440X	440X	57386	126515	47750	105271
	1750–2250	50	400M	440M	51416	113353	44210	97467
	3050	50	440M	440M	56416	124375	47857	105507
	3050	50	440X	440X	59233	130587	49597	109343
	2000–2600	60	440M	44HM	63881	140833	55322	121963
	2800–3300	60	440X	44HX	68270	150509	58634	129265
	3050	50	440M	44HM	66252	146060	57693	127190
	3050	50	440X	44HX	70117	154581	60481	133337

Note: Chiller weights include the following:
1. TECU 0.028 in. (0.71 mm) tube wall.
2. 1034.2 kPaG (150 psig) non-marine waterboxes.
3. Largest bundles.

(a) To calculate chiller maximum weight with starter, add starter weight from Table 13, p. 19 to the chiller maximum weight from Table 7, p. 17, above.

Table 7. CVHH and CDHH CenTraVac™ chiller maximum weights, 2068.4 kPaG (300 psig) marine waterboxes (1- or 3-pass), without starter[a]

Model	Comp Size	Hz	Evap Size	Cond Size	Weight without Starter[a]			
					Operating		Shipping	
	NTON	HRTZ	EVSZ	CDSZ	kg	lb	kg	lb
CVHH	900–1200	60	100M	100M	24482	53973	20840	45945
	900–1200	60	100L	100L	25401	56000	21536	47479
	900–1200	60	100M	10HM	28071	61886	24590	54211
	900–1200	60	130M	130M	27691	61049	23120	50971
	900–1200	60	130M	13HM	31828	70168	27589	60824
	900–1200	60	160M	200M	33392	73616	27625	60902
	900–1200	60	160M	20HM	37004	81579	31810	70129
	900–1200	60	200L	220L	38878	85712	30933	68196
	900–1200	60	220L	220L	42894	94565	34012	74984
	1700–1500	60	200L	200L	37867	83483	31188	68758
	1700–1500	60	200L	20HL	42200	93036	35988	79340
	1700–1500	60	220L	220L	43308	95478	34426	75897
	1700–1500	60	220L	22HL	49753	109686	41942	92467
	950–1050	50	100M	100M	25420	56041	21778	48013
	950–1050	50	100L	100L	26339	58068	22474	49547
	950–1050	50	100M	10HM	29009	63954	25528	56279
	950–1050	50	130M	130M	28629	63117	24058	53039
	950–1050	50	130M	13HM	32766	72236	28527	62892
	950–1050	50	160M	200M	34330	75684	28563	62970
	950–1050	50	160M	20HM	37942	83647	32748	72197
	950–1050	50	200L	220L	39816	87780	31871	70264
	950–1050	50	220L	220L	43832	96633	34950	77052
	1550	50	200L	200L	38892	85743	32213	71018
	1550	50	200L	20HL	43226	95296	37013	81600
	1550	50	220L	220L	44333	97738	35451	78157
	1550	50	220L	22HL	50778	111946	42967	94727
CDHH	2000–2600	60	400M	440M	59954	132175	49454	109027
	2800–3300	60	440M	440M	66958	147617	54731	120662
	2800–3300	60	440X	440X	70905	156319	57637	127068
	1750–2250	50	400M	440M	62275	137293	51776	114146
	3050	50	440M	440M	69329	152844	57102	125889
	3050	50	440X	440X	72752	160391	59484	131140

Note: Chiller weights include the following:
1. TECU 0.035-in. (0.89 mm) tube wall.
2. 2068.4 kPaG (300 psig) marine waterboxes (1- or 3-pass).
3. Largest bundles.

(a) To calculate chiller maximum weight with starter, add starter weight from Table 13, p. 19 to the chiller maximum weight from Table 7, p. 17, above.

Table 8. Compressor and motor maximum weights[a],[b]

Model	NTON	Compressor and Motor Weight	
		kg	lb
CVHH	900	5737	12648
	1000	5737	12648
	1200	5737	12648
	1500	6132	13518
	1550	7108	15670
	1700	6132	13518
CDHH	2000	5737	12648
	2600	5737	12648
	2800	6132	13518
	3050	7108	15670
	3300	6132	13518

(a) For Duplex™ chillers, weights shown are for individual components; multiply by two for total component weights (for Duplex chillers only).
(b) All weights are nominal and ±10%.

Table 9. Component maximum weights[a],[b]

Control Panel		Purge		Oil Tank		Suction Elbow[c]		Economizer		Economizer Liquid Piping		Economizer Vapor Piping	
kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
54.4	120	64	140	522	1150	504	1111	707	1558	114	252	146	322

(a) For Duplex chillers, weights shown are for individual components; multiply by two for total component weights (for Duplex chillers only).
(b) All weights are nominal and ±10%.
(c) Suction elbow weights include flanges and assume largest compressor available for that size.

Table 10. Evaporator maximum weights[a]

Model	Shell Size	Shell[b]	
		kg	lb
CVHH	100L	4445	9799
	100M	4151	9152
	130M	4995	11012
	160M	6597	14544
	200L	7820	17240
	220L	9342	20596
CDHH	400M	12790	28197
	440M	15341	33820
	440X	16643	36692

(a) All weights are nominal and ±10%.
(b) Evaporator shell weight includes: Evaporator + Legs; waterbox weight is NOT included.

Table 11. Condenser maximum weights[a]

Model	Shell Size	Shell[b]	
		kg	lb
CVHH	100L	4540	12105
	100M	4154	11255
	10HM	5169	13491
	130M	4967	13047
	13HM	6264	15905
	200L	6246	15865
	200M	5977	15273
	20HL	8000	19733
	20HM	7413	18438
	220L	7365	18332
	22HL	9648	23366
CDHH	440M	12290	29191
	440X	13861	32653
	44HM	23115	50960
	44HX	25624	56492

(a) All weights are nominal and ±10%.
(b) Condenser shell weight includes: Condenser + Oil Tank + Purge + Legs; waterbox weight is NOT included.

Table 12. Waterbox maximum weights

Shell Size	Description	Non-Marine				Marine					
		Plate		Dome		Plate Cover		Dome Cover		Waterbox	
		kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
100	Evaporator, 1034.2 kPa (150 psi)	–	–	314	693	–	–	258	569	586	1292
	Evaporator, 2068.4 kPa (300 psi)	280	617	–	–	369	814	–	–	619	1365
	Condenser, 1034.2 kPa (150 psi)	–	–	203	448	–	–	147	324	432	953
	Condenser, 2068.4 kPa (300 psi)	–	–	291	642	–	–	198	436	542	1195
130	Evaporator, 1034.2 kPa (150 psi)	–	–	347	766	–	–	292	645	645	1423
	Evaporator, 2068.4 kPa (300 psi)	331	731	–	–	320	705	–	–	693	1527
	Condenser, 1034.2 kPa (150 psi)	–	–	267	589	–	–	185	409	529	1166
	Condenser, 2068.4 kPa (300 psi)	–	–	386	851	–	–	255	562	686	1513
160	Evaporator, 1034.2 kPa (150 psi)	–	–	391	863	–	–	310	683	822	1813
	Evaporator, 2068.4 kPa (300 psi)	416	919	–	–	411	906	–	–	878	1937
200/400	Evaporator, 1034.2 kPa (150 psi)	–	–	295	652	581	1282	–	–	870	1918
	Evaporator, 2068.4 kPa (300 psi)	898	1981	–	–	799	1763	–	–	1292	2849
	Condenser, 1034.2 kPa (150 psi)	–	–	317	700	–	–	–	–	700	1544
	Condenser, 2068.4 kPa (300 psi)	–	–	–	–	782	1724	–	–	970	2138
220/440	Evaporator, 1034.2 kPa (150 psi)	–	–	364	802	772	1702	–	–	1214	2677
	Evaporator, 2068.4 kPa (300 psi)	–	–	717	1581	1123	2476	–	–	1876	4137
	Condenser, 1034.2 kPa (150 psi)	–	–	346	763	–	–	246	543	724	1598
	Condenser, 2068.4 kPa (300 psi)	–	–	513	1132	–	–	321	708	862	1901
10H	Heat Recovery Condenser, 1034.2 kPa (150 psi)	917	2022	–	–	–	–	–	–	–	–
13H	Heat Recovery Condenser, 1034.2 kPa (150 psi)	1106	2439	–	–	–	–	–	–	–	–
20H	Heat Recovery Condenser, 1034.2 kPa (150 psi)	1247	2750	–	–	–	–	–	–	–	–
22H	Heat Recovery Condenser, 1034.2 kPa (150 psi)	1747	3853	–	–	–	–	–	–	–	–

Table 13. Unit-mounted starters/Adaptive Frequency drives[(a)] maximum weights

		kg	lb
Low Voltage (less than 600 volts)	Wye-delta	253	557
	Solid State	253	557
		kg	**lb**
Adaptive Frequency Drive (less than 600 volts)	900 amp	1361	3000
	1210 amp	1361	3000
		kg	**lb**
Medium Voltage (2300 to 6600 volts)	Across-the-line	296	652
	Primary Reactor	727	1602
	Autotransformer	772	1702

(a) All weights are nominal and ±10%.

Unit Disassembly

Remove Nitrogen Charge

⚠WARNING

Refrigerant May Be Under Positive Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.
System contains refrigerant and may be under positive pressure; system may also contain oil. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or non-approved refrigerant additives.

Important: *Remove the nitrogen charge from the chiller vessel before starting any disassembly procedures.*

Note: *New units ship with a 34.5 kPag (5 psig) dry nitrogen holding charge at nominal 22.2°C (72°F).*

Important: *New units that have been factory run-tested contain residual refrigerant; vent discharge outdoors.*

Check to make sure there is a positive pressure holding charge.

Overview

All CVHH and CDHH chillers ship standard with separable shells and compressor doweling (shell and foot) for take-apart applications. The process is to be initiated by experienced service technicians. Contact your local Trane Service office for assistance if required.

This section discusses a typical disassembly process. Proper lifting techniques vary based on mechanical room layout.

⚠WARNING

Heavy Objects!

Failure to follow instructions below could result in unit dropping which could result in death or serious injury, and equipment or property-only damage.
Ensure that all the lifting equipment used is properly rated for the weight of the unit being lifted. Each of the cables (chains or slings), hooks, and shackles used to lift the unit must be capable of supporting the entire weight of the unit. Lifting cables (chains or slings) may not be of the same length. Adjust as necessary for even unit lift.

- It is the responsibility of the person(s) performing the work to be properly trained in the safe practice of rigging, lifting, securing, and fastening the components involved.
- It is the responsibility of the person(s) providing and using the rigging and lifting devices to inspect these devices to ensure they are free from defect and are rated to meet or exceed the published weights.
- Always use rigging and lifting devices in accordance with the applicable instructions for such devices.

Note: *Components to reassemble the unit–including gaskets, O-rings, and couplings–are available as a kit for units that are to be taken apart in the field.*

NOTICE

Equipment Damage!

Failure to remove the strain relief with the sensor could result in equipment damage.
Do NOT attempt to pull sensor bulb through the strain relief; always remove the entire strain relief with the sensor.

Unit-mounted Starter Removal

Additional horizontal and vertical clearances may be obtained by removing the unit-mounted starter on chillers so equipped. Refer to Figure 11, p. 20 and Figure 12, p. 21.

Figure 11. Wye-delta starter

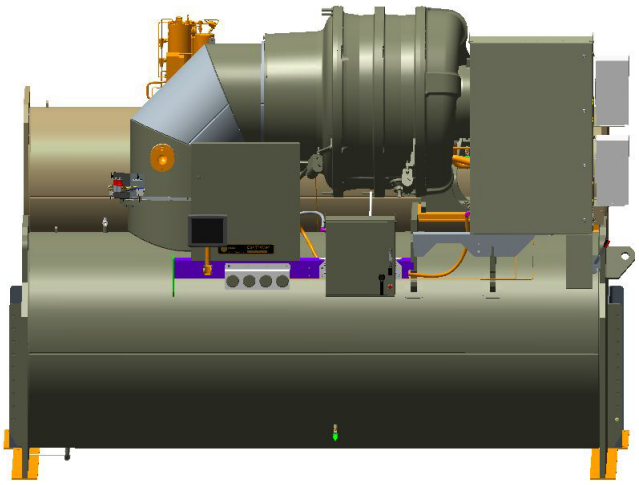
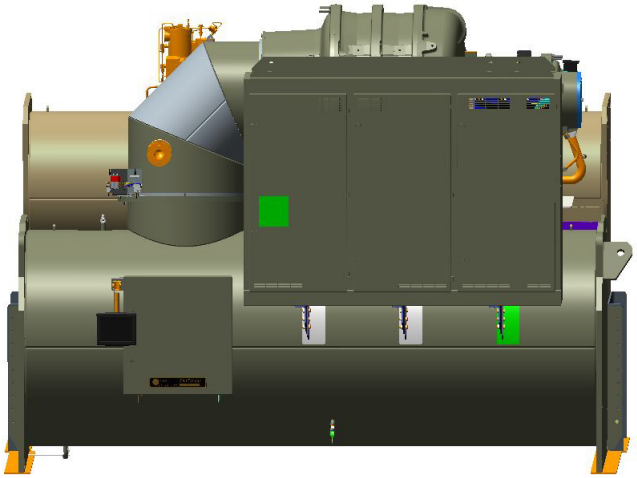


Figure 12. AFDE unit-mounted starter



The following procedures (“,” p. 21 and “AFDE Unit-mounted Starter Removal,” p. 22) assume the chiller is new and has never been installed and therefore there is no electrical power connected to the chiller. *If there is power to the unit, follow proper lockout/tagout procedures, and any other applicable safety regulations regarding electric power.*

Wye-delta Starter Removal

⚠WARNING

Hazardous Voltage w/Capacitors!

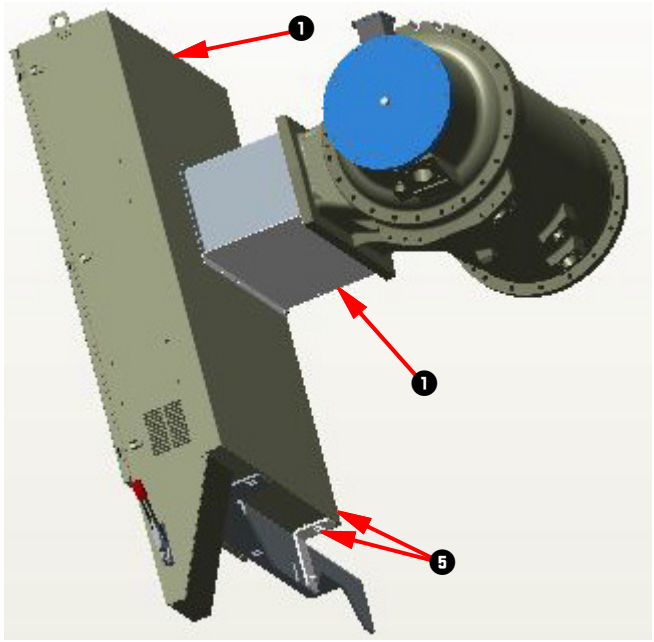
Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer’s literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

Note: *Graphic labels (shown above) are used for CE application only.*

Important:

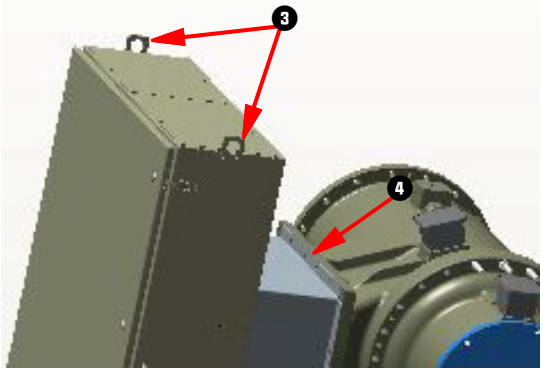
- *Before servicing, disconnect all power sources and allow at least 30 minutes for capacitors to discharge.*
- *All electrical enclosures–unit or remote–are IP2X.*

Figure 13. Wye-delta starter (lower)



1. Mark and disconnect the power wiring at the compressor motor terminal lugs inside the starter panel.
2. Mark and disconnect control wiring entering the starter panel.

Figure 14. Wye-delta starter lift points



⚠WARNING

Heavy Objects!

Placing, assembling, and/or suspending more than one module/subassembly at a time could result in death, serious injury, or equipment damage.
Always place, assemble, and suspend modules/ subassemblies one at a time.

3. Support the starter with rigging at lift points on top of the starter. Refer to Table 13, p. 19 for starter weights.
4. Loosen the bolts which hold the starter to the flange on the motor.
5. Remove the bolts which hold the starter to the flange on the motor.
6. Using proper rigging, lift and remove the starter panel.
7. Store the panel in a clean dry area free of any corrosive agents.

Reassemble the panel on the chiller in reverse order.

AFDE Unit-mounted Starter Removal

⚠WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/ tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

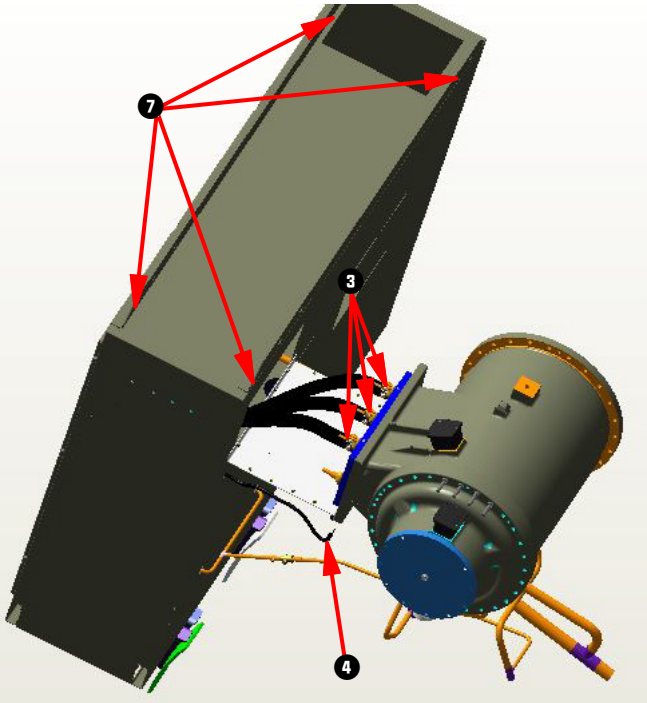
Note: *Graphic labels (shown above) are used for CE application only.*

Important:

- *Before servicing, disconnect all power sources and allow at least 30 minutes for capacitors to discharge.*
- *All electrical enclosures—unit or remote—are IP2X.*

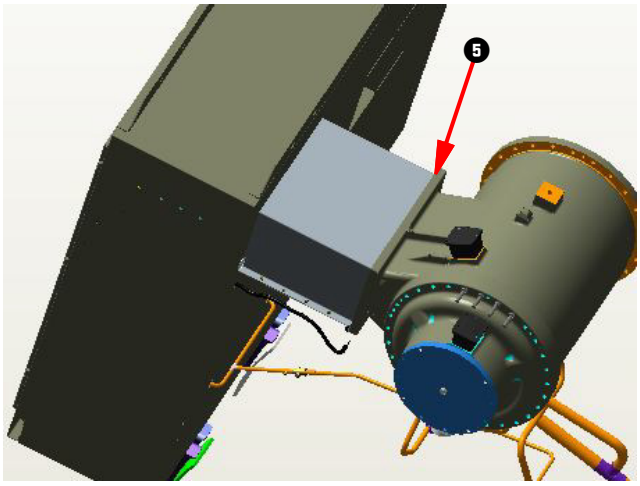
1. Remove nitrogen charge.
2. Disconnect and remove control panel wiring from AFDE Adaptive Frequency™ drive.

Figure 15. AFDE (top)



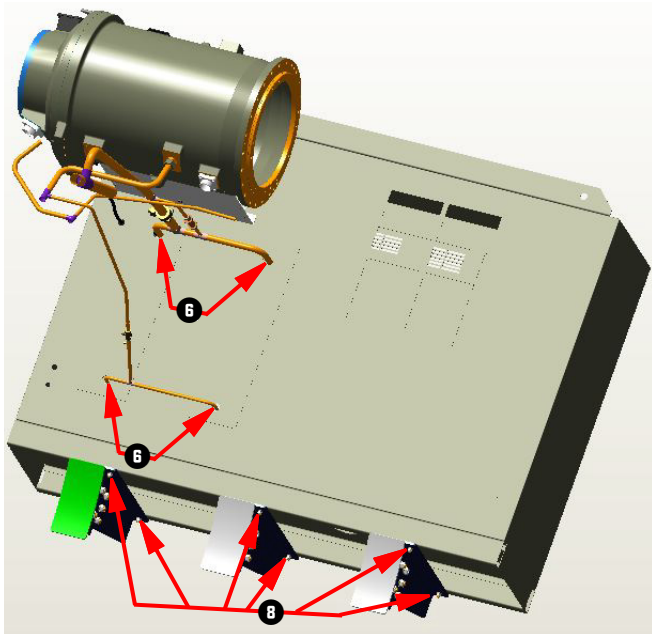
3. Open far right drive panel door to access ERIFLEX® **FLEXIBAR**® (Flexible Insulated Busbar) connected to compressor motor.
   a. Use a backup wrench while removing fasteners for **FLEXIBAR**.
   b. Unbolt **FLEXIBAR** from motor terminals at the motor terminal board.
   c. Carefully pull **FLEXIBAR** away from motor terminals.
4. Disconnect ground strap at motor/**AFDE** terminal cover.

Figure 16. AFDE motor terminal cover



5. Unbolt motor/**AFDE** terminal cover from motor.

Figure 17. AFDE (bottom)



6. Unbolt the **AFDE** cooling piping from the back side of the **AFDE** (4 O-ring flanges with 2 bolts each).
7. Support **AFDE** with rigging at lift points on top of **AFDE**.
8. Unbolt the AFDE from the mounting brackets (2 bolts per bracket).
9. Remove the **AFDE**.
10. Remove the **AFDE** brackets from the evaporator shell.
11. Secure in a clean, dry environment.
12. Install in reverse order.

Control Panel Removal

⚠WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

Note: *Graphic labels (shown above) are used for CE application only.*

Important:

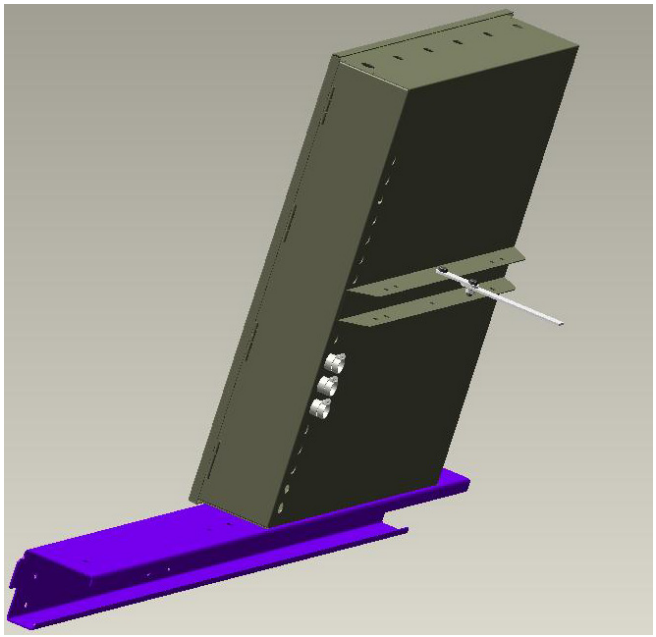
- *Before servicing, disconnect all power sources and allow at least 30 minutes for capacitors to discharge.*
- *All electrical enclosures—unit or remote—are IP2X.*

Figure 18. Control panel

Use the following steps to remove the control panel if additional horizontal clearance is required.

1. Mark and disconnect incoming wiring to the control panel.
2. Remove the bolts from the bottom of the panel which secure the panel to the lower mounting bracket.
3. Loosen the bolts on the back of the panel which secure the panel to the top (suction elbow) mounting bracket. See Figure 19, p. 24.

Figure 19. Control panel mounting bracket



4. Two people will be needed to lift the panel clear of the chiller. Refer to Table 9, p. 18 for control panel weight. Steady the panel as the top retaining bolts are removed. Then lift the panel clear. Store the panel in a clean dry area.

Use the reverse order to reassemble the control panel.

Tracer AdaptiView™ Display Arm Removal

⚠WARNING

Hazardous Voltage w/Capacitors!

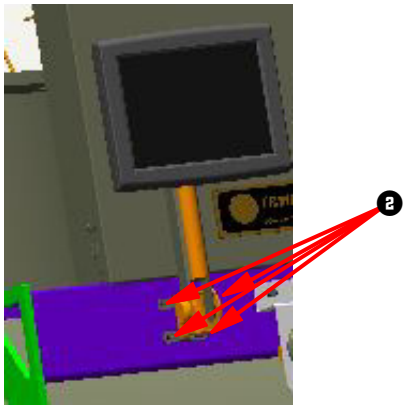
Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

Note: *Graphic labels (shown above) are used for CE application only.*

Important:

- *Before servicing, disconnect all power sources and allow at least 30 minutes for capacitors to discharge.*
- *All electrical enclosures—unit or remote—are IP2X.*

Figure 20. Tracer AdaptiView display arm



Use the following steps to remove the Tracer AdaptiView™ display arm if additional clearance is required.

1. Cut tie wraps holding wires inside of control arm and remove wires from arm.
2. Remove the four bolts that mount the arm from the channel below the control panel.

Use the reverse order to re-attach the arm to the control panel mounting bracket.

Purge Unit Removal

⚠WARNING

Refrigerant May Be Under Positive Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.
System contains refrigerant and may be under positive pressure; system may also contain oil. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or non-approved refrigerant additives.

⚠WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

Note: *Graphic labels (shown above) are used for CE application only.*

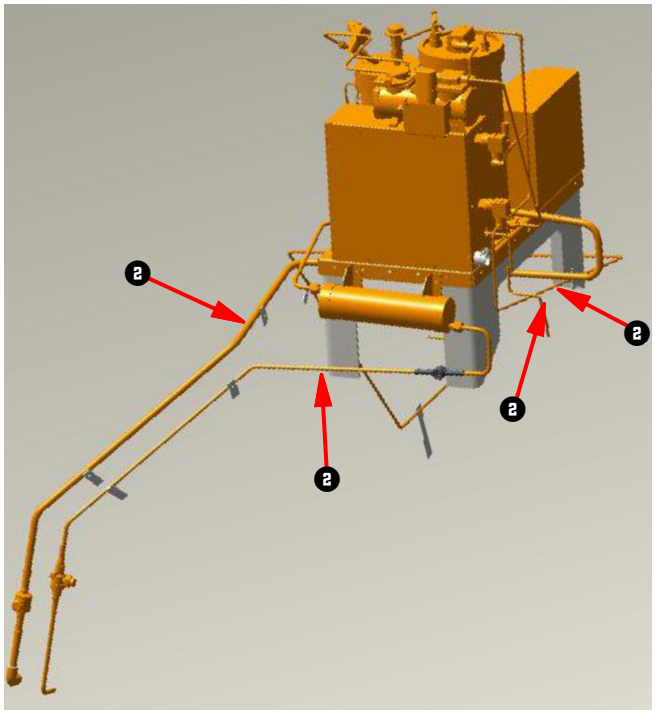
Important:

- *Before servicing, disconnect all power sources and allow at least 30 minutes for capacitors to discharge.*
- *All electrical enclosures—unit or remote—are IP2X.*

To remove the purge assembly (see Figure 21, p. 26) from the top of the condenser:

1. Isolate the purge unit from the condenser shell by closing the vapor and liquid line valves.
2. Disconnect and mark all piping and wiring attached to the purge unit. Sand all paint off at points and use a tubing cutter where cuts are to be made. Cut four tubes at points shown in Figure 21, p. 26.

Figure 21. Cut lines where indicated (four places) to remove purge assembly



3. Remove the fasteners connecting the purge unit base to its mounting bracket.
4. Two people will be needed to lift purge unit clear of the chiller. Refer to Table 9, p. 18 for purge unit weight. Store the purge unit in a clean dry area.

Reassemble the purge unit in reverse order when the process is complete.

Economizer Removal

⚠WARNING

Heavy Objects!

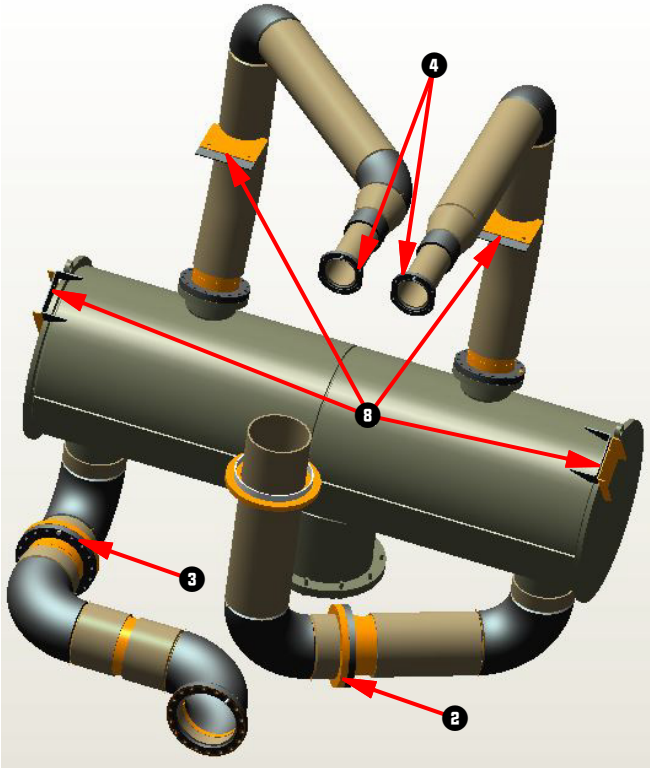
Failure to follow instructions below could result in unit dropping which could result in death or serious injury, and equipment or property-only damage.
Ensure that all the lifting equipment used is properly rated for the weight of the unit being lifted. Each of the cables (chains or slings), hooks, and shackles used to lift the unit must be capable of supporting the entire weight of the unit. Lifting cables (chains or slings) may not be of the same length. Adjust as necessary for even unit lift.

⚠WARNING

Refrigerant May Be Under Positive Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.
System contains refrigerant and may be under positive pressure; system may also contain oil. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or non-approved refrigerant additives.

Figure 22. Economizer

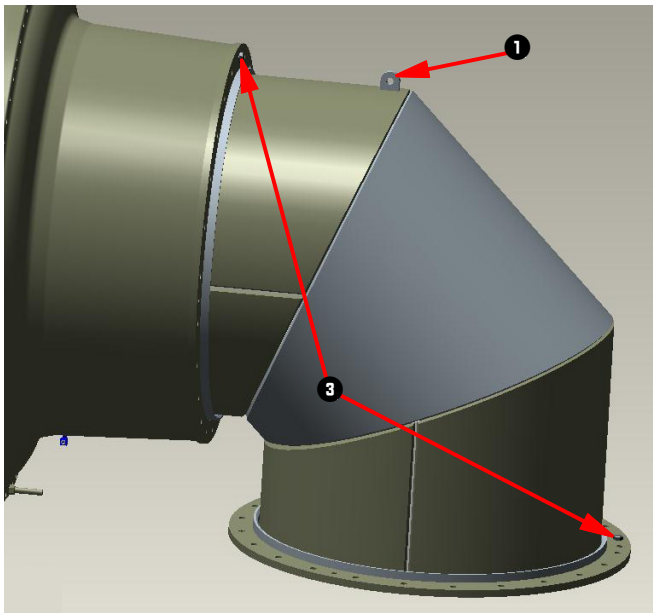


Use the following steps to remove the economizer if additional horizontal clearance is required.

1. Support the weight of the economizer with either a movable floor jack or gantry and lifting chains with clevises. Economizer weight is provided in Table 9, p. 18; also see submittal. It is recommended that larger size economizers be lifted using overhead rigging.
2. If the unit has insulation, remove the insulation and loosen the bolts on the condenser liquid line flange. See Figure 22, p. 27. Do not remove the bolts at this time.
3. Loosen the bolts on the evaporator liquid line flange. This connection is near the bottom of the evaporator. See Figure 22, p. 27. Do not remove the bolts at this time.
4. Loosen the economizer vent pipe bolts that secure the vent pipes to the compressor interstage castings (unless the compressor has already been removed to gain vertical clearance).
5. Secure economizer with appropriate rigging.
6. Remove the bolts from the condenser and evaporator liquid line connection flanges. Adjust the floor jack or gantry and lifting chains as necessary to support the weight of the economizer.
7. Remove the economizer vent pipe flange bolts.
8. Economizers are connected to the condenser shell via four bolted mounting brackets. See Figure 31, p. 31. Remove the bolts at all four mounting brackets.
9. When the bolts are free, back the economizer away from the chiller. If using floor jack, the economizer may tend to rotate off the jack towards the chiller; be prepared to offset the rotation.
10. Remove the economizer orifice plates and mark them so they are reinstalled in their original position. The orifice with the greatest number of holes is to be located between the economizer and the evaporator. The orifice with fewer holes is to be located between the condenser and economizer.
11. Move the economizer away from the chiller and set it on a pallet. Cover all openings to prevent the entry of foreign material into the economizer, condenser and compressor.
12. Use the reverse order to reassemble the economizer on the chiller. Be sure to install new gaskets at the appropriate joints.
13. Torque all bolts to specifications. Consult with your Trane service group for specific torques for your economizer design.

Compressor Suction Elbow Removal

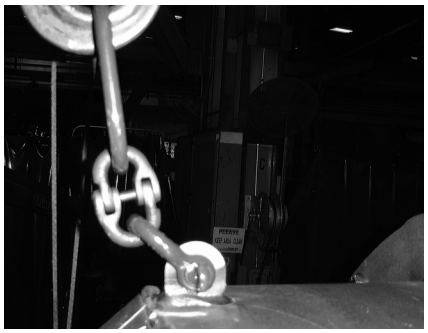
Figure 23. Compressor suction elbow

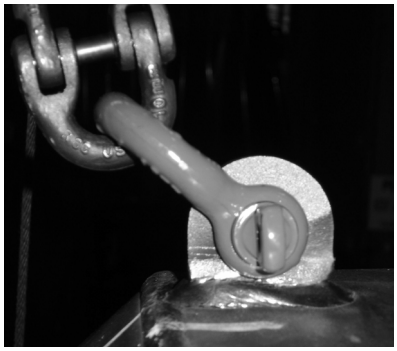


The compressor suction elbow has a lifting tab for use in the removal process.

1. Use a lifting clevis to remove the suction elbow, shackle-type Crosby screw pin shackle model S-209, stock number 1018482 with a 5/8-in. pin or equivalent.

Figure 24. Lifting clevis on the suction elbow lifting tab (three-piece elbow style)





2. Ensure that control panel mounting bracket bolts have been removed.
3. Remove suction elbow bolts at the compressor and evaporator flange connections.
4. Being careful to avoid damage to the flange surfaces, lift the suction elbow from the chiller.
5. Install protective covering on the evaporator and compressor flange connections.
6. Torque all bolts to specifications.

Compressor Removal

Figure 25. Compressor and motor

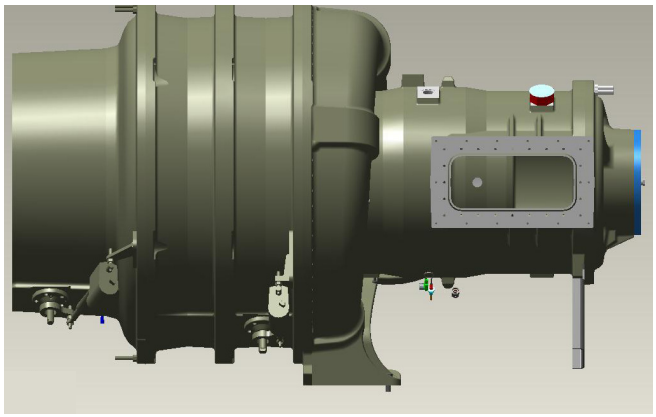


Figure 26, p. 28 and Figure 27, p. 29 show factory-installed compressor doweling on shell and foot.

Figure 26. Compressor foot and discharge volute

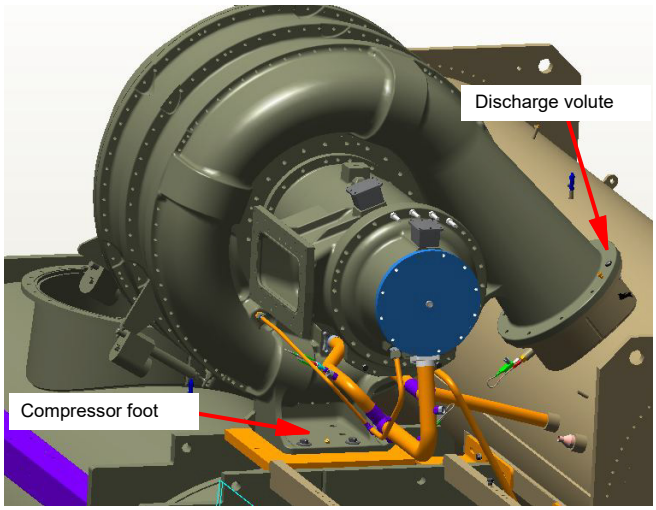
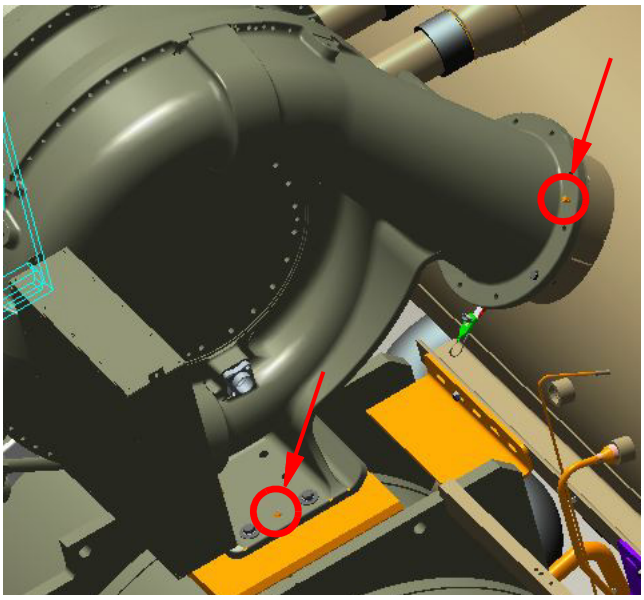


Figure 27. Compressor foot and volute doweling



⚠WARNING

Refrigerant May Be Under Positive Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.
System contains refrigerant and may be under positive pressure; system may also contain oil. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or non-approved refrigerant additives.

NOTICE

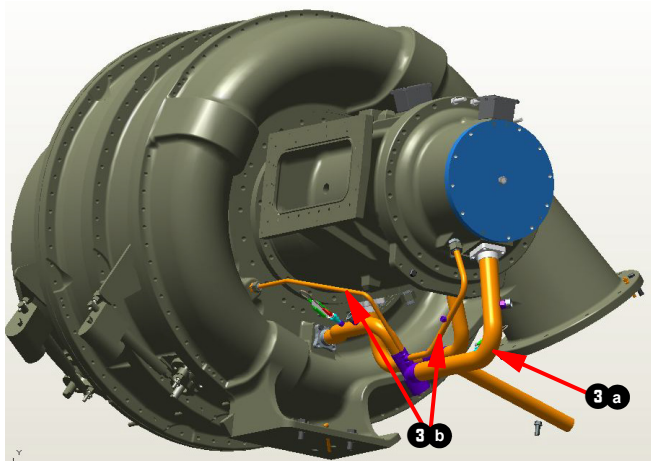
Equipment Damage!

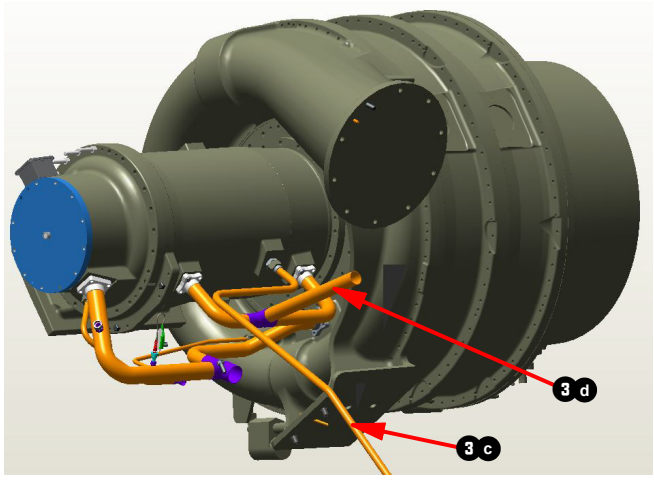
Failure to follow instructions below could result in equipment damage.
The cast iron foot of the compressor and the discharge flange of the volute can be broken easily if rough handling of the compressor/motor assembly is allowed. Take great care to prevent this breakage when removing the compressor/motor assembly and setting it down, or when moving it laterally on the floor (e.g., on rollers, etc). Take extra care to gently sit the compressor/motor assembly down and avoid letting it swing or drop into an obstruction while lifting or moving it.

Important: *Before removing the compressor, remove the starter, control panel, purge, economizer, and suction elbow.*

1. Mark and disconnect the control and sensor wiring.
2. Disconnect the control wiring from the inlet guide vane actuators.

Figure 28. Compressor lube cooling lines





3. Disconnect all external vent lines, motor cooling supply and drain lines, and the oil supply and drain which are connected to the compressor and compressor motor.
   a. Unbolt the oil return piping flanges at the back base of motor and the discharge volute.
   b. Disconnect the oil supply piping from base of motor and back of the discharge volute.
   c. Unbolt the motor cooling return piping flanges at the base of the motor.
   d. Disconnect the motor cooling supply piping from base of the motor.

⚠WARNING

Heavy Objects!

Failure to follow instructions below could result in unit dropping which could result in death or serious injury, and equipment or property-only damage.
Ensure that all the lifting equipment used is properly rated for the weight of the unit being lifted. Each of the cables (chains or slings), hooks, and shackles used to lift the unit must be capable of supporting the entire weight of the unit. Lifting cables (chains or slings) may not be of the same length. Adjust as necessary for even unit lift.

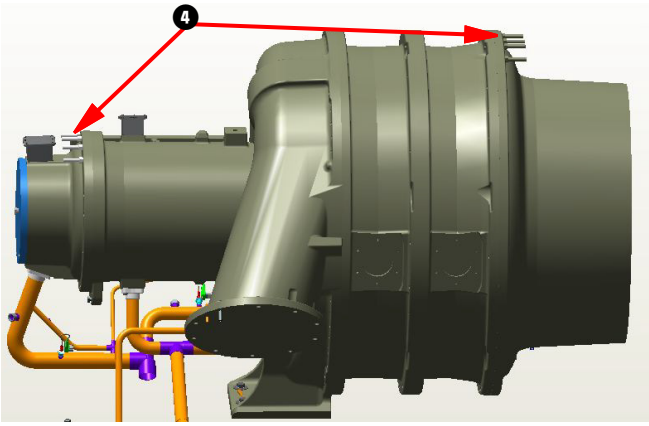
⚠WARNING

Improper Unit Lift!

Using the elbow lifting tab to lift chiller could result in chiller dropping which could result in death, serious injury, or equipment damage.

- **Do NOT lift chiller using elbow lifting tab. Elbow lifting tab and approved clevis are used ONLY when removing elbow from chiller.**
- **Do not lift chiller utilizing waterbox lifting lug. Waterbox lifting lug is to be used only for removing waterbox from chiller.**

Figure 29. Compressor lift points



4. Install certified lifting fixtures to the compressor and motor at lift points on the compressor and motor.
5. Secure compressor assembly with proper rigging.

Important: *Rigging must be able to support the entire weight of the compressor and motor assembly.*

6. With the weight of the compressor and motor secured by the external rigging, loosen and remove the bolts at the compressor foot and discharge volute.

Notes:

- *Jack bolts may be required to separate the foot from the evaporator shell.*
- *Jack bolts may be required to separate the discharge volute from the condenser flange.*

7. Cover and store the compressor assembly in a clean and dry environment. Cover all openings of the compressor assembly with plastic and tape.

Reinstall compressor in reverse order.

Evaporator/Condenser Shell Separation

After the compressor assembly has been removed on separable shell units, the condenser and evaporator shells can be taken apart at flanged connections to reduce the horizontal clearance required for the chiller installation.

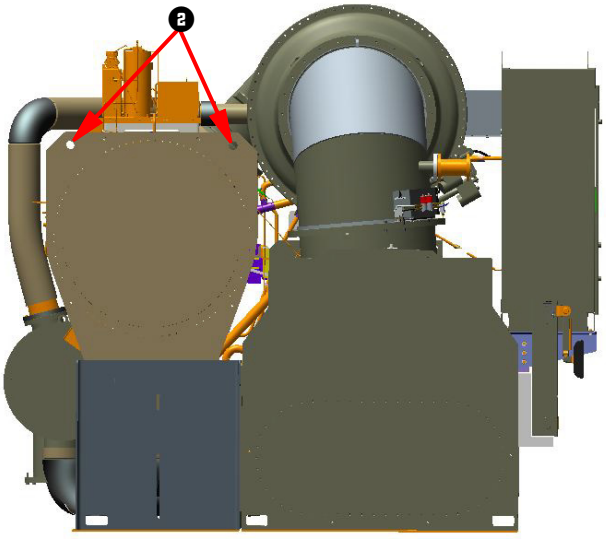
⚠WARNING

Heavy Objects!

Failure to follow instructions below could result in unit dropping which could result in death or serious injury, and equipment or property-only damage.
Ensure that all the lifting equipment used is properly rated for the weight of the unit being lifted. Each of the cables (chains or slings), hooks, and shackles used to lift the unit must be capable of supporting the entire weight of the unit. Lifting cables (chains or slings) may not be of the same length. Adjust as necessary for even unit lift.

1. Ensure that condenser and evaporator shells are securely supported on level ground. If not, shim under the bases.
2. Support the condenser with rigging using the lifting holes on the tube sheets. See Figure 30, p. 30. Do not lift the shell, simply support it to avoid slipping as the bolts are removed from the connecting flange.

Figure 30. Separable shell unit (end view)



3. Remove the bolts from the flanges connecting the evaporator tube sheet and condenser shell support (see

Figure 31, p. 31). Then remove the bolts from the flanges connecting the shells.

Note: *Some small shell combinations do not have flanged connections between shells.*

4. Remove the two dowel pins located in the flange on each end of the shell tube sheet connections and lift the condenser clear of the evaporator.
5. Reassemble the evaporator and condenser shells in the reverse order.
6. Torque all bolts to specifications listed in Table 14, p. 32.

Figure 31. Separable shell foot

Unit Reassembly

NOTICE

Equipment Damage!

Failure to remove the strain relief with the sensor could result in equipment damage.
Do NOT attempt to pull sensor bulb through the strain relief; always remove the entire strain relief with the sensor.

It is important to remove used O-rings and gaskets and clean joints before reassembling the compressor with new O-rings and gaskets. All necessary replacement O-rings and gaskets are supplied by the factory when the compressor doweling or separable shell options are ordered.

Note: *Due to the pressure vessel codes applied to CVHH and CDHH CenTraVac™ chillers, the bolts used for both the economizer sump cover and the oil tank cover are specified for both ASME and PED application (SCREW, METRIC CAP-M16 x 70 mm with FULL THREAD), HEAVY HEXAGON HEAD - ASME SA-193M GRADE B7, ZINC PLATED.*
Do not substitute! *Contact your local Trane representative for replacement bolts.*

Refer to CTV-SB-66*-EN (*General Service Bulletin: CenTraVac O-Ring and Flange Sealant*), or the most recent version, for proper installation of gaskets, O-Rings, and Loctite® sealant. Install a new O-ring on the compressor discharge connection mating surfaces. Use Loctite 515 **Gasket Eliminator** to lubricate the O-ring and provide additional sealing. This is the only sealing compound recommended by Trane for use on O-ring joints. To use this sealing compound, apply a light bead (approximately 1/8-in. in diameter) to the O-ring groove, insert the O-ring and then apply a light bead to the O-ring. Also apply a 1/8-in. bead of sealing compound between the O-ring groove and the bolt hole circle. The parts can now be assembled.

Torque all bolts to specifications listed in Table 14, p. 32.

Table 14. Bolt torques for waterbox mounting

Bolt Size		Torque	
(in)	(mm)	(ft·lb)	(N·m)
1/2	13	70–100	95–136
5/8	16	130–190	176–258

Metric Bolt Size (Non-Gasketed Joints or O-ring Joints)

Bolt Size	Torque	
	(ft·lb)	(N·m)
M8	12–16	16–22
M10	24–33	33–45
M12	48–65	65–89
M16	130–179	177–243
M20	239–334	324–453

Reconnect the previously cut compressor/motor oil supply and return lines and the motor cooling lines using the factory-supplied couplings.

Brazing

⚠WARNING

Explosion Hazard and Deadly Gases!

Failure to follow all proper safe refrigerant handling practices could result in death or serious injury. Never solder, braze or weld on refrigerant lines or any unit components that are above atmospheric pressure or where refrigerant may be present. Always remove refrigerant by following the guidelines established by the EPA Federal Clean Air Act or other state or local codes as appropriate. After refrigerant removal, use dry nitrogen to bring system back to atmospheric pressure before opening system for repairs. Mixtures of refrigerants and air under pressure may become combustible in the presence of an ignition source leading to an explosion. Excessive heat from soldering, brazing or welding with refrigerant vapors present can form highly toxic gases and extremely corrosive acids.

Except as noted in the following, braze with the following filler metals:

- Braze all copper-to-copper joints with A.W.S. BCuP-6 filler metal.
- Braze all copper-to-brass joints with A.W.S. BCuP-6 filler metal using white or black brazing flux.
- Braze all other joints with A.W.S. BAg-28 filler metal.

Bleed dry nitrogen through the lines while brazing to prevent the formation of oxides which can contaminate the oil and refrigerant systems.

Note: *Use silver soldering with 96% Sn-4% Ag (for example, J.W. Harris Co. Stay Brite®) to replace brazing when the heat from brazing would be detrimental to the immediate or nearby parts.*

Examples:

1. Joints next to threaded joints in which the copper or brass threads become too soft and/or Loctite loses its sealing capability due to excess heat.
2. Joints next to valves in which the valves cannot be taken apart or are not recommended for brazing.

Final Installation Procedures

After the chiller has been moved to the equipment room and reassembled under Trane supervision, leak testing, and evacuation can be performed by Trane or under Trane supervision. Upon verification of leak tightness, installation can proceed for unit piping, wiring, etc. After installation has been completed, fill out *CenTraVac™ Installation Completion Check Sheet and Request for Trane Service* (CTV-ADF001*-EN) to schedule the startup; the chiller commissioning process can be completed by Trane or under the supervision of authorized Trane personnel.

Note: *Forms in* (CTV-ADF001*-EN) *also includes section of CenTraVac™ Water-cooled Chillers Model CVHH With Symbio™ Controls Installation, Operation, and Maintenance* (CVHH-SVX003*-EN) *and CenTraVac™ Water-cooled Chillers Model CDHH With Symbio™ Controls Installation, Operation, and Maintenance* (CDHH-SVX003*-EN).

Notes

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

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